

Texinfo

The GNU Documentation Format
for Texinfo version 7.1, 18 October 2023

Robert J. Chassell
Richard M. Stallman

This manual is for GNU Texinfo (version 7.1, 18 October 2023), a documentation system that can produce both online information and a printed manual from a single source using semantic markup.

Copyright © 1988-2023 Free Software Foundation, Inc.

Permission is granted to copy, distribute and/or modify this document under the terms of the GNU Free Documentation License, Version 1.3 or any later version published by the Free Software Foundation; with no Invariant Sections, no Front-Cover Texts, and no Back-Cover Texts. A copy of the license is included in the section entitled “GNU Free Documentation License”.

Published by the Free Software Foundation
51 Franklin St, Fifth Floor
Boston, MA 02110-1301
USA
ISBN 1-882114-67-1

Short Contents

Texinfo Copying Conditions	1
1 Overview of Texinfo	2
2 Writing a Texinfo File	9
3 Nodes	27
4 Chapter Structuring	38
5 Cross-references	44
6 Marking Text, Words and Phrases	55
7 Quotations and Examples	66
8 Lists and Tables	76
9 Special Displays	84
10 Indices	91
11 Special Insertions	98
12 Forcing and Preventing Breaks	114
13 Definition Commands	118
14 Internationalization	131
15 Conditionally Visible Text	134
16 Defining New Texinfo Commands	144
17 Include Files	155
18 Formatting and Printing with \TeX	157
19 <code>texi2any</code> : The Translator for Texinfo	164
20 Creating and Installing Info Files	196
21 Generating HTML	205
A @-Command Details	217
B Tips and Hints	242
C Sample Texinfo Files	247
D Using Texinfo Mode	251
E Global Document Commands	275
F Info Format Specification	283
G GNU Free Documentation License	289
Command and Variable Index	297
General Index	303

Table of Contents

Texinfo Copying Conditions	1
1 Overview of Texinfo	2
1.1 Reporting Bugs	2
1.2 Output Formats	3
1.3 Info Files	4
1.4 Printed Books	5
1.5 Adding Output Formats	5
1.6 History	6
2 Writing a Texinfo File	9
2.1 General Syntactic Conventions	9
2.2 Comments	10
2.3 What a Texinfo File Must Have	10
2.4 Short Sample	11
2.5 Texinfo File Header	12
2.5.1 The First Line of a Texinfo File	13
2.5.2 @setfilename: Set the Output File Name	13
2.5.3 @settitle: Set the Document Title	14
2.5.4 Preamble	14
2.5.5 Start and End of Header for Emacs	15
2.6 Directory Category	16
2.7 Document Permissions	16
2.7.1 @copying: Declare Copying Permissions	17
2.7.2 @insertcopying: Include Permissions Text	18
2.8 Title and Copyright Pages	18
2.8.1 @titlepage	18
2.8.2 @title, @subtitle, and @author	19
2.8.3 @titlefont, @center, and @sp	20
2.8.4 Copyright Page	21
2.8.5 Heading Generation	22
2.9 Generating a Table of Contents	22
2.10 The ‘Top’ Node and Master Menu	23
2.10.1 Parts of a Master Menu	23
2.11 The Body of the Document	24
2.12 Ending a Texinfo File	26
3 Nodes	27
3.1 Writing a @node Line	27
3.2 Choosing Node Names	28
3.3 @node Line Requirements	29
3.4 The First Node	30

3.5	The <code>@top</code> Sectioning Command.....	31
3.6	Texinfo Document Structure.....	31
3.7	Node and Menu Illustration.....	32
3.8	Node Descriptions.....	33
3.9	Menus.....	34
3.9.1	Writing a Menu.....	34
3.9.2	A Menu Example.....	35
3.9.3	Menu Location.....	36
3.9.4	The Parts of a Menu.....	36
3.9.5	Less Cluttered Menu Entry.....	37
3.9.6	Referring to Other Info Files.....	37
4	Chapter Structuring.....	38
4.1	Tree Structure of Sections.....	38
4.2	Structuring Command Types.....	38
4.3	<code>@chapter</code> : Chapter Structuring.....	39
4.4	<code>@unnumbered</code> , <code>@appendix</code> : Chapters with Other Labeling.....	40
4.5	<code>@majorheading</code> , <code>@chapheading</code> : Chapter-level Headings.....	40
4.6	<code>@section</code> : Sections Below Chapters.....	40
4.7	<code>@unnumberedsec</code> , <code>@appendixsec</code> , <code>@heading</code>	41
4.8	<code>@subsection</code> : Subsections Below Sections.....	41
4.9	The <code>@subsection</code> -like Commands.....	41
4.10	<code>@subsubsection</code> and Other Subsub Commands.....	42
4.11	<code>@part</code> : Groups of Chapters.....	42
4.12	Raise/lower Sections: <code>@raisesections</code> and <code>@lowersections</code> ...	43
5	Cross-references.....	44
5.1	Different Cross-reference Commands.....	44
5.2	Parts of a Cross-reference.....	44
5.3	<code>@xref</code> with One Argument.....	45
5.4	<code>@xref</code> with Two Arguments.....	46
5.5	<code>@xref</code> with Three Arguments.....	46
5.6	<code>@xref</code> with Four and Five Arguments.....	47
5.7	Referring to a Manual as a Whole.....	48
5.8	<code>@xref</code>	49
5.9	<code>@ref</code>	49
5.10	<code>@pxref</code>	50
5.11	<code>@anchor</code> : Defining Arbitrary Cross-reference Targets.....	50
5.12	<code>@link</code> : Plain, unadorned hyperlink.....	51
5.13	<code>@inforef</code> : Cross-references to Info-only Material.....	51
5.14	<code>@url</code> , <code>@uref{url[, text] [, replacement]}</code>	51
5.14.1	<code>@url</code> Examples.....	52
5.14.2	URL Line Breaking.....	53
5.14.3	<code>@url</code> PDF Output Format.....	53
5.15	<code>@cite{reference}</code>	53
5.16	PDF Colors.....	54

6	Marking Text, Words and Phrases	55
6.1	Indicating Definitions, Commands, etc.	55
6.1.1	Highlighting Commands are Useful	55
6.1.2	<code>@code{sample-code}</code>	56
6.1.3	<code>@kbd{keyboard-characters}</code>	57
6.1.4	<code>@key{key-name}</code>	58
6.1.5	<code>@samp{text}</code>	58
6.1.6	<code>@verb{char text char}</code>	59
6.1.7	<code>@var{metasyntactic-variable}</code>	59
6.1.8	<code>@env{environment-variable}</code>	60
6.1.9	<code>@file{file-name}</code>	60
6.1.10	<code>@command{command-name}</code>	61
6.1.11	<code>@option{option-name}</code>	61
6.1.12	<code>@dfn{term}</code>	61
6.1.13	<code>@abbr{abbreviation[, meaning]}</code>	61
6.1.14	<code>@acronym{acronym[, meaning]}</code>	62
6.1.15	<code>@indicateurl{uniform-resource-locator}</code>	63
6.1.16	<code>@email{email-address[, displayed-text]}</code>	63
6.2	Emphasizing Text	63
6.2.1	<code>@emph{text}</code> and <code>@strong{text}</code>	63
6.2.2	<code>@sc{text}</code> : The Small Caps Font	64
6.2.3	Fonts for Printing	64
7	Quotations and Examples	66
7.1	Block Enclosing Commands	66
7.2	<code>@quotation</code> : Block Quotations	67
7.3	<code>@indentedblock</code> : Indented text blocks	68
7.4	<code>@example</code> : Example Text	68
7.5	<code>@verbatim</code> : Literal Text	69
7.6	<code>@lisp</code> : Marking a Lisp Example	70
7.7	<code>@display</code> : Examples Using the Text Font	70
7.8	<code>@format</code> : Examples Using the Full Line Width	70
7.9	<code>@exdent</code> : Undoing a Line's Indentation	71
7.10	<code>@flushleft</code> and <code>@flushright</code>	71
7.11	<code>@raggedright</code> : Ragged Right Text	72
7.12	<code>@noindent</code> : Omitting Indentation	73
7.13	<code>@indent</code> : Forcing Indentation	73
7.14	<code>@cartouche</code> : Rounded Rectangles	74
7.15	<code>@small...</code> Block Commands	75

8	Lists and Tables	76
8.1	Introducing Lists	76
8.2	<code>@itemize</code> : Making an Itemized List	77
8.3	<code>@enumerate</code> : Making a Numbered or Lettered List	78
8.4	Making a Two-column Table	79
8.4.1	Using the <code>@table</code> Command	79
8.4.2	<code>@ftable</code> and <code>@vtable</code>	81
8.4.3	<code>@itemx</code> : Second and Subsequent Items	81
8.5	<code>@multitable</code> : Multi-column Tables	81
8.5.1	Multitable Column Widths	82
8.5.2	Multitable Rows	82
9	Special Displays	84
9.1	Floats	84
9.1.1	<code>@float</code> [<i>type</i>][<i>label</i>]: Floating Material	84
9.1.2	<code>@caption</code> & <code>@shortcaption</code>	85
9.1.3	<code>@listoffloats</code> : Tables of Contents for Floats	86
9.2	Inserting Images	86
9.2.1	Image Syntax	86
9.2.2	Image Scaling	87
9.3	Footnotes	88
9.3.1	Footnote Commands	88
9.3.2	Footnote Styles	89
10	Indices	91
10.1	Predefined Indices	91
10.2	Defining the Entries of an Index	92
10.3	Advanced Indexing Commands	93
10.4	Making Index Entries	93
10.5	Printing Indices and Menus	94
10.6	Combining Indices	95
10.6.1	<code>@syncodeindex</code> : Combining Indices Using <code>@code</code>	95
10.6.2	<code>@synindex</code> : Combining Indices	96
10.7	Defining New Indices	96
11	Special Insertions	98
11.1	Special Characters: Inserting @ { } , \ # &	98
11.1.1	Inserting '@' with <code>@@</code> and <code>@atchar{}</code>	98
11.1.2	Inserting '{' with <code>@{ @}</code> and <code>@l rbracechar{}</code>	98
11.1.3	Inserting ',' with <code>@comma{}</code>	98
11.1.4	Inserting '\' with <code>@backslashchar{}</code>	99
11.1.5	Inserting '#' with <code>@hashchar{}</code>	99
11.1.6	Inserting '&' with <code>@&</code> and <code>@ampchar{}</code>	99
11.2	Inserting Quote Characters	100
11.3	Inserting Space	101

11.3.1	Multiple Spaces	101
11.3.2	Not Ending a Sentence	101
11.3.3	Ending a Sentence	102
11.3.4	<code>@frenchspacing val</code> : Control Sentence Spacing	102
11.3.5	<code>@dmn{dimension}</code> : Format a Dimension	103
11.4	Inserting Accents	103
11.5	Inserting Quotation Marks	104
11.6	<code>@sub</code> and <code>@sup</code> : Inserting Subscripts and Superscripts	106
11.7	<code>@math</code> and <code>@displaymath</code> : Formatting Mathematics	106
11.8	Glyphs for Text	107
11.8.1	<code>@TeX{}</code> (T _E X) and <code>@LaTeX{}</code> (L ^A T _E X)	107
11.8.2	<code>@copyright{}</code> (©)	107
11.8.3	<code>@registeredsymbol{}</code> (®)	107
11.8.4	<code>@dots (...)</code> and <code>@enddots (...)</code>	107
11.8.5	<code>@bullet (•)</code>	108
11.8.6	<code>@euro (€)</code> : Euro Currency Symbol	108
11.8.7	<code>@pounds (£)</code> : Pounds Sterling	108
11.8.8	<code>@textdegree (°)</code> : Degrees Symbol	108
11.8.9	<code>@minus (-)</code> : Inserting a Minus Sign	108
11.8.10	<code>@geq (≥)</code> and <code>@leq (≤)</code> : Inserting Relations	108
11.9	Glyphs for Programming	109
11.9.1	Glyphs Summary	109
11.9.2	<code>@result{}</code> (⇒): Result of an Expression	109
11.9.3	<code>@expansion{}</code> (↦): Indicating an Expansion	109
11.9.4	<code>@print{}</code> (⊖): Indicating Generated Output	110
11.9.5	<code>@error{}</code> (⊞): Indicating an Error Message	110
11.9.6	<code>@equiv{}</code> (≡): Indicating Equivalence	111
11.9.7	<code>@point{}</code> (★): Indicating Point in a Buffer	111
11.9.8	Click Sequences	112
11.10	Inserting Unicode: @U	112

12 Forcing and Preventing Breaks 114

12.1	Break Commands	114
12.2	<code>@*</code> and <code>@/</code> : Generate and Allow Line Breaks	114
12.3	<code>@-</code> and <code>@hyphenation</code> : Hyphenation in Printed Output	115
12.4	<code>@allowcodebreaks</code> : Control Line Breaks in <code>@code</code>	115
12.5	<code>@w{text}</code> : Prevent Line Breaks	115
12.6	<code>@tie{}</code> : Inserting an Unbreakable Space	116
12.7	<code>@sp n</code> : Insert Blank Lines	116
12.8	<code>@page</code> : Start a New Page	116
12.9	<code>@group</code> : Prevent Page Breaks	116
12.10	<code>@need mils</code> : Prevent Page Breaks	117

13	Definition Commands	118
13.1	The Template for a Definition	118
13.2	Definition Command Continuation Lines	119
13.3	Optional and Repeated Arguments	119
13.4	Omitting the Space After a Definition Name	120
13.5	<code>@defn_x</code> , et al.: Two or More ‘First’ Lines	120
13.6	The Definition Commands	120
13.6.1	Functions and Similar Entities	120
13.6.2	Functions in Typed Languages	121
13.6.3	Variables and Similar Entities	123
13.6.4	Variables in Typed Languages	124
13.6.5	Data Types	124
13.6.6	Object-Oriented Programming	125
13.6.6.1	Object-Oriented Variables	125
13.6.6.2	Object-Oriented Methods	126
13.7	Generic Definition Commands	127
13.8	Conventions for Writing Definitions	128
13.9	A Sample Function Definition	129
14	Internationalization	131
14.1	<code>@documentlanguage</code> <i>ll[_cc]</i> : Set the Document Language	131
14.2	<code>@documentencoding</code> <i>enc</i> : Set Input Encoding	132
15	Conditionally Visible Text	134
15.1	Conditional Commands	134
15.2	Conditional Not Commands	135
15.3	Raw Formatter Commands	136
15.4	Inline Conditionals: <code>@inline</code> , <code>@inlineifelse</code> , <code>@inlineraw</code> ...	137
15.5	Flags: <code>@set</code> , <code>@clear</code> , conditionals, and <code>@value</code>	138
15.5.1	<code>@set</code> and <code>@value</code>	138
15.5.2	<code>@ifset</code> and <code>@ifclear</code>	139
15.5.3	<code>@inlineifset</code> and <code>@inlineifclear</code>	140
15.5.4	<code>@value</code> Example	140
15.6	Testing for Texinfo Commands: <code>@ifcommanddefined</code> , <code>@ifcommandnotdefined</code>	141
15.7	Conditional Nesting	142
16	Defining New Texinfo Commands	144
16.1	Defining Macros	144
16.2	Invoking Macros	145
16.3	Macro Details and Caveats	147
16.4	‘ <code>@alias new=existing</code> ’	150
16.5	Line Macros	151
16.6	<code>@definfoenclose</code> : Customized Highlighting	152
16.7	External Macro Processors: Line Directives	153

16.7.1	'#line' Directive	153
16.7.2	'#line' and \TeX	153
16.7.3	'#line' Syntax Details	154
17	Include Files	155
17.1	How to Use Include Files	155
17.2	Sample File with <code>@include</code>	155
17.3	<code>@verbatiminclude file</code> : Include a File Verbatim	156
18	Formatting and Printing with \TeX	157
18.1	Use \TeX	157
18.2	Format with <code>texi2dvi</code> or <code>texi2pdf</code>	157
18.3	Format with <code>tex/texindex</code>	159
18.3.1	Formatting Partial Documents	160
18.3.2	Details of <code>texindex</code>	161
18.4	Print with <code>lpr</code> from Shell	161
18.5	Preparing for \TeX	162
18.6	Overfull "hboxes"	162
19	texi2any: The Translator for Texinfo	164
19.1	Invoking <code>texi2any</code> from a Shell	164
19.2	Environment Variables Recognized by <code>texi2any</code>	170
19.3	<code>texi2any</code> Printed Output	171
19.4	Customization Variables	172
19.4.1	Customization Variables for @-Commands	172
19.4.2	Customization Variables and Options	173
19.4.3	HTML Customization Variables	174
19.4.4	MathJax Customization Variables	181
19.4.5	<code>latex2html</code> Customization Variables	181
19.4.6	<code>tex4ht</code> Customization Variables	182
19.4.7	\LaTeX Customization Variables	182
19.4.8	Other Customization Variables	183
19.5	Internationalization of Document Strings	190
19.6	Invoking <code>pod2texi</code> : Convert Pod to Texinfo	192
19.6.1	<code>pod2texi</code>	192
19.7	<code>texi2html</code> : Ancestor of <code>texi2any</code>	194
20	Creating and Installing Info Files	196
20.1	Installing an Info File	196
20.1.1	The Directory File <code>dir</code>	196
20.1.2	Listing a New Info File	196
20.1.3	Info Files in Other Directories	197
20.1.4	Installing Info Directory Files	198
20.1.5	Invoking <code>install-info</code>	199
20.2	Tag Files and Split Files	201

20.3	Info Format FAQ	203
21	Generating HTML	205
21.1	HTML Translation	205
21.2	HTML Splitting	206
21.3	HTML CSS	206
21.4	@documentdescription: Summary Text	207
21.5	Generating EPUB	208
21.5.1	Container Directory and Output Files	208
21.5.2	EPUB Cross-References	208
21.5.3	HTML Generated for EPUB	209
21.6	Code Examples Syntax Highlighting in HTML	209
21.7	HTML Cross-references	209
21.7.1	HTML Cross-reference Link Basics	210
21.7.2	HTML Cross-reference Node Name Expansion	211
21.7.3	HTML Cross-reference Command Expansion	212
21.7.4	HTML Cross-reference 8-bit Character Expansion	213
21.7.5	HTML Cross-reference Mismatch	214
21.7.6	HTML Cross-reference Configuration: <code>htmlxref.cnf</code>	214
Appendix A	@-Command Details	217
A.1	@-Command Syntax	217
A.2	@-Command List	218
A.3	@-Command Contexts	240
A.4	Obsolete @-Commands	241
Appendix B	Tips and Hints	242
Appendix C	Sample Texinfo Files	247
C.1	GNU Sample Texts	247
C.2	Verbatim Copying License	249
C.3	All-permissive Copying License	249
Appendix D	Using Texinfo Mode	251
D.1	Texinfo Mode Overview	251
D.2	The Usual GNU Emacs Editing Commands	251
D.3	Inserting Frequently Used Commands	252
D.4	Showing the Sectioning Structure of a File	254
D.4.1	Using <code>texinfo-show-structure</code>	254
D.4.2	Using <code>occur</code>	255
D.5	Updating Nodes and Menus	256
D.5.1	The Updating Commands	256
D.5.2	Updating Requirements	258
D.5.3	Update Outer File and Include Files	259

D.5.4	Include Files Requirements.....	260
D.5.5	Other Updating Commands.....	260
D.6	Formatting for Info.....	261
D.6.1	Running <code>texi2any/makeinfo</code> Within Emacs.....	261
D.6.2	The <code>texinfo-format...</code> Commands.....	262
D.7	Formatting and Printing with Emacs.....	263
D.7.1	Formatting and Printing in Texinfo Mode.....	263
D.7.2	Using the Local Variables List.....	265
D.8	Texinfo Mode Summary.....	265
D.9	Direct Formatting of Info files.....	268
D.9.1	Tagifying a File.....	268
D.9.2	Splitting a File Manually.....	268
D.10	Catching Mistakes.....	269
D.10.1	<code>texi2any</code> Preferred.....	269
D.10.2	Catching Errors with Info Formatting.....	269
D.10.3	Debugging with <code>T_EX</code>	270
D.10.4	Finding Badly Referenced Nodes.....	272
D.10.4.1	Using <code>Info-validate</code>	272
D.10.4.2	Creating an Unsplit File and Adding a Tag Table ..	273
D.11	Batch Formatting.....	274

Appendix E Global Document Commands ... 275

E.1	<code>@setchapternewpage</code> : Blank Pages Before Chapters.....	275
E.2	Page Headings.....	276
E.2.1	The <code>@headings</code> Command.....	276
E.2.2	Standard Heading Formats.....	277
E.2.3	How to Make Your Own Headings.....	277
E.3	<code>@paragraphindent</code> : Controlling Paragraph Indentation.....	280
E.4	<code>@firstparagraphindent</code> : Indenting After Headings.....	280
E.5	<code>@exampleindent</code> : Environment Indenting.....	280
E.6	<code>@smallbook</code> : Printing “Small” Books.....	281
E.7	Printing on A4 Paper.....	281
E.8	<code>@pagesizes [width][, height]</code> : Custom Page Sizes.....	281
E.9	Microtypography.....	282
E.10	Magnification.....	282

Appendix F Info Format Specification 283

F.1	Info Format: A Whole Manual.....	283
F.2	Info Format: Preamble.....	284
F.3	Info Format: Indirect Table.....	284
F.4	Info Format: Tag Table.....	285
F.5	Info Format: Local Variables.....	285
F.6	Info Format: Regular Nodes.....	285
F.7	Info Format: Menu.....	286
F.8	Info Format: Image.....	286
F.9	Info Format: Printindex.....	287

F.10 Info Format: Cross-reference	288
Appendix G GNU Free Documentation License	289
Command and Variable Index	297
General Index.....	303

Texinfo Copying Conditions

GNU Texinfo is *free software*; this means that everyone is free to use it and free to redistribute it on certain conditions. Texinfo is not in the public domain; it is copyrighted and there are restrictions on its distribution, but these restrictions are designed to permit everything that a good cooperating citizen would want to do. What is not allowed is to try to prevent others from further sharing any version of Texinfo that they might get from you.

Specifically, we want to make sure that you have the right to give away copies of the programs that relate to Texinfo, that you receive source code or else can get it if you want it, that you can change these programs or use pieces of them in new free programs, and that you know you can do these things.

To make sure that everyone has such rights, we have to forbid you to deprive anyone else of these rights. For example, if you distribute copies of the Texinfo related programs, you must give the recipients all the rights that you have. You must make sure that they, too, receive or can get the source code. And you must tell them their rights.

Also, for our own protection, we must make certain that everyone finds out that there is no warranty for the programs that relate to Texinfo. If these programs are modified by someone else and passed on, we want their recipients to know that what they have is not what we distributed, so that any problems introduced by others will not reflect on our reputation.

The precise conditions of the licenses for the programs currently being distributed that relate to Texinfo are found in the General Public Licenses that accompany them. This manual is covered by the GNU Free Documentation License (see Appendix G [GNU Free Documentation License], page 289).

1 Overview of Texinfo

Texinfo is a documentation system that uses a single source file to produce both online information and printed output. This means that instead of writing several different documents, one for each output format, you need only write one document.

Using Texinfo, you can create a printed document (via the TEX typesetting system) in PDF format, including chapters, sections, cross-references, and indices. From the same Texinfo source file, you can create HTML output suitable for use with a web browser, you can create an Info file for use in GNU Emacs or other Info-reading programs, and also create DocBook, EPUB 3, or $\text{L}\text{A}\text{T}\text{E}\text{X}$ files.

A Texinfo source file is a plain text file containing text interspersed with *@-commands* (words preceded by an '@') that tell the Texinfo processors what to do. Texinfo's markup commands are almost entirely *semantic*; that is, they specify the intended meaning of text in the document, rather than physical formatting instructions.

GNU Emacs has a special mode, called Texinfo mode, that provides various Texinfo-related features. (See Appendix D [Texinfo Mode], page 251.)

Texinfo was devised specifically for the purpose of writing software documentation and manuals. If you want to write a good manual for your program, Texinfo has many features which we hope will make your job easier. However, Texinfo is not intended to be a general-purpose formatting program. It provides almost no commands for controlling the final formatting, so may be inappropriate for your needs if you want to lay out a newspaper, devise a glossy magazine ad, or follow the exact formatting requirements of a publishing house.

Spell “Texinfo” with a capital “T” and the other letters in lowercase. The first syllable of “Texinfo” is pronounced like “speck”, not “hex”. This odd pronunciation is derived from the pronunciation of TEX . Pronounce TEX as if the ‘X’ were the last sound in the name ‘Bach’. In the word TEX , the ‘X’ is, rather than the English letter “ex”, actually the Greek letter “chi”.

Texinfo is the official documentation format of the GNU project. More information, including manuals for GNU packages, is available at the GNU documentation web page (<http://www.gnu.org/doc/>).

1.1 Reporting Bugs

We welcome bug reports and suggestions for any aspect of the Texinfo system: programs, documentation, installation, etc. Please email them to bug-texinfo@gnu.org. You can get the latest version of Texinfo via its home page, <http://www.gnu.org/software/texinfo>.

For bug reports, please include enough information for the maintainers to reproduce the problem. Generally speaking, that means:

- The version number of Texinfo and the program(s) or manual(s) involved.
- The contents of any input files necessary to reproduce the bug.
- Precisely how you ran any program(s) involved.
- A description of the problem and samples of any erroneous output.
- Hardware and operating system names and versions.

- Anything else that you think would be helpful.

When in doubt whether something is needed or not, include it. It's better to include too much than to leave out something important.

It is critical to send an actual input file that reproduces the problem.

Any problems with the Info reader in Emacs should be reported to the Emacs developers: see Section “Bugs” in *The GNU Emacs Manual*.

Patches are welcome; if possible, please make them with ‘`diff -c`’, ‘`diff -u`’ (see *Comparing and Merging Files*), or ‘`git diff`’ and include `ChangeLog` entries (see Section “Change Log” in *GNU Coding Standards*), and follow the existing coding style.

1.2 Output Formats

Here is an overview of the output formats currently supported by Texinfo.

- Info** (Generated via `texi2any`.) Info format is mostly a plain text transliteration of the Texinfo source. It adds a few control characters to provide navigational information for cross-references, indices, and so on. The Emacs Info subsystem (see *Info*), and the standalone `info` program (see *GNU Info*), among others, can read these files. See Section 1.3 [Info Files], page 4, and Chapter 20 [Creating and Installing Info Files], page 196.
- Plain text** (Generated via `texi2any --plaintext`.) This is almost the same as Info output with the navigational control characters are omitted.
- HTML** (Generated via `texi2any --html`.) HTML, standing for Hyper Text Markup Language, is the language for writing documents on the World Wide Web. Web browsers can render this language online. There are many versions of HTML, both different standards and browser-specific variations. `texi2any` uses a subset of the language that can be interpreted by any common browser, intentionally not using many newer or less widely-supported tags. Although the native output is thus rather plain, it can be customized at various levels, if desired. See Chapter 21 [Generating HTML], page 205.
- EPUB 3** (Generated via `texi2any --epub3`.) EPUB is a format designed for reading electronic books on portable devices. It is a derivative of HTML. The format was developed by the International Digital Publishing Forum (IDPF), which is now part of the World Wide Web Consortium (W3C). The latest major revision, EPUB 3, dates from 2011.
- DVI** (Generated via `texi2dvi`.) The DeVIce Independent binary format is output by the T_EX typesetting program (<http://tug.org>). This is then read by a DVI ‘driver’, which knows the actual device-specific commands that can be viewed or printed, notably Dvips for translation to PostScript (see *Dvips*) and Xdvi for viewing on an X display (<http://sourceforge.net/projects/xdvi/>). See Chapter 18 [Hardcopy with T_EX], page 157. (Be aware that the Texinfo language is very different from T_EX’s usual languages: plain T_EX, L^AT_EX, ConT_EXt, etc.)
- PostScript** (Generated via `texi2dvi --ps`.) PostScript is a page description language that became widely used around 1985 and is still used today. <https://en>.

wikipedia.org/wiki/PostScript gives a basic description and more preferences. By default, Texinfo uses the `dvips` program to convert T_EX's DVI output to PostScript. See *Dvips*.

PDF (Generated via `texi2dvi --pdf` or `texi2pdf`.) This format was developed by Adobe Systems for portable document interchange, based on their previous PostScript language. It can represent the exact appearance of a document, including fonts and graphics, and supporting arbitrary scaling. It is intended to be platform-independent and easily viewable, among other design goals; https://en.wikipedia.org/wiki/Portable_Document_Format and <http://tug.org/TUGboat/tb22-3/tb72beebe-pdf.pdf> have some background. By default, Texinfo uses the `pdftex` program, an extension of T_EX, to output PDF; see <http://tug.org/applications/pdftex>. See [PDF Output], page 157.

L^AT_EX (Generated via `texi2any --latex`.) This is a typesetting system built on top of T_EX. It was originally released by Leslie Lamport in 1984. L^AT_EX adds more definitions to those of T_EX and has a wide range of packages built on it. L^AT_EX is ubiquitous in academic literature. The current version of L^AT_EX is under active development; more information is available online at <https://www.latex-project.org/>.

The L^AT_EX output can be further processed into DVI, PostScript, or PDF. In theory, the L^AT_EX output should allow for much more customizability of the output than would be possible with the plain T_EX implementation of Texinfo.

DocBook (Generated via `texi2any --docbook`.) This is an XML-based format, primarily for technical documentation. It therefore bears some resemblance, in broad outline, to Texinfo. See <http://www.docbook.org>. Various converters from DocBook *to* Texinfo have also been developed; see the Texinfo web pages.

XML (Generated via `texi2any --xml`.) The `texi2any` XML output, unlike all the other output formats, is a transliteration of the Texinfo source, rather than finished output. Texinfo XML files cannot be viewed in web browsers or other programs.

XML is a generic syntax specification usable for any sort of content. (A reference is at <http://www.w3.org/XML>.) The purpose of the Texinfo XML output is to allow further processing by XML tools. The output syntax is defined in an XML DTD, which is contained in a file `texinfo.dtd` included in the Texinfo source distribution.

The Texinfo source distribution includes a utility script `txixml2texi` to do a backward transformation to recreate the original Texinfo content (except for Texinfo macros and conditionals).

1.3 Info Files

As mentioned above, Info format is mostly a plain text transliteration of the Texinfo source, with the addition of a few control characters to separate nodes and provide navigational information, so that Info-reading programs can operate on it.

Info files are nearly always created by processing a Texinfo source document. `texi2any`, also known as `makeinfo`, is the principal command that converts a Texinfo file into an Info file; see Chapter 19 [Generic Translator `texi2any`], page 164.

Generally, you enter an Info file through a node that by convention is named ‘Top’. This node normally contains just a brief summary of the file’s purpose, and a large menu through which the rest of the file is reached. From this node, you can either traverse the file systematically by going from node to node, or you can go to a specific node listed in the main menu, or you can search the index menus and then go directly to the node that has the information you want. Alternatively, with the standalone Info program, you can specify specific menu items on the command line (see *Info*).

If you want to read through an Info file in sequence, as if it were a printed manual, you can hit `SPC` repeatedly, or you get the whole file with the advanced Info command `g *`. (See Section “Advanced Info commands” in *Info*.)

The `dir` file in the `info` directory serves as the departure point for the whole Info system. From it, you can reach the ‘Top’ nodes of each of the documents in a complete Info system.

If you wish to refer to an Info file via a URI, you can use the (unofficial) syntax exemplified by the following. This works with Emacs/W3, for example:

```
info:emacs#Dissociated%20Press
info:///usr/info/emacs#Dissociated%20Press
info://localhost/usr/info/emacs#Dissociated%20Press
```

The `info` program itself does not follow URIs of any kind.

1.4 Printed Books

A Texinfo file can be formatted and typeset as a printed book or manual. To do this, you need `TEX`, a sophisticated typesetting program written by Donald Knuth of Stanford University. It is not part of the Texinfo distribution.

Texinfo provides a file `texinfo.tex` that contains the definitions that `TEX` uses when it typesets a Texinfo file. You can get the latest version of `texinfo.tex` from the Texinfo home page, <http://www.gnu.org/software/texinfo/>.

A Texinfo-based book is similar to any other typeset, printed work: it can have a title page, copyright page, table of contents, and preface, as well as chapters, numbered or unnumbered sections and subsections, page headers, cross-references, footnotes, and indices.

`TEX` is very powerful and has a great many features. However, because a Texinfo file must be able to present information both on a character-only terminal in Info form and in a typeset book, the formatting commands that Texinfo supports are necessarily limited.

See Chapter 18 [Hardcopy with `TEX`], page 157, for more information on processing a manual with `TEX`.

1.5 Adding Output Formats

The output formats in the previous sections handle a wide variety of usage, but of course there is always room for more.

If you are a programmer and would like to contribute to the GNU project by implementing additional output formats for Texinfo, that would be excellent. The way to do this that

would be most useful is to write a new back-end for `texi2any`, our reference implementation of a Texinfo parser; it creates a tree representation of the Texinfo input that you can use for the conversion. The documentation in the source file `tp/Texinfo/Convert/Converter.pm` is a good place to start (see Section “`Texinfo::Convert::Converter`” in *Texinfo modules documentation*). See Chapter 19 [Generic Translator `texi2any`], page 164.

Another viable approach is use the Texinfo XML output from `texi2any` as your input. This XML is an essentially complete representation of the input, but without the Texinfo syntax and option peculiarities, as described above.

If you still cannot resist the temptation of writing a new program that reads Texinfo source directly, let us give some more caveats: please do not underestimate the amount of work required. Texinfo is by no means a simple language to parse correctly, and remains under development, so you would be committing to an ongoing task. You are advised to check that the tests of the language that come with `texi2any` give correct results with your new program.

From time to time, proposals are made to generate traditional Unix man pages from Texinfo source. However, because man pages have a strict conventional format, creating a good man page requires a completely different source from that needed for the typical Texinfo applications of writing a good user tutorial and/or a good reference manual. This makes generating man pages incompatible with the Texinfo design goal of not having to document the same information in different ways for different output formats. You might as well write the man page directly.

As an alternative way to support man pages, you may find the program `help2man` to be useful. It generates a traditional man page from the ‘`--help`’ output of a program. In fact, the man pages for the programs in the Texinfo distribution are generated with this. It is GNU software written by Brendan O’Dea, available from <http://www.gnu.org/software/help2man>.

1.6 History

Richard M. Stallman invented the Texinfo format, wrote the initial processors, and created Edition 1.0 of this manual. Robert J. Chassell greatly revised and extended the manual, starting with Edition 1.1. Brian Fox was responsible for the standalone Texinfo distribution until version 3.8. Karl Berry continued maintenance from Texinfo 3.8 (manual edition 2.22), and Gavin Smith has continued maintenance since Texinfo 6.0.

Beginnings

Richard Stallman included an on-line, hypertext help system called Info in the original implementation of Emacs (in 1975/6). Stallman had been inspired after seeing a presentation a couple of years earlier on the “NLS” hypertext system of Douglas Engelbart.

In another development, in the 1970’s at CMU, Brian Reid developed a program and format named Scribe to mark up documents for printing. It used the `@` character to introduce commands, as Texinfo does. Much more consequentially, it strove to describe document contents rather than formatting, an idea wholeheartedly adopted by Texinfo.

Meanwhile, people at MIT developed another format called Bolio. Richard Stallman (RMS) worked on converting Bolio to use \TeX as its typesetting language, resulting in $\text{Bo}\TeX$. The earliest $\text{Bo}\TeX$ version seems to have been 0.02 on October 31, 1984.

BoT_EX could only be used as a markup language for documents to be printed, not for online documents. RMS combined BoT_EX and Info to create Texinfo, a mark-up language for text that is intended to be read both online and as printed hard copy.

The original translator to create Info was written (primarily by RMS and Bob Chassell) in Emacs Lisp, namely the `texinfo-format-buffer` and other functions. In the early 1990s, Brian Fox reimplemented the conversion program in C, now called `makeinfo`, as well as the standalone `info` program.

Reimplementing in Perl

In 2012, the C `makeinfo` was itself replaced by a Perl implementation generically called `texi2any`. This version supports the same level of output customization as `texi2html`, an independent program originally written by Lionel Cons, later with substantial work by many others. The many additional features needed to make `texi2html` a replacement for `makeinfo` were implemented by Patrice Dumas. The first, never-released version of `texi2any` was based on the `texi2html` code.

That implementation, however, was abandoned in favor of the current program (also written by Patrice Dumas), which parses the Texinfo input into a tree for processing. It inherited the design of customization and other features from `texi2html` (for more on `texi2html` compatibility, see Section 19.7 [`texi2html`], page 194). However, `texi2any` is a full reimplementaion: it constructs a tree-based representation of the input document for all back-ends to work from.

The new Perl program is much slower than the old C program. The speed gap has partially closed since first release, but it may not ever be entirely comparable. So why did we switch? In short, we intend and hope that the present program will be much easier than the previous C implementation of `makeinfo` to extend to different output styles, back-end output formats, and all other customizations. In more detail:

- HTML customization. Many GNU and other free software packages had been happily using the HTML customization features in `texi2html` for years. Thus, in effect two independent implementations of the Texinfo language had developed, and keeping them in sync was not simple. Adding the HTML customization possible in `texi2html` to a C program would have been an enormous effort.
- Unicode, and multilingual support generally, especially of east Asian languages. At that time, doing it in C would have been tantamount to rewriting the entire program. Since then, the parser and bits of converter back-ends have been rewritten in C, but the converter back-ends are still mostly in Perl which has good multilingual support built in.
- Additional back-ends. The `makeinfo` code had become convoluted to the point where adding a new back-end was quite complex, requiring complex interactions with existing back-ends. In contrast, the new implementation provides a clean tree-based representation for all back-ends to work from. People have requested numerous different back-ends (L^AT_EX, the latest (X)HTML, . . .); this change made them much more feasible to implement. Which leads to the last item:
- Making contributions easier. In general, due to the cleaner structure, the separate parser/back-ends implementation should be considerably easier than the former C `makeinfo` implementation for anyone to read and contribute to, with the resulting

obvious benefits. After ten years, contributed back-ends were yet to happen, but it is still believed that this structure could in theory lend better to contributions.

`texi2any` is intended to be a reference implementation that defines parts of the language not fully specified by the manual. Without such a reference, alternative implementations would be very likely to have subtle, or not-so-subtle, differences in behavior, and thus Texinfo documents would become dependent on the processor. It is also important to have consistent command-line options for all processors. Extensive tests of the language and processor were developed at the same time as `texi2any`; we encourage anyone thinking of writing a program to parse Texinfo input to make use of these tests.

With the release of `texi2any` as the reference implementation, development of both the C implementation of `makeinfo` and `texi2html` has been halted. Going forward, we ask authors of Texinfo documents to use only `texi2any`.

2 Writing a Texinfo File

This chapter describes Texinfo syntax and what is required in a Texinfo file, and gives a short sample file.

2.1 General Syntactic Conventions

This section describes the general conventions used in all Texinfo documents.

- All printable ASCII characters except ‘@’, ‘{’ and ‘}’ can appear in a Texinfo file and stand for themselves. ‘@’ is the escape character which introduces commands, while ‘{’ and ‘}’ are used to surround arguments to certain commands. To put one of these special characters into the document, put an ‘@’ character in front of it, like this: ‘@@’, ‘@{’, and ‘@}’.
- In a Texinfo file, the commands you write to describe the contents of the manual are preceded by an ‘@’ character; they are called *@-commands*. (The ‘@’ in Texinfo has the same meaning that ‘\’ has in plain T_EX.)

Depending on what they do or what arguments they take, you need to write @-commands on lines of their own, or as part of sentences. As a general rule, a command requires braces if it mingles among other text; but it does not need braces if it is on a line of its own. For more details of Texinfo command syntax, see Section A.1 [Command Syntax], page 217.

- Whitespace following an @-command name is optional and (usually) ignored if present. The exceptions are contexts when whitespace is significant, e.g., an `@example` environment.
- Texinfo supports the usual quotation marks used in English and in other languages; see Section 11.5 [Inserting Quotation Marks], page 104.
- Use three hyphens in a row, ‘---’, to produce a long dash—like this (called an *em dash*), used for punctuation in sentences. Use two hyphens, ‘--’, to produce a medium dash (called an *en dash*), used primarily for numeric ranges, as in “June 25–26”. Use a single hyphen, ‘-’, to produce a standard hyphen used in compound words. For display on the screen, Info reduces three hyphens to two and two hyphens to one (not transitively!). Of course, any number of hyphens in the source remain as they are in literal contexts, such as `@code` and `@example`.
- *Whitespace*. Texinfo files are plain text files composed of lines terminated by the usual newline character (line feed). Texinfo processors read input one line at a time. Paragraphs are terminated by an empty line or a line containing only spaces. A sequence of several spaces in text is usually treated the same as a single space (except in verbatim modes).

Form feed (*CTRL-1*) characters in normal text end any open paragraph. Other ASCII whitespace (tab, carriage return) may be treated the same as space characters, although the results may differ depending on output format. Hence, there is not much point in using these in documents. Non-ASCII spaces, such as Unicode “em space”, are not recognized as whitespace at all and will be treated as regular, non-whitespace characters. However, in verbatim modes, for example in code samples, tab characters may produce the correct formatting in the output.

2.2 Comments

You can write comments in a Texinfo file by using the `@comment` command, which may be abbreviated to `@c`. Such comments are for a person looking at the Texinfo source file. All the text on a line that follows either `@comment` or `@c` is a comment; the rest of the line does not appear in the visible output. (To be precise, the character after the `@c` or `@comment` must be something other than a dash or alphanumeric, or it will be taken as part of the command.)

Often, you can write the `@comment` or `@c` in the middle of a line, and only the text that follows after the `@comment` or `@c` command does not appear; but some commands, such as `@settitle`, work on a whole line. You cannot use `@comment` or `@c` within a line beginning with such a command.

In cases of nested command invocations, complicated macro definitions, etc., `@c` and `@comment` may provoke an error when processing with \TeX . Therefore, you can also use the `DEL` character (ASCII 127 decimal, 0x7f hex, 0177 octal) as a true \TeX comment character (catcode 14, in \TeX internals). Everything on the line after the `DEL` will be ignored and the next line will be merged.

You can also have long stretches of text ignored by the Texinfo processors with the `@ignore` and `@end ignore` commands. Write each of these commands on a line of its own, starting each command at the beginning of the line. Text between these two commands does not appear in the processed output. You can use `@ignore` and `@end ignore` for writing comments. (For some caveats regarding nesting of such commands, see Section 15.7 [Conditional Nesting], page 142.)

2.3 What a Texinfo File Must Have

By convention, the name of a Texinfo file ends with one of the extensions `.texi`, `.texinfo`, `.txi`, or `.tex`. Using `.tex` is discouraged as this extension is already used by \TeX and \LaTeX input files. The most common and recommended extension is `.texi`. The name of a Texinfo file should only contain ASCII characters.

The output name is based on the input file name, in the default case. First, any of the extensions `.texi`, `.tex`, `.txi`, or `.texinfo` is removed from the input file name; then, the output format specific extension is added—`.html` when generating HTML, `.info` when generating Info, etc. The output name should only contain ASCII characters¹.

In order to be made into a printed manual, a Texinfo file must begin with a line like this:

```
\input texinfo
```

The contents of the file follow this beginning, and then you must end the Texinfo source with a line like this:

```
@bye
```

The `@bye` line at the end of the file on a line of its own tells \TeX that the file is ended and to stop formatting. If you leave this out, you'll be dumped at \TeX 's prompt at the end of the run.

¹ `texi2any` can handle non ASCII characters in input file names, but non ASCII characters in output name will create problems for some output formats, especially for cross-references.

Furthermore, you will usually provide a Texinfo file with a title, a title page, indices, and the like, all of which are explained in this manual. But the minimum, which can be useful for short documents, is just the one line at the beginning and the one line at the end.

Without additional information, the input and output encodings are assumed to be UTF-8, an universal codeset compatible with 7-bit ASCII.

2.4 Short Sample

Here is a short sample Texinfo file.

```
\input texinfo
@settitle Sample Manual 1.0

@copying
This is a short example of a complete Texinfo file.

Copyright @copyright{} 2016 Free Software Foundation, Inc.
@end copying

@titlepage
@title Sample Title
@page
@vskip 0pt plus 1filll
@insertcopying
@end titlepage

@contents

@node Top
@top GNU Sample

This manual is for GNU Sample
(version @value{VERSION}, @value{UPDATED}).

@menu
* First Chapter::    The first chapter is the
                    only chapter in this sample.
* Index::           Complete index.
@end menu

@node First Chapter
@chapter First Chapter

@cindex chapter, first
This is the first chapter.
@cindex index entry, another
```


Here is a numbered list.

```
@enumerate
@item
This is the first item.

@item
This is the second item.
@end enumerate
```

```
@node First Section
@section First Section
```

First section of first chapter.

```
@node Second Section
@section Second Section
```

Second section of first chapter.

```
@node Index
@unnumbered Index
```

```
@printindex cp
```

```
@bye
```

2.5 Texinfo File Header

Texinfo files start with the line:

```
\input texinfo
```

The ‘`\input texinfo`’ line tells $\text{T}_{\text{E}}\text{X}$ to use the `texinfo.tex` file, which tells $\text{T}_{\text{E}}\text{X}$ how to translate the Texinfo @-commands into $\text{T}_{\text{E}}\text{X}$ typesetting commands. (Note the use of the backslash, ‘`\`’; this is correct for $\text{T}_{\text{E}}\text{X}$.)

It makes sense to include any command that affects document formatting as a whole in the header. The `@settitle` line is usually present at the beginning of the header:

```
@settitle Sample Manual 1.0
```

The `@settitle` line specifies a title for the page headers (or footers) of the printed manual, and the default title and document description for the ‘`<head>`’ in HTML. `@synindex` (see Section 10.6.2 [`@synindex`], page 96), for instance, is another command often included in the header.

The start of the Texinfo file up to the first content that is output as part of the main body of the document is the *preamble*. It includes the header, Section 2.7 [Document Permissions],

page 16, and Section 2.8 [Titlepage & Copyright Page], page 18, specification. It is important for the L^AT_EX output format as the end of preamble is where the `\begin{document}` line is output. In other output formats it may be used to determine how some special output is formatted, for example Section 2.7.1 [copying], page 17, output as a comment at the beginning of output files, or the language used in file headers.

2.5.1 The First Line of a Texinfo File

Every Texinfo file that is to be the top-level input to T_EX must begin with a line that looks like this:

```
\input texinfo
```

When the file is processed by T_EX, the `\input texinfo` command tells T_EX to load the macros needed for processing a Texinfo file. These are in a file called `texinfo.tex`, which should have been installed on your system along with either the T_EX or Texinfo software. T_EX uses the backslash, `\`, to mark the beginning of a command, exactly as Texinfo uses `@`. The `texinfo.tex` file causes the switch from `\` to `@`; before the switch occurs, T_EX requires `\`, which is why it appears at the beginning of the file.

You may optionally follow this line with a comment to tell GNU Emacs to use Texinfo mode when the file is edited:

```
\input texinfo  @c --texinfo--
```

This may be useful when Emacs doesn't detect the file type from the file extension automatically.

2.5.2 @setfilename: Set the Output File Name

The `@setfilename` line specifies the name of the output file to be generated by `texi2any`. This command is ignored for T_EX formatting. When present, it should be the first Texinfo command (that is, after `\input texinfo`). Write the `@setfilename` command at the beginning of a line and follow it on the same line by the Info file name.

```
@setfilename info-file-name
```

The name must be different from the name of the Texinfo file. There are two conventions for choosing the name: you can either remove the extension (such as `.texi`) entirely from the input file name, or (recommended) replace it with the `.info` extension. It is not advised to base the `@setfilename` name on a entirely different name than the input file name.

When a `@setfilename` line is present, the Texinfo processors ignore everything written before the `@setfilename` line. This is why the very first line of the file (the `\input` line) does not show up in the output.

If there is no `@setfilename` line, `texi2any` uses the input file name to determine the output name (see Section 2.3 [Minimum], page 10). The `\input` line is still ignored in this processing, as well as leading blank lines.

When producing another output format, `texi2any` will replace any final extension with the output format-specific extension (`.html` when generating HTML, for example), or add a dot followed by the extension (`.html` for HTML) if the given name has no extension.

@-commands are not allowed in `@setfilename`, except for `@@`, `@{`, `@}` and associated @-commands such as `@atchar{}`.

`@setfilename` used to be required by the Texinfo processors and some other programs. This should not be the case any more; `@setfilename` can be omitted. If the Texinfo input is processed from standard input, without an input file name to deduce the base file name from, `@setfilename` could still be relevant. This is not the only way, however: `--output` option specifies the output file name on the `texi2any` command-line (see Section 19.1 [Invoking `texi2any`], page 164).

Although an explicit `.info` extension is preferable, some operating systems cannot handle long file names. You can run into a problem even when the file name you specify is itself short enough. This occurs because the Info formatters split a long Info file into short indirect subfiles, and name them by appending `'-1'`, `'-2'`, `...`, `'-10'`, `'-11'`, and so on, to the original file name. (See Section 20.2 [Tag and Split Files], page 201.) The subfile name `texinfo.info-10`, for example, is too long for old systems with a 14-character limit on filenames; so the Info file name for this document could be `texinfo` rather than `texinfo.info` on such a system. `@setfilename` is a way to specify an alternative name.

2.5.3 @settitle: Set the Document Title

A Texinfo file should contain a line that looks like this:

```
@settitle title
```

Write the `@settitle` command at the beginning of a line and follow it on the same line by the title. Do not write anything else on the line. The `@settitle` command should precede everything that generates actual output. The best place for it is right after the `@setfilename` command, if present (described in the previous section).

This command gives the title to use in a header or footer for double-sided printed output, in case such headings are output. For more on headings for printed output, see Section 2.8.5 [Heading Generation], page 22.

In HTML, *title* serves as the document `<title>` and it becomes the default document description in the `<head>` part.

When the title page is used in the output, as is generally the case for printed output, the title in the `@settitle` command does not affect the title as it appears on the title page. Thus, the two do not need not to match exactly. A practice we recommend is to include the version or edition number of the manual in the `@settitle` title; on the title page, the version number generally appears as a `@subtitle` so it would be omitted from the `@title`. See Section 2.8.1 [`@titlepage`], page 18.

2.5.4 Preamble

The *preamble* starts at the beginning of the Texinfo file and continues until the first directly output material. It typically includes the file header (see Section 2.5 [Texinfo File Header], page 12), the `@copying` block specifying the document permissions (see Section 2.7.1 [`@copying`], page 17) and the `@titlepage` specification (see Section 2.8 [Titlepage & Copyright Page], page 18).

The preamble may contain commands that affect document formatting as a whole but which do not produce output, or do not produce output straight away, such as `@settitle` (see Section 2.5.3 [`@settitle`], page 14), `@documentlanguage`, (see Section 14.1 [`@documentlanguage`], page 131), commands setting the headings, controlling indentation or hyphenation, or the table of contents (see Section 2.9 [Contents], page 22).

Any text that starts a paragraph, @-commands that are formatted as quotations, tables, lists and so on, and @node (see Chapter 3 [Nodes], page 27) and chapter structuring commands (see Chapter 4 [Chapter Structuring], page 38) end the preamble.

The concept of the preamble is significant for L^AT_EX output, as the `\begin{document}` line is output at the end of the preamble.

In plaintext, the preamble is simply output as usual at the beginning of the document; for example, a @contents in the preamble is output as the table of contents (see Section 2.9 [Contents], page 22).

There is not much special treatment of the preamble for HTML and Info output either. However, some settings current at the very end of the preamble may be used for the document as a whole, regardless of what follows. This may apply to commands specifying the indentation, or the language (see Section 14.1 [@documentlanguage], page 131).

For example, for the following document, the HTML and Info copying comments are formatted with @documentlanguage set to ‘pt’, as it is the last @documentlanguage before the end of the preamble.

```
\input texinfo
@documentlanguage fr

@copying
The copying information @error{} some text
@end copying

@documentlanguage pt

Text ending the preamble

@documentlanguage de

@node Top
```

2.5.5 Start and End of Header for Emacs

In Emacs, start- and end-of-header lines can be used to enclose commands that globally affect the document in the Texinfo preamble. This allows you to format only part of a Texinfo file for Info or printing. See Section D.6.2 [texinfo-format commands], page 262.

A start-of-header line is a Texinfo comment that looks like this:

```
@c %**start of header
```

Write the start-of-header line on the second line of a Texinfo file. Follow the start-of-header commands that globally affect the document formatting, such as @settitle, @synindex or @footnotestyle; and then by an end-of-header line.

A end-of-header line is a Texinfo comment that looks like this:

```
@c %**end of header
```

The odd string of characters, ‘%**’, is to ensure that no other comment is accidentally taken for a start-of-header line. You can change it if you wish by setting the `tex-start-`

`of-header` and/or `tex-end-of-header` Emacs variables. See Section D.7.1 [Texinfo Mode Printing], page 263.

The start- and end-of-header lines are not part of the Texinfo format specification, which is why they are implemented with comments.

2.6 Directory Category

Use the `@dircategory` command to specify a category for the manual. Here are a few examples of category names:

```
Basics
Text creation and manipulation
Archiving
Compression
Database
Editors
Emacs
Email
Graphics
Localization
Network applications
Printing
Science
Software development
Software libraries
Version control
```

`@dircategory` commands are usually followed by a `@direntry` blocks, which are used by `install-info`. See Section 20.1.4 [Installing Dir Entries], page 198, for details.

The first `@dircategory` command in a manual is the category for the entire manual. Subsequent uses of `@dircategory` set the category for following `@direntry` blocks only.

2.7 Document Permissions

This segment describes the document and contains the copyright notice and copying permissions. This is done with the `@copying` command. A real manual includes more text here, according to the license under which it is distributed.

```
@copying
This is a short example of a complete Texinfo file, version 1.0.

Copyright @copyright{} 2016 Free Software Foundation, Inc.
@end copying
```

The copyright notice and copying permissions for a document need to appear in several places in the various Texinfo output formats. Therefore, Texinfo provides a command (`@copying`) to declare this text once, and another command (`@insertcopying`) to insert the text at appropriate points.

If the document is a software manual, the software is typically under a different license—for GNU and many other free software packages, software is usually released under the GNU

GPL, and manuals are released under the GNU FDL. It is helpful to state the license of the software of the manual, but giving the complete text of the software license is not necessarily required.

2.7.1 @copying: Declare Copying Permissions

The `@copying` command should be given very early in the document; the recommended location is right after the header material (see Section 2.5 [Texinfo File Header], page 12). It conventionally consists of a sentence or two about what the program is, identification of the documentation itself, the legal copyright line, and the copying permissions. Here is a skeletal example:

```
@copying
This manual is for program (version version, updated
date), which ...

Copyright @copyright{} years copyright-owner.

@quotation
Permission is granted to ...
@end quotation
@end copying
```

The `@quotation` has no legal significance; it's there to improve readability in some contexts.

The text of `@copying` appears as a comment at the beginning of Info and HTML output files. This information is also output at the beginning of the DocBook output files using appropriate markup. It is *not* output implicitly in plain text or printed output; it's up to you to use `@insertcopying` to emit the copying information. See the next section for details.

The `@copyright{}` command generates a ‘c’ inside a circle when the output format supports this glyph (print and HTML always do, for instance). When the glyph is not supported in the output, it generates the three-character sequence ‘(C)’.

The copyright notice itself has the following legally-prescribed form:

```
Copyright © years copyright-owner.
```

The word ‘Copyright’ must always be written in English, even if the document is otherwise written in another language. This is due to international law.

The list of years should include all years in which a version was completed (even if it was released in a subsequent year). It is simplest for each year to be written out individually and in full, separated by commas.

The copyright owner (or owners) is whoever holds legal copyright on the work. In the case of works assigned to the FSF, the owner is ‘Free Software Foundation, Inc.’

The copyright ‘line’ may actually be split across multiple lines, both in the source document and in the output. This often happens for documents with a long history, having many different years of publication. If you do use several lines, do not indent any of them (or anything else in the `@copying` block) in the source file.

See Section “Copyright Notices” in *GNU Maintainer Information*, for additional information. See Section C.1 [GNU Sample Texts], page 247, for the full text to be used in GNU

manuals. See Appendix G [GNU Free Documentation License], page 289, for the license itself under which GNU and other free manuals are distributed.

2.7.2 @insertcopying: Include Permissions Text

The @insertcopying command is simply written on a line by itself, like this:

```
@insertcopying
```

This inserts the text previously defined by @copying. To meet legal requirements, it must be used on the copyright page in the printed manual (see Section 2.8.4 [Copyright], page 21).

The @copying command itself causes the permissions text to appear in an Info file *before* the first node. The text is also copied into the beginning of each split Info output file, as is legally necessary. This location implies a human reading the manual using Info does *not* see this text (except when using the advanced Info command *g **). This does not matter for legal purposes, because the text is present. But to get a visible text in the output, @insertcopying should be used.

Similarly, the @copying text is automatically included at the beginning of each HTML output file, as an HTML comment. Again, this text is not visible without @insertcopying (unless the reader views the HTML source).

The permissions text defined by @copying also appears automatically at the beginning of the DocBook output files using appropriate markup. @insertcopying can be used to output the permission text within normal text.

2.8 Title and Copyright Pages

In hard copy output, the manual's name and author are usually printed on a title page. Copyright information is usually printed on the back (verso) of the title page. This segment must be enclosed between @titlepage and @end titlepage commands:

```
@titlepage
@title Sample Title

@c The following two commands start the copyright page.
@page
@vskip 0pt plus 1filll
@insertcopying
@end titlepage
```

We use the @insertcopying command to include the permission text from the previous section, instead of writing it out again.

The title and copyright pages appear in printed manuals, but not in most other output formats. In HTML, the best way to get a title page similar to printed manuals is to set the NO_TOP_NODE_OUTPUT customization variable (see [NO_TOP_NODE_OUTPUT], page 186).

2.8.1 @titlepage

Start the material for the title page and following copyright page with @titlepage on a line by itself and end it with @end titlepage on a line by itself.

The `@end titlepage` command starts a new page and turns on page numbering (see Section 2.8.5 [Heading Generation], page 22). All the material that you want to appear on unnumbered pages should be put between the `@titlepage` and `@end titlepage` commands.

By using the `@page` command, you can force a page break within the region delineated by the `@titlepage` and `@end titlepage` commands and thereby create more than one unnumbered page. This is how the copyright page is produced. (The `@titlepage` command might perhaps have been better named the `@titleandadditionalpages` command, but that would have been rather long!)

When you write a manual about a computer program, you should write the version of the program to which the manual applies on the title page. If the manual changes more frequently than the program or is independent of it, you should also include an edition number² for the manual. This helps readers keep track of which manual is for which version of the program. (The ‘Top’ node should also contain this information; see Section 2.10 [The Top Node], page 23.)

One method uses the `@title`, `@subtitle`, and `@author` commands to create a title page. With this method, you do not specify any of the actual formatting of the title page. You specify the text you want, and Texinfo does the formatting. The usual formatting consist of black rules under the title and author lines and the subtitle text set flush to the right-hand side of the page.

Texinfo also provides a second method for creating a title page. using typesetting commands that are not to be used in the main text. This method uses uses the `@titlefont`, `@sp`, and `@center` commands to generate a title page in which the words on the page are centered.

For sufficiently simple documents, and for the bastard title page in traditional book frontmatter, Texinfo also provides a command `@shorttitlepage` which takes the rest of the line as the title. The argument is typeset on a page by itself and followed by a blank page. In HTML, `@shorttitlepage` can play the same role as `@settitle`, if `@settitle` is not set. See Section 2.5.3 [`@settitle`], page 14.

2.8.2 `@title`, `@subtitle`, and `@author`

You can use the `@title`, `@subtitle`, and `@author` commands to create a title page in which the vertical and horizontal spacing is done for you automatically.

Write the `@title`, `@subtitle`, or `@author` commands at the beginning of a line followed by the title, subtitle, or author. The `@author` command may be used for a quotation in an `@quotation` block (see Section 7.2 [`@quotation`], page 67); except for that, it is an error to use any of these commands outside of `@titlepage`.

The `@title` command normally produces a line in which the title is set flush to the left-hand side of the page in a larger than normal font. The title is underlined with a black rule. The title must be given on a single line in the source file; it will be broken into multiple lines of output is needed.

For long titles, the `@*` command may be used to specify the line breaks in long titles if the automatic breaks do not suit. Such explicit line breaks are generally reflected in all

² We have found that it is helpful to refer to versions of independent manuals as ‘editions’ and versions of programs as ‘versions’; otherwise, we find we are liable to confuse each other in conversation by referring to both the documentation and the software with the same words.

output formats; if you only want to specify them for the printed output, use a conditional (see Chapter 15 [Conditionals], page 134). For example:

```
@title This Long Title@inlinefmt{tex,*} Is Broken in @TeX{}
```

The `@subtitle` command normally sets subtitles in a normal-sized font flush to the right-hand side of the page.

The `@author` command normally sets the names of the author or authors in a middle-sized font flush to the left-hand side of the page on a line near the bottom of the title page. The names are followed by a black rule that is thinner than the rule that normally underlines the title.

There are two ways to use the `@author` command: you can write the name or names on the remaining part of the line that starts with an `@author` command:

```
@author by Jane Smith and John Doe
```

or you can write the names one above each other by using multiple `@author` commands:

```
@author Jane Smith
@author John Doe
```

A template for this method looks like this:

```
@titlepage
@title name-of-manual-when-printed
@subtitle subtitle-if-any
@subtitle second-subtitle
@author author
@page
...
@end titlepage
```

2.8.3 @titlefont, @center, and @sp

You can also use the `@titlefont`, `@sp`, and `@center` commands to create a title page for a printed document.

Use the `@titlefont` command to select a large font suitable for the title itself. You can use `@titlefont` more than once if you have an especially long title.

For HTML output, each `@titlefont` command produces an `<h1>` heading, but the HTML document `<title>` is not affected. For that, you could put a `@settitle` command before the `@titlefont` command (see Section 2.5.3 [`@settitle`], page 14).

For example:

```
@titlefont{Texinfo}
```

Use the `@center` command at the beginning of a line to center the remaining text on that line. Thus,

```
@center @titlefont{Texinfo}
```

centers the title, which in this example is “Texinfo” printed in the title font.

Use the `@sp` command to insert vertical space. For example:

```
@sp 2
```

This inserts two blank lines on the printed page. (See Section 12.7 [`@sp`], page 116, for more information about the `@sp` command.)

A template for this method looks like this:

```
@titlepage
@sp 10
@center @titlefont{name-of-manual-when-printed}
@sp 2
@center subtitle-if-any
@sp 2
@center author
...
@end titlepage
```

The spacing of the example fits an 8.5 by 11 inch manual.

2.8.4 Copyright Page

By international treaty, the copyright notice for a book must be either on the title page or on the back of the title page. When the copyright notice is on the back of the title page, that page is customarily not numbered. Therefore, in Texinfo, the information on the copyright page should be within `@titlepage` and `@end titlepage` commands.

Use the `@page` command to cause a page break. To push the copyright notice and the other text on the copyright page towards the bottom of the page, use the following incantation after `@page`:

```
@vskip Opt plus 1filll
```

The `@vskip` command inserts whitespace in the T_EX output; it is ignored in all other output formats. The `'Opt plus 1filll'` means to put in zero points of mandatory whitespace, and as much optional whitespace as needed to push the following text to the bottom of the page. Note the use of three 'l's in the word 'filll'; this is correct.

To insert the copyright text itself, write `@insertcopying` next (see Section 2.7 [Document Permissions], page 16):

```
@insertcopying
```

Follow the copying text by the publisher, ISBN numbers, cover art credits, and other such information.

Here is an example putting all this together:

```
@titlepage
...
@page
@vskip Opt plus 1filll
@insertcopying

Published by ...

Cover art by ...
@end titlepage
```

We have one more special case to consider: for plain text output, you must insert the copyright information explicitly if you want it to appear. For instance, you could have the following after the copyright page:

```
@ifplaintext
```

```
@insertcopying
@end ifplaintext
```

You could include other title-like information for the plain text output in the same place.

2.8.5 Heading Generation

Texinfo has two standard page heading formats, one for documents printed on one side of each sheet of paper (single-sided printing), and the other for documents printed on both sides of each sheet (double-sided printing).

In full generality, you can control the headings in different ways:

- The conventional way is to write a `@setchapternewpage` command before the title page commands.
Most documents are formatted with the standard single-sided or double-sided headings, (sometimes) using `@setchapternewpage odd` for double-sided printing and (almost always) no `@setchapternewpage` command for single-sided printing (see Section E.1 [`@setchapternewpage`], page 275).
- Alternatively, you can use the `@headings` command to prevent page headings from being generated or to start them for either single or double-sided printing. To turn off headings, write `@headings off`. See Section E.2.1 [`@headings`], page 276.
- Or, you may specify your own page heading and footing format. See Section E.2 [Headings], page 276.

2.9 Generating a Table of Contents

The `@chapter`, `@section`, and other structuring commands (see Chapter 4 [Chapter Structuring], page 38) supply the information to make up a table of contents, but they do not cause an actual table to appear in the manual. To do this, you must use the `@contents` and/or `@summarycontents` command(s).

`@contents`

Generates a table of contents in a printed manual, including all chapters, sections, subsections, etc., as well as appendices and unnumbered chapters. Headings generated by `@majorheading`, `@chapheading`, and the other `@...heading` commands do not appear in the table of contents (see Section 4.2 [Structuring Command Types], page 38).

`@shortcontents`

`@summarycontents`

(`@summarycontents` is a synonym for `@shortcontents`.)

Generates a short or summary table of contents that lists only the chapters, appendices, and unnumbered chapters. Sections, subsections and subsubsections are omitted. Only a long manual needs a short table of contents in addition to the full table of contents.

Both contents commands should be written on a line by themselves, and placed near the beginning of the file, after the `@end titlepage` (see Section 2.8.1 [`@titlepage`], page 18), before any sectioning command. The contents commands automatically generate a chapter-like heading at the top of the first table of contents page, so don't include any sectioning command such as `@unnumbered` before them.

Since an Info file uses menus instead of tables of contents, the Info formatting commands ignore the contents commands. But the contents are included in plain text output and in other output formats, such as HTML.

In HTML output, the links in the short table of contents point to corresponding entries in the full table of contents rather than the text of the document. The links in the full table of contents point to the main text of the document.

`@shortcontents` is not implemented for \LaTeX output.

2.10 The ‘Top’ Node and Master Menu

The ‘Top’ node is the node in which a reader enters an Info manual. As such, it should contain a very brief description of the manual (including the version number). The contents of the ‘Top’ node do not appear in printed output nor in DocBook output.

It is conventional to write a `@top` sectioning command line containing the title of the document immediately after the `@node Top` line (see Section 3.5 [`@top` Command], page 31).

We repeat the short description from the beginning of the ‘`@copying`’ text, but there’s no need to repeat the copyright information, so we don’t use ‘`@insertcopying`’ here.

The ‘Top’ node contains a top-level *menu* listing the chapters, and possibly a *detailed menu* listing all the nodes in the entire document.

```
@node Top
@top Short Sample
```

```
This is a short sample Texinfo file.
```

```
@menu
* First Chapter:: The first chapter is the
                  only chapter in this sample.
* Index::        Complete index.
@end menu
```

2.10.1 Parts of a Master Menu

A *master menu* is the main menu. It is customary to include a detailed menu listing all the nodes in the document in this menu. Like any other menu, a master menu is enclosed in `@menu` and `@end menu` and does not appear in the printed output nor in DocBook output.

The master menu contains entries for the major nodes in the Texinfo file: the nodes for the chapters, chapter-like sections, and the appendices, followed by nodes for the indices.

You may choose to follow these entries with a *detailed menu*. This lists other, lower-level nodes, often ordered by chapter. These items may be a convenience for an inquirer who can go directly to a particular node when searching for specific information, rather than going through an intermediate menu. If you use a detailed menu in your master menu, mark it with the `@detailmenu ... @end detailmenu` environment.

Each section in the menu can be introduced by a descriptive line. So long as the line does not begin with an asterisk, it will not be treated as a menu entry. (See Section 3.9.1 [Writing a Menu], page 34, for more information.)

For example, the master menu for this manual looks like the following (but has many more entries):

```
@menu
* Copying Conditions:: Your rights.
* Overview::          Texinfo in brief.
...
* Command and Variable Index::
* General Index::

@detailmenu
--- The Detailed Node Listing ---

Overview of Texinfo

* Reporting Bugs:: ...
...

Beginning a Texinfo File

* Sample Beginning:: ...
...
@end detailmenu
@end menu
```

2.11 The Body of the Document

The body segment contains all the text of the document. A manual is divided into one or more *nodes* (see Chapter 3 [Nodes], page 27). The example illustrates a chapter made of three nodes, one for introductory material in the chapter, and two sections. The introductory material contains an enumerated list.

```
@node First Chapter
@chapter First Chapter

@cindex chapter, first
This is the first chapter.
@cindex index entry, another
```

Here is a numbered list.

```
@enumerate
@item
This is the first item.

@item
This is the second item.
@end enumerate
```

```
@node First Section
@section First Section
```

First section of first chapter.

```
@node Second Section
@section Second Section
```

Second section of first chapter.

In the Info output, the ‘First Chapter’ node will contain a menu listing the two sections in the chapter. Similarly, when this node is output in its own HTML file, it will contain a table of contents for the chapter.

Here is what the contents of this chapter will look like:

1. First Chapter

This is the first chapter.

Here is a numbered list.

1. This is the first item.
2. This is the second item.

1.1 First Section

First section of first chapter.

1.2 Second Section

Second section of first chapter.

(In the Info and HTML output, the chapter would also be split into nodes.)

2.12 Ending a Texinfo File

The end of a Texinfo file should include commands to create indices (see Section 10.5 [Printing Indices & Menus], page 94), and the `@bye` command to mark the last line to be processed. For example:

```
@node Index
@unnumbered Index

@printindex cp

@bye
```

A `@bye` command terminates Texinfo processing. It should be on a line by itself. Anything following `@bye` is completely ignored.

3 Nodes

A *node* is a region of text that begins at a `@node` command, and continues until the next `@node` command. To specify a node, write a `@node` command at the beginning of a line, and follow it with the name of the node. Info readers display one node at a time, and provide commands for the user to move to related nodes. The HTML output can be similarly navigated.

Nodes are used as the targets of cross-references. Cross-references, such as the one at the end of this sentence, are made with `@xref` and related commands; see Chapter 5 [Cross References], page 44. Cross-references can be sprinkled throughout the text. Other `@`-commands may also be the target of cross-references (see Section 5.11 [`@anchor`], page 50, see Section 9.1 [Floats], page 84).

Normally, you put a node command immediately before each chapter structuring command—for example, an `@section` or `@subsection` line. (See Chapter 4 [Chapter Structuring], page 38.) You should do this even if you do not intend to format the file for Info. This is because printed output uses both `@node` names and chapter-structuring names in the output for cross-references. The only time you are likely to use the chapter structuring commands without also using nodes is if you are writing a document that contains no cross references and will only be printed, not transformed into Info, HTML, or other formats.

3.1 Writing a `@node` Line

Write `@node` at the beginning of a line followed by the name of the node, like this:

```
@node node-name
```

After you have inserted a `@node` line, you should immediately write the `@`-command for the associated chapter or section (if any) and insert its name.

You may optionally follow the node name argument to `@node` with up to three optional arguments on the rest of the same line, separating the arguments with commas. These are the names of the ‘Next’, ‘Previous’, and ‘Up’ pointers, in that order. Hence, the template for a fully-written-out node line with ‘Next’, ‘Previous’, and ‘Up’ pointers looks like this:

```
@node node-name, next, previous, up
```

The *node-name* argument must be present, but the others are optional. If you wish to specify some but not others, just insert commas as needed, as in: ‘`@node mynode, , uppernode`’. Any spaces before or after each name on the `@node` line are ignored. However, if your Texinfo document is hierarchically organized, as virtually all are, we recommend leaving off all the pointers and letting `texi2any` determine them.

The `texi2any` program automatically determines node pointers for a hierarchically organized document. For it to do this, each `@node` command should be followed immediately by a sectioning command such as `@chapter` or `@section` (except that comment lines may intervene). Finally, you must follow the ‘Top’ `@node` line with a line beginning with `@top` to mark the top-level node in the file. See Section 3.5 [`@top` Command], page 31.

Even when you explicitly specify all pointers, you cannot write the nodes in the Texinfo source file in an arbitrary order. You must write the nodes in the order you wish them to appear in the output. For Info format one can imagine that the order may not matter, but it matters for the other formats.

In most cases, you will want to take advantage of the pointer creation feature, and not redundantly specify node pointers that the programs can determine. However, Texinfo documents are not required to be organized hierarchically or in fact to contain sectioning commands at all (for example, if you never intend the document to be printed), so node pointers may still be specified explicitly, in full generality.

If you are using GNU Emacs, and want explicit pointers, you can use the update node commands provided by Texinfo mode to insert the names of the pointers. (See Section D.5 [Updating Nodes and Menus], page 256.)

Alternatively, you can insert the ‘Next’, ‘Previous’, and ‘Up’ pointers yourself. If you do this in Emacs, you may find it helpful to use the Texinfo mode keyboard command `C-c C-c n`. This command inserts `@node` and a comment line listing the names of the pointers in their proper order. The comment line helps you keep track of which arguments are for which pointers.

3.2 Choosing Node Names

The name of a node identifies the node. For all the details of node names, see Section 3.3 [Node Line Requirements], page 29).

Here are some suggestions for node names:

- Try to pick node names that are informative but short.
In the Info file, the file name, node name, and pointer names are all inserted on one line, which may run into the right edge of the window. (This does not cause a problem with Info, but is ugly.)
- Try to pick node names that differ from each other near the beginnings of their names. This way, it is easy to use automatic name completion in Info.
- Conventionally, node names are capitalized in the same way as section and chapter titles. In this manual, initial and significant words are capitalized; others are not. In other manuals, just initial words and proper nouns are capitalized. Either way is fine; we recommend just being consistent.
- In HTML output, any characters in the node name other than plain ASCII letters, numbers or spaces will be changed in the file name. (See Section 21.7.2 [HTML Xref Node Name Expansion], page 211.) This can make the URLs for the pages in your manual less user-friendly; for example, in this manual the ‘@dots’ node is output as `__0040dots.html`.

Because node names are used in cross-references, it is not desirable to casually change them once published. When you delete or rename a node, it is usually a good idea to define an `@anchor` with the old name. That way, references from other manuals, from mail archives, and so on are not invalidated. See Section 5.11 [`@anchor`], page 50.

The pointers from a given node enable you to reach other nodes and consist simply of the names of those nodes.

Normally, a node’s ‘Up’ pointer contains the name of the node whose menu mentions that node. The node’s ‘Next’ pointer contains the name of the node that follows the present node in that menu and its ‘Previous’ pointer contains the name of the node that precedes it in that menu. When a node’s ‘Previous’ node is the same as its ‘Up’ node, both pointers name the same node.

Usually, the first node of a Texinfo file is the ‘Top’ node, and its ‘Up’ pointer points to the `dir` file, which contains the main menu for all of Info.

3.3 @node Line Requirements

Names used with `@node` have several requirements:

- All the node names in a single Texinfo file must be unique.

This means, for example, that if you end every chapter with a summary, you must name each summary node differently. You cannot just call them all “Summary”. You may, however, duplicate the titles of chapters, sections, and the like. Thus you can end each chapter with a section called “Summary”, so long as the node names for those sections are all different.

Node names, anchor names (see Section 5.11 [`@anchor`], page 50), and float labels (see Section 9.1.1 [`@float`], page 84) must all be unique.

- Node names can contain `@-commands`¹. For example, using `@TeX{}` in a node name results in the T_EX logo being output, as it would be in normal text. Cross-references should use `@TeX{}` just as the node name does.

Some commands do not make sense in node names; for instance, environments (e.g., `@quotation`), commands that read a whole line as their argument (e.g., `@sp`), and plenty of others. For the complete list of commands that are allowed, and their expansion for HTML identifiers and file names, see Section 21.7.3 [HTML Xref Command Expansion], page 212.

- A node name may not start with a left parenthesis preceding a right parenthesis, as in `(not)allowed`, since this syntax is used to specify an external manual.
- Unfortunately, you cannot reliably use periods, commas, or colons within a node name; these can confuse some Info readers. `texi2any` quotes problematic node names and labels by default, but some Info readers do not recognize this syntax. Node name and label quoting causes DEL characters (‘CTRL-?’ , character number 127, often rendered as ‘^?’) to appear around the name. To remove node names and labels quoting, you can set the customization variable `INFO_SPECIAL_CHARS_QUOTE` to ‘0’ (see Section 19.4.8 [Other Customization Variables], page 183).

`texi2any` warns about such problematic usage in node names, menu items, and cross-references. If you don’t want to see the warnings, you can set the customization variable `INFO_SPECIAL_CHARS_WARNING` to ‘0’ (see Section 19.4.8 [Other Customization Variables], page 183).

If you insist on using these characters in node names, in order not to confuse the Texinfo processors you must still escape those characters, by using either special insertions (see Section 11.1.3 [Inserting a Comma], page 98) or `@asis` (see [`@asis`], page 80). For example:

```
@node foo@asis{::}bar@comma{ } baz
```

As an example of avoiding the special characters, the following is a section title in this manual:

```
@section @code{@@unnumbered}, @code{@@appendix}: Chapters with...
```

¹ Prior to the Texinfo 5 release in 2013, this feature was supported in an ad hoc way (the `--commands-in-node-names` option to `makeinfo`). Now it is part of the language.

But the corresponding node name lacks the commas and the subtitle:

```
@node @code{@@unnumbered @@appendix}
```

- Case is significant in node names.
- Spaces before and after names on the ‘@node’ line are ignored. Multiple whitespace characters “inside” a name are collapsed to a single space. For example:

```
@node foo bar
@node  foo bar,
@node foo bar ,
@node foo  bar,
@node foo  bar ,
```

all define the same node, namely ‘foo bar’. In menu entries, a single internal space should be used in node names or some versions of some Info readers will not find the node.

3.4 The First Node

The first node of a Texinfo file is the *Top* node, except in an included file (see Chapter 17 [Include Files], page 155). The Top node should contain a short summary and a master menu. See Section 2.10 [The Top Node], page 23, for more information on the Top node contents and examples. Straight text before the Top node outside of any node should be avoided. Such text, if present, is not output for DocBook.

Here is a description of the node pointers to be used in the Top node:

- The Top node (which must be named ‘top’ or ‘Top’) should have as its ‘Up’ node the name of a node in another file, where there is a menu that leads to this file. Specify the file name in parentheses.

Usually, all Info files are available through a single virtual Info tree, constructed from multiple directories. In this case, use ‘(dir)’ as the parent of the Top node; this specifies the top-level node in the *dir* file, which contains the main menu for the Info system as a whole. (Each directory with Info files is intended to contain a file named *dir*.)

That’s fine for Info, but for HTML output, one might well want the Up link from the Top node to go to some specific place. For example, for GNU the natural place would be <http://www.gnu.org/manual/> (a web page collecting links to most GNU manuals), better specified as just */manual/* if the manual will be installed on www.gnu.org. This can be specified with the `TOP_NODE_UP_URL` customization variable (see Section 19.4.3 [HTML Customization Variables], page 174), as in

```
$ texi2any --html -c TOP_NODE_UP_URL=/manual/ ...
```

- The ‘Prev’ node of the Top node is usually omitted.
- The ‘Next’ node of the Top node should be the first chapter in your document.

See Section 20.1 [Installing an Info File], page 196, for more information about installing an Info file in the *info* directory.

It is usually best to leave the pointers off entirely and let the tools implicitly define them, with this simple result:

```
@node Top
```

3.5 The @top Sectioning Command

The `@top` command is a special sectioning command that you should only use after a ‘`@node Top`’ line at the beginning of a Texinfo file.

It produces the same sort of output as `@unnumbered` (see Section 4.4 [`@unnumbered @appendix`], page 40). In \LaTeX `\part*` is used.

`@top` is ignored when raising or lowering sections. That is, it is never lowered and nothing can be raised to it (see Section 4.12 [Raise/lower sections], page 43).

It used to be conventional to wrap the ‘`Top`’ node in an `@ifnottex` conditional so that it would not appear in printed output (see Chapter 15 [Conditionals], page 134). Thus, a `Top` node often looked like this:

```
@ifnottex
@node Top
@top your-manual-title

very-high-level-summary
@end ifnottex
```

This is no longer necessary, as the ‘`Top`’ node is now never output for printed output. The ‘`Top`’ node is not output for DocBook either.

3.6 Texinfo Document Structure

Nodes can contain *menus*, which contain the names of *child nodes* within the parent node; for example, a node corresponding to a chapter would have a menu of the sections in that chapter. The menus allow the user to move to the child nodes in the Info output.

In addition, nodes contain *node pointers* that name other nodes. The ‘`Next`’ and ‘`Previous`’ pointers link nodes at the same sectioning level into a chain. As you might imagine, the ‘`Next`’ pointer links to the next node, and the ‘`Previous`’ pointer links to the previous node. In general, ‘`Next`’ and ‘`Previous`’ refer to nodes at the *same hierarchical level* in the manual, not necessarily to the next node within the Texinfo file. In the Texinfo file, the subsequent node may be at a lower level—a section-level node most often follows a chapter-level node, for example. Thus, for example, all the nodes that are at the level of sections within a chapter are linked together, and the order in this chain is the same as the order of the children in the menu of the parent chapter. Each child node records the parent node name as its ‘`Up`’ pointer.

Since the ‘`Top`’ node is the only node at that level, ‘`Next`’ refers to the first following node, which is almost always a chapter or chapter-level node. This is an exception to the rule of ‘`Next`’ being at the same hierarchical level.

The Info and HTML output for each node includes links to the ‘`Next`’, ‘`Previous`’, and ‘`Up`’ nodes. The HTML also uses the `accesskey` attribute with the values ‘`n`’, ‘`p`’, and ‘`u`’ respectively. This allows people using web browsers to follow the navigation using (typically) *M-letter*, e.g., *M-n* for the ‘`Next`’ node, from anywhere within the node. Node pointers and menus provide structure for Info files just as chapters, sections, subsections, and the like provide structure for printed books. The two structures are theoretically distinct; in practice, however, the tree structure of printed books is essentially always used for the node and menu structure also, as this leads to a document which is easy to follow.

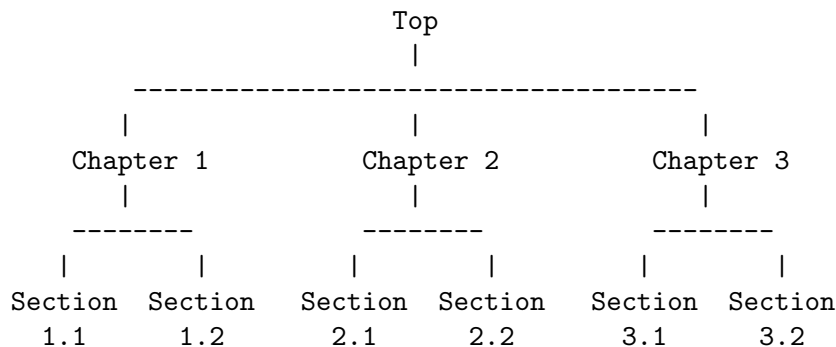
Typically, the sectioning structure and the node structure are completely parallel, with one node for each chapter, section, etc., and with the nodes following the same hierarchical arrangement as the sectioning. Thus, if a node is at the logical level of a chapter, its child nodes are at the level of sections; similarly, the child nodes of sections are at the level of subsections.

It is technically possible to create Texinfo documents with only one structure or the other, or for the two structures not to be parallel, or for either the sectioning or node structure to be different from the conventional structure. To the best of our knowledge, however, all the Texinfo manuals currently in general use do follow the conventional parallel structure.

3.7 Node and Menu Illustration

Here is a diagram that illustrates a Texinfo file with three chapters, each of which contains two sections.

The “root” is at the top of the diagram and the “leaves” are at the bottom. This is how such a diagram is drawn conventionally; it illustrates an upside-down tree. For this reason, the root node is called the ‘Top’ node, and ‘Up’ node pointers carry you closer to the root.



Using explicit pointers (not recommended, but shown for purposes of the example), the fully-written command to start Chapter 2 would be this:

```

@node      Chapter 2, Chapter 3, Chapter 1, Top
@comment  node-name, next,          previous, up
  
```

This `@node` line says that the name of this node is “Chapter 2”, the name of the ‘Next’ node is “Chapter 3”, the name of the ‘Previous’ node is “Chapter 1”, and the name of the ‘Up’ node is “Top”. You can (and should) omit writing out these node names if your document is hierarchically organized, but the pointer relationships still obtain.

To go to Sections 2.1 and 2.2 using Info, you need a menu inside Chapter 2. (See Section 3.9 [Menus], page 34.) You would write the menu just before the beginning of Section 2.1, like this:

```

@menu
* Sect. 2.1::      Description of this section.
* Sect. 2.2::      Description.
@end menu
  
```

The automatic pointers for the node for Sect. 2.1 correspond to:

```

@node      Sect. 2.1, Sect. 2.2, ,          Chapter 2
@comment  node-name, next,          previous, up
  
```

Note that no ‘Prev’ pointer is generated, since there is no other node at the same hierarchical level before Sect. 2.1.

Using explicit pointers, the node for Sect. 2.1 could be written like this:

```
@node      Sect. 2.1, Sect. 2.2, Chapter 2, Chapter 2
@comment  node-name, next,      previous, up
```

With automatic pointers, the ‘Next’ and ‘Previous’ pointers of a node lead to other nodes at the same level—from chapter to chapter or from section to section. As shown, when using explicit pointers, the pointers can also lead somewhere else, here, for example, the ‘Previous’ pointer points up. An ‘Up’ pointer usually leads to a node at the level above (closer to the ‘Top’ node; and a ‘Menu’ leads to nodes at a level below (closer to ‘leaves’). (A cross-reference can point to a node at any level; see Chapter 5 [Cross References], page 44.)

Technically, explicit node pointers can carry you to any node, regardless of the structure of the document; even to nodes in a different Info file. However, it would be very confusing for readers to have the ‘Next’, ‘Previous’ and ‘Up’ pointers lead to nodes that do not correspond, even loosely, to the next, previous and up node.

A `@node` command and a chapter structuring command are conventionally used together, in that order, often followed by indexing commands. (As shown in the example above, you may follow the `@node` line with a comment line, e.g., to show which pointer is which if explicit pointers are used.) The Texinfo processors use this construct to determine the relationships between nodes and sectioning commands.

Here is the beginning of the chapter in this manual called “Ending a Texinfo File”. This shows a `@node` line followed by a `@chapter` line, and then by indexing lines.

```
@node Ending a File
@chapter Ending a Texinfo File
@cindex Ending a Texinfo file
@cindex Texinfo file ending
@cindex File ending
```

3.8 Node Descriptions

You can provide a short description of the purpose of a node by using the `@nodedescription` command following the `@node` line. Such a description might elaborate on or extend the information in the node name itself.

You can also use a `@nodedescriptionblock` environment to provide a node description. This may be useful for longer descriptions.

`texi2any` uses the content you provide with these commands when outputting menus for Info output format (and, optionally, for HTML). `texi2any` uses the description after a menu entry for the node if it is generating the menu automatically, or if no description for the menu entry was provided in an explicit `@menu` block. (See Section 3.9 [Menus], page 34).

Here is an example of using these commands:

```
@node Tools
@chapter Tools
```

```
This chapter is on different tools you can use.
```

```
@node Screwdrivers
@nodedescription Flathead and Phillips.
@section Screwdrivers
```

This section is about screwdrivers.

```
@node Drills
@nodedescriptionblock
Making holes in things with power screwdrivers, drill drivers, combi
drills, impact drivers, hammer drills, breakers and demolition drills.
@end nodedescriptionblock
@section Drills
```

This section is about drills.

In Info output, `texi2any` would output the ‘Tools’ node with a menu as follows:

```
* Menu:

* Screwdrivers::      Flathead and Phillips.
* Drills::           Making holes in things with power
                    screwdrivers, drill drivers, combi
                    drills, impact drivers, hammer drills,
                    breakers and demolition drills.
```

3.9 Menus

Menus contain pointers to subordinate nodes. In Info output, you use menus to go to such nodes. `texi2any` can output menus in HTML output, but does not do so by default (see Section 19.4.8 [Other Customization Variables], page 183, under `FORMAT_MENU`). Menus have no role in printed manuals or other output formats.

Menus are automatically generated by `texi2any` when outputting Info for nodes followed by a sectioning command, without an explicit `@menu` block, and with automatic pointers.

It is often more convenient to let `texi2any` generate menus for you, as you do not then have the burden of updating menu blocks in your Texinfo source when you add, remove, or relocate nodes. In the usual case of a hierarchically organized manual with sectioning commands associated with nodes, and with node pointers left out, you should only write menus if you want exact control over the contents and formatting of menus in Info.

3.9.1 Writing a Menu

A menu consists of a `@menu` command on a line by itself, followed by menu entry lines or menu comment lines, and then followed by an `@end menu` command on a line by itself.

A menu looks like this:

This produces:

```
* Menu:
  Larger Units of Text

* Files::                All about handling files.
* Multiples: Buffers.    Multiple buffers; editing
                        several files at once.
```

In this example, the menu has two entries. ‘Files’ is both a menu entry name and the name of the node referred to by that name. ‘Multiples’ is the menu entry name; it refers to the node named ‘Buffers’. The line ‘Larger Units of Text’ is a comment; it appears in the menu, but is not an entry.

Since no file name is specified with either ‘Files’ or ‘Buffers’, they must be the names of nodes in the same Info file (see Section 3.9.6 [Referring to Other Info Files], page 37).

3.9.3 Menu Location

There may be at most one menu in a node. A menu is conventionally located at the end of a node, without any regular text or additional commands between the `@end menu` and the beginning of the next node.

This convention is useful, since a reader who uses the menu could easily miss any such text. Also, any such post-menu text will be considered part of the menu in Info output (which has no marker for the end of a menu). Thus, a line beginning with ‘*’ will likely be incorrectly handled.

It’s usually best if a node with a menu does not contain much text. If you find yourself with a lot of text before a menu, we generally recommend moving all but a couple of paragraphs into a new subnode. Otherwise, it is easy for readers to miss the menu.

3.9.4 The Parts of a Menu

A menu entry has three parts, only the second of which is required:

1. The menu entry name (optional).
2. The name of the node (required).
3. A description of the item (optional).

The template for a generic menu entry looks like this (but see the next section for one more possibility):

```
* menu-entry-name: node-name.    description
```

Follow the menu entry name with a single colon, and follow the node name with tab, comma, newline, or the two characters period and space (‘. ’).

The third part of a menu entry is a descriptive phrase or sentence. Menu entry names and node names are often short; the description explains to the reader what the node is about. A useful description complements the node name rather than repeats it. The description, which is optional, can spread over multiple lines; if it does, some authors prefer to indent the second line while others prefer to align it with the first (and all others). It’s up to you. An empty line, or the next menu entry, ends a description.

Space characters in a menu are preserved as-is in the Info output; this allows you to format the menu as you wish. Unfortunately you must type node names without any extra

spaces or some versions of some Info readers will not find the node (see Section 3.3 [Node Line Requirements], page 29).

`texi2any` warns and protect names when the text of a menu item (and node names and cross-references) contains a problematic construct that could interfere with its parsing in Info. See [Info Node Names Constraints], page 29.

3.9.5 Less Cluttered Menu Entry

When the menu entry name and node name are the same, you can write the name immediately after the asterisk and space at the beginning of the line and follow the name with two colons.

For example, write

```
* Name::                description
```

instead of

```
* Name: Name.          description
```

We recommend using the node name for the menu entry name whenever possible, since it reduces visual clutter in the menu.

3.9.6 Referring to Other Info Files

You can create a menu entry that enables a reader in Info to go to a node in another Info file by writing the file name in parentheses just before the node name. Some examples:

```
@menu
* first-entry-name:(filename)nodename.    description
* (filename)second-node::                description
@end menu
```

For example, to refer directly to the ‘Outlining’ and ‘Rebinding’ nodes in the *Emacs Manual*, you could write a menu like this:

```
@menu
* Outlining: (emacs)Outline Mode. The major mode for
              editing outlines.
* (emacs)Rebinding::                How to redefine the
              meaning of a key.
@end menu
```

If you do not list the node name, but only name the file, then Info presumes that you are referring to the ‘Top’ node. Examples:

```
* Info: (info).                Documentation browsing system.
* (emacs)::                    The extensible, self-documenting
                              text editor.
```

The GNU Emacs Texinfo mode menu updating commands only work with nodes within the current buffer, so you cannot use them to create menus that refer to other files. You must write such menus by hand. See Section D.5 [Updating Nodes and Menus], page 256.

4 Chapter Structuring

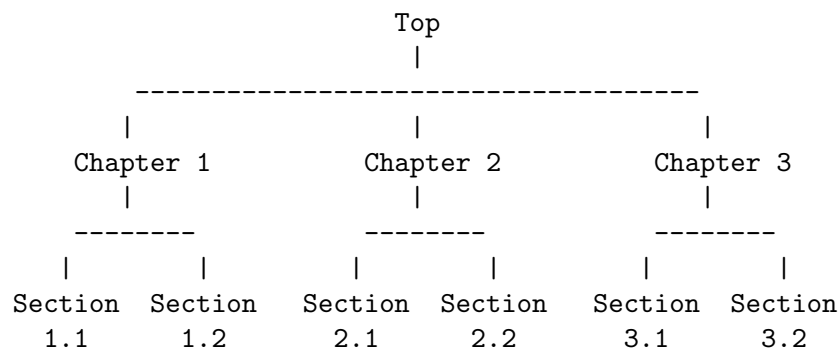
Texinfo's *chapter structuring* commands divide a document into a hierarchy of chapters, sections, subsections, and subsubsections. These commands generate large headings in the text, like the one above. They also provide information for generating the table of contents (see Section 2.9 [Generating a Table of Contents], page 22).

Normally you put a `@node` command immediately before each chapter structuring command. See Chapter 3 [Nodes], page 27.

4.1 Tree Structure of Sections

A Texinfo file is usually structured like a book with chapters, sections, subsections, and the like. This structure can be visualized as a tree (or rather as an upside-down tree) with the root at the top and the levels corresponding to chapters, sections, subsection, and subsubsections.

Here is a diagram that shows a Texinfo file with three chapters, each with two sections.



In a Texinfo file that has this structure, the beginning of Chapter 2 would be written like this:

```
@node    Chapter 2
@chapter Chapter 2
```

For purposes of example, here is how it would be written with explicit node pointers:

```
@node    Chapter 2, Chapter 3, Chapter 1, Top
@chapter Chapter 2
```

The chapter structuring commands are described in the sections that follow; the `@node` command is described in the previous chapter (see Chapter 3 [Nodes], page 27).

4.2 Structuring Command Types

The chapter structuring commands fall into four groups, each of which contains structuring commands at the levels of chapters, sections, subsections, and subsubsections:

- The `@chapter`-like commands and `@appendix`-like commands produce numbered or lettered entries both in the body of a document and in its table of contents.
- The `@unnumbered`-like commands produce unnumbered entries both in the body of a document and in its table of contents. The `@top` command, which has a special use, is

a member of this group (see Section 3.5 [`@top` Command], page 31). An `@unnumbered` section is a normal part of the document structure.

- The `@heading`-like commands produce simple unnumbered headings that do not appear in a table of contents, are not associated with nodes, and cannot be cross-referenced. These heading commands never start a new page.

In printed output, the chapter structuring commands produce headings in the document. When a `@setchapternewpage` command says to do so, the `@chapter`, `@unnumbered`, and `@appendix` commands start new pages in the printed manual; the `@heading` commands do not. See Section E.1 [`@setchapternewpage`], page 275.

In Info and plain text output, the command causes the title to appear on a line by itself, with a line of an ASCII character (`*`, `=`, ...) inserted underneath. For example, the “Chapter Structuring” heading could be:

```
5 Chapter Structuring
*****
```

The underlining character is the same for all the commands at the same level. For instance, it is the same for the chapter-level commands `@chapter`, `@appendix`, `@unnumbered` and `@chapheading`.

In HTML, the chapter-level commands produce an `<h2>`-level header by default (controlled by the `CHAPTER_HEADER_LEVEL` customization variable, see Section 19.4.8 [Other Customization Variables], page 183). The heading element level is adjusted for the other commands.

In the DocBook output, the appropriate level of element is used. The produced element includes all following sections up to the next command at the same or higher level. For example, a `<chapter>` element is produced for `@chapter`, and contains any sections or subsections in the chapter.

Here is a summary:

<i>Numbered</i>	<i>Unnumbered</i>	<i>Lettered/numbered</i>	No new page
In contents	In contents	In contents	<i>Unnumbered</i>
	<code>@top</code>		Not in contents
<code>@chapter</code>	<code>@unnumbered</code>	<code>@appendix</code>	<code>@majorheading</code>
<code>@section</code>	<code>@unnumberedsec</code>	<code>@appendixsec</code>	<code>@chapheading</code>
<code>@subsection</code>	<code>@unnumberedsubsec</code>	<code>@appendixsubsec</code>	<code>@heading</code>
<code>@subsubsection</code>	<code>@unnumberedsubsubsec</code>	<code>@appendixsubsubsec</code>	<code>@subheading</code>
			<code>@subsubheading</code>

4.3 `@chapter`: Chapter Structuring

`@chapter` identifies a chapter in the document—the highest level of the normal document structuring hierarchy. Write the command at the beginning of a line and follow it on the same line by the title of the chapter. The chapter is numbered automatically, starting from 1.

For example, the present chapter in this manual is entitled “Chapter Structuring”; the `@chapter` line looks like this:

```
@chapter Chapter Structuring
```

4.4 @unnumbered, @appendix: Chapters with Other Labeling

Use the `@unnumbered` command to start a chapter-level element that appears without chapter numbers of any kind. Use the `@appendix` command to start an appendix that is labeled by letter ('A', 'B', ...) instead of by number; appendices are also at the chapter level of structuring.

Write an `@appendix` or `@unnumbered` command at the beginning of a line and follow it on the same line by the title, just as with `@chapter`.

Texinfo also provides a command `@centerchap`, which is analogous to `@unnumbered`, but centers its argument in the printed and HTML outputs. This kind of stylistic choice is not usually offered by Texinfo. You are recommended not to use this command, as it may be removed in future releases of Texinfo.

With `@unnumbered`, if the name of the associated node is one of these English words (case-insensitive):

Acknowledgements Colophon Dedication Preface

then the DocBook output uses corresponding special tags (`<preface>`, etc.) instead of the default `<chapter>`. The argument to `@unnumbered` itself can be anything, and is output as the element title as usual.

4.5 @majorheading, @chapheading: Chapter-level Headings

The `@majorheading` and `@chapheading` commands produce chapter-like headings in the body of a document.

However, neither command produces an entry in the table of contents, and neither command causes T_EX to start a new page in a printed manual.

In T_EX, a `@majorheading` command generates a larger vertical whitespace before the heading than a `@chapheading` command but is otherwise the same.

In other output formats, the `@majorheading` and `@chapheading` commands produce a similar output to `@chapter`. The difference is the lack of numbering and the lack of any association with nodes. See Section 4.3 [`@chapter`], page 39.

4.6 @section: Sections Below Chapters

An `@section` command identifies a section within a chapter unit, whether created with `@chapter`, `@unnumbered`, or `@appendix`, following the numbering scheme of the chapter-level command. Thus, within a `@chapter` chapter numbered '1', the sections are numbered '1.1', '1.2', etc.; within an `@appendix` "chapter" labeled 'A', the sections are numbered 'A.1', 'A.2', etc.; within an `@unnumbered` chapter, the section gets no number.

To make a section, write the `@section` command at the beginning of a line and follow it on the same line by the section title. For example:

`@section This is a section`

Section titles are listed in the table of contents.

4.7 @unnumberedsec, @appendixsec, @heading

The `@unnumberedsec`, `@appendixsec`, and `@heading` commands are, respectively, the unnumbered, appendix-like, and heading-like equivalents of the `@section` command (see the previous section).

`@unnumberedsec` and `@appendixsec` do not need to be used in ordinary circumstances, because `@section` may also be used within `@unnumbered` and `@appendix` chapters; again, see the previous section.

`@unnumberedsec`

The `@unnumberedsec` command may be used within an unnumbered chapter or within a regular chapter or appendix to produce an unnumbered section.

`@appendixsec`

`@appendixsection`

`@appendixsection` is a longer spelling of the `@appendixsec` command; the two are synonymous.

Conventionally, the `@appendixsec` or `@appendixsection` command is used only within appendices.

`@heading` You may use the `@heading` command (almost) anywhere for a section-style heading that will not appear in the table of contents. The `@heading-series` commands can appear inside most environments, for example, though pathological and useless locations such as an argument to another command, etc., are not allowed.

4.8 @subsection: Subsections Below Sections

Subsections are to sections as sections are to chapters; see Section 4.6 [`@section`], page 40. For example:

```
@subsection This is a subsection
```

Subsection titles are listed in the table of contents.

4.9 The @subsection-like Commands

The `@unnumberedsubsec`, `@appendixsubsec`, and `@subheading` commands are, respectively, the unnumbered, appendix-like, and heading-like equivalents of the `@subsection` command. (See Section 4.8 [`@subsection`], page 41.)

`@unnumberedsubsec` and `@appendixsubsec` do not need to be used in ordinary circumstances, because `@subsection` may also be used within sections of `@unnumbered` and `@appendix` chapters (see Section 4.6 [`@section`], page 40).

An `@subheading` command produces a heading like that of a subsection except that it is not numbered and does not appear in the table of contents. Similarly, an `@unnumberedsubsec` command produces an unnumbered heading like that of a subsection and an `@appendixsubsec` command produces a subsection-like heading labeled with a letter and numbers; both of these commands produce headings that appear in the table of contents.

4.10 @subsubsection and Other Subsub Commands

The fourth and lowest level sectioning commands in Texinfo are the ‘subsub’ commands. They are:

@subsubsection

Subsubsections are to subsections as subsections are to sections. (See Section 4.8 [**@subsection**], page 41.) Subsubsection titles appear in the table of contents.

@unnumberedsubsubsec

Unnumbered subsubsection titles appear in the table of contents, but lack numbers. Otherwise, unnumbered subsubsections are the same as subsubsections.

@appendixsubsubsec

Conventionally, appendix commands are used only for appendices and are lettered and numbered appropriately. They also appear in the table of contents.

@subsubheading

The **@subsubheading** command may be used anywhere that you want a small heading that will not appear in the table of contents.

As with subsections, **@unnumberedsubsubsec** and **@appendixsubsubsec** do not need to be used in ordinary circumstances, because **@subsubsection** may also be used within subsections of **@unnumbered** and **@appendix** chapters (see Section 4.6 [**@section**], page 40).

4.11 @part: Groups of Chapters

The final sectioning command is **@part**, to mark a *part* of a manual, that is, a group of chapters or (rarely) appendices. This behaves quite differently from the other sectioning commands, to fit with the way such “parts” are conventionally used in books.

No **@node** command is associated with **@part**. Just write the command on a line by itself, including the part title, at the place in the document you want to mark off as starting that part. For example:

```
@part Part I:@* The beginning
```

As can be inferred from this example, no automatic numbering or labeling of the **@part** text is done. The text is taken as-is.

Because parts are not associated with nodes, no general text can follow the **@part** line. To produce the intended output, it must be followed by a chapter-level command (including its node). Thus, to continue the example:

```
@part Part I:@* The beginning
```

```
@node Introduction
```

```
@chapter Introduction
```

```
...
```

In the T_EX output, the **@part** text is included in both the normal and short tables of contents (see Section 2.9 [Contents], page 22), without a page number (since that is the normal convention). In addition, a “part page” is output in the body of the document, with just the **@part** text. In the example above, the **@*** causes a line break on the part page (but is replaced with a space in the tables of contents). This part page is always forced

to be on an odd (right-hand) page, regardless of the chapter pagination (see Section E.1 [`@setchapternewpage`], page 275). In the L^AT_EX output, the `@part` is output as `\part`.

In the HTML output, the `@part` text is similarly included in the tables of contents, and a heading is included in the main document text, as part of the following chapter or appendix node.

In the DocBook output, the `<part>` element includes all the following chapters, up to the next `<part>`. A `<part>` containing chapters is also closed at an appendix.

In the Info and plain text output, `@part` has no effect.

`@part` is ignored when raising or lowering sections (see next section). That is, it is never lowered and nothing can be raised to it.

4.12 Raise/lower Sections: `@raisesections` and `@lowersections`

The `@raisesections` and `@lowersections` commands implicitly raise and lower the hierarchical level of following chapters, sections and the other sectioning commands (excluding parts).

That is, the `@raisesections` command changes sections to chapters, subsections to sections, and so on. Conversely, the `@lowersections` command changes chapters to sections, sections to subsections, and so on. Thus, a `@lowersections` command cancels a `@raisesections` command, and vice versa.

As a practical matter, you generally only want to raise or lower large chunks, usually in external files. You can use `@lowersections` to include text written as an outer or standalone Texinfo file in another Texinfo file as an inner, included file (see Chapter 17 [Include Files], page 155). Typical usage looks like this:

```
@lowersections
@include somefile.texi
@raisesections
```

(Without the `@raisesections`, all the subsequent sections in the main file would also be lowered.)

If the included file being lowered has a `@top` node, you'll need to conditionalize its inclusion with a flag (see Section 15.5.1 [`@set @value`], page 138).

Any menus in the final result have to take the raising and lowering into account, so arbitrarily sprinkling `@raisesections` and `@lowersections` commands throughout the document will likely lead to errors (unless the menus in your document are all generated automatically).

Repeated use of the commands continues to raise or lower the hierarchical level a step at a time. An attempt to raise above 'chapter' reproduces chapter commands; an attempt to lower below 'subsubsection' reproduces subsubsection commands. Also, lowered subsubsections and raised chapters will not work with `texi2any`'s feature of implicitly determining node pointers, since the menu structure cannot be represented correctly.

Write each `@raisesections` and `@lowersections` command on a line of its own.

5 Cross-references

Cross-references are used to refer the reader to other parts of the same or different Texinfo files.

Use cross-references to provide access to information that is too detailed for the current context, or incidental to it. An online help system or a reference manual is not like a novel; few read such documents in sequence from beginning to end. Instead, people look up what they need. For this reason, such creations should contain many cross-references to help readers find other information that they may not have read.

In a printed manual, a cross-reference results in a page reference, unless it is to another manual altogether, in which case the cross-reference names that manual. In Info, a cross-reference results in an entry that you can follow using the Info ‘f’ command. (See Section “Following cross-references” in *Info*.) In HTML, a cross-reference results in an hyperlink. In DocBook, the <link> element is used for cross-references unless it is to another manual, in which case the cross-reference names that manual.

The various cross-reference commands use nodes, anchors (see Section 5.11 [`@anchor`], page 50) or float labels (see Section 9.1.1 [`@float`], page 84) to define cross-reference locations. When TeX generates a DVI file, it records each cross-reference location page number and uses the page numbers in making references. Thus, even if you are writing a manual that will only be printed, and not used online, you must nonetheless write `@node` lines (or `@anchor` anchors) in order to name the places to which you make cross-references.

5.1 Different Cross-reference Commands

There are three different cross-reference commands:

- `@xref` Used to start a sentence with an Info cross-reference saying ‘*Note *name*: *node*.’ or with ‘See . . .’ in other output formats.
- `@ref` Used within or, more often, at the end of a sentence; produces an Info cross-reference saying ‘*note *name*: *node*.’, and just the reference in other output formats, without the preceding ‘See’.
- `@pxref` Used within parentheses, at the end of a sentence, or otherwise before punctuation, to make a reference. Its output starts with a lowercase ‘*note’ in Info, and with a lowercase ‘see’ in the other output formats. (‘p’ is for ‘parenthesis’.)

Additionally, there are commands to produce references to documents outside the Texinfo system. The `@cite` command is used to make references to books and manuals. `@url` produces a URL, for example a reference to a page on the World Wide Web.

5.2 Parts of a Cross-reference

A cross-reference command requires only one argument, which is the name of the node to which it refers. A cross-reference command may contain up to four additional arguments. The template for a full five argument cross-reference looks like this:

```
@xref{node-name, online-label, printed-label,
manual-name, printed-manual-title}
```

The five possible arguments for a cross-reference are:

1. The node or anchor name. This is the location to which the cross-reference takes you. In a printed document, the location of the node provides the page reference only for references within the same document. Use `@node` to define the node (see Section 3.1 [Writing a Node], page 27), `@anchor` (see Section 5.11 [`@anchor`], page 50), or `@float` (see Section 9.1.1 [`@float`], page 84) with a label. This argument is required (except for reference to whole manuals).

Write a node name in a cross-reference in exactly the same way as in the `@node` line, including the same capitalization; otherwise, the processors may not find the reference.

2. A label for online output. It is usually omitted; then the topic description (third argument) is used if it was specified; if that was omitted as well, the node name is used.
3. A label for printed output. Often, this is the title or topic of the section. This is used as the name of the reference in the printed manual. If omitted, the node name is used.
4. The name of the manual to which the reference refers, if it is outside the current manual, in a different Texinfo file.
5. The title of the printed manual to which the reference refers, from a different Texinfo file.

Whitespace before and after the commas separating these arguments is ignored. To include a comma in one of the arguments, use `@comma{}` (see Section 11.1.3 [Inserting a Comma], page 98).

Cross-references with one, two, three, four, and five arguments are described separately in following sections.

When processing with TeX, a comma is automatically inserted after the page number for cross-references to within the same manual, unless the closing brace of the argument is followed by non-whitespace (such as a comma or period). This gives you the choice of whether to have a comma there in other output formats. For example,

```
@xref{Another Section} for more info
```

with TeX produces ‘See Another Section, page *ppp*, for more info’, and in the Info output produces ‘*Note Another Section:: for more info’.

If an unwanted comma is added, follow the argument with a command such as ‘@:’. For example, ‘`@xref{Hurricanes}@: --- for the details`’ produces

```
See Hurricanes, page ppp — for the details
```

instead of ‘See Hurricanes, page *ppp*, — for the details’.

`texi2any` warns and protect names when the text of a cross-reference (and node names and menu items) contains a problematic construct that could interfere with its parsing in Info. See [Info Node Names Constraints], page 29.

5.3 `@xref` with One Argument

The simplest form of `@xref` takes one argument, the name of another node in the same Texinfo file.

For example,

```
@xref{Tropical Storms}.
```

produces

```
*Note Tropical Storms::.
```

in Info and

```
See Section 3.1 [Tropical Storms], page 24.
```

in a printed manual.

5.4 @xref with Two Arguments

With two arguments, the second is used as a label for the online output.

The template is like this:

```
@xref{node-name, online-label}.
```

For example,

```
@xref{Electrical Effects, Lightning}.
```

produces:

```
*Note Lightning: Electrical Effects.
```

in Info and

```
See Section 5.2 [Electrical Effects], page 57.
```

in a printed manual, where the node name is printed.

The second argument to cross-references shares constraints with node names. The potentially problematic character in this context is the colon. See [Info Node Names Constraints], page 29.

5.5 @xref with Three Arguments

A third argument replaces the node name in the printed output. The third argument should be the name of the section in the printed output, or else state the topic discussed by that section.

The template is like this:

```
@xref{node-name, online-label, printed-label}.
```

For example,

```
@xref{Electrical Effects, Lightning, Thunder and Lightning},
for details.
```

produces

```
*Note Lightning: Electrical Effects, for details.
```

in Info and

```
See Section 5.2 [Thunder and Lightning], page 57, for details.
```

in a printed manual.

If a third argument is given and the second one is empty, then the third argument serves for both. (Note how two commas, side by side, mark the empty second argument.)

```
@xref{Electrical Effects, , Thunder and Lightning},
for details.
```

produces

```
*Note Thunder and Lightning: Electrical Effects, for details.
```

in Info and

```
See Section 5.2 [Thunder and Lightning], page 57, for details.
```

in a printed manual.

The third argument to cross-references shares constraints with node names. The potentially problematic character in this context is the colon. See [Info Node Names Constraints], page 29.

As a practical matter, it is often best to write cross-references with just the first argument if the node name and the section title are the same (or nearly so), and with the first and third arguments only if the node name and title are different.

Texinfo offers a setting to use the section title instead of node names by default in cross-references (an explicitly specified third argument still takes precedence):

```
@xrefautomaticsectiontitle on
```

Typically this line would be given near the beginning of the document and used for the whole manual. But you can turn it off if you want (`@xrefautomaticsectiontitle off`), for example, if you're including some other sub-document that doesn't have suitable section names. This setting also applies to node headers in HTML, if `@xrefautomaticsectiontitle` is on, the sections names are used in node headers instead of the node names when possible.

5.6 @xref with Four and Five Arguments

In a cross-reference, a fourth argument specifies the name of another manual, different from the file in which the reference appears, and a fifth argument specifies its title as a printed manual.

The full template is:

```
@xref{node-name, online-label, printed-label,  
manual-name, printed-manual-title}.
```

For example,

```
@xref{Electrical Effects, Lightning, Thunder and Lightning,  
weather, An Introduction to Meteorology}.
```

produces this output in Info:

```
*Note Lightning: (weather)Electrical Effects.
```

As you can see, the name of the manual is enclosed in parentheses and precedes the name of the node. In HTML, the manual name and the node name are used to construct the hyperlink URL (see Section 21.7 [HTML Xref], page 209), while the link text is based on the label.

In a printed manual, the reference looks like this:

```
See section "Thunder and Lightning" in An Introduction to Meteorology.
```

The title of the printed manual is typeset like `@cite`; and the reference lacks a page number since the page a reference refers when that reference is to another manual cannot be known.

Next case: often, you will leave out the second argument when you use the long version of `@xref`. In this case, the third argument, the topic description, will be used as the cross-reference name in online formats. For example,

```
@xref{Electrical Effects, , Thunder and Lightning,  
weather, An Introduction to Meteorology}.
```

produces

```
*Note Thunder and Lightning: (weather)Electrical Effects.
```

in Info and

See section “Thunder and Lightning” in *An Introduction to Meteorology*.

in a printed manual.

Next case: If the node name and the section title are the same in the other manual, you may also leave out the section title. In this case, the node name is used in both instances. For example,

```
@xref{Electrical Effects,,,  
weather, An Introduction to Meteorology}.
```

produces

```
*Note (weather)Electrical Effects::.
```

in Info and

See section “Electrical Effects” in *An Introduction to Meteorology*.

in a printed manual.

In general, there is no reason to have a manual name argument without a printed manual argument, unless no printed manual is generated. You may also want to refer to another manual file that is within a single printed manual—when multiple Texinfo files are incorporated into the same printed manual but can create separate output files in other output formats. In this case, you need to specify only the fourth argument, and not the fifth. If the printed manual title argument is missing, the manual name will be used instead in printed output.

A printed manual title argument without an online manual argument is of little use unless only a printed manual is generated from the Texinfo source. The result in online formats depends on the format, and can be, for example, an empty manual name or a reference to the printed manual formatted in a similar way to the printed output.

Finally, it’s also allowed to leave out all the arguments *except* the fourth and fifth, to refer to another manual as a whole. See the next section.

5.7 Referring to a Manual as a Whole

Ordinarily, you must always name a node in a cross-reference. However, it’s not unusual to want to refer to another manual as a whole, rather than a particular section within it. In this case, giving any section name is an unnecessary distraction.

So, with cross-references to other manuals (see Section 5.6 [Four and Five Arguments], page 47), if the first argument is either ‘Top’ (capitalized just that way) or omitted entirely, and the third argument is omitted, the printed output includes no node or section name. (The Info output includes ‘Top’ if it was given.) For example,

```
@xref{Top,,, make, The GNU Make Manual}.
```

produces

```
*Note (make)Top::.
```

and

See *The GNU Make Manual*.

Info readers will go to the Top node of the manual whether or not the ‘Top’ node is explicitly specified.

It’s also possible (and is historical practice) to refer to a whole manual by specifying the ‘Top’ node and an appropriate entry for the third argument to the `@xref` command. Using this idiom, to make a cross-reference to *The GNU Make Manual*, you would write:

```
@xref{Top,, Overview, make, The GNU Make Manual}.
```

which produces

```
*Note Overview: (make)Top.
```

in Info and

See section “Overview” in *The GNU Make Manual*.

in a printed manual.

In this example, ‘Top’ is the name of the first node, and ‘Overview’ is the name of the first section of the manual. There is no widely-used convention for naming the first section in a printed manual, this is just what the Make manual happens to use. This arbitrariness of the first name is a principal reason why omitting the third argument in whole-manual cross-references is preferable.

5.8 @xref

The `@xref` command generates a cross-reference for the beginning of a sentence. Examples of using `@xref` are in previous sections.

5.9 @ref

`@ref` is nearly the same as `@xref` except that it does not generate a ‘See’ in the output, just the reference itself. This makes it useful as the last part of a sentence.

For example,

```
For more information, @pxref{This}, and @ref{That}.
```

produces in Info:

```
For more information, *note This::, and *note That::.
```

and in printed output:

```
For more information, see Section 1.1 [This], page 1, and Section 1.2 [That],
page 2.
```

The `@ref` command can tempt writers to express themselves in a manner that is suitable for a printed manual but looks awkward in the Info format. Bear in mind that your audience could be using both the printed and other output formats such as Info. For example:

```
Sea surges are described in @ref{Hurricanes}.
```

looks ok in the printed output:

```
Sea surges are described in Section 6.7 [Hurricanes], page 72.
```

but is awkward to read in Info, “note” being a verb:

```
Sea surges are described in *note Hurricanes::.
```

5.10 @pxref

The parenthetical reference command, `@pxref`, is nearly the same as `@xref`, but it is best used within parentheses. The command differs from `@xref` in that the reference is typeset with a lowercase ‘see’ rather than an uppercase ‘See’. In Info, ‘*note’ is output.

With one argument, a parenthetical cross-reference looks like this:

```
... storms cause flooding (@pxref{Hurricanes}) ...
```

which produces

```
... storms cause flooding (*note Hurricanes::) ...
```

in Info and

```
... storms cause flooding (see Section 6.7 [Hurricanes], page 72) ...
```

in a printed manual.

In past versions of Texinfo, it was not allowed to write punctuation after a `@pxref`, so it could be used *only* before a right parenthesis. This is no longer the case. The effect of ‘`@pxref{node-name}`’ is similar to that of ‘`see @ref{node-name}`’. However, in many circumstances the latter is preferable, as this makes it clear in the Info output that the word “see” should be present.

5.11 @anchor: Defining Arbitrary Cross-reference Targets

An *anchor* is a position in your document, labelled so that cross-references can refer to it, just as they can to nodes. You create an anchor with the `@anchor` command, and give the label as a normal brace-delimited argument. For example:

```
This marks the @anchor{x-spot}spot.
...
@xref{x-spot,,the spot}.
```

produces:

```
This marks the spot.
...
See [the spot], page 1.
```

As you can see, the `@anchor` command itself produces no output. This example defines an anchor ‘x-spot’ just before the word ‘spot’. You can refer to it later with an `@xref` or other cross reference command, as shown (see Chapter 5 [Cross References], page 44).

It is best to put `@anchor` commands just before the position you wish to refer to; that way, the reader’s eye is led on to the correct text when they jump to the anchor. You can put the `@anchor` command on a line by itself if that helps readability of the source. Whitespace (including newlines) is ignored after `@anchor`.

Anchor names, node names and float labels may not conflict. Anchors, nodes and float labels are given similar treatment in some ways; for example, the `goto-node` command takes either an anchor name or a node name as an argument. (See Section “Go to node” in *Info*.) Anchors names and float labels could also appear in menus (see Section 3.9 [Menus],

page 34) and node direction pointers (see Section 3.1 [Writing a Node], page 27), although this is not recommended.

Anchor names share the same constraints as nodes on the characters that can be included (see [Info Node Names Constraints], page 29).

Because of this duality, when you delete or rename a node, it is usually a good idea to define an `@anchor` with the old name. That way, any links to the old node, whether from other Texinfo manuals or general web pages, keep working.

5.12 `@link`: Plain, unadorned hyperlink

`@link` produces a plain hyperlink in output formats that support it, including in HTML, DocBook, L^AT_EX and online PDF. The template is:

```
@link{node-name, label, manual-name}
```

node-name is the name of the target node or anchor. Either or both of *label* and *manual-name* can be omitted. *label*, if given, is the text to use for the link. *manual-name* is the name of the external manual that the target appears within; if not given, the reference is to the current manual.

`@link` has similar output to `@ref`, except that it does produce any extra text around the link label in Info or printed output that would mark it as a cross-reference.

Be careful about using `@link` to produce links that are necessary for a user to move around a manual, as these links will do nothing in these output formats. `@link` is best used to add convenience links that are nonetheless not essential for a reader to understand the text of the manual. For example, you might use `@link` in a code sample to reference documentation of a symbol in a programming library.

5.13 `@inforef`: Cross-references to Info-only Material

`@inforef` is used for making cross-references to Info documents—even from a printed manual. This was originally used for Info files that were not generated from any Texinfo source. The command is now obsolete and should not be used. In addition to having little use, similar output can be obtained with `@xref`, `@ref` or `@pxref` with the Info file name as the fourth argument and no fifth argument.

The command takes either two or three arguments, in the following order:

1. The node name.
2. The cross-reference name (optional).
3. The Info file name.

The template is:

```
@inforef{node-name, cross-reference-name, info-file-name}
```

5.14 `@url`, `@uref{url[, text][, replacement]}`

`@url` produces a reference to a uniform resource locator (URL). It takes one mandatory argument, the URL, and two optional arguments which control the text that is displayed. In HTML and PDF output, `@url` produces a link you can follow. (To merely indicate

a URL without creating a link people can follow, use `@indicateurl`, see Section 6.1.15 [`@indicateurl`], page 63.)

`@uref` is a synonym for `@url`. (Originally, `@url` had the meaning of `@indicateurl` and `@uref` was required to produce a working link, but in practice `@url` was almost always misused. So we've changed the meaning.)

The second argument, if specified, is the text to display (the default is the URL itself); in output formats other than HTML, the URL is output in addition to this text.

The third argument, if specified, is the text to display, but in this case the URL is not output in any format. This is useful when the text is already sufficiently referential, as in a man page. Also, if the third argument is given, the second argument is ignored.

5.14.1 `@url` Examples

First, here is an example of the simplest form of `@url`, with just one argument. The given URL is both the target and the visible text of the link:

```
The official GNU ftp site is @url{http://ftp.gnu.org/gnu}.
produces:
```

```
The official GNU ftp site is http://ftp.gnu.org/gnu.
```

Two-argument form of `@url`

Here is an example of the two-argument form:

```
The official @url{http://ftp.gnu.org/gnu, GNU ftp site}
holds programs and texts.
```

which produces:

```
The official GNU ftp site (http://ftp.gnu.org/gnu)
holds programs and texts.
```

The HTML output is this:

```
The official <a href="http://ftp.gnu.org/gnu">GNU ftp site</a>
holds programs and texts.
```

In other formats, the output is like this:

```
The official GNU ftp site (http://ftp.gnu.org/gnu)
holds programs and texts.
```

Three-argument form of `@url`

Finally, an example of the three-argument form:

```
The @url{/man.cgi/1/ls,,ls} program ...
```

which, except for HTML, produces:

```
The ls program ...
```

but with HTML:

```
The <a href="/man.cgi/1/ls">ls</a> program ...
```

By the way, some people prefer to display URLs in the unambiguous format:

```
<URL:http://host/path>
```

You can use this form in the input file if you wish. We feel it's not necessary to include the '<URL:' and '>' in the output, since to be useful any software that tries to detect URLs in text already has to detect them without the '<URL:'.

5.14.2 URL Line Breaking

T_EX allows line breaking within URLs at only a few characters (which are special in URLs): '&', '.', '#', '?', and '/' (but not between two '/' characters). A tiny amount of stretchable space is also inserted around these characters to help with line breaking.

For HTML output, modern browsers will also do line breaking within displayed URLs. If you need to allow breaks at other characters you can insert @/ as needed (see Section 12.2 [Line Breaks], page 114).

By default, in T_EX any such breaks at special characters will occur after the character. Some people prefer such breaks to happen before the special character. This can be controlled with the @urefbreakstyle command (this command has effect only in T_EX):

```
@urefbreakstyle how
```

where the argument *how* is one of these words:

- 'after' (the default) Potentially break after the special characters.
- 'before' Potentially break before the special characters.
- 'none' Do not consider breaking at the special characters at all; any potential breaks must be manually inserted.

5.14.3 @url PDF Output Format

If the ultimate purpose of a PDF is only to be viewed online, perhaps similar to HTML in some inchoate way, you may not want the URLs to be included in the visible text (just as URLs are not visible to readers of web pages). Texinfo provides a PDF-specific option for this, which must be used inside @tex:

```
@tex
\global\urefurlonlylinktrue
@end tex
```

The result is that @url{http://www.gnu.org, GNU} has the visible output of just 'GNU', with a link target of http://www.gnu.org. Ordinarily, the visible output would include both the label and the url: 'GNU (http://www.gnu.org)'.

This option only has effect when the PDF output is produced with the pdfT_EX program, not with other ways of getting from Texinfo to PDF (e.g., T_EX to DVI to PDF). Consequently, it is ok to specify this option unconditionally within @tex, as shown above. It is ignored when DVI is being produced.

5.15 @cite{reference}

Use the @cite command for the name of a book that lacks a companion Info file. For example, we could refer to *A Book*. The command selects a slanted font in the printed manual, and generates quotation marks in the Info file.

If a book is written in Texinfo, it is better to use a cross-reference command since a reader can easily follow such a reference in Info. See Section 5.8 [@xref], page 49.

5.16 PDF Colors

By default, URLs and cross-reference links are printed in black in PDF output. Very occasionally, however, you may want to highlight such “live” links with a different color, as is commonly done on web pages. Texinfo provides a PDF-specific option for specifying these colors, which must be used inside `@tex`:

```
@tex
\global\def\linkcolor{1 0 0} % red
\global\def\urlcolor{0 1 0}  % green
@end tex
```

`\urlcolor` changes the color of `@url` output (both the actual URL and any textual label), while `\linkcolor` changes the color for cross-references to nodes, etc. They are independent.

The three given values must be numbers between 0 and 1, specifying the amount of red, green, and blue respectively.

These definitions only have an effect when the PDF output is produced with the pdf \TeX program, not with other ways of getting from Texinfo to PDF (e.g., \TeX to DVI to PDF). Consequently, it is ok to specify this option unconditionally within `@tex`, as shown above. It is ignored when DVI is being produced.

We do not recommend colorizing just for fun; unless you have a specific reason to use colors, best to skip it.

6 Marking Text, Words and Phrases

In Texinfo, you can mark words and phrases in a variety of ways. The Texinfo processors use this information to determine how to highlight the text. You can specify, for example, whether a word or phrase is a defining occurrence, a metasyntactic variable, or a symbol used in a program. Also, you can emphasize text, in several different ways.

6.1 Indicating Definitions, Commands, etc.

Texinfo has commands for indicating just what kind of object a piece of text refers to. For example, email addresses are marked by `@email`; that way, the result can be a live link to send email when the output format supports it. If the email address was simply marked as “print in a typewriter font”, that would not be possible.

6.1.1 Highlighting Commands are Useful

The commands serve a variety of purposes:

`@code{sample-code}`

Indicate text that is a literal example of a piece of a program. See Section 6.1.2 [`@code`], page 56.

`@kbd{keyboard-characters}`

Indicate keyboard input. See Section 6.1.3 [`@kbd`], page 57.

`@key{key-name}`

Indicate the conventional name for a key on a keyboard. See Section 6.1.4 [`@key`], page 58.

`@samp{text}`

Indicate text that is a literal example of a sequence of characters. See Section 6.1.5 [`@samp`], page 58.

`@verb{text}`

Write a verbatim sequence of characters. See Section 6.1.6 [`@verb`], page 59.

`@var{metasyntactic-variable}`

Indicate a metasyntactic variable. See Section 6.1.7 [`@var`], page 59.

`@env{environment-variable}`

Indicate an environment variable. See Section 6.1.8 [`@env`], page 60.

`@file{file-name}`

Indicate the name of a file. See Section 6.1.9 [`@file`], page 60.

`@command{command-name}`

Indicate the name of a command. See Section 6.1.10 [`@command`], page 61.

`@option{option}`

Indicate a command-line option. See Section 6.1.11 [`@option`], page 61.

`@dfn{term}`

Indicate the introductory or defining use of a term. See Section 6.1.12 [`@dfn`], page 61.

`@cite{reference}`

Indicate the name of a book. See Section 5.15 [`@cite`], page 53.

`@abbr{abbreviation}`

Indicate an abbreviation, such as ‘Comput.’.

`@acronym{acronym}`

Indicate an acronym. See Section 6.1.14 [`@acronym`], page 62.

`@indicateurl{uniform-resource-locator}`

Indicate an example (that is, nonfunctional) uniform resource locator. See Section 6.1.15 [`@indicateurl`], page 63. (Use `@url` (see Section 5.14 [`@url`], page 51) for live URLs.)

`@email{email-address[, displayed-text]}`

Indicate an electronic mail address. See Section 6.1.16 [`@email`], page 63.

6.1.2 `@code{sample-code}`

Use the `@code` command to indicate text that is a piece of a program and which consists of entire syntactic tokens. Enclose the text in braces.

Thus, you should use `@code` for an expression in a program, for the name of a variable or function used in a program, or for a keyword in a programming language.

Use `@code` for command names in languages that resemble programming languages, such as Texinfo. For example, `@code` and `@samp` are produced by writing ‘`@code{@@code}`’ and ‘`@code{@@samp}`’ in the Texinfo source, respectively.

It is incorrect to alter the case of a word inside a `@code` command when it appears at the beginning of a sentence. Most computer languages are case sensitive. In C, for example, `Printf` is different from the identifier `printf`, and most likely is a misspelling of it. Even in languages which are not case sensitive, it is confusing to a human reader to see identifiers spelled in different ways. Pick one spelling and always use that. If you do not want to start a sentence with a command name written all in lowercase, you should rearrange the sentence.

The `@code` argument is typeset in a typewriter (monospace) font. where the output format allows this. For example,

```
The function returns @code{nil}.
```

produces this:

```
The function returns nil.
```

Here are some cases for which it is preferable *not* to use `@code`:

- For shell command names, such as `ls` (use `@command`).
- For environment variables, such as `TEXINPUTS` (use `@env`).
- For shell options, such as ‘`-c`’, when such options stand alone (use `@option`).
- An entire shell command often looks better if written using `@samp` rather than `@code`. In this case, the rule is to choose the more pleasing format.
- For a string of characters shorter than a syntactic token. For example, if you are writing about ‘`goto-ch`’, which is just a part of the name for the `goto-char` Emacs Lisp function, you should use `@samp`.

- In general, when writing about the characters used in a token; for example, do not use `@code` when you are explaining what letters or printable symbols can be used in the names of functions. (Use `@samp.`) Also, you should not use `@code` to mark text that is considered input to programs unless the input is written in a language that is like a programming language. For example, you should not use `@code` for the keystroke commands of GNU Emacs (use `@kbd` instead) although you may use `@code` for the names of the Emacs Lisp functions that the keystroke commands invoke.

By default, \TeX will consider breaking lines at ‘-’ and ‘_’ characters within `@code` and related commands. This can be controlled with `@allowcodebreaks` (see Section 12.4 [`@allowcodebreaks`], page 115). In the HTML output breaking lines is up to the browser’s behavior. For Info, it seems better never to make such breaks.

For Info and plaintext, quotation characters are usually output around the output of the `@code` command and related commands (e.g., `@kbd`, `@command`) except in typewriter-like contexts such as the `@example` environment (see Section 7.4 [`@example`], page 68) and `@code` itself, etc. To control which quoting characters are inserted by `texi2any` in the output of ‘`@code`’, etc., see the `OPEN_QUOTE_SYMBOL` and `CLOSE_QUOTE_SYMBOL` customization variables (see Section 19.4.8 [Other Customization Variables], page 183).

6.1.3 `@kbd{keyboard-characters}`

Use the `@kbd` command for characters of input to be typed by users. For example, to refer to the characters *M-a*, write:

```
@kbd{M-a}
```

and to refer to the characters *M-x shell*, write:

```
@kbd{M-x shell}
```

By default, the `@kbd` command produces a different font (slanted typewriter instead of normal typewriter, where the output format allows), so users can distinguish the characters that they are supposed to type from those that the computer outputs.

Since the usage of `@kbd` varies from manual to manual, you can control the font switching with the `@kbdinputstyle` command. This command has no effect on Info output. Write this command at the beginning of a line with a single word as an argument, one of the following:

‘code’ Always use the same font for `@kbd` as `@code`.

‘example’ Use the distinguishing font for `@kbd` only in `@example` and similar environments.

‘distinct’

(the default) Always use the distinguishing font for `@kbd`.

You can embed another `@-`command inside the braces of a `@kbd` command. Here, for example, is the way to describe a command that would be described more verbosely as “press the ‘r’ key and then press the RETURN key”:

```
@kbd{r @key{RET}}
```

This produces: *r* RET. (The present manual uses the default for `@kbdinputstyle`.)

You also use the `@kbd` command if you are spelling out the letters you type; for example:

```
To give the @code{logout} command,
```

type the characters `@kbd{l o g o u t @key{RET}}`.

This produces:

To give the `logout` command, type the characters `l o g o u t RET`.

(Also, this example shows that you can add spaces for clarity. If you explicitly want to mention a space character as one of the characters of input, write `@key{SPC}` for it.)

6.1.4 `@key{key-name}`

Use the `@key` command for the conventional name for a key on a keyboard, as in:

```
@key{RET}
```

You can use the `@key` command within the argument of an `@kbd` command when the sequence of characters to be typed includes one or more keys that are described by name.

For example, to produce `C-x ESC` and `M-TAB` you would type:

```
@kbd{C-x @key{ESC}}
@kbd{M-@key{TAB}}
```

Here is a list of the recommended names for keys:

SPC	Space
RET	Return
LFD	Linefeed (however, since most keyboards nowadays do not have a Linefeed key, it might be better to call this character <code>C-j</code>)
TAB	Tab
BS	Backspace
ESC	Escape
DELETE	Delete
SHIFT	Shift
CTRL	Control
META	Meta

There are subtleties to handling words like ‘meta’ or ‘ctrl’ that are names of modifier keys. When mentioning a character in which the modifier key is used, such as `Meta-a`, use the `@kbd` command alone; do not use the `@key` command; but when you are referring to the modifier key in isolation, use the `@key` command. For example, write `@kbd{Meta-a}` to produce `Meta-a` and `@key{META}` to produce `META`.

6.1.5 `@samp{text}`

Use the `@samp` command to indicate text that is a literal example or ‘sample’ of a sequence of characters in a file, string, pattern, etc. Enclose the text in braces. The argument appears within single quotation marks; in addition, it is printed in a fixed-width font.

```
To match @samp{foo} at the end of the line,
use the regexp @samp{foo$}.
```

produces

To match ‘foo’ at the end of the line, use the regexp ‘foo\$’.

Any time you are referring to single characters, you should use `@samp` unless `@kbd` or `@key` is more appropriate. Also, you may use `@samp` for entire statements in C and for entire shell commands—in this case, `@samp` often looks better than `@code`. Basically, `@samp` is a catchall for whatever is not covered by `@code`, `@kbd`, `@key`, `@command`, etc.

Only include punctuation marks within braces if they are part of the string you are specifying. Write punctuation marks outside the braces if those punctuation marks are part of the English text that surrounds the string. In the following sentence, for example, the commas and period are outside of the braces:

```
In English, the vowels are @samp{a}, @samp{e},
@samp{i}, @samp{o}, @samp{u}, and sometimes
@samp{y}.
```

This produces:

```
In English, the vowels are ‘a’, ‘e’, ‘i’, ‘o’, ‘u’, and sometimes ‘y’.
```

6.1.6 `@verb{char}`

Use the `@verb` command to print a verbatim sequence of characters.

Like \LaTeX ’s `\verb` command, the verbatim text can be quoted using any unique delimiter character. Enclose the verbatim text, including the delimiters, in braces. Text is printed in a fixed-width font:

```
How many @verb{|@|}-escapes does one need to print this
@verb{.@a @b.@c.} string or @verb{+@'e?`{}`!\+} this?
```

produces

```
How many @-escapes does one need to print this
@a @b.@c string or @'e?`{}`!\ this?
```

This is in contrast to `@samp` (see the previous section), `@code`, and similar commands; in those cases, the argument is normal Texinfo text, where the three characters `@{}` are special, as usual. With `@verb`, nothing is special except the delimiter character you choose.

The delimiter character itself may appear inside the verbatim text, as shown above. As another example, `@verb{...}` prints a single (fixed-width) period.

It is not reliable to use `@verb` inside other Texinfo constructs. In particular, it does not work to use `@verb` in anything related to cross-referencing, such as section titles or figure captions.

6.1.7 `@var{metasyntactic-variable}`

Use the `@var` command to indicate metasyntactic variables. A *metasyntactic variable* is something that stands for another piece of text. For example, you should use a metasyntactic variable in the documentation of a function to describe the arguments that are passed to that function.

Do not use `@var` for the names of normal variables in computer programs. These are specific names, so `@code` is correct for them. For example, the Emacs Lisp variable `texinfo-tex-command` is not a metasyntactic variable; it is properly formatted using `@code`.

Do not use `@var` for environment variables either; `@env` is correct for them (see the next section).

The effect of `@var` in the Info file is to change the case of the argument to all uppercase. In the printed manual, the argument is output in slanted type.¹

For example,

```
To delete file @var{filename},
type @samp{rm @var{filename}}.
```

produces

```
To delete file filename, type 'rm filename'.
```

(Note that `@var` may appear inside `@code`, `@samp`, `@file`, etc.)

Write a metasyntactic variable all in lowercase without spaces, and use hyphens to make it more readable. Thus, the Texinfo source for the illustration of how to begin a Texinfo manual looks like this:

```
\input texinfo
@@settitle @var{name-of-manual}
```

This produces:

```
\input texinfo
@settitle name-of-manual
```

In some documentation styles, metasyntactic variables are shown with angle brackets, for example:

```
..., type rm <filename>
```

However, that is not the style that Texinfo uses.

6.1.8 `@env{environment-variable}`

Use the `@env` command to indicate environment variables, as used by many operating systems, including GNU. Do not use it for *metasyntactic* variables; use `@var` for those (see the previous section).

`@env` is equivalent to `@code` in its effects. For example:

```
The @env{PATH} environment variable ...
```

produces

```
The PATH environment variable ...
```

6.1.9 `@file{file-name}`

Use the `@file` command to indicate text that is the name of a file, buffer, or directory, or is the name of a node in Info. You can also use the command for file name suffixes. Do not use `@file` for symbols in a programming language; use `@code`.

`@file` is equivalent to `code` in its effects. For example,

```
The @file{.el} files are in
the @file{/usr/local/emacs/lisp} directory.
```

produces

```
The .el files are in the /usr/local/emacs/lisp directory.
```

¹ In T_EX output, `@var` currently uses a slanted typewriter font in code contexts such as `@code` or `@example`. We plan to change this in the next release to use a variable-width, slanted roman font in all contexts. To avoid this change, set the `'txicodevaristt'` flag using `@set`; specify `'@clear txicodevaristt'` to make this change now (see Section 15.5.1 [`@set @value`], page 138). Note that this flag does nothing in L^AT_EX output.

6.1.10 `@command{command-name}`

Use the `@command` command to indicate command names, such as `ls` or `cc`.

`@command` is equivalent to `@code` in its effects. For example:

The command `@command{ls}` lists directory contents.

produces

The command `ls` lists directory contents.

You should write the name of a program in the ordinary text font, rather than using `@command`, if you regard it as a new English word, such as ‘Emacs’ or ‘Bison’.

When writing an entire shell command invocation, as in ‘`ls -l`’, you should use either `@samp` or `@code` at your discretion.

6.1.11 `@option{option-name}`

Use the `@option` command to indicate a command-line option; for example, `-l` or `--version` or `--output=filename`.

`@option` is equivalent to `@code` in its effects. For example:

The option `@option{-l}` produces a long listing.

produces

The option `-l` produces a long listing.

6.1.12 `@dfn{term}`

Use the `@dfn` command to identify the introductory or defining use of a technical term. Use the command only in passages whose purpose is to introduce a term which will be used again or which the reader ought to know. Mere passing mention of a term for the first time does not deserve `@dfn`. The command selects a slanted font in the printed manual, and generates double quotation marks in the Info file. For example:

Getting rid of a file is called `@dfn{deleting}` it.

produces

Getting rid of a file is called *deleting* it.

As a general rule, a sentence containing the defining occurrence of a term should be a definition of the term. The sentence does not need to say explicitly that it is a definition, but it should contain the information of a definition—it should make the meaning clear.

6.1.13 `@abbr{abbreviation[, meaning]}`

You can use the `@abbr` command for general abbreviations. The abbreviation is given as the single argument in braces, as in ‘`@abbr{Comput.}`’. As a matter of style, or for particular abbreviations, you may prefer to omit periods, as in ‘`@abbr{Mr} Stallman`’.

`@abbr` accepts an optional second argument, intended to be used for the meaning of the abbreviation.

If the abbreviation ends with a lowercase letter and a period, and is not at the end of a sentence, and has no second argument, remember to use the `@.` command (see Section 11.3.3 [Ending a Sentence], page 102) to get the correct spacing. However, you do not have to use `@.` within the abbreviation itself; Texinfo automatically assumes periods within the abbreviation do not end a sentence.

In output formats with an appropriate tag, such as HTML and DocBook, this tag is used. Otherwise, the first argument is printed as-is; if the second argument is present, it is printed in parentheses after the abbreviation. For instance:

```
@abbr{Comput. J., Computer Journal}
```

produces:

```
Comput. J. (Computer Journal)
```

For abbreviations consisting of all capital letters, you may prefer to use the `@acronym` command instead. See the next section for more on the usage of these two commands.

6.1.14 `@acronym{acronym[, meaning]}`

You can use the `@acronym` command for abbreviations written in all capital letters, such as ‘NASA’. The abbreviation is given as the single argument in braces, as in ‘`@acronym{NASA}`’. As a matter of style, or for particular acronyms, you may prefer to use periods, as in ‘`@acronym{N.A.S.A.}`’.

`@acronym` accepts an optional second argument, intended to be used for the meaning of the acronym.

If the acronym is at the end of a sentence, and if there is no second argument, remember to use the `@.` or similar command (see Section 11.3.3 [Ending a Sentence], page 102) to get the correct spacing.

In $\text{T}_{\text{E}}\text{X}$, the acronym is printed in slightly smaller font. In the Info output, the argument is printed as-is. In either format, and in $\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X}$ output, if the second argument is present, it is printed in parentheses after the acronym. In HTML and DocBook the appropriate tag is used.

For instance (since GNU is a recursive acronym, we use `@acronym` recursively):

```
@acronym{GNU, @acronym{GNU}'s Not Unix}
```

produces:

```
GNU (GNU's Not Unix)
```

In some circumstances, it is conventional to print family names in all capitals. Don’t use `@acronym` for this, since a name is not an acronym. Use `@sc` instead (see Section 6.2.2 [Smallcaps], page 64).

`@abbr` and `@acronym` are closely related commands: they both signal to the reader that a shortened form is being used, and possibly give a meaning. When choosing whether to use these two commands, please bear the following in mind.

- In common English usage, acronyms are a subset of abbreviations: they include pronounceable words like ‘NATO’, ‘radar’, and ‘snafu’; some sources also include syllable acronyms like ‘Usenet’, hybrids like ‘SIGGRAPH’, and unpronounceable initialisms like ‘FBI’.
- In Texinfo, an acronym (but not an abbreviation) should consist only of capital letters and periods, no lowercase.
- In $\text{T}_{\text{E}}\text{X}$, an acronym (but not an abbreviation) is printed in a slightly smaller font.
- It usually turns out to be quite difficult and/or time-consuming to consistently use `@acronym` for all sequences of uppercase letters. Furthermore, it looks strange for some acronyms to be in the normal font size and others to be smaller. Thus, a simpler

approach you may wish to consider is to avoid `@acronym` and just typeset everything as normal text in all capitals: ‘GNU’, producing the output ‘GNU’.

- In general, it’s not essential to use either of these commands for all abbreviations; use your judgment. Text is perfectly readable without them.

6.1.15 `@indicateurl{uniform-resource-locator}`

Use the `@indicateurl` command to indicate a uniform resource locator on the World Wide Web. This is purely for markup purposes and does not produce a link you can follow (use the `@url` or `@uref` command for that, see Section 5.14 [`@url`], page 51). `@indicateurl` is useful for URLs which do not actually exist. For example:

For example, the URL might be `@indicateurl{http://example.org/path}`.

which produces:

For example, the URL might be ‘`http://example.org/path`’.

The output from `@indicateurl` is usually like that of `@samp` (see Section 6.1.5 [`@samp`], page 58).

6.1.16 `@email{email-address[, displayed-text]}`

Use the `@email` command to indicate an electronic mail address. It takes one mandatory argument, the address, and one optional argument, the text to display (the default is the address itself).

In Info, the address is shown in angle brackets, preceded by the text to display if any. In printed output, the angle brackets are omitted. In HTML and DocBook output, `@email` produces a ‘mailto’ link. In HTML, a ‘mailto’ link usually brings up a mail composition window. For example:

Send bug reports to `@email{bug-texinfo@gnu.org}`,
suggestions to the `@email{bug-texinfo@gnu.org, same place}`.

produces

Send bug reports to `bug-texinfo@gnu.org`,
suggestions to the same place.

6.2 Emphasizing Text

Usually, Texinfo changes the font to mark words in the text according to the category the words belong to; an example is the `@code` command. Most often, this is the best way to mark words. However, sometimes you will want to emphasize text without indicating a category. Texinfo has two commands to do this. Also, Texinfo has several commands that specify the font in which text will be output. These commands have no effect in Info and only one of them, the `@r` command, has any regular use.

6.2.1 `@emph{text}` and `@strong{text}`

The `@emph` and `@strong` commands are for emphasis; `@strong` is stronger. In printed output, `@emph` produces *italics* and `@strong` produces **bold**. In the Info output, `@emph` surrounds the text with underscores (‘_’), and `@strong` puts asterisks around the text.

For example,

```
@strong{Caution:} @samp{rm * .[^.]*}
removes @emph{all} files in the directory.
```

produces the following:

Caution: ‘rm * .[^.]*’ removes *all* files in the directory.

The `@strong` command is seldom used except to mark what is, in effect, a typographical element, such as the word ‘Caution’ in the preceding example.

Caution: Do not use `@strong` with the word ‘Note’ followed by a space; Info will mistake the combination for a cross-reference. Use a phrase such as **Please notice** or **Caution** instead, or the optional argument to `@quotation`—‘Note’ is allowable there.

6.2.2 `@sc{text}`: The Small Caps Font

Use the ‘`@sc`’ command to set text in A SMALL CAPS FONT (where possible). Write the text you want to be in small caps between braces in lowercase, like this:

```
Richard @sc{Stallman} a commenc  le projet GNU.
```

This produces:

```
Richard STALLMAN a commenc  le projet GNU.
```

As shown here, we recommend reserving `@sc` for special cases where you want typographic small caps; family names are one such, especially in languages other than English, though there are no hard-and-fast rules about such things.

TEX typesets any uppercase letters between the braces of an `@sc` command in full-size capitals; only lowercase letters are printed in the small caps font. In the Info output, the argument to `@sc` is printed in all uppercase. In HTML, the argument is uppercased and the output marked with the `<small>` tag to reduce the font size, since HTML cannot easily represent true small caps. In LATEX, a command setting small caps fonts is output.

Overall, we recommend using standard upper- and lowercase letters wherever possible.

6.2.3 Fonts for Printing

Texinfo provides one command to change the size of the main body font in printed output for a document: `@fonttextsize`. It has no effect in other output. It takes a single argument on the remainder of the line, which must be either ‘10’ or ‘11’. For example:

```
@fonttextsize 10
```

The effect is to reduce the body font to a 10 pt size (the default is 11 pt). Fonts for other elements, such as sections and chapters, are reduced accordingly. This should only be used in conjunction with `@smallbook` (see Section E.6 [`@smallbook`], page 281) or similar, since 10 pt fonts on standard paper (8.5x11 or A4) are too small. One reason to use this command is to save pages, and hence printing cost, for physical books.

Texinfo does not at present have commands to switch the font family to use, or more general size-changing commands.

Texinfo also provides a number of font commands that specify font changes in the printed manual and (where possible) in the HTML and DocBook output. They have no effect in Info. All the commands apply to a following argument surrounded by braces.

`@b` selects **bold** face;

- @i** selects an *italic* font;
- @r** selects a roman font, which is the usual font in which text is printed. It may or may not be seriffed.
- @sansserif** selects a sans serif font;
- @slanted** selects a *slanted* font;
- @t** selects the **fixed-width**, typewriter-style font used by **@code**;

The **@r** command can be useful in example-like environments, to write comments in the standard roman font instead of the fixed-width font. This looks better in printed output.

For example,

```
@lisp
(+ 2 2)    ; @r{Add two plus two.}
@end lisp
```

produces

```
(+ 2 2)    ; Add two plus two.
```

The **@t** command can occasionally be useful for producing output in a typewriter font where that is supported, but no distinction with quotation marks is needed in Info or plain text. (Compare **@t{foo}** producing `foo` with **@code{foo}** producing `foo`.) Here are some possible reasons for using **@t** instead of **@code**:

- The argument is a single character
- There are already quotes of some kind enclosing the argument
- It's evident from context or the argument itself that the argument could be computer code (e.g. name of a Usenet newsgroup)

In general, the other font commands are unlikely to be useful; they exist primarily to make it possible to document the functionality of specific font effects, such as in **T_EX** and related packages.

7 Quotations and Examples

Quotations and examples are blocks of text consisting of one or more whole paragraphs that are set off from the bulk of the text and treated differently. They are usually indented in the output.

In Texinfo, you always begin a quotation or example by writing an @-command at the beginning of a line by itself, and end it by writing an @end command that is also at the beginning of a line by itself. For instance, you begin an example by writing @example by itself at the beginning of a line and end the example by writing @end example on a line by itself, at the beginning of that line, and with only one space between the @end and the example.

7.1 Block Enclosing Commands

Here is a summary of commands that enclose blocks of text, also known as *environments*. They're explained further in the following sections.

@quotation

Indicate text that is quoted. The text is filled, indented (from both margins), and printed in a roman font by default.

@indentedblock

Like @quotation, but the text is indented only on the left.

@example Illustrate code, commands, and the like. The text is printed in a fixed-width font, and indented but not filled.

@lisp Like @example, but specifically for illustrating Lisp code. The text is printed in a fixed-width font, and indented but not filled.

@verbatim

Mark a piece of text that is to be printed verbatim; no character substitutions are made and all commands are ignored, until the next @end verbatim. The text is printed in a fixed-width font, and not indented or filled. Extra spaces and blank lines are significant, and tabs are expanded.

@display Display illustrative text. The text is indented but not filled, and no font is selected (so, by default, the font is roman).

@format Like @display (the text is not filled and no font is selected), but the text is not indented.

@smallquotation

@smallindentedblock

@smallexample

@smalllisp

@smalldisplay

@smallformat

These @small... commands are just like their non-small counterparts, except that they output text in a smaller font size, where possible.

`@flushleft`

`@flushright`

Text is not filled, but is set flush with the left or right margin, respectively.

`@raggedright`

Text is filled, but only justified on the left, leaving the right margin ragged.

`@cartouche`

Highlight text, often an example or quotation, by drawing a box with rounded corners around it.

The `@exdent` command is used within the above constructs to undo the indentation of a line.

The `@noindent` command may be used after one of the above constructs (or at the beginning of any paragraph) to prevent the following text from being indented as a new paragraph.

7.2 `@quotation`: Block Quotations

The text of a quotation is processed like normal text (regular font, text is filled) except that:

- the left margin is closer to the center of the page, so the whole of the quotation is indented; the right margin may also be closer to the center of the page
- the first lines of paragraphs are indented no more than other lines; and
- an `@author` command may be given to specify the author of the quotation.

This is an example of text written between a `@quotation` command and an `@end quotation` command. A `@quotation` command is most often used to indicate text that is excerpted from another (real or hypothetical) printed work.

Write a `@quotation` command as text on a line by itself. This line will disappear from the output. Mark the end of the quotation with a line beginning with and containing only `@end quotation`. The `@end quotation` line will likewise disappear from the output.

`@quotation` takes one optional argument, given on the remainder of the line. This text, if present, is included at the beginning of the quotation in bold or otherwise emphasized, and followed with a `‘:’`. For example:

```
@quotation Note
This is
a foo.
@end quotation
```

produces

Note: This is a foo.

If the `@quotation` argument is one of these English words (case-insensitive):

```
Caution Important Note Tip Warning
```

then the DocBook output uses corresponding special tags (`<note>`, etc.) instead of the default `<blockquote>`.

If the author of the quotation is specified in the `@quotation` block with the `@author` command, a line with the author name is displayed after the quotation:

```
@quotation
```



```

People sometimes ask me if it is a sin in the Church of Emacs to use
vi. Using a free version of vi is not a sin; it is a penance. So happy
hacking.

```

```

@author Richard Stallman
@end quotation

```

produces

```

People sometimes ask me if it is a sin in the Church of Emacs to use vi. Using
a free version of vi is not a sin; it is a penance. So happy hacking.
—Richard Stallman

```

7.3 @indentedblock: Indented text blocks

The `@indentedblock` environment is similar to `@quotation`, except that text is only indented on the left (and there is no optional argument for an author). Thus, the text font remains unchanged, and text is gathered and filled as usual, but the left margin is increased. For example:

```

This is an example of text written between an @indentedblock command and an
@end indentedblock command. The @indentedblock environment can contain any
text or other commands desired.

```

This is written in the Texinfo source as:

```

@indentedblock
This is an example ...
@end indentedblock

```

7.4 @example: Example Text

The `@example` environment is used to indicate computer input or output that is not part of the running text. If you want to embed code fragments within sentences, use the `@code` command or its relatives instead (see Section 6.1.2 [`@code`], page 56).

Write an `@example` command at the beginning of a line by itself. Mark the end of the block with `@end example`. For example,

```

@example
cp foo @var{dest1}; \
cp foo @var{dest2}
@end example

```

produces

```

cp foo dest1; \
cp foo dest2

```

The output uses a fixed-width font and is indented. Each line in the input file is a line in the output; that is, the source text is not filled. Extra spaces and blank lines are significant. Texinfo commands *are* expanded; if you want the output to be the input verbatim, use the `@verbatim` environment instead (see Section 7.5 [`@verbatim`], page 69).

Examples are often, logically speaking, “in the middle” of a paragraph, and the text that continues afterwards should not be indented, as in the example above. The `@noindent`

command prevents a piece of text from being indented as if it were a new paragraph (see Section 7.12 [`@noindent`], page 73).

If you wish to use the normal roman font for a code comment, you can use the `@r` command (see Section 6.2.3 [Fonts], page 64).

You may optionally give arguments to the `@example` command, separated by commas if there is more than one. In the HTML output, any such arguments are output as class names, prefixed by the string `'user-'`. This may be useful for adding syntax highlighting to manuals for code samples.

We recommend that when you give multiple arguments to `@example`, you use the first argument to specify the language of the code (e.g. `'C'`, `'lisp'`, `'Cplusplus'`). You may find uses for other arguments, such as providing a formatting hint or marking code samples for extraction and further processing, but for now nothing definitive is recommended. Perhaps this will change in future Texinfo releases.

Caution: Do not use tabs in the lines of an example! (Or anywhere else in Texinfo, except in verbatim environments.) \TeX treats tabs as single spaces, and that is not what they look like.

7.5 `@verbatim`: Literal Text

Use the `@verbatim` environment for printing of text that may contain special characters or commands that should not be interpreted, such as computer input or output (`@example` interprets its text as regular Texinfo commands). This is especially useful for including automatically generated files in a Texinfo manual.

In general, the output will be just the same as the input. No character substitutions are made, e.g., all spaces and blank lines are significant, including tabs. The text is typeset in a fixed-width font, and not indented or filled.

Write a `@verbatim` command at the beginning of a line by itself. This line will disappear from the output. Mark the end of the verbatim block with an `@end verbatim` command, also written at the beginning of a line by itself. The `@end verbatim` will also disappear from the output.

For example:

```
@verbatim
{
<tab>@command with strange characters: @'e
expand<tab>me
}
@end verbatim
```

(where `<tab>` stands for a literal tab character). This produces:

```
{
    @command with strange characters: @'e
expand me
}
```

Since the lines containing `@verbatim` and `@end verbatim` produce no output, typically you should put a blank line before the `@verbatim` and another blank line after the `@end`

`verbatim`. Blank lines between the beginning `@verbatim` and the ending `@end verbatim` will appear in the output.

You can get a “small” verbatim by enclosing the `@verbatim` in an `@smallformat` environment, as shown here:

```
@smallformat
@verbatim
... still verbatim, but in a smaller font ...
@end verbatim
@end smallformat
```

Finally, a word of warning: it is not reliable to use `@verbatim` inside other Texinfo constructs.

See also Section 17.3 [`@verbatiminclude`], page 156.

7.6 `@lisp`: Marking a Lisp Example

The `@lisp` command was used for Lisp code:

```
@lisp
Example lisp code
@end lisp
```

This is now synonymous with the following:

```
@example lisp
Example lisp code
@end example
```

Use `@lisp` to preserve information regarding the nature of the example. This is useful, for example, if you write a function that evaluates only and all the Lisp code in a Texinfo file. Then you can use the Texinfo file as a Lisp library.

7.7 `@display`: Examples Using the Text Font

The `@display` command begins another kind of environment, where the font is left unchanged, not switched to typewriter as with `@example`. Each line of input still produces a line of output, and the output is still indented.

```
This is an example of text written between a @display command
and an @end display command. The @display command
indents the text, but does not fill it.
```

7.8 `@format`: Examples Using the Full Line Width

The `@format` command is similar to `@display`, except it leaves the text unindented. Like `@display`, it does not select the fixed-width font. Thus,

```
@format
This is an example of text written between a @code{@@format} command
and an @code{@@end format} command. As you can see
from this example,
the @code{@@format} command does not fill the text.
@end format
```

produces

This is an example of text written between a `@format` command and an `@end format` command. As you can see from this example, the `@format` command does not fill the text.

7.9 `@exdent`: Undoing a Line's Indentation

The `@exdent` command removes any indentation a line might have. The command is written at the beginning of a line and applies only to the text that follows the command that is on the same line. Do not use braces around the text. The text on an `@exdent` line is also printed in the roman font where the output format allows this.

`@exdent` is usually used within examples. Thus,

```
@example
  This line follows an @@example command.
  @exdent This line is exdented.
  This line follows the exdented line.
  The @@end example comes on the next line.
@end example
```

produces

```
  This line follows an @example command.
This line is exdented.
  This line follows the exdented line.
  The @end example comes on the next line.
```

In practice, the `@exdent` command is rarely used. Usually, you un-indent text by ending the example and returning the page to its normal width.

`@exdent` does not have an effect in all output formats.

7.10 `@flushleft` and `@flushright`

The `@flushleft` and `@flushright` commands line up the ends of lines on the left and right margins of a page, but do not fill the text. The commands are written on lines of their own, without braces. The `@flushleft` and `@flushright` commands are ended by `@end flushleft` and `@end flushright` commands on lines of their own.

For example,

```
@flushleft
This text is
written flushleft.
@end flushleft
```

produces

```
This text is
written flushleft.
```

`@flushright` produces the type of indentation often used in the return address of letters. For example,

```
@flushright
Here is an example of text written
flushright. The @code{@flushright} command
right justifies every line but leaves the
left end ragged.
@end flushright
```

produces

```
Here is an example of text written
flushright. The @flushright command
right justifies every line but leaves the
left end ragged.
```

7.11 @raggedright: Ragged Right Text

The `@raggedright` fills text as usual, but the text is only justified on the left; the right margin is ragged. The command is written on a line of its own, without braces. The `@raggedright` command is ended by `@end raggedright` on a line of its own. This command only has an effect in output formats where text is justified on the left, but not in output formats where text is always set ragged right, such as Info or HTML.

The `@raggedright` command can be useful with paragraphs containing lists of commands with long names, when it is known in advance that justifying the text on both margins will make the paragraph look bad.

An example (from elsewhere in this manual):

```
@raggedright
Commands for double and single angle quotation marks:
@code{@@guillemetleft@{ }}, @code{@@guillemetright@{ }},
@code{@@guillemotleft@{ }}, @code{@@guillemotright@{ }},
@code{@@guilsinglleft@{ }}, @code{@@guilsinglright@{ }}.
@end raggedright
```

produces

```
Commands for double and single angle quotation marks: @guillemetleft{ },
@guillemetright{ }, @guillemotleft{ }, @guillemotright{ }, @guilsinglleft{ },
@guilsinglright{ }.
```

7.12 @noindent: Omitting Indentation

An example or other inclusion can break a paragraph into segments. Ordinarily, the formatters indent text that follows an example as a new paragraph. You can prevent this on a case-by-case basis by writing `@noindent` at the beginning of a line, preceding the continuation text. You can also disable indentation for all paragraphs globally with `@paragraphindent` (see Section E.3 [`@paragraphindent`], page 280).

Here is an example showing how to eliminate the normal indentation of the text after an `@example`, a common situation:

```
@example
This is an example
@end example
```

```
@noindent
This line is not indented. As you can see, the
beginning of the line is fully flush left with the
line that follows after it.
```

produces:

```
    This is an example
```

```
    This line is not indented. As you can see, the
    beginning of the line is fully flush left with the
    line that follows after it.
```

The standard usage of `@noindent` is just as above: at the beginning of what would otherwise be a paragraph, to eliminate the indentation that normally happens there. It can either be followed by text or be on a line by itself. There is no reason to use it in other contexts, such as in the middle of a paragraph or inside an environment (see Chapter 7 [Quotations and Examples], page 66).

You can control the number of blank lines in the Info file output by adjusting the input as desired: a line containing just `@noindent` does not generate a blank line, and neither does an `@end` line for an environment.

Do not put braces after a `@noindent` command; they are not used, since `@noindent` is a command used outside of paragraphs (see Section A.1 [Command Syntax], page 217).

7.13 @indent: Forcing Indentation

To complement the `@noindent` command (see the previous section), Texinfo provides the `@indent` command to force a paragraph to be indented. For instance, this paragraph (the first in this section) is indented using an `@indent` command.

And indeed, the first paragraph of a section is the most likely place to use `@indent`, to override the normal behavior of no indentation there (see Section E.3 [`@paragraphindent`], page 280). It can either be followed by text or be on a line by itself.

As a special case, when `@indent` is used in an environment where text is not filled, it produces a paragraph indentation space in the T_EX output. (These environments are where

a line of input produces a line of output, such as `@example` and `@display`; for a summary of all environments, see Section 7.1 [Block Enclosing Commands], page 66.)

Do not put braces after an `@indent` command; they are not used, since `@indent` is a command used outside of paragraphs (see Section A.1 [Command Syntax], page 217).

7.14 `@cartouche`: Rounded Rectangles

Where the output format allows, the `@cartouche` command draws a box with rounded corners around its contents. In HTML, a normal rectangle is drawn. You can use this command to isolate a portion of the manual from the main flow. You can also further highlight an example or quotation with `@cartouche`.

For instance, you could write a manual in which one type of example is surrounded by a cartouche for emphasis. For example,

```
@cartouche
@example
% pwd
/usr/local/share/emacs
@end example
@end cartouche
```

surrounds the two-line example with a box with rounded corners, in the printed manual.

The output from the example looks like this (if you're reading this in Info, you'll see the `@cartouche` had no effect):

```
% pwd
/usr/local/share/emacs
```

`@cartouche` takes one optional argument, given on the remainder of the line. This text, if present, is the cartouche title. It is output in bold or otherwise emphasized at the beginning of the cartouche, and is centered in some output formats.

The following example illustrates a cartouche with a title:

```
@cartouche Important
Text explaining something important out of the main
flow of the text.
@end cartouche
```

The cartouche with a title looks like this:

```
Important  
Text explaining something important out of the main flow of the text.
```

A cartouche is output on a single page in printed output, similarly to `@group` (see Section 12.9 [`@group`], page 116).

7.15 @small... Block Commands

In addition to the regular @example and similar commands, Texinfo has “small” example-style commands. These are @smallquotation, @smallindentedblock, @smalldisplay, @smallexample, @smallformat, and @smalllisp.

In most output formats, the @small... commands are equivalent to their non-small companion commands.

In printed output, however, the @small... commands typeset text in a smaller font than the non-small example commands. Thus, for instance, code examples can contain longer lines and still fit on a page without needing to be rewritten.

Mark the end of a @small... block with a corresponding @end small.... For example, pair @smallexample with @end smallexample.

Here is an example of the font used by the @smallexample command (in most output formats, the output will be the same as usual):

```
... to make sure that you have the freedom to
distribute copies of free software (and charge for
this service if you wish), that you receive source
code or can get it if you want it, that you can
change the software or use pieces of it in new free
programs; and that you know you can do these things.
```

The @small... commands use the same font style as their normal counterparts: @smallexample and @smalllisp use a fixed-width font, and everything else uses the regular font. They also have the same behavior in other respects—whether filling is done and whether margins are narrowed.

As a general rule, it’s better to just use the regular commands (such as @example instead of @smallexample), unless you have a good reason for it.

8 Lists and Tables

Texinfo has several ways of making lists and tables. Lists can be bulleted or numbered; two-column tables can highlight the items in the first column; multi-column tables are also supported.

8.1 Introducing Lists

Texinfo automatically indents the text in lists or tables, and numbers an enumerated list. This last feature is useful if you modify the list, since you do not need to renumber it yourself.

Numbered lists and tables begin with the appropriate @-command at the beginning of a line, and end with the corresponding @end command on a line by itself. The table and itemized-list commands also require that you write formatting information on the same line as the beginning @-command.

Begin an enumerated list, for example, with an @enumerate command and end the list with an @end enumerate command. Begin an itemized list with an @itemize command, followed on the same line by a formatting command such as @bullet, and end the list with an @end itemize command.

Precede each element of a list with an @item or @itemx command.

Here is an itemized list of the different kinds of table and lists:

- Itemized lists with and without bullets.
- Enumerated lists, using numbers or letters.
- Two-column tables with highlighting.

Here is an enumerated list with the same items:

1. Itemized lists with and without bullets.
2. Enumerated lists, using numbers or letters.
3. Two-column tables with highlighting.

And here is a two-column table with the same items and their @-commands:

@itemize	Itemized lists with and without bullets.
@enumerate	Enumerated lists, using numbers or letters.
@table	
@ftable	
@vtable	Two-column tables, optionally with indexing.

8.2 @itemize: Making an Itemized List

The `@itemize` command produces a sequence of “items”, each starting with a bullet or other mark inside the left margin, and generally indented.

Begin an itemized list by writing `@itemize` at the beginning of a line. Follow the command, on the same line, with a character or a Texinfo command that generates a mark. Usually, you will use `@bullet` after `@itemize`, but you can use `@minus`, or any command or character that results in a single character in the Info file. (When you write the mark command such as `@bullet` after an `@itemize` command, you may omit the ‘{’.) If you don’t specify a mark command, the default is `@bullet`. If you don’t want any mark at all, but still want logical items, use `@w{}` (in this case the braces are required).

After the `@itemize`, write your items, each starting with `@item`. Text can follow on the same line as the `@item`. The text of an item can continue for more than one paragraph.

There should be at least one `@item` inside the `@itemize` environment. If none are present, `texi2any` gives a warning. If you just want indented text and not a list of items, use `@indentedblock`; see Section 7.3 [`@indentedblock`], page 68.

Index entries and comments that are given before an `@item` including the first, are automatically moved (internally) to after the `@item`, so the output is as expected. Historically this has been a common practice.

Usually, you should put a blank line between items. This puts a blank line in the Info file. (`TEX` inserts the proper vertical space in any case.) Except when the entries are very brief, these blank lines make the list look better.

Here is an example of the use of `@itemize`, followed by the output it produces. `@bullet` produces an ‘*’ in Info and a round dot in other output formats.

```
@itemize @bullet
@item
Some text for foo.

@item
Some text
for bar.
@end itemize
```

This produces:

- Some text for foo.
- Some text for bar.

Itemized lists may be embedded within other itemized lists. Here is a list marked with dashes embedded in a list marked with bullets:

```

@itemize @bullet
@item
First item.

@itemize @minus
@item
Inner item.

@item
Second inner item.
@end itemize

@item
Second outer item.
@end itemize

```

This produces:

- First item.
 - Inner item.
 - Second inner item.
- Second outer item.

8.3 @enumerate: Making a Numbered or Lettered List

`@enumerate` is like `@itemize` (see Section 8.2 [`@itemize`], page 77), except that the labels on the items are successive integers or letters instead of bullets.

Write the `@enumerate` command at the beginning of a line. The command does not require an argument, but accepts either a number or a letter as an option. Without an argument, `@enumerate` starts the list with the number ‘1’. With a numeric argument, such as ‘3’, the command starts the list with that number. With an upper- or lowercase letter, such as ‘a’ or ‘A’, the command starts the list with that letter.

Write the text of the enumerated list in the same way as an itemized list: write a line starting with `@item` at the beginning of each item in the enumeration. It is ok to have text following the `@item`, and the text for an item can continue for several paragraphs.

You should put a blank line between entries in the list. This generally makes it easier to read the Info file.

Here is an example of `@enumerate` without an argument:

```

@enumerate
@item
Underlying causes.

@item
Proximate causes.
@end enumerate

```

This produces:

1. Underlying causes.

2. Proximate causes.

Here is an example with an argument of 3:

```
@enumerate 3
@item
Predisposing causes.

@item
Precipitating causes.

@item
Perpetuating causes.
@end enumerate
```

This produces:

3. Predisposing causes.
4. Precipitating causes.
5. Perpetuating causes.

Here is a summary:

- a. `@enumerate`
Without an argument, produce a numbered list, with the first item numbered 1.
- b. `@enumerate unsigned-integer`
With an (unsigned) numeric argument, start a numbered list with that number. You can use this to continue a list that you interrupted with other text.
- c. `@enumerate upper-case-letter`
With an uppercase letter as argument, start a list in which each item is marked by a letter, beginning with that uppercase letter.
- d. `@enumerate lower-case-letter`
With a lowercase letter as argument, start a list in which each item is marked by a letter, beginning with that lowercase letter.

You can also nest enumerated lists, as in an outline.

8.4 Making a Two-column Table

`@table` is similar to `@itemize` (see Section 8.2 [`@itemize`], page 77), but allows you to specify a name or heading line for each item. The `@table` command is used to produce two-column tables, and is especially useful for glossaries, explanatory exhibits, and command-line option summaries.

8.4.1 Using the `@table` Command

Use the `@table` command to produce a two-column table. This command is typically used when you have a list of items and a brief text with each one, such as a list of definitions.

Write the `@table` command at the beginning of a line, after a blank line, and follow it on the same line with an argument that is an ‘indicating’ command, such as `@code`, `@samp`, `@var`, `@option`, or `@kbd` (see Section 6.1 [Indicating], page 55). This command will be applied to the text in the first column. For example, `@table @code` will cause the text in the first column to be output as if it had been the argument to a `@code` command.

You may use the `@asis` command as an argument to `@table`. `@asis` is a command that does nothing: if you use this command after `@table`, the first column entries are output without added highlighting (“as is”).

The `@table` command works with other commands besides those explicitly mentioned here. However, you can only use predefined Texinfo commands that take an argument in braces. You cannot reliably use a new command defined with `@macro`, although an `@alias` (for a suitable predefined command) is acceptable. See Chapter 16 [Defining New Texinfo Commands], page 144.

Begin each table entry with an `@item` command at the beginning of a line. Write the text for the first column on the same line as the `@item` command. Write the text for the second column on the line following the `@item` line and on subsequent lines. You may write as many lines of supporting text as you wish, even several paragraphs. But only the text on the same line as the `@item` will be placed in the first column (including any footnotes). You do not need to type anything for an empty second column.

Normally, you should put a blank line between table entries. This puts a blank line in the Info file, which looks better unless the entries are very brief.

End the table with a line consisting of `@end table`. Follow the end of the table by a blank line for consistent formatting across output formats.

For example, the following table highlights the text in the first column with the `@samp` command:

```
@table @samp
@item foo
This is the text for
@samp{foo}.

@item bar
Text for @samp{bar}.
@end table
```

This produces:

```
‘foo’      This is the text for ‘foo’.
‘bar’      Text for ‘bar’.
```

If you want to list two or more named items with a single block of text, use the `@itemx` command. (See Section 8.4.3 [`@itemx`], page 81.)

The `@table` command (see Section 8.4.1 [`@table`], page 79) is not supported inside `@display`. Since `@display` is line-oriented, it doesn’t make sense to use them together. If you want to indent a table, try `@quotation` (see Section 7.2 [`@quotation`], page 67) or `@indentedblock` (see Section 7.3 [`@indentedblock`], page 68).

8.4.2 @ftable and @vtable

The `@ftable` and `@vtable` commands are the same as the `@table` command except that `@ftable` automatically enters each of the items in the first column of the table into the index of functions and `@vtable` automatically enters each of the items in the first column of the table into the index of variables. This simplifies the task of creating indices. Only the items on the same line as the `@item` or `@itemx` commands are indexed, and they are indexed in exactly the form that they appear on that line. See Chapter 10 [Indices], page 91, for more information about indices.

Begin a two-column table using `@ftable` or `@vtable` by writing the `@-`command at the beginning of a line, followed on the same line by an argument that is a Texinfo command such as `@code`, exactly as you would for a `@table` command; and end the table with an `@end ftable` or `@end vtable` command on a line by itself.

See the example for `@table` in the previous section.

8.4.3 @itemx: Second and Subsequent Items

Use the `@itemx` command inside a table when you have two or more first column entries for the same item, each of which should appear on a line of its own.

Use `@item` for the first entry, and `@itemx` for all subsequent entries; `@itemx` must always follow an `@item` command, with no blank line intervening.

The `@itemx` command works exactly like `@item` except that it does not generate extra vertical space above the first column text in some output formats. If you have multiple consecutive `@itemx` commands, do not insert any blank lines between them.

For example,

```
@table @code
@item upcase
@itemx lowercase
These two functions accept a character or a string as
argument, and return the corresponding uppercase (lowercase)
character or string.
@end table
```

This produces:

```
upcase
downcase  These two functions accept a character or a string as argument, and return the
           corresponding uppercase (lowercase) character or string.
```

(Note also that this example illustrates multi-line supporting text in a two-column table.)

8.5 @multitable: Multi-column Tables

`@multitable` allows you to construct tables with any number of columns, with each column having any width you like.

You define the column widths on the `@multitable` line itself, and write each row of the actual table following an `@item` command, with columns separated by a `@tab` command. Finally, `@end multitable` completes the table. Details in the sections below.

8.5.1 Multitable Column Widths

You can define the column widths for a multitable in two ways: as fractions of the line length; or with a prototype row. Mixing the two methods is not supported. In either case, the widths are defined entirely on the same line as the `@multitable` command.

1. To specify column widths as fractions of the line length, write `@columnfractions` and the decimal numbers (presumably less than 1; a leading zero is allowed and ignored) after the `@multitable` command, as in:

```
@multitable @columnfractions .33 .33 .33
```

The fractions need not add up exactly to 1.0, as these do not. This allows you to produce tables that do not need the full line length.

When using `@columnfractions`, the leftmost column may appear slightly wider than you might expect, relative to the other columns. This is due to spacing between columns being included in the width of the other columns.

2. To specify a prototype row, write the longest entry for each column enclosed in braces after the `@multitable` command. For example:

```
@multitable {some text for column one} {for column two}
```

The first column will then have the width of the typeset ‘some text for column one’, and the second column the width of ‘for column two’.

The prototype entries need not appear in the table itself.

Although we used simple text in this example, the prototype entries can contain Texinfo commands; markup commands such as `@code` are particularly likely to be useful.

Prototype rows have no effect in HTML output.

8.5.2 Multitable Rows

After the `@multitable` command defining the column widths (see the previous section), you begin each row in the body of a multitable with `@item`, and separate the column entries with `@tab`. Line breaks are not special within the table body, and you may break input lines in your source file as necessary.

You can also use `@headitem` instead of `@item` to produce a *heading* row. The TeX output for such a row is in bold, and the HTML and DocBook output uses the `<thead>` tag. In Info, the heading row is followed by a separator line made of dashes (‘-’ characters).

The command `@headitemfont` can be used in templates when the entries in a `@headitem` row need to be used in a template. It is a synonym for `@b`, but using `@headitemfont` avoids any dependency on that particular font style, in case we provide a way to change it in the future.

Here is a complete example of a multi-column table (the text is from *The GNU Emacs Manual*, see Section “Splitting Windows” in *The GNU Emacs Manual*):

```
@multitable @columnfractions .15 .45 .4
@headitem Key @tab Command @tab Description
@item C-x 2
@tab @code{split-window-vertically}
@tab Split the selected window into two windows,
with one above the other.
```

```

@item C-x 3
@tab @code{split-window-horizontally}
@tab Split the selected window into two windows
positioned side by side.
@item C-Mouse-2
@tab
@tab In the mode line or scroll bar of a window,
split that window.
@end multitable

```

produces:

Key	Command	Description
C-x 2	<code>split-window-vertically</code>	Split the selected window into two windows, with one above the other.
C-x 3	<code>split-window-horizontally</code>	Split the selected window into two windows positioned side by side.
C-Mouse-2		In the mode line or scroll bar of a window, split that window.

9 Special Displays

The commands in this chapter allow you to write text that is specially displayed (output format permitting), outside of the normal document flow.

One set of such commands is for creating “floats”, that is, figures, tables, and the like, set off from the main text, possibly numbered, captioned, and/or referred to from elsewhere in the document. Images are often included in these displays.

Another group of commands is for creating footnotes in Texinfo.

9.1 Floats

A *float* is a display which is set off from the main text. It is typically labeled as being a “Figure”, “Table”, “Example”, or some similar type.

A float is so-named because, in principle, it can be moved to the bottom or top of the current page, or to a following page, in the printed output. (Floating does not make sense in other output formats.) In every output format except for L^AT_EX, however, this floating is unfortunately not yet implemented. Instead, the floating material is simply output at the current location, more or less as if it were an `@group` (see Section 12.9 [`@group`], page 116).

9.1.1 `@float [type][,label]`: Floating Material

To produce floating material, enclose the material you want to be displayed separate between `@float` and `@end float` commands, on lines by themselves.

Floating material often uses `@image` to display an already-existing graphic (see Section 9.2 [Images], page 86), or `@multitable` to display a table (see Section 8.5 [Multi-column Tables], page 81). However, the contents of the float can be anything. Here’s an example with simple text:

```
@float Figure,fig:ex1
This is an example float.
@end float
```

And the output:

This is an example float.

Figure 9.1

As shown in the example, `@float` takes two arguments (separated by a comma), *type* and *label*. Both are optional.

type Specifies the sort of float this is; typically a word such as “Figure”, “Table”, etc. If this is not given, and *label* is, any cross-referencing will simply use a bare number.

label Specifies a cross-reference label for this float. If given, this float is automatically given a number, and will appear in any `@listoffloats` output (see Section 9.1.3 [`@listoffloats`], page 86). Cross references to *label* are allowed. For example, ‘see `@ref{fig:ex1}`’ will produce see Figure 9.1.

On the other hand, if *label* is not given, then the float will not be numbered and consequently will not appear in the `@listoffloats` output or be cross-referenceable.

Ordinarily, you specify both *type* and *label*, to get a labeled and numbered float.

In the L^AT_EX output, code loading the `float` package is output in the preamble if `@float` are present. A `@float` with type ‘`figure`’ or ‘`table`’ (case insensitive) is already defined by the package. Other float types lead to the definition of a new float environment, with names based on the `@float` type with anything else than letters and ‘-’ removed.

In Texinfo, all floats are numbered in the same way: with the chapter number (or appendix letter), a period, and the float number, which simply counts 1, 2, 3, . . . , and is reset at each chapter. Each float type is counted independently.

Floats within an `@unnumbered`, or outside of any chapter, are simply numbered consecutively from 1.

These numbering conventions are not, at present, changeable.

9.1.2 @caption & @shortcaption

You may write a `@caption` anywhere within a `@float` environment, to define a caption for the float. It is not allowed in any other context. `@caption` takes a single argument, enclosed in braces. Here’s an example:

```
@float
  An example float, with caption.
  @caption{Caption for example float.}
@end float
```

The output is:

An example float, with caption.

Caption for example float.

`@caption` can appear anywhere within the float; it is not processed until the `@end float`. The caption text is usually a sentence or two, but may consist of several paragraphs if necessary.

In the output, the caption always appears below the float; this is not currently changeable. It is preceded by the float type and/or number, as specified to the `@float` command (see the previous section).

The `@shortcaption` command likewise may be used only within `@float`, and takes a single argument in braces. The short caption text is used instead of the caption text in a list of floats (see the next section). Thus, you can write a long caption for the main document, and a short title to appear in the list of floats. For example:

```
@float
  ... as above ...
  @shortcaption{Text for list of floats.}
@end float
```

The text for `@shortcaption` may not contain comments (`@c`), verbatim text (`@verb`), environments such as `@example`, footnotes (`@footnote`), multiple paragraphs, or other complex constructs. The same constraints apply to `@caption` unless there is a `@shortcaption`. In L^AT_EX a multi-paragraph `@caption` will lead to an error when formatted, unless there is a `@shortcaption`.

9.1.3 @listoffloats: Tables of Contents for Floats

You can write a `@listoffloats` command to generate a list of floats for a given float type (see Section 9.1.1 [`@float`], page 84), analogous to the document’s overall table of contents. Typically, it is written in its own `@unnumbered` node to provide a heading and structure, rather like `@printindex` (see Section 10.5 [Printing Indices & Menus], page 94).

`@listoffloats` takes one optional argument, the float type. Here’s an example:

```
@node List of Figures
@unnumbered List of Figures
@listoffloats Figure
```

Without any argument, `@listoffloats` generates a list of floats for which no float type was specified, i.e., no first argument to the `@float` command (see Section 9.1.1 [`@float`], page 84).

Here’s what the output from `@listoffloats` looks like, given the example figure earlier in this chapter:

```
Figure 9.1: ..... 84
```

Usually, each line in the list of floats contains the float type (if any), the float number, and the caption, if any—the `@shortcaption` argument, if it was specified, else the `@caption` argument. The page number may also be included, depending on output format.

Unnumbered floats (those without cross-reference labels) are omitted from the list of floats.

The formatting of `@listoffloats` depends on the output format. In Info, for example, a `@listoffloats` is formatted as a menu.

In L^AT_EX output, `\listoffigures` is output for the ‘figure’ (case insensitive) float type, `\listoftables` is output for the ‘table’ (case insensitive) float type. For other float types, a specific `\listof` command is output.

9.2 Inserting Images

You can insert an image given in an external file with the `@image` command. Although images can be used anywhere, including the middle of a paragraph, we describe them in this chapter since they are most often part of a displayed figure or example.

9.2.1 Image Syntax

Here is the synopsis of the `@image` command:

```
@image{filename[, width[, height[, alttext[, extension]]]]}
```

The *filename* argument is mandatory, and must not have an extension, because the different processors support different formats:

- T_EX (DVI output) reads the file *filename.eps* (Encapsulated PostScript format).
- T_EX (PDF output) reads *filename.pdf*, *filename.png*, *filename.jpg*, or *filename.jpeg* (in that order). It also tries uppercase versions of the extensions. The PDF format does not support EPS images, so such must be converted first.
- In Info, *filename.txt* is included verbatim (more or less as if it were in `@verbatim`). The Info output may also include a reference to *filename.png* or *filename.jpg*. (See below.)

- In HTML, a reference to *filename.png*, *filename.jpg*, *filename.jpeg* or *filename.gif* (in that order) is output. If none of those exist, it gives an error, and outputs a reference to *filename.jpg* anyway.
- In DocBook, references to *filename.eps*, *filename.gif*, *filename.jpeg*, *filename.jpg*, *filename.pdf*, *filename.png* and *filename.svg* are output, for every file found. Also, *filename.txt* is included verbatim, if present. (The subsequent DocBook processor is supposed to choose the appropriate one.)
- For L^AT_EX, *filename* without any extension is used; the subsequent L^AT_EX processor is supposed to choose the appropriate image type.
- For Info and HTML output, the optional fifth argument *extension* to `@image` is used for the file extension, if it is specified and the file is found. Any leading period should be included in *extension*. For example:

```
@image{foo,,,.xpm}
```

If you want to install image files for use by Info readers too, we recommend putting them in a subdirectory like *'foo-figures'* for a package *foo*. Copying the files into $$(infodir)/foo-figures/$ should be done in your *Makefile*.

The *width* and *height* arguments are described in the next section.

If an image is the first thing in a paragraph and followed by more text, then you should precede the `@image` command with `@indent` or `@noindent` to indicate the beginning of paragraph formatting. This is especially important for T_EX output to get correct paragraph indentation.

Use `@center` to center an image (see Section 2.8.3 [`@titlefont @center @sp`], page 20).

For HTML output, the *alt attribute* for inline images is set to the optional *alttext* (fourth) argument to `@image`, if supplied. If not supplied, the full file name of the image being displayed is used. The *alttext* is processed as Texinfo text, so special characters such as `'` and `<` and `&` are escaped in the HTML output; also, you can get an empty `alt` string with `@-` (a command that produces no output; see Section 12.3 [`@- @hyphenation`], page 115).

For Info output, the *alttext* string is also processed as Texinfo text and output. In this case, `\` is escaped as `\\` and `"` as `\"`; no other escapes are done.

In Info output, a reference to the binary image file is written (trying *filename* suffixed with *extension*, *.extension*, *.png*, or *.jpg*, in that order) if one exists. The *.txt* file is also literally included, if one exists. This way, Info readers which can display images (such as the Emacs Info browser, running under X) can do so, whereas Info readers which can only use text (such as the standalone Info reader) can display the textual version.

9.2.2 Image Scaling

The optional *width* and *height* arguments to the `@image` command (see the previous section) specify the size to which to scale the image. They are only taken into account in printed output.

In T_EX, if neither is specified, the image is presented in its natural size (given in the file); if only one is specified, the other is scaled proportionately; and if both are specified, both are respected, thus likely distorting the original image by changing its aspect ratio.

The *width* and *height* may be specified using any valid T_EX dimension, namely:

```
pt          point (72.27pt = 1in)
```

pc	pica (1pc = 12pt)
bp	big point (72bp = 1in)
in	inch
cm	centimeter (2.54cm = 1in)
mm	millimeter (10mm = 1cm)
dd	didôt point (1157dd = 1238pt)
cc	cicero (1cc = 12dd)
sp	scaled point (65536sp = 1pt)

For example, the following will scale a file `ridt.eps` to one inch vertically, with the width scaled proportionately:

```
@image{ridt,,1in}
```

For `@image` to work with \TeX , the file `epsf.tex` must be installed somewhere that \TeX can find it. (The standard location is `texmf/tex/generic/dvips/epsf.tex`, where `texmf` is a root of your \TeX directory tree.) This file is included in the Texinfo distribution and is also available from `ftp://tug.org/tex/epsf.tex`, among other places.

`@image` can be used within a line as well as for displayed figures. Therefore, if you intend it to be displayed, be sure to leave a blank line before the command, or the output will run into the preceding text.

Image scaling is presently implemented only in printed output, not in any other sort of output.

9.3 Footnotes

A *footnote* is for a reference that documents or elucidates the primary text.¹

Footnotes are distracting; use them sparingly at most, and it is best to avoid them completely. Standard bibliographical references are usually better placed in a bibliography at the end of a document instead of in footnotes throughout.

9.3.1 Footnote Commands

In Texinfo, footnotes are created with the `@footnote` command. This command is followed immediately by a left brace, then by the text of the footnote, and then by a terminating right brace. Footnotes may be of any length (they will be broken across pages if necessary), but are usually short. The template is:

```
ordinary text@footnote{text of footnote}
```

As shown here, the `@footnote` command should come right after the text being footnoted, with no intervening space; otherwise, the footnote marker might end up starting a line.

For example, this clause is followed by a sample footnote²; in the Texinfo source, it looks like this:

```
...a sample footnote@footnote{Here is the sample
```

¹ A footnote should complement or expand upon the primary text, but a reader should not need to read a footnote to understand the primary text. For a thorough discussion of footnotes, see *The Chicago Manual of Style*, which is published by the University of Chicago Press.

² Here is the sample footnote.

```
footnote.}]; in the Texinfo source...
```

As you can see, this source includes two punctuation marks next to each other; in this case, ‘.}];’ is the sequence. This is normal (the first ends the footnote and the second belongs to the sentence being footnoted), so don’t worry that it looks odd. (Another style, perfectly acceptable, is to put the footnote after punctuation belonging to the sentence, as in ‘;@footnote{...}’.)

In printed output formats, the reference mark for a footnote is a small, superscripted number; the text of the footnote appears at the bottom of the page, below a horizontal line.

In Info, the reference mark for a footnote is a pair of parentheses with the footnote number between them, like this: ‘(1)’. The reference mark is followed by a cross-reference link to the footnote text if footnotes are put in separate nodes (see Section 9.3.2 [Footnote Styles], page 89).

In the HTML output, footnote references are generally marked with a small, superscripted number which is rendered as a hypertext link to the footnote text.

Footnotes cannot be nested, and cannot appear in section headings of any kind or other “unusual” places.

A final tip: footnotes in the argument of an @item command for an @table must be entirely on the same line as the @item (as usual). See Section 8.4 [Two-column Tables], page 79.

9.3.2 Footnote Styles

Online formats have two footnote styles, which determine where the text of the footnote is located, the ‘end’ and ‘separate’ footnote style.

‘end’ For Info, in the ‘end’ node style, all the footnotes for a single node are placed at the end of that node. The footnotes are separated from the rest of the node by a line of dashes with the word ‘Footnotes’ within it. Each footnote begins with an ‘(n)’ reference mark.

Here is an example of the Info output for a single footnote in the end-of-node style:

```
----- Footnotes -----
```

```
(1) Here is a sample footnote.
```

In HTML, when the footnote style is ‘end’, or if the output is not split, footnotes are put at the end of each output file.

‘separate’

For Info, in the ‘separate’ node style, all the footnotes for a single node are placed in an automatically constructed node of their own. In this style, a “footnote reference” follows each ‘(n)’ reference mark in the body of the node. The footnote reference is actually a cross-reference which you use to reach the footnote node.

The name of the node with the footnotes is constructed by appending ‘-Footnotes’ to the name of the node that contains the footnotes. (Consequently, the footnotes’ node for the Footnotes node is Footnotes-Footnotes!) The footnotes’ node has an ‘Up’ node pointer that leads back to its parent node.

Here is how the first footnote in this manual looks after being formatted for Info in the separate node style:

```
File: texinfo.info Node: Overview-Footnotes, Up: Overview
```

```
(1) The first syllable of "Texinfo" is pronounced like  
"speck", not "hex". ...
```

In HTML, when the footnote style is ‘`separate`’, and the output is split, footnotes are placed in a separate file.

Unless your document has long and important footnotes (as in, say, Gibbon’s *Decline and Fall* . . .), we recommend the ‘`end`’ style, as it is simpler for readers to follow.

Use the `@footnotestyle` command to specify the footnote style. Write this command at the beginning of a line followed by an argument, either ‘`end`’ for the end node style or ‘`separate`’ for the separate node style.

For example,

```
@footnotestyle end
```

or

```
@footnotestyle separate
```

Write a `@footnotestyle` command in the Texinfo file preamble.

10 Indices

Using Texinfo, you can generate indices without having to sort and collate entries manually. In an index, the entries are listed in alphabetical order, together with information on how to find the discussion of each entry. In a printed manual, this information consists of page numbers. In other formats, links to the index entries location or to the associated nodes are generated.

Texinfo provides several predefined kinds of indices: an index for functions, an index for variables, an index for concepts, and so on. You can combine indices or use them for other than their canonical purpose. Lastly, you can define your own new indices.

10.1 Predefined Indices

Texinfo provides six predefined indices. Here are their nominal meanings, abbreviations, and the corresponding index entry commands:

<code>'cp'</code>	<code>(@cindex)</code> Concept index, for general concepts.
<code>'fn'</code>	<code>(@findex)</code> Function index, for function and function-like names (such as entry points of libraries).
<code>'ky'</code>	<code>(@kindex)</code> Keystroke index, for keyboard commands.
<code>'pg'</code>	<code>(@pindex)</code> Program index, for names of programs.
<code>'tp'</code>	<code>(@tindex)</code> Data type index, for type names (such as structures defined in header files).
<code>'vr'</code>	<code>(@vindex)</code> Variable index, for variable names (such as library global variables).

Not every manual needs all of these, and most manuals use only two or three at most. The present manual, for example, has two indices: a concept index and an @-command index. (The latter is actually the function index but is called a command index in the chapter heading.)

You are not required to use the predefined indices strictly for their canonical purposes. For example, suppose you wish to index some C preprocessor macros. You could put them in the function index along with actual functions, just by writing `@findex` commands for them; then, when you print the “Function Index” as an unnumbered chapter, you could give it the title ‘Function and Macro Index’ and all will be consistent for the reader.

On the other hand, it is best not to stray too far from the meaning of the predefined indices. Otherwise, in the event that your text is combined with other text from other manuals, the index entries will not match up. Instead, define your own new index (see Section 10.7 [New Indices], page 96).

We recommend having a single index in the final document whenever possible, however many source indices you use, since then readers have only one place to look. Two or more source indices can be combined into one output index by using the `@synindex` or `@syncodeindex` commands (see Section 10.6 [Combining Indices], page 95).

Index entry commands based on the the two letter index names are also valid, for example `@cpindex` can be used instead of `@cindex`.

10.2 Defining the Entries of an Index

The data to make an index come from many individual indexing commands scattered throughout the Texinfo source file. Each command says to add one entry to a particular index; after formatting, the index will give the current page number or node name as the reference.

An index entry consists of an indexing command at the beginning of a line followed, on the rest of the line, by the entry.

For example, this section begins with the following five entries for the concept index:

```
@cindex Defining indexing entries
@cindex Index entries, defining
@cindex Entries for an index
@cindex Specifying index entries
@cindex Creating index entries
```

Each predefined index has its own indexing command—`@cindex` for the concept index, `@findex` for the function index, and so on, as listed in the previous section.

Index entries should precede the visible material that is being indexed. For instance:

```
@cindex hello
Hello, there!
```

Among other reasons, that way following indexing links (in whatever context) ends up before the material, where readers want to be, instead of after.

In Info, an index is usually formatted as a menu. Try to avoid using a colon in index entries, as this may confuse some Info readers. See Section 3.9.4 [Menu Parts], page 36, for more information about the structure of a menu entry.

By default, entries for a concept index are printed in a roman font and entries for the other indices are printed in a typewriter font. You may change the way part of an entry is printed with the usual Texinfo commands, such as `@file` for file names (see Chapter 6 [Marking Text], page 55), and `@r` for the normal roman font (see Section 6.2.3 [Fonts], page 64).

You may specify an explicit sort key for an index entry using `@sortas` following either the index command or the text of the entry. For example: `'@findex @sortas{\} \ @r{(literal \ in @code{@@math})}'` sorts the index entry this produces under backslash.

You may choose to ignore certain characters in index entries for the purposes of sorting. The characters that you can currently choose to ignore are `'\'`, `'-'`, `'<'` and `'@'`, which are ignored by giving as an argument to the `@set` command, respectively, `txiindexbackslashignore`, `txiindexhyphenignore`, `txiindexlessthanignore` and `txiindexatsignignore`. For example, specifying `'@set txiindexbackslashignore'` causes the `'\mathop\sup'` entry in the index for this manual to be sorted as if it were `'mathop\sup'`, so that it appears among the other entries beginning with `'M'`. This avoids the need to provide explicit sort keys for index entries containing these characters.

When using these options, it is possible to get an index entry with an empty sort key. To avoid this, specify a `@sortas` directive in the index entry. For example:

```
@set txiindexbackslashignore
@findex @sortas{\} \
```

10.3 Advanced Indexing Commands

Texinfo provides several further commands for indexing.

First, you can create *multilevel* index entries, allowing you to group many related subtopics under the same higher-level topic. You do this by separating the parts of such an entry with the `@subentry` command. Such commands might look like this:

```
@cindex Superhumans @subentry villains
@cindex Superhumans @subentry heroes
```

You may have up to three levels in an entry:

```
@cindex coffee makers @subentry electric @subentry pink
@cindex coffee makers @subentry electric @subentry blue
```

You can use the `@sortas` command mentioned earlier with any or all of the three parts of an entry to cause them to sort differently than they would by default.

Second, you may provide an index entry that points to another, using the `@seeentry` (“see entry”) command. For example:

```
@cindex Indexes @seeentry{Indices}
```

Such an entry should be unique in your document; the idea is to redirect the reader to the other entry where they will find all the information they are looking for.

Finally, you may provide a “see also” entry using the `@seealso` command. These entries go along with regular entries, and are grouped together with them in the final printed index. For example:

```
@cindex Coffee
@cindex Coffee @subentry With milk and sugar
@cindex Coffee @subentry With doughnuts
@cindex Coffee @subentry Decaffeinated
@cindex Coffee @seealso{Tea}
```

When using all three of these advanced commands, *do not* place a comma between the different parts of the index text. The `texindex` program, which sorts the index entries and generates the indexing formatting commands, takes care of placing commas in the correct places for you.

Do not interrupt an index or `@subentry` entry by `@sortas` or advanced commands with braces; place the commands with braces at the beginning or at the end of the entry.

These features are the most useful with printed documents, and when translating Texinfo to DocBook.

10.4 Making Index Entries

Concept index entries consist of text. The best way to write an index is to devise entries which are terse yet clear. If you can do this, the index usually looks better if the entries are written just as they would appear in the middle of a sentence, that is, capitalizing only proper names and acronyms that always call for uppercase letters. This is the case convention we use in most GNU manuals’ indices.

If you don’t see how to make an entry terse yet clear, make it longer and clear—not terse and confusing. If many of the entries are several words long, the index may look better

if you use a different convention: capitalize the first word of each entry. Whichever case convention you use, use it consistently.

In any event, do not ever capitalize a case-sensitive name such as a C or Lisp function name or a shell command; that would be a spelling error. Entries in indices other than the concept index are symbol names in programming languages, or program names; these names are usually case-sensitive, so likewise use upper- and lowercase as required.

It is a good idea to make index entries unique wherever feasible. That way, people using the printed output or online completion of index entries don't see undifferentiated lists. Consider this an opportunity to make otherwise-identical index entries be more specific, so readers can more easily find the exact place they are looking for. The advanced indexing features described in Section 10.3 [Advanced Indexing], page 93, can help with this, as well.

When you are making index entries, it is good practice to think of the different ways people may look for something. Different people *do not* think of the same words when they look something up. A helpful index will have items indexed under all the different words that people may use. For example, one reader may think it obvious that the two-letter names for indices should be listed under “Indices, two-letter names”, since “Indices” are the general concept. But another reader may remember the specific concept of two-letter names and search for the entry listed as “Two letter names for indices”. A good index will have both entries and will help both readers.

Like typesetting, the construction of an index is a skilled art, the subtleties of which may not be appreciated until you need to do it yourself.

10.5 Printing Indices and Menus

`@printindex` takes one argument, a two-letter index abbreviation. You must include the `@printindex` command at the place in the document where you want the index to appear. This does not happen automatically just because you use `@cindex` or other index-entry generating commands in the Texinfo file; those just cause the raw data for the index to be accumulated.

You should precede the `@printindex` command with a suitable section or chapter command (usually `@appendix` or `@unnumbered`) to supply the chapter heading and put the index into the table of contents. Precede the chapter heading with an `@node` line as usual.

For example:

```
@node Variable Index
@unnumbered Variable Index

@printindex vr

@node Concept Index
@unnumbered Concept Index

@printindex cp
```

The text ‘Index’ needs to appear in the name of the node containing the index for the index to be found by Info readers.

If you have more than one index, we recommend placing the concept index last.

Other details of index output in output formats:

- As part of the process of creating a printed manual with \TeX , you run a program called `texindex` (see Chapter 18 [Hardcopy with \TeX], page 157) to sort the raw data to produce a sorted index file. The sorted index file is what is actually used to print the index.

`@printindex` reads the corresponding sorted index file and produces a traditional two-column index, with index terms and page numbers.

- In Info output, `@printindex` produces a special menu containing the line number of the entry, relative to the start of the node. Info readers can use this to go to the exact line of an entry, not just the containing node. (Older Info readers will just go to the node.) Here's an example:

```
* First index entry:   Top.   (line 7)
```

- In plain text output, `@printindex` formatting is usually similar to a menu in Info, showing the line number of each entry relative to the start of the file.
- In HTML output, `@printindex` produces links to the index entries.
- In DocBook and \LaTeX output, it simply records the index to be printed.

10.6 Combining Indices

Sometimes you will want to combine two disparate indices such as functions and concepts, perhaps because you have few enough entries that a separate index would look silly.

You could put functions into the concept index by writing `@cindex` commands for them instead of `@findex` commands, and produce a consistent manual by printing the concept index with the title 'Function and Concept Index' and not printing the 'Function Index' at all; but this is not a robust procedure. It works only if your document is never included as part of another document that is designed to have a separate function index; if your document were to be included with such a document, the functions from your document and those from the other would not end up together. Also, to make your function names appear in the right font in the concept index, you would need to enclose every one of them between the braces of `@code`.

10.6.1 `@syncodeindex`: Combining Indices Using `@code`

When you want to combine functions and concepts into one index, you should index the functions with `@findex` and index the concepts with `@cindex`, and use the `@syncodeindex` command to redirect the function index entries into the concept index.

The `@syncodeindex` command takes two arguments; they are the name of the index to redirect, and the name of the index to redirect it to. The template looks like this:

```
@syncodeindex from to
```

For this purpose, the indices are given two-letter names:

'cp'	Concept index
'fn'	Function index
'ky'	Key index

<code>'pg'</code>	Program index
<code>'tp'</code>	Data type index
<code>'vr'</code>	Variable index

Write a `@syncodeindex` command before or shortly after the end-of-header line at the beginning of a Texinfo file. For example, to merge a function index with a concept index, write the following:

```
@syncodeindex fn cp
```

This causes all entries designated for the function index to merge in with the concept index instead.

To merge both a variable index and a function index into a concept index, write the following:

```
@syncodeindex vr cp
@syncodeindex fn cp
```

The `@syncodeindex` command puts all the entries from the ‘from’ index (the redirected index) into the `@code` font, overriding whatever default font is used by the index to which the entries are now directed. This way, if you direct function names from a function index into a concept index, all the function names are printed in the `@code` font as you would expect.

10.6.2 `@synindex`: Combining Indices

The `@synindex` command is nearly the same as the `@syncodeindex` command, except that it does not put the ‘from’ index entries into the `@code` font; rather it puts them in the roman font. Thus, you use `@synindex` when you merge a concept index into a function index.

See Section 10.5 [Printing Indices & Menus], page 94, for information about printing an index at the end of a book or creating an index menu in an Info file.

10.7 Defining New Indices

In addition to the predefined indices (see Section 10.1 [Predefined Indices], page 91), you may use the `@defindex` and `@defcodeindex` commands to define new indices. These commands create new indexing `@`-commands with which you mark index entries. The `@defindex` command is used like this:

```
@defindex name
```

New index names are usually two-letter words, such as ‘au’. For example:

```
@defindex au
```

This defines a new index, called the ‘au’ index. At the same time, it creates a new indexing command, `@auindex`, that you can use to make index entries. Use this new indexing command just as you would use a predefined indexing command.

For example, here is a section heading followed by a concept index entry and two ‘au’ index entries.

```
@section Cognitive Semantics
@cindex kinesthetic image schemas
@auindex Johnson, Mark
```

```
@auindex Lakoff, George
```

(Evidently, ‘au’ serves here as an abbreviation for “author”.)

Texinfo constructs the new indexing command by concatenating the name of the index with ‘index’; thus, defining an ‘xy’ index leads to the automatic creation of an `@xyindex` command.

Use the `@printindex` command to print the index, as you do with the predefined indices. For example:

```
@node Author Index
@unnumbered Author Index
```

```
@printindex au
```

The `@defcodeindex` command is like the `@defindex` command, except that, in the printed output, it prints entries in an `@code` font by default instead of in a roman font.

You should define new indices before the end-of-header line of a Texinfo file, and (of course) before any `@synindex` or `@syncodeindex` commands (see Section 2.5 [Texinfo File Header], page 12).

As mentioned earlier (see Section 10.1 [Predefined Indices], page 91), we recommend having a single index in the final document whenever possible (no matter how many source indices you use), since then readers have only one place to look.

When creating an index, `TEX` creates a file whose extension is the name of the index (see [Names of index files], page 159). Therefore you should avoid using index names that collide with extensions used for other purposes, such as ‘.aux’ or ‘.xml’. `texi2any` already reports an error if a new index conflicts well-known extension name.

11 Special Insertions

Texinfo provides several commands for inserting characters that have special meaning in Texinfo, such as braces, and for other graphic elements that do not correspond to simple characters you can type.

11.1 Special Characters: Inserting @ {} , \ # &

‘@’ and curly braces are the basic special characters in Texinfo. To insert these characters so they appear in text, you must put an ‘@’ in front of these characters to prevent Texinfo from misinterpreting them. Alphabetic commands are also provided.

The other characters (comma, backslash, hash, ampersand) are special only in restricted contexts, as explained in the respective sections.

11.1.1 Inserting ‘@’ with @@ and @atchar{}

@@ produces a single ‘@’ character in the output. Do not put braces after an @@ command.

@atchar{} also produces a single ‘@’ character in the output. It does need following braces, as usual for alphabetic commands. In inline conditionals (see Section 15.4 [Inline Conditionals], page 137), it can be necessary to avoid using the literal ‘@’ character in the source (and may be clearer in other contexts).

11.1.2 Inserting ‘{ ‘}’ with @{ @} and @l rbracechar{}

@{ produces a single ‘{’ in the output, and @} produces a single ‘}’. Do not put braces after either an @{ or an @} command.

@lbracechar{} and @rbracechar{} also produce single ‘{’ and ‘}’ characters in the output. They do need following braces, as usual for alphabetic commands. In inline conditionals (see Section 15.4 [Inline Conditionals], page 137), it can be necessary to avoid using literal brace characters in the source (and may be clearer in other contexts).

11.1.3 Inserting ‘,’ with @comma{}

Ordinarily, a comma ‘,’ is a normal character that can be simply typed in your input where you need it.

However, Texinfo uses the comma as a special character only in one context: to separate arguments to those Texinfo commands, such as @node (see Section 3.3 [Node Line Requirements], page 29), @acronym (see Section 6.1.14 [@acronym], page 62) and @xref (see Chapter 5 [Cross References], page 44), as well as user-defined macros (see Section 16.1 [Defining Macros], page 144), which take more than one argument.

Since a comma character would confuse Texinfo’s parsing for these commands, you must use the command ‘@comma{’ instead if you want to pass an actual comma. Here are some examples:

```
@acronym{ABC, A Bizarre @comma{}}
@xref{Comma,, The @comma{ } symbol}
@mymac{One argument@comma{ } containing a comma}
```

Although ‘@comma{’ can be used nearly anywhere, there is no need for it anywhere except in this unusual case.

(Incidentally, the name ‘@comma’ lacks the ‘char’ suffix used in its companion commands only for historical reasons. It didn’t seem important enough to define a synonym.)

11.1.4 Inserting ‘\’ with @backslashchar{}

Ordinarily, a backslash ‘\’ is a normal character in Texinfo that can be simply typed in your input where you need it. The result is to typeset the backslash from the typewriter font.

However, Texinfo uses the backslash as a special character in one restricted context: to delimit formal arguments in the bodies of user-defined macros (see Section 16.1 [Defining Macros], page 144).

Due to the vagaries of macro argument parsing, it is more reliable to pass an alphabetic command that produces a backslash instead of using a literal \. Hence @backslashchar{}. Here is an example macro call:

```
@mymac{One argument@backslashchar{} with a backslash}
```

Texinfo documents may also use \ as a command character inside @math (see Section 11.7 [Inserting Math], page 106). In this case, @\ or \backslash produce a “math” backslash (from the math symbol font), while @backslashchar{} produces a typewriter backslash as usual.

Although ‘@backslashchar{}’ can be used nearly anywhere, there is no need for it except in these unusual cases.

11.1.5 Inserting ‘#’ with @hashchar{}

Ordinarily, a hash ‘#’ is a normal character in Texinfo that can be simply typed in your input where you need it. The result is to typeset the hash character from the current font.

This character has many other names, varying by locale, such as “number sign”, “pound”, and “octothorp”. It is also sometimes called “sharp” or “sharp sign” since it vaguely resembles the musical symbol by that name. In situations where Texinfo is used, “hash” is the most common in our experience.

However, Texinfo uses the hash character as a special character in one restricted context: to introduce the so-called #line directive and variants (see Section 16.7 [External Macro Processors], page 153).

So, in order to typeset an actual hash character in such a place (for example, in a program that needs documentation about #line), it’s necessary to use @hashchar{} or some other construct. Here’s an example:

```
@hashchar{} 10 "example.c"
```

Although ‘@hashchar{}’ can be used nearly anywhere, there is no need for it anywhere except this unusual case.

11.1.6 Inserting ‘&’ with @& and @ampchar{}

Ordinarily, an ampersand ‘&’ is a normal character in Texinfo that can be simply typed in your input where you need it. The result is to typeset the ampersand character.

However, the ampersand character is treated specially in just one restricted context. In the argument to a definition command (see Chapter 13 [Definition Commands], page 118),

an ampersand followed by a series of letters may be typeset specially when processing with \TeX ¹ (see Section 13.8 [Def Cmd Conventions], page 128). For example:

```
@defun foo integer1 &optional integer2 &rest integers
@code{foo} described here.
@end defun
```

may have ‘&optional’ and ‘&rest’ formatted in bold, even without any @-command involved.

So, in order to typeset an ampersand in such a context, it’s necessary to use @& or some other construct. Here’s an example of a C++ function taking a reference as a parameter:

```
@deftypefn Function int foo (const std::vector<int>&& @var{bar})
Documentation of @code{foo}.
@end deftypefn
```

This gives the output

```
int foo (const std::vector<int>&& bar) [Function]
Documentation of foo.
```

Although ‘&&’ and ‘@ampchar{’ can be used nearly anywhere, there is no need for them anywhere except this unusual case.

11.2 Inserting Quote Characters

As explained in the early section on general Texinfo input conventions (see Section 2.1 [Conventions], page 9), Texinfo source files use the ASCII character ` (96 decimal) to produce a left quote (‘), and ASCII ' (39 decimal) to produce a right quote (’). Doubling these input characters (` ` and ' ') produces double quotes (“ and ”). These are the conventions used by \TeX .

In examples of computer code, however, ` and ' produce typical renderings for these ASCII characters: the backtick character (standalone grave accent) and undirected single quote respectively. In the past, directed glyphs (‘ and ’) were used by default in \TeX output. Texinfo provides these commands to choose between these alternate renderings:

```
@codequoteundirected on-off
```

Set to ‘off’ to output the ' character in code environments as the right curly single quote.

```
@codequotebacktick on-off
```

Set to ‘off’ to output the ` character in code environments as the left curly single quote.

If you want these settings for only part of the document, @codequote... on will restore the normal behavior, as in @codequoteundirected on.

These settings affect @code, @example, @kbd, @samp, @verb, and @verbatim. See Section 6.1.1 [Useful Highlighting], page 55.

Unfortunately, some document viewers will mangle the directed quote characters when copying and pasting. (The free PDF reader *xpdf* works fine, but other PDF readers, both free and nonfree, have problems.)

¹ This syntax is used for Emacs Lisp keywords. See Section “A Sample Function Description” in *GNU Emacs Lisp Reference Manual*.

This feature can also be controlled by using `@set` and `@clear` on the corresponding variables `txicodequoteundirected` and `txicodequotebacktick`.

11.3 Inserting Space

The following sections describe commands that control spacing of various kinds within and after sentences.

11.3.1 Multiple Spaces

Ordinarily, multiple whitespace characters (space, tab, and newline) are collapsed into a single space.

Occasionally, you may want to produce several consecutive spaces, either for purposes of example (e.g., what your program does with multiple spaces as input), or merely for purposes of appearance in headings or lists. Texinfo supports three commands: `@SPACE`, `@TAB`, and `@NL`, all of which insert a single space into the output. (Here, `@SPACE` represents an ‘@’ character followed by a space, i.e., ‘@ ’, `TAB` represents an actual tab character, and `@NL` represents an ‘@’ character and end-of-line, i.e., when ‘@’ is the last character on a line.)

For example,

```
Spacey@ @ @ @
example.
```

produces

```
Spacey   example.
```

Do not follow any of these commands with braces.

To produce a non-breakable space, see Section 12.6 [`@tie`], page 116.

11.3.2 Not Ending a Sentence

When a period, exclamation point or question mark is at the end of a sentence, slightly more space is inserted after it in a typeset manual.

Usually, Texinfo can determine automatically when a period ends a sentence. However, special commands are needed in some circumstances. Use the `@:` command after a period, question mark, exclamation mark or colon that should not be followed by extra space. This is necessary in the following situations:

1. After a period that ends a lowercase abbreviation which is not at the end of a sentence.
2. When a parenthetical remark in the middle of a sentence (like this one!) ends with a period, exclamation point or question mark, `@:` should be used after the right parenthesis. Similarly for right brackets and right quotes (both single and double).

For example:

```
‘foo vs.@: bar (or?)@: baz’,
```

The first line below shows the output, and for comparison, the second line shows the spacing when the ‘@:’ commands were not used.

```
foo vs. bar (or?) baz
foo vs. bar (or?) baz
```

If you look carefully, you will see a bit of extraneous space after the ‘vs.’ and ‘(or?)’.

It may help you to remember what `@:` does by imagining that it stands for an invisible lower-case character that stops a word ending in a period.

A few Texinfo commands force normal interword spacing, so that you don't have to insert `@:` where you otherwise would. These are the code-like highlighting commands, `@var`, `@abbr`, and `@acronym` (see Section 6.1.1 [Useful Highlighting], page 55). For example, in `'@code{foo. bar}'` the period is not considered to be the end of a sentence, and no extra space is inserted.

`@:` has no effect on the HTML or DocBook output.

11.3.3 Ending a Sentence

As mentioned above, Texinfo normally inserts additional space after the end of a sentence. It uses the same heuristic for this as \TeX : a sentence ends with a period, exclamation point, or question mark, either preceded or followed by optional closing punctuation, and then whitespace, and *not* preceded by a capital letter.

Use `@.` instead of a period, `@!` instead of an exclamation point, and `@?` instead of a question mark at the end of a sentence that does end with a capital letter. Do not put braces after any of these commands. For example:

```
Give it to M.I.B. and to M.E.W@. Also, give it to R.J.C@.
Give it to M.I.B. and to M.E.W. Also, give it to R.J.C.
```

The output follows. In printed output and Info, you can see the desired extra whitespace after the 'W' in the first line.

```
Give it to M.I.B. and to M.E.W. Also, give it to R.J.C.
Give it to M.I.B. and to M.E.W. Also, give it to R.J.C.
```

In other output formats, `@.` is equivalent to a simple `'.'`; likewise for `@!` and `@?`.

The “closing punctuation” mentioned above is defined as a right parenthesis (`'`), right bracket (`]`), or right quote, either single or double (`'` and `'`); the many possible additional Unicode right quotes are not included). These characters can be thought of as invisible with respect to whether a given period ends a sentence. (This is the same rule as \TeX .) For instance, the periods in `'foo.) Bar'` and `'foo.' Bar'` do end sentences.

The meanings of `@:` and `@.`, etc. in Texinfo are designed to work well with the Emacs sentence motion commands (see Section “Sentences” in *The GNU Emacs Manual*). It may help to imagine that the `@` in `@.`, etc., is an invisible lower-case letter ‘a’ which makes an upper-case letter before it immaterial for the purposes of deciding whether the period ends the sentence.

A few Texinfo commands are not considered as being an abbreviation, even though they may end with a capital letter when expanded, so that you don't have to insert `@.` and companions. Notably, this is the case for code-like highlighting commands, `@var` arguments ending with a capital letter, `@LaTeX`, and `@TeX`. For example, that sentence ended with `'... @code{@TeX}.'`; `@.` was not needed. Similarly, in `'... @var{VARNAME}. Text'` the period after `VARNAME` ends the sentence; there is no need to use `@.`

11.3.4 `@frenchspacing val:` Control Sentence Spacing

In American typography, it is traditional and correct to put extra space at the end of a sentence. This is the default in Texinfo (implemented in Info and printed output, not in

other output formats). In French typography (and others), this extra space is wrong; all spaces are uniform.

Therefore Texinfo provides the `@frenchspacing` command to control the spacing after punctuation. It reads the rest of the line as its argument, which must be the single word ‘on’ or ‘off’ (always these words, regardless of the language of the document). Here is an example:

```
@frenchspacing on
This is text. Two sentences. Three sentences. French spacing.
```

```
@frenchspacing off
This is text. Two sentences. Three sentences. Non-French spacing.
```

produces:

This is text. Two sentences. Three sentences. French spacing.

This is text. Two sentences. Three sentences. Non-French spacing.

`@frenchspacing` also affects the output after `@.`, `@!`, and `@?` (see Section 11.3.3 [Ending a Sentence], page 102).

`@frenchspacing` has no effect on the HTML or DocBook output.

11.3.5 `@dmn{dimension}`: Format a Dimension

You can use the `@dmn` command to format a dimension with just enough space for proper typesetting inserted in printed output. In other output formats, the formatting commands insert no space at all.

To use the `@dmn` command, write the number and then follow it immediately, with no intervening space, by `@dmn`, and then by the dimension within braces. For example,

```
A4 paper is 8.27@dmn{in} wide.
```

produces

A4 paper is 8.27 in wide.

Not everyone uses this style. Some people prefer ‘8.27 in.’ or ‘8.27 inches’. In these cases, however, you need to use `@tie` (see Section 12.6 [`@tie`], page 116) or `@w` (see Section 12.5 [`@w`], page 115) so that no line break can occur between the number and the dimension. Also, if you write a period after an abbreviation within a sentence (as with the ‘in.’ above), you should write ‘@:’ after the period to avoid inserting extra whitespace in printed output, as shown here. See Section 11.3.2 [Not Ending a Sentence], page 101.

11.4 Inserting Accents

Here is a table with the commands Texinfo provides for inserting floating accents. They all need an argument, the character to accent, which can either be given in braces as usual (`@{e}`), or, as a special case, the braces can be omitted, in which case the argument is the next character (`@e`). This is to make the source as convenient as possible to type and read, since accented characters are very common in some languages.

If the command is alphabetic, such as `@dotaccent`, then there must be a space between the command name and argument if braces are not used. If the command is non-alphabetic, such as `@'`, then there must *not* be a space; the argument is the very next character.

Exception: the argument to `@tieaccent` must be enclosed in braces (since it is two characters instead of one).

In Info and plain text output, accent constructs are output as the true accented characters if the document encoding supports the required characters, unless the option `--disable-encoding` is given to `texi2any` (see Section 14.2 [`@documentencoding`], page 132). ASCII transliterations are used if the encoded characters are not output.

Command	Output	What
<code>@"o</code>	ö	umlaut accent
<code>@'o</code>	ó	acute accent
<code>@,{c}</code>	ç	cedilla accent
<code>@=o</code>	ō	macron/overbar accent
<code>@~o</code>	ô	circumflex accent
<code>@'o</code>	ò	grave accent
<code>@~o</code>	õ	tilde accent
<code>@dotaccent{o}</code>	ô	overdot accent
<code>@H{o}</code>	ő	long Hungarian umlaut
<code>@ogonek{a}</code>	ą	ogonek
<code>@ringaccent{o}</code>	ô	ring accent
<code>@tieaccent{oo}</code>	ôo	tie-after accent
<code>@u{o}</code>	ö	breve accent
<code>@ubaraccent{o}</code>	o	underbar accent
<code>@udotaccent{o}</code>	o	underdot accent
<code>@v{o}</code>	ö	caron/hacek/check accent

This table lists the Texinfo commands for inserting other characters commonly used in languages other than English.

<code>@exclamdown{}</code>	¡	upside-down !
<code>@questiondown{}</code>	¿	upside-down ?
<code>@aa{}</code> <code>@AA{}</code>	å Å	a,A with circle
<code>@ae{}</code> <code>@AE{}</code>	æ Æ	ae,AE ligatures
<code>@dh{}</code> <code>@DH{}</code>	ð Ð	Icelandic eth
<code>@dotless{i}</code>	ı	dotless i
<code>@dotless{j}</code>	ĵ	dotless j
<code>@l{}</code> <code>@L{}</code>	ł Ł	suppressed-L,l
<code>@o{}</code> <code>@O{}</code>	ø Ø	O,o with slash
<code>@oe{}</code> <code>@OE{}</code>	œ Œ	oe,OE ligatures
<code>@ordf{}</code> <code>@ordm{}</code>	ª º	Spanish ordinals
<code>@ss{}</code>	ß	es-zet or sharp S
<code>@th{}</code> <code>@TH{}</code>	þ Þ	Icelandic thorn

11.5 Inserting Quotation Marks

Use doubled single-quote characters to begin and end quotations: ‘ ‘...’ ’. Two single quotes are converted to left- and right-hand doubled quotation marks, “like this”.

You may occasionally need to produce two consecutive single quotes; for example, in documenting a computer language such as Maxima where ‘ ’ is a valid command. You

can do this with the input `'@w{}`'; the empty `@w` command stops the combination into the double-quote characters.

The left quote character (`'`, ASCII code 96) used in Texinfo is a grave accent in ANSI and ISO character set standards. We use it as a quote character because that is how \TeX is set up, by default.

Texinfo supports several other quotation marks used in languages other than English. Below is a table with the commands Texinfo provides for inserting quotation marks.

Command	Glyph	Unicode name (point)
<code>@quotedblleft{}</code>	``	Left double quotation mark (U+201C)
<code>@quotedblright{}</code>	''	Right double quotation mark (U+201D)
<code>@quoteleft{}</code>	`	Left single quotation mark (U+2018)
<code>@quoteright{}</code>	'	Right single quotation mark (U+2019)
<code>@quotedblbase{}</code>	„	Double low-9 quotation mark (U+201E)
<code>@quotesinglbase{}</code>	,	Single low-9 quotation mark (U+201A)
<code>@guillemetleft{}</code>	«	Left-pointing double angle quotation mark (U+00AB)
<code>@guillemetright{}</code>	»	Right-pointing double angle quotation mark (U+00BB)
<code>@guilsinglleft{}</code>	<	Single left-pointing angle quotation mark (U+2039)
<code>@guilsinglright{}</code>	>	Single right-pointing angle quotation mark (U+203A)

For the double angle quotation marks, Adobe and \LaTeX glyph names are also supported: `@guillemotleft` and `@guillemotright`. These names are incorrect; a “guillemot” is a bird species (a type of auk).

The standard \TeX fonts support the usual quotation marks used in English (the ones produced with single and doubled ASCII single quotes). For the other quotation marks, \TeX uses European Computer Modern (EC) fonts (`ecrm1000` and other variants). These fonts are freely available, of course; you can download them from <http://ctan.org/pkg/ec>, among other places.

The free EC fonts are bitmap fonts created with Metafont. Especially for on-line viewing, Type 1 (vector) versions of the fonts are preferable; these are available in the CM-Super font package (<http://ctan.org/pkg/cm-super>).

Both distributions include installation instructions.

Traditions for quotation mark usage vary to a great extent between languages (https://en.wikipedia.org/wiki/Quotation_mark). Texinfo does not provide commands or configurations for typesetting quotation marks according to the numerous traditions. Therefore, you have to choose the commands appropriate for the language of your manual. Sometimes aliases (see Section 16.4 [`@alias`], page 150) can simplify the usage and make the source code more readable. For example, in German, `@quotedblbase` is used for the left double quote, and the right double quote is the glyph produced by `@quotedblleft`, which is counterintuitive. Thus, in this case the following aliases would be convenient:

```
@alias lgqq = quotedblbase
@alias rgqq = quotedblleft
```

11.6 @sub and @sup: Inserting Subscripts and Superscripts

You can insert subscripts and superscripts with the `@sub` and `@sup` commands. For example:

```
here@sub{below}@sup{above}
```

produces:

```
herebelowabove
```

In Info and plain text, `@sub{text}` is currently output as ‘`_ {text}`’ and `@sup{text}` as ‘`^ {text}`’, including the literal braces (to mark the beginning and end of the “script” text to the reader).

When the output format (and display program) permit (printed output, HTML), the superscript is set above the subscript when both commands are given consecutively.

For subscripts and superscripts in mathematical expressions, it is better to use TeX’s ‘`_`’ and ‘`^`’ characters. See the next section.

11.7 @math and @displaymath: Formatting Mathematics

You can write a mathematical expression, equation or formula using the `@math` command. Write the TeX math notation between braces, like this:

```
@math{\partial_\alpha \partial^\alpha A^\beta = \mu_0 J^\beta}
```

`@math` is formatted inline when used inside a paragraph, like $\partial_\alpha \partial^\alpha A^\beta = \mu_0 J^\beta$ in this example. The `@math` command has no special effect on the Info output, merely outputting the contents verbatim.

For printed output, `@math` switches into TeX “math mode”. In that context, ‘`\`’ must be used instead of ‘`@`’ for plain TeX math control sequences for symbols, functions, and so on.

By default, the HTML output is only emphasized. `texi2any` provides three options for displaying properly formatted mathematics for HTML. You can select these with the `HTML_MATH` variable (see Section 19.4.3 [HTML Customization Variables], page 174). With `HTML_MATH` set to ‘`12h`’, `texi2any` attempts to use the `latex2html` program to produce image files for mathematical material. With the ‘`t4h`’ setting, `texi2any` attempts to use the `tex4ht` program. With the ‘`mathjax`’ setting, `texi2any` inserts references in the output files to MathJax scripts to format the material. The MathJax option requires JavaScript to be enabled in the browser to work. See also Section 19.4.4 [MathJax Customization Variables], page 181, Section 19.4.5 [`latex2html` Customization Variables], page 181, and Section 19.4.6 [`tex4ht` Customization Variables], page 182.

For displayed equations, you can use the `@displaymath` command. Example:

```
@displaymath
f(x) = {1\over\sigma\sqrt{2\pi}}
e^{-{1\over2}\left({x-\mu\over\sigma}\right)^2}
@end displaymath
```

which produces:

$$f(x) = \frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2}$$

In general, the contents of `@math` or `@displaymath` should be plain TeX only, with no interspersed Texinfo commands. If you do use any Texinfo commands, then you should

mark these with ‘@’ as usual, rather than ‘\’ (e.g. ‘@var’ rather than ‘\var’), but we do not guarantee which Texinfo commands will work.

Although @sub and @sup may work inside math mode in some contexts, it is better to use TeX’s ‘_’ and ‘^’ characters to denote subscripts and superscripts within mathematical expressions.

L^ATeX-specific code will only work when the output format is L^ATeX, and with the HTML_MATH options (although tex4ht needs T4H_MATH_CONVERSION to be set to ‘latex’; see Section 19.4.6 [tex4ht Customization Variables], page 182).

Due to the conflict with Texinfo’s @sup command, you can access the plain TeX command \sup as \mathopsup instead, in the unlikely occurrence that you want to do this (but only when processing with TeX, not when outputting L^ATeX nor with any of the HTML_MATH options).

11.8 Glyphs for Text

Texinfo has support for a few additional glyphs that are commonly used in printed text but not available in ASCII. Of course, there are many thousands more. It is possible to use Unicode characters as-is as far as texi2any is concerned, but TeX is not so lucky.

11.8.1 @TeX{} (TeX) and @LaTeX{} (L^ATeX)

Use the @TeX{} command to generate ‘TeX’. In a printed manual, this is a special logo that is different from three ordinary letters. In other output formats, it just looks like ‘TeX’.

Similarly, use the @LaTeX{} command to generate ‘L^ATeX’, which is even more special in printed manuals (and different from the incorrect LaTeX{}). In other output formats, the result is just ‘LaTeX’.

The spelling of these commands is unusual for Texinfo, in that they use both uppercase and lowercase letters.

11.8.2 @copyright{} (©)

Use the @copyright{} command to generate the copyright symbol, ‘©’. Where possible, this is a ‘c’ inside a circle; otherwise this is ‘(C)’.

Legally, it’s not necessary to use the copyright symbol; the English word ‘Copyright’ suffices, according to international treaty.

11.8.3 @registeredsymbol{} (®)

Use the @registeredsymbol{} command to generate the registered symbol, ‘®’. Where possible, this is an ‘R’ inside a circle; otherwise this is ‘(R)’.

11.8.4 @dots (...) and @enddots (...)

An *ellipsis* (a sequence of dots) would be spaced wrong when typeset as a string of periods, so a special command is used in Texinfo: use the @dots{} command to generate a normal ellipsis, which is three dots in a row, appropriately spaced . . . like so. To emphasize: do not simply write three periods in the input file; that could work in some output formats, but would produce the wrong amount of space between the periods in printed manuals.

The @enddots{} command generates an end-of-sentence ellipsis, which also has three dots, but with different spacing afterwards, . . . Look closely to see the difference.

Here is an ellipsis: . . . Here are three periods in a row: ...

In printed (and usually HTML) output, the three periods in a row are much closer together than the dots in the ellipsis.

11.8.5 @bullet (●)

Use the `@bullet{}` command to generate a large round dot, or the closest possible thing to one. An asterisk can also be used. Here is a bullet: ●

When you use `@bullet` in `@itemize`, you do not need to type the braces, because `@itemize` supplies them. (see Section 8.2 [`@itemize`], page 77).

11.8.6 @euro (€): Euro Currency Symbol

Use the `@euro{}` command to generate ‘€’. Where possible, this is the symbol for the Euro currency. Otherwise, the word ‘Euro’ is used.

The Euro symbol does not exist in the standard \TeX fonts (which were designed before the Euro was legislated into existence). Therefore, \TeX uses an additional font, named `feymr10` (along with other variables). It is freely available, of course; you can download it from <http://ctan.org/pkg/eurosym>, among other places. The distribution includes installation instructions.

11.8.7 @pounds (£): Pounds Sterling

Use the `@pounds{}` command to generate ‘£’. Where possible, this is the symbol for the pounds sterling British currency. Otherwise, it is ‘#’.

11.8.8 @textdegree (°): Degrees Symbol

Use the `@textdegree{}` command to generate ‘°’. Where possible, this is the normal symbol for degrees. Otherwise, it is an ‘o’.

11.8.9 @minus (−): Inserting a Minus Sign

Use the `@minus{}` command to generate a minus sign. Where the character encoding and font used in the output allow it, the symbol is the customary length for a minus sign—a little longer than a hyphen, shorter than an em-dash:

‘−’ is a minus sign generated with ‘`@minus{}`’,

‘-’ is a hyphen generated with the character ‘-’,

‘—’ is an em-dash for text.

If you actually want to typeset some math that does a subtraction, it is better to use `@math`, as in `@math{a-b}` (see Section 11.7 [Inserting Math], page 106).

11.8.10 @geq (≥) and @leq (≤): Inserting Relations

Use the `@geq{}` and `@leq{}` commands to generate greater-than-or-equal and less-than-equal-signs, ‘≥’ and ‘≤’. When those symbols are not available, the ASCII sequences ‘>=’ and ‘<=’ are output.

11.9 Glyphs for Programming

In Texinfo, code is often illustrated in examples that are delimited by `@example` and `@end example`. In such examples, you can indicate the results of evaluation or an expansion using ‘ \Rightarrow ’ or ‘ \mapsto ’. Likewise, there are commands to insert glyphs to indicate printed output, error messages, equivalence of expressions, the location of point in an editor, and GUI operation sequences.

The glyph-insertion commands do not need to be used within an example, but most often they are. All glyph-insertion commands are followed by empty braces.

11.9.1 Glyphs Summary

Here is a summary of the glyph commands:

\Rightarrow	<code>@result{}</code> indicates the result of an expression.
\mapsto	<code>@expansion{}</code> indicates the results of a macro expansion.
\dashv	<code>@print{}</code> indicates printed output.
error	<code>@error{}</code> indicates the following text is an error message.
\equiv	<code>@equiv{}</code> indicates the exact equivalence of two forms.
*	<code>@point{}</code> shows the location of point.
A \rightarrow B	<code>@clicksequence{A @click{ } B}</code> indicates a GUI operation sequence: first A, then clicking B, or choosing B from a menu, or otherwise selecting it.

11.9.2 `@result{}` (\Rightarrow): Result of an Expression

Use the `@result{}` command to indicate the result of evaluating an expression.

The `@result{}` command is displayed as ‘ \Rightarrow ’, either a double stemmed arrow or (when that is not available) the ASCII sequence ‘`=>`’.

Thus, the following,

```
(cdr '(1 2 3))
 $\Rightarrow$  (2 3)
```

may be read as “`(cdr '(1 2 3))` evaluates to `(2 3)`”.

11.9.3 `@expansion{}` (\mapsto): Indicating an Expansion

When an expression is a macro call, it expands into a new expression. You can indicate the result of the expansion with the `@expansion{}` command.

The `@expansion{}` command is displayed as ‘ \mapsto ’, either a long arrow with a flat base or (when that is not available) the ASCII sequence ‘`==>`’.

For example, the following

```
@example lisp
(third '(a b c))
  @expansion{ (car (cdr (cdr '(a b c)))) }
  @result{ c }
@end example
```

produces

```
(third '(a b c))
  ↳ (car (cdr (cdr '(a b c))))
  ⇒ c
```

which may be read as:

(third '(a b c)) expands to (car (cdr (cdr '(a b c)))); the result of evaluating the expression is c.

Often, as in this case, an example looks better if the `@expansion{}` and `@result{}` commands are indented.

11.9.4 `@print{}` (`-`): Indicating Generated Output

Sometimes an expression will generate output during its execution. You can indicate such displayed output with the `@print{}` command.

The `@print{}` command is displayed as ‘`-`’, either a horizontal dash butting against a vertical bar or (when that is not available) the ASCII sequence ‘`-|`’.

In the following example, the printed text is indicated with ‘`-`’, and the value of the expression follows on the last line.

```
(progn (print 'foo) (print 'bar))
  -| foo
  -| bar
  ⇒ bar
```

In a Texinfo source file, this example is written as follows:

```
@example lisp
(progn (print 'foo) (print 'bar))
  @print{ } foo
  @print{ } bar
  @result{ } bar
@end example
```

11.9.5 `@error{}` (`error`): Indicating an Error Message

A piece of code may cause an error when you evaluate it. You can designate the error message with the `@error{}` command.

The `@error{}` command is displayed as ‘`error`’, either the word ‘error’ in a box in the printed output, the word error followed by an arrow in other formats or (when no arrow is available) ‘`error-->`’.

Thus,

```
@example lisp
(+ 23 'x)
@error{ } Wrong type argument: integer-or-marker-p, x
@end example
```

produces

```
(+ 23 'x)
error Wrong type argument: integer-or-marker-p, x
```

This indicates that the following error message is printed when you evaluate the expression:

```
Wrong type argument: integer-or-marker-p, x
```

The word ‘`error`’ itself is not part of the error message.

11.9.6 `@equiv{}` (\equiv): Indicating Equivalence

Sometimes two expressions produce identical results. You can indicate the exact equivalence of two forms with the `@equiv{}` command. The `@equiv{}` command is displayed as ‘ \equiv ’, either a standard mathematical equivalence sign (three parallel horizontal lines) or (when that is not available) as the ASCII sequence ‘`==`’.

Thus,

```
@example lisp
(make-sparse-keymap) @equiv{ } (list 'keymap)
@end example
```

produces

```
(make-sparse-keymap)  $\equiv$  (list 'keymap)
```

This indicates that evaluating `(make-sparse-keymap)` produces identical results to evaluating `(list 'keymap)`.

11.9.7 `@point{}` (\star): Indicating Point in a Buffer

Sometimes you need to show an example of text in an Emacs buffer. In such examples, the convention is to include the entire contents of the buffer in question between two lines of dashes containing the buffer name.

You can use the ‘`@point{}`’ command to show the location of point in the text in the buffer. (The symbol for point, of course, is not part of the text in the buffer; it indicates the place *between* two characters where point is located.)

The `@point{}` command is displayed as ‘ \star ’, either a pointed star or (when that is not available) the ASCII sequence ‘`-!-`’.

The following example shows the contents of buffer `foo` before and after evaluating a Lisp command to insert the word `changed`.

```
----- Buffer: foo -----
This is the  $\star$ contents of foo.
----- Buffer: foo -----

(insert "changed ")
 $\Rightarrow$  nil
----- Buffer: foo -----
This is the changed  $\star$ contents of foo.
----- Buffer: foo -----
```

In a Texinfo source file, the example is written like this:

```
@example
----- Buffer: foo -----
This is the @point{ }contents of foo.
```

```

----- Buffer: foo -----

(insert "changed ")
  @result{} nil
----- Buffer: foo -----
This is the changed @point{}contents of foo.
----- Buffer: foo -----
@end example

```

11.9.8 Click Sequences

When documenting graphical interfaces, it is necessary to describe sequences such as ‘Click on ‘File’, then choose ‘Open’, then ...’. Texinfo offers commands `@clicksequence` and `click` to represent this, typically used like this:

```
... @clicksequence{File @click{} Open} ...
```

which produces:

```
... File → Open ...
```

The `@click` command produces a right arrow by default; this glyph is also available independently via the command `@arrow{}`.

You can change the glyph produced by `@click` with the command `@clickstyle`, which takes a command name as its single argument on the rest of the line, much like `@itemize` and friends (see Section 8.2 [`@itemize`], page 77). The command should produce a glyph, and the usual empty braces ‘{}’ are omitted. Here’s an example:

```
@clickstyle @result
... @clicksequence{File @click{} Open} ...
```

now produces:

```
... File ⇒ Open ...
```

11.10 Inserting Unicode: @U

The command `@U{hex}` inserts a representation of the Unicode character $U+hex$. For example, `@U{0132}` inserts the Dutch ‘IJ’ ligature (‘IJ’).

The *hex* value should be at least four hex digits; leading zeros are *not* added. In general, *hex* must specify a valid normal Unicode character; e.g., $U+10FFFF$ (the very last code point) is invalid by definition, and thus cannot be inserted this way.

`@U` is useful for inserting occasional glyphs for which Texinfo has no dedicated command, while allowing the Texinfo source to remain purely 7-bit ASCII for maximum portability.

This command has many limitations—the same limitations as inserting Unicode characters in UTF-8 or another binary form. First and most importantly, \TeX knows nothing about most of Unicode. Supporting specific additional glyphs upon request is possible, but it’s not viable for `texinfo.tex` to support whole additional scripts (Japanese, Urdu, ...). The `@U` command does nothing to change this. If the specified character is not supported in \TeX , an error is given. \LaTeX output has more possibilities regarding UTF-8, but could require extra code to load fonts and declare how UTF-8 characters are output. (See Section 14.2 [`@documentencoding`], page 132.)

In HTML and DocBook, the output from `@U` is always an entity reference of the form `&#xhex;`, as in `Ĳ` for the example above. This should work even when an HTML document uses some other encoding (say, Latin 1) and the given character is not supported in that encoding.

In Info and plain text, if the output encoding is not UTF-8, the output is the ASCII sequence `'U+hex'`, as in the six ASCII characters `'U+0132'` for the example above.

12 Forcing and Preventing Breaks

Line and page breaks can sometimes occur in the ‘wrong’ place in one or another form of output. It’s up to you to ensure that text looks right in all the output formats.

For example, in a printed manual, page breaks may occur awkwardly in the middle of an example; to prevent this, you can hold text together using a grouping command that keeps the text from being split across two pages. Conversely, you may want to force a page break where none would normally occur.

You can use the break, break prevention, or pagination commands to fix problematic line and page breaks.

12.1 Break Commands

The break commands create or allow line and paragraph breaks:

- `@*` Force a line break.
- `@sp n` Skip *n* blank lines.
- `@-` Insert a discretionary hyphen.
- `@hyphenation{hy-phen-a-ted words}`
Define hyphen points in *hy-phen-a-ted words*.

These commands hold text together on a single line:

- `@w{text}` Prevent *text* from being split and hyphenated across two lines.
- `@tie{}` Insert a normal interword space at which a line break may not occur.

The pagination commands apply only to printed output, since other output formats do not have pages.

- `@page` Start a new page.
- `@group` Hold text together that must appear on one page.
- `@need mils`
Start a new page if not enough space on this one.

12.2 @* and @/: Generate and Allow Line Breaks

The `@*` command forces a line break in all output formats. The `@/` command allows a line break (printed manual only).

Here is an example with `@*`:

```
This sentence is broken @*into two lines.
produces
This sentence is broken
into two lines.
```

The `@/` command can be useful within long URLs or other identifiers where TeX can’t find a good place to break. TeX will automatically break URLs at the natural places (see Section 5.14.2 [URL Line Breaking], page 53), so only use `@/` if you need it. `@/` has no effect on the other output formats.

12.3 @- and @hyphenation: Hyphenation in Printed Output

Although T_EX’s hyphenation algorithm is generally pretty good, it does miss useful hyphenation points from time to time. (Or, far more rarely, insert an incorrect hyphenation.) So, for documents with an unusual vocabulary or when fine-tuning for a printed edition, you may wish to specify hyphenation points explicitly. Texinfo supports two commands for this:

@-

Insert a discretionary hyphen, i.e., a place where a word can be broken across lines with a hyphen. This is especially useful when you notice that an overfull hbox is due to T_EX missing a hyphenation (see Section 18.6 [Overfull hboxes], page 162). T_EX will not insert any hyphenation points itself into a word containing @-.

@hyphenation{*hy-phen-a-ted words*}

Give hyphenation points for certain words. For example:

```
@hyphenation{man-u-script man-u-scripts}
```

As shown, you put a ‘-’ at each hyphenation point. T_EX only uses the specified hyphenation points when the words match exactly, so give all necessary variants, such as plurals.

Non-printed output is not hyphenated, so none of these commands have any effect in other output formats.

12.4 @allowcodebreaks: Control Line Breaks in @code

Ordinarily, T_EX considers breaking lines at ‘-’ and ‘_’ characters within @code and related commands (see Section 6.1.2 [code], page 56), more or less as if they were “empty” hyphenation points.

This is necessary since many manuals, especially for Lisp-family languages, must document very long identifiers. On the other hand, some manuals don’t have this problem, and you may not wish to allow a line break at the underscore in, for example, SIZE_MAX, or even worse, after any of the four underscores in __typeof__.

So Texinfo provides this command:

```
@allowcodebreaks false
```

to prevent from breaking at ‘-’ or ‘_’ within @code. You can go back to allowing such breaks with @allowcodebreaks true. Write these commands on lines by themselves.

These commands can be given anywhere in the document. For example, you may have just one problematic paragraph where you need to turn off the breaks, but want them in general, or vice versa.

This command has no effect except in T_EX output.

12.5 @w{*text*}: Prevent Line Breaks

@w{*text*} outputs *text*, while prohibiting line breaks within *text*.

Thus, you can use @w to produce a non-breakable space, fixed at the width of a normal interword space:

```
@w{ } @w{ } @w{ } indentation.
```


produces:

```
indentation.
```

The space from `@w{ }`, as well as being non-breakable, also will not stretch or shrink. Sometimes that is what you want, for instance if you're doing manual indenting. However, usually you want a normal interword space that does stretch and shrink (in the printed output); for that, see the `@tie` command in the next section.

In printed output, you can also use the `@w` command to prevent a long name or phrase being automatically hyphenated, for example if it happens to fall near the end of a line.

You can also use `@w` to avoid unwanted keyword expansion in source control systems. For example, to literally write `Id` in your document, use `@w{$}Id$`. This trick isn't effective for output files in some output formats, though.

12.6 @tie{}: Inserting an Unbreakable Space

The `@tie{}` command produces a normal interword space at which a line break may not occur. Always write it with following (empty) braces, as usual for commands used within a paragraph. Here's an example:

```
@TeX{} was written by Donald E.@tie{}Knuth.
```

produces:

```
TEX was written by Donald E. Knuth.
```

There are two important differences between `@tie{}` and `@w{ }`:

- The space produced by `@tie{}` will stretch and shrink slightly along with the normal interword spaces in the paragraph; the space produced by `@w{ }` will not vary.
- `@tie{}` allows hyphenation of the surrounding words, while `@w{ }` inhibits hyphenation of those words (for T_EXnical reasons, namely that it produces an `'\hbox'`).

12.7 @sp n: Insert Blank Lines

A line beginning with and containing only `@sp n` generates n blank lines of space. `@sp` also forces a paragraph break. For example,

```
@sp 2
```

generates two blank lines.

The `@sp` command is most often used in the title page.

12.8 @page: Start a New Page

A line containing only `@page` starts a new page in a printed manual. In other formats, without the concept of pages, it starts a new paragraph. A `@page` command is often used in the `@titlepage` section of a Texinfo file to start the copyright page.

12.9 @group: Prevent Page Breaks

The `@group` command is used to hold an example together on one page. Use it inside an `@example` or similar construct to begin an unsplittable vertical group, which will appear entirely on one page in the printed output. Terminate the group by a line containing only `@end group`. This command has an effect in T_EX output only.

The `@group` and `@end group` commands need to be inside the `@example` and `@end example` commands, thus:

```
@example
@group
...
@end group
@end example
```

Although `@group` would make sense conceptually in a wide variety of contexts, its current implementation works only within `@example` and variants, and within `@display`, `@format`, `@flushleft` and `@flushright`. See Chapter 7 [Quotations and Examples], page 66. (What all these commands have in common is that each line of input produces a line of output.)

12.10 `@need mils`: Prevent Page Breaks

A line containing only `@need n` starts a new page in a printed manual if fewer than *n* mils (thousandths of an inch) remain on the current page. Do not use braces around the argument *n*. The `@need` command has no effect on other output formats since they are not paginated.

This paragraph is preceded by a `@need` command that starts a new page in printed output if fewer than 800 mils (eight-tenths inch) remain on the page. It looks like this:

```
@need 800
This paragraph is preceded by ...
```

The `@need` command is useful for preventing orphans: single lines at the bottoms of printed pages.

13 Definition Commands

The `@defn` command and the other *definition commands* enable you to describe functions, variables, macros, commands, user options, special forms and other entities in a uniform format.

In the output, the name of the entity is shown with any arguments, along with the entity category —‘Function’, ‘Variable’, or whatever. Underneath, the body of the definition is indented. The name of the entity is also entered into the appropriate index.

All the definition commands follow a similar format. This chapter starts by describing `@defn` before detailing all the other definition commands.

13.1 The Template for a Definition

```
@defn category name arguments...
  body-of-definition
@end defn
```

The `@defn` command is used for definitions of entities that resemble functions—entities that may take arguments. Write the `@defn` command at the beginning of a line and follow it on the same line by the category of the entity, the name of the entity itself, and its arguments (if any). Then write the body of the definition on succeeding lines. Finally, end the definition with an `@end defn` command written on a line of its own.

For example,

```
@defn Command forward-word count
  This command moves point forward @var{count} words
  (or backward if @var{count} is negative). ...
@end defn
```

produces

```
forward-word count [Command]
  This command moves point forward count words (or backward if count is
  negative). ...
```

Capitalize the category name like a title. If the name of the category contains spaces, as in the phrase ‘Interactive Command’, enclose it in braces. For example:

```
@defn {Interactive Command} isearch-forward
...
@end defn
```

Otherwise, the second word will be mistaken for the name of the entity. As a general rule, when any of the arguments in the heading line *except* the last one are more than one word, you need to enclose them in braces. This may also be necessary if the text contains commands, for example, ‘{declaraci@'on}’ if you are writing in Spanish.

The category is output in a different location for different output formats. For example, in the Info file, the category appears at the beginning of the first line of the definition. With T_EX output, the category is printed next to the right margin.

`@defn` enters names into the index of functions.

Three predefined, specialized variations of `@defn` (`@defun`, `@defmac`, and `@defspec`) specify the category for you: “Function”, “Macro”, and “Special Form” respectively. (In Lisp, a special form is an entity much like a function.) Similarly, the general `@defvr` command is accompanied by several specialized variations for describing particular kinds of variables.

13.2 Definition Command Continuation Lines

The heading line of a definition command can get very long. Therefore, Texinfo has a special syntax allowing them to be continued over multiple lines of the source file: a lone ‘@’ at the end of each line to be continued. Here’s an example:

```
@defun fn-name @
  arg1 arg2 arg3
  This is the basic continued defun.
@end defun
```

produces:

```
fn-name arg1 arg2 arg3 [Function]
  This is the basic continued defun.
```

As you can see, the continued lines are combined, as if they had been typed on one source line.

Although this example only shows a one-line continuation, continuations may extend over any number of lines, in the same way; put an @ at the end of each line to be continued.

In general, any number of spaces or tabs before the @ continuation character are collapsed into a single space. There is one exception: the Texinfo processors will not fully collapse whitespace around a continuation inside braces. For example:

```
@defn {Category @
  Name} ...
```

The output (not shown) has excess space between ‘Category’ and ‘Name’. To avoid this, elide the unwanted whitespace in your input, or put the continuation @ outside braces.

@ does not function as a continuation character in *any* other context. Ordinarily, ‘@’ followed by a whitespace character (space, tab, newline) produces a normal interword space (see Section 11.3.1 [Multiple Spaces], page 101).

13.3 Optional and Repeated Arguments

Some entities take optional or repeated arguments. One convention for indicating these uses square brackets and ellipses: an argument enclosed within square brackets is optional, and an argument followed by an ellipsis is optional and may be repeated more than once.

Thus, [*optional-arg*] means that *optional-arg* is optional and *repeated-args...* stands for zero or more arguments. Parentheses are used when several arguments are grouped into additional levels of list structure in Lisp.

Here is the definition line of an example of an imaginary (complicated) special form:

```
foobar (var [from to [inc]]) body. . . [Special Form]
```

In this example, the arguments *from* and *to* are optional, but must both be present or both absent. If they are present, *inc* may optionally be specified as well. These arguments are

grouped with the argument *var* into a list, to distinguish them from *body*, which includes all remaining elements of the form.

In a Texinfo source file, this `@defspec` line is written like this:

```
@defspec foobar (var [from to [inc]]) body@dots{}
```

13.4 Omitting the Space After a Definition Name

As a matter of style or as demanded by the syntax of a programming language, you may wish to omit any space after a name in a definition, occurring before an opening bracket. To do this, set the ‘`txidefnamenspace`’ flag (see Section 15.5.1 [`@set @value`], page 138). For example, this input

```
@set txidefnamenspace
@defn Builtin index (string, substring)
@dots{}
@end defn
```

produces the following:

```
index(string, substring) [Builtin]
...
```

13.5 @defnfx, et al.: Two or More ‘First’ Lines

To create two or more ‘first’ or header lines for a definition, follow the first `@defn` line by a line beginning with `@defnfx`.

For example,

```
@defn {Interactive Command} isearch-forward
@defnfx {Interactive Command} isearch-backward
These two search commands are similar except ...
@end defn
```

produces

```
isearch-forward [Interactive Command]
isearch-backward [Interactive Command]
These two search commands are similar except ...
```

Each definition command has an ‘x’ form: `@defunx`, `@defvrnx`, `@deftypefunx`, etc.

The ‘x’ forms work similarly to `@itemx` (see Section 8.4.3 [`@itemx`], page 81).

13.6 The Definition Commands

This section describes all the definition commands of Texinfo.

13.6.1 Functions and Similar Entities

This section describes the commands for describing functions and similar entities with simple arguments:

```
@defn category name arguments...
```

The `@defn` command is the general definition command for functions, interactive commands, and similar entities that may take simple arguments. You must

choose a term to describe the category of entity being defined; for example, “Function” could be used if the entity is a function. The `@deffn` command is written at the beginning of a line and is followed on the same line by the category of entity being described, the name of this particular entity, and its arguments, if any. Terminate the definition with `@end deffn` on a line of its own.

For example, here is a definition:

```
@deffn Command forward-char nchars
Move point forward @var{nchars} characters.
@end deffn
```

This shows a rather terse definition for a “command” named `forward-char` with one argument, `nchars`.

Where the output format allows, `@deffn` uses a typewriter font for *name*, and a slanted font for the rest of the *arguments*, as would be produced by `@var`.

Within the text of the description, write an argument name explicitly with `@var` to refer to the value of the argument. In the example above, we used ‘`@var{nchars}`’ in this way.

In the extremely unusual case when an argument name contains ‘--’, or another character sequence which is treated specially (see Section 2.1 [Conventions], page 9), use `@code` around the special characters. This avoids the conversion to typographic en-dashes and em-dashes.

`@defun name arguments...`

The `@defun` command is the definition command for functions with simple arguments. `@defun` is equivalent to ‘`@deffn Function ...`’. Terminate the definition with `@end defun` on a line of its own.

`@defmac name arguments...`

The `@defmac` command is the definition command for macros. `@defmac` is equivalent to ‘`@deffn Macro ...`’ and works like `@defun`.

`@defspec name arguments...`

The `@defspec` command is the definition command for special forms. (In Lisp, a special form is an entity much like a function; see Section “Special Forms” in *GNU Emacs Lisp Reference Manual*.) `@defspec` is equivalent to ‘`@deffn {Special Form} ...`’ and works like `@defun`.

All these commands create entries in the index of functions.

13.6.2 Functions in Typed Languages

The `@deftypefn` command and its variants are generic commands for describing functions. They are particularly suitable for languages in which you must declare types of variables and functions, such as C and C++.

`@deftypefn category data-type name arguments...`

The `@deftypefn` command is the general definition command for functions and similar entities that may take arguments and that could be typed. The `@deftypefn` command is written at the beginning of a line and is followed on the same line by the category of entity being described, information on the returned value, the name of this particular entity, and its arguments, if any.

For example,

```
@deftypefn {Library Function} int foobar @
  (int @var{foo}, float @var{bar})
...
@end deftypefn
```

produces:

```
int foobar (int foo, float bar)           [Library Function]
...
```

This means that `foobar` is a “library function” that returns an `int`, and its arguments are `foo` (an `int`) and `bar` (a `float`). ‘Library Function’ has to be enclosed in braces to make it a single argument.

When using `@deftypefn` command and variations, you should mark parameter names with `@var` to distinguish these from data type names, keywords, and other parts of the literal syntax of the programming language. Where the output format allows, all output on the definition line is in a typewriter font by default. `@var` uses an appropriate font where it occurs.

If you are describing a procedure in a language that has packages, such as Ada, you might consider using `@deftypefn` in the following manner:

```
@deftypefn stacks private push @
  (@var{s}:in out stack; @
   @var{n}:in integer)
...
@end deftypefn
```

(In these examples the `@deftypefn` arguments are shown using continuations (see Section 13.2 [Def Cmd Continuation Lines], page 119), but could be on a single line.)

In this instance, the procedure is classified as belonging to the package `stacks` rather than classified as a ‘procedure’ and its data type is described as `private`. (The name of the procedure is `push`, and its arguments are `s` and `n`.) Output:

```
private push (s:in out stack; n:in integer)   [stacks]
...
```

`@deftypefn` and variants could be used when it is convenient to interpret the arguments list as literal computer code, marking argument names with `@var`. It is not necessary for any type names to appear, and you can give an empty return type as ‘{}’.

The information on return values may be used to name the return variables. For example, in Perl, returned scalars may be given the `$result` and `$status` name in the following manner:

```
@deftypefn {Sub} {(@var{$result}, @var{$status} =)} @
  process (@var{$input})
... Set @var{$status} to 0 in case of failure ...
@end deftypefn
```

to get output like

```
($result, $status) = process ($input) [Sub]
... Set $status to 0 in case of failure ...
```

`@deftypefn` creates an entry in the index of functions for *name*.

`@deftypefun` *data-type name arguments...*

The `@deftypefun` command is the specialized definition command for functions. The command is equivalent to ‘`@deftypefn Function ...`’.

`@deftypefun` creates an entry in the index of functions for *name*.

Ordinarily, the return type is printed on the same line as the function name and arguments, as shown above. In source code, GNU style for typed functions is to put the return type on a line by itself. So Texinfo provides an option to do that: `@deftypefnnewline on`.

This affects the generic functions only—not untyped functions with simple arguments such as `@defn`, not typed variables, etc. Specifically, it affects the commands in this section, and the analogous commands for object-oriented languages, namely `@deftypeop` and `@deftypemethod` (see Section 13.6.6.2 [Object-Oriented Methods], page 126).

Specifying `@deftypefnnewline off` reverts to the default.

13.6.3 Variables and Similar Entities

Here are the commands for defining variables and similar entities:

`@defvr` *category name*

The `@defvr` command is a general definition command for something like a variable—an entity that records a value. You must choose a term to describe the category of entity being defined; for example, “Variable” could be used if the entity is a variable. Write the `@defvr` command at the beginning of a line and follow it on the same line by the category of the entity and the name of the entity.

We recommend capitalizing the category name like a title. If the name of the category contains spaces, as in the name “User Option”, enclose it in braces. Otherwise, the second word will be mistaken for the name of the entity. For example,

```
@defvr {User Option} fill-column
This buffer-local variable specifies
the maximum width of filled lines.
...
@end defvr
```

Terminate the definition with `@end defvr` on a line of its own.

`@defvr` creates an entry in the index of variables for *name*.

`@defvar` *name*

The `@defvar` command is the definition command for variables. `@defvar` is equivalent to ‘`@defvr Variable ...`’.

For example:

```
@defvar kill-ring
...
@end defvar
```

`@defvar` creates an entry in the index of variables for *name*.

`@defopt` *name*

The `@defopt` command is the definition command for *user options*, i.e., variables intended for users to change according to taste; Emacs has many such (see Section “Variables” in *The GNU Emacs Manual*). `@defopt` is equivalent to ‘`@defvr {User Option} ...`’.

13.6.4 Variables in Typed Languages

Variables in typed languages are handled in a manner similar to functions in typed languages. See Section 13.6.2 [Typed Functions], page 121. The general definition command `@deftypevr` corresponds to `@deftypefn` and the specialized definition command `@deftypevar` corresponds to `@deftypefun`.

`@deftypevr` *category data-type name*

The `@deftypevr` command is the general definition command for something like a variable in a typed language—an entity that records a value. You must choose a term to describe the category of the entity being defined; for example, “Variable” could be used if the entity is a variable.

The `@deftypevr` command is written at the beginning of a line and is followed on the same line by the category of the entity being described, the data type, and the name of this particular entity.

For example:

```
@deftypevr {Global Flag} int enable
...
@end deftypevr
```

produces the following:

```
int enable [Global Flag]
...
```

`@deftypevar` *data-type name*

The `@deftypevar` command is the specialized definition command for variables in typed languages. `@deftypevar` is equivalent to ‘`@deftypevr Variable ...`’.

These commands create entries in the index of variables.

13.6.5 Data Types

Here is the command for data types:

`@deftp` *category name attributes...*

The `@deftp` command is the generic definition command for data types. The command is written at the beginning of a line and is followed on the same line by the category, by the name of the type (which is a word like `int` or `float`),

and then by names of attributes of objects of that type. Thus, you could use this command for describing `int` or `float`, in which case you could use `data type` as the category. (A data type is a category of certain objects for purposes of deciding which operations can be performed on them.)

In Lisp, for example, `pair` names a particular data type, and an object of that type has two slots called the `CAR` and the `CDR`. Here is how you would write the first line of a definition of `pair`.

```
@defntp {Data type} pair car cdr
...
@end defntp
```

`@defntp` creates an entry in the index of data types.

13.6.6 Object-Oriented Programming

Here are the commands for formatting descriptions about abstract objects, such as are used in object-oriented programming. A class is a defined type of abstract object. An instance of a class is a particular object that has the type of the class. An instance variable is a variable that belongs to the class but for which each instance has its own value.

13.6.6.1 Object-Oriented Variables

These commands allow you to define different sorts of variables in object-oriented programming languages.

`@defcv` *category class name*

The `@defcv` command is the general definition command for variables associated with classes in object-oriented programming. The `@defcv` command is followed by three arguments: the category of thing being defined, the class to which it belongs, and its name. For instance:

```
@defcv {Class Option} Window border-pattern
...
@end defcv
```

produces:

```
border-pattern [Class Option of Window]
...
```

`@defcv` creates an entry in the index of variables.

`@deftypecv` *category class data-type name*

The `@deftypecv` command is the definition command for typed class variables in object-oriented programming. It is analogous to `@defcv` with the addition of the *data-type* parameter to specify the type of the instance variable.

```
@deftypecv {Class Option} Window int border-pattern
...
@end deftypecv
```

produces:

```
int border-pattern [Class Option of Window]
...
```

`@deftypecv` creates an entry in the index of variables.

`@defivar` *class name*

The `@defivar` command is the definition command for instance variables in object-oriented programming. `@defivar` is equivalent to ‘`@defcv {Instance Variable} ...`’. For instance:

```
@defivar Window border-pattern
...
@end defivar
```

produces:

```
border-pattern                                [Instance Variable of Window]
...
```

`@defivar` creates an entry in the index of variables.

`@deftypeivar` *class data-type name*

The `@deftypeivar` command is the definition command for typed instance variables in object-oriented programming. It is analogous to `@defivar` with the addition of the *data-type* parameter to specify the type of the instance variable.

```
@deftypeivar Window int border-pattern
...
@end deftypeivar
```

produces:

```
int border-pattern                            [Instance Variable of Window]
...
```

`@deftypeivar` creates an entry in the index of variables.

13.6.6.2 Object-Oriented Methods

These commands allow you to define different sorts of function-like entities resembling methods in object-oriented programming languages. These entities take arguments, as functions do, but are associated with particular classes of objects.

`@defop` *category class name arguments...*

The `@defop` command is the definition command for these method-like entities with simple arguments.

For example, some systems have constructs called *wrappers* that are associated with classes as methods are, but that act more like macros than like functions. You could use `@defop Wrapper` to describe one of these.

Sometimes it is useful to distinguish methods and *operations*. You can think of an operation as the specification for a method. Thus, a window system might specify that all window classes have a method named `expose`; we would say that this window system defines an `expose` operation on windows in general. Typically, the operation has a name and also specifies the pattern of arguments; all methods that implement the operation must accept the same arguments, since applications that use the operation do so without knowing which method will implement it.

Often it makes more sense to document operations than methods. For example, window application developers need to know about the `expose` operation, but need not be concerned with whether a given class of windows has its own method to implement this operation. To describe this operation, you would write:

```
@defop Operation windows expose
```

The `@defop` command is written at the beginning of a line and is followed on the same line by the overall name of the category of operation, the name of the class of the operation, the name of the operation, and its arguments, if any.

`@defop` creates an entry, such as ‘`expose on windows`’, in the index of functions.

```
@deftypeop category class data-type name arguments...
```

The `@deftypeop` command is the generic definition command for operations in object-oriented programming. It is particularly suitable for typed object-oriented languages. It is similar to `@defop` with the addition of the *data-type* parameter to specify information on the return value of the method, for example the return type.

```
@defmethod class name arguments...
```

The `@defmethod` command is the definition command for methods in object-oriented programming. A method is a kind of function that implements an operation for a particular class of objects and its subclasses.

`@defmethod` is equivalent to ‘`@defop Method ...`’. The command is written at the beginning of a line and is followed by the name of the class of the method, the name of the method, and its arguments, if any.

For example:

```
@defmethod bar-class bar-method argument
...
@end defmethod
```

illustrates the definition for a method called `bar-method` of the class `bar-class`. The method takes an argument.

`@defmethod` creates an entry in the index of functions.

```
@deftypemethod class data-type name arguments...
```

The `@deftypemethod` command is the definition command for methods in object-oriented languages, in particular for typed languages such as C++ and Java. It is similar to the `@defmethod` command with the addition of the *data-type* parameter to specify information on the return value of the method, for example the return type.

The commands with information on return values are affected by the `@deftypefnnewline` option (see Section 13.6.2 [Functions in Typed Languages], page 121).

13.7 Generic Definition Commands

Texinfo provides commands for definitions that do not produce automatic index entries.

You create a generic definition environment with ‘`@defblock`’ paired with ‘`@end defblock`’. Within this environment, use a `@defline` or `@deftypeline` line for each symbol you document. For example:

```

@defblock
@define Macro mac (arg1, arg2)
Description of mac.
@deftypeline Builtin int foo (int @var{bar})
Description of foo.
@end defblock

```

This produces the output:

```

mac (arg1, arg2) [Macro]
Description of mac.

int foo (int bar) [Builtin]
Description of foo.

```

The syntax of `@define` is similar to that of `@defn`. The first argument gives a category for the definition. Follow this with the symbol name, followed by any parameters. You should surround any arguments containing spaces with braces.

You use `@deftypeline` in a similar way to `@deftypeln`, following the category with a data type, and marking any parameters with `@var`. (See Section 13.6.2 [Typed Functions], page 121).)

To share the same description for multiple symbols, you can put several `@define` lines together. For example:

```

@defblock
@define Function set-var (value)
@define {Settable Variable} var
Description of set-var and var.
@end defblock

```

This produces the output:

```

set-var (value) [Function]
var [Settable Variable]
Description of set-var and var.

```

It may be useful to define line macros (see Section 16.5 [Line Macros], page 151) in combination with these commands.

13.8 Conventions for Writing Definitions

A manual need not and should not contain more than one definition for a given name. An appendix containing a summary should use `@table` rather than the definition commands.

When you write a definition using `@defn`, `@defun`, or one of the other definition commands, please take care to use arguments that indicate the meaning, as with the `count` argument to the `forward-word` function. Also, if the name of an argument contains the name of a type, such as *integer*, take care that the argument actually is of that type.

Fonts. As Texinfo is a semantic language, you should nearly never need to specify font styles with explicit font commands in definitions (see Section 6.2.3 [Fonts], page 64). However,

you may need to work around problems for particular output formats and/or constructs. Here are some possibilities:

- Explicitly marking a Lisp keyword like `&keyword` with `@r{&keyword}`, producing `&keyword`.
Note such keywords in definition arguments are (at present) rendered in roman in T_EX, but this formatting is not done in any other output format.
- `@r{@slanted{argument}}`, producing *argument*, similar to `@var` but avoiding upper-casing its argument in Info output.
In this and the previous point, `@r` resets the font from that being used in the definition line context (slanted or typewriter) to a roman, upright style.
- You could use `@t` (or even `@r{@t{...}`, using `@r` to reset font styles) to mark literal syntax on a definition line where text would otherwise be output in the slanted roman style. `@code` would be inappropriate here as it adds quotation marks in Info output.

Some degree of trial and error may be needed to get the result you want. As ever, how nested font commands combine depends on the output format, so should be avoided where possible.

Hopefully, such usages are kept to a minimum. One possibility is to wrap these in `@macro` (see Chapter 16 [Defining New Texinfo Commands], page 144), allowing these usages to be easily changed in the future.

13.9 A Sample Function Definition

Here is a definition from Section “Calling Functions” in *The GNU Emacs Lisp Reference Manual*, using the `@defun` command. The name of the function, `apply`, follows immediately after the `@defun` command and it is followed, on the same line, by the parameter list.

`apply function &rest arguments` [Function]

`apply` calls *function* with *arguments*, just like `funcall` but with one difference: the last of *arguments* is a list of arguments to give to *function*, rather than a single argument. We also say that this list is *appended* to the other arguments.

`apply` returns the result of calling *function*. As with `funcall`, *function* must either be a Lisp function or a primitive function; special forms and macros do not make sense in `apply`.

```
(setq f 'list)
⇒ list
(apply f 'x 'y 'z)
[error] Wrong type argument: listp, z
(apply '+ 1 2 '(3 4))
⇒ 10
(apply '+ '(1 2 3 4))
⇒ 10

(apply 'append '((a b c) nil (x y z) nil))
⇒ (a b c x y z)
```

An interesting example of using `apply` is found in the description of `mapcar`.

In the Texinfo source file, this example should look like this:

```
@defun apply function @r{&rest} arguments
@code{apply} calls @var{function} with
@var{arguments}, just like @code{funcall} but with one
difference: the last of @var{arguments} is a list of
arguments to give to @var{function}, rather than a single
argument. We also say that this list is @dfn{appended}
to the other arguments.
```

```
@code{apply} returns the result of calling
@var{function}. As with @code{funcall},
@var{function} must either be a Lisp function or a
primitive function; special forms and macros do not make
sense in @code{apply}.
```

```
@example
(setq f 'list)
  @result{} list
(apply f 'x 'y 'z)
@error{} Wrong type argument: listp, z
(apply '+ 1 2 '(3 4))
  @result{} 10
(apply '+ '(1 2 3 4))
  @result{} 10

(apply 'append '((a b c) nil (x y z) nil))
  @result{} (a b c x y z)
@end example
```

```
An interesting example of using @code{apply} is found
in the description of @code{mapcar}.
```

```
@end defun
```

In this manual, this function is listed in the Command and Variable Index under `apply`.

14 Internationalization

Texinfo has some support for writing in languages other than English, although this area still needs considerable work. (If you are the one helping to translate the fixed strings written to documents, see Section 19.5 [Internationalization of Document Strings], page 190.)

For a list of the various accented and special characters Texinfo supports, see Section 11.4 [Inserting Accents], page 103.

14.1 @documentlanguage *ll*[_cc]: Set the Document Language

The `@documentlanguage` command declares the current document locale. Write it on a line by itself, near the beginning of the file.

```
@documentlanguage ll[_cc]
```

Include a two-letter ISO 639-2 language code (*ll*) following the command name, optionally followed by an underscore and two-letter ISO 3166 two-letter country code (*cc*). If you have a multilingual document, the intent is to be able to use this command multiple times, to declare each language change. If the command is not used at all, the default is `en_US` for US English.

As with GNU Gettext (see *Gettext*), if the country code is omitted, the main dialect is assumed where possible. For example, `de` is equivalent to `de_DE` (German as spoken in Germany).

For Info and other online output, this command changes the translation of various *document strings* such as “see” in cross-references (see Chapter 5 [Cross References], page 44), “Function” in defuns (see Chapter 13 [Definition Commands], page 118), and so on. Some strings, such as “Node:”, “Next:”, “Menu:”, etc., are keywords in Info output, so are not translated there; they are translated in other output formats. In DocBook output `@documentlanguage` sets the language for following sections.

For L^AT_EX, this command causes code to load the ‘`babel`’ package to be output in the preamble, and `\selectlanguage` to be output.

For T_EX, this command causes a file `txi-locale.tex` to be read (if it exists). If `@documentlanguage` argument contains the optional ‘`_cc`’ suffix, this is tried first. For example, with `@documentlanguage de_DE`, T_EX first looks for `txi-de_DE.tex`, then `txi-de.tex`.

Such a `txi-*` file is intended to redefine the various English words used in T_EX output, such as ‘Chapter’, ‘See’, and so on. We are aware that individual words like these cannot always be translated in isolation, and that a very different strategy would be required for ideographic (among other) scripts. Help in improving Texinfo’s language support is welcome.

`@documentlanguage` also changes T_EX’s current hyphenation patterns, if the T_EX program being run has the necessary support included. This will generally not be the case for `tex` itself, but will usually be the case for up-to-date distributions of the extended T_EX programs `etex` (DVI output) and `pdftex` (PDF output). `texi2dvi` will use the extended T_EXs if they are available (see [Format with `texi2dvi`], page 157).

Since the lists of language codes and country codes are updated relatively frequently, we don’t attempt to list them here. The valid language codes are on the official home page for ISO 639, <http://www.loc.gov/standards/iso639-2/>. The country codes and the official web site for ISO 3166 can be found via https://en.wikipedia.org/wiki/ISO_3166.

14.2 @documentencoding *enc*: Set Input Encoding

In the default case, the input and output document encoding are assumed to be UTF-8, the vast global character encoding, expressed in 8-bit bytes. UTF-8 is compatible with 7-bit ASCII. It is recommended to use UTF-8 encoding for Texinfo manuals.

The `@documentencoding` command declares the input document encoding, and also affects the encoding of the output. Write it on a line by itself, with a valid encoding specification following, near the beginning of the file if your document encoding is not the default encoding.

```
@documentencoding enc
```

UTF-8 should always be the best choice for the encoding. Texinfo still supports additional encodings, mainly for compatibility with older manuals¹:

US-ASCII Character encoding based on the English alphabet.

ISO-8859-1

ISO-8859-15

ISO-8859-2

These specify the pre-UTF-8 standard encodings for Western European (the first two) and Eastern European languages (the third), respectively. ISO 8859-15 replaces some little-used characters from 8859-1 (e.g., precomposed fractions) with more commonly needed ones, such as the Euro symbol (€).

A full description of the encodings is beyond our scope here; one useful reference is <http://czyborra.com/charsets/iso8859.html>.

koi8-r This was a commonly used encoding for the Russian language before UTF-8.

koi8-u This was a commonly used encoding for the Ukrainian language before UTF-8.

In Info output, a so-called ‘Local Variables’ section (see Section “File Variables” in *The GNU Emacs Manual*) is output including the output encoding. This allows Info readers to set the encoding appropriately. It looks like this:

```
Local Variables:
coding: UTF-8
End:
```

By default, for Info and plain text output, `texi2any` outputs accent constructs and special characters (such as `@'e`) as the actual UTF-8 sequence or 8-bit character in the output encoding where possible. If this is not possible, or if the option `--disable-encoding` is given, an ASCII transliteration is used instead.

In HTML output, a `<meta>` tag is output, in the `<head>` section of the HTML, that specifies the output encoding. Web servers and browsers cooperate to use this information so the correct encoding is used to display the page, if supported by the system. That looks like this:

```
<meta http-equiv="Content-Type" content="text/html;
      charset=utf-8">
```

¹ `texi2any` supports more encodings for Texinfo manuals, potentially all the encodings supported by both Perl and `iconv` (see Section “Generic Charset Conversion” in *The GNU C Library*). The support in output formats may be lacking, however, especially for L^AT_EX output.

In HTML and L^AT_EX output, if `OUTPUT_CHARACTERS` is set (see Section 19.4.8 [Other Customization Variables], page 183), accent constructs and special characters, such as `@'e` or ````, are output as the actual UTF-8 sequence or 8-bit character in the output encoding where possible. Otherwise, HTML entities are used for those characters in HTML, and L^AT_EX macros are used in L^AT_EX.

In DocBook output, if the encoding is different from UTF-8, an `encoding` attribute is added to the XML declaration. If `OUTPUT_CHARACTERS` is set (see Section 19.4.8 [Other Customization Variables], page 183), accent constructs such as `@'e` are output as the actual 8-bit or UTF-8 character in the output encoding where possible. Otherwise XML entities are used for those constructs.

In T_EX output, the characters which are supported in the standard Computer Modern fonts are output accordingly. For example, this means using constructed accents rather than precomposed glyphs. Using a missing character generates a warning message, as does specifying an unimplemented encoding.

Although modern T_EX systems support nearly every script in use in the world, this wide-ranging support is not available in `texinfo.tex`, and it's not feasible to duplicate or incorporate all that effort.

In L^AT_EX output, code loading the `'inputenc'` package is output based on the encoding. This, by itself, does not ensure that all the characters from the input document can be subsequently output. The fonts used in the default case should cover the specific Texinfo glyphs, but not all the possible encoded characters. You may need to load different fonts in the preamble and use `\DeclareUnicodeCharacter` with a UTF-8 encoding. For example:

```
@latex
\DeclareUnicodeCharacter{017B}{\ .Z}
@end latex
```

Cross-references between Info files in different character encodings with non-ASCII characters in node names fail. We strongly recommend using UTF-8 only as the encoding for manuals with non-ASCII characters in the destinations of cross-references.

15 Conditionally Visible Text

The *conditional commands* allow you to use different text for different output formats, or for general conditions that you define. For example, you can use them to specify different text for the printed manual and the Info output.

The conditional commands comprise the following categories.

- Commands specific to an output format (Info, T_EX, HTML, ...).
- Commands specific to any output format *excluding* a given one (e.g., not Info, not T_EX, ...).
- ‘Raw’ formatter text for any output format, passed straight through with minimal (but not zero) interpretation of @-commands.
- Format-independent variable substitutions, and testing if a variable is set or clear.

15.1 Conditional Commands

Texinfo has an @i`format` environment for each output format, to allow conditional inclusion of text for a particular output format.

@i`info` begins segments of text that should be ignored when not producing Info output, in particular in printed output. The segment of text appears only in the Info file and, for historical compatibility, the plain text output.

The environments for the other formats are analogous:

```
@ifdocbook ... @end ifdocbook
    Text to appear only in the DocBook output.

@ifhtml ... @end ifhtml
    Text to appear only in the HTML output.

@iflatex ... @end iflatex
    Text to appear only in the LATEX output.

@ifplaintext ... @end ifplaintext
    Text to appear only in the plain text output.

@iftex ... @end iftex
    Text to appear only in the printed manual.

@ifxml ... @end ifxml
    Text to appear only in the XML output.
```

The @i`if...` and @i`end if...` commands must appear on lines by themselves in your source file. The newlines following the commands are (more or less) treated as whitespace, so that the conditional text is flowed normally into a surrounding paragraph.

The @i`if...` constructs are intended to conditionalize normal Texinfo source; see Section 15.3 [Raw Formatter Commands], page 136, for using underlying format commands directly.

Here is an example showing all these conditionals:

```
@iftex
    This text will appear only in the printed manual.
```

```

@end iftex
@ifinfo
However, this text will appear only in Info and plain text.
@end ifinfo
@ifhtml
And this text will only appear in HTML.
@end ifhtml
@iflatex
Moreover, this text will only appear in @LaTeX{}.
@end iflatex
@ifplaintext
Whereas this text will only appear in plain text.
@end ifplaintext
@ifxml
Notwithstanding that this will only appear in XML.
@end ifxml
@ifdocbook
Nevertheless, this will only appear in DocBook.
@end ifdocbook

```

The preceding example produces the following line:

This text will appear only in the printed manual.

Notice that you only see one of the input lines, depending on which version of the manual you are reading.

In complex documents, you may want Texinfo to issue an error message in some conditionals that should not ever be processed. The `@errormsg{text}` command will do this; it takes one argument, the text of the error message.

We mention `@errormsg{}` here even though it is not strictly related to conditionals, since in practice it is most likely to be useful in that context. Technically, it can be used anywhere. See Section 16.7 [External Macro Processors], page 153, for a caveat regarding the line numbers which `@errormsg` emits in \TeX .

15.2 Conditional Not Commands

You can specify text to be included in any output format *other* than a given one with the `@ifnot...` environments:

```

@ifnotdocbook ... @end ifnotdocbook
@ifnohtml ... @end ifnohtml
@ifnotininfo ... @end ifnotininfo
@ifnotlatex ... @end ifnotlatex
@ifnotplaintext ... @end ifnotplaintext
@ifnottex ... @end ifnottex
@ifnotxml ... @end ifnotxml

```

The `@ifnot...` command and the `@end` command must appear on lines by themselves in your actual source file.

If the output file is being made in the given format, the region is *ignored*. Otherwise, it is included.

There is one exception (for historical compatibility): `@ifnotinfo` text is omitted for both Info and plain text output, not just Info. To specify text which appears only in Info and not in plain text, use `@ifnotplaintext`, like this:

```
@ifinfo
@ifnotplaintext
This will be in Info, but not plain text.
@end ifnotplaintext
@end ifinfo
```

The regions delimited by these commands are ordinary Texinfo source as with `@iftex`, not raw formatter source as with `@tex` (see Section 15.3 [Raw Formatter Commands], page 136).

15.3 Raw Formatter Commands

The `@if...` conditionals just described must be used only with normal Texinfo source. For instance, most features of plain T_EX will not work within `@iftex`. The purpose of `@if...` is to provide conditional processing for Texinfo source, not provide access to underlying formatting features. For that, Texinfo provides so-called *raw formatter commands*. They should only be used when truly required (most documents do not need them).

The first raw formatter command is `@tex`. You can enter plain T_EX completely, and use ‘\’ in the T_EX commands, by delineating a region with the `@tex` and `@end tex` commands. All plain T_EX commands and category codes are restored within a `@tex` region. The sole exception is that the `@` character still introduces a command, so that `@end tex` can be recognized. Texinfo processors will not output material in such a region unless T_EX output is being produced.

In complex cases, you may wish to define new T_EX macros within `@tex`. You must use `\gdef` to do this, not `\def`, because `@tex` regions are processed in a T_EX group. If you need to make several definitions, you may wish to set `\globaldefs=1` (its value will be restored to zero as usual when the group ends at `@end tex`, so it won’t cause problems with the rest of the document).

As an example, here is a displayed equation written in plain T_EX:

```
@tex
$$ \chi^2 = \sum_{i=1}^N
    \left( y_i - (a + b x_i)
    \over \sigma_i \right)^2 $$
@end tex
```

The output of this example will appear only in a printed manual. If you are reading this in a format not generated by T_EX, you will not see the equation that appears in the printed manual.

$$\chi^2 = \sum_{i=1}^N \left(\frac{y_i - (a + bx_i)}{\sigma_i} \right)^2$$

Analogously, you can use `@html ... @end html` for a region of raw HTML, `@docbook ... @end docbook` for a region of raw DocBook, `@latex ... @end latex` for a region of raw L^AT_EX, and `@xml ... @end xml` for a region of raw XML.

The behavior of newlines in raw regions is unspecified.

In all cases, in raw processing, `@` retains the same meaning as in the remainder of the document. Thus, the Texinfo processors must recognize and even execute, to some extent, the contents of the raw regions, regardless of the final output format. Therefore, specifying changes that globally affect the document inside a raw region leads to unpredictable and generally undesirable behavior. For example, using the `@kbdinputstyle` command inside a raw region is undefined. The remedy is simple: don't do that.

15.4 Inline Conditionals: `@inline`, `@inlineifelse`, `@inlineraw`

Texinfo provides a set of conditional commands with arguments given within braces:

`@inlinefmt{format, text}`

Process the Texinfo *text* if *format* output is being generated.

`@inlinefmtifelse{format, then-text, else-text}`

Process the Texinfo *then-text* if *format* output is being generated; otherwise, process *else-text*.

`@inlineraw{format, text}`

Similar, but for raw *text* (see Section 15.3 [Raw Formatter Commands], page 136).

The supported *format* names are:

```
docbook  html  info  latex  plaintext  tex  xml
```

For example,

```
@inlinefmt{html, @emph{HTML-only text}}
```

is nearly equivalent to

```
@ifhtml
@emph{HTML-only text}
@end ifhtml
```

except that no whitespace is added, as happens in the latter (environment) case.

In these commands, whitespace is ignored after the comma separating the arguments, as usual, but is *not* ignored at the end of *text*.

To insert a literal at sign, left brace, or right brace in one of the arguments, you must use the alphabetic commands `@atchar{}` (see Section 11.1.1 [Inserting an Atsign], page 98), and `@lbracechar{}` or `@rbracechar{}` (see Section 11.1.2 [Inserting Braces], page 98), or the parsing will become confused.

With `@inlinefmtifelse`, it is also necessary to use `@comma{}` to avoid mistaking a `,` in the text for the delimiter. With `@inlinefmt` and `@inlineraw`, `@comma{}` is not required (though it's fine to use it), since these commands always have exactly two arguments.

For \TeX , the processed *text* cannot contain newline-delimited commands. Text to be ignored (i.e., for non- \TeX) can, though.

Two other `@inline...` conditionals complement the `@ifset` and `@ifclear` commands; see the next section.

15.5 Flags: @set, @clear, conditionals, and @value

You can direct the Texinfo formatting commands to format or ignore parts of a Texinfo file with the @set, @clear, @ifset, and @ifclear commands. Here is a summary:

@set *flag* [*value*]

Set the variable *flag*, to the optional *value* if specified.

@clear *flag*

Undefine the variable *flag*, whether or not it was previously defined.

@ifset *flag*

If *flag* is set, text through the next @end ifset command is formatted. If *flag* is clear, text through the following @end ifset command is ignored.

@inlineifset{*flag*, *text*}

Brace-delimited version of @ifset.

@ifclear *flag*

If *flag* is set, text through the next @end ifclear command is ignored. If *flag* is clear, text through the following @end ifclear command is formatted.

@inlineifclear{*flag*, *text*}

Brace-delimited version of @ifclear.

15.5.1 @set and @value

You use the @set command to specify a value for a flag, which is later expanded by the @value command.

A *flag* (aka *variable*) name is an identifier starting with an alphanumeric, ‘-’, or ‘_’. Subsequent characters, if any, may not be whitespace, ‘@’, braces, angle brackets, or any of ‘~`^+|’; other characters, such as ‘%’, may work. However, it is best to use only letters and numerals in a flag name, not ‘-’ or ‘_’ or others—they will work in some contexts, but not all, due to limitations in T_EX.

The value is the remainder of the input line, and can contain anything.

Write the @set command like this:

```
@set foo This is a string.
```

This sets the value of the flag `foo` to “This is a string.”.

The Texinfo processors then replace a @value{*flag*} command with the string to which *flag* is set. Thus, when `foo` is set as shown above, the Texinfo processors convert this:

```
@value{foo}
```

to this:

```
This is a string.
```

You can write a @value command within a paragraph; but you must write a @set command on a line of its own.

If you write the @set command like this:

```
@set foo
```

without specifying a string, the value of `foo` is the empty string.

If you clear a previously set flag with `@clear flag`, a subsequent `@value{flag}` command will report an error.

For example, if you set `foo` as follows:

```
@set howmuch very, very, very
```

then the processors transform

```
It is a @value{howmuch} wet day.
```

into

```
It is a very, very, very wet day.
```

If you write

```
@clear howmuch
```

then the processors transform

```
It is a @value{howmuch} wet day.
```

into

```
It is a {No value for "howmuch"} wet day.
```

`@value` cannot be reliably used as the argument to an accent command (see Section 11.4 [Inserting Accents], page 103). For example, this fails:

```
@set myletter a
@'@value{myletter}
```

15.5.2 @ifset and @ifclear

When a *flag* is set, the Texinfo formatting commands format text between subsequent pairs of `@ifset flag` and `@end ifset` commands. When the *flag* is cleared, the Texinfo formatting commands do *not* format the text. `@ifclear` operates analogously.

Write the conditionally formatted text between `@ifset flag` and `@end ifset` commands, like this:

```
@ifset flag
  conditional-text
@end ifset
```

For example, you can create one document that has two variants, such as a manual for a ‘large’ and ‘small’ model:

```
You can use this machine to dig up shrubs
without hurting them.
```

```
@set large
```

```
@ifset large
  It can also dig up fully grown trees.
@end ifset
```

```
Remember to replant promptly ...
```

In the example, the formatting commands will format the text between `@ifset large` and `@end ifset` because the `large` flag is set.

When *flag* is cleared, the Texinfo formatting commands do *not* format the text between `@ifset flag` and `@end ifset`; that text is ignored and does not appear in the output.

For example, if you clear the flag of the preceding example by writing an `@clear large` command after the `@set large` command (but before the conditional text), then the Texinfo formatting commands ignore the text between the `@ifset large` and `@end ifset` commands. In the formatted output, that text does not appear; you see only the lines that say, “You can use this machine to dig up shrubs without hurting them. Remember to replant promptly ...”.

If a flag is cleared with a `@clear flag` command, then the formatting commands format text between subsequent pairs of `@ifclear` and `@end ifclear` commands. But if the flag is set with `@set flag`, then the formatting commands do *not* format text between an `@ifclear` and an `@end ifclear` command; rather, they ignore that text. An `@ifclear` command looks like this:

```
@ifclear flag
```

15.5.3 @inlineifset and @inlineifclear

`@inlineifset` and `@inlineifclear` provide brace-delimited alternatives to the `@ifset` and `@ifclear` forms, similar to the other `@inline...` Commands (see Section 15.4 [Inline Conditionals], page 137). The same caveats about argument parsing given there apply here too.

```
@inlineifset{var, text}
```

Process the Texinfo *text* if the flag *var* is defined.

```
@inlineifclear{var, text}
```

Process the Texinfo *text* if the flag *var* is not defined.

Except for the syntax, their general behavior and purposes is the same as with `@ifset` and `@ifclear`, described in the previous section.

15.5.4 @value Example

You can use the `@value` command to minimize the number of places you need to change when you record an update to a manual. See Section C.1 [GNU Sample Texts], page 247, for the full text of an example of using this to work with Automake distributions.

This example is adapted from *The GNU Make Manual*.

1. Set the flags:

```
@set EDITION 0.35 Beta
@set VERSION 3.63 Beta
@set UPDATED 14 August 1992
@set UPDATE-MONTH August 1992
```

2. Write text for the `@copying` section (see Section 2.7.1 [`@copying`], page 17):

```

@copying
This is Edition @value{EDITION},
last updated @value{UPDATED},
of @cite{The GNU Make Manual},
for @code{make}, version @value{VERSION}.

```

```
Copyright ...
```

```

Permission is granted ...
@end copying

```

3. Write text for the title page, for people reading the printed manual:

```

@titlepage
@title GNU Make
@subtitle A Program for Directing Recompilation
@subtitle Edition @value{EDITION}, ...
@subtitle @value{UPDATE-MONTH}
@page
@insertcopying
...
@end titlepage

```

(On a printed cover, a date listing the month and the year looks less fussy than a date listing the day as well as the month and year.)

4. Write text for the Top node, for people reading the Info file:

```

@ifnottex
@node Top
@top Make

```

```

This is Edition @value{EDITION},
last updated @value{UPDATED},
of @cite{The GNU Make Manual},
for @code{make}, version @value{VERSION}.
@end ifnottex

```

After you format the manual, the @value constructs have been expanded, so the output contains text like this:

```

This is Edition 0.35 Beta, last updated 14 August 1992,
of `The GNU Make Manual', for `make', Version 3.63 Beta.

```

When you update the manual, you change only the values of the flags; you do not need to edit the three sections.

15.6 Testing for Texinfo Commands: @ifcommanddefined, @ifcommandnotdefined

Occasionally, you may want to arrange for your manual to test if a given Texinfo command is available and (presumably) do some sort of fallback formatting if not. There are conditionals @ifcommanddefined and @ifcommandnotdefined to do this. For example:

```
@ifcommanddefined node
```

```

    Good, @samp{@@node} is defined.
  @end ifcommanddefined

```

will output the expected ‘Good, ‘@node’ is defined.’.

This conditional will also consider any new commands defined by the document via `@macro`, `@alias`, `@definfoenclose`, and `@def(code)index` (see Chapter 16 [Defining New Texinfo Commands], page 144) to be true. Caveat: the \TeX implementation reports internal \TeX commands, in addition to all the Texinfo commands, as being “defined”; the `texi2any` implementation is reliable in this regard, however.

You can check the NEWS file in the Texinfo source distribution and linked from the Texinfo home page (<http://www.gnu.org/software/texinfo>) to see when a particular command was added.

These command-checking conditionals themselves were added in Texinfo 5.0, released in 2013—decades after Texinfo’s inception. In order to test if they themselves are available, the predefined flag `txicommandconditionals` can be tested, like this:

```

@ifset txicommandconditionals
  @ifcommandnotdefined foobarnode
    (Good, @samp{@@foobarnode} is not defined.)
  @end ifcommandnotdefined
@end ifset

```

Since flags (see the previous section) were added early in the existence of Texinfo, there is no problem with assuming they are available.

We recommend avoiding these tests whenever possible—which is usually the case. For many software packages, it is reasonable for all developers to have a given version of Texinfo (or newer) installed, and thus no reason to worry about older versions. (It is straightforward for anyone to download and install the Texinfo source; it does not have any problematic dependencies.)

The issue of Texinfo versions does not generally arise for end users. With properly distributed packages, users need not process the Texinfo manual simply to build and install the package; they can use preformatted Info (or other) output files. This is desirable in general, to avoid unnecessary dependencies between packages (see Section “Releases” in *GNU Coding Standards*).

15.7 Conditional Nesting

Texinfo requires that for a failing conditional, the ignored text must be properly nested with respect to that failing conditional. Here’s an example:

```

@ifset somevar
  @ifset anothervar
    Both somevar and anothervar are set.
  @end ifset
  @ifclear anothervar
    Somevar is set, anothervar is not.
  @end ifclear
@end ifset

```

If ‘somevar’ is not set, the whole block is skipped.

To allow the processors to reliably determine which commands to consider for nesting purposes, all conditional commands must be on lines by themselves, with no text (even spaces) before or after.

16 Defining New Texinfo Commands

Texinfo provides several ways to define new commands (in all cases, it's not recommended to try redefining existing commands):

- A Texinfo *macro* allows you to define a new Texinfo command as any sequence of text and/or existing commands (including other macros). The macro can have any number of *parameters*—text you supply each time you use the macro.

Incidentally, these macros have nothing to do with the `@defmac` command, which is for documenting macros in the subject area of the manual (see Section 13.1 [Def Cmd Template], page 118).

- ‘`@linemacro`’ allows you to define a macro whose arguments extend to the end of the line and are separated by spaces.
- ‘`@alias`’ defines a new name for an existing command.
- ‘`@definfoenclose`’ allows you to define new commands with customized output for some non-printed output formats. This command is deprecated.

Most generally of all (not just for defining new commands), it is possible to invoke any external macro processor and have Texinfo recognize so-called `#line` directives for error reporting.

If you want to do simple text substitution, `@set` and `@value` is the simplest approach (see Section 15.5 [`@set @clear @value`], page 138).

16.1 Defining Macros

You use the Texinfo `@macro` command to define a macro, like this:

```
@macro macroname{param1, param2, ...}
  text ... \param1\ ...
@end macro
```

The *parameters* *param1*, *param2*, ... correspond to arguments supplied when the macro is subsequently used in the document (described in the next section).

In principle, *macroname* should consist of alphanumeric characters, and (except as the first character) ‘-’. The ‘_’ character is excluded so that macros can be called inside `@math` without a following space (see Section 11.7 [Inserting Math], page 106). However, for a macro to work consistently with \TeX , *macroname* must consist entirely of letters: no digits, hyphens, or other special characters. So, we recommend using only letters. Texinfo commands should not be redefined as macros.

If a macro needs no parameters, you can define it either with an empty list (`@macro foo {}`) or with no braces at all (`@macro foo`).

The definition or *body* of the macro can contain most Texinfo commands, including macro invocations. However, a macro definition that defines another macro does not work in \TeX due to limitations in the design of `@macro`.

In the macro body, instances of a parameter name surrounded by backslashes, as in ‘`\param1\`’ in the example above, are replaced by the corresponding argument from the macro invocation. You can use parameter names any number of times in the body, including zero.

To get a single ‘\’ in the macro expansion, use ‘\\’. Any other use of ‘\’ in the body yields a warning.

The newline characters after the `@macro` line and before the `@end macro` line are ignored, that is, not included in the macro body. All other whitespace is treated according to the usual Texinfo rules.

To allow a macro to be used recursively, that is, in an argument to a call to itself, you must define it with ‘`@rmacro`’, like this:

```
@rmacro rmac {arg}
a\arg\b
@end rmacro
...
@rmac{1@rmac{text}2}
```

This produces the output ‘`a\atextb2b`’. With ‘`@macro`’ instead of ‘`@rmacro`’, an error message is given.

You can undefine a macro `foo` with `@unmacro foo`. It is not an error to undefine a macro that is already undefined. For example:

```
@unmacro foo
```

16.2 Invoking Macros

After a macro is defined (see the previous section), you can *invoke* (use) it in your document like this:

```
@macroname {arg1, arg2, ...}
```

and the result will be more or less as if you typed the body of `macroname` at that spot. For example:

```
@macro foo {p, q}
Together: \p\ & \q\.
@end macro
@foo{a, b}
```

produces:

```
Together: a & b.
```

Thus, the arguments and parameters are separated by commas and delimited by braces; any whitespace after (but not before) a comma is ignored. The braces are required in the invocation even when the macro takes no arguments, consistent with other Texinfo commands. For example:

```
@macro argless {}
No arguments here.
@end macro
@argless{}
```

produces:

```
No arguments here.
```

Passing macro arguments containing commas requires care, since commas also separate the arguments. To include a comma character in an argument, the most reliable method is to use the `@comma{}` command. Another method is to surround the argument with

‘@asis{...}’. For `texi2any`, you can also prepend a backslash character, as in ‘\,’, but this does not work with `TeX`.

It’s not always necessary to worry about commas. To facilitate use of macros, two rules for *automatic quoting* are implemented:

1. If a macro takes only one argument, all commas in its invocation are quoted by default. For example:

```
@macro TRYME{text}
@strong{TRYME: \text\}
@end macro
```

```
@TRYME{A nice feature, though it can be dangerous.}
```

will produce the following output

TRYME: A nice feature, though it can be dangerous.

And indeed, it can. Namely, there is no control on the number of arguments passed to one-argument macros, so be careful when you invoke them.

2. If a macro invocation includes another command (including a recursive invocation of itself), any commas in the nested command invocation(s) are quoted by default. For example, in

```
@say{@strong{Yes, I do}, person one}
```

the comma after ‘Yes’ is implicitly quoted. Here’s another example, with a recursive macro:

```
@rmacro cat{a,b}
\a\\b\
@end rmacro
```

```
@cat{@cat{foo, bar}, baz}
```

will produce the string ‘foobarbaz’.

3. Otherwise, a comma should be explicitly quoted, as above, for it to be treated as a part of an argument.

The backslash itself can be quoted in macro arguments with another backslash. For example:

```
@macname {\bleh}
```

will pass the argument ‘\bleh’ to *macname*.

`texi2any` also recognizes ‘\{’ and ‘\}’ sequences for curly braces, but these are not recognized by the implementation in `TeX`. There should, however, rarely be a need for these, as they are only needed when a macro argument contains unbalanced braces.

If a macro is defined to take exactly one argument, it can be invoked without any braces, taking all of the line after the macro name as the argument. For example:

```
@macro bar {p}
Twice: \p\ & \p\.
@end macro
@bar aah
```

produces:

Twice: aah & aah.

In these arguments, there is no escaping of special characters, so each ‘\’ stands for itself.

If a macro is defined to take more than one argument, but is called with only one (in braces), the remaining arguments are set to the empty string, and no error is given. For example:

```
@macro addtwo {p, q}
Both: \p\\q\
@end macro
@addtwo{a}
```

produces simply:

Both: a.

16.3 Macro Details and Caveats

By design, macro expansion should not happen in the following contexts:

- `@macro` and `@unmacro` lines;
- `@if...` lines, including `@ifset` and similar;
- `@set`, `@clear`, `@value`;
- `@clickstyle` lines;
- `@end` lines when there is no macro expansion in the block command.

Unfortunately, \TeX may do some expansion in these situations, possibly yielding errors.

Also, quite a few macro-related constructs cause problems with \TeX ; some of the caveats are listed below. Thus, if you get macro-related errors when producing the printed version of a manual, you might try expanding the macros with `texi2any` by invoking `texi2dvi` with the ‘-E’ option (see [Format with `texi2dvi`], page 157). Or, more reliably, eschew Texinfo macros altogether and use a language designed for macro processing, such as M4 (see Section 16.7 [External Macro Processors], page 153).

- As mentioned earlier, macro names must consist entirely of letters.
- It is not advisable to redefine any \TeX primitive, plain, or Texinfo command name as a macro. Unfortunately, this is a large and open-ended set of names, and the possible resulting errors are unpredictable.
- Arguments to macros taking more than one argument cannot cross lines.
- Macros containing a command which must be on a line by itself, such as a conditional, cannot be invoked in the middle of a line. Similarly, macros containing line-oriented commands or text, such as `@example` environments, may behave unpredictably in \TeX .
- Texinfo commands in the expansion of a macro in the text of an index entry may end up being typeset as literal text (including an “@” sign), instead of being interpreted with their intended meaning.
- White space is ignored at the beginnings of lines.
- Macros can’t be reliably used in the argument to accent commands (see Section 11.4 [Inserting Accents], page 103).

- The backslash escape for commas in macro arguments does not work; `@comma{}` must be used.
- Ending a macro body with ‘`@c`’ may cause text following the macro invocation to be ignored as a comment in `texi2any`. This is not the case when processing with `TEX`. This was often done to “comment out” an unwanted newline at the end of a macro body, but this is not necessary any more, as the final newline before ‘`@end macro`’ is not included in the macro body anyway.
- In general, you can’t arbitrarily substitute a macro (or `@value`) call for Texinfo command arguments, even when the text is the same. Texinfo is not M4 (or even plain `TEX`). It might work with some commands, it fails with others. Best not to do it at all. For instance, this fails:

```
@macro offmacro
off
@end macro
@headings @offmacro
```

This looks equivalent to `@headings off`, but for `TEX` technical reasons, it fails with a mysterious error message (namely, ‘Paragraph ended before `@headings` was complete’).

- Expanding macros in a math context may lead to poor spacing in `TEX` output. For example:

```
@iftex
@macro atan
\\mathop{\\rm atan}
@end macro
@end iftex

@math{@atan}(x)
```

The braces following ‘`@atan`’ are treated by `TEX` as a subformula, leading to extra space before the opening parenthesis. You can work around this by defining a raw `TEX` macro instead:

```
@tex
\gdef\atan#1{\mathop{\rm atan}}
@end tex
```

The ‘`#1`’ in this definition absorbs the braces, so that the spacing is as expected for the `\mathop` object.

- If you have problems using conditionals within a macro, an alternative is to use separate macro definitions inside conditional blocks. For example, instead of

```
@macro Mac
@iftex
text for TeX output
@end iftex
@ifnottex
text for not TeX output
@end ifnottex
@end macro
```

you can do the following instead:

```
@iftex
@macro Mac
text for TeX output
@end macro
@end iftex

@ifnottex
@macro Mac
text for not TeX output
@end macro
@end ifnottex
```

- Macros cannot define macros in the natural way. To do this, you must use conditionals and raw \TeX . For example:

```
@ifnottex
@macro ctor {name, arg}
@macro \name\
something involving \arg\ somehow
@end macro
@end macro
@end ifnottex
@tex
\gdef\ctor#1{\ctorx#1,}
\gdef\ctorx#1,#2,{\def#1{something involving #2 somehow}}
@end tex
```

The following limitations are by design:

- If you want to pass an argument with the Texinfo command `@`, (to produce a cedilla, see Section 11.4 [Inserting Accents], page 103), you have to use `@value` or another workaround. Otherwise, the comma may be taken as separating the arguments. With `texi2any`, the comma can be escaped by a backslash. With \TeX another workaround need to be used, therefore we recommend using such a workaround.

For example,

```
@macro mactwo{argfirst, argsecond}
\argfirst\+\argsecond\
@end macro
@set fc Fran@,cois
@mactwo{@value{fc},}
```

produces:

François+.

- `@verbatim` and macros do not mix; for instance, you can't start a verbatim block inside a macro and end it outside (see Section 7.5 [`@verbatim`], page 69). Starting any environment inside a macro and ending it outside may or may not work, for that matter.
- Macros that completely define macros are ok, but it's not possible to have incompletely nested macro definitions. That is, `@macro` and `@end macro` (likewise for `@rmacro`) must

be correctly paired. For example, you cannot start a macro definition within a macro, and then end that nested definition outside the macro.

In the `makeinfo` implementation before Texinfo 5.0, ends of lines from expansion of a `@macro` definition did not end an `@-`command line-delimited argument (`@chapter`, `@center`, etc.). This is no longer the case. For example:

```
@macro twolines{}
aaa
bbb
@end macro
@center @twolines{}
```

In the current `texi2any`, this is equivalent to:

```
@center aaa
bbb
```

with just ‘aaa’ as the argument to `@center`. In the earlier implementation, it would have been parsed as this:

```
@center aaa bbb
```

16.4 ‘@alias *new=existing*’

The ‘@alias’ command defines a new command to be just like an existing one. This is useful for defining additional markup names, thus preserving additional semantic information in the input even though the output result may be the same.

Write the ‘@alias’ command on a line by itself, followed by the new command name, an equals sign, and the existing command name. Whitespace around the equals sign is optional and ignored if present. Thus:

```
@alias new = existing
```

For example, if your document contains citations for both books and some other media (movies, for example), you might like to define a macro `@moviecite{}` that does the same thing as an ordinary `@cite{}` but conveys the extra semantic information as well. You’d do this as follows:

```
@alias moviecite = cite
```

Macros do not always have the same effect as aliases, due to vagaries of argument parsing. Also, aliases are much simpler to define than macros. So the command is not redundant.

Unfortunately, it’s not possible to alias Texinfo environments; for example, `@alias lang=example` is an error.

Aliases must not be recursive, directly or indirectly.

It is not advisable to redefine any `TEX` primitive, plain `TEX`, or Texinfo command name as an alias. Unfortunately this is a very large set of names, and the possible resulting errors from `TEX` are unpredictable.

Alias identifiers should be the same as for macro names, that is alphanumerics and (except as the first character) ‘-’. However, with `TEX`, letters only should be used. So, we recommend using only letters.

16.5 Line Macros

You can also define a macro using the ‘@linemacro’ command. The syntax for line macro definitions is similar to that for @macro.

However, the syntax for using a macro defined this way is different. The macro call uses the rest of the line, with arguments separated by spaces. The line macro facility is mainly intended to allow you to define commands that operate similarly to the builtin commands for providing definitions (see Chapter 13 [Definition Commands], page 118).

For example:

```
@linemacro defbuiltin {name, args}
@define {Builtin} \name\ \args\
@end linemacro
```

The above macro may be used as

```
@defblock
@defbuiltin foo (bar)
Explanation
@end defblock
```

This produces the following result:

```
foo (bar) [Builtin]
  Explanation
```

Here the first argument is ‘foo’, and is substituted where ‘\name\’ appears in the macro body. Likewise, ‘(bar)’ is substituted for ‘\args\’.

You can include spaces in a macro argument by surrounding the argument by braces. Any pair of braces enclosing an argument is removed before substitution. Any empty arguments (including the last one) must be given as ‘{ }’. Additionally, non-initial spaces may appear in the final argument in the argument list without surrounding braces (as in the example below).

If an argument line for a line macro ends in a ‘@’ character, then this character together with the following newline are included in a macro argument, and the following line in the input file is also used to get the arguments for the macro. Note that any substitution of the ‘@<newline>’ sequence must be in a valid context, such as a definition line (see Section 13.2 [Def Cmd Continuation Lines], page 119).

Another example:

```
@linemacro deffunc {type, name, args}
@findex \name\
@deftypeline {Func} {\type\} \name\ \args\
@end linemacro

@defblock
@deffunc {long int} F (int @var{one}, int @var{two}, @
int @var{three}, int @var{four}, int @var{five})
Explanation
@end defblock
```

Note how braces are needed around ‘\type\’ in the macro body in case the `type` argument contains a space. This example produces the output below and enters an index entry for `F`.

```
long int F (int one, int two, int three, int four, int five)      [Func]
  Explanation
```

Line macros produce a whole number of lines of output in their expansion. There may be better compatibility between the Texinfo processors (`texi2any` and `TEX` with `texinfo.tex`) for macros defined with `@linemacro` than for those defined with `@macro`.

16.6 @definfoenclose: Customized Highlighting

An `@definfoenclose` command may be used to define a highlighting command for online output formats. A command defined using `@definfoenclose` marks text by enclosing it in strings that precede and follow the text.

In practice, there is little use for this command, and we do not recommend you use it. Support for `@definfoenclose` may be removed in future releases of Texinfo.

Write a `@definfoenclose` command at the beginning of a line followed by three comma-separated arguments. The first argument to `@definfoenclose` is the `@`-command name (without the `@`); the second argument is the start delimiter string; and the third argument is the end delimiter string. The latter two arguments enclose the highlighted text in the output.

A delimiter string may contain spaces. Neither the start nor end delimiter is required. If you do not want a start delimiter but do want an end delimiter, you must follow the command name with two commas in a row; otherwise, the end delimiter string you intended will naturally be (mis)interpreted as the start delimiter string.

An enclosure command defined this way takes one argument in braces, since it is intended for new markup commands (see Chapter 6 [Marking Text], page 55).

For example, you can write:

```
@definfoenclose phoo,/,\\
```

near the beginning of a Texinfo file to define `@phoo` as an Info and HTML formatting command that inserts ‘/’ before and ‘\’ after the argument to `@phoo`. You can then write `@phoo{bar}` wherever you want ‘/bar\’ highlighted in Info and HTML.

For `TEX` formatting, you could write

```
@iftex
@alias phoo = i
@end iftex
```

to define `@phoo` as a command that causes `TEX` to typeset the argument to `@phoo` in italics.

Each definition applies to its own formatter: one for `TEX`, the other for online formats. The `TEX` definitions need to be in ‘`@iftex`’. `@definfoenclose` command need not be within ‘`@ifinfo`’ unless you want to use different definitions for different online output formats. `@definfoenclose` defined commands have no effect in DocBook and `LATEX` output, their argument is output as-is. An `@alias` could also be used for these formats.

`@definfoenclose` definitions must not be recursive, directly or indirectly.

16.7 External Macro Processors: Line Directives

Texinfo macros (and its other text substitution facilities) work fine in straightforward cases. If your document needs unusually complex processing, however, their fragility and limitations can be a problem. In this case, you may want to use a different macro processor altogether, such as M4 (see *M4*) or CPP (see *The C Preprocessor*).

With one exception, Texinfo does not need to know whether its input is “original” source or preprocessed from some other source file. Therefore, you can arrange your build system to invoke whatever programs you like to handle macro expansion or other preprocessing needs. Texinfo does not offer built-in support for any particular preprocessor, since no one program seemed likely to suffice for the requirements of all documents.

The one exception is line numbers in error messages. In that case, the line number should refer to the original source file, whatever it may be. There’s a well-known mechanism for this: the so-called ‘`#line`’ directive. Texinfo supports this.

16.7.1 ‘`#line`’ Directive

An input line such as this:

```
#line 100 "foo.ptexi"
```

indicates that the next line was line 100 of the file `foo.ptexi`, and so that’s what an error message should refer to. Both M4 (see Section “Preprocessor features” in *GNU M4*) and CPP (see Section “Line Control” in *The C Preprocessor*, and Section “Preprocessor Output” in *The C Preprocessor*) can generate such lines.

The `texi2any` program recognizes these lines by default, except within `@verbatim` blocks (see Section 7.5 [`@verbatim`], page 69). Their recognition can be turned off completely with `CPP_LINE_DIRECTIVES` (see Section 19.4.8 [Other Customization Variables], page 183), though there is normally no reason to do so.

For those few programs (M4, CPP, Texinfo) which need to document ‘`#line`’ directives and therefore have examples which would otherwise match the pattern, the command `@hashchar{}` can be used (see Section 11.1.5 [Inserting a Hashsign], page 99). The example line above looks like this in the source for this manual:

```
@hashchar{ }line 100 "foo.ptexi"
```

The `@hashchar` command was added to Texinfo in 2013. If you don’t want to rely on it, you can also use `@set` and `@value` to insert the literal ‘`#`’:

```
@set hash #
@value{hash}line 1 "example.c"
```

Or, if suitable, a `@verbatim` environment can be used instead of `@example`. As mentioned above, `#line`-recognition is disabled inside `verbatim` blocks.

16.7.2 ‘`#line`’ and `TEX`

As mentioned, `texi2any` recognizes the ‘`#line`’ directives described in the previous section. However, `texinfo.tex` does not and cannot. Therefore, such a line will be incorrectly typeset `verbatim` if `TEX` sees it. The solution is to use `texi2any`’s macro expansion options before running `TEX`. There are three approaches:

- If you run `texi2dvi` or its variants (see [Format with `texi2dvi`], page 157), you can pass `-E` and `texi2dvi` will run `texi2any` first to expand macros and eliminate ‘`#line`’.

- If you run `texi2any`, you can specify `--no-ifinfo --iftex -E somefile.out`, and then give `somefile.out` to `texi2dvi` in a separate command.
- Or you can run `texi2any --dvi --Xopt -E`. (Or `--pdf` instead of `--dvi`.) `texi2any` will then call `texi2dvi -E`.

One last caveat regarding use with \TeX : since the `#line` directives are not recognized, the line numbers emitted by the `@errmsg{}` command (see Section 15.1 [Conditional Commands], page 134), or by \TeX itself, are the (incorrect) line numbers from the derived file which \TeX is reading, rather than the preprocessor-specified line numbers.

16.7.3 ‘#line’ Syntax Details

Syntax details for the ‘#line’ directive: the ‘#’ character can be preceded or followed by whitespace, the word ‘line’ is optional, and the file name can be followed by a whitespace-separated list of integers (these are so-called “flags” output by CPP in some cases). For those who like to know the gory details, the actual (Perl) regular expression which is matched is this:

```
/^\s*#\s*(line)? (\d+)(( "[^"]+")(\s+\d+)*)?\s*$/
```

As far as we’ve been able to tell, the trailing integer flags only occur in conjunction with a file name, so that is reflected in the regular expression.

As an example, the following is a syntactically valid ‘#line’ directive, meaning line 1 of `/usr/include/stdio.h`:

```
# 1 "/usr/include/stdio.h" 2 3 4
```

Unfortunately, the quoted file name (“...”) has to be optional, because M4 (especially) can often generate ‘#line’ directives within a single file. Since the ‘line’ is also optional, the result is that lines might match which you wouldn’t expect, e.g.,

```
# 1
```

The possible solutions are described above (see Section 16.7.1 [‘#line’ Directive], page 153).

17 Include Files

When a Texinfo processor sees an `@include` command in a Texinfo file, it processes the contents of the file named by the `@include` and incorporates them into the output files being created. Include files thus let you keep a single large document as a collection of conveniently small parts.

17.1 How to Use Include Files

To include another file within a Texinfo file, write the `@include` command at the beginning of a line and follow it on the same line by the name of a file to be included. For example:

```
@include buffers.texi
```

`@value{var}` references are expanded on the `@include` line. Other than that, the only `@`-commands allowed are `@@`, `@{`, `@}` and associated `@`-commands such as `@atchar{}`.

An included file should simply be a segment of text that you expect to be included as is into the overall or *outer* Texinfo file; it should not contain the standard beginning and end parts of a Texinfo file. In particular, you should not start an included file with a line saying `\input texinfo`; if you do, that text is inserted into the output file literally. Likewise, you should not end an included file with a `@bye` command; nothing after `@bye` is formatted.

In the long-ago past, you were required to write an `@setfilename` line at the beginning of an included file, but no longer. Now, it does not matter whether you write such a line. If an `@setfilename` line exists in an included file, it is ignored.

GNU Emacs Texinfo mode provides `texinfo-multiple-files-update` to update node pointers and master menu with multiple include files. See Section D.5.3 [Update Multiple Files], page 259.

17.2 Sample File with @include

Here is an example of an outer Texinfo file with `@include` files within it:

```
\input texinfo @c -*-texinfo*-

@settitle Include Example

@node Top
@top Include Example

@include foo.texi
@include bar.texi
@include concept-index.texi
@bye
```

An included file, such as `foo.texi`, might look like this:

```
@node First
@chapter First Chapter

Contents of first chapter ...
```


The full contents of `concept-index.texi` might be as simple as this:

```
@node Concept Index
@unnumbered Concept Index

@printindex cp
```

The outer Texinfo source file for *The GNU Emacs Lisp Reference Manual* is named `elisp.texi`. This outer file has already contained a master menu with 417 entries and a list of 41 `@include` files.

17.3 `@verbatiminclude file`: Include a File Verbatim

You can include the exact contents of a file in the document with the `@verbatiminclude` command:

```
@verbatiminclude filename
```

The contents of `filename` is printed in a verbatim environment (see Section 7.5 [`@verbatim`], page 69). Generally, the file is printed exactly as it is, with all special characters and white space retained. No indentation is added; if you want indentation, enclose the `@verbatiminclude` within `@example` (see Section 7.4 [`@example`], page 68).

`@value{var}` references are expanded on the `@verbatiminclude` line. This makes it possible to include files in other directories within a distribution, for instance:

```
@verbatiminclude @value{top_srcdir}/NEWS
```

(You still have to get `top_srcdir` defined in the first place.)

Other than that, the only `@`-commands allowed are `@@`, `@{`, `@}` and associated `@`-commands such as `@atchar{}`.

For a method on printing the file contents in a smaller font size, see the end of the section on `@verbatim`.

18 Formatting and Printing with T_EX

Running the `texi2dvi` or `texi2pdf` command is the simplest way to create printable output. These commands are installed as part of the Texinfo package.

In more detail, typesetting and printing a Texinfo file is a multi-step process in which you use the T_EX program to create a file for printing (called a DVI or PDF file), and then print the file. Optionally, you may also create indices using the `texindex` command after first running T_EX; and then you must run T_EX again. `texi2dvi` takes care of all of this, running T_EX and `texindex` as needed (see [Format with `texi2dvi`], page 157).

When you use the shell commands, you can either work directly in the operating system shell or work within a shell inside GNU Emacs (or some other computing environment). You can give formatting and printing commands from a shell within GNU Emacs, just like any other shell command. To create a shell within Emacs, type `M-x shell` (see Section “Shell” in *The GNU Emacs Manual*). If you are using GNU Emacs, you can also use commands provided by Texinfo mode instead of shell commands. See Section D.7 [Printing with Emacs], page 263.

For specifying details of the printed output such as paper size, see Appendix E [Global Document Commands], page 275.

18.1 Use T_EX

The typesetting program called T_EX is used to format a Texinfo document for printable output. T_EX is a very powerful typesetting program and, when used correctly, does an exceptionally good job. It is not included in the Texinfo package, being a vast suite of software in itself.

T_EX is a document formatter that is used by the FSF for its documentation. It is the easiest way to get printed output (e.g., PDF and PostScript) for Texinfo manuals. TeX is freely redistributable, and you can get it over the Internet or on physical media. See <http://tug.org/texlive>.

18.2 Format with `texi2dvi` or `texi2pdf`

The `texi2dvi` program takes care of all the steps for producing a T_EX DVI file from a Texinfo document. Similarly, `texi2pdf` produces a PDF file¹.

To run `texi2dvi` or `texi2pdf` on an input file `foo.texi`, do this (where ‘`prompt$`’ is your shell prompt):

```
prompt$ texi2dvi foo.texi
prompt$ texi2pdf foo.texi
```

As shown in this example, the file names given to `texi2dvi` and `texi2pdf` must include any extension, such as ‘`.texi`’.

For a list of all the options, run ‘`texi2dvi --help`’. Some of the options are discussed below.

¹ PDF stands for ‘Portable Document Format’. It was invented by Adobe Systems for document interchange, based on their PostScript language.

With the `--pdf` option, `texi2dvi` produces PDF output instead of DVI, by running `pdftex` instead of `tex`. Alternatively, the command `texi2pdf` is an abbreviation for running `'texi2dvi --pdf'`. The command `pdftexi2dvi` is also provided as a convenience for AUC-T_EX (see *AUC-T_EX*), as it prefers to merely prepend `'pdf'` to DVI producing tools to have PDF producing tools.

With the `--dvipdf` option, `texi2dvi` produces PDF output by running T_EX and then a DVI-to-PDF program: if the DVIPDF environment variable is set, that value is used, else the first program extant among `dvipdfmx`, `dvipdfm`, `dvipdf`, `dvi2pdf`, `dvitopdf`. This method generally supports CJK typesetting better than `pdftex`.

With the `--ps` option, `texi2dvi` produces PostScript instead of DVI, by running `tex` and then `dvips` (see *Dvips*). (Or the value of the DVIPS environment variable, if set.)

`texi2dvi` can also be used to process L^AT_EX files. Normally `texi2dvi` is able to guess the input file language by its contents and file name extension; however, if it guesses wrong you can explicitly specify the input language using `--language=lang` command line option, where *lang* is either `'latex'` or `'texinfo'`.

One useful option to `texi2dvi` is `'--command=cmd'`. This inserts *cmd* on a line by itself at the start of the file in a temporary copy of the input file, before running T_EX. With this, you can specify different printing formats, such as `@smallbook` (see Section E.6 [`@smallbook`], page 281), `@fourpaper` (see Section E.7 [A4 Paper], page 281), or `@pagesizes` (see Section E.8 [`@pagesizes`], page 281), without actually changing the document source. (You can also do this on a site-wide basis with `texinfo.cnf`; see Section 18.5 [Preparing for T_EX], page 162).

The option `-E` (equivalently, `-e` and `--expand`) does Texinfo macro expansion using `texi2any` instead of the T_EX implementation (see Section 16.3 [Macro Details], page 147). Each implementation has its own limitations and advantages.

`texi2dvi` takes the `--build=mode` option to specify where the T_EX compilation takes place, and, as a consequence, how auxiliary files are treated. The build mode can also be set using the environment variable `TEXI2DVI_BUILD_MODE`. The valid values for *mode* are:

- `'local'` Compile in the current directory, leaving all the auxiliary files around. This is the traditional TeX use.
- `'tidy'` Compile in a local `*.t2d` directory, where the auxiliary files are left. Output files are copied back to the original file.

Using the `'tidy'` mode brings several advantages:

- the current directory is not cluttered with plethora of temporary files.
- clutter can be even further reduced using `--build-dir=dir`: all the `*.t2d` directories are stored there.
- clutter can be reduced to zero using, e.g., `--build-dir=/tmp/\$USER.t2d` or `--build-dir=\$HOME/.t2d`.
- the output file is updated after every successful T_EX run, for sake of concurrent visualization of the output. In a `'local'` build the viewer stops during the whole T_EX run.
- if the compilation fails, the previous state of the output file is preserved.
- PDF and DVI compilation are kept in separate subdirectories preventing any possibility of auxiliary file incompatibility.

On the other hand, because ‘tidy’ compilation takes place in another directory, occasionally T_EX won’t be able to find some files (e.g., when using `\graphicspath`): in that case, use `-I` to specify the additional directories to consider.

‘clean’ Same as ‘tidy’, but remove the auxiliary directory afterwards. Every compilation therefore requires the full cycle.

`texi2dvi` will use `etex` if it is available, because it runs faster in some cases, and provides additional tracing information when debugging `texinfo.tex`. Nevertheless, this extended version of T_EX is not required, and the DVI output is identical.

`texi2dvi` attempts to detect auxiliary files output by T_EX, either by using the `-recorder` option, or by scanning for ‘`\openout`’ in the log file that a run of T_EX produces. You may control how `texi2dvi` does this with the `TEXI2DVI_USE_RECORDER` environment variable. Valid values are:

‘yes’ use the `-recorder` option, no checks.

‘no’ scan for ‘`\openout`’ in the log file, no checks.

‘yesmaybe’ check whether `-recorder` option is supported, and if yes use it, otherwise check for tracing ‘`\openout`’ in the log file is supported, and if yes use it, else it is an error.

‘nomaybe’ same as ‘yesmaybe’, except that the ‘`\openout`’ trace in log file is checked first.

The default is ‘nomaybe’. This environment variable is provided for troubleshooting purposes, and may change or disappear in the future.

18.3 Format with `tex/texindex`

You can do the basic formatting of a Texinfo file with the shell command `tex` followed by the name of the Texinfo file. For example:

```
tex foo.texi
```

T_EX will produce a *DVI file* as well as several auxiliary files containing information for indices, cross-references, etc. The DVI file (for *DeVice Independent* file) can be printed on virtually any device, perhaps after a further conversion (see the previous section).

The `tex` formatting command itself does not sort the indices; it writes an output file of unsorted index data. To generate a printed index after running the `tex` command, you first need a sorted index to work from. The `texindex` command sorts indices. (`texi2dvi`, described in the previous section, runs `tex` and `texindex` as necessary.)

`tex` outputs unsorted index files under names following a standard convention: the name of your main input file with any ‘`.texi`’ or similar extension replaced by the two letter index name. For example, the raw index output files for the input file `foo.texi` would be, by default, `foo.cp`, `foo.vr`, `foo.fn`, `foo.tp`, `foo.pg` and `foo.ky`. Those are exactly the arguments to give to `texindex`.

Instead of specifying all the unsorted index file names explicitly, it's typical to use '??' as shell wildcards and give the command in this form:

```
texindex foo.??
```

This command will run `texindex` on all the unsorted index files, including any two letter indices that you have defined yourself using `@defindex` or `@defcodeindex`. You can safely run `texindex foo.??` even if there are files with two letter extensions that are not index files, such as `foo.el`. The `texindex` command reports but otherwise ignores such files.

For each file specified, `texindex` generates a sorted index file whose name is made by appending 's' to the input file name; for example, `foo.cps` is made from `foo.cp`. The `@printindex` command looks for a file with that name (see Section 10.5 [Printing Indices & Menus], page 94). T_EX does not read the raw index output file, and `texindex` does not alter it.

After you have sorted the indices, you need to rerun `tex` on the Texinfo file. This regenerates the output file, this time with up-to-date index entries.

Finally, you may need to run `tex` one more time, to get the page numbers in the cross-references correct.

To summarize, this is a five-step process. (Alternatively, it's a one-step process: run `texi2dvi`; see the previous section.)

1. Run `tex` on your Texinfo file. This generates a DVI file (with undefined cross-references and no indices), and the raw index files (with two letter extensions).
2. Run `texindex` on the raw index files. This creates the corresponding sorted index files (with three letter extensions).
3. Run `tex` again on your Texinfo file. This regenerates the DVI file, this time with indices and defined cross-references, but with page numbers for the cross-references from the previous run, generally incorrect.
4. Sort the indices again, with `texindex`.
5. Run `tex` one last time. This time the correct page numbers are written for the cross-references.

To generate PDF, you can run the `pdftex` program instead of plain `tex`. That is, run `pdftex foo.texi` instead of `tex foo.texi` in the examples above.

18.3.1 Formatting Partial Documents

Sometimes you may wish to print a document while you know it is incomplete, or to print just one chapter of a document. In such a case, the usual auxiliary files that T_EX creates and warnings T_EX gives about undefined cross-references are just nuisances. You can avoid them with the `@novalidate` command, which you must give *before* any sectioning or cross-reference commands.

Thus, the beginning of your file would look approximately like this:

```
\input texinfo
@novalidate
...
```

`@novalidate` also turns off validation in `texi2any`, just like its `--no-validate` option (see Section 19.1 [Invoking `texi2any`], page 164).

Furthermore, you need not run `texindex` each time after you run `tex`. The `tex` formatting command simply uses whatever sorted index files happen to exist from a previous use of `texindex`. If those are out of date, that is usually ok while you are creating or debugging a document.

18.3.2 Details of `texindex`

In Texinfo version 6, released in 2015, the `texindex` program was completely reimplemented. The principal functional difference is that index entries beginning with a left brace or right brace (`{` resp. `}`) can work properly. For example, these simple index entries are processed correctly, including the “index initial” shown in the index:

```
@cindex @{
@cindex @}
...
@printindex cp
```

Although not a matter of functionality, readers may be interested to know that the new `texindex` is a literate program (https://en.wikipedia.org/wiki/Literate_programming) using Texinfo for documentation and (portable) `awk` for code. A single source file, `texindex/ti.twjr` in this case, produces the runnable program, a printable document, and an online document.

The system is called TexiWeb Jr. and was created by Arnold Robbins, who also wrote the new `texindex`. Not coincidentally, he is also the long-time maintainer of `gawk` (GNU Awk, see *The GNU Awk User's Guide*). The file `texindex/Makefile.am` shows example usage of the system.

18.4 Print with `lpr` from Shell

The way to print a DVI file depends on your system installation. Two common ones are `dvips foo.dvi -o` to make a PostScript file first and then print that, and `lpr -d foo.dvi` to print a DVI file directly.

For example, the following commands will (probably) suffice to sort the indices, format, and print this manual using the `texi2dvi` shell script (see [Format with `texi2dvi`], page 157).

```
texi2dvi texinfo.texi
dvips texinfo.dvi -o
lpr texinfo.ps
```

Depending on the `lpr` setup on your machine, you might be able to combine the last two steps into `lpr -d texinfo.dvi`.

You can also generate a PDF file by running `texi2dvi` instead of `texi2dvi`; a PDF is often directly printable. Or you can generate a PCL file by using `dvilj` instead of `dvips`, if you have a printer that prefers that format.

`lpr` is a standard program on Unix systems, but it is usually absent on MS-DOS/MS-Windows. If so, just create a PostScript or PDF or PCL file, whatever is most convenient, and print that in the usual way for your machine (e.g., by sending to the appropriate port, usually `PRN`).

18.5 Preparing for T_EX

T_EX needs to find the `texinfo.tex` file that the `\input texinfo` command on the first line reads. The `texinfo.tex` file tells T_EX how to handle @-commands; it is included in all standard GNU distributions. The latest version released for general use is available from the usual GNU servers and mirrors:

```
http://ftp.gnu.org/gnu/texinfo/texinfo.tex
http://ftpmirror.gnu.org/texinfo/texinfo.tex
```

The latest development version is available from the Texinfo source repository:

```
http://git.savannah.gnu.org/cgiit/texinfo.git/plain/doc/texinfo.tex
```

`texinfo.tex` is essentially a standalone file, so, if you need or want to try a newer version than came with your system, it nearly always suffices to download it and put it anywhere that T_EX will find it. You can replace any existing `texinfo.tex` with a newer version (of course saving the original in case of disaster).

Also, you should install `epsf.tex`, if it is not already installed from another distribution. More details are at the end of the description of the `@image` command (see Section 9.2 [Images], page 86).

To use quotation marks other than those used in English, you'll need to have the European Computer Modern fonts (e.g., `ecrm1000`) and (for PDF output) CM-Super fonts (see Section 11.5 [Inserting Quotation Marks], page 104).

To use the `@euro` command, you'll need the `'feym*` fonts (e.g., `feymr10`). See Section 11.8.6 [`@euro`], page 108.

All of the above files should be installed by default in a reasonable T_EX installation.

Optionally, you may create a file `texinfo.cnf` for site configuration. When processing a Texinfo file, T_EX looks for this file in its search path, which includes the current directory and standard installation directories. You can use this file for local conventions. For example, if `texinfo.cnf` contains the line `@afourpaper` (see Section E.7 [A4 Paper], page 281), then all Texinfo documents will be processed with that page size in effect. If you have nothing to put in `texinfo.cnf`, you do not need to create it.

You can set the `TEXINPUTS` environment variable to allow T_EX to find `texinfo.cnf`. (This also works for `texinfo.tex` and any other file T_EX might read). For example, if you are using a Bourne shell-compatible shell (`sh`, `bash`, `ksh`, ...), your `.profile` file could contain the lines:

```
TEXINPUTS=./home/me/mylib:
export TEXINPUTS
```

These settings would cause T_EX first to look for an `\input` file in the current directory, indicated by the `.`, then in a hypothetical user `'me'`'s `mylib` directory, and finally in the system directories. (A leading, trailing, or doubled `:` indicates searching the system directories at that point.)

18.6 Overfull “hboxes”

T_EX is sometimes unable to typeset a line within the normal margins. This most often occurs when T_EX comes upon what it interprets as a long word that it cannot hyphenate,

such as an electronic mail network address or a very long identifier. When this happens, T_EX prints an error message like this:

```
Overfull @hbox (20.76302pt too wide)
```

(In T_EX, lines are in “horizontal boxes”, hence the term, “hbox”. ‘@hbox’ is a T_EX primitive not used in the Texinfo language.)

T_EX also provides the line number in the Texinfo source file and the text of the offending line, which is marked at all the places that T_EX considered hyphenation. See Section D.10.3 [Debugging with T_EX], page 270, for more information about typesetting errors.

If the Texinfo file has an overfull hbox, you can rewrite the sentence so the overfull hbox does not occur, or you can decide to leave it. A small excursion into the right margin often does not matter and may not even be noticeable.

If you have many overfull boxes and/or an antipathy to rewriting, you can coerce T_EX into greatly increasing the allowable interword spacing, thus (if you’re lucky) avoiding many of the bad line breaks, like this:

```
@tex
\global\emergencystretch = .9\hsize
@end tex
```

(You should adjust the fraction as needed.) This huge value for `\emergencystretch` cannot be the default, since then the typeset output would generally be of noticeably lower quality; its default value is `’.15\hsize’`. `\hsize` is the T_EX dimension containing the current line width.

For any overfull boxes you do have, T_EX will print a large, ugly, black rectangle beside the line that contains the overfull hbox unless told otherwise. This is so you will notice the location of the problem if you are correcting a draft.

To prevent such a monstrosity from marring your final printout, write the following in the beginning of the Texinfo file on a line of its own, before the `@titlepage` command:

```
@finalout
```


19 texi2any: The Translator for Texinfo

`texi2any` is the generic translator for Texinfo that can produce different output formats and is highly customizable. It supports these formats:

- Info (by default, or with `--info`),
- HTML (with `--html`),
- EPUB 3 (with `--epub3`),
- plain text (with `--plaintext`),
- L^AT_EX (with `--latex`),
- DocBook (with `--docbook`),
- Texinfo XML (with `--xml`).

`makeinfo` is an alias for `texi2any`. By default, both `texi2any` and `makeinfo` generate Info output; indeed, there are no differences in behavior based on the name.

Beside these default formats, command line options to `texi2any` can change many aspects of the output. Beyond that, initialization files provide even more control over the final output—nearly anything not specified in the Texinfo input file. Initialization files are written in Perl, like the main program, and anything which can be specified on the command line can also be specified within a initialization file.

19.1 Invoking `texi2any` from a Shell

To process a Texinfo file, invoke `texi2any` followed by the name of the Texinfo file. Also select the format you want to output with the appropriate command line option (default is Info). Thus, to create the Info file for Bison, type the following to the shell:

```
texi2any --info bison.texi
```

You can specify more than one input file name; each is processed in turn. If an input file name is ‘-’, standard input is read.

The `texi2any` program accepts many options. Perhaps the most basic are those that change the output format. By default, `texi2any` outputs Info.

Each command line option is either a long name preceded by ‘--’ or a single letter preceded by ‘-’. You can use abbreviations for the long option names as long as they are unique.

For example, you could use the following shell command to create an Info file for `bison.texi` in which lines are filled to only 68 columns:

```
texi2any --fill-column=68 bison.texi
```

You can write two or more options in sequence, like this:

```
texi2any --no-split --fill-column=70 ...
```

(This would keep the Info file together as one possibly very long file and would also set the fill column to 70.)

The options are (approximately in alphabetical order):

`--commands-in-node-names`

This option now does nothing, but remains for compatibility. (It used to ensure that @-commands in node names were expanded throughout the document, especially @value. This is now done by default.)

- `--conf-dir=dir`
Prepend *dir* to the directory search list for finding customization files that may be loaded with `--init-file` (see below). The *dir* value can be a single directory, or a list of several directories separated by the usual path separator character (':' on Unix-like systems, ';' on Windows).
- `--css-include=file`
When producing HTML, literally include the contents of *file*, which should contain Cascading Style Sheets specifications, in the '<style>' block of the HTML output. If *file* is '-', read standard input. See Section 21.3 [HTML CSS], page 206.
- `--css-ref=url`
When producing HTML, add a '<link>' tag to the output which references a cascading style sheet at *url*. This allows using standalone style sheets.
- `-D var`
`-D 'var value'`
Cause the Texinfo variable *var* to be defined. This is equivalent to `@set var` in the Texinfo file (see Section 15.5 [`@set @clear @value`], page 138).
The argument to the option is always one word to the shell; if it contains internal whitespace, the first word is taken as the variable name and the remainder as the value. For example, `-D 'myvar someval'` is equivalent to `@set myvar someval`.
- `--docbook`
Generate DocBook output (rather than Info).
- `--document-language=lang`
Use *lang* to translate Texinfo keywords which end up in the output document. The default is the locale specified by the `@documentlanguage` command if there is one, otherwise English (see Section 14.1 [`@documentlanguage`], page 131).
- `--dvi`
Generate a TeX DVI file using `texi2dvi`, rather than Info (see Section 19.3 [`texi2any` Printed Output], page 171).
- `--dvipdf`
Generate a PDF file using `texi2dvi --dvipdf`, rather than Info (see Section 19.3 [`texi2any` Printed Output], page 171).
- `--enable-encoding`
`--disable-encoding`
By default, or with `--enable-encoding`, output accented and special characters in Info and plain text output based on the document encoding. With `--disable-encoding`, 7-bit ASCII transliterations are output. Also obeyed in other output formats for index keys sorting and for some plain text output.
- `--epub3`
Generate EPUB 3 output.
- `--error-limit=limit`
`-e limit`
Report *limit* errors before aborting (on the assumption that continuing would be useless); default 100.
- `--fill-column=width`
`-f width`
Specify the maximum number of columns in a line; this is the right-hand edge of a line. Paragraphs that are filled will be filled to this width. (Filling is the

process of breaking up and connecting lines so that lines are the same length as or shorter than the number specified as the fill column. Lines are broken between words.) The default value is 72.

`--footnote-style=style`

`-s style` Set the footnote style to *style*: either ‘end’ for the end node style (the default) or ‘separate’ for the separate node style. The value set by this option overrides the value set in a Texinfo file by a `@footnotestyle` command (see Section 9.3.2 [Footnote Styles], page 89).

In Info, when the footnote style is ‘separate’, `texi2any` makes a new node containing the footnotes found in the current node. When the footnote style is ‘end’, `texi2any` places the footnote references at the end of the current node.

In HTML, when the footnote style is ‘end’, or if the output is not split, footnotes are put at the end of the output. If set to ‘separate’, and the output is split, they are placed in a separate file.

`--force`

`-F` Ordinarily, if the input file has errors, the output files are not created. With this option, they are preserved.

`--help`

`-h` Print a message with available options and basic usage, then exit successfully.

`--html`

Generate HTML output (rather than Info). By default, the HTML output is split into one output file per node, and the split output is written into a subdirectory based on the name of the input file. See Chapter 21 [Generating HTML], page 205.

`-I dir`

Append *dir* to the directory search list for finding files that are included using the `@include` command. By default, `texi2any` searches only the current directory. If *dir* is not given, the current directory is appended. The *dir* value can be a single directory or a list of several directories separated by the usual path separator character (‘:’ on Unix-like systems, ‘;’ on Windows).

`--ifdocbook`

`--ifhtml`

`--ifinfo`

`--iflatex`

`--ifplaintext`

`--iftex`

`--ifxml` For the given format, process ‘`@ifformat`’ and ‘`@format`’ commands, and do not process ‘`@ifnotformat`’, regardless of the format being output. For instance, if `--iftex` is given, then ‘`@iftex`’ and ‘`@tex`’ blocks will be read, and ‘`@ifnottex`’ blocks will be ignored.

- `--no-ifdocbook`
- `--no-ifhtml`
- `--no-ifinfo`
- `--no-iflatex`
- `--no-ifplaintext`
- `--no-iftex`
- `--no-ifxml`
 - For the given format, do not process ‘`@ifformat`’ and ‘`@format`’ commands, and do process ‘`@ifnotformat`’, regardless of the format being output. For instance, if `--no-ifhtml` is given, then ‘`@ifhtml`’ and ‘`@html`’ blocks will not be read, and ‘`@ifnohtml`’ blocks will be.
- `--info`
 - Generate Info output. By default, if the output file contains more than about 300,000 bytes, it is split into shorter subfiles of about that size. The name of the output file and any subfiles is determined by the input file name, or by `@setfilename`, if present (see [Setting the Output File Name], page 13). See Section 20.2 [Tag and Split Files], page 201.
- `--init-file=file`
 - Load *file* as code to modify the behavior and output of the generated manual. It is customary to use the `.pm` or the `.init` extensions for these customization files, but that is not enforced; the *file* name can be anything. The `--conf-dir` option (see above) can be used to add to the list of directories in which these customization files are searched for.
- `--internal-links=file`
 - In HTML mode, output a tab-separated file containing three columns: the internal link to an indexed item or item in the table of contents, the name of the index (or table of contents) in which it occurs, and the term which was indexed or entered. The items are in the natural sorting order for the given element. This dump can be useful for post-processors.
- `--latex`
 - Generate L^AT_EX output.
- `--macro-expand=file`
- `-E file`
 - Output the Texinfo source, with all Texinfo macros expanded, to *file*. Normally, the result of macro expansion is used internally by `texi2any` and then discarded.
- `--no-headers`
 - Do not include menus or node separator lines in the output.
 - When generating Info, this is the same as using `--plaintext`, resulting in a simple plain text file. Furthermore, output is to standard output unless overridden with `-o`. (This behavior is for backward compatibility.)
 - When generating HTML, and output is split, also output navigation links only at the beginning of each file. If output is not split, do not include navigation links at the top of each node at all. See Chapter 21 [Generating HTML], page 205.
- `--node-files`
- `--no-node-files`
 - With `--node-files`, when generating HTML, create redirection files for anchors and any nodes not already output with the file name corresponding to the node

name (see Section 21.7.2 [HTML Xref Node Name Expansion], page 211). This makes it possible for section- and chapter-level cross-manual references to succeed (see Section 21.7.6 [HTML Xref Configuration], page 214).

If the output is split, this is enabled by default. If the output is not split, `--node-files` enables the creation of the redirection files, in addition to the monolithic main output file. `--no-node-files` suppresses the creation of redirection files in any case. This option has no effect with any output format other than HTML. See Chapter 21 [Generating HTML], page 205.

`--no-validate`

`--no-pointer-validate`

Suppress the pointer-validation phase of `texi2any`—a dangerous thing to do. This can also be done with the `@novalidate` command (see Section 18.3.1 [Formatting Partial Documents], page 160).

If you do not suppress pointer validation, `texi2any` will check the validity of cross-references and menu entries in the Texinfo file, as well as node pointers if they are given explicitly.

`--no-warn`

Suppress warning messages (but not error messages).

`--number-footnotes`

`--no-number-footnotes`

With `--no-number-footnotes`, suppress automatic footnote numbering. By default, footnotes are numbered sequentially within a node, i.e., the current footnote number is reset to 1 at the start of each node.

`--number-sections`

`--no-number-sections`

With `--number-sections` (the default), output chapter, section, and appendix numbers as in printed manuals. This works only with hierarchically structured manuals. You should specify `--no-number-sections` if your manual is not normally structured.

`--output=file`

`-o file` Specify that the output should be directed to *file*. This overrides any file name specified in a `@setfilename` command found in the Texinfo source. If neither `@setfilename` nor this option are specified, the input file name is used to determine the output name. See [Setting the Output File Name], page 13.

If *file* is `-`, output goes to standard output and `--no-split` is implied.

If *file* is a directory or ends with a `/` the usual rules are used to determine the output file name (namely, use `@setfilename` or the input file name) but the files are written to the *file* directory. For example, `'texi2any -o bar/ foo.texi'`, with or without `--no-split`, will write `bar/foo.info`, and possibly other files, under `bar/`.

When generating HTML and output is split, *file* is used as the name for the directory into which all files are written. For example, `'texi2any -o bar --html foo.texi'` will write `bar/index.html`, among other files.

When generating EPUB a container directory for the files and directories needed for the EPUB format is created, as well as the EPUB output file. If *file* corresponds to a directory, the container directory is placed within *file*. The EPUB output file is never put in this directory. If *file* corresponds to a file, it is used for the EPUB output file name.

`--output-indent=val`

This option now does nothing, but remains for compatibility. (It used to alter indentation in XML/DocBook output.)

`-P path` Prepend *path* to the directory search list for `@include`. If *path* is not given, the current directory is prepended. See ‘`-I`’ above.

`--paragraph-indent=indent`

`-p indent` Set the paragraph indentation style to *indent*. The value set by this option overrides the value set in a Texinfo file by an `@paragraphindent` command (see Section E.3 [`@paragraphindent`], page 280). The value of *indent* is interpreted as follows:

‘`asis`’ Preserve any existing indentation (or lack thereof) at the beginnings of paragraphs.

‘`0`’ or ‘`none`’ Delete any existing indentation.

num Indent each paragraph by *num* spaces.

The default is to indent by two spaces, except for paragraphs following a section heading, which are not indented.

`--pdf` Generate a PDF file using `texi2dvi --pdf`, rather than Info (see Section 19.3 [`texi2any` Printed Output], page 171).

`--plaintext`

Output a plain text file (rather than Info): do not include menus or node separator lines in the output. This results in a straightforward plain text file that you can (for example) send in email without complications, or include in a distribution (for example, an `INSTALL` file).

With this option the output goes to standard output by default, instead of to a file with a name based on the input file name or `@setfilename`; this can be overridden with `-o`.

`--ps` Generate a PostScript file using `texi2dvi --ps`, rather than Info (see Section 19.3 [`texi2any` Printed Output], page 171).

`--set-customization-variable var=value`

`-c var=value`

Set the customization variable *var* to *value*. The `=` is optional, but both *var* and *value* must be quoted to the shell as necessary so the result is a single word. Many aspects of `texi2any` behavior and output may be controlled by customization variables, beyond what can be set in the document by `@-`commands and with other command line switches. See Section 19.4 [Customization Variables], page 172.

`--split=how`

`--no-split`

When generating Info, by default large output files are split into smaller subfiles, of approximately 300k bytes. When generating HTML, by default each output file contains one node (see Chapter 21 [Generating HTML], page 205). `--no-split` suppresses this splitting of the output.

Alternatively, `--split=how` may be used to specify at which level the HTML output should be split. The possible values for *how* are:

‘`chapter`’ The output is split at `@chapter` and other sectioning `@`-commands at this level (`@appendix`, etc.).

‘`section`’ The output is split at `@section` and similar.

‘`node`’ The output is split at every node. This is the default.

Plain text output can be split similarly to HTML. This may be useful for extracting sections from a Texinfo document and making them available as separate files.

`--split-size=num`

Keep Info files to at most *num* characters if possible; default is 300,000. (However, a single node will never be split across Info files.)

`--transliterate-file-names`

Enable transliteration of non-ASCII characters in node names for the purpose of file name creation. See Section 21.7.4 [HTML Xref 8-bit Character Expansion], page 213.

`-U var`

Cause *var* to be undefined. This is equivalent to `@clear var` in the Texinfo file (see Section 15.5 [`@set @clear @value`], page 138).

`--verbose`

Cause `texi2any` to display messages saying what it is doing. Normally, `texi2any` only outputs messages if there are errors or warnings.

`--version`

`-V`

Print the version number, then exit successfully.

`--Xopt str`

Pass *str* (a single shell word) to `texi2dvi`; may be repeated (see Section 19.3 [`texi2any` Printed Output], page 171).

`--xml`

Generate Texinfo XML output (rather than Info).

19.2 Environment Variables Recognized by `texi2any`

`texi2any` also reads the environment variable `TEXINFO_OUTPUT_FORMAT` to determine the output format, if not overridden by a command line option. The value should be one of:

`docbook dvi dvi pdf epub3 html info latex pdf plaintext ps xml`

If not set or otherwise specified, Info output is the default.

`TEXINFO_OUTPUT_FORMAT` may take some other special values, which do not correspond to any command-line settable output format (see Section 19.4.2 [Customization Variables and Options], page 173).

The customization variable of the same name is also read; if set, that overrides an environment variable setting, but not a command-line option. See Section 19.4.2 [Customization Variables and Options], page 173.

You can control `texi2any`'s use of Perl extension modules by setting the `TEXINFO_XS` environment variable. These modules are compiled native code that the interpreted Perl code can use. Ideally, these extension modules should just work, and the only noticeable difference they should make is that `texi2any` finishes running sooner. However, you can use this environment variable for the purposes of troubleshooting: for example, if you have problems with the output of `texi2any` varying depending on whether the extension modules are in use.

The following values of `TEXINFO_XS` are recognized by `texi2any`:

- 'default' The default behavior. Try to load extension modules, and silently fall back to the interpreted Perl implementations if this fails.
- 'warn' Try to load extension modules, and if this fails, give a warning message before falling back to the interpreted Perl implementations.
- 'debug' Try to load extension modules, printing many messages while doing so.
- 'omit' Do not use extension modules.

Set `TEXINFO_XS_PARSER` to '0' to disable the use of the native code implementation of the parser module. This is the part of `texi2any` that converts Texinfo input into an internal tree format used for further processing into output formats. This may be useful for working around bugs or incompatibilities between the native code implementation and the implementation in pure Perl code.

19.3 `texi2any` Printed Output

To justify the name Texinfo-to-*any*, `texi2any` has basic support for creating printed output in the various formats: TeX DVI, PDF, and PostScript. This is done via the simple method of executing the `texi2dvi` program when those output formats are requested, after checking the validity of the input to give users the benefit of `texi2any`'s error checking. If you don't want such error checking, perhaps because your manual plays advanced TeX tricks together with `texinfo.tex`, just invoke `texi2dvi` directly.

The output format options for this are `--dvi`, `--dviPDF`, `--pdf`, and `--ps`. See [Format with `texi2dvi`], page 157, for more details on these options and general `texi2dvi` operation. In addition, the `--verbose`, `--silent`, and `--quiet` options are passed on if specified; the `-I` and `-o` options are likewise passed on with their arguments, and `--debug` without its argument.

The only option remaining that is related to the `texi2dvi` invocation is `--Xopt`. Here, just the argument is passed on and multiple `--Xopt` options accumulate. This provides a way to construct an arbitrary command line for `texi2dvi`. For example, running

```
texi2any --Xopt -t --Xopt @a4paper --pdf foo.texi
```


is equivalent to running

```
texi2dvi -t @a4paper --pdf foo.texi
```

except for the validity check.

Although one might wish that other options to `texi2any` would take effect, they don't. For example, running '`texi2any --no-number-sections --dvi foo.texi`' still results in a DVI file with numbered sections. (Perhaps this could be improved in the future, if requests are received.)

The actual name of the command that is invoked is specified by the `TEXI2DVI` customization variable (see Section 19.4.8 [Other Customization Variables], page 183). As you might guess, the default is '`texi2dvi`'.

`texi2any` itself does not generate any normal output when it invokes `texi2dvi`, only diagnostic messages.

19.4 Customization Variables

Warning: These customization variable names and meanings may change in any Texinfo release. We always try to avoid incompatible changes, but we cannot absolutely promise, since needs change over time.

Many aspects of the behavior and output of `texi2any` may be modified by modifying so-called *customization variables*. These fall into a few general categories:

- Those associated with @-commands; for example, `@documentlanguage`.
- Those associated with command-line options; for example, the customization variable `SPLIT` is associated with the `--split` command-line option, and `TEXINFO_OUTPUT_FORMAT` allows specifying the output format.
- Those associated with customizing the HTML output.
- Other ad hoc variables.

Customization variables may set on the command line using `--set-customization-variable 'var value'` (quoting the variable/value pair to the shell) or `--set-customization-variable var=value` (using =). A special *value* is '`undef`', which sets the variable to this special “undefined” Perl value.

The sections below give the details for each of these.

19.4.1 Customization Variables for @-Commands

Each of the following @-commands has an associated customization variable with the same name (minus the leading @):

<code>@afivepaper</code>	<code>@afourpaper</code>	<code>@afourlatex</code>
<code>@afourwide</code>	<code>@allowcodebreaks</code>	<code>@bsixpaper</code>
<code>@contents</code>	<code>@clickstyle</code>	<code>@codequotebacktick</code>
<code>@codequoteundirected</code>	<code>@deftypefnnewline</code>	<code>@documentdescription</code>
<code>@documentencoding</code>	<code>@documentlanguage</code>	<code>@evenfooting</code>
<code>@evenfootingmarks</code>	<code>@evenheading</code>	<code>@evenheadingmarks</code>
<code>@everyfooting</code>	<code>@everyfootingmarks</code>	<code>@everyheading</code>
<code>@everyheadingmarks</code>	<code>@exampleindent</code>	<code>@firstparagraphindent</code>
<code>@fonttextsize</code>	<code>@footnotestyle</code>	<code>@frenchspacing</code>

<code>@headings</code>	<code>@kbdinputstyle</code>	<code>@microtype</code>
<code>@novalidate</code>	<code>@oddfooting</code>	<code>@oddfootingmarks</code>
<code>@oddheading</code>	<code>@oddheadingmarks</code>	<code>@pagesizes</code>
<code>@paragraphindent</code>	<code>@setfilename</code>	<code>@setchapternewpage</code>
<code>@shortcontents</code>	<code>@smallbook</code>	<code>@summarycontents</code>
<code>@urefbreakstyle</code>	<code>@xrefautomaticsectiontitle</code>	

Setting such a customization variable to a value ‘foo’ is similar to executing `@cmd foo`. It is not exactly the same, though, since any side effects of parsing the Texinfo source are not redone. Also, some variables do not take Texinfo code when generating particular formats, but an argument that is already formatted. This is the case, for example, for HTML for `documentdescription`.

Note that if `texi2any` is invoked to process the file with \TeX (e.g., with the `--pdf` option), then these customization variables may not be passed on to \TeX .

19.4.2 Customization Variables and Options

The following table gives the customization variables associated with some command line options. See Section 19.1 [Invoking `texi2any`], page 164, for the meaning of the options.

Option	Variable
<code>--enable-encoding</code>	<code>ENABLE_ENCODING</code>
<code>--document-language</code>	<code>documentlanguage</code>
<code>--error-limit</code>	<code>ERROR_LIMIT</code>
<code>--fill-column</code>	<code>FILLCOLUMN</code>
<code>--footnote-style</code>	<code>footnotestyle</code>
<code>--force</code>	<code>FORCE</code>
<code>--internal-links</code>	<code>INTERNAL_LINKS</code>
<code>--macro-expand</code>	<code>MACRO_EXPAND</code>
<code>--headers</code>	<code>HEADERS, FORMAT_MENU</code>
<code>--no-warn</code>	<code>NO_WARN</code>
<code>--no-validate</code>	<code>novalidate</code>
<code>--number-footnotes</code>	<code>NUMBER_FOOTNOTES</code>
<code>--number-sections</code>	<code>NUMBER_SECTIONS</code>
<code>--node-files</code>	<code>NODE_FILES</code>
<code>--output</code>	<code>OUTFILE, SUBDIR</code>
<code>--paragraph-indent</code>	<code>paragraphindent</code>
<code>--silent</code>	<code>SILENT</code>
<code>--split</code>	<code>SPLIT</code>
<code>--split-size</code>	<code>SPLIT_SIZE</code>
<code>--transliterate-file-names</code>	<code>TRANSLITERATE_FILE_NAMES</code>
<code>--verbose</code>	<code>VERBOSE</code>

Setting such a customization variable to a value ‘foo’ is essentially the same as specifying the `--opt=foo` if the option takes an argument, or `--opt` if not.

In addition, the customization variable `TEXINFO_OUTPUT_FORMAT` allows specifying what `texi2any` outputs, either one of the usual output formats that can be specified with options, or various other forms:

<code>'docbook'</code>	
<code>'dvi'</code>	
<code>'dvipdf'</code>	
<code>'epub3'</code>	
<code>'html'</code>	
<code>'info'</code>	
<code>'pdf'</code>	
<code>'plaintext'</code>	
<code>'ps'</code>	
<code>'xml'</code>	These correspond to the command-line options (and <code>TEXINFO_OUTPUT_FORMAT</code> environment variable values) of the same name. See Section 19.1 [Invoking <code>texi2any</code>], page 164.
<code>'debugtree'</code>	Instead of generating a regular output format, output a text representation of the tree obtained by parsing the input texinfo document.
<code>'parse'</code>	Do only Texinfo source parsing; there is no output.
<code>'plaintexinfo'</code>	Output the Texinfo source with all the macros, <code>@include</code> and <code>@value{}</code> expanded. This is similar to setting <code>--macro-expand</code> , but instead of being output in addition to the normal conversion, output of Texinfo is the main output.
<code>'rawtext'</code>	Output raw text, with minimal formatting. For example, footnotes are ignored and there is no paragraph filling. This is used by the parser for file names and copyright text in HTML comments, for example.
<code>'structure'</code>	Do only Texinfo source parsing and determination of the document structure; there is no output.
<code>'texinfosxml'</code>	Output the document in TexinfoSXML representation, a syntax for writing XML data using Lisp S-expressions.
<code>'textcontent'</code>	Output the text content only, stripped of commands; this is useful for spell checking or word counting, for example. The trivial <code>detexinfo</code> script setting this is in the <code>util</code> directory of the Texinfo source as an example. It's one line: <pre>exec texi2any -c TEXINPUT_OUTPUT_FORMAT=textcontent "\$@"</pre>

19.4.3 HTML Customization Variables

This table gives the customization variables which apply to HTML output only. A few other customization variables apply to both HTML and other output formats; see Section 19.4.8 [Other Customization Variables], page 183.

AVOID_MENU_REDUNDANCY

If set, and the menu entry and menu description are the same, then do not print the menu description; default false.

AFTER_BODY_OPEN

If set, the corresponding text will appear at the beginning of each HTML file; default unset.

AFTER_SHORT_TOC_LINES**AFTER_TOC_LINES**

If set, the corresponding text is output after the short table of contents for `AFTER_SHORT_TOC_LINES` and after the table of contents for `AFTER_TOC_LINES`; otherwise, a default string is used. At the time of writing, a `</div>` element is closed.

In general, you should set `BEFORE_SHORT_TOC_LINES` if `AFTER_SHORT_TOC_LINES` is set, and you should set `BEFORE_TOC_LINES` if `AFTER_TOC_LINES` is set.

BASEFILENAME_LENGTH

The maximum length of a base file name; default 245. Changing this would make cross-manual references to such long node names invalid (see Section 21.7.1 [HTML Xref Link Basics], page 210).

BEFORE_SHORT_TOC_LINES**BEFORE_TOC_LINES**

If set, the corresponding text is output before the short table of contents for `BEFORE_SHORT_TOC_LINES` and before the table of contents for `BEFORE_TOC_LINES`, otherwise a default string is used. At the time of writing, a `<div ...>` element is opened.

In general you should set `AFTER_SHORT_TOC_LINES` if `BEFORE_SHORT_TOC_LINES` is set, and you should set `AFTER_TOC_LINES` if `BEFORE_TOC_LINES` is set.

BIG_RULE Rule used after and before the top element and before special elements, but not for footers and headers; default `<hr>`.

BODYTEXT The text appearing in `<body>`. By default, sets the HTML `lang` attribute to the document language (see Section 14.1 [`@documentlanguage`], page 131).

CASE_INSENSITIVE_FILENAMES

Construct output file names as if the filesystem were case insensitive (see Section 21.2 [HTML Splitting], page 206); default false.

CHAPTER_HEADER_LEVEL

Header formatting level used for chapter level sectioning commands; default '2'.

CHECK_HTMLXREF

Check that manuals which are the target of external cross-references (see Section 5.6 [Four and Five Arguments], page 47) are present in `htmlxref.cnf` (see Section 21.7.6 [HTML Xref Configuration], page 214); default false.

COMPLEX_FORMAT_IN_TABLE

If set, use tables for indentation of complex formats; default false.

CONTENTS_OUTPUT_LOCATION

If set to `'after_top'`, output the contents at the end of the `@top` section. If set to `'inline'`, output the contents where the `@contents` and similar `@-`commands

are located. If set to `'separate_element'` output the contents in separate elements, either at the end of the document if not split, or in a separate file. If set to `'after_title'` the tables of contents are output after the title; default `'after_top'`.

CONVERT_TO_LATEX_IN_MATH

If set, try to convert any Texinfo `@`-commands inside `@math` and `@displaymath` to \LaTeX , before converting the `@math` or `@displaymath` to HTML. Default `undef`. If undefined, set if `HTML_MATH` is set.

COPIABLE_LINKS

If set, output copiable links for the definition commands (see Chapter 13 [Definition Commands], page 118) and table commands (see Section 8.4 [Two-column Tables], page 79) where an index entry is defined. A link appears as a `¶` sign that appears when you hover the mouse pointer over the heading text.

DATE_IN_HEADER

Put the document generation date in the header; off by default.

DEF_TABLE

If set, a `<table>` construction for `@deffn` and similar `@`-commands is used (looking more like the \TeX output), instead of definition lists; default false.

DEFAULT_RULE

Rule used between element, except before and after the top element, and before special elements, and for footers and headers; default `<hr>`.

DO_ABOUT If set to 0 never do an About special element; if set to 1 always do an About special element; default 0.

EXTERNAL_CROSSREF_SPLIT

For cross-references to other manuals, this determines if the other manual is considered to be split or monolithic. By default, it is set based on the value of `SPLIT`. See Section 21.7 [HTML Xref], page 209, and see Section 21.7.6 [HTML Xref Configuration], page 214.

EXTERNAL_DIR

Base directory for external manuals; default none. It is better to use the general external cross-reference mechanism (see Section 21.7.6 [HTML Xref Configuration], page 214) than this variable.

EXTERNAL_CROSSREF_EXTENSION

File extension for cross-references to other manuals. If unset, based on `EXTENSION`.

EXTRA_HEAD

Additional text appearing within `<head>`; default unset.

FOOTNOTE_END_HEADER_LEVEL

Header formatting level used for the footnotes header with the `'end'` `footnotestyle`; default `'4'`. See Section 9.3.2 [Footnote Styles], page 89.

FOOTNOTE_SEPARATE_HEADER_LEVEL

Header formatting level used for the footnotes header with the `'separate'` `footnotestyle`; default `'4'`. See Section 9.3.2 [Footnote Styles], page 89.

FRAMES If set, a file describing the frame layout is generated, together with a file with the short table of contents; default false.

FRAMESET_DOCTYPE
Same as `DOCTYPE`, but for the file containing the frame description.

HEADER_IN_TABLE
Use tables for header formatting rather than a simple `<div>` element; default false.

HTML_MATH
Method to use to render `@math`. This can be unset, set to `'mathjax'` (see Section 19.4.4 [MathJax Customization Variables], page 181), set to `'l2h'`, which uses `latex2html` (see Section 19.4.5 [`latex2html` Customization Variables], page 181), or set to `'t4h'`, which uses `tex4ht` (see Section 19.4.6 [`tex4ht` Customization Variables], page 182). In the default case, setting `HTML_MATH` also sets `CONVERT_TO_LATEX_IN_MATH`.

HTML_ROOT_ELEMENT_ATTRIBUTES
Use that string for the `<html>` HTML document root element. Default undefined.

HTMLXREF_FILE
Set the file name used for cross-references to other manuals. If not defined, `htmlxref.cnf` is used (see Section 21.7.6 [HTML Xref Configuration], page 214). Not defined in the default case. If `TEST` is set, `HTMLXREF_MODE` is set to the default and `HTMLXREF_FILE` is not defined, information on cross-references to other manuals is not used.

If `HTMLXREF_MODE` is set to `'file'` the file name is directly used as the source of information, otherwise the file name is searched for in directories, and all the files found are used (see Section 21.7.6 [HTML Xref Configuration], page 214).

HTMLXREF_MODE
How cross-references to other manuals information is determined. If set to `'none'`, no information is used. If set to `'file'`, the information is determined from a file path, `htmlxref.cnf` in the default case, or the value of `HTMLXREF_FILE`. If not defined (the default) or set to any other value, search in directories and use all the files (see Section 21.7.6 [HTML Xref Configuration], page 214).

ICONS Use icons for the navigation panel; default false.

IMAGE_LINK_PREFIX
If set, the associated value is prepended to the image file links; default unset.

INDEX_ENTRY_COLON
Symbol used between the index entry and the associated node or section; default `':'`.

INFO_JS_DIR
(Experimental.) Add a JavaScript browsing interface to the manual. The value of the variable is the directory to place the code for this interface, so you would run the program as e.g. `'texi2any --html -c INFO_JS_DIR=js manual.texi'` to place files in a `'js'` directory under the output. This provides some of the

functionality of the Info browsers in a web browser, such as keyboard navigation and index lookup. This only works with non-split HTML output.

The interface should provide an acceptable fallback in functionality if JavaScript or web browser features are not available. However, please be cautious when using this option, in case you do make your documentation harder to access for some of your users.

`IGNORE_REF_TO_TOP_NODE_UP`

Ignore references to `TOP_NODE_UP`, the up node for the Top node.

`INLINE_CSS_STYLE`

Put CSS directly in HTML elements rather than at the beginning of the output; default false.

`JS_WEBLABELS`

`JS_WEBLABELS_FILE`

Specify how to use a *JavaScript license web labels* page to give licensing information and source code for any JavaScript used in the HTML files for the manual. (See <https://www.gnu.org/licenses/javascript-labels.html>).

With the value `'generate'` (the default), generate a labels page at `JS_WEBLABELS_FILE`, and link to it in the HTML output files. Only do this if actually referencing JavaScript files (either with `HTML_MATH` set to `'mathjax'`, or when using the experimental JS browsing interface when `INFO_JS_DIR` is set). With this setting, `JS_WEBLABELS_FILE` must be a relative file name.

With the value `'reference'`, link to the labels file given by `JS_WEBLABELS_FILE` in the output, and do not generate a labels file. This setting is useful if you separately maintain a single labels file for a larger website that includes your manual.

With `'omit'`, neither generate nor link to a labels file.

`MAX_HEADER_LEVEL`

Maximum header formatting level used (higher header formatting level numbers correspond to lower sectioning levels); default `'4'`.

`MENU_ENTRY_COLON`

Symbol used between the menu entry and the description; default `':'`.

`MENU_SYMBOL`

Symbol used in front of menu entries when node names are used for menu entries formatting; default is undefined and set to `•`; if `USE_NUMERIC_ENTITY` is not set, and to `’`; if set.

`MONOLITHIC`

Output only one file including the table of contents. Set by default, but only relevant when the output is not split.

`NO_CSS` Do not use CSS; default false. See Section 21.3 [HTML CSS], page 206.

`NO_CUSTOM_HTML_ATTRIBUTE`

Do not output HTML with custom attributes in elements; default false.

NO_NUMBER_FOOTNOTE_SYMBOL

Symbol used for footnotes if `NUMBER_FOOTNOTES` is false. Default is `*`.

NODE_NAME_IN_INDEX

If true, use node names in index entries, otherwise prefer section names. If undefined, use `USE_NODES` value in HTML. Default is undefined.

PRE_BODY_CLOSE

If set, the given text will appear at the footer of each HTML file; default unset.

PROGRAM_NAME_IN_ABOUT

Used when an About element is output. If set, output the program name and miscellaneous related information in About special element; default false.

PROGRAM_NAME_IN_FOOTER

If set, output the program name and miscellaneous related information in the page footers; default false.

SECTION_NAME_IN_TITLE

If set, when output is split, use the argument of the chapter structuring command (e.g., `@chapter` or `@section`) in the `<title>` instead of the argument to `@node`.

SHORT_TOC_LINK_TO_TOC

If set, the cross-references in the Short table of contents links to the corresponding Table of Contents entries, if a Table of Contents is output; default true.

SHOW_BUILTIN_CSS_RULES

Output the built-in default CSS rules on the standard output and exit.

SHOW_TITLE

If set, output the title at the beginning of the document; default `'undef'`. If set to `'undef'`, setting `NO_TOP_NODE_OUTPUT` also sets `SHOW_TITLE` for HTML.

SIMPLE_MENU

If set, use a simple preformatted style for the menu, instead of breaking down the different parts of the menu; default false. See Section 3.9.4 [Menu Parts], page 36.

TOC_LINKS

If set, links from headings to toc entries are created; default false.

TOP_FILE This file name may be used for the top-level file. The extension is set appropriately, if necessary. This is used to override the default, and is, in general, only taken into account when output is split, and for HTML.

TOP_NODE_FILE_TARGET

File name used for the Top node in cross-references; default is `index.html`.

TOP_NODE_UP_URL

A URL used for Top node up references; the default is `undef`, in that case no Top node Up reference is generated. For more about the Top node pointers, see Section 3.4 [First Node], page 30. For overriding the Up pointer name in case `TOP_NODE_UP_URL` is set and for other formats, see `TOP_NODE_UP` in Section 19.4.8 [Other Customization Variables], page 183.

USE_ACCESSKEY

Use `accesskey` in cross-references; default true.

USE_ISO

Use entities for doubled single-quote characters (see Section 11.5 [Inserting Quotation Marks], page 104), and ‘`---`’ and ‘`--`’ (see Section 2.1 [Conventions], page 9); default true.

USE_LINKS

Generate `<link>` elements in the HTML `<head>` output; default true.

USE_NEXT_HEADING_FOR_LONE_NODE

If set, a node not associated to a sectioning command but followed by a heading command not usually associated to node such as `@heading` before other formatted contents do not have its name output as a heading, under the assumption that the command found provides the heading. Default true.

USE_NODE_DIRECTIONS

If true, use nodes to determine where next, up and prev link to in node headers. If false, use sections. If undefined, use `USE_NODES` value. Default is undefined. Note that this setting does not determine the link string only where the links points to, see Section 5.5 [xrefautomaticsectiontitle], page 46, for the link string customization. If nodes and sections are systematically associated, this customization has no practical effect.

USE_REL_REV

Use `rel` in cross-references; default true.

USE_TITLEPAGE_FOR_TITLE

Use the full `@titlepage` as the title, not a simple title string; default true. Only relevant if `SHOW_TITLE` is set.

USE_XML_SYNTAX

Use XML/XHTML compatible syntax.

VERTICAL_HEAD_NAVIGATION

If set, a vertical navigation panel is used; default false.

WORDS_IN_PAGE

When output is split by nodes, specifies the approximate minimum page length at which a navigation panel is placed at the bottom of a page. To avoid ever having the navigation buttons at the bottom of a page, set this to a sufficiently large number. The default is 300.

XREF_USE_FLOAT_LABEL

If set, for the float name in cross-references, use the float label instead of the type followed by the float number (see Section 9.1.1 [`@float`], page 84). The default is off.

XREF_USE_NODE_NAME_ARG

Only relevant for cross-reference commands with no cross reference name (second argument). If set to 1, use the node name (first) argument in cross-reference `@-`commands for the text displayed as the hyperlink. If set to 0, use the node name if `USE_NODES` is set, otherwise the section name. If set to ‘`undef`’, use the

first argument in preformatted environments, otherwise use the node name or section name depending on `USE_NODES`. The default is `'undef'`.

19.4.4 MathJax Customization Variables

This table lists the customization variables which can be used when MathJax is being used, which will be the case when `HTML_MATH` is set to `'mathjax'`.

MATHJAX_SCRIPT

URL of the MathJax component file (e.g. `tex-svg.js`) you are using. `texi2any` provides a default value for this variable, but you are encouraged to host this file yourself on your website so that you are not dependent on others' hosting.

MATHJAX_SOURCE

A URL of the full source code in its preferred form for modification, or instructions for obtaining such source code, for the component file named by `MATHJAX_SCRIPT`. 'Preferred form for modification' means that this should not be in a 'minified' form. Used in the license labels page (see Section 19.4.3 [HTML Customization Variables], page 174, under `JS_WEBLABELS`).

Again, `texi2any` provides a default value for this variable, but you are encouraged to host the source code for MathJax and its dependencies yourself. This is in order to make the source code available reliably, and to reduce you and your users' dependence on others' distribution systems.

19.4.5 latex2html Customization Variables

This table lists the customization variables which can be used when `latex2html` is being used to convert `@math`, `@displaymath`, `@latex` and `@tex` sections for HTML. These customization variables are relevant only if `HTML_MATH` is set to `'l2h'`.

To actually convert `@tex` sections, `--iftex` should be used, and to actually convert `@latex` sections, `--iflatex` should be used.

L2H_CLEAN

If set, the intermediate files generated in relation with `latex2html` are removed; default true.

`L2H_FILE` If set, the given file is used as `latex2html`'s init file; default unset.

L2H_HTML_VERSION

The HTML version used in the `latex2html` call; default unset.

`L2H_L2H` The program invoked as `latex2html`; default is `latex2html`.

`L2H_SKIP` If set to a true value, the actual call to `latex2html` is skipped; previously generated content is reused instead. If set to 0, the cache is not used at all. If set to `'undef'`, the cache is used for as many \TeX fragments as possible and for any remaining the command is run. The default is `'undef'`.

`L2H_TMP` Set the directory used for temporary files. None of the file name components in this directory name may start with `'.'`; otherwise, `latex2html` will fail (because of `dvips`). The default is the empty string, which means the current directory.

19.4.6 tex4ht Customization Variables

This table lists the customization variables which can be used when `tex4ht` is being used to convert `@math`, `@displaymath`, `@tex` and `@latex` sections for HTML. These customization variables are relevant only if `HTML_MATH` is set to `'t4h'`.

To actually convert `@tex` sections, `--iftex` should be used, and to actually convert `@latex` sections, `--iflatex` should be used.

T4H_LATEX_CONVERSION

If set, the conversion type used for `@latex` sections. Possibilities are `'latex'`, `'tex'` and `'texi'`. Set to `'latex'` if not defined.

T4H_MATH_CONVERSION

If set, the conversion type used for `@math` and `@displaymath`. Possibilities are `'latex'`, `'tex'` and `'texi'`. Set to `'tex'` if not defined.

T4H_TEX_CONVERSION

If set, the conversion type used for `@tex` sections. Possibilities are `'latex'`, `'tex'` and `'texi'`. Set to `'tex'` if not defined.

19.4.7 L^AT_EX Customization Variables

warning: L^AT_EX output customization is experimental. Nothing is decided, everything can change, and we would welcome any feedback.

This table gives the customization variables which apply to L^AT_EX output only.

CLASS_BEGIN_USEPACKAGE

If set, the corresponding text will replace the L^AT_EX `\documentclass`, package imports that are always output and are output right after `\documentclass`, and package imports that depend on the document encoding setting the input and font encoding (`inputenc` and `fontenc`).

The text replaced is along:

```
\documentclass{book}
\usepackage{amsfonts}
\usepackage{amsmath}
\usepackage[gen]{eurosym}
\usepackage{textcomp}
\usepackage{graphicx}
\usepackage{etoolbox}
\usepackage{titleps}
\usepackage[utf8]{inputenc}
\usepackage[T1]{fontenc}
```

END_USEPACKAGE

If set, the corresponding text will replace the package imports that depend on the Texinfo commands used, and the last packages imports that are always output and output after all the other packages imports. The last package imports corresponds to `'\usepackage[hidelinks]{hyperref}'`.

Here is an example of the corresponding text for a document with indices, `@need`, `@multitable`, definition commands, `@cartouche`, lists, and `@float`:

```
\usepackage{imakeidx}
\usepackage{needspace}
\usepackage{array}
\usepackage{embrac}
\usepackage{expl3}
\usepackage{tabularx}
\usepackage[framemethod=tikz]{mdframed}
\usepackage{enumitem}
\usepackage{float}
\usepackage[hidelinks]{hyperref}
```

19.4.8 Other Customization Variables

This table gives the remaining customization variables, which apply to multiple formats, or affect global behavior, or otherwise don't fit into the categories of the previous sections.

ASCII_DASHES_AND_QUOTES

For Info output, when set, use plain ASCII characters to represent quotation marks, hyphens and dashes when these are given in the Texinfo source as `'-`, `'--'`, `'---`, `'~'`, `'~~'`, `'|'`, and `'||'`, rather than UTF-8 directional quotation marks, en dashes, vel sim. On by default.

ASCII_GLYPH

For Info output, use ASCII output for glyph commands such as the copyright sign (`@copyright{}`, becoming `'(C)'`), and the bullet symbol (`@bullet{}`, becoming `'*`'), rather than other Unicode sequences. Off by default.

ASCII_PUNCTUATION

Avoid any unnecessary or gratuitous non-ASCII, UTF-8 sequences in the output. Implies both `ASCII_DASHES_AND_QUOTES` and `ASCII_GLYPH` and additionally affects the output of commands such as `@samp` which output quotation marks.

AUTO_MENU_DESCRIPTION_ALIGN_COLUMN

For Info output, column at which to start a menu entry description provided by `@nodedescription` or `@nodedescriptionblock`. Undefined by default, in which case 45% of the fill column value is used (see Section 19.1 [Invoking `texi2any`], page 164).

AUTO_MENU_MAX_WIDTH

Maximum number of columns in a menu entry line in Info when adding a description from `@nodedescription` or `@nodedescriptionblock`. Undefined by default, in which case 10% more than the fill column value is used (see Section 19.1 [Invoking `texi2any`], page 164).

CHECK_MISSING_MENU_ENTRY

When a `@menu` block occurs in a node, check if there is a menu entry for all subordinate nodes in the document sectioning structure. On by default.

CHECK_NORMAL_MENU_STRUCTURE

Warn if the node pointers (either explicitly or automatically set) are not consistent with the order of node menu entries. This is a more thorough structure check than that provided by `CHECK_MISSING_MENU_ENTRY`. Off by default.

CLOSE_QUOTE_SYMBOL

When a closing quote is needed, e.g. for `@samp` output, use this character; default `’` in DocBook. Undefined in the default case in HTML and set to `’` if `USE_NUMERIC_ENTITY` is not set, to `’` if set, and to a quote character if `OUTPUT_CHARACTERS` is set and the output encoding includes that character.

The default for Info is set the same as for `OPEN_QUOTE_SYMBOL`, except that the Unicode code is a closing quote (see below).

CLOSE_DOUBLE_QUOTE_SYMBOL

When a closing double quote is needed, for `'@dfn'` in Info, use this character. The default for Info is set the same as for `OPEN_DOUBLE_QUOTE_SYMBOL`, except that the Unicode code is a closing double quote (see below).

COMMAND_LINE_ENCODING

Encoding used to decode command-line arguments. Default is based on the locale encoding. This may affect file names inserted into output files or error messages printed by the program.

Note that some file and directory names from the command line may not be decoded immediately, and may not be decoded at all.

CPP_LINE_DIRECTIVES

Recognize `#line` directives in a “preprocessing” pass (see Section 16.7 [External Macro Processors], page 153); on by default.

DEBUG If set, debugging output is generated; default is off (zero).

DOC_ENCODING_FOR_INPUT_FILE_NAME

If set, use the input Texinfo document encoding information for the encoding of input file names, such as file names specified as `@include` or `@verbatiminclude` arguments. If unset, use the locale encoding instead. Default is set, except on MS-Windows where the locale encoding is used by default.

Note that this is for file names only; the default encoding or `@documentencoding` is always used for the encoding of file content (see Section 14.2 [`@documentencoding`], page 132).

The `INPUT_FILE_NAME_ENCODING` variable overrides this variable.

DOC_ENCODING_FOR_OUTPUT_FILE_NAME

If set, use the input Texinfo document encoding information for the encoding of output file names, such as files specified with `--output`. If unset, use the locale encoding instead. Default is unset, so files names are encoded using the current locale.

Note that this is for file names only; `OUTPUT_ENCODING_NAME` is used for the encoding of file content.

The `OUTPUT_FILE_NAME_ENCODING` variable overrides this variable.

- DOCTYPE** For DocBook, HTML, XML. Specifies the `SystemLiteral`, the entity's system identifier. This is a URI which may be used to retrieve the entity, and identifies the canonical DTD for the document. The default value is different for each of HTML, DocBook and XML.
- DUMP_TEXI**
For debugging. If set, no conversion is done, only parsing and macro expansion. If the option `--macro-expand` is set, the Texinfo source is also expanded to the corresponding file. Default false.
- DUMP_TREE**
For debugging. If set, the tree constructed upon parsing a Texinfo document is output to standard error; default false.
- EPUB_CREATE_CONTAINER_FILE**
If set to 0, do not generate the EPUB output file. Default is set to 1.
- EPUB_KEEP_CONTAINER_FOLDER**
If set, keep the directory containing the directories and files needed for EPUB. The EPUB output file is a ZIP archive of this directory. Default is not defined. Set if not defined and `TEST` or `DEBUG` is set. See Section 21.5.1 [EPUB Output File and Directory], page 208.
- EXTENSION**
The extension added to the output file name. The default is different for each output format.
- FORMAT_MENU**
If set to `'menu'`, output Texinfo menus. This is the default for Info. `'sectiontoc'` is the default setting for HTML, where instead of the contents of `@menu` blocks being output, a list of subordinate sections is output in each node. If set to `'nomenu'`, do not output menus.
This variable is set to `'nomenu'` when generating DocBook, or when `--no-headers` is specified.
- HIGHLIGHT_SYNTAX**
If set, `@example` blocks with language information as first argument are highlighted in the HTML output. It is also possible to specify a default for the language with `HIGHLIGHT_SYNTAX_DEFAULT_LANGUAGE`. Syntax highlighting requires an external program to generate the highlighted HTML. The `HIGHLIGHT_SYNTAX` value allows to select a specific program. The possibilities are `highlight`, `pygments`, any other value standing for `source-highlight` (see Section 21.6 [Syntax Highlighting], page 209).
- HIGHLIGHT_SYNTAX_DEFAULT_LANGUAGE**
The default language used for syntax highlighting when there is no language information.
- IGNORE_SPACE_AFTER_BRACED_COMMAND_NAME**
If set, spaces are ignored after an `@`-command that takes braces. Default true, matching the `TEX` behavior.

INDEX_SPECIAL_CHARS_WARNING

If set, warn about ‘:’ in index entry, as not all Info readers may be able to process these. For Info and plaintext only. Default false, because parsing problems there don’t prevent navigation; readers can still relatively easily find their way to the node in question.

INFO_SPECIAL_CHARS_QUOTE

If set, whenever there are problematic characters for Info output in places such as node names or menu items, surround the part of the construct where they appear with quoting characters, as described in Appendix F [Info Format Specification], page 283. Default is set for Info and unset for plaintext. See Section 3.3 [Node Line Requirements], page 29.

INFO_SPECIAL_CHARS_WARNING

If set, warn about problematic constructs for Info output (such as the string ‘:’) in node names, menu items, and cross-references. If not defined, set unless `INFO_SPECIAL_CHARS_QUOTE` is set. Default is set for Info and not defined for plaintext. Similar warnings in index entries are covered by `INDEX_SPECIAL_CHARS_WARNING`.

INPUT_FILE_NAME_ENCODING

Encoding used for input file names. This variable overrides any encoding from the document or current locale. Normally, you do not need to set this variable, but it can be used if file names are in a certain character encoding on a filesystem. An alternative is to set `DOC_ENCODING_FOR_INPUT_FILE_NAME` to ‘0’ to use the locale encoding. See also `OUTPUT_FILE_NAME_ENCODING`.

LOCALE_ENCODING

Locale encoding obtained from the system. You should not need to explicitly set this variable.

MAX_MACRO_CALL_NESTING

The maximal number of recursive calls of @-commands defined through `@macro`; default 100000. The purpose of this variable is to avoid infinite recursions.

MESSAGE_ENCODING

Encoding used to encode messages output by `texi2any`. Default is based on the locale encoding.

It is also used for command-line argument passed to commands called from `texi2any`. For example, `latex2html` will be called from `texi2any` if `HTML_MATH` is set to ‘12h’.

NO_TOP_NODE_OUTPUT

If set do not output the Top node content. The Top node is still parsed, but the content is discarded. Not set in the default case for HTML. Set in the default case for EPUB. If `SHOW_TITLE` is ‘undef’, setting `NO_TOP_NODE_OUTPUT` also sets `SHOW_TITLE` for HTML.

Setting `NO_TOP_NODE_OUTPUT`, which removes the Top node and adds a title page corresponds more to the formatting of a book. Setting `NO_TOP_NODE_OUTPUT` to false, with `SHOW_TITLE` remaining ‘undef’, and false, corresponds more to a

document setup for browsing, with a direct access to the information at the Top node.

For DocBook, `NO_TOP_NODE_OUTPUT` is set to true. Setting `NO_TOP_NODE_OUTPUT` to false causes the Top node content to be output. It is not recommended to output the Top node in DocBook as the title and copying informations are always output. This option is kept for DocBook for compatibility, as before 2022 the Top node was output in DocBook. It could be removed in the future.

`NO_USE_SETFILENAME`

If set, do not use `@setfilename` to set the document name; instead, base the output document name only on the input file name. The default is false.

`NODE_NAME_IN_MENU`

If set, use node names in menu entries, otherwise prefer section names; default true.

`OPEN_QUOTE_SYMBOL`

When an opening quote is needed, e.g., for `@samp` output, use the specified character; default `‘`; for DocBook. Undefined in the default case in HTML and set to `&lsquo`; if `USE_NUMERIC_ENTITY` is not set, to `’`; if set, and to a quote character if `OUTPUT_CHARACTERS` is set and the output encoding includes that character.

For Info, the default depends on the enabled document encoding. If `--disable-encoding` is set or the document encoding is not UTF-8, `'` is used. This character usually appears as an undirected single quote on modern systems. Otherwise, the Info output uses a Unicode left quote.

`OPEN_DOUBLE_QUOTE_SYMBOL`

When an opening double quote is needed, for `@dfn` output in Info, use the specified character. If `--disable-encoding` is set or the document encoding is not UTF-8, `"` is used. Otherwise, the Info output uses a Unicode left double quote.

`OUTPUT_CHARACTERS`

If not set, the default, output accented and special characters in HTML, XML and DocBook using XML entities, and in \LaTeX using macros. If set, output accented characters in HTML, XML, DocBook and \LaTeX output and special characters in HTML and \LaTeX output based on the document encoding. See Section 14.2 [`@documentencoding`], page 132, and Section 11.4 [Inserting Accents], page 103.

`OUTPUT_ENCODING_NAME`

Normalized encoding name used for output files. Should be a usable charset name in HTML, typically one of the preferred IANA encoding names. By default, if an input encoding is set (typically through `@documentencoding`), this information is used to set the output encoding name, otherwise the output encoding is based on the default encoding. See Section 14.2 [`@documentencoding`], page 132.

`OUTPUT_FILE_NAME_ENCODING`

Encoding used for output file names. This variable overrides any encoding from the document or current locale.

Normally, you do not need to set this variable, but it can be used if file names should be created in a certain character encoding on a filesystem. See also `INPUT_FILE_NAME_ENCODING`.

PACKAGE**PACKAGE_VERSION****PACKAGE_AND_VERSION****PACKAGE_URL****PACKAGE_NAME**

The implementation's short package name, package version, package name and version concatenated, package URL, and full package name, respectively. By default, these variables are all set through Autoconf, Automake, and `configure`.

PREFIX The output file prefix, which is prepended to some output file names. By default it is set by `@setfilename` or from the input file (see [Setting the Output File Name], page 13). How this value is used depends on the value of other customization variables or command line options, such as whether the output is split. The default is unset.

PROGRAM Name of the program used. By default, it is set to the name of the program launched, with a trailing `' .pl'` removed.

SORT_ELEMENT_COUNT

If set, the name of a file to which a list of elements (nodes or sections, depending on the output format) is dumped, sorted by the number of lines they contain after removal of `@-`commands; default unset. This is used by the program `texi-elements-by-size` in the `util/` directory of the Texinfo source distribution (see [texi-elements-by-size], page 245).

SORT_ELEMENT_COUNT_WORDS

When dumping the `elements-by-size` file (see preceding item), use word counts instead of line counts; default false.

TEST If set to true, some variables which are normally dynamically generated anew for each run (date, program name, version) are set to fixed and given values. This is useful to compare the output to a reference file, as is done for the tests. The default is false.

TEXI2DVI Name of the command used to produce PostScript, PDF, and DVI; default `'texi2dvi'`. See Section 19.3 [texi2any Printed Output], page 171.

TEXI2HTML

Generate HTML and try to be as compatible as possible with `texi2html`; default false.

TEXINFO_DTD_VERSION

For XML. Version of the DTD used in the XML output preamble. The default is set based on a variable in `configure.ac`.

TEXTCONTENT_COMMENT

For stripped text content output (i.e., when `TEXINFO_OUTPUT_FORMAT` is set to `textcontent`). If set, also output comments. Default false.

TOP_NODE_UP

Up node for the Top node; default `'(dir)'`. This node name is supposed to be already formatted for the output format. In HTML can be used in attribute, so should not contain any element. Used for HTML output only if `TOP_NODE_UP_URL` is set to override the URL, see `TOP_NODE_UP_URL` in Section 19.4.3 [HTML Customization Variables], page 174.

TREE_TRANSFORMATIONS

The associated value is a comma separated list of transformations that can be applied to the Texinfo tree prior to outputting the result. If more than one is specified, the ordering is irrelevant; each is always applied at the necessary point during processing.

By default, the tree transformations `'move_index_entries_after_items'` and `'relate_index_entries_to_table_entries'` are executed for HTML and DocBook output. Here's an example of updating the master menu in a document:

```
texi2any \
  -c TREE_TRANSFORMATIONS=regenerate_master_menu \
  -c TEXINFO_OUTPUT_FORMAT=plaintexinfo \
  mydoc.texi \
  -o /tmp/out
```

(Caveat: Since `'plaintexinfo'` output expands Texinfo macros and conditionals, it's necessary to remove any such differences before installing the updates in the original document. This may be remedied in a future release.)

The following transformations are currently supported (many are used in the `pod2texi` utility distributed with Texinfo; see Section 19.6 [Invoking `pod2texi`], page 192):

`'complete_tree_nodes_menus'`

Add menu entries or whole menus for nodes associated with sections of any level, based on the sectioning tree.

`'complete_tree_nodes_missing_menu'`

Add whole menus for nodes associated with sections without menu. The menus are based on the sectioning tree.

`'fill_gaps_in_sectioning'`

Adds empty `@unnumbered...` sections in a tree to fill gaps in sectioning. For example, an `@unnumberedsec` will be inserted if a `@chapter` is followed by a `@subsection`.

`'insert_nodes_for_sectioning_commands'`

Insert nodes for sectioning commands lacking a corresponding node.

`'move_index_entries_after_items'`

In `@enumerate` and `@itemize`, move index entries appearing just before an `@item` to just after the `@item`. Comment lines between index entries are moved too. As mentioned, this is always done for HTML and DocBook output.

`'regenerate_master_menu'`

Update the Top node master menu, either replacing the (first) `@detailmenu` in the Top node menu, or creating it at the end of the Top node menu.

`'relate_index_entries_to_table_entries'`

In `@table`, `@vtable` and `@ftable`, reassociate the index entry information from an index `@`-command appearing right after an `@item` line with the first element of the `@item`. Remove the index `@`-command from the tree.

`'simple_menu'`

Mostly the same as `SIMPLE_MENU`: use a simple preformatted style for the menu. It differs from setting `SIMPLE_MENU` in that `SIMPLE_MENU` only has an effect in HTML output.

`USE_NODES`

Preferentially use nodes to decide where elements are separated. If set to false, preferentially use sectioning to decide where elements are separated. The default is true.

`USE_NUMERIC_ENTITY`

For HTML, XML and DocBook. If set, use numeric entities instead of named entities. By default, set to true for DocBook output.

`USE_UP_NODE_FOR_ELEMENT_UP`

Fill in up sectioning direction with node direction when there is no sectioning up direction. In practice this can only happen when there is no `@top` section. Not set by default.

`USE_SETFILENAME_EXTENSION`

Default is on for Info, off for other output. If set, use exactly what `@setfilename` gives for the output file name, including the extension. You should not need to explicitly set this variable.

`USE_UNICODE`

If set to false, do not use the `Text::Unidecode` Perl module to transliterate more characters; default true.

19.5 Internationalization of Document Strings

`texi2any` writes fixed strings into the output document at various places: cross-references, page footers, the help page, alternate text for images, and so on. The string chosen depends on the value of the `documentlanguage` at the time of the string being output (see Section 14.1 [`@documentlanguage`], page 131, for the Texinfo command interface).

The `Gettext` framework is used for those strings (see *Gettext*). The `libintl-perl` package is used as the `gettext` implementation; more specifically, the pure Perl implementation is used, so Texinfo can support consistent behavior across all platforms and installations, which would not otherwise be possible. `libintl-perl` is included in the Texinfo distribution and always installed, to ensure that it is available if needed. It is also possible to use the system `gettext` (the choice can be made at build-time).

The Gettext domain ‘`texinfo_document`’ is used for the strings. Translated strings are written as Texinfo, and may include `@`-commands. In translated strings, the varying parts of the string are not usually denoted by `%s` and the like, but by ‘`{arg_name}`’. (This convention is common for `gettext` in Perl and is fully supported in GNU Gettext; see Section “Perl Format Strings” in *GNU Gettext*.) For example, in the following, ‘`{section}`’ will be replaced by the section name:

```
see {section}
```

These Perl-style brace format strings are used for two reasons: first, changing the order of `printf` arguments is only available since Perl 5.8.0; second, and more importantly, the order of arguments is unpredictable, since `@`-command expansion may lead to different orders depending on the output format.

The expansion of a translation string is done like this:

1. First, the string is translated. The locale is `documentlanguage.documentencoding`.

If the `documentlanguage` has the form ‘`ll_CC`’, that is tried first, and then just ‘`ll`’.

To cope with the possibility of having multiple encodings, a special use of the `us-ascii` locale encoding is also possible. If the ‘`ll`’ locale in the current encoding does not exist, and the encoding is not `us-ascii`, then `us-ascii` is tried.

The idea is that if there is a `us-ascii` encoding, it means that all the characters in the charset may be expressed as `@`-commands. For example, there is a `fr.us-ascii` locale that can accommodate any encoding, since all the Latin 1 characters have associated `@`-commands. On the other hand, Japanese has only a translation `ja.utf-8`, since there are no `@`-commands for Japanese characters.

The `us-ascii` locales are not needed much now that UTF-8 is used for most documents. Note that accented characters are required to be expressed as `@`-commands in the `us-ascii` locales, which may be inconvenient for translators.

2. Next, the string is expanded as Texinfo, and converted. The arguments are substituted; for example, ‘`{arg_name}`’ is replaced by the corresponding actual argument.

In the following example, ‘`{date}`’, ‘`{program_homepage}`’ and ‘`{program}`’ are the arguments of the string. Since they are used in `@uref`, their order is not predictable. ‘`{date}`’, ‘`{program_homepage}`’ and ‘`{program}`’ are substituted after the expansion:

```
Generated on @emph{{date}} using
@uref{{program_homepage}, @emph{{program}}}.
```

This approach is admittedly a bit complicated. Its usefulness is that it supports having translations available in different encodings for encodings which can be covered by `@`-commands, and also specifying how the formatting for some commands is done, independently of the output format—yet still be language-dependent. For example, the ‘`@pxref`’ translation string can be like this:

```
see {node_file_href} section `{section}' in @cite{{book}}
```

which allows for specifying a string independently of the output format, while nevertheless with rich formatting it may be translated appropriately in many languages.

19.6 Invoking `pod2texi`: Convert Pod to Texinfo

The `pod2texi` program translates Perl Pod documentation file(s) to Texinfo. There are two basic modes of operation: generating a standalone manual from each input Pod, or (if `--base-level=1` or higher is given) generating Texinfo subfiles suitable for use with `@include`.

The `pod2texi` program may be useful outside of the rest of Texinfo; thus, the invocation of `pod2texi` is documented in the Pod language using the man page format to follow the convention used in Perl standalone programs, with a version on the web <http://www.gnu.org/software/texinfo/manual/pod2texi.html> and a version included below. The version included in the manual is also an example of `pod2texi` use, as it is converted from Pod using `pod2texi`.

19.6.1 `pod2texi`

`pod2texi` NAME

`pod2texi` - convert Pod to Texinfo

`pod2texi` SYNOPSIS

```
pod2texi [OPTION]... POD...
```

`pod2texi` DESCRIPTION

Translate Pod file(s) to Texinfo. There are two basic modes of operation. First, by default, each Pod is translated to a standalone Texinfo manual.

Second, if `--base-level` is set higher than 0, each Pod is translated to a file suitable for `@include`, and one more file with a main menu and all the `@include` is generated.

`pod2texi` OPTIONS

`--appendix-sections`

Use appendix sectioning commands (`@appendix`, ...) instead of the default numbered sectioning Texinfo `@`-commands (`@chapter`, `@section`, ...).

`--base-level=NUM|NAME`

Sets the level of the `head1` commands. It may be an integer or a Texinfo sectioning command (without the `@`): 1 corresponds to the `@chapter/@unnumbered` level, 2 to the `@section` level, and so on. The default is 0, meaning that `head1` commands are still output as chapters, but the output is arranged as a standalone manual.

If the level is not 0, the Pod file is rendered as a fragment of a Texinfo manual suitable for `@include`. In this case, each Pod file has an additional sectioning command covering the entire file, one level above the `--base-level` value. Therefore, to make each Pod file a chapter in a large manual, you should use `section` as the base level.

For an example of making Texinfo out of the Perl documentation itself, see `contrib/perl-doc-all` in the Texinfo source distribution.

`--debug=NUM`

Set debugging level to `NUM`.

-headings-as-sections

Use headings commands (`@heading`, ...) instead of the default numbered sectioning Texinfo @-commands (`@chapter`, `@section`, ...). The sectioning command covering the entire file output for each Pod file if `-base-level` is not 0 is a numbered command.

-help

Display help and exit.

-menus

Output node menus. If there is a main manual, its Top node menu is always output, since a master menu is generated. Other nodes menus are not output in the default case.

-output=NAME

Name for the first manual, or the main manual if there is a main manual. Default is to write to standard output.

-no-section-nodes

Use anchors for sections instead of nodes.

-no-fill-section-gaps

Do not fill sectioning gaps with empty `@unnumbered` files. Ordinarily, it's good to keep the sectioning hierarchy intact.

-preamble=STR

Insert *STR* as top boilerplate before menu and includes. If *STR* is set to -, read the top boilerplate from the standard input. The default top boilerplate is a minimal beginning for a Texinfo document.

-setfilename=STR

Use *STR* in top boilerplate before menu and includes for `@setfilename`. No `@setfilename` is output in the default case.

-subdir=NAME

If there is a main manual with include files (each corresponding to an input Pod file), then those include files are put in directory *NAME*.

-unnumbered-sections

Use unnumbered sectioning commands (`@unnumbered`, ...) instead of the default numbered sectioning Texinfo @-commands (`@chapter`, `@section`, ...).

-top=TOP

Name of the `@top` element for the main manual. May contain Texinfo code.

-version

Display version information and exit.

pod2texi SEE ALSO

Pod-Simple-Texinfo. `perlpod`. The Texinfo manual. Texinfo home page: <http://www.gnu.org/software/texinfo/>

pod2texi COPYRIGHT AND LICENSE

Copyright 2012-2023 Free Software Foundation, Inc.

This program is free software; you can redistribute it and/or modify it under the terms of the GNU General Public License as published by the Free Software Foundation; either version 3 of the License, or (at your option) any later version.

There is NO WARRANTY, to the extent permitted by law.

pod2texi AUTHOR

Patrice Dumas <bug-texinfo@gnu.org>.

19.7 texi2html: Ancestor of texi2any

Conceptually, the `texi2html` program is the parent of today's `texi2any` program. `texi2html` was developed independently, originally by Lionel Cons in 1998; at the time, `makeinfo` could not generate HTML. Many other people contributed to `texi2html` over the years.

The present `texi2any` uses little of the actual code of `texi2html`, and has quite a different basic approach to the implementation (namely, parsing the Texinfo document into a tree), but still, there is a family resemblance.

By design, `texi2any` supports nearly all the features of `texi2html` in some way. However, we did not attempt to maintain strict compatibility, so no `texi2html` executable is installed by the Texinfo package. An approximation can be run with an invocation like this:

```
texi2any --set-customization-variable TEXI2HTML=1 ...
```

but, to emphasize, this is *not* a drop-in replacement for the previous `texi2html`. Here are the biggest differences:

- Most blatantly, the command line options of `texi2html` are now customization variables, for the most part. A table of approximate equivalents is given below.
- The program-level customization API is very different in `texi2any`.
- Indices cannot be split.

We do not intend to reimplement these differences. Therefore, the route forward for authors is alter manuals and build processes as necessary to use the new features and methods of `texi2any`. The `texi2html` maintainers (one of whom is the principal author of `texi2any`) do not intend to make further releases.

Here is the table showing `texi2html` options and corresponding `texi2any` customization variables.

<code>--toc-links</code>	<code>TOC_LINKS</code>
<code>--short-ext</code>	<code>EXTENSION</code> set to 'htm'
<code>--prefix</code>	<code>PREFIX</code>
<code>--def-table</code>	<code>DEF_TABLE</code>
<code>--html-xref-prefix</code>	<code>EXTERNAL_DIR</code>
<code>--l2h</code>	<code>HTML_MATH</code> set to 'l2h'
<code>--l2h-l2h</code>	<code>L2H_L2H</code>
<code>--l2h-skip</code>	<code>L2H_SKIP</code>

<code>--l2h-tmp</code>	<code>L2H_TMP</code>
<code>--l2h-file</code>	<code>L2H_FILE</code>
<code>--l2h-clean</code>	<code>L2H_CLEAN</code>
<code>--use-nodes</code>	<code>USE_NODES</code>
<code>--monolithic</code>	<code>MONOLITHIC</code>
<code>--top-file</code>	<code>TOP_FILE</code>
<code>--frames</code>	<code>FRAMES</code>
<code>--menu</code>	<code>FORMAT_MENU</code>
<code>--debug</code>	<code>DEBUG</code>
<code>--doctype</code>	<code>DOCTYPE</code>
<code>--frameset-doctype</code>	<code>FRAMESET_DOCTYPE</code>
<code>--test</code>	<code>TEST</code>

Finally, any `texi2html` users seeking more detailed information can check the first part of the archived file `doc/texi2oldapi.texi` in the Texinfo source repository.

20 Creating and Installing Info Files

This chapter gives some information on the Info output and describes how to install Info files. For the creation of Info files with `texi2any`, see Chapter 19 [Generic Translator `texi2any`], page 164, and with Emacs, Section D.6 [Info Formatting], page 261. See Section 1.3 [Info Files], page 4, for general information about the file format. See Appendix F [Info Format Specification], page 283, for a detailed technical specification of the Info format.

20.1 Installing an Info File

Info files are usually kept in the `info` directory. You can read Info files using the standalone Info program or the Info reader built into Emacs. (See *Info*, for an introduction to Info.)

20.1.1 The Directory File `dir`

For Info to work, the `info` directory must contain a file that serves as a top-level directory for the Info system. By convention, this file is called `dir`. (You can find the location of this file within Emacs by typing `C-h i` to enter Info and then typing `C-x C-f` to see the location of the `info` directory.)

The `dir` file is itself an Info file. It contains the top-level menu for all the Info files in the system. The menu looks like this:

```
* Menu:
* Info:   (info).      Documentation browsing system.
* Emacs:  (emacs).    The extensible, self-documenting
                  text editor.
* Texinfo: (texinfo). With one source file, make
                  either a printed manual using
                  @TeX{} or an Info file.
...

```

Each of these menu entries points to the ‘Top’ node of the Info file that is named in parentheses. (The menu entry does not need to specify the ‘Top’ node, since Info goes to the ‘Top’ node if no node name is mentioned. See Section 3.9.6 [Nodes in Other Info Files], page 37.)

Thus, the ‘Info’ entry points to the ‘Top’ node of the `info` file and the ‘Emacs’ entry points to the ‘Top’ node of the `emacs` file.

In each of the Info files, the ‘Up’ pointer of the ‘Top’ node refers back to the `dir` file. For example, the line for the ‘Top’ node of the Emacs manual looks like this in Info:

```
File: emacs Node: Top, Up: (DIR), Next: Distrib
```

In this case, the `dir` file name is written in uppercase letters—it can be written in either upper- or lowercase. This is not true in general, it is a special case for `dir`.

See the `util/dir-example` file in the Texinfo distribution for a large sample `dir` file.

20.1.2 Listing a New Info File

To add a new Info file to your system, you must write a menu entry to add to the menu in the `dir` file in the `info` directory. For example, if you were adding documentation for GDB, you would write the following new entry:

```
* GDB: (gdb).          The source-level C debugger.
```

The first part of the menu entry is the menu entry name, followed by a colon. The second part is the name of the Info file, in parentheses, followed by a period. The third part is the description.

The name of an Info file often has a `.info` extension. Thus, the Info file for GDB might be called either `gdb` or `gdb.info`. The Info reader programs automatically try the file name both with and without `.info`¹; so it is better to avoid clutter and not to write `'gdb.info'` explicitly in the menu entry. For example, the GDB menu entry should use just `'gdb'` for the file name, not `'gdb.info'`.

20.1.3 Info Files in Other Directories

If an Info file is not in the `info` directory, there are three ways to specify its location:

1. Write the file name in the `dir` file as the second part of the menu.
2. Specify the Info directory name in the `INFOPATH` environment variable in your `.profile` or `.cshrc` initialization file. (Only you and others who set this environment variable will be able to find Info files whose location is specified this way.)
3. If you are using Emacs, list the name of the file in a second `dir` file, in its directory; and then add the name of that directory to the `Info-directory-list` variable in your personal or site initialization file.

This variable tells Emacs where to look for `dir` files (the files must be named `dir`). Emacs merges the files named `dir` from each of the listed directories. (In Emacs version 18, you can set the `Info-directory` variable to the name of only one directory.)

For example, to reach a test file in the `/home/bob/info` directory, you could add an entry like this to the menu in the standard `dir` file:

```
* Test: (/home/bob/info/info-test).  Bob's own test file.
```

In this case, the absolute file name of the `info-test` file is written as the second part of the menu entry.

If you don't want to edit the system `dir` file, you can tell Info where to look by setting the `INFOPATH` environment variable in your shell startup file. This works with both the Emacs and standalone Info readers.

Emacs uses the `INFOPATH` environment variable to initialize the value of Emacs's own `Info-directory-list` variable. The standalone Info reader merges any files named `dir` in any directory listed in the `INFOPATH` variable into a single menu presented to you in the node called `'(dir)Top'`.

However you set `INFOPATH`, if its last character is a colon (on MS-DOS/MS-Windows systems, use a semicolon instead), this is replaced by the default (compiled-in) path. This gives you a way to augment the default path with new directories without having to list all the standard places. For example (using `sh` syntax):

```
INFOPATH=/home/bob/info:
export INFOPATH
```

will search `/home/bob/info` first, then the standard directories. Leading or doubled colons are not treated specially.

¹ On MS-DOS/MS-Windows systems, Info will try the `.inf` extension as well.

When you create your own `dir` file for use with `Info-directory-list` or `INFOPATH`, it's easiest to start by copying an existing `dir` file and replace all the text after the `'* Menu:'` with your desired entries. That way, the punctuation and special `CTRL_` characters that Info needs will be present.

As one final alternative, which works only with Emacs Info, you can change the `Info-directory-list` variable. For example:

```
(add-hook 'Info-mode-hook '(lambda ()
  (add-to-list 'Info-directory-list
    (expand-file-name "~/info"))))
```

20.1.4 Installing Info Directory Files

When you install an Info file onto your system, you can use the program `install-info` to update the Info directory file `dir`. Normally the makefile for the package runs `install-info`, just after copying the Info file into its proper installed location.

In order for the Info file to work with `install-info`, you include the commands `@dircategory` and `@direntry...@end direntry` in the Texinfo source file. Use `@direntry` to specify the menu entries to add to the Info directory file. Use `@dircategory` to specify a category for the manual, which determines which part of the Info directory to put it in. See Section 2.6 [Directory Category], page 16.

Here is how these commands are used in this manual:

```
@dircategory Texinfo documentation system
@direntry
* Texinfo: (texinfo).          The GNU documentation format.
* install-info: (texinfo)Invoking install-info. ...
...
@end direntry
```

Here's what this produces in the Info file:

```
INFO-DIR-SECTION Texinfo documentation system
START-INFO-DIR-ENTRY
* Texinfo: (texinfo).          The GNU documentation format.
* install-info: (texinfo)Invoking install-info. ...
...
END-INFO-DIR-ENTRY
```

The `install-info` program sees these lines in the Info file, and that is how it knows what to do.

Always use the `@direntry` and `@dircategory` commands near the beginning of the Texinfo input, before the first `@node` command. If you use them later on in the input, `install-info` will not notice them.

`install-info` will automatically reformat the description of the menu entries it is adding. As a matter of convention, the description of the main entry (above, 'The GNU documentation format') should start at column 32, starting at zero (as in `what-cursor-position` in Emacs). This will make it align with most others. Description for individual utilities best start in column 48, where possible. For more information about formatting see the `'--calign'`, `'--align'`, and `'--max-width'` options in Section 20.1.5 [Invoking `install-info`], page 199.

If you use `@dircategory` more than once in the Texinfo source, each usage specifies the ‘current’ category; any subsequent `@direntry` commands will add to that category.

Each ‘Invoking’ node for every program installed should have a corresponding `@direntry`. This lets users easily find the documentation for the different programs they can run, as with the traditional `man` system.

20.1.5 Invoking `install-info`

`install-info` inserts menu entries from an Info file into the top-level `dir` file in the Info system (see the previous sections for an explanation of how the `dir` file works). `install-info` also removes menu entries from the `dir` file. It’s most often run as part of software installation, or when constructing a `dir` file for all manuals on a system. Synopsis:

```
install-info [option...] [info-file [dir-file]]
```

If `info-file` or `dir-file` are not specified, the options (described below) that define them must be. There are no compile-time defaults, and standard input is never used. `install-info` can read only one Info file and write only one `dir` file per invocation.

If `dir-file` (however specified) does not exist, `install-info` creates it if possible (with no entries).

If any input file is compressed with `gzip` (see *Gzip*), `install-info` automatically uncompresses it for reading. And if `dir-file` is compressed, `install-info` also automatically leaves it compressed after writing any changes. If `dir-file` itself does not exist, `install-info` tries to open `dir-file.gz`, `dir-file.xz`, `dir-file.bz2`, `dir-file.lz`, and `dir-file.lzma`, in that order.

Options:

`--add-once`

Specifies that the entry or entries will only be put into a single section.

`--align=column`

Specifies the column that the second and subsequent lines of menu entry’s description will be formatted to begin at. The default for this option is ‘35’. It is used in conjunction with the ‘`--max-width`’ option. `column` starts counting at 1.

`--append-new-sections`

Instead of alphabetizing new sections, place them at the end of the DIR file.

`--calign=column`

Specifies the column that the first line of menu entry’s description will be formatted to begin at. The default for this option is ‘33’. It is used in conjunction with the ‘`--max-width`’ option. When the name of the menu entry exceeds this column, entry’s description will start on the following line. `column` starts counting at 1.

`--debug` Report what is being done.

`--delete` Delete the entries in `info-file` from `dir-file`. The file name in the entry in `dir-file` must be `info-file` (except for an optional ‘`.info`’ in either one). Don’t insert any new entries. Any empty sections that result from the removal are also removed.

- `--description=text`
Specify the explanatory portion of the menu entry. If you don't specify a description (either via `--entry`, `--item` or this option), the description is taken from the Info file itself.
- `--dir-file=name`
Specify file name of the Info directory file. This is equivalent to using the *dir-file* argument.
- `--dry-run`
Same as `--test`.
- `--entry=text`
Insert *text* as an Info directory entry; *text* should have the form of an Info menu item line plus zero or more extra lines starting with whitespace. If you specify more than one entry, they are all added. If you don't specify any entries, they are determined from information in the Info file itself.
- `--help`
Display a usage message with basic usage and all available options, then exit successfully.
- `--info-file=file`
Specify Info file to install in the directory. This is equivalent to using the *info-file* argument.
- `--info-dir=dir`
Specify the directory where the directory file *dir* resides. Equivalent to `--dir-file=dir/dir`.
- `--infodir=dir`
Same as `--info-dir`.
- `--item=text`
Same as `--entry=text`. An Info directory entry is actually a menu item.
- `--keep-old`
Do not replace pre-existing menu entries. When `--remove` is specified, this option means that empty sections are not removed.
- `--max-width=column`
Specifies the column that the menu entry's description will be word-wrapped at. *column* starts counting at 1.
- `--maxwidth=column`
Same as `--max-width`.
- `--menuentry=text`
Same as `--name`.
- `--name=text`
Specify the name portion of the menu entry. If the *text* does not start with an asterisk `*`, it is presumed to be the text after the `*` and before the parentheses that specify the Info file. Otherwise *text* is taken verbatim, and is taken as defining the text up to and including the first period (a space is appended if

necessary). If you don't specify the name (either via `--entry`, `--item` or this option), it is taken from the Info file itself. If the Info does not contain the name, the basename of the Info file is used.

- `--no-indent`
Suppress formatting of new entries into the `dir` file.
- `--quiet`
- `--silent` Suppress warnings, etc., for silent operation.
- `--remove` Same as `--delete`.
- `--remove-exactly`
Also like `--delete`, but only entries if the Info file name matches exactly; `.info` and/or `.gz` suffixes are *not* ignored.
- `--section=sec`
Put this file's entries in section `sec` of the directory. If you specify more than one section, all the entries are added in each of the sections. If you don't specify any sections, they are determined from information in the Info file itself. If the Info file doesn't specify a section, the menu entries are put into the Miscellaneous section.
- `--section regex sec`
Same as `--regex=regex --section=sec --add-once`.
`install-info` tries to detect when this alternate syntax is used, but does not always guess correctly. Here is the heuristic that `install-info` uses:
 1. If the second argument to `--section` starts with a hyphen, the original syntax is presumed.
 2. If the second argument to `--section` is a file that can be opened, the original syntax is presumed.
 3. Otherwise the alternate syntax is used.
 When the heuristic fails because your section title starts with a hyphen, or it happens to be a file that can be opened, the syntax should be changed to `--regex=regex --section=sec --add-once`.
- `--regex=regex`
Put this file's entries into any section that matches `regex`. If more than one section matches, all of the entries are added in each of the sections. Specify `regex` using basic regular expression syntax, more or less as used with `grep`, for example.
- `--test` Suppress updating of the directory file.
- `--version`
Display version information and exit successfully.

20.2 Tag Files and Split Files

Info files always contain a *tag table*, to be able to jump to nodes quickly. Info files can be *nonsplit* (also called *unsplit*) or *split*.

If the Info file contains less than about 300,000 characters the file should be nonsplit. In that case, the tag table should appear at the end of the Info file. If the Texinfo file contains more than about 300,000 characters, Texinfo processors split the large Info file into shorter *indirect* subfiles of about 300,000 characters each. With `texi2any`, splitting may be prevented by `--no-split`, and the default size of 300,000 characters may be modified with `--split-size` (see Section 19.1 [Invoking `texi2any`], page 164).

When a file is split, Info itself makes use of a shortened version of the original file that contains just the tag table and references to the files that were split off. The split-off files are called *indirect* files.

The split-off files have names that are created by appending ‘-1’, ‘-2’, ‘-3’ and so on to the output file name, specified by the `@setfilename` command or the input file name. The shortened version of the original file continues to have the name specified by `@setfilename` or the input file name.

At one stage in writing this document, for example, the Info file was saved as the file `test-texinfo` and that file looked like this:

```
Info file: test-texinfo,    -*-Text*-
produced by texinfo-format-buffer
from file: new-texinfo-manual.texinfo

^_
Indirect:
test-texinfo-1: 102
test-texinfo-2: 50422
test-texinfo-3: 101300
^_^L
Tag table:
(Indirect)
Node: overview^?104
Node: info file^?1271
Node: printed manual^?4853
Node: conventions^?6855
...
```

(But `test-texinfo` had far more nodes than are shown here.) Each of the split-off, indirect files, `test-texinfo-1`, `test-texinfo-2`, and `test-texinfo-3`, is listed in this file after the line that says ‘Indirect:’. The tag table is listed after the line that says ‘Tag table:’.

In the list of indirect files, the number following the file name records the cumulative number of bytes in the preceding indirect files, not counting the file list itself, the tag table, or any permissions text in the first file. In the tag table, the number following the node name records the location of the beginning of the node, in bytes from the beginning of the (unsplit) output.

If you are using `texinfo-format-buffer` to create Info files, you may want to run the `Info-validate` command. (The `texi2any` command does such a good job on its own, you do not need `Info-validate`.) However, you cannot run the `M-x Info-validate` node-checking command on indirect files. For information on how to prevent files from being

split with `texinfo-format-buffer` and how to validate the structure of the nodes, see Section D.10.4.1 [Using `Info-validate`], page 272.

20.3 Info Format FAQ

Here are some questions that have been frequently asked on the project mailing lists and elsewhere.

Why when I run ‘`info foo`’ do I get the same output as ‘`man foo`’?

Check that the Info manuals are installed. Not all GNU/Linux distributions install all the Info manuals by default. This is regrettable, as often the Info manual provides more information than the provided man page.

Why not use HTML instead of Info?

Manuals are rarely written in the Info format itself, but are generated from Texinfo source by the `texi2any` program. `texi2any` can generate HTML as well as Info from Texinfo source. You can also access and download HTML manuals from the GNU website (<https://www.gnu.org/manual/manual.html>). Additionally, some GNU/Linux distributions provide packages for the installation of HTML manuals.

Info still has some advantages over HTML for locally installed documentation. The Info browsers support index lookup and support for links between locally installed manuals in multiple locations. It’s important to have documentation installed locally on your machine rather than relying on the Internet; this makes accessing documentation more reliable, and ensures it matches installed versions of packages. It’s hoped that support for browsing locally installed Texinfo documentation in some form of HTML can be improved in the future.

Why provide the command-line `info` program when the Emacs Info reader is better?

The Emacs Info reader can display images, and fully supports using a mouse. There are not many differences among the Info readers besides that. Command-line `info` can be configured to change the default key bindings, as well as change the color of cross-references and search results, and to enable mouse scrolling support. You should not need to be experienced with the Emacs editor to use `info`. (Some recommend another program called `pinfo`, but this lacks in important features like index lookup.)

Some prefer to be able to scroll through the entire manual at once (as happens with man pages), rather than being limited to a single ‘node’ of content at once. Of course, there is no accounting for taste, but a single, unstructured block of text becomes more awkward as a manual becomes longer and more complicated. (However, if you really want to, you can view an info manual all at once in the `less` pager with ‘`info foo | less`’.)

Why do I have ‘see’ appearing in front of all of my links?

By default, Emacs Info mode either changes the marker ‘`*note`’ for cross-references to ‘see’, or hides it completely. Command-line `info` does the same if `hide-note-references` is set. Unfortunately, there is no way to do this reliably, as both the `@pxref` and `@ref` commands in Texinfo output this marker in the Info output, and the ‘see’ text is only appropriate for `@pxref`.

Yes, but how do I get a plain link, with no extra markup?

You can't. Info is a plain text format that is displayed mostly as-is in the viewers, and without the `*note` text there would be nothing to mark text as a link.

For output formats such as HTML, you can use the `@link` command to produce a plain link. See Section 5.12 [`@link`], page 51. This does not produce a working cross-reference in Info output or in a printed copy of the manual, though.

Why do lines containing links appear mysteriously short?

This due to Emacs (or info with `hide-note-references` set to `'On'`) hiding `*note` strings, as mentioned above.

Can the Info format be extended to support fonts, colors or reflowable text?

Any extension would be incompatible with existing Info-viewing programs. Extra markup added to Info files would be displayed to the user, making files ugly and unreadable.

When Texinfo files are processed into Info files, information about which Texinfo commands were used to markup text is lost. Moreover, it is not possible to reliably detect whether text can be reflowed (e.g. a paragraph of prose), or whether line breaks should be kept (e.g. a code sample, or poem).

Info's core purpose is to display documentation on text terminals. If you want more, you are recommended to use the HTML output from `texi2any` instead.

21 Generating HTML

`texi2any` generates Info output by default, but given the `--html` option, it will generate HTML, for web browsers and other programs. This chapter gives some details on such HTML output.

`texi2any` has many user-definable customization variables with which you can influence the HTML output. See Section 19.4 [Customization Variables], page 172. In particular, there is support for syntax highlighting in `@example` (see Section 21.6 [Syntax Highlighting], page 209). You can also write so-called *initialization files*, or *init files* for short, to modify almost every aspect of HTML output formatting. Initialization files contain code and are loaded by `--init-file` (see Section 19.1 [Invoking `texi2any`], page 164).

Some initialization files are maintained with Texinfo and installed in the default case. For example, `chm.pm` produces the intermediate compressed HTML Help format files that can be subsequently converted to the CHM format.

The documentation of `texi2any` HTML output adaptation using customization files is in a separate manual. See *GNU Texinfo texi2any Output Customization*.

21.1 HTML Translation

The HTML generated by `texi2any` generates standard HTML output. The output is intentionally quite plain for maximum portability and accessibility.

You can customize the output via CSS (see Section 21.3 [HTML CSS], page 206) or other means (see Section 19.4 [Customization Variables], page 172). If you cannot accomplish a reasonable customization, feel free to report that.

Navigation bar: By default, a navigation bar is inserted at the start of each node, analogous to Info output. If the `--no-headers` option is used, the navigation bar is only inserted at the beginning of split files. Header `<link>` elements in split output support Info-like navigation with browsers which implement this feature.

Raw HTML: `texi2any` will include segments of Texinfo source between `@ifhtml` and `@end ifhtml` in the HTML output (but not any of the other conditionals, by default). Source between `@html` and `@end html` is passed without change to the output (i.e., suppressing the normal escaping of input `'<'`, `'>'` and `'&'` characters which have special significance in HTML). See Section 15.1 [Conditional Commands], page 134.

Standards: It is intentionally not our goal, and not even always possible, to pass through every conceivable validation test without any diagnostics. Different validation tests have different goals, often about pedantic enforcement of some standard or another. Our overriding goal is to help users, not blindly comply with standards.

Please report output from an error-free run of `texi2any` which has *practical* browser or EPUB reader portability problems as a bug (see Section 1.1 [Reporting Bugs], page 2).

In practice, the HTML produced by `texi2any` is slowly adjusted over time towards the latest HTML standard, while also trying to keep compatibility with earlier produced HTML. We use transitional markup and try to be slow enough to give time for the diverse HTML readers to adjust (and for standards to reincorporate useful features that were dropped. . .).

21.2 HTML Splitting

When splitting output at nodes (which is the default), `texi2any` writes HTML output into (basically) one output file per Texinfo source `@node`.

Each output file name is the node name with spaces replaced by ‘-’s and special characters changed to ‘_’ followed by their code point in hex (see Section 21.7 [HTML Xref], page 209). This is to make it portable and easy to use as a file name. In the unusual case of two different nodes having the same name after this treatment, they are written consecutively to the same file, with HTML anchors so each can be referred to independently.

If `texi2any` is run on a system which does not distinguish case in file names, nodes which are the same except for case (e.g., ‘`index`’ and ‘`Index`’) will also be folded into the same output file with anchors. You can also pretend to be on a case insensitive filesystem by setting the customization variable `CASE_INSENSITIVE_FILENAMES`.

It is also possible to split at chapters or sections with `--split` (see Section 19.1 [Invoking `texi2any`], page 164). In that case, the file names are constructed after the name of the node associated with the relevant sectioning command. Also, unless `--no-node-files` is specified, a redirection file is output for every node in order to more reliably support cross-references to that manual (see Section 21.7 [HTML Xref], page 209).

When splitting, the HTML output files are written into a subdirectory. The subdirectory name is derived from the base name (that is, any extension is removed), with `_html` postpended. For example, HTML output for `gcc.texi` would be written into a subdirectory named ‘`gcc_html/`’. The subdirectory name is based on `@setfilename` or on the input file name (see [Setting the Output File Name], page 13).

In any case, the top-level output file within the directory is always named ‘`index.html`’.

Monolithic output (`--no-split`) is named according to `@setfilename`, if present (with any ‘`.info`’ extension replaced with ‘`.html`’), `--output` (the argument is used literally), or based on the input file name as a last resort (see [Setting the Output File Name], page 13).

21.3 HTML CSS

Cascading Style Sheets (CSS) is an Internet standard for influencing the display of HTML documents: see <http://www.w3.org/Style/CSS/>.

By default, some CSS code is included to better implement the appearance of some Texinfo environments. For example:

```
pre.display { font-family:inherit }
```

The above tells the web browser to use the same font as the main document inside ‘`<pre>`’ elements used for `@display` environments. By default, the HTML ‘`<pre>`’ command uses a monospaced font.

Please see the reference above for a full explanation of CSS.

You can influence the CSS in the HTML output with two `texi2any` options: `--css-include=file` and `--css-ref=url`.

The option `--css-ref=url` adds to each output HTML file a ‘`<link>`’ tag referencing a CSS at the given `url`. This allows using external style sheets.

The option `--css-include=file` includes the contents `file` in the HTML output, as you might expect. However, the details are somewhat tricky, as described in the following, to provide maximum flexibility.

The CSS file first line may be a ‘@charset’ directive. If present, this directive is used to determine the encoding of the CSS file. The line is not copied into the output.

The CSS file may begin with so-called ‘@import’ directives, which link to external CSS specifications for browsers to use when interpreting the document. Again, a full description is beyond our scope here, but we’ll describe how they work syntactically, so we can explain how they are handled.

There can be more than one ‘@import’, but they have to come first in the file, with only whitespace and comments interspersed, no normal definitions. Comments in CSS files are delimited by ‘/* ... */’, as in C. An ‘@import’ directive must be in one of these two forms:

```
@import url(http://example.org/foo.css);
@import "http://example.net/bar.css";
```

The crucial characters are the ‘@’ at the beginning and the semicolon terminating the directive. When reading the CSS file, any such ‘@’-directive is simply copied into the output, as follows:

- If *file* contains only normal CSS declarations, it is included after the default CSS, thus overriding it.
- If *file* begins with ‘@import’ specifications (see below), then the ‘import’'s are included first (they have to come first, according to the standard), and then the default CSS is included. If you need to override the default CSS from an ‘@import’, you can do so with the ‘! important’ CSS construct, as in:

```
pre.example { font-size: inherit ! important }
```

- If *file* contains both ‘@import’ and inline CSS specifications, the ‘@import’'s are included first, then default CSS, and lastly the inline CSS from *file*.
- Any @-directive other than ‘@import’ and ‘@charset’ is treated as a CSS declaration, meaning the default CSS is included and then the rest of the file is prepended.

If the CSS file is malformed or erroneous, the output is unspecified. The meaning of the CSS file is not interpreted in any way; the special ‘@’ and ‘;’ characters are looked for the text is blindly copied into the output. Comments in the CSS file may or may not be included in the output.

In addition to the possibilities offered by CSS, `texi2any` has many user-definable customization variables with which you can influence the HTML output. See Section 19.4 [Customization Variables], page 172.

21.4 @documentdescription: Summary Text

When producing HTML output for a document, a ‘<meta>’ element is written in the ‘<head>’ to give some idea of the content of the document. By default, this *description* is the title of the document, taken from the @settitle command (see Section 2.5.3 [settitle], page 14). To change this, use the @documentdescription environment, as in:

```
@documentdescription
descriptive text.
@end documentdescription
```

This will produce the following output in the ‘<head>’ of the HTML:

```
<meta name=description content="descriptive text.">
```

21.5 Generating EPUB

EPUB is a format designed for reading electronic books on portable devices. `texi2any` generated EPUB 3.2 in 2022. An EPUB file is a ZIP archive container, holding informative files as well as the manual rendered in HTML.

The generation of the EPUB file depends on the `Archive::Zip` Perl module being installed. This dependency is checked at runtime. In the default case, trying to output EPUB without this dependency raises an error. However, if the EPUB output file is not generated, with the customization variable `EPUB_CREATE_CONTAINER_FILE` set to 0, it is not an error if `Archive::Zip` is not installed.

The `texi2any` tests related to EPUB generation do not require the installation of `Archive::Zip`, as they set `EPUB_CREATE_CONTAINER_FILE` to 0 and keep the directory containing the files and directories needed for the EPUB file by setting the `EPUB_KEEP_CONTAINER_FOLDER` customization variable to 1.

21.5.1 Container Directory and Output Files

A directory containing the files and directories needed for the EPUB format is created when outputting EPUB. The name of this container directory is derived from the base name of the input file (that is, any extension is removed), with `_epub_package` postpended. If an output directory is specified, with `--output`, or with the `SUBDIR` customization variable, the container directory is created in that directory instead of the current directory. At the beginning of a new run, the container directory and all its contents are removed. The container directory is also removed after the final EPUB file has been generated in the default case.

The HTML files produced from the Texinfo manual are output in subdirectories of the container directory. Image files referred to from the Texinfo manual, if found, are copied to subdirectories of the container directory.

The EPUB output file is a ZIP archive of the container directory. The file name is derived from the base name, with the `.epub` extension postpended. If an output file is specified, with `--output`, or with the `OUTFILE` customization function, this file name is used instead. The output EPUB file is never placed in the directory specified by `--output` or `SUBDIR`; only the container directory is placed there, as explained just above.

The EPUB output file is not generated if the customization variable `EPUB_CREATE_CONTAINER_FILE` is set to 0. The container directory is left after the final EPUB file has been generated if `EPUB_KEEP_CONTAINER_FOLDER` is set.

See Section 19.1 [Invoking `texi2any`], page 164.

21.5.2 EPUB Cross-References

The EPUB format does not support references from an EPUB file to another EPUB file. Therefore any references to “external” Texinfo manuals should resolve to an external URL. `texi2any` produces these links with HTML cross-reference configuration (see Section 21.7.6 [HTML Xref Configuration], page 214). Since the links in the resulting EPUB are incorrect if no information is found for the cross-references, `texi2any` issues a warning by default for missing cross-references information. If these warnings are unwanted, set `CHECK_HTMLXREF` to 0.

21.5.3 HTML Generated for EPUB

The HTML generated for EPUB is XHTML conformant, UTF-8 encoded, and formatted without the usual HTML navigation headers and footers. Most of these features are enabled with customization variables, such as `USE_XML_SYNTAX` or `OUTPUT_FILE_NAME_ENCODING`. Some features of printed output are used in EPUB. In particular, the Top node does not appear in the EPUB output, while a title page is generated. This is obtained by setting `NO_TOP_NODE_OUTPUT`.

The `OUTFILE` and `SUBDIR` customization variables values correspond initially to the EPUB directory container and/or the EPUB output file (see Section 21.5.1 [EPUB Output File and Directory], page 208). These customization variables values are undefined or reset to the locations in the container directory where the XHTML files are output for the HTML generation. It is mentioned here because resetting customization variables is unusual; however, the variables reset are used internally for the conversion, and should not interact with any customization set by the user.

See Section 19.4.3 [HTML Customization Variables], page 174.

21.6 Code Examples Syntax Highlighting in HTML

warning: Source highlighting is experimental, feedback is welcomed.

Support for source code syntax highlighting is available in `texi2any` for the HTML output, with the help of external software. This feature is turned on by setting `HIGHLIGHT_SYNTAX`. Source code highlighting is set up for `@example` blocks. The language specified for syntax highlighting is the first argument on the `@example` line (see Section 7.4 [`@example`], page 68), or `HIGHLIGHT_SYNTAX_DEFAULT_LANGUAGE` if set and there is no first argument.

The `HIGHLIGHT_SYNTAX` value determines the command used for highlighting:

`highlight`

Use `highlight` from <http://www.andre-simon.de/doku/highlight/en/highlight.php>;

`pygments` Use `pygmentize` from <https://pygments.org/>;

`anything else`

Use `source-highlight` (see *GNU Source-highlight*).

See Section 19.4.8 [Other Customization Variables], page 183.

21.7 HTML Cross-references

Cross-references between Texinfo manuals in HTML format become standard HTML `<a>` links. This section describes the algorithm used, so that Texinfo can cooperate with other programs, such as `texi2html`, by writing mutually compatible HTML files.

This algorithm may or may not be used for links *within* HTML output for a Texinfo file. Since no issues of compatibility arise in such cases, we do not need to specify this.

We try to support references to such “external” manuals in both monolithic and split forms. A *monolithic* (mono) manual is entirely contained in one file, and a *split* manual has a file for each node. (See Section 21.2 [HTML Splitting], page 206.)

The algorithm was primarily devised by Patrice Dumas in 2003–04.

21.7.1 HTML Cross-reference Link Basics

For our purposes, an HTML link consists of four components: a host name, a directory part, a file part, and a target part. We always assume the `http` protocol. For example:

```
http://host/dir/file.html#target
```

The information to construct a link comes from the node name and manual name in the cross-reference command in the Texinfo source (see Chapter 5 [Cross References], page 44), and from *external information* (see Section 21.7.6 [HTML Xref Configuration], page 214).

We now consider each part in turn.

The *host* is hardwired to be the local host. This could either be the literal string ‘localhost’, or, according to the rules for HTML links, the ‘http://localhost/’ could be omitted entirely.

The *dir* and *file* parts are more complicated, and depend on the relative split/mono nature of both the manual being processed and the manual that the cross-reference refers to. The underlying idea is that there is one directory for Texinfo manuals in HTML, and a given *manual* is either available as a monolithic file *manual.html*, or a split subdirectory *manual_html/*.html*. Here are the cases:

- If the present manual is split, and the referent manual is also split, the directory is ‘*./referent_html/*’ and the file is the expanded node name (described later).
- If the present manual is split, and the referent manual is mono, the directory is ‘*./*’ and the file is *referent.html*.
- If the present manual is mono, and the referent manual is split, the directory is *referent_html/* and the file is the expanded node name.
- If the present manual is mono, and the referent manual is also mono, the directory is *./* (or just the empty string), and the file is *referent.html*.

Another rule, that only holds for file names, is that base file names are truncated to 245 characters, to allow for an extension to be appended and still comply with the 255-character limit which is common to many filesystems. Although technically this can be changed with the `BASEFILENAME_LENGTH` customization variable (see Section 19.4.8 [Other Customization Variables], page 183), doing so would make cross-manual references to such nodes invalid.

Any directory part in the file name argument of the source cross reference command is ignored. Thus, `@xref{,,./foo}` and `@xref{,,foo}` both use ‘foo’ as the manual name. This is because any such attempted hardwiring of the directory is very unlikely to be useful for all the output formats that use the manual name.

Finally, the *target* part is always the expanded node name.

Whether the present manual is split or mono is determined by user option; `texi2any` defaults to split, with the `--no-split` option overriding this.

Whether the referent manual is split or mono, however, is another bit of the external information (see Section 21.7.6 [HTML Xref Configuration], page 214). By default, `texi2any` uses the same form of the referent manual as the present manual.

Thus, there can be a mismatch between the format of the referent manual that the generating software assumes, and the format it’s actually present in. See Section 21.7.5 [HTML Xref Mismatch], page 214.

21.7.2 HTML Cross-reference Node Name Expansion

As mentioned in the previous section, the key part of the HTML cross reference algorithm is the conversion of node names in the Texinfo source into strings suitable for XHTML identifiers and file names. The restrictions are similar for each: plain ASCII letters, numbers, and the ‘-’ and ‘_’ characters are all that can be used. (Although HTML anchors can contain most characters, XHTML is more restrictive.)

Cross-references in Texinfo can refer either to nodes, anchors (see Section 5.11 [`@anchor`], page 50) or float labels (see Section 9.1.1 [`@float`], page 84). However, anchors and float labels are treated identically to nodes in this context, so we’ll continue to say “node” names for simplicity.

A special exception: the Top node (see Section 2.10 [The Top Node], page 23) is always mapped to the file `index.html`, to match web server software. However, the HTML *target* is ‘Top’. Thus (in the split case):

```
@xref{Top,,, emacs, The GNU Emacs Manual}.
⇒ <a href="./emacs_html/index.html#Top">
```

1. The standard ASCII letters (a-z and A-Z) are not modified. All other characters may be changed as specified below.
2. The standard ASCII numbers (0-9) are not modified except when a number is the first character of the node name. In that case, see below.
3. Multiple consecutive space, tab and newline characters are transformed into just one space.
4. Leading and trailing spaces are removed.
5. After the above has been applied, each remaining space character is converted into a ‘-’ character.
6. Other ASCII 7-bit characters are transformed into ‘_00xx’, where xx is the ASCII character code in (lowercase) hexadecimal. This includes ‘_’, which is mapped to ‘_005f’.
7. If the node name does not begin with a letter, the literal string ‘g_t’ is prefixed to the result. (Due to the rules above, that string can never occur otherwise; it is an arbitrary choice, standing for “GNU Texinfo”.) This is necessary because XHTML requires that identifiers begin with a letter.

For example:

```
@node A node --- with _'%
⇒ A-node-_002d_002d_002d-with-_005f_0027_0025
```

Example translations of common characters:

- ‘_’ ⇒ ‘_005f’
- ‘-’ ⇒ ‘_002d’
- ‘A node’ ⇒ ‘A-node’

On case-folding computer systems, nodes differing only by case will be mapped to the same file. In particular, as mentioned above, Top always maps to the file `index.html`. Thus, on a case-folding system, Top and a node named ‘Index’ will both be written to `index.html`. Fortunately, the targets serve to distinguish these cases, since HTML target names are always case-sensitive, independent of operating system.

21.7.3 HTML Cross-reference Command Expansion

Node names may contain @-commands (see Section 3.3 [Node Line Requirements], page 29). This section describes how they are handled.

First, comments are removed.

Next, any @value commands (see Section 15.5.1 [@set @value], page 138) and macro invocations (see Section 16.2 [Invoking Macros], page 145) are fully expanded.

Then, for the following commands, the command name and braces are removed, and the text of the argument is recursively transformed:

```
@asis @b @cite @code @command @dfn @dmn @dotless
@emph @env @file @i @indicateurl @kbd @key
@samp @sansserif @sc @slanted @strong @sub @sup
@t @U @var @verb @w
```

In addition, the following commands are replaced by constant text, as shown below. If any of these commands have non-empty arguments, as in @TeX{bad}, it is an error, and the result is unspecified. In this table, ‘(space)’ means a space character and ‘(nothing)’ means the empty string. The notation ‘U+hhhh’ means Unicode code point hhhh (in hex, as usual).

There are further transformations of many of these expansions to yield the final file or other target name, such as space characters to ‘-’, etc., according to the other rules.

@(newline)	(space)
@(space)	(space)
@(tab)	(space)
@!	‘!’
@*	(space)
@-	(nothing)
@.	‘.’
@:	(nothing)
@?	‘?’
@@	‘@’
@{	‘{’
@}	‘}’
@LaTeX	‘LaTeX’
@TeX	‘TeX’
@arrow	U+2192
@bullet	U+2022
@comma	‘,’
@copyright	U+00A9
@dots	U+2026
@enddots	‘...’
@equiv	U+2261
@error	‘error-->’
@euro	U+20AC
@exclamdown	U+00A1
@expansion	U+21A6
@geq	U+2265
@leq	U+2264

@minus	U+2212
@ordf	U+00AA
@ordm	U+00BA
@point	U+22C6
@pounds	U+00A3
@print	U+22A3
@questiondown	U+00BF
@registeredsymbol	U+00AE
@result	U+21D2
@textdegree	U+00B0
@tie	(space)

Quotation mark @-commands (`@quotedblright{}` and the like), are likewise replaced by their Unicode values. Normal quotation *characters* (e.g., ASCII ‘ and ’) are not altered. See Section 11.5 [Inserting Quotation Marks], page 104.

Any `@acronym`, `@abbr`, `@email`, and `@image` commands are replaced by their first argument. (For these commands, all subsequent arguments are optional, and ignored here.) See Section 6.1.14 [`@acronym`], page 62, and Section 6.1.16 [`@email`], page 63, and Section 9.2 [Images], page 86.

Accents are handled according to the next section.

Any other command is an error, and the result is unspecified.

21.7.4 HTML Cross-reference 8-bit Character Expansion

Usually, characters other than plain 7-bit ASCII are transformed into the corresponding Unicode code point(s) in Normalization Form C, which uses precomposed characters where available. (This is the normalization form recommended by the W3C and other bodies.) This holds when that code point is `0xffff` or less, as it almost always is.

These will then be further transformed by the rules above into the string ‘`_hhhh`’, where `hhhh` is the code point in hex.

For example, combining this rule and the previous section:

```
@node @b{A} @TeX{} @u{B} @point{}@enddots{}
⇒ A-TeX-B_0306-_22C6_002e_002e_002e
```

Notice: 1) `@enddots` expands to three periods which in turn expands to three ‘`_002e`’; 2) `@u{B}` is a ‘B’ with a breve accent, which does not exist as a pre-accented Unicode character, therefore expands to ‘`B_0306`’ (B with combining breve).

When the Unicode code point is above `0xffff`, the transformation is ‘`__xxxxxx`’, that is, two leading underscores followed by six hex digits. Since Unicode has declared that their highest code point is `0x10ffff`, this is sufficient. (We felt it was better to define this extra escape than to always use six hex digits, since the first two would nearly always be zeros.)

This method works fine if the node name consists mostly of ASCII characters and contains only few 8-bit ones. But if the document is written in a language whose script is not based on the Latin alphabet (for example, Ukrainian), it will create file names consisting almost entirely of ‘`_xxxx`’ notations, which is inconvenient and all but unreadable. To handle such cases, `texi2any` offers the `--transliterate-file-names` command line option. This option enables *transliteration* of node names into ASCII characters for the purposes of file

name creation and referencing. The transliteration is based on phonetic principles, which makes the generated file names more easily understandable.

For the definition of Unicode Normalization Form C, see Unicode report UAX#15, <http://www.unicode.org/reports/tr15/>. Many related documents and implementations are available elsewhere on the web.

21.7.5 HTML Cross-reference Mismatch

As mentioned earlier (see Section 21.7.1 [HTML Xref Link Basics], page 210), the generating software may need to guess whether a given manual being cross-referenced is available in split or monolithic form—and, inevitably, it might guess wrong. However, when the *referent* manual is generated, it is possible to handle at least some mismatches.

In the case where we assume the referent is split, but it is actually available in mono, the only recourse would be to generate a `manual_html/` subdirectory full of HTML files which redirect back to the monolithic `manual.html`. Since this is essentially the same as a split manual in the first place, it's not very appealing.

On the other hand, in the case where we assume the referent is mono, but it is actually available in split, it is possible to use JavaScript to redirect from the putatively monolithic `manual.html` to the different `manual_html/node.html` files. Here's an example:

```
function redirect() {
  switch (location.hash) {
    case "#Node1":
      location.replace("manual_html/Node1.html#Node1"); break;
    case "#Node2" :
      location.replace("manual_html/Node2.html#Node2"); break;
    ...
    default;;
  }
}
```

Then, in the `<body>` tag of `manual.html`:

```
<body onLoad="redirect();">
```

Once again, this is something the software which generated the *referent* manual has to do in advance, it's not something the software generating the cross-reference in the present manual can control.

21.7.6 HTML Cross-reference Configuration: `htmlxref.cnf`

`texi2any` reads a file named `htmlxref.cnf` to gather information for cross-references to other manuals in HTML output. It is looked for in the following directories:

```
./          (the current directory)
./..texinfo/
             (under the current directory)
~/..texinfo/
             (where ~ is the current user's home directory)
```

sysconfdir/texinfo/

(where *sysconfdir* is the system configuration directory specified at compile-time, e.g., */usr/local/etc*)

datadir/texinfo/

(likewise specified at compile time, e.g., */usr/local/share*)

All files found are used, with earlier entries overriding later ones. The Texinfo distribution includes a default file which handles many GNU manuals; it is installed in the last of the above directories, i.e., *datadir/texinfo/htmlxref.cnf*.

The `HTMLXREF_MODE` customization variable can be set to modify how the files are found. For instance, if set to `'none'`, no external information is used. `HTMLXREF_FILE` sets the file name to something else than `htmlxref.cnf`. see Section 19.4.3 [HTML Customization Variables], page 174.

The file is line-oriented. Lines consisting only of whitespace are ignored. Comments are indicated with a `#` at the beginning of a line, optionally preceded by whitespace. Since `#` can occur in URLs (like almost any character), it does not otherwise start a comment.

Each non-blank non-comment line must be either a *variable assignment* or *manual information*.

A variable assignment line looks like this:

```
varname = varvalue
```

Whitespace around the `=` is optional and ignored. The *varname* should consist of letters; case is significant. The *varvalue* is an arbitrary string, continuing to the end of the line. Variables are then referenced with `'${varname}'`; variable references can occur in the *varvalue*.

A manual information line looks like this:

```
manual keyword urlprefix
```

with *manual* the short identifier for a manual, *keyword* being one of: `mono`, `node`, `section`, `chapter`, and *urlprefix* described below. Variable references can occur only in the *urlprefix*. For example (used in the canonical `htmlxref.cnf`):

```
G = http://www.gnu.org
GS = ${G}/software
hello mono    ${GS}/hello/manual/hello.html
hello chapter ${GS}/hello/manual/html_chapter/
hello section ${GS}/hello/manual/html_section/
hello node    ${GS}/hello/manual/html_node/
```

If the keyword is `mono`, *urlprefix* gives the host, directory, and file name for *manual* as one monolithic file.

If the keyword is `node`, `section`, or `chapter`, *urlprefix* gives the host and directory for *manual* split into nodes, sections, or chapters, respectively.

When available, `texi2any` will use the “corresponding” value for cross-references between manuals. That is, when generating monolithic output (`--no-split`), the `mono` URL will be used, when generating output that is split by node, the `node` URL will be used, etc. However, if a manual is not available in that form, anything that is available can be used. Here is the search order for each style:

```
node    ⇒ node,    section, chapter, mono
```

```
section ⇒ section, chapter, node,    mono
chapter ⇒ chapter, section, node,    mono
mono    ⇒ mono,    chapter, section, node
```

These section- and chapter-level cross-manual references can succeed only when the target manual was created using `--node-files`; this is the default for split output.

If you have additions or corrections to the `htmlxref.cnf` distributed with Texinfo, please email bug-texinfo@gnu.org as usual. You can get the latest version from <http://ftpmirror.gnu.org/texinfo/htmlxref.cnf>.

Appendix A @-Command Details

Here are the details of @-commands: information about their syntax, a list of commands, and information about where commands can appear.

A.1 @-Command Syntax

Texinfo has the following types of @-command:

1. Brace commands

These commands start with @ followed by a letter or a word, followed by an argument within braces. For example, the command @dfn indicates the introductory or defining use of a term; it is used as follows: ‘In Texinfo, @-commands are @dfn{mark-up} commands.’

2. Line commands

These commands occupy an entire line. The line starts with @, followed by the name of the command (a word); for example, @center or @cindex. If no argument is needed, the word is followed by the end of the line. If there is an argument, it is separated from the command name by a space. Braces are not used.

3. Block commands

These commands are written at the start of a line, with general text on following lines, terminated by a matching @end command on a line of its own. For example, @example, then the lines of a coding example, then @end example. Some of these block commands take arguments as line commands do; for example, @enumerate A opening an environment terminated by @end enumerate. Here ‘A’ is the argument.

4. Symbol insertion commands with no arguments

These commands start with @ followed by a word followed by a left and right-brace. These commands insert special symbols in the document; they do not take arguments. Some examples: @dots{} ⇒ ‘...’, @equiv{} ⇒ ‘≡’, @TeX{} ⇒ ‘TEX’, and @bullet{} ⇒ ‘•’.

5. Non-alphabetic commands

The names of commands in all of the above categories consist of alphabetic characters, almost entirely in lower-case. Unlike those, the non-alphabetic commands consist of an @ followed by a punctuation mark or other character that is not part of the Latin alphabet. Non-alphabetic commands are almost always part of text within a paragraph. The non-alphabetic commands include @@, @{, }, @., @SPACE, and most of the accent commands.

6. Miscellaneous commands

There are a handful of commands that don’t fit into any of the above categories; for example, the obsolete command @refill, which is always used at the end of a paragraph immediately following the final period or other punctuation character. @refill takes no argument and does not require braces. Likewise, @tab used in a @multitable block does not take arguments, and is not followed by braces.

Thus, the alphabetic commands fall into classes that have different argument syntaxes. You cannot tell to which class a command belongs by the appearance of its name, but you can tell by the command's meaning: if the command stands for a glyph, it is in class 4 and does not require an argument; if it makes sense to use the command among other text as part of a paragraph, the command is in class 1 and must be followed by an argument in braces. The non-alphabetic commands, such as @:, are exceptions to the rule; they do not need braces.

The purpose of having different syntax for commands is to make Texinfo files easier to read, and also to help the GNU Emacs paragraph and filling commands work properly.

A.2 @-Command List

Here is an alphabetical list of the @-commands in Texinfo. Square brackets, [], indicate optional arguments; an ellipsis, '...', indicates repeated text.

@whitespace

An @ followed by a space, tab, or newline produces a normal, stretchable, interword space. See Section 11.3.1 [Multiple Spaces], page 101.

@! Produce an exclamation point that ends a sentence (usually after an end-of-sentence capital letter). See Section 11.3.3 [Ending a Sentence], page 102.

@"

@' Generate an umlaut or acute accent, respectively, over the next character, as in ö and ó. See Section 11.4 [Inserting Accents], page 103.

@&

@ampchar{}

Generate an ampersand. See Section 11.1.6 [Inserting an Ampersand], page 99.

@* Force a line break. See Section 12.2 [Line Breaks], page 114.

@,{c} Generate a cedilla accent under c, as in ç. See Section 11.4 [Inserting Accents], page 103.

@- Insert a discretionary hyphenation point. See Section 12.3 [@- @hyphenation], page 115.

@. Produce a period that ends a sentence (usually after an end-of-sentence capital letter). See Section 11.3.3 [Ending a Sentence], page 102.

@/ Produces no output, but allows a line break. See Section 12.2 [Line Breaks], page 114.

@: Tell printed output processors to refrain from inserting extra whitespace after an immediately preceding period, question mark, exclamation mark, or colon. See Section 11.3.2 [Not Ending a Sentence], page 101.

@= Generate a macron (bar) accent over the next character, as in ō. See Section 11.4 [Inserting Accents], page 103.

@? Produce a question mark that ends a sentence (usually after an end-of-sentence capital letter). See Section 11.3.3 [Ending a Sentence], page 102.

- @@**
@atchar{} Insert an at sign, ‘@’. See Section 11.1.1 [Inserting an Atsign], page 98.
- @**
@backslashchar{} Insert a backslash, ‘\’; **@backslashchar{}** works anywhere, while **@** works only inside **@math**. See Section 11.1.4 [Inserting a Backslash], page 99, and Section 11.7 [Inserting Math], page 106.
- @~**
@` Generate a circumflex (hat) or grave accent, respectively, over the next character, as in ô and è. See Section 11.4 [Inserting Accents], page 103.
- @{**
@lbracechar{} Insert a left brace, ‘{’. See Section 11.1.2 [Inserting Braces], page 98.
- @}**
@rbracechar{} Insert a right brace, ‘}’. See Section 11.1.2 [Inserting Braces], page 98.
- @~** Generate a tilde accent over the next character, as in Ñ. See Section 11.4 [Inserting Accents], page 103.
- @AA{}**
@aa{} Generate the uppercase and lowercase Scandinavian A-ring letters, respectively: Å, å. See Section 11.4 [Inserting Accents], page 103.
- @abbr{abbreviation}** Indicate a general abbreviation, such as ‘Comput.’. See Section 6.1.13 [**@abbr**], page 61.
- @acronym{acronym}** Indicate an acronym in all capital letters, such as ‘NASA’. See Section 6.1.14 [**@acronym**], page 62.
- @AE{}**
@ae{} Generate the uppercase and lowercase AE ligatures, respectively: Æ, æ. See Section 11.4 [Inserting Accents], page 103.
- @afivepaper** Change page dimensions for the A5 paper size. See Section E.7 [A4 Paper], page 281.
- @afourlatex**
@afourpaper
@afourwide Change page dimensions for the A4 paper size. See Section E.7 [A4 Paper], page 281.
- @alias new=existing** Make the command ‘@new’ a synonym for the existing command ‘@existing’. See Section 16.4 [**@alias**], page 150.

@allowcodebreaks *true-false*

Control breaking at ‘-’ and ‘_’ in printed output. See Section 12.4 [**@allowcodebreaks**], page 115.

@anchor{*name*}

Define *name* as the current location for use as a cross-reference target. See Section 5.11 [**@anchor**], page 50.

@appendix *title*

Begin an appendix. The title appears in the table of contents. See Section 4.4 [**@unnumbered @appendix**], page 40.

@appendixsec *title***@appendixsection** *title*

Begin an appendix section within an appendix. The section title appears in the table of contents. **@appendixsection** is a longer spelling of the **@appendixsec** command. See Section 4.7 [**@unnumberedsec @appendixsec @heading**], page 41.

@appendixsubsec *title*

Begin an appendix subsection. The title appears in the table of contents. See Section 4.9 [**@unnumberedsubsec @appendixsubsec @subheading**], page 41.

@appendixsubsubsec *title*

Begin an appendix subsubsection. The title appears in the table of contents. See Section 4.10 [**@subsubsection**], page 42.

@arrow{ } Generate a right arrow glyph: ‘→’. Used by default for **@click**. See Section 11.9.8 [Click Sequences], page 112.

@asis Keep the argument as is. Used following **@table**, **@ftable**, and **@vtable** to print the table’s first column without highlighting (“as is”). See [**@asis**], page 80.

@author *author*

Set a manual author in the title page. See Section 2.8.2 [**@title @subtitle @author**], page 19. Set a quotation author in **@quotation**. See Section 7.2 [**@quotation**], page 67.

@b{*text*} Set *text* in a **bold** font, if possible. See Section 6.2.3 [Fonts], page 64.

@bullet{ }

Generate a large round dot, ●, or the closest possible thing to one. Often used with **@table**. See Section 11.8.5 [**@bullet**], page 108.

@bsixpaper

Change page dimensions for the B6 paper size. See Section E.7 [A4 Paper], page 281.

@bye

Stop processing a file. The processors do not see anything in the input file following **@bye**. See Section 2.12 [Ending a File], page 26.

@c *comment*

Begin a comment in Texinfo. The rest of the line does not appear in any output. A synonym for **@comment**. *DEL* also starts a comment. See Section 2.2 [Comments], page 10.

- @caption** Define the full caption for a **@float**. See Section 9.1.2 [**@caption @shortcaption**], page 85.
- @cartouche**
Highlight an example or quotation by drawing a box with rounded corners around it, if possible. Pair with **@end cartouche**. See Section 7.14 [**@cartouche**], page 74.
- @center** *line-of-text*
Center the line of text following the command. See Section 2.8.3 [**@titlefont @center @sp**], page 20.
- @centerchap** *line-of-text*
Like **@chapter**, but centers the chapter title. See Section 4.3 [**@chapter**], page 39.
- @chapheading** *title*
Print an unnumbered chapter-like heading, but omit from the table of contents. See Section 4.5 [**@majorheading @chapheading**], page 40.
- @chapter** *title*
Begin a numbered chapter. The chapter title appears in the table of contents. See Section 4.3 [**@chapter**], page 39.
- @cindex** *entry*
Add *entry* to the index of concepts. See Section 10.4 [Defining the Entries of an Index], page 93.
- @cite{reference}**
Highlight the name of a book or other reference that has no companion Info file. See Section 5.15 [**@cite**], page 53.
- @clear** *flag*
Unset *flag*, preventing the Texinfo formatting commands from formatting text between subsequent pairs of **@ifset flag** and **@end ifset** commands, and preventing **@value{flag}** from expanding to the value to which *flag* is set. See Section 15.5 [**@set @clear @value**], page 138.
- @click{}** Represent a single “click” in a GUI. Used within **@clicksequence**. See Section 11.9.8 [Click Sequences], page 112.
- @clicksequence{action @click{} action}**
Represent a sequence of clicks in a GUI. See Section 11.9.8 [Click Sequences], page 112.
- @clickstyle @cmd**
Execute **@cmd** for each **@click**; the default is **@arrow**. The usual following empty braces on **@cmd** are omitted. See Section 11.9.8 [Click Sequences], page 112.
- @code{sample-code}**
Indicate an expression, a syntactically complete token of a program, or a program name. See Section 6.1.2 [**@code**], page 56.
- @codequotebacktick** *on-off*
- @codequoteundirected** *on-off*
Control output of ``` and `'` in code examples. See Section 11.2 [Inserting Quote Characters], page 100.

- @comma{}** Insert a comma ‘,’ character; only needed when a literal comma would be taken as an argument separator. See Section 11.1.3 [Inserting a Comma], page 98.
- @command{*command-name*}**
Indicate a command name, such as `ls`. See Section 6.1.10 [`@command`], page 61.
- @comment *comment***
Begin a comment in Texinfo. The rest of the line does not appear in any output. A synonym for `@c`. See Section 2.2 [Comments], page 10.
- @contents**
Print a complete table of contents or specify that a table of content should be output, for formats that may output a table of contents. See Section 2.9 [Generating a Table of Contents], page 22.
- @copying** Specify copyright holders and copying conditions for the document. Pair with `@end copying`. See Section 2.7.1 [`@copying`], page 17.
- @copyright{}**
Generate the copyright symbol ©. See Section 11.8.2 [`@copyright`], page 107.
- @defblock**
Start a block containing definitions. Pair with ‘`@end defblock`’. See Section 13.7 [Generic Definition Commands], page 127.
- @defcodeindex *index-name***
Define a new index and its indexing command. Print entries in an `@code` font. See Section 10.7 [Defining New Indices], page 96.
- @defcv *category class name***
@defcvx *category class name*
Format a description for a variable associated with a class in object-oriented programming. Takes three arguments: the category of thing being defined, the class to which it belongs, and its name. See Chapter 13 [Definition Commands], page 118.
- @deffn *category name arguments...***
@deffnx *category name arguments...*
Format a description for a function, interactive command, or similar entity that may take arguments. `@deffn` takes as arguments the category of entity being described, the name of this particular entity, and its arguments, if any. See Chapter 13 [Definition Commands], page 118.
- @defindex *index-name***
Define a new index and its indexing command. Print entries in a roman font. See Section 10.7 [Defining New Indices], page 96.
- @definfoenclose *newcmd, before, after***
Create a new command `@newcmd` for online formats that marks text by enclosing it in strings that precede and follow the text. See Section 16.6 [`@definfoenclose`], page 152.

`@defivar` *class instance-variable-name*

`@defivarx` *class instance-variable-name*

Format a description for an instance variable in object-oriented programming. The command is equivalent to ‘`@defcv {Instance Variable} ...`’. See Chapter 13 [Definition Commands], page 118.

`@defline` *category name arguments...*

Use within a `@defblock` environment to give the heading prototype line for a symbol being defined. This command does not create any index entries. See Section 13.7 [Generic Definition Commands], page 127.

`@defmac` *macroname arguments...*

`@defmacx` *macroname arguments...*

Format a description for a macro; equivalent to ‘`@defn Macro ...`’. See Chapter 13 [Definition Commands], page 118.

`@defmethod` *class method-name arguments...*

`@defmethodx` *class method-name arguments...*

Format a description for a method in object-oriented programming; equivalent to ‘`@defop Method ...`’. See Chapter 13 [Definition Commands], page 118.

`@defop` *category class name arguments...*

`@defopx` *category class name arguments...*

Format a description for an operation in object-oriented programming. `@defop` takes as arguments the name of the category of operation, the name of the operation’s class, the name of the operation, and its arguments, if any. See Chapter 13 [Definition Commands], page 118, and Section 13.6.6 [Abstract Objects], page 125.

`@defopt` *option-name*

`@defoptx` *option-name*

Format a description for a user option; equivalent to ‘`@defvr {User Option} ...`’. See Chapter 13 [Definition Commands], page 118.

`@defspec` *special-form-name arguments...*

`@defspecx` *special-form-name arguments...*

Format a description for a special form; equivalent to ‘`@defn {Special Form} ...`’. See Chapter 13 [Definition Commands], page 118.

`@deftp` *category name-of-type attributes...*

`@deftpx` *category name-of-type attributes...*

Format a description for a data type; its arguments are the category, the name of the type (e.g., ‘`int`’), and then the names of attributes of objects of that type. See Chapter 13 [Definition Commands], page 118, and Section 13.6.5 [Data Types], page 124.

`@deftypecv` *category class data-type name*

`@deftypecvx` *category class data-type name*

Format a description for a typed class variable in object-oriented programming. See Chapter 13 [Definition Commands], page 118, and Section 13.6.6 [Abstract Objects], page 125.

`@deftypefn` *category data-type name arguments...*

`@deftypefnx` *category data-type name arguments...*

Format a description for a function or similar entity that may take arguments and that is typed. `@deftypefn` takes as arguments the category of entity being described, the type, the name of the entity, and its arguments, if any. See Chapter 13 [Definition Commands], page 118.

`@deftypefnnewline` *on-off*

Specifies whether return types for `@deftypefn` and similar are printed on lines by themselves; default is off. See Section 13.6.2 [Functions in Typed Languages], page 121.

`@deftypefun` *data-type function-name arguments...*

`@deftypefunx` *data-type function-name arguments...*

Format a description for a function in a typed language. The command is equivalent to ‘`@deftypefn Function ...`’. See Chapter 13 [Definition Commands], page 118.

`@deftypeivar` *class data-type variable-name*

`@deftypeivarx` *class data-type variable-name*

Format a description for a typed instance variable in object-oriented programming. See Chapter 13 [Definition Commands], page 118, and Section 13.6.6 [Abstract Objects], page 125.

`@deftypeline` *category data-type name arguments...*

Use within a `@defblock` environment to give the heading prototype line for a symbol being defined, with data types. This command does not create any index entries. See Section 13.7 [Generic Definition Commands], page 127.

`@deftypemethod` *class data-type method-name arguments...*

`@deftypemethodx` *class data-type method-name arguments...*

Format a description for a typed method in object-oriented programming. See Chapter 13 [Definition Commands], page 118.

`@deftypeop` *category class data-type name arguments...*

`@deftypeopx` *category class data-type name arguments...*

Format a description for a typed operation in object-oriented programming. See Chapter 13 [Definition Commands], page 118, and Section 13.6.6 [Abstract Objects], page 125.

`@deftypevar` *data-type variable-name*

`@deftypevarx` *data-type variable-name*

Format a description for a variable in a typed language. The command is equivalent to ‘`@deftypevr Variable ...`’. See Chapter 13 [Definition Commands], page 118.

`@deftypevr` *category data-type name*

`@deftypevrx` *category data-type name*

Format a description for something like a variable in a typed language—an entity that records a value. Takes as arguments the category of entity being described, the type, and the name of the entity. See Chapter 13 [Definition Commands], page 118.

@defun *function-name arguments...*

@defunx *function-name arguments...*

Format a description for a function; equivalent to ‘@defn Function ...’. See Chapter 13 [Definition Commands], page 118.

@defvar *variable-name*

@defvarx *variable-name*

Format a description for a variable; equivalent to ‘@defvr Variable ...’. See Chapter 13 [Definition Commands], page 118.

@defvr *category name*

@defvrx *category name*

Format a description for any kind of variable. **@defvr** takes as arguments the category of the entity and the name of the entity. See Chapter 13 [Definition Commands], page 118.

@detailmenu

Mark the (optional) detailed node listing in a master menu. See Section 2.10.1 [Master Menu Parts], page 23.

@dfn{*term*}

Indicate the introductory or defining use of a term. See Section 6.1.12 [dfn], page 61.

@DH{}

@dh{}

Generate the uppercase and lowercase Icelandic letter eth, respectively: Ð, ð. See Section 11.4 [Inserting Accents], page 103.

@dircategory *dirpart*

Specify a category for the manual. See Section 2.6 [Directory Category], page 16.

@direntry

Begin the Info directory menu entry for this file. Pair with **@end direntry**. See Section 20.1.4 [Installing Dir Entries], page 198.

@display Begin a kind of example. Like **@example** (indent text, do not fill), but do not select a new font. Pair with **@end display**. See Section 7.7 [display], page 70.

@displaymath

Format a block of math in “display” format. See Section 11.7 [Inserting Math], page 106.

@dmn{*dimension*}

Format a unit of measure, as in 12 pt. See Section 11.3.5 [dmn], page 103.

@docbook Enter DocBook completely. Pair with **@end docbook**. See Section 15.3 [Raw Formatter Commands], page 136.

@documentdescription

Set the document description text, included in the HTML output. Pair with **@end documentdescription**. See Section 21.4 [documentdescription], page 207.

@documentencoding *enc*

Declare the input encoding to be *enc*. See Section 14.2 [documentencoding], page 132.

- @documentlanguage** *CC*
 Declare the document language as the two-character ISO-639 abbreviation *CC*. See Section 14.1 [**@documentlanguage**], page 131.
- @dotaccent**{*c*}
 Generate a dot accent over the character *c*, as in *ó*. See Section 11.4 [Inserting Accents], page 103.
- @dotless**{*i-or-j*}
 Generate dotless *i* (*ı*) and dotless *j* (*ȷ*). See Section 11.4 [Inserting Accents], page 103.
- @dots**{ }
 Generate an ellipsis, ‘...’. See Section 11.8.4 [**@dots**], page 107.
- @email**{*address* [, *displayed-text*] }
 Indicate an electronic mail address. See Section 6.1.16 [**@email**], page 63.
- @emph**{*text*}
 Emphasize *text*. See Section 6.2 [Emphasizing Text], page 63.
- @end environment**
 Ends *environment*, as in ‘@end example’. See [**@-commands**], page 9.
- @enddots**{ }
 Generate an end-of-sentence ellipsis, like this: ... See Section 11.8.4 [**@dots**], page 107.
- @enumerate** [*number-or-letter*]
 Begin a numbered list, using **@item** for each entry. Optionally, start list with *number-or-letter*. Pair with **@end enumerate**. See Section 8.3 [**@enumerate**], page 78.
- @env**{*environment-variable*}
 Indicate an environment variable name, such as **PATH**. See Section 6.1.8 [**@env**], page 60.
- @equiv**{ }
 Indicate to the reader the exact equivalence of two forms with a glyph: ‘≡’. See Section 11.9.6 [**@equiv**], page 111.
- @error**{ }
 Indicate to the reader with a glyph that the following text is an error message: ‘**error**’. See Section 11.9.5 [**@error**], page 110.
- @errormsg**{*msg*}
 Report *msg* as an error to standard error, and exit unsuccessfully. Texinfo commands within *msg* are expanded to plain text. See Chapter 15 [Conditionals], page 134, and Section 16.7 [External Macro Processors], page 153.
- @euro**{ }
 Generate the Euro currency sign. See Section 11.8.6 [**@euro**], page 108.
- @evenfooting** [*left*] @| [*center*] @| [*right*]
@evenheading [*left*] @| [*center*] @| [*right*]
 Specify page footings resp. headings for even-numbered (left-hand) pages. See Section E.2.3 [How to Make Your Own Headings], page 277.

- `@everyfooting` [*left*] @| [*center*] @| [*right*]
`@everyheading` [*left*] @| [*center*] @| [*right*]
 Specify page footings resp. headings for every page. Not relevant to Info. See Section E.2.3 [How to Make Your Own Headings], page 277.
- `@example` Begin an example. Indent text, do not fill, and select fixed-width font. Pair with `@end example`. `@example` accepts optional arguments, separated by commas. It is recommended to set the first argument to the language of the example code. See Section 7.4 [`@example`], page 68.
- `@exampleindent` *indent*
 Indent example-like environments by *indent* number of spaces (perhaps 0). See Section E.5 [`@exampleindent`], page 280.
- `@exclamdown`{*n*}
 Generate an upside-down exclamation point. See Section 11.4 [Inserting Accents], page 103.
- `@exdent` *line-of-text*
 Remove any indentation a line might have. See Section 7.9 [`@exdent`], page 71.
- `@expansion`{*text*}
 Indicate the result of a macro expansion to the reader with a special glyph: ‘ \mapsto ’. See Section 11.9.3 [`@expansion`], page 109.
- `@file`{*filename*}
 Highlight the name of a file, buffer, node, directory, etc. See Section 6.1.9 [`@file`], page 60.
- `@finalout`
 Prevent T_EX from printing large black warning rectangles beside over-wide lines. See Section 18.6 [Overfull hboxes], page 162.
- `@findex` *entry*
 Add *entry* to the index of functions. See Section 10.4 [Defining the Entries of an Index], page 93.
- `@firstparagraphindent` *word*
 Control indentation of the first paragraph after section headers according to *word*, one of ‘none’ or ‘insert’. See Section E.4 [`@firstparagraphindent`], page 280.
- `@float` Environment to define floating material. Pair with `@end float`. See Section 9.1 [Floats], page 84.
- `@flushleft`
`@flushright`
 Do not fill text; left (right) justify every line while leaving the right (left) end ragged. Leave font as is. Pair with `@end flushleft` (`@end flushright`). See Section 7.10 [`@flushleft @flushright`], page 71.
- `@fonttextsize` *10-11*
 Change the size of the main body font in the printed output. See Section 6.2.3 [Fonts], page 64.

@footnote*{text-of-footnote}*

Enter a footnote, for a reference that documents or elucidates the primary text. Footnote text is printed at the bottom of the page in printed output. In other formats, footnote text can be output in the same node, in a separate node, or simply be marked as being footnote text. See Section 9.3 [Footnotes], page 88.

@footnotestyle *style*

Specify a footnote style, either ‘end’ for the end node style or ‘separate’ for the separate style. In the separate style, footnotes are put in a separate node or file. See Section 9.3.2 [Footnote Styles], page 89.

@format Begin a kind of example. Like **@display**, but do not indent. Pair with **@end format**. See Section 7.4 [**@example**], page 68.

@frenchspacing *on-off*

Control spacing after punctuation. See Section 11.3.4 [**@frenchspacing**], page 102.

@ftable *formatting-command*

Begin a two-column table, using **@item** for each entry. Automatically enter each of the items in the first column into the index of functions. Pair with **@end ftable**. The same as **@table**, except for indexing. See Section 8.4.2 [**@ftable @vtable**], page 81.

@geq{} Generate a greater-than-or-equal sign, ‘≥’. See Section 11.8.10 [**@geq @leq**], page 108.

@group Disallow page breaks within following text. Pair with **@end group**. Ignored in Info. See Section 12.9 [**@group**], page 116.

@guillemetleft{}**@guillemetright{}****@guillemotleft{}****@guillemotright{}****@guilsinglleft{}****@guilsinglright{}**

Double and single angle quotation marks: « » ‹ ›. **@guillemotleft** and **@guillemotright** are synonyms for **@guillemetleft** and **@guillemetright**. See Section 11.5 [Inserting Quotation Marks], page 104.

@H{c} Generate the long Hungarian umlaut accent over *c*, as in *ó*.

@hashchar{}

Insert a hash ‘#’ character; only needed when a literal hash would introduce **#line** directive. See Section 11.1.5 [Inserting a Hashsign], page 99, and Section 16.7 [External Macro Processors], page 153.

@heading *title*

Print an unnumbered section-like heading, but omit from the table of contents. See Section 4.7 [**@unnumberedsec @appendixsec @heading**], page 41.

@headings *on-off-single-double*

Turn page headings on or off, and/or specify single-sided or double-sided page headings for printing. See Section E.2.1 [**@headings**], page 276.

- @headitem** Begin a heading row in a multitable. See Section 8.5.2 [Multitable Rows], page 82.
- @headitemfont{*text*}** Set *text* in the font used for multitable heading rows; mostly useful in multitable templates. See Section 8.5.2 [Multitable Rows], page 82.
- @html** Enter HTML completely. Pair with **@end html**. See Section 15.3 [Raw Formatter Commands], page 136.
- @hyphenation{*hy-phen-a-ted words*}** Explicitly define hyphenation points. See Section 12.3 [@- @hyphenation], page 115.
- @i{*text*}** Set *text* in an *italic* font, when possible. See Section 6.2.3 [Fonts], page 64.
- @ifclear *txivar***
If the Texinfo variable *txivar* is not set, format the following text. Pair with **@end ifclear**. See Section 15.5 [@set @clear @value], page 138.
- @ifcommanddefined *txicmd***
@ifcommandnotdefined *txicmd*
If the Texinfo code ‘*txicmd*’ is (not) defined, format the follow text. Pair with the corresponding **@end ifcommand...**. See Section 15.6 [Testing for Texinfo Commands], page 141.
- @ifdocbook**
@ifhtml
@ifinfo
@iflatex
@ifplaintext
@ifxml Begin text that will appear only in the given output format. **@ifinfo** output appears in both Info and (for historical compatibility) plain text output. Pair with **@end ifdocbook** resp. **@end ifhtml...**. See Chapter 15 [Conditionals], page 134.
- @ifnotdocbook**
@ifnohtml
@ifnotlatex
@ifnotplaintext
@ifnottex
@ifnotxml
Begin text to be ignored in one output format but not the others. **@ifnohtml** text is omitted from HTML output, etc. Pair with the corresponding **@end ifnotformat**. See Chapter 15 [Conditionals], page 134.
- @ifnotinfo**
Begin text to appear in output other than Info and (for historical compatibility) plain text. Pair with **@end ifnotinfo**. See Chapter 15 [Conditionals], page 134.

- @ifset** *txivar*
If the Texinfo variable *txivar* is set, format the following text. Pair with **@end ifset**. See Section 15.5 [**@set @clear @value**], page 138.
- @iftex** Begin text to appear only in the T_EX output. Pair with **@end iftex**. See Chapter 15 [Conditionals], page 134.
- @ignore** Begin text that will not appear in any output. Pair with **@end ignore**. See Section 2.2 [Comments and Ignored Text], page 10.
- @image**{*filename*, [*width*], [*height*], [*alt*], [*ext*]}
Include graphics image in external *filename* scaled to the given *width* and/or *height*, using *alt* text and looking for '*filename.ext*' in HTML. See Section 9.2 [Images], page 86.
- @include** *filename*
Read the contents of Texinfo source file *filename*. See Chapter 17 [Include Files], page 155.
- @indent** Insert paragraph indentation. See Section 7.13 [**@indent**], page 73.
- @indentedblock**
Indent a block of arbitrary text on the left. Pair with **@end indentedblock**. See Section 7.3 [**@indentedblock**], page 68.
- @indicateurl**{*indicateurl*}
Indicate text that is a uniform resource locator for the World Wide Web. See Section 6.1.15 [**@indicateurl**], page 63.
- @inforef**{*node-name*, [*entry-name*], *info-file-name*}
Make a cross-reference to an Info file for which there is no printed manual. See Section 5.13 [**@inforef**], page 51.
- @inlinefmt**{*fmt*, *text*}
Insert *text* only if the output format is *fmt*. See Section 15.4 [Inline Conditionals], page 137.
- @inlinefmtifelse**{*fmt*, *text*, *else-text*}
Insert *text* if the output format is *fmt*, else *else-text*.
- @inlineifclear**{*var*, *text*}
@inlineifset{*var*, *text*}
Insert *text* only if the Texinfo variable *var* is (not) set.
- @inlineraw**{*fmt*, *raw-text*}
Insert *text* as in a raw conditional, only if the output format is *fmt*.
- \input** *macro-definitions-file*
Use the specified macro definitions file. This command is used only in the first line of a Texinfo file to cause T_EX to make use of the **texinfo** macro definitions file. The **** in **\input** is used instead of an **@** because T_EX does not recognize **@** until after it has read the definitions file. See Section 2.5 [Texinfo File Header], page 12.

- @insertcopying**
Insert the text previously defined with the `@copying` environment. See Section 2.7.2 [`@insertcopying`], page 18.
- @item**
Indicate the beginning of a marked paragraph for `@itemize` and `@enumerate`; indicate the beginning of the text of a first column entry for `@table`, `@ftable`, and `@vtable`. See Chapter 8 [Lists and Tables], page 76.
- @itemize** *mark-generating-character-or-command*
Begin an unordered list: indented paragraphs with a mark, such as `@bullet`, inside the left margin at the beginning of each item. Pair with `@end itemize`. See Section 8.2 [`@itemize`], page 77.
- @itemx**
Like `@item` in `@table`, `@ftable`, and `@vtable`, but do not generate extra vertical space above the item text. Thus, when several items have the same description, use `@item` for the first and `@itemx` for the others. See Section 8.4.3 [`@itemx`], page 81.
- @kbd{*keyboard-characters*}**
Indicate characters of input to be typed by users. See Section 6.1.3 [`@kbd`], page 57.
- @kbinputstyle** *style*
Specify when `@kbd` should use a font distinct from `@code` according to *style*: `code`, `distinct`, `example`. See Section 6.1.3 [`@kbd`], page 57.
- @key{*key-name*}**
Indicate the name of a key on a keyboard. See Section 6.1.4 [`@key`], page 58.
- @kindex** *entry*
Add *entry* to the index of keys. See Section 10.4 [Defining the Entries of an Index], page 93.
- @L{}**
- @l{}**
Generate the uppercase and lowercase Polish suppressed-L letters, respectively: Ł, ł.
- @LaTeX{}**
Generate the L^AT_EX logo. See Section 11.8.1 [`@TeX @LaTeX`], page 107.
- @latex**
Enter L^AT_EX completely. Pair with `@end latex`. See Section 15.3 [Raw Formatter Commands], page 136.
- @leq{}**
Generate a less-than-or-equal sign, ‘≤’. See Section 11.8.10 [`@geq @leq`], page 108.
- @linemacro** *macroname* {*params*}
Define a new macro which takes rest of the line as an argument, and expands to a whole number of complete lines. See Section 16.5 [Line Macros], page 151.
- @link{*nodename*, *label*, *manual-name*}**
Create a plain link with no visible markup or page reference. See Section 5.12 [`@link`], page 51.
- @lisp**
Begin an example of Lisp code. Indent text, do not fill, and select fixed-width font. Pair with `@end lisp`. See Section 7.6 [`@lisp`], page 70.

- @listoffloats**
Produce a table-of-contents-like listing of @floats. See Section 9.1.3 [listoffloats], page 86.
- @lowersections**
Change subsequent chapters to sections, sections to subsections, and so on. See Section 4.12 [raisesections and lowersections], page 43.
- @macro *macroname* {*params*}**
Define a new Texinfo command @*macroname*{*params*}. Pair with @end macro. See Section 16.1 [Defining Macros], page 144.
- @majorheading *title***
Print an unnumbered chapter-like heading, but omit from the table of contents. This generates more vertical whitespace before the heading than the @chapheading command. See Section 4.5 [majorheading @chapheading], page 40.
- @math{*mathematical-expression*}**
Format a mathematical expression. See Section 11.7 [Inserting Math], page 106.
- @menu** Mark the beginning of a menu of nodes. No effect in a printed manual. Pair with @end menu. See Section 3.9 [Menus], page 34.
- @microtype *on-off***
Turn microtype on or off. See Section E.9 [Microtypography], page 282.
- @minus{}** Generate a minus sign, ‘−’. See Section 11.8.9 [minus], page 108.
- @multitable *column-width-spec***
Begin a multi-column table. Begin each row with @item or @headitem, and separate columns with @tab. Pair with @end multitable. See Section 8.5.1 [Multitable Column Widths], page 82.
- @need *n*** Start a new page in a printed manual if fewer than *n* mils (thousandths of an inch) remain on the current page. See Section 12.10 [need], page 117.
- @node *name*, [*next*], [*previous*], [*up*]**
Begin a new node. Only the first argument is mandatory. See Section 3.1 [Writing a Node], page 27.
- @nodedescription *node-description***
Provide a short elaboration of the purpose of a node. See Section 3.8 [Node Descriptions], page 33.
- @nodedescriptionblock**
Used to start a longer node description. Pair with ‘@end nodedescriptionblock’. See Section 3.8 [Node Descriptions], page 33.
- @noindent**
Prevent text from being indented as if it were a new paragraph. See Section 7.12 [noindent], page 73.

@novalidate

Suppress validation of node references and omit creation of auxiliary files with T_EX. Use before any sectioning or cross-reference commands. See [Pointer Validation], page 168.

@O{}

@o{} Generate the uppercase and lowercase O-with-slash letters, respectively: Ø, ø.

@oddfooting [*left*] @| [*center*] @| [*right*]**@oddheading** [*left*] @| [*center*] @| [*right*]

Specify page footings resp. headings for odd-numbered (right-hand) pages. See Section E.2.3 [How to Make Your Own Headings], page 277.

@OE{}

@oe{} Generate the uppercase and lowercase OE ligatures, respectively: Œ, œ. See Section 11.4 [Inserting Accents], page 103.

@ogonek{c}

Generate an ogonek diacritic under the next character, as in ą. See Section 11.4 [Inserting Accents], page 103.

@option{option-name}

Indicate a command-line option, such as `-l` or `--help`. See Section 6.1.11 [option], page 61.

@ordf{}

@ordm{} Generate the feminine and masculine Spanish ordinals, respectively: ^a, ^o. See Section 11.4 [Inserting Accents], page 103.

@page Start a new page in a printed manual. See Section 12.8 [page], page 116.

@pagesizes [*width*] [, *height*]

Change page dimensions. See [pagesizes], page 281.

@paragraphindent *indent*

Indent paragraphs by *indent* number of spaces (perhaps 0); preserve source file indentation if *indent* is *asis*. See Section E.3 [paragraphindent], page 280.

@part *title*

Begin a group of chapters or appendixes; included in the tables of contents. See Section 4.11 [part], page 42.

@pindex *entry*

Add *entry* to the index of programs. See Section 10.4 [Defining the Entries of an Index], page 93.

@point{} Indicate the position of point in a buffer to the reader with a glyph: ‘★’. See Section 11.9.7 [point], page 111.

@pounds{}

Generate the pounds sterling currency sign, ‘£’. See Section 11.8.7 [pounds], page 108.

@print{} Indicate printed output to the reader with a glyph: ‘-’. See Section 11.9.4 [print], page 110.

@printindex *index-name*

Generate the index for *index-name*. See Section 10.5 [Printing Indices & Menus], page 94.

@pxref{*node*, [*entry*], [*node-title*], [*info-file*], [*printed-manual*]}

Make a reference to be used within parentheses. Starts with a lowercase ‘see’ in a printed manual. The first argument is mandatory, except for references to whole manuals. To refer to another manual as a whole, the *printed-manual* and/or the *info-file* are the only required arguments. See Section 5.10 [@pxref], page 50.

@questiondown{}

Generate an upside-down question mark. See Section 11.4 [Inserting Accents], page 103.

@quotation

Narrow the margins to indicate text that is quoted from another work. Takes optional argument specifying prefix text. Pair with **@end quotation**. See Section 7.2 [@quotation], page 67.

@quotedblleft{}**@quotedblright**{}**@quoteleft**{}**@quoteright**{}**@quotedblbase**{}**@quotesinglbase**{}

Produce various quotation marks: “ ” ‘ ’ „ ,. See Section 11.5 [Inserting Quotation Marks], page 104.

@r{*text*} Set *text* in the regular roman font, if possible. See Section 6.2.3 [Fonts], page 64.

@raggedright

Fill text; left justify every line while leaving the right end ragged. Leave font as is. Pair with **@end raggedright**. See Section 7.11 [@raggedright], page 72.

@raisesections

Change subsequent sections to chapters, subsections to sections, and so on. See Section 4.12 [Raise/lower sections], page 43.

@ref{*node*, [*entry*], [*node-title*], [*info-file*], [*printed-manual*]}

Make a plain reference that does not start with any special text. Follow command with a punctuation mark. The first argument is mandatory, except for references to whole manuals. To refer to another manual as a whole, the *printed-manual* and/or the *info-file* are the only required arguments. See Section 5.9 [@ref], page 49.

@registeredsymbol{}

Generate the legal symbol ®. See Section 11.8.3 [@registeredsymbol], page 107.

@result{}

Indicate the result of an expression to the reader with a special glyph: ‘⇒’. See Section 11.9.2 [@result], page 109.

- @ringaccent**{*c*}
Generate a ring accent over the next character, as in \circ . See Section 11.4 [Inserting Accents], page 103.
- @samp**{*text*}
Indicate a literal example of a sequence of characters, in general. See Section 6.1.5 [@samp], page 58.
- @sansserif**{*text*}
Set *text* in a sans serif font if possible. See Section 6.2.3 [Fonts], page 64.
- @sc**{*text*} Set *text* in a small caps font if possible, and uppercase in Info. See Section 6.2.2 [Smallcaps], page 64.
- @section** *title*
Begin a section within a chapter. The section title appears in the table of contents. Within **@chapter** and **@appendix**, the section title is numbered; within **@unnumbered**, the section is unnumbered. See Section 4.6 [@section], page 40.
- @seealso**{*index-text*}
Use in an index entry to refer the reader to another relevant index entry. See Section 10.3 [Advanced Indexing], page 93.
- @seeentry**{*index-text*}
Use in an index entry to redirect the reader to another index entry. See Section 10.3 [Advanced Indexing], page 93.
- @set** *txivar* [*string*]
Define the Texinfo variable *txivar*, optionally to the value *string*. See Section 15.5 [@set @clear @value], page 138.
- @setchapternewpage** *on-off-odd*
Specify whether chapters start on new pages, and if so, whether on odd-numbered (right-hand) new pages. See Section E.1 [@setchapternewpage], page 275.
- @setfilename** *info-file-name*
Provide a name to be used for the output files. This command is ignored for TeX formatting. See Section 2.5.2 [@setfilename], page 13.
- @settitle** *title*
Specify the title for page headers in a printed manual, and the default document title for HTML. See Section 2.5.3 [@settitle], page 14.
- @shortcaption**
Define the short caption for a **@float**. See Section 9.1.2 [@caption @shortcaption], page 85.
- @shortcontents**
Print a short table of contents, with chapter-level entries only, or specify that a short table of contents should be output. For formats that may output a short table of contents. See Section 2.9 [Generating a Table of Contents], page 22.
- @shorttitlepage** *title*
Generate a minimal title page. See Section 2.8.1 [@titlepage], page 18.

- @slanted{*text*}**
Set *text* in a *slanted* font if possible. See Section 6.2.3 [Fonts], page 64.
- @smallbook**
In printed output, use a 7 by 9.25 inch format rather than the regular 8.5 by 11 inch format. See Section E.6 [@smallbook], page 281.
- @smalldisplay**
Begin a kind of example. Like @display, but use a smaller font size where possible. Pair with @end smalldisplay. See Section 7.15 [small], page 75.
- @smallexample**
Begin an example. Like @example, but use a smaller font size where possible. Pair with @end smallexample. See Section 7.15 [small], page 75.
- @smallformat**
Begin a kind of example. Like @format, but use a smaller font size where possible. Pair with @end smallformat. See Section 7.15 [small], page 75.
- @smallindentedblock**
Like @indentedblock, but use a smaller font size where possible. Pair with @end smallindentedblock. See Section 7.15 [small], page 75.
- @smalllisp**
Begin an example of Lisp code. Same as @smallexample. Pair with @end smalllisp. See Section 7.15 [small], page 75.
- @smallquotation**
Like @quotation, but use a smaller font size where possible. Pair with @end smallquotation. See Section 7.15 [small], page 75.
- @sortas {*key*}**
Used in the arguments to index commands to give a string by which the index entry should be sorted. See Section 10.2 [Indexing Commands], page 92.
- @sp *n***
Skip *n* blank lines. See Section 12.7 [@sp], page 116.
- @ss{}**
Generate the German sharp-S es-zet letter, ß. See Section 11.4 [Inserting Accents], page 103.
- @strong {*text*}**
Emphasize *text* more strongly than @emph. See [Emphasizing Text], page 63.
- @sub {*text*}**
Set *text* as a subscript. See Section 11.6 [Inserting Subscripts and Superscripts], page 106.
- @subentry**
Use in an index entry to separate parts of a multi-level entry. See Section 10.3 [Advanced Indexing], page 93.
- @subheading *title***
Print an unnumbered subsection-like heading, but omit from the table of contents of a printed manual. See Section 4.9 [@unnumberedsubsec @appendixsubsec @subheading], page 41.

@subsection *title*

Begin a subsection within a section. The subsection title appears in the table of contents. Same context-dependent numbering as **@section**. See Section 4.8 [**@subsection**], page 41.

@subsubheading *title*

Print an unnumbered subsubsection-like heading, but omit from the table of contents of a printed manual. See Section 4.10 [**@subsubsection**], page 42.

@subsubsection *title*

Begin a subsubsection within a subsection. The subsubsection title appears in the table of contents. Same context-dependent numbering as **@section**. See Section 4.10 [**@subsubsection**], page 42.

@subtitle *title*

Set a subtitle for the title page. See Section 2.8.2 [**@title @subtitle @author**], page 19.

@summarycontents

Print or specify a short table of contents. Synonym for **@shortcontents**. See Section 2.9 [Generating a Table of Contents], page 22.

@sup {*text*}

Set *text* as a superscript. See Section 11.6 [Inserting Subscripts and Superscripts], page 106.

@syncodeindex *from-index to-index*

Merge the index named in the first argument into the index named in the second argument, formatting the entries from the first index with **@code**. See Section 10.6 [Combining Indices], page 95.

@synindex *from-index to-index*

Merge the index named in the first argument into the index named in the second argument. Do not change the font of *from-index* entries. See Section 10.6 [Combining Indices], page 95.

@t{*text*} Set *text* in a **fixed-width**, typewriter-like font, if possible. See Section 6.2.3 [Fonts], page 64.

@tab Separate columns in a row of a multitable. See Section 8.5.2 [Multitable Rows], page 82.

@table *formatting-command*

Begin a two-column table (description list), using **@item** for each entry. Write each first column entry on the same line as **@item**. First column entries are printed in the font resulting from *formatting-command*. Pair with **@end table**. See Section 8.4 [Making a Two-column Table], page 79. Also see Section 8.4.2 [**@ftable @vtable**], page 81, and Section 8.4.3 [**@itemx**], page 81.

@TeX{ } Generate the T_EX logo. See Section 11.8.1 [**@TeX @LaTeX**], page 107.

@tex Enter T_EX completely. Pair with **@end tex**. See Section 15.3 [Raw Formatter Commands], page 136.

- @textdegree{}**
Generate the degree symbol. See Section 11.8.8 [**@textdegree**], page 108.
- @thischapter**
@thischaptername
@thischapternum
@thissection
@thissectionname
@thissectionnum
@thisfile
@thispage
@thistitle
Only allowed in a heading or footing. Stands for, respectively, the number and name of the current chapter (in the format ‘Chapter 1: Title’), the current chapter name only, the current chapter number only, the number and name of the current section, the current section name only, the current section number only, the file name, the current page number, and the title of the document. See Section E.2.3 [How to Make Your Own Headings], page 277.
- @TH{}**
@th{} Generate the uppercase and lowercase Icelandic letter thorn, respectively: Þ, þ. See Section 11.4 [Inserting Accents], page 103.
- @tie{}** Generate a normal interword space at which a line break is not allowed. See Section 12.6 [**@tie**], page 116.
- @tieaccent{cc}**
Generate a tie-after accent over the next two characters *cc*, as in ‘ôô’. See Section 11.4 [Inserting Accents], page 103.
- @tindex entry**
Add *entry* to the index of data types. See Section 10.4 [Defining the Entries of an Index], page 93.
- @title title**
Set the title for the title page. See Section 2.8.2 [**@title @subtitle @author**], page 19.
- @titlefont{text}**
Print *text* in a larger than normal font, if possible. See Section 2.8.3 [**@titlefont @center @sp**], page 20.
- @titlepage**
Begin the title page. Write the command on a line of its own, paired with **@end titlepage**. The title page is not output, in the default case, in online formats. See Section 2.8.1 [**@titlepage**], page 18.
- @today{}** Insert the current date, in ‘1 Jan 1900’ style. See Section E.2.3 [How to Make Your Own Headings], page 277.
- @top title** Mark the topmost **@node** in the file, which must be defined on the line immediately preceding the **@top** command. The title is formatted as a chapter-level heading. In T_EX the **@top** command is merely a synonym for **@unnumbered**.

- @U{hex}** Output a representation of Unicode character U+*hex*. See Section 11.10 [Inserting Unicode], page 112.
- @u{c}**
- @ubaraccent{c}**
- @udotaccent{c}**
Generate a breve, underbar, or underdot accent, respectively, over or under the character *c*, as in *ö, o, o*. See Section 11.4 [Inserting Accents], page 103.
- @unmacro *macroname***
Undefine the macro **@*macroname*** if it has been defined. See Section 16.1 [Defining Macros], page 144.
- @unnumbered *title***
Begin a chapter that appears without chapter numbers of any kind. The title appears in the table of contents. See Section 4.4 [**@unnumbered @appendix**], page 40.
- @unnumberedsec *title***
Begin a section that appears without section numbers of any kind. The title appears in the table of contents. See Section 4.7 [**@unnumberedsec @appendixsec @heading**], page 41.
- @unnumberedsubsec *title***
Begin an unnumbered subsection. The title appears in the table of contents. See Section 4.9 [**@unnumberedsubsec @appendixsubsec @subheading**], page 41.
- @unnumberedsubsubsec *title***
Begin an unnumbered subsubsection. The title appears in the table of contents. See Section 4.10 [**@subsubsection**], page 42.
- @uref{url[, *displayed-text*] [, *replacement*]}**
- @url{url[, *displayed-text*] [, *replacement*]}**
Define a cross-reference to an external uniform resource locator, e.g., for the World Wide Web. See Section 5.14 [**@url**], page 51.
- @urefbreakstyle *style***
Specify how **@uref/@url** should break at special characters: **after**, **before**, **none**. See Section 5.14 [**@url**], page 51.
- @v{c}** Generate check accent over the character *c*, as in *ö*. See Section 11.4 [Inserting Accents], page 103.
- @value{*txivar*}**
Insert the value, if any, of the Texinfo variable *txivar*, previously defined by **@set**. See Section 15.5 [**@set @clear @value**], page 138.
- @var{*metasyntactic-variable*}**
Highlight a metasyntactic variable, which is something that stands for another piece of text. See Section 6.1.7 [**@var**], page 59.
- @verb{*delim literal delim*}**
Output *literal*, delimited by the single character *delim*, exactly as is (in the fixed-width font), including any whitespace or Texinfo special characters. See Section 6.1.6 [**@verb**], page 59.

@verbatim

Output the text of the environment exactly as is (in the fixed-width font). Pair with `@end verbatim`. See Section 7.5 [`@verbatim`], page 69.

@verbatiminclude *filename*

Output the contents of *filename* exactly as is (in the fixed-width font). See Section 17.3 [`@verbatiminclude`], page 156.

@vindex *entry*

Add *entry* to the index of variables. See Section 10.4 [Defining the Entries of an Index], page 93.

@vskip *amount*

In a printed manual, insert whitespace so as to push text on the remainder of the page towards the bottom of the page. Used in formatting the copyright page with the argument ‘`Opt plus 1filll`’. (Note spelling of ‘`filll`’.) See Section 2.8.4 [Copyright], page 21.

@vtable *formatting-command*

Begin a two-column table, using `@item` for each entry. Automatically enter each of the items in the first column into the index of variables. Pair with `@end vtable`. The same as `@table`, except for indexing. See Section 8.4.2 [`@ftable` `@vtable`], page 81.

@w{*text*} Disallow line breaks within *text*. See Section 12.5 [`@w`], page 115.

@xml Enter XML completely. Pair with `@end xml`. See Section 15.3 [Raw Formatter Commands], page 136.

@xref{*node*, [*entry*], [*node-title*], [*info-file*], [*printed-manual*]}

Make a reference that starts with ‘See’ in a printed manual. Follow command with a punctuation mark. The first argument is mandatory, except for references to whole manuals. To refer to another manual as a whole, the *printed-manual* and/or the *info-file* are the only required arguments. See Section 5.8 [`@xref`], page 49.

@xrefautomaticsectiontitle *on-off*

By default, use the section title instead of the node name in cross references, including in node headers in HTML. See Section 5.5 [Three Arguments], page 46.

A.3 @-Command Contexts

Here we describe approximately which @-commands can be used in which contexts. It is not exhaustive or meant to be a complete reference. Discrepancies between the information here and the Texinfo processors implementations are most likely to be resolved in favor of the implementations.

By *general text* below, we mean anything except sectioning and other such outer-level document commands, such as `@section`, `@node`, and `@setfilename`.

`@c`, `@comment` and `@if ... @end if` conditional commands may appear anywhere (except the conditionals must still be on lines by themselves). `@caption` and `@shortcaption` may only appear in `@float` but may contain general text. `@footnote` content likewise.

@-commands with braces marking text (such as `@strong`, `@sc`, `@asis`) may contain raw formatter commands such as `@html` but no other block commands (other commands terminated by `@end`) and may not be split across paragraphs, but may otherwise contain general text.

In addition to the block command restriction, on `@center`, `@exdent` and `@item` in `@table` lines, @-commands that makes only sense in a paragraph are not accepted, such as `@indent`.

In addition to the above, sectioning commands cannot contain `@anchor`, `@footnote` or `@verb`.

In addition to the above, remaining commands (`@node`, `@anchor`, `@printindex`, `@ref`, `@math`, `@cindex`, `@url`, `@image`, and so on) cannot contain cross-reference commands (`@ref`, `@xref`, `@pxref` and `@inforef`).

For precise and complete information, we suggest looking into the test suite in the sources, which exhaustively tries combinations.

A.4 Obsolete @-Commands

Here are Texinfo @-commands which are obsolete or have been removed completely. This section is for historical purposes.

@refill This command used to refill and indent the paragraph after all the other processing has been done. It is no longer needed, since all formatters now automatically refill as needed, but you may still see it in the source to some manuals, as it does no harm.

@setcontentsaftertitlepage

In the past, the contents commands were sometimes placed at the end of the file, after any indices and just before the `@bye`, but we no longer recommend this. This command could be used by a user printing a manual, to force the contents to be printed after the title page (after the `'@end titlepage'` line) even if the `@contents` command was at the end of the manual.

@setshortcontentsaftertitlepage

This placed the short table of contents after the `'@end titlepage'` command even if the `@shortcontents` command was at the end.

Appendix B Tips and Hints

Here are some tips for writing Texinfo documentation:

- Write in the present tense, not in the past or the future.
- Write actively! For example, write “We recommend that . . .” rather than “It is recommended that . . .”.
- Use 70 or 72 as your fill column. Longer lines are hard to read.
- Include a copyright notice and copying permissions.
- Design your manual so that it can be read sequentially, as far as possible. People tire of flipping back and forth to find information that should be presented to them as they need it.

Index, Index, Index!

Write many index entries, in different ways. Readers like indices; they are helpful and convenient.

Although it is easiest to write index entries as you write the body of the text, some people prefer to write entries afterwards. In either case, write an entry before the paragraph to which it applies. This way, an index entry points to the first page of a paragraph that is split across pages.

Here are more index-related hints we have found valuable:

- Write each index entry differently, so each entry refers to a different place in the document.
- Write index entries only where a topic is discussed significantly. For example, it is not useful to index “debugging information” in a chapter on reporting bugs. Someone who wants to know about debugging information will certainly not find it in that chapter.
- Consistently capitalize the first word of every concept index entry, or else consistently use lowercase. Terse entries often call for lowercase; longer entries for capitalization. Whichever case convention you use, please use one or the other consistently! Mixing the two styles looks bad.
- Always capitalize or use uppercase for those words in an index for which this is proper, such as names of countries or acronyms. Always use the appropriate case for case-sensitive names, such as those in C or Lisp.
- Write the indexing commands that refer to a whole section immediately after the section command, and write the indexing commands that refer to a paragraph before that paragraph.

In the example that follows, a blank line comes after the index entry for “Leaping”:

```
@section The Dog and the Fox
@cindex Jumping, in general
@cindex Leaping

@cindex Dog, lazy, jumped over
@cindex Lazy dog jumped over
@cindex Fox, jumps over dog
@cindex Quick fox jumps over dog
The quick brown fox jumps over the lazy dog.
```

(Note that the example shows entries for the same concept that are written in different ways—‘Lazy dog’, and ‘Dog, lazy’—so readers can look up the concept in different ways.)

Blank Lines

- Insert a blank line between a sectioning command and the first following sentence or paragraph, or between the indexing commands associated with the sectioning command and the first following sentence or paragraph, as shown in the tip on indexing. It makes the source easier to read.
- Always insert a blank line before a `@table` command and after an `@end table` command; but never insert a blank line after an `@table` command.

For example,

```
Types of fox:
```

```
@table @samp
@item Quick
Jump over lazy dogs.
```

```
@item Brown
Also jump over lazy dogs.
@end table
```

```
@noindent
On the other hand, ...
```

Insert blank lines before and after `@itemize ... @end itemize` and `@enumerate ... @end enumerate` in the same way.

Complete Phrases

Complete phrases are easier to read than ...

- Write entries in an itemized list as complete sentences; or at least, as complete phrases. Incomplete expressions ... awkward ... like this.
- Write the prefatory sentence or phrase for a multi-item list or table as a complete expression. Do not write “You can set:”; instead, write “You can set these variables:”. The former expression sounds cut off.

Editions, Dates and Versions

Include edition numbers, version numbers, and dates in the `@copying` text (for people reading the Texinfo file, and for the legal copyright in the output files). Then use `@insertcopying` in the `@titlepage` section for people reading the printed output (see [Short Sample], page 11).

It is easiest to handle such version information using `@set` and `@value`. See Section 15.5.4 [`@value` Example], page 140, and Section C.1 [GNU Sample Texts], page 247.

Definition Commands

Definition commands are `@defn`, `@defun`, `@defmac`, and the like, and enable you to write descriptions in a uniform format.

- Write just one definition command for each entity you define with a definition command. The automatic indexing feature creates an index entry that leads the reader to the definition.
- Use `@table ... @end table` in an appendix that contains a summary of functions, not `@defn` or other definition commands.

Capitalization

- Capitalize “Texinfo”; it is a name. Do not write the ‘x’ or ‘i’ in uppercase.
- Capitalize “Info”; it is a name.
- Write \TeX using the `@TeX{}` command. Note the uppercase ‘T’ and ‘X’. This command causes the formatters to typeset the name according to the wishes of Donald Knuth, who wrote \TeX . (Likewise `@LaTeX{}` for \LaTeX .)

Spaces

Do not use spaces to format a Texinfo file, except inside of `@example ... @end example` and other literal environments and commands.

For example, \TeX fills the following:

```
@kbd{C-x v}
@kbd{M-x vc-next-action}
  Perform the next logical operation
  on the version-controlled file
  corresponding to the current buffer.
```

so it looks like this:

```
C-x v M-x vc-next-action Perform the next logical operation on the version-
controlled file corresponding to the current buffer.
```

In this case, the text should be formatted with `@table`, `@item`, and `@itemx`, to create a table.

@code, @samp, @var, and ‘---’

- Use `@code` around Lisp symbols, including command names. For example,


```
The main function is @code{vc-next-action}, ...
```
- Avoid putting letters such as ‘s’ immediately after an ‘@code’. Such letters look bad.
- Use `@var` around meta-variables. Do not write angle brackets around them.
- Use three hyphens in a row, ‘---’, to indicate a long dash. The Info formatter reduces three hyphens to two; a long dash is typeset in other output formats.

Periods Outside of Quotes

Place periods and other punctuation marks *outside* of quotations, unless the punctuation is part of the quotation. This practice goes against some publishing conventions in the United States, but enables the reader to distinguish between the contents of the quotation and the whole passage.

For example, you should write the following sentence with the period outside the end quotation marks:

```
Evidently, ‘au’ is an abbreviation for ``author''.
```

since ‘au’ does *not* serve as an abbreviation for ‘author.’ (with a period following the word).

Introducing New Terms

- Introduce new terms so that a reader who does not know them can understand them from context; or write a definition for the term.

For example, in the following, the terms “check in”, “register” and “delta” are all appearing for the first time; the example sentence should be rewritten so they are understandable.

The major function assists you in checking in a file to your version control system and registering successive sets of changes to it as deltas.

- Use the `@dfn` command around a word being introduced, to indicate that the reader should not expect to know the meaning already, and should expect to learn the meaning from this passage.

Program Invocation Nodes

You can invoke programs such as Emacs, GCC, and `gawk` from a shell. The documentation for each program should contain a section that describes this. Unfortunately, if the node names and titles for these sections are all different, they are difficult for users to find.

So, there is a convention to name such sections with a phrase beginning with the word ‘Invoking’, as in ‘Invoking Emacs’; this way, users can find the section easily.

ANSI C Syntax

When you use `@example` to describe a C function’s calling conventions, use the ANSI C syntax, like this:

```
void dld_init (char *@var{path});
```

And in the subsequent discussion, refer to the argument values by writing the same argument names, again highlighted with `@var`.

Avoid the obsolete style that looks like this:

```
#include <dld.h>

dld_init (path)
char *path;
```

Also, it is best to avoid writing `#include` above the declaration just to indicate that the function is declared in a header file. The practice may give the misimpression that the `#include` belongs near the declaration of the function. Either state explicitly which header file holds the declaration or, better yet, name the header file used for a group of functions at the beginning of the section that describes the functions.

Node Length

Keep nodes (sections) to a reasonable length, whatever reasonable might be in the given context. Don’t hesitate to break up long nodes into subnodes and have an extensive tree structure; that’s what it’s there for. Many times, readers will probably try to find a single specific point in the manual, using search, indexing, or just plain guessing, rather than reading the whole thing from beginning to end.

You can use the `texi-elements-by-size` utility to see a list of all nodes (or sections) in the document, sorted by size (either lines or words), to find candidates for splitting. It's in the `util/` subdirectory of the Texinfo sources.

Bad Examples

Here are several examples of bad writing to avoid:

In this example, say, “. . . you must `@dfn{check in}` the new version.” That flows better.

When you are done editing the file, you must perform a `@dfn{check in}`.

In the following example, say, “. . . makes a unified interface such as VC mode possible.”

SCCS, RCS and other version-control systems all perform similar functions in broadly similar ways (it is this resemblance which makes a unified control mode like this possible).

And in this example, you should specify what ‘it’ refers to:

If you are working with other people, it assists in coordinating everyone’s changes so they do not step on each other.

And Finally . . .

- Pronounce `TEX` as if the ‘X’ were a Greek ‘chi’, as the last sound in the name ‘Bach’. But pronounce Texinfo as in ‘speck’: “teckinfo”.
- Write notes for yourself at the very end of a Texinfo file after the `@bye`. None of the processors process text after the `@bye`; it is as if the text were within `@ignore . . . @end ignore`.

Appendix C Sample Texinfo Files

This appendix includes texts to be used in GNU manuals.

C.1 GNU Sample Texts

Following is a sample Texinfo document with the full texts that should be used (adapted as necessary) in GNU manuals.

As well as the legal texts, it also serves as a practical example of how many elements in a GNU system can affect the manual. If you're not familiar with all these different elements, don't worry. They're not required and a perfectly good manual can be written without them. They're included here nonetheless because many manuals do (or could) benefit from them.

See [Short Sample], page 11, for a minimal example of a Texinfo file.

Here are some notes on the example:

- The `version.texi` in the `@include` command is maintained automatically by Automake (see Section “Texinfo” in *GNU Automake*). It sets the ‘VERSION’, ‘UPDATED’ and ‘UPDATED-MONTH’ values used elsewhere. If your distribution doesn't use Automake, but you do use Emacs, you may find the `time-stamp.el` package helpful (see Section “Time Stamps” in *The GNU Emacs Manual*).
- The `@syncodeindex` command reflects the recommendation to use only one index where possible, to make it easier for readers to look up index entries.
- The `@dircategory` specify a category for the manual. It is used for constructing the Info directory. See Section 2.6 [Directory Category], page 16, which includes a variety of recommended category names. See Section 20.1.4 [Installing Dir Entries], page 198.
- The ‘Invoking’ node is a GNU standard to help users find the basic information about command-line usage of a given program. See Section “Manual Structure Details” in *GNU Coding Standards*.
- This sample shows how to includes the FDL in a manual using the `@include` command. The `fdl.texi` file is available in the Texinfo and other GNU source distributions. It is also available on the GNU website (at <https://www.gnu.org/licenses/fdl-1.3.html>) along with guidance for using it.
- If the FSF is not the copyright holder, then use the appropriate name.
- For documents that express your personal views, feelings or experiences, it is more appropriate to use a license permitting only verbatim copying, rather than the FDL. See Section C.2 [Verbatim Copying License], page 249.

Here is the sample document:

```
\input texinfo @c -*-texinfo-*-
@comment %**start of header
@include version.texi
@settitle GNU Sample @value{VERSION}
@syncodeindex pg cp
@comment %**end of header
@copying
This manual is for GNU Sample (version @value{VERSION}, @value{UPDATED}),
```

which is an example in the Texinfo documentation.

Copyright @copyright{} 2016 Free Software Foundation, Inc.

@quotation

Permission is granted to copy, distribute and/or modify this document under the terms of the GNU Free Documentation License, Version 1.3 or any later version published by the Free Software Foundation; with no Invariant Sections, with no Front-Cover Texts, and with no Back-Cover Texts. A copy of the license is included in the section entitled ``GNU Free Documentation License''.

@end quotation

@end copying

@dircategory Texinfo documentation system

@direntry

* sample: (sample)Invoking sample.

@end direntry

@titlepage

@title GNU Sample

@subtitle for version @value{VERSION}, @value{UPDATED}

@author A.U. Thor (@email{bug-sample@gnu.org})

@page

@vskip 0pt plus 1filll

@insertcopying

@end titlepage

@contents

@node Top

@top GNU Sample

This manual is for GNU Sample (version @value{VERSION}, @value{UPDATED}).

@menu

* Invoking sample::

* GNU Free Documentation License::

* Index::

@end menu

@node Invoking sample

@chapter Invoking sample

@pindex sample

@cindex invoking @command{sample}

This is a sample manual. There is no sample program to invoke, but if there were, you could see its basic usage and command line options here.

```
@node GNU Free Documentation License
@appendix GNU Free Documentation License
```

```
@include fdl.texi
```

```
@node Index
@unnumbered Index
```

```
@printindex cp
```

```
@bye
```

C.2 Verbatim Copying License

For software manuals and other documentation, it is critical to use a license permitting free redistribution and updating, so that when a free program is changed, the documentation can be updated as well.

On the other hand, for documents that express your personal views, feelings or experiences, it is more appropriate to use a license permitting only verbatim copying.

Here is a sample text for such a license permitting verbatim copying only. This is just the license text itself. For a complete sample document, see the previous sections.

```
@copying
```

```
This document is a sample for allowing verbatim copying only.
```

```
Copyright @copyright{} 2016 Free Software Foundation, Inc.
```

```
@quotation
```

```
Permission is granted to make and distribute verbatim copies
of this entire document without royalty provided the
copyright notice and this permission notice are preserved.
```

```
@end quotation
```

```
@end copying
```

C.3 All-permissive Copying License

For software manuals and other documentation, it is important to use a license permitting free redistribution and updating, so that when a free program is changed, the documentation can be updated as well.

On the other hand, for small supporting files, short manuals (under 300 lines long) and rough documentation (README files, INSTALL files, etc.), the full FDL would be overkill. They can use a simple all-permissive license.

Here is a sample text for such an all-permissive license. This is just the license text itself. For a complete sample document, see the previous sections.

Copyright @copyright{} 2016 Free Software Foundation, Inc.

Copying and distribution of this file, with or without modification,
are permitted in any medium without royalty provided the copyright
notice and this notice are preserved.

Appendix D Using Texinfo Mode

You may edit a Texinfo file with any text editor you choose. A Texinfo file is no different from any other ASCII file. However, GNU Emacs comes with a special mode, called Texinfo mode, that provides Emacs commands and tools to help ease your work.

D.1 Texinfo Mode Overview

Texinfo mode provides special features for working with Texinfo files. You can:

- Insert frequently used @-commands.
- Automatically create @node lines.
- Show the structure of a Texinfo source file.
- Automatically create or update the ‘Next’, ‘Previous’, and ‘Up’ pointers of a node.
- Automatically create or update menus.
- Automatically create a master menu.
- Format a part or all of a file for Info.
- Typeset and print part or all of a file.

Perhaps the two most helpful features are those for inserting frequently used @-commands and for creating node pointers and menus.

D.2 The Usual GNU Emacs Editing Commands

In most cases, the usual Text mode commands work the same in Texinfo mode as they do in Text mode. Texinfo mode adds new editing commands and tools to GNU Emacs’ general purpose editing features. The major difference concerns filling. In Texinfo mode, the paragraph separation variable and syntax table are redefined so that Texinfo commands that should be on lines of their own are not inadvertently included in paragraphs. Thus, the *M-q* (`fill-paragraph`) command will refill a paragraph but not mix an indexing command on a line adjacent to it into the paragraph.

In addition, Texinfo mode sets the `page-delimiter` variable to the value of `texinfo-chapter-level-regexp`; by default, this is a regular expression matching the commands for chapters and their equivalents, such as appendices. With this value for the page delimiter, you can jump from chapter title to chapter title with the *C-x]* (`forward-page`) and *C-x [* (`backward-page`) commands and narrow to a chapter with the *C-x n p* (`narrow-to-page`) command. (See Section “Pages” in *The GNU Emacs Manual*, for details about the page commands.)

GNU Emacs automatically enters Texinfo mode when you visit a file with a `.texinfo`, `.texi` or `.txi` extension. Also, Emacs switches to Texinfo mode when you visit a file that has `‘-*-texinfo-*/’` in its first line. If ever you are in another mode and wish to switch to Texinfo mode, type *M-x texinfo-mode*.

Like all other Emacs features, you can customize or enhance Texinfo mode as you wish. In particular, the keybindings are very easy to change. The keybindings described here are the default or standard ones.

D.3 Inserting Frequently Used Commands

Texinfo mode provides commands to insert various frequently used @-commands into the buffer. You can use these commands to save keystrokes.

The insert commands are invoked by typing `C-c` twice and then the first letter of the @-command:

`C-c C-c c`

`M-x texinfo-insert-@code`

Insert `@code{}` and put the cursor between the braces.

`C-c C-c d`

`M-x texinfo-insert-@dfn`

Insert `@dfn{}` and put the cursor between the braces.

`C-c C-c e`

`M-x texinfo-insert-@end`

Insert `@end` and attempt to insert the correct following word, such as ‘example’ or ‘table’. (This command does not handle nested lists correctly, but inserts the word appropriate to the immediately preceding list.)

`C-c C-c i`

`M-x texinfo-insert-@item`

Insert `@item` and put the cursor at the beginning of the next line.

`C-c C-c k`

`M-x texinfo-insert-@kbd`

Insert `@kbd{}` and put the cursor between the braces.

`C-c C-c n`

`M-x texinfo-insert-@node`

Insert `@node` and a comment line listing the sequence for the ‘Next’, ‘Previous’, and ‘Up’ nodes. Leave point after the `@node`.

`C-c C-c o`

`M-x texinfo-insert-@noindent`

Insert `@noindent` and put the cursor at the beginning of the next line.

`C-c C-c r`

`M-x texinfo-insert-dwim-@ref`

This function and binding were added in Emacs 27.1. Inserts one of `@pxref{}`, `@xref{}`, or `@ref{}` based on the text around point; calling it near an unclosed preceding open parenthesis results in `@pxref{}`, at the beginning of a sentence or at `(point-min)` yields `@xref{}`, any other location (including inside a word), will result in `@ref{}`. A numeric argument says how many words the braces should surround. Puts the cursor between the braces.

`C-c C-c s`

`M-x texinfo-insert-@samp`

Insert `@samp{}` and put the cursor between the braces.

`C-c C-c t`

`M-x texinfo-insert-@table`

Insert `@table` followed by a SPC and leave the cursor after the SPC.

`C-c C-c v`

`M-x texinfo-insert-@var`

Insert `@var{}` and put the cursor between the braces.

`C-c C-c x`

`M-x texinfo-insert-@example`

Insert `@example` and put the cursor at the beginning of the next line.

`C-c C-c {`

`M-x texinfo-insert-braces`

Insert `{}` and put the cursor between the braces.

`C-c }`

`C-c]`

`M-x up-list`

Move from between a pair of braces forward past the closing brace. Typing `C-c]` is easier than typing `C-c }`, which is, however, more mnemonic; hence the two keybindings. (Also, you can move out from between braces by typing `C-f`.)

To put a command such as `@code{...}` around an *existing* word, position the cursor in front of the word and type `C-u 1 C-c C-c c`. This makes it easy to edit existing plain text. The value of the prefix argument tells Emacs how many words following point to include between braces—‘1’ for one word, ‘2’ for two words, and so on. Use a negative argument to enclose the previous word or words. If you do not specify a prefix argument, Emacs inserts the `@`-command string and positions the cursor between the braces. This feature works only for those `@`-commands that operate on a word or words within one line, such as `@kbd` and `@var`.

This set of insert commands was created after analyzing the frequency with which different `@`-commands are used in the *GNU Emacs Manual* and the *GDB Manual*. If you wish to add your own insert commands, you can bind a keyboard macro to a key, use abbreviations, or extend the code in `texinfo.el`.

`C-c C-c C-d` (`texinfo-start-menu-description`) is an insert command that works differently from the other insert commands. It inserts a node’s section or chapter title in the space for the description in a menu entry line. (A menu entry has three parts, the entry name, the node name, and the description. Only the node name is required, but a description helps explain what the node is about. See Section 3.9.4 [The Parts of a Menu], page 36.)

To use `texinfo-start-menu-description`, position point in a menu entry line and type `C-c C-c C-d`. The command looks for and copies the title that goes with the node name, and inserts the title as a description; it positions point at the beginning of the inserted text so you can edit it. The function does not insert the title if the menu entry line already contains a description.

This command is only an aid to writing descriptions; it does not do the whole job. You must edit the inserted text since a title tends to use the same words as a node name but a useful description uses different words.

D.4 Showing the Sectioning Structure of a File

You can show the sectioning structure of a Texinfo file by using the `C-c C-s` command (`texinfo-show-structure`). This command lists the lines that begin with the `@`-commands for `@chapter`, `@section`, and the like. It constructs what amounts to a table of contents. These lines are displayed in another buffer called the `*Occur*` buffer. In that buffer, you can position the cursor over one of the lines and use the `C-c C-c` command (`occur-mode-goto-occurrence`), to jump to the corresponding spot in the Texinfo file.

`C-c C-s`

`M-x texinfo-show-structure`

Show the `@chapter`, `@section`, and such lines of a Texinfo file.

`C-c C-c`

`M-x occur-mode-goto-occurrence`

Go to the line in the Texinfo file corresponding to the line under the cursor in the `*Occur*` buffer.

If you call `texinfo-show-structure` with a prefix argument by typing `C-u C-c C-s`, it will list not only those lines with the `@`-commands for `@chapter`, `@section`, and the like, but also the `@node` lines. You can use `texinfo-show-structure` with a prefix argument to check whether the ‘Next’, ‘Previous’, and ‘Up’ pointers of an `@node` line are correct.

Often, when you are working on a manual, you will be interested only in the structure of the current chapter. In this case, you can mark off the region of the buffer that you are interested in by using the `C-x n n` (`narrow-to-region`) command and `texinfo-show-structure` will work on only that region. To see the whole buffer again, use `C-x n w` (`widen`). (See Section “Narrowing” in *The GNU Emacs Manual*, for more information about the narrowing commands.)

In addition to providing the `texinfo-show-structure` command, Texinfo mode sets the value of the page delimiter variable to match the chapter-level `@`-commands. This enables you to use the `C-x]` (`forward-page`) and `C-x [` (`backward-page`) commands to move forward and backward by chapter, and to use the `C-x n p` (`narrow-to-page`) command to narrow to a chapter. See Section “Pages” in *The GNU Emacs Manual*, for more information about the page commands.

D.4.1 Using `texinfo-show-structure`

It is not always easy to keep track of the nodes, chapters, sections, and subsections of a Texinfo file. This is especially true if you are revising or adding to a Texinfo file that someone else has written.

In GNU Emacs, in Texinfo mode, the `texinfo-show-structure` command lists all the lines that begin with the `@`-commands that specify the structure: `@chapter`, `@section`, `@appendix`, and so on. With an argument (`C-u` as prefix argument, if interactive), the command also shows the `@node` lines. The `texinfo-show-structure` command is bound to `C-c C-s` in Texinfo mode, by default.

The lines are displayed in a buffer called the `*Occur*` buffer, indented by hierarchical level. For example, here is a part of what was produced by running `texinfo-show-structure` on this manual:

```

Lines matching "^@\\(chapter \\|sect\\|subs\\|subh\\|
unnum\\|major\\|chapheading \\|heading \\|appendix\\)"
in buffer texinfo.texi.
...
4177:@chapter Nodes
4198:   @heading Two Paths
4231:   @section Node and Menu Illustration
4337:   @section The @code{@@node} Command
4393:     @subheading Choosing Node and Pointer Names
4417:     @subsection How to Write a @code{@@node} Line
4469:     @subsection @code{@@node} Line Tips
...

```

This says that lines 4337, 4393, and 4417 of `texinfo.texi` begin with the `@section`, `@subheading`, and `@subsection` commands respectively. If you move your cursor into the `*Occur*` window, you can position the cursor over one of the lines and use the `C-c C-c` command (`occur-mode-goto-occurrence`), to jump to the corresponding spot in the Texinfo file. See Section “Using Occur” in *The GNU Emacs Manual*, for more information about `occur-mode-goto-occurrence`.

The first line in the `*Occur*` window describes the *regular expression* specified by `texinfo-heading-pattern`. This regular expression is the pattern that `texinfo-show-structure` looks for. See Section “Using Regular Expressions” in *The GNU Emacs Manual*, for more information.

When you invoke the `texinfo-show-structure` command, Emacs will display the structure of the whole buffer. If you want to see the structure of just a part of the buffer, of one chapter, for example, use the `C-x n n` (`narrow-to-region`) command to mark the region. (See Section “Narrowing” in *The GNU Emacs Manual*.) This is how the example used above was generated. (To see the whole buffer again, use `C-x n w` (`widen`).

If you call `texinfo-show-structure` with a prefix argument by typing `C-u C-c C-s`, it will list lines beginning with `@node` as well as the lines beginning with the `@`-sign commands for `@chapter`, `@section`, and the like.

You can remind yourself of the structure of a Texinfo file by looking at the list in the `*Occur*` window; and if you have mis-named a node or left out a section, you can correct the mistake.

D.4.2 Using occur

Sometimes the `texinfo-show-structure` command produces too much information. Perhaps you want to remind yourself of the overall structure of a Texinfo file, and are overwhelmed by the detailed list produced by `texinfo-show-structure`. In this case, you can use the `occur` command directly. To do this, type:

```
M-x occur
```

and then, when prompted, type a *regex*, a regular expression for the pattern you want to match. (See Section “Regular Expressions” in *The GNU Emacs Manual*.) The `occur` command works from the current location of the cursor in the buffer to the end of the buffer. If you want to run `occur` on the whole buffer, place the cursor at the beginning of the buffer.

For example, to see all the lines that contain the word ‘@chapter’ in them, just type ‘@chapter’. This will produce a list of the chapters. It will also list all the sentences with ‘@chapter’ in the middle of the line.

If you want to see only those lines that start with the word ‘@chapter’, type ‘~@chapter’ when prompted by `occur`. If you want to see all the lines that end with a word or phrase, end the last word with a ‘\$’; for example, ‘catching mistakes\$’. This can be helpful when you want to see all the nodes that are part of the same chapter or section and therefore have the same ‘Up’ pointer.

See Section “Using Occur” in *The GNU Emacs Manual*, for more information.

D.5 Updating Nodes and Menus

The `texi2any` command will create an Info file for a hierarchically organized Texinfo file that lacks ‘Next’, ‘Previous’ and ‘Up’ pointers (see Section 3.1 [Writing a Node], page 27). Thus, in general, there is no need for explicit ‘Next’, ‘Previous’, and ‘Up’ pointers. In this setting, menus will be added automatically for nodes without an explicit menu. (See Chapter 19 [Generic Translator `texi2any`], page 164, for more information about `texi2any`.)

If you still want explicit pointers, Texinfo mode provides commands for automatically creating or updating menus and node pointers. The commands are called “update” commands because their most frequent use is for updating a Texinfo file after you have worked on it; but you can use them to insert the ‘Next’, ‘Previous’, and ‘Up’ pointers into an `@node` line that has none and to create menus in a file that has none.

D.5.1 The Updating Commands

You can use the updating commands to:

- insert or update the ‘Next’, ‘Previous’, and ‘Up’ pointers of a node,
- insert or update the menu for a section, and
- create a master menu for a Texinfo source file.

You can also use the commands to update all the nodes and menus in a region or in a whole Texinfo file.

The updating commands work only with conventional Texinfo files, which are structured hierarchically like books. In such files, a structuring command line must follow closely after each `@node` line, except for the ‘Top’ `@node` line. (A *structuring command line* is a line beginning with `@chapter`, `@section`, or other similar command.)

You can write the structuring command line on the line that follows immediately after an `@node` line or else on the line that follows after a single `@comment` line or a single `@ifinfo` line. You cannot interpose more than one line between the `@node` line and the structuring command line; and you may interpose only a `@comment` line or an `@ifinfo` line.

Commands which work on a whole buffer require that the ‘Top’ node be followed by a node with a `@chapter` or equivalent-level command. The menu updating commands will not create a main or master menu for a Texinfo file that has only `@chapter`-level nodes! The menu updating commands only create menus *within* nodes for lower level nodes. To create a menu of chapters, you must provide a ‘Top’ node.

The menu updating commands remove menu entries that refer to other Info files since they do not refer to nodes within the current buffer. This is a deficiency. Rather than use

menu entries, you can use cross references to refer to other Info files. None of the updating commands affect cross-references.

Texinfo mode has five updating commands that are used most often: two are for updating the node pointers or menu of a single node (or a region); two are for updating every node pointer and menu in a file; and one, the `texinfo-master-menu` command, is for creating a master menu for a complete file, and optionally, for updating every node and menu in the whole Texinfo file.

The `texinfo-master-menu` command is the primary command:

C-c C-u m

M-x texinfo-master-menu

Create or update a master menu that includes all the other menus (incorporating the descriptions from pre-existing menus, if any).

With an argument (prefix argument, *C-u*, if interactive), first create or update all the nodes and all the regular menus in the buffer before constructing the master menu. (See Section 2.10 [The Top Node and Master Menu], page 23, for more about a master menu.)

For `texinfo-master-menu` to work, the Texinfo file must have a ‘Top’ node and at least one subsequent node.

After extensively editing a Texinfo file, you can type the following:

`C-u M-x texinfo-master-menu`

or

`C-u C-c C-u m`

This updates all the nodes and menus completely and all at once.

The other major updating commands do smaller jobs and are designed for the person who updates nodes and menus as he or she writes a Texinfo file.

The commands are:

C-c C-u C-n

M-x texinfo-update-node

Insert the ‘Next’, ‘Previous’, and ‘Up’ pointers for the node that point is within (i.e., for the `@node` line preceding point). If the `@node` line has pre-existing ‘Next’, ‘Previous’, or ‘Up’ pointers in it, the old pointers are removed and new ones inserted. With an argument (prefix argument, *C-u*, if interactive), this command updates all `@node` lines in the region (which is the text between point and mark).

C-c C-u C-m

M-x texinfo-make-menu

Create or update the menu in the node that point is within. With an argument (*C-u* as prefix argument, if interactive), the command makes or updates menus for the nodes which are either within or a part of the region.

Whenever `texinfo-make-menu` updates an existing menu, the descriptions from that menu are incorporated into the new menu. This is done by copying descriptions from the existing menu to the entries in the new menu that have the same node names. If the node names are different, the descriptions are not copied to the new menu.

C-c C-u C-e

M-x texinfo-every-node-update

Insert or update the ‘Next’, ‘Previous’, and ‘Up’ pointers for every node in the buffer.

C-c C-u C-a

M-x texinfo-all-menus-update

Create or update all the menus in the buffer. With an argument (**C-u** as prefix argument, if interactive), first insert or update all the node pointers before working on the menus.

If a master menu exists, the `texinfo-all-menus-update` command updates it; but the command does not create a new master menu if none already exists. (Use the `texinfo-master-menu` command for that.)

When working on a document that does not merit a master menu, you can type the following:

C-u C-c C-u C-a

or

C-u M-x texinfo-all-menus-update

This updates all the nodes and menus.

The `texinfo-column-for-description` variable specifies the column to which menu descriptions are indented. By default, the value is 32 although it can be useful to reduce it to as low as 24. You can set the variable via customization (see Section “Customization” in *The GNU Emacs Manual*) or with the `M-x set-variable` command (see Section “Examining and Setting Variables” in *The GNU Emacs Manual*).

Also, the `texinfo-indent-menu-description` command may be used to indent existing menu descriptions to a specified column. Finally, if you wish, you can use the `texinfo-insert-node-lines` command to insert missing `@node` lines into a file. In particular, you can ignore `@node` lines altogether in your first draft and then use the `texinfo-insert-node-lines` command to create `@node` lines for you. However, we do not recommend this practice. It is better to name the node itself at the same time that you write a segment so you can easily make cross-references. Useful cross-references are an especially important feature of a good Texinfo manual. (See Section D.5.5 [Other Updating Commands], page 260, for more information.)

D.5.2 Updating Requirements

To use the updating commands, you must organize the Texinfo file hierarchically with chapters, sections, subsections, and the like. When you construct the hierarchy of the manual, do not ‘jump down’ more than one level at a time: you can follow the ‘Top’ node with a chapter, but not with a section; you can follow a chapter with a section, but not with a subsection. However, you may ‘jump up’ any number of levels at one time—for example, from a subsection to a chapter.

Each `@node` line, with the exception of the line for the ‘Top’ node, must be followed by a line with a structuring command such as `@chapter`, `@section`, or `@unnumberedsubsec`.

Each `@node` line/structuring-command line combination must look either like this:

```

@node      Comments, Minimum, Conventions, Overview
@comment  node-name, next,    previous,    up
@section  Comments

```

or like this (without the `@comment` line):

```

@node Comments, Minimum, Conventions, Overview
@section Comments

```

or like this (without the explicit node pointers):

```

@node Comments
@section Comments

```

In this example, ‘Comments’ is the name of both the node and the section. The next node is called ‘Minimum’ and the previous node is called ‘Conventions’. The ‘Comments’ section is within the ‘Overview’ node, which is specified by the ‘Up’ pointer.

If a file has a ‘Top’ node, it must be called ‘`top`’ or ‘`Top`’ and be the first node in the file.

The menu updating commands create a menu of sections within a chapter, a menu of subsections within a section, and so on. This means that you must have a ‘Top’ node if you want a menu of chapters.

D.5.3 Update Outer File and Include Files

GNU Emacs Texinfo mode provides the `texinfo-multiple-files-update` command. This command creates or updates ‘Next’, ‘Previous’, and ‘Up’ pointers of included files as well as those in the outer or overall Texinfo file, and it creates or updates a main menu in the outer file. Depending on whether you call it with optional arguments, the command updates only the pointers in the first `@node` line of the included files or all of them.

With `C-u` as a prefix argument, create and insert a master menu in the outer file. With a numeric prefix argument, such as `C-u 2`, first update all the menus and all the ‘Next’, ‘Previous’, and ‘Up’ pointers of all the included files before creating and inserting a master menu in the outer file.

In more details:

M-x texinfo-multiple-files-update

Called without any arguments:

- Create or update the ‘Next’, ‘Previous’, and ‘Up’ pointers of the first `@node` line in each file included in an outer or overall Texinfo file.
- Create or update the ‘Top’ level node pointers of the outer or overall file.
- Create or update a main menu in the outer file.

C-u M-x texinfo-multiple-files-update

Called with `C-u` as a prefix argument:

- Create or update pointers in the first `@node` line in each included file.
- Create or update the ‘Top’ level node pointers of the outer file.
- Create and insert a master menu in the outer file. The master menu is made from all the menus in all the included files.

C-u 8 M-x texinfo-multiple-files-update

Called with a numeric prefix argument, such as *C-u 8*:

- Create or update *all* the ‘Next’, ‘Previous’, and ‘Up’ pointers of all the included files.
- Create or update *all* the menus of all the included files.
- Create or update the ‘Top’ level node pointers of the outer or overall file.
- And then create a master menu in the outer file. This is similar to invoking `texinfo-master-menu` with an argument when you are working with just one file.

Note the use of the prefix argument in interactive use: with a regular prefix argument, just *C-u*, the `texinfo-multiple-files-update` command inserts a master menu; with a numeric prefix argument, such as *C-u 8*, the command updates *every* pointer and menu in *all* the files and then inserts a master menu.

D.5.4 Include Files Requirements

If you plan to use the `texinfo-multiple-files-update` command, the outer Texinfo file that lists included files within it should contain nothing but the beginning and end parts of a Texinfo file, and a number of `@include` commands listing the included files. It should not even include indices, which should be listed in an included file of their own.

Moreover, each of the included files must contain exactly one highest level node (conventionally, `@chapter` or equivalent), and this node must be the first node in the included file. Furthermore, each of these highest level nodes in each included file must be at the same hierarchical level in the file structure. Usually, each is a `@chapter`, an `@appendix`, or an `@unnumbered` node. Thus, normally, each included file contains one, and only one, chapter or equivalent-level node.

The outer file should contain only *one* node, the ‘Top’ node. It should *not* contain any nodes besides the single ‘Top’ node. The `texinfo-multiple-files-update` command will not process them.

D.5.5 Other Updating Commands

In addition to the major updating commands, Texinfo mode possesses several less frequently used updating commands:

M-x texinfo-insert-node-lines

Insert `@node` lines before the `@chapter`, `@section`, and other sectioning commands wherever they are missing throughout a region in a Texinfo file.

With an argument (*C-u* as prefix argument, if interactive), the command `texinfo-insert-node-lines` not only inserts `@node` lines but also inserts the chapter or section titles as the names of the corresponding nodes. In addition, it inserts the titles as node names in pre-existing `@node` lines that lack names. Since node names should be more concise than section or chapter titles, you must manually edit node names so inserted.

For example, the following marks a whole buffer as a region and inserts `@node` lines and titles throughout:

```
C-x h C-u M-x texinfo-insert-node-lines
```

This command inserts titles as node names in `@node` lines; the `texinfo-start-menu-description` command (see Section D.3 [Inserting], page 252) inserts titles as descriptions in menu entries, a different action. However, in both cases, you need to edit the inserted text.

M-x texinfo-indent-menu-description

Indent every description in the menu following point to the specified column. You can use this command to give yourself more space for descriptions. With an argument (`C-u` as prefix argument, if interactive), the `texinfo-indent-menu-description` command indents every description in every menu in the region. However, this command does not indent the second and subsequent lines of a multi-line description.

M-x texinfo-sequential-node-update

Insert the names of the nodes immediately following and preceding the current node as the ‘Next’ or ‘Previous’ pointers regardless of those nodes’ hierarchical level. This means that the ‘Next’ node of a subsection may well be the next chapter. Sequentially ordered nodes are useful for novels and other documents that you read through sequentially. (However, in Info, the `g *` command lets you look through the file sequentially, so sequentially ordered nodes are not strictly necessary.) With an argument (prefix argument, if interactive), the `texinfo-sequential-node-update` command sequentially updates all the nodes in the region.

D.6 Formatting for Info

Texinfo mode provides several commands for formatting part or all of a Texinfo file for Info.

D.6.1 Running `texi2any/makeinfo` Within Emacs

The `texi2any` program provides better error messages than either of the Emacs formatting commands. We recommend it. The `texi2any` program is independent of Emacs.

You can run `texi2any` (or `makeinfo`) in GNU Emacs Texinfo mode by using either the `makeinfo-region` or the `makeinfo-buffer` commands. In Texinfo mode, the commands are bound to `C-c C-m C-r` and `C-c C-m C-b` by default.

C-c C-m C-r

M-x makeinfo-region

Format the current region for Info.

C-c C-m C-b

M-x makeinfo-buffer

Format the current buffer for Info.

When you invoke `makeinfo-region` the output goes to a temporary buffer. When you invoke `makeinfo-buffer` output goes to the file set with `@setfilename` (see Section 2.5.2 [`@setfilename`], page 13).

The Emacs `makeinfo-region` and `makeinfo-buffer` commands run the `texi2any` program in a temporary shell buffer. If `texi2any` finds any errors, Emacs displays the error messages in the temporary buffer.

You can parse the error messages by typing `C-x `` (`next-error`). This causes Emacs to go to and position the cursor on the line in the Texinfo source that `texi2any` thinks caused the error. See Section “Running `make` or Compilers Generally” in *The GNU Emacs Manual*, for more information about using the `next-error` command.

In addition, you can kill the shell in which the `texi2any` command is running or make the shell buffer display its most recent output.

`C-c C-m C-k`

`M-x makeinfo-kill-job`

Kill the current running `texi2any` (or `makeinfo`) job (from `makeinfo-region` or `makeinfo-buffer`).

`C-c C-m C-l`

`M-x makeinfo-recenter-output-buffer`

Redisplay the `texi2any` shell buffer to display its most recent output.

(Note that the parallel commands for killing and recentering a `TEX` job are `C-c C-t C-k` and `C-c C-t C-l`. See Section D.7.1 [Texinfo Mode Printing], page 263.)

You can specify options for `texi2any` by setting the `makeinfo-options` variable with either the `M-x customize` or the `M-x set-variable` command, or by setting the variable in your `.emacs` initialization file.

For example, you could write the following in your `.emacs` file:

```
(setq makeinfo-options
      "--paragraph-indent=0 --no-split
      --fill-column=70 --verbose")
```

For more information, see [texi2any Options], page 164, as well as “Easy Customization Interface,” “Examining and Setting Variables,” and “Init File” in *The GNU Emacs Manual*.

D.6.2 The `texinfo-format...` Commands

In GNU Emacs in Texinfo mode, you can format part or all of a Texinfo file with the `texinfo-format-region` command. This formats the current region and displays the formatted text in a temporary buffer called `*Info Region*`.

Similarly, you can format a buffer with the `texinfo-format-buffer` command. This command creates a new buffer and generates the Info file in it. Typing `C-x C-s` will save the Info file under the name specified by the `@setfilename` line which must be near the beginning of the Texinfo file.

`C-c C-e C-r`

`texinfo-format-region`

Format the current region for Info.

`C-c C-e C-b`

`texinfo-format-buffer`

Format the current buffer for Info.

The `texinfo-format-region` and `texinfo-format-buffer` commands provide you with some error checking, and other functions can provide you with further help in finding formatting errors. These procedures are described in an appendix; see Section D.10 [Catching

Mistakes], page 269. However, the `texi2any` program provides better error checking (see Section D.6.1 [`texi2any` in Emacs], page 261).

A peculiarity of the `texinfo-format-buffer` and `texinfo-format-region` commands is that they do not indent (nor fill) paragraphs that contain `@w` or `@*` commands.

D.7 Formatting and Printing with Emacs

GNU Emacs can be used for formatting and printing with \TeX , from an Emacs Shell. Texinfo mode also provides predefined key commands for formatting and printing.

D.7.1 Formatting and Printing in Texinfo Mode

Texinfo mode provides several predefined key commands for \TeX formatting and printing. These include commands for sorting indices, looking at the printer queue, killing the formatting job, and recentering the display of the buffer in which the operations occur.

Often, when you are writing a document, you want to typeset and print only part of a file to see what it will look like. You can use the `texinfo-tex-region` and related commands for this purpose. Use the `texinfo-tex-buffer` command to format all of a buffer.

For `texinfo-tex-region` or `texinfo-tex-buffer` to work, the file *must* start with a `\input texinfo` line and must include a `@settitle` line. The file must end with `@bye` on a line by itself. (When you use `texinfo-tex-region`, you must surround the `@settitle` line with start-of-header and end-of-header lines.)

C-c C-t C-b

M-x texinfo-tex-buffer

Run `texi2dvi` on the buffer. In addition to running \TeX on the buffer, this command automatically creates or updates indices as needed.

C-c C-t C-r

M-x texinfo-tex-region

Run \TeX on the current region.

If `@`-commands related to printed output are between the start-of-header and end-of-header lines, then `texinfo-tex-region` will format the region accordingly. For example, if you write the `@smallbook` command between the start-of-header and end-of-header lines, `texinfo-tex-region`, will format the region in “small” book size.

C-c C-t C-i

M-x texinfo-texindex

Run `texindex` to sort the indices of a Texinfo file formatted with `texinfo-tex-region`. The `texinfo-tex-region` command does not run `texindex` automatically; it only runs the `tex` typesetting command. You must run the `texinfo-tex-region` command a second time after sorting the raw index files with the `texindex` command. (Usually, you do not format an index when you format a region, only when you format a buffer. Now that the `texi2dvi` command exists, there is little or no need for this command.)

C-c C-t C-p

M-x texinfo-tex-print

Print a DVI file that was made with `texinfo-tex-region` or `texinfo-tex-buffer`.

C-c C-t C-q

M-x tex-show-print-queue

Show the print queue.

C-c C-t C-d

M-x texinfo-delete-from-print-queue

Delete a job from the print queue; you will be prompted for the job number shown by a preceding *C-c C-t C-q* command (`texinfo-show-tex-print-queue`).

C-c C-t C-k

M-x tex-kill-job

Kill the currently running \TeX job started by either `texinfo-tex-region` or `texinfo-tex-buffer`, or any other process running in the Texinfo shell buffer.

C-c C-t C-x

M-x texinfo-quit-job

Quit a \TeX formatting job that has stopped because of an error by sending an `x` to it. When you do this, \TeX preserves a record of what it did in a `.log` file.

C-c C-t C-l

M-x tex-recenter-output-buffer

Redisplay the shell buffer in which the \TeX printing and formatting commands are run to show its most recent output.

Thus, the usual sequence of commands for formatting a buffer is as follows (with comments to the right):

<i>C-c C-t C-b</i>	Run <code>texi2dvi</code> on the buffer.
<i>C-c C-t C-p</i>	Print the DVI file.
<i>C-c C-t C-q</i>	Display the printer queue.

The Texinfo mode \TeX formatting commands start a subshell in Emacs called the `*tex-shell*`. The `texinfo-tex-command`, `texinfo-texindex-command`, and `tex-dvi-print-command` commands are all run in this shell.

You can watch the commands operate in the `*tex-shell*` buffer, and you can switch to and from and use the `*tex-shell*` buffer as you would any other shell buffer.

The formatting and print commands depend on the values of several variables. The default values are:

Variable	Default value
<code>texinfo-texi2dvi-command</code>	<code>"texi2dvi"</code>
<code>texinfo-tex-command</code>	<code>"tex"</code>
<code>texinfo-texindex-command</code>	<code>"texindex"</code>
<code>texinfo-delete-from-print-queue-command</code>	<code>"lprm"</code>
<code>texinfo-tex-trailer</code>	<code>"@bye"</code>
<code>tex-start-of-header</code>	<code>"%**start"</code>
<code>tex-end-of-header</code>	<code>"%**end"</code>
<code>tex-dvi-print-command</code>	<code>"lpr -d"</code>
<code>tex-show-queue-command</code>	<code>"lpq"</code>

You can change the values of these variables with the *M-x set-variable* command (see Section “Examining and Setting Variables” in *The GNU Emacs Manual*), or with your `.emacs` initialization file (see Section “Init File” in *The GNU Emacs Manual*).

Beginning with version 20, GNU Emacs offers a user-friendly interface, called *Customize*, for changing values of user-definable variables. See Section “Easy Customization Interface” in *The GNU Emacs Manual*, for more details about this. The Texinfo variables can be found in the ‘Development/Docs/Texinfo’ group, once you invoke the *M-x customize* command.

D.7.2 Using the Local Variables List

Yet another way to apply the \TeX formatting command to a Texinfo file is to put that command in a *local variables list* at the end of the Texinfo file. You can then specify the `tex` or `texi2dvi` commands as a `compile-command` and have Emacs run it by typing *M-x compile*. This creates a special shell called the `*compilation*` buffer in which Emacs runs the compile command. For example, at the end of the `gdb.texi` file, after the `@bye`, you could put the following:

```
Local Variables:
compile-command: "texi2dvi gdb.texi"
End:
```

This technique is most often used by programmers who also compile programs this way; see Section “Compilation” in *The GNU Emacs Manual*.

D.8 Texinfo Mode Summary

In Texinfo mode, each set of commands has default keybindings that begin with the same keys. All the commands that are custom-created for Texinfo mode begin with `C-c`. The keys are somewhat mnemonic.

Insert Commands

The insert commands are invoked by typing `C-c` twice and then the first letter of the `@`-command to be inserted. (It might make more sense mnemonically to use `C-c C-i`, for ‘custom insert’, but `C-c C-c` is quick to type.)

```
C-c C-c c      Insert '@code'.
C-c C-c d      Insert '@dfn'.
```

<code>C-c C-c e</code>	Insert '@end'.
<code>C-c C-c i</code>	Insert '@item'.
<code>C-c C-c n</code>	Insert '@node'.
<code>C-c C-c s</code>	Insert '@samp'.
<code>C-c C-c v</code>	Insert '@var'.
<code>C-c {</code>	Insert braces.
<code>C-c]</code>	
<code>C-c }</code>	Move out of enclosing braces.
<code>C-c C-c C-d</code>	Insert a node's section title in the space for the description in a menu entry line.

Show Structure

The `texinfo-show-structure` command is often used within a narrowed region.

<code>C-c C-s</code>	List all the headings.
----------------------	------------------------

The Master Update Command

The `texinfo-master-menu` command creates a master menu; and can be used to update every node and menu in a file as well.

<code>C-c C-u m</code>	
<code>M-x texinfo-master-menu</code>	Create or update a master menu.

<code>C-u C-c C-u m</code>	With <code>C-u</code> as a prefix argument, first create or update all nodes and regular menus, and then create a master menu.
----------------------------	--

Update Pointers

The update pointer commands are invoked by typing `C-c C-u` and then either `C-n` for `texinfo-update-node` or `C-e` for `texinfo-every-node-update`.

<code>C-c C-u C-n</code>	Update a node.
<code>C-c C-u C-e</code>	Update every node in the buffer.

Update Menus

Invoke the update menu commands by typing `C-c C-u` and then either `C-m` for `texinfo-make-menu` or `C-a` for `texinfo-all-menus-update`. To update both nodes and menus at the same time, precede `C-c C-u C-a` with `C-u`.

<code>C-c C-u C-m</code>	Make or update a menu.
--------------------------	------------------------

<code>C-c C-u C-a</code>	Make or update all menus in a buffer.
--------------------------	--

<code>C-u C-c C-u C-a</code>	With <code>C-u</code> as a prefix argument, first create or update all nodes and then create or update all menus.
------------------------------	---

Format for Info

The Info formatting commands that are written in Emacs Lisp are invoked by typing `C-c C-e` and then either `C-r` for a region or `C-b` for the whole buffer.

The Info formatting commands that are based on the `texi2any/makeinfo` program are invoked by typing `C-c C-m` and then either `C-r` for a region or `C-b` for the whole buffer.

Use the `texinfo-format...` commands:

```
C-c C-e C-r    Format the region.
C-c C-e C-b    Format the buffer.
```

Use `texi2any/makeinfo`:

```
C-c C-m C-r    Format the region.
C-c C-m C-b    Format the buffer.
C-c C-m C-l    Recenter the texi2any output buffer.
C-c C-m C-k    Kill the texi2any formatting job.
```

Typeset and Print

The \TeX typesetting and printing commands are invoked by typing `C-c C-t` and then another control command: `C-r` for `texinfo-tex-region`, `C-b` for `texinfo-tex-buffer`, and so on.

```
C-c C-t C-r    Run  $\TeX$  on the region.
C-c C-t C-b    Run texi2dvi on the buffer.
C-c C-t C-i    Run texindex.
C-c C-t C-p    Print the DVI file.
C-c C-t C-q    Show the print queue.
C-c C-t C-d    Delete a job from the print queue.
C-c C-t C-k    Kill the current  $\TeX$  formatting job.
C-c C-t C-x    Quit a currently stopped  $\TeX$  formatting job.
C-c C-t C-l    Recenter the output buffer.
```

Other Updating Commands

The remaining updating commands do not have standard keybindings because they are rarely used.

```
M-x texinfo-insert-node-lines
      Insert missing @node lines in region.
      With C-u as a prefix argument,
      use section titles as node names.
```

```
M-x texinfo-multiple-files-update
      Update a multi-file document.
      With C-u 2 as a prefix argument,
      create or update all nodes and menus
      in all included files first.
```

```
M-x texinfo-indent-menu-description
      Indent descriptions.
```


M-x texinfo-sequential-node-update
 Insert node pointers in strict sequence.

D.9 Direct Formatting of Info files

In general, there is no need to edit or process Info files. Most of the content of Info file is plain text, but the tag tables require computing offsets for nodes and indirect files (see Section 20.2 [Tag and Split Files], page 201), which is impractical. The Texinfo processors output well-formatted Info from Texinfo input. Also, lot of information from the Texinfo source is lost in the Info file. The Texinfo source is therefore more suitable to analyse a manual, be it for error reporting, for statistics, or to set up translations.

Still, especially with manually written Info files, there are some situations where it may be interesting to process Info files directly, in particular to compute Info files node offsets and to compute split Info files file offsets. Two Emacs commands do that. **Info-tagify** adds a tag table for a nonsplit file lacking one. This function is also useful for Info file validation (see Section D.10.4 [Running Info-validate], page 272). It is also possible to split a nonsplit Info file with **Info-split**.

D.9.1 Tagifying a File

Texinfo processors create tag tables automatically. The only exception arise when **texinfo-format-buffer** is called with a prefix, as *C-u M-x texinfo-format-buffer*, to create a non split Info file without a tag table (which can be useful in some cases for Info file validation, see Section D.10.4.2 [Unsplit and Tagify], page 273). Adding a tag table is therefore more generally useful for manually written Info files.

To create a tag table for an nonsplit file, visit the Info file you wish to tagify and type:

M-x Info-tagify

(Note the uppercase ‘I’ in **Info-tagify**.) This creates an Info file with a tag table. A tag table is part of a well formed Info file (see Section 20.2 [Tag and Split Files], page 201). A tag table is also needed to validate or split the Info file.

D.9.2 Splitting a File Manually

You should split a large file or else let the **texinfo-format-buffer** or **makeinfo-buffer** command do it for you automatically. (Generally you will let one of the formatting commands do this job for you. See Section D.6 [Info Formatting], page 261.)

The split-off files are called the indirect subfiles.

Tag tables are created automatically by the formatting command; you only need to create a tag table yourself if you are doing the job manually. See Section D.9.1 [Tagifying], page 268, for information about creating a tag table.

Visit the Info file you wish to tagify and split manually and type the two commands:

M-x Info-tagify
M-x Info-split

(Note that the ‘I’ in ‘Info’ is uppercase.)

When you use the **Info-split** command, the buffer is modified into a (small) Info file which lists the indirect subfiles. This file should be saved in place of the original visited file.

The indirect subfiles are written in the same directory the original file is in, with names generated by appending ‘-’ and a number to the original file name.

The primary file still functions as an Info file, but it contains just the tag table and a directory of subfiles. See Section 20.2 [Tag and Split Files], page 201.

D.10 Catching Mistakes

Besides mistakes in the content of your documentation, there are two kinds of mistake you can make with Texinfo: you can make mistakes with @-commands, and you can make mistakes with the structure of the nodes and chapters.

For finding problems with @-commands, you can run `TeX` or a region formatting command on the region that has a problem; indeed, you can run these commands on each region as you write it.

For finding problems with the structure of nodes and chapters, you can use `C-c C-s` (`texinfo-show-structure`) and the related `occur` command and you can use the `M-x Info-validate` command.

D.10.1 `texi2any` Preferred

The `texi2any` program does an excellent job of catching errors and reporting them—far better than `texinfo-format-region` or `texinfo-format-buffer`. In addition, the various functions for automatically creating and updating node pointers and menus remove many opportunities for human error.

Use `texi2any` (or its Texinfo mode manifestations, `makeinfo-region` and `makeinfo-buffer`) to format your file and check for other errors. This is the best way to work with Texinfo. But if you cannot use `texi2any`, or your problem is very puzzling, then you may want to use the tools described in this section.

D.10.2 Catching Errors with Info Formatting

After you have written part of a Texinfo file, you can use the `texinfo-format-region` or the `makeinfo-region` command to see whether the region formats properly.

Most likely, however, you are reading this section because for some reason you cannot use the `makeinfo-region` command; therefore, the rest of this section presumes that you are using `texinfo-format-region`.

If you have made a mistake with an @-command, `texinfo-format-region` will stop processing at or after the error and display an error message. To see where in the buffer the error occurred, switch to the ‘*Info Region*’ buffer; the cursor will be in a position that is after the location of the error. Also, the text will not be formatted after the place where the error occurred (or more precisely, where it was detected).

For example, if you accidentally end a menu with the command `@end menus` with an ‘s’ on the end, instead of with `@end menu`, you will see an error message that says:

```
@end menus is not handled by texinfo
```

The cursor will stop at the point in the buffer where the error occurs, or not long after it. The buffer will look like this:

```

----- Buffer: *Info Region* -----
* Menu:

* Using texinfo-show-structure::  How to use
                                  `texinfo-show-structure'
                                  to catch mistakes.
* Running Info-validate::        How to check for
                                  unreferenced nodes.

@end menus
*
----- Buffer: *Info Region* -----

```

The `texinfo-format-region` command sometimes provides slightly odd error messages. For example, the following cross-reference fails to format:

```
(@xref{Catching Mistakes, for more info.})
```

In this case, `texinfo-format-region` detects the missing closing brace but displays a message that says ‘Unbalanced parentheses’ rather than ‘Unbalanced braces’. This is because the formatting command looks for mismatches between braces as if they were parentheses.

Sometimes `texinfo-format-region` fails to detect mistakes. For example, in the following, the closing brace is swapped with the closing parenthesis:

```
(@xref{Catching Mistakes), for more info.}
```

Formatting produces:

```
(*Note for more info.: Catching Mistakes)
```

The only way for you to detect this error is to realize that the reference should have looked like this:

```
(*Note Catching Mistakes::, for more info.)
```

Incidentally, if you are reading this node in Info and type `f RET` (`Info-follow-reference`), you will generate an error message that says:

```
No such node: "Catching Mistakes) The only way ...
```

This is because Info perceives the example of the error as the first cross-reference in this node and if you type a `RET` immediately after typing the Info `f` command, Info will attempt to go to the referenced node. If you type `f catch TAB RET`, Info will complete the node name of the correctly written example and take you to the ‘Catching Mistakes’ node. (If you try this, you can return from the ‘Catching Mistakes’ node by typing `l` (`Info-last`).)

D.10.3 Debugging with \TeX

You can also catch mistakes when you format a file with \TeX .

Usually, you will want to do this after you have run `texinfo-format-buffer` (or, better, `makeinfo-buffer`) on the same file, because `texinfo-format-buffer` sometimes displays error messages that make more sense than \TeX . (See Section D.10.2 [Debugging with Info], page 269, for more information.)

For example, \TeX was run on a Texinfo file, part of which is shown here:

```
----- Buffer: texinfo.texi -----
```

```

name of the Texinfo file as an extension. The
@samp{??} are `wildcards' that cause the shell to
substitute all the raw index files. (@xref{sorting
indices, for more information about sorting
indices.})
----- Buffer: texinfo.texi -----

```

(The cross-reference lacks a closing brace.) T_EX produced the following output, after which it stopped:

```

----- Buffer: *tex-shell* -----
Runaway argument?
{sorting indices, for more information about sorting
indices.} @ETC.
! Paragraph ended before @xref was complete.
<to be read again>
      @par
1.27
?
----- Buffer: *tex-shell* -----

```

In this case, T_EX produced an accurate and understandable error message:

```
Paragraph ended before @xref was complete.
```

‘@par’ is an internal T_EX command of no relevance to Texinfo. ‘1.27’ means that T_EX detected the problem on line 27 of the Texinfo file. The ‘?’ is the prompt T_EX uses in this circumstance.

Unfortunately, T_EX is not always so helpful, and sometimes you must truly be a Sherlock Holmes to discover what went wrong.

In any case, if you run into a problem like this, you can do one of three things.

1. You can tell T_EX to continue running and ignore just this error by typing RET at the ‘?’ prompt.
2. You can tell T_EX to continue running and to ignore all errors as best it can by typing r RET at the ‘?’ prompt.

This is often the best thing to do. However, beware: the one error may produce a cascade of additional error messages as its consequences are felt through the rest of the file. To stop T_EX when it is producing such an avalanche of error messages, type C-c (or C-c C-c, if you are running a shell inside Emacs).

3. You can tell T_EX to stop this run by typing x RET at the ‘?’ prompt.

If you are running T_EX inside Emacs, you need to switch to the shell buffer and line at which T_EX offers the ‘?’ prompt.

Sometimes T_EX will format a file without producing error messages even though there is a problem. This usually occurs if a command is not ended but T_EX is able to continue processing anyhow. For example, if you fail to end an itemized list with the @end itemize command, T_EX will write a DVI file that you can print out. The only error message that T_EX will give you is the somewhat mysterious comment:

```
(@end occurred inside a group at level 1)
```

However, if you print the DVI file, you will find that the text of the file that follows the itemized list is entirely indented as if it were part of the last item in the itemized list. The error message is the way T_EX says that it expected to find an `@end` command somewhere in the file; but that it could not determine where it was needed.

Another source of notoriously hard-to-find errors is a missing `@end group` command. If you ever are stumped by incomprehensible errors, look for a missing `@end group` command first.

If the Texinfo file lacks header lines, T_EX may stop in the beginning of its run and display output that looks like the following. The ‘*’ indicates that T_EX is waiting for input.

```
This is TeX, Version 3.14159 (Web2c 7.0)
(test.texinfo [1])
*
```

In this case, simply type `\end` RET after the asterisk. Then write the header lines in the Texinfo file and run the T_EX command again. (Note the use of the backslash, ‘\’. T_EX uses ‘\’ instead of ‘@’; and in this circumstance, you are working directly with T_EX, not with Texinfo.)

D.10.4 Finding Badly Referenced Nodes

You can use the `Info-validate` command to check whether any of the ‘Next’, ‘Previous’, ‘Up’ or other node pointers fail to point to a node. This command checks that every node pointer points to an existing node. The `Info-validate` command works only on Info files, not on Texinfo files.

The `texi2any` program validates pointers automatically, so you do not need to use the `Info-validate` command if you are using `texi2any`. With the customization variable `CHECK_NORMAL_MENU_STRUCTURE` set, `texi2any` will also warn if the nodes pointers (either explicitly or automatically set) are not consistent with the order of node menu entries. `texi2any` does not check that every ‘Next’ pointer is matched by a ‘Previous’ (in the node where the ‘Next’ points) which points back, since it may be correct for a non standard document structure.

You only may need to use `Info-validate` if you are unable to run `texi2any` and instead must create an Info file using `texinfo-format-region` or `texinfo-format-buffer`, or if you write an Info file from scratch.

D.10.4.1 Using Info-validate

To use `Info-validate`, visit the Info file you wish to check and type:

```
M-x Info-validate
```

Note that the `Info-validate` command requires an uppercase ‘I’. You may also need to create a tag table before running `Info-validate`. See Section D.9.1 [Tagifying], page 268.

If your file is valid, you will receive a message that says “File appears valid”. However, if you have a pointer that does not point to a node, error messages will be displayed in a buffer called ‘*problems in info file*’.

For example, `Info-validate` was run on a test file that contained only the first node of this manual. One of the messages said:

```
In node "Overview", invalid Next: Texinfo Mode
```

This meant that the node called ‘Overview’ had a ‘Next’ pointer that did not point to anything (which was true in this case, since the test file had only one node in it).

Now suppose we add a node named ‘Texinfo Mode’ to our test case but we do not specify a ‘Previous’ for this node. Then we will get the following error message:

```
In node "Texinfo Mode", should have Previous: Overview
```

This is because, with a standard document structure, every ‘Next’ pointer should be matched by a ‘Previous’ (in the node where the ‘Next’ points) which points back.

`Info-validate` also checks that all menu entries and cross-references point to actual nodes.

`Info-validate` requires a tag table and does not work with files that have been split. (The `texinfo-format-buffer` command automatically splits large files.) In order to use `Info-validate` on a large file, you must run `texinfo-format-buffer` with an argument so that it does not split the Info file; and you must create a tag table for the unsplit file.

D.10.4.2 Creating an Unsplit File and Adding a Tag Table

You can run `Info-validate` only on a single Info file that has a tag table. The command will not work on the indirect subfiles that are generated when a master file is split. If you have a large file (longer than 300,000 bytes or so), you need to run the `texinfo-format-buffer` or `makeinfo-buffer` command in such a way that it does not create indirect subfiles. You will also need to create a tag table for the Info file. After you have done this, you can run `Info-validate` and look for badly referenced nodes.

The first step is to create an unsplit Info file. To prevent `texinfo-format-buffer` from splitting a Texinfo file into smaller Info files, give a prefix to the `M-x texinfo-format-buffer` command:

```
C-u M-x texinfo-format-buffer
```

or else

```
C-u C-c C-e C-b
```

When you do this, `texinfo-format-buffer` will not split the file and will not create a tag table for it.

After creating an unsplit Info file, you must create a tag table for it (see Section D.9.1 [Tagifying], page 268). Visit the unsplit Info file created by `texinfo-format-buffer` and type:

```
M-x Info-tagify
```

The third step is to validate the Info file:

```
M-x Info-validate
```

(Note the uppercase ‘I’ in `Info-validate`.) In brief, the steps are:

```
C-u M-x texinfo-format-buffer
```

```
M-x Info-tagify
```

```
M-x Info-validate
```

After you have validated the node structure, you can rerun `texinfo-format-buffer` in the normal way so it will construct a tag table and split the file automatically, or you can make the tag table and split the file manually (see Section D.9.2 [Splitting], page 268).

D.11 Batch Formatting

You can format Texinfo files for Info using `batch-texinfo-format` and Emacs batch mode. You can run Emacs in batch mode from any shell, including a shell inside of Emacs. (See Section “Initial Options” in *The GNU Emacs Manual*.)

Here is a shell command to format all the files that end in `.texinfo` in the current directory:

```
emacs -batch -funcall batch-texinfo-format *.texinfo
```

Emacs processes all the files listed on the command line, even if an error occurs while attempting to format some of them.

Run `batch-texinfo-format` only with Emacs in batch mode as shown; it is not interactive. It kills the batch mode Emacs on completion.

`batch-texinfo-format` is convenient if you lack `texi2any` and want to format several Texinfo files at once. When you use Batch mode, you create a new Emacs process. This frees your current Emacs, so you can continue working in it. (When you run `texinfo-format-region` or `texinfo-format-buffer`, you cannot use that Emacs for anything else until the command finishes.)

Appendix E Global Document Commands

Here are additional commands which affect the document as a whole. Most of these commands are for customizing the appearance of the printed output. They are generally all given before the Top node, if they are given at all.

E.1 `@setchapternewpage`: Blank Pages Before Chapters

In an officially bound book, text is usually printed on both sides of the paper, chapters start on right-hand pages, and right-hand pages have odd numbers. But in short reports, text often is printed only on one side of the paper. Also in short reports, chapters sometimes do not start on new pages, but are printed on the same page as the end of the preceding chapter, after a small amount of vertical whitespace.

You can use the `@setchapternewpage` command with various arguments to specify how chapters should be started in printed output and whether headers should be formatted for printing on one or both sides of the paper (single-sided or double-sided printing).

Write the `@setchapternewpage` command at the beginning of a line followed by its argument. For example, you would write the following to cause each chapter to start on a fresh odd-numbered page:

```
@setchapternewpage odd
```

You can specify one of three alternatives with the `@setchapternewpage` command:

```
@setchapternewpage off
```

Typeset a new chapter on the same page as the last chapter, after skipping some vertical whitespace. Also, format page headers for single-sided printing.

```
@setchapternewpage on
```

Start new chapters on new pages and format page headers for single-sided printing. This is the form most often used for short reports or personal printing. This is the default.

```
@setchapternewpage odd
```

Start new chapters on new, odd-numbered pages (right-handed pages) and typeset for double-sided printing. This is the form most often used for books and manuals.

Texinfo does not have a `@setchapternewpage even` command, because there is no printing tradition of starting chapters or books on an even-numbered page.

If you don't like the default headers that `@setchapternewpage` sets, you can explicitly control them with the `@headings` command. See Section E.2.1 [`@headings`], page 276.

At the beginning of a manual or book, pages are not numbered—for example, the title and copyright pages of a book are not numbered. By convention, table of contents and frontmatter pages are numbered with roman numerals and not in sequence with the rest of the document.

The `@setchapternewpage` has no effect in output formats that do not have pages, such as Info and HTML.

We recommend not including any `@setchapternewpage` command in your document source at all, since such desired pagination is not intrinsic to the document. For a particular

hard copy run, if you don't want the default output (no blank pages, same headers on all pages) use the `--texinfo` option to `texi2dvi` to specify the output you want.

E.2 Page Headings

Most printed manuals contain headings along the top of every page except the title and copyright pages. Some manuals also contain footings. Headings and footings have no meaning in Info or the other output formats.

Texinfo provides two standard heading formats, one for manuals printed on one side of each sheet of paper, and the other for manuals printed on both sides of the paper. By default, nothing is specified for the footing of a Texinfo file, so the footing remains blank.

Texinfo also has several heading and footing commands that you can use to generate your own heading and footing formats.

In Texinfo, headings and footings are single lines at the tops and bottoms of pages; you cannot create multiline headings or footings. Each header or footer line is divided into three parts: a left part, a middle part, and a right part. Any part, or a whole line, may be left blank. Text for the left part of a header or footer line is set flushleft; text for the middle part is centered; and, text for the right part is set flushright.

E.2.1 The `@headings` Command

The `@headings` command is rarely used. It specifies what kinds of page headings and footings to print on each page. Usually, this is controlled by the `@setchapternewpage` command. You need the `@headings` command only if the `@setchapternewpage` command does not do what you want.

You can use `@headings` as follows:

`@headings off`

Turn off printing of page headings.

`@headings single`

Turn on page headings appropriate for single-sided printing.

`@headings double`

Turn on page headings appropriate for double-sided printing.

`@headings singleafter`

`@headings doubleafter`

Turn on `single` or `double` headings, respectively, after the current page is output.

`@headings on`

Turn on page headings: `single` if '`@setchapternewpage on`', `double` otherwise.

For example, suppose you write `@setchapternewpage off` before the `@titlepage` command to start a new chapter on the same page as the end of the last chapter. This command also causes page headers to be typeset for single-sided printing. To cause page headers to be typeset for double-sided printing, write `@headings double`.

You can stop any page headings at all from being generated by writing `@headings off` on a line of its own, like this:

```
@headings off
```

E.2.2 Standard Heading Formats

Texinfo provides two standard heading formats, one for manuals printed on one side of each sheet of paper, and the other for manuals printed on both sides of the paper.

The standard format for single-sided printing consists of a header line in which the left-hand part contains the name of the chapter, the central part is blank, and the right-hand part contains the page number. A single-sided page looks like this:

```

-----
|                               |
| chapter    page number      |
|                               |
| Start of text ...          |
| ...                          |
|                               |

```

In the standard double-sided format, the left part of the left-hand (even-numbered) page contains the page number, the central part is blank, and the right part contains the title (specified by the `@settitle` command). The left part of the right-hand (odd-numbered) page contains the name of the chapter, the central part is blank, and the right part contains the page number. An even-numbered page and an odd-numbered page, side by side as in an open book, look like this:

```

-----
| page number    title        | | chapter    page number |
|                               | |                               |
| Start of text ...          | | More text ...          |
| ...                          | | ...                    |
|                               | |                               |

```

The chapter name is preceded by the word “Chapter”, the chapter number and a colon. This makes it easier to keep track of where you are in the manual.

Note that on pages where a new chapter starts, some text may be omitted from the heading line.

By default, nothing is specified for the footing of a Texinfo file, so the footing remains blank.

E.2.3 How to Make Your Own Headings

You can use the standard headings provided with Texinfo or specify your own. By default, Texinfo has no footers, so if you specify them, the available page size for the main text will be slightly reduced.

Texinfo provides six commands for specifying headings and footings:

- `@everyheading` and `@everyfooting` generate page headers and footers that are the same for both even- and odd-numbered pages.
- `@evenheading` and `@evenfooting` commands generate headers and footers for even-numbered (left-hand) pages.
- `@oddheading` and `@oddfooting` generate headers and footers for odd-numbered (right-hand) pages.

You must cancel the predefined heading commands with the `@headings off` command before defining your own specifications.

Here is how to place the chapter name at the left, the page number in the center, and the date at the right of every header for both even- and odd-numbered pages:

```
@headings off
@everyheading @thischapter @| @thispage @| @today{}
```

You need to divide the left part from the central part and the central part from the right part by inserting ‘@|’ between parts. Otherwise, the specification command will not be able to tell where the text for one part ends and the next part begins.

Each part can contain text or @-commands. The text is printed as if the part were within an ordinary paragraph in the body of the page. The @-commands replace themselves with the page number, date, chapter name, or whatever.

Here are the six heading and footing commands:

```
@everyheading left @| center @| right
@everyfooting left @| center @| right
```

The ‘every’ commands specify the format for both even- and odd-numbered pages. These commands are for documents that are printed on one side of each sheet of paper, or for documents in which you want symmetrical headers or footers.

```
@evenheading left @| center @| right
@oddheading left @| center @| right
@evenfooting left @| center @| right
@oddfooting left @| center @| right
```

The ‘even’ and ‘odd’ commands specify the format for even-numbered pages and odd-numbered pages. These commands are for books and manuals that are printed on both sides of each sheet of paper.

Use the ‘@this...’ series of @-commands to provide the names of chapters and sections and the page number. You can use the ‘@this...’ commands in the left, center, or right portions of headers and footers.

Here are the ‘@this...’ commands:

```
@thispage
    Expands to the current page number.
```

```
@thissectionname
    Expands to the name of the current section.
```

```
@thissectionnum
    Expands to the number of the current section.
```

```
@thissection
    Expands to the number and name of the current section, in the format ‘Section 1: Title’.
```

```
@thischaptername
    Expands to the name of the current chapter.
```

@thischapternum

Expands to the number of the current chapter, or letter of the current appendix.

@thischapter

Expands to the number and name of the current chapter, in the format ‘Chapter 1: Title’.

@thistitle

Expands to the name of the document, as specified by the **@settitle** command.

@thisfile

For **@include** files only: expands to the name of the current **@include** file. If the current Texinfo source file is not an **@include** file, this command has no effect. This command does *not* provide the name of the current Texinfo source file unless it is an **@include** file. (See Chapter 17 [Include Files], page 155, for more information about **@include** files.)

You can also use the **@today{}** command, which expands to the current date, in ‘1 Jan 1900’ format.

Other **@**-commands and text are printed in a header or footer just as if they were in the body of a page. It is useful to incorporate text, particularly when you are writing drafts:

```
@headings off
@everyheading @emph{Draft!} @| @thispage @| @thischapter
@everyfooting @| @| Version: 0.27: @today{}
```

Beware of overlong titles: they may overlap another part of the header or footer and blot it out.

If you have very short chapters and/or sections, several of them can appear on a single page. You can specify which chapters and sections you want **@thischapter**, **@thissection** and other such macros to refer to on such pages as follows:

@everyheadingmarks *ref*

@everyfootingmarks *ref*

The *ref* argument can be either **top** (the **@this...** commands will refer to the chapter/section at the top of a page) or **bottom** (the commands will reflect the situation at the bottom of a page). These ‘**@every...**’ commands specify what to do on both even- and odd-numbered pages.

@evenheadingmarks *ref*

@oddheadingmarks *ref*

@evenfootingmarks *ref*

@oddfootingmarks *ref*

These ‘**@even...**’ and ‘**@odd...**’ commands specify what to do on only even- or odd-numbered pages, respectively. The *ref* argument is the same as with the ‘**@every...**’ commands.

Write these commands immediately after the **@...contents** commands, or after the **@end titlepage** command if you don’t have a table of contents or if it is printed at the end of your manual. These commands have no effect in **L^AT_EX**.

By default, for **T_EX**, the **@this...** commands reflect the situation at the bottom of a page both in headings and in footings.

E.3 @paragraphindent: Controlling Paragraph Indentation

The Texinfo processors may insert whitespace at the beginning of the first line of each paragraph, thereby indenting that paragraph. You can use the `@paragraphindent` command to specify this indentation. Write a `@paragraphindent` command at the beginning of a line followed by either ‘asis’ or a number:

```
@paragraphindent indent
```

The indentation is according to the value of *indent*:

asis Do not change the existing indentation (not implemented in printed output).

none

0 Omit all indentation.

n Indent by *n* space characters in Info output, by *n* ems in printed output.

The default value of *indent* is 3. `@paragraphindent` is ignored for HTML output.

It is best to write the `@paragraphindent` command before the end-of-header line at the beginning of a Texinfo file, so the region formatting commands indent paragraphs as specified. See [Start of Header], page 15.

E.4 @firstparagraphindent: Indenting After Headings

As you can see in the present manual, the first paragraph in any section is not indented by default. Typographically, indentation is a paragraph separator, which means that it is unnecessary when a new section begins. This indentation is controlled with the `@firstparagraphindent` command:

```
@firstparagraphindent word
```

The first paragraph after a heading is indented according to the value of *word*:

none Prevents the first paragraph from being indented (default). This option is ignored by `makeinfo` if `@paragraphindent asis` is in effect.

insert Include normal paragraph indentation. This respects the paragraph indentation set by a `@paragraphindent` command (see Section E.3 [`@paragraphindent`], page 280).

`@firstparagraphindent` is ignored for HTML and DocBook output.

It is best to write the `@firstparagraphindent` command before the end-of-header line at the beginning of a Texinfo file, so the region formatting commands indent paragraphs as specified. See [Start of Header], page 15.

E.5 @exampleindent: Environment Indenting

The Texinfo processors indent each line of `@example` and similar environments. You can use the `@exampleindent` command to specify this indentation. Write an `@exampleindent` command at the beginning of a line followed by either ‘asis’ or a number:

```
@exampleindent indent
```

The indentation is according to the value of *indent*:

asis Do not change the existing indentation (not implemented in printed output).

- 0 Omit all indentation.
- n* Indent environments by *n* space characters in Info output, by *n* ems in printed output.

The default value of *indent* is 5 spaces in Info, and 0.4 in in printed output, which is somewhat less. (The reduction is to help fit more characters onto physical lines in printed manuals.)

It is best to write the `@exampleindent` command before the end-of-header line at the beginning of a Texinfo file, so the region formatting commands indent paragraphs as specified. See [Start of Header], page 15.

E.6 @smallbook: Printing “Small” Books

By default, \TeX typesets pages for printing in an 8.5 by 11 inch format, which is the “letter” size commonly used in the United States. However, you can direct \TeX or \LaTeX to typeset a document in a 7 by 9.25 inch format that is suitable for bound books by inserting the following command on a line by itself at the beginning of the Texinfo file, before the title page:

```
@smallbook
```

(Since many books are about 7 by 9.25 inches, this command might better have been called the `@regularbooksize` command, but it came to be called the `@smallbook` command by comparison to the 8.5 by 11 inch format.)

See Section 18.2 [Format with `texi2dvi` or `texi2pdf`], page 157, and Section 18.5 [Preparing for \TeX], page 162, for other ways to format with `@smallbook` with \TeX that do not require changing the source file.

E.7 Printing on A4 Paper

You can format a document for printing on ISO 216 A4 paper size with the `@fourpaper` command. Write the command on a line by itself near the beginning of the Texinfo file, before the title page.

You may or may not prefer the formatting that results from the command `@fourlatex`. There’s also `@fourwide` for A4 paper in wide format, `@fivepaper` for A5 paper, and `@sixpaper` for B6 paper.

See Section 18.2 [Format with `texi2dvi` or `texi2pdf`], page 157, and Section 18.5 [Preparing for \TeX], page 162, for other ways to format for different paper sizes that do not require changing the source file.

E.8 @pagesizes [*width*][, *height*]: Custom Page Sizes

You can explicitly specify the height and (optionally) width of the main text area on the page with the `@pagesizes` command. Write this on a line by itself near the beginning of the Texinfo file, before the title page. The height comes first, then the width if desired, separated by a comma. Examples:

```
@pagesizes 200mm,150mm
```

and

```
@pagesizes 11.5in
```

This would be reasonable for printing on B5-size paper. To emphasize, this command specifies the size of the *text area*, not the size of the paper (which is 250 mm by 177 mm for B5, 14 in by 8.5 in for legal).

To make more elaborate changes, such as changing any of the page margins, you must define a new command in `texinfo.tex` or `texinfo.cnf`.

See Section 18.2 [Format with `texi2dvi` or `texi2pdf`], page 157, and Section 18.5 [Preparing for `TEX`], page 162, for other ways to specify `@pagesizes` that do not require changing the source file.

E.9 Microtypography

Some versions of `TEX`, namely `pdfTEX` and `LuaTEX`, have *microtypography* features. These involve stretching font glyphs slightly, and allowing text to produce very slightly into the margins. Use of these gives `TEX` more flexibility in breaking a paragraph into lines, and can improve paragraph appearance by reducing hyphenation and producing a more consistent typographic color.

`texinfo.tex` uses these features (‘microtype’ for short) when available. You can turn microtype off by specifying ‘`@microtype off`’ in your input file; likewise, ‘`@microtype on`’ turns microtype back on.

The fonts used in `LATEX` output may not be scalable. If fonts are not scalable, using microtypography could trigger an error when converting the `LATEX` output. Therefore microtypography is not turned on in the default case in `LATEX` output. It is possible to turn it on with ‘`@microtype on`’. A way to get scalable fonts for the font used in the default `LATEX` output is to install the CM-Super font package (<http://ctan.org/pkg/cm-super>).

The `@microtype` command does nothing for other output formats.

E.10 Magnification

You can attempt to direct `TEX` to typeset pages larger or smaller than usual with the `\mag TEX` command. Everything that is typeset is scaled proportionally larger or smaller. (`\mag` stands for “magnification”.) This is *not* a Texinfo `@`-command, but is a raw `TEX` command that is prefixed with a backslash. You have to write this command between `@tex` and `@end tex` (see Section 15.3 [Raw Formatter Commands], page 136).

Follow the `\mag` command with an ‘=’ and then a number that is 1000 times the magnification you desire. For example, to print pages at 1.2 normal size, write the following near the beginning of the Texinfo file, before the title page:

```
@tex
\global\mag=1200
@end tex
```

With some printing technologies, you can print normal-sized copies that look better than usual by giving a larger-than-normal master to your print shop. They do the reduction, thus effectively increasing the resolution.

Depending on your system, DVI files prepared with a nonstandard-`\mag` may not print or may print only with certain magnifications. Be prepared to experiment.

Appendix F Info Format Specification

Here we describe the technical details of the Info format.

In this formal description, the characters `<>*()|=#` are used for the language of the description itself. Other characters are literal. The formal constructs used are typical: `<...>` indicates a metavariable name, `=` means definition, `*` repetition, `?` optional, `()` grouping, `|` alternation, and `#` comment.

In general, programs that read Info files should try to be case-insensitive to keywords that occur in the file (for example, `Tag Table` and `Tag table` should be equivalent) in order to support Info-generating programs that use different capitalization.

We specify literal parentheses (those that are part of the Info format) with `<lparen>` and `<rparen>`, meaning the single characters `'(` and `)'` respectively. Finally, the two-character sequence `^x` means the single character `'CTRL-x'`, for any `x`.

This format definition was written some 25 years after the Info format was first devised. So in the event of conflicts between this definition and actual practice, practice wins. It also assumes some general knowledge of Texinfo; it is meant to be a guide for implementors rather than a rigid technical standard. We may refer back to other parts of this manual for examples and definitions, rather than redundantly spelling out every detail.

F.1 Info Format: A Whole Manual

To begin, an Info manual is either *nonsplit* (contained wholly within a single file) or *split* (across several files).

The syntax for a nonsplit manual is:

```
<nonsplit info file> =
  <preamble>
  <node>*
  <tag table>?
  <local variables>?
```

When split, there is a *main file*, which contains only pointers to the nodes given in other *subfiles*. The main file looks like this:

```
<split info main file> =
  <preamble>
  <indirect table>
  <tag table>
  <local variables>?
```

The subfiles in a split manual have the following syntax:

```
<split info subfile> =
  <preamble>
  <node>*
```

Note that the tag table is not optional for split files, as it is used with the indirect table to deduce which subfile a particular node is in.

Several of the sections in an Info file (such as nodes or tag tables) begin with a sequence:

```
<separator> = (^L)?^(^L)?^J
```

That is, a `'CTRL-_'` character followed by a newline, with optional formfeed characters.

F.2 Info Format: Preamble

The `<preamble>` is text at the beginning of all output files. It is not intended to be visible by default in an Info viewer, but may be displayed upon user request.

```

<preamble> =
<identification>      # "This is FILENAME, produced by ..."
<copying text>        # Expansion of @copying text.
<dir entries>         # Derived from @dircategory and @direntry.

```

These pieces are:

`<identification line>`

An arbitrary string beginning the output file, followed by a blank line.

`<copying text>`

The expansion of a `@copying` environment, if the manual has one (see Section 2.7.1 [`@copying`], page 17).

`<dir entries>`

The result of any `@dircategory` and `@direntry` commands present in the manual (see Section 20.1.4 [Installing Dir Entries], page 198).

F.3 Info Format: Indirect Table

```

<indirect table> =
<separator>
Indirect:
(<filename>: <bytepos>)*

```

The indirect table is written to the main file in the case of split output only. It specifies, as a decimal integer, the starting byte position (zero-based) that the first node of each subfile would have if the subfiles were concatenated together in order, not including the top-level file. The first node of actual content is pointed to by the first entry.

As an example, suppose split output is generated for the GDB manual. The top-level file `gdb.info` will contain something like this:

```

<separator>
Indirect:
gdb.info-1: 1878
gdb.info-2: 295733
...

```

This tells Info viewers that the first node of the manual occurs at byte 1878 of the file `gdb.info-1` (which would be after that file's preamble.) The first node in the `gdb.info-2` subfile would start at byte 295733 if `gdb.info-2` were appended to `gdb.info-1`, including any preamble sections in both files.

Unfortunately, Info-creating programs such as `makeinfo` have not always implemented these rules perfectly, due to various bugs and oversights. Therefore, robust Info viewers should fall back to searching “nearby” the given position for a node, instead of giving up immediately if the position is not exactly at a node beginning.

F.4 Info Format: Tag Table

```

    <tag table> =
    <separator>
    Tag Table:
    (<lparen>Indirect<rparen>)?
    (Node|Ref): <nodeid>^?<bytepos>
    <separator>
    End Tag Table
  
```

The ‘(Indirect)’ line appears in the case of split output only.

The tag table specifies the starting byte position of each node and anchor in the file. In the case of split output, it is only written in the main output file.

Each line defines an identifier as either an anchor or a node, as specified. For example, ‘Node: Top^?1647’ says that the node named ‘Top’ starts at byte 1647 while ‘Ref: Overview-Footer-1^?30045’ says that the anchor named ‘Overview-Footer-1’ starts at byte 30045. It is an error to define the same identifier both ways.

In the case of nonsplit output, the byte positions simply refer to the location in the output file. In the case of split output, the byte positions refer to an imaginary file created by concatenating all the split files (but not the top-level file). See the previous section.

Here is an example:

```

    ^_
    Tag Table:
    Node: Top^?89
    Node: Ch1^?292
    ^_
    End Tag Table
  
```

This specifies a manual with two nodes, ‘Top’ and ‘Ch1’, at byte positions 89 and 292 respectively. Because the ‘(Indirect)’ line is not present, the manual is not split.

Preamble sections or other non-node sections of files do not have a tag table entry.

F.5 Info Format: Local Variables

The local variables section is optional and is currently used to give the encoding information. It may be augmented in the future.

```

    <local variables> =
    <separator>
    Local Variables:
    coding: <encoding>
    End:
  
```

See Section 14.2 [documentencoding], page 132.

F.6 Info Format: Regular Nodes

Regular nodes look like this:

```

    <node> =
    <separator>
  
```

```
File: <fn>, Node: <id1>, (Next: <id2>, )? (Prev: <id3>, )? Up: <id4>
```

```
<general text, until the next ^_ or end-of-file>
```

At least one space or tab must be present after each colon and comma, but any number of spaces are ignored. The <id> node identifiers have following format:

```
<id> = (<lparen><infofile><rparen>)?<node-spec>?
<node-spec> = <nodename> | <del><nodename><del>
<del> = ^?
```

This <node> defines <id1> in file <fn>, which is typically either ‘manualname’ or ‘manualname.info’. No parenthesized <infofile> component may appear within <id1>.

Each of the identifiers after *Next*, *Prev* and *Up* refer to nodes or anchors within a file. These pointers normally refer within the same file, but ‘(dir)’ is often used to point to the top-level dir file. If an <infofile> component is used then the node name may be omitted, in which case the node identifier refers to the ‘Top’ node within the referenced file.

The *Next* and *Prev* pointers are optional. The *Up* pointer is technically also optional, although most likely this indicates a mistake in the node structuring. Conventionally, the nodes are arranged to form a tree, but this is not a requirement of the format.

Node names containing periods, commas, colons or parentheses can confuse Info readers. If it is necessary to refer to a node whose name contains any of these, the <nodename> should be surrounded by a pair of DEL characters (‘CTRL-?’ , character number 127). `makeinfo` adds these characters when needed in the default case. Note that not all Info readers recognize this syntax. See [Info Node Names Constraints], page 29.

The <general text> of the node can include the special constructs described next.

F.7 Info Format: Menu

Conventionally menus appear at the end of nodes, but the Info format places no restrictions on their location.

```
<menu> =
* Menu:
(<menu entry> | <menu comment>)*
```

The parts of a <menu entry> are also described in Section 3.9.4 [Menu Parts], page 36. They have the same syntax as cross-references, with a leading ‘*’ instead of ‘* (N|n)ote’ (see Section F.10 [Info Format Cross Reference], page 288). Indices extend the menu format to specify the destination line; see Section F.9 [Info Format Printindex], page 287.

A <menu comment> is any line not beginning with ‘*’ that appears either at the beginning of the menu or is separated from a menu entry by one or more blank lines. These comments are intended to be displayed as part of the menu, as-is (see Section 3.9.1 [Writing a Menu], page 34).

F.8 Info Format: Image

The @image command results in the following special directive within the Info file (see Section 9.2 [Images], page 86):

```
<image> =
```

```

^@^H[image src="<image file>"
      (text="<txt file contents>")?
      (alt="<alt text>")?
^@^H]

```

The line breaks and indentation in this description are editorial; the whitespace between the different parts of the directive in Info files is arbitrary.

In the strings <image file>, <txt file contents> and <alt text>, ‘”’ is quoted as ‘\”’ and ‘\’ is quoted as ‘\\’. The txt and alt specifications are optional.

The alt value serves the same purpose as in HTML: A prose description of the image. In text-only displays or speech systems, for example, the alt value may be used instead of displaying the (typically graphical) <image file>.

The <txt file contents>, if present, should be taken as an ASCII representation of the image, for possible use on a text-only display.

The format does not prescribe the choice between displaying the <image file>, the <alt text> or the <txt file contents>.

F.9 Info Format: Printindex

An index in Info format is a kind of menu, with an additional directive at the beginning to mark it as an index menu.

```

      <printindex> =
^@^H[index^@^H]
* Menu:

```

```

<index entry>*

```

The <index entry> items are similar to normal menu entries, but the free-format description is replaced by the line number of where the entries occurs in the text:

```

      <index entry> =
* <entry text>: <node-spec>. <line-spec>

```

```

      <line-spec> =
<lparen>line <lineno><rparen>

```

The initial part, ‘<entry text>: <entry node>.’, should be on a single line. The <entry text> is the index term.

Even though <entry text> is followed by a colon, it may itself contain colons, so Info readers should try to include as much of the line as possible in the <entry text>. (However, <entry text> may not contain the DEL characters that may occur in <node-spec>.)

<lineno> is an unsigned integer, given relative to the start of the <entry node>. An optional line break may occur before ‘<line-spec>’.

Here is an example:

```

^@^H[index^@^H]
* Menu:

* thunder:                Weather Phenomena.                (line 5)

```

This means that an index entry for ‘thunder’ appears at line 5 of the node ‘Weather Phenomena’.

F.10 Info Format: Cross-reference

A general cross-reference in Info format has one of the following two forms:

```
<cross-reference> =
* (N|n)ote <id>::
| * (N|n)ote <label>:<id>(.,)

<id> = (<lparen><infofile><rparen>)?<node-spec>?
<label> = <label text> | <del><label text><del>
```

No space should occur between the ‘*’ character and the following ‘N’ or ‘n’. ‘*Note’ should be used at the start of a sentence, otherwise ‘*note’ should be used. (Some Info readers, such as the one in Emacs, can display ‘*Note’ and ‘*note’ as ‘See’ and ‘see’ respectively.) In both cases, <label text> is descriptive text.

In both forms the <id> refers to a node or anchor, in the same way as a reference in the node information line does (see Section F.6 [Info Format Regular Nodes], page 285). The optional parenthesized ‘<infofile>’ is the name of the manual being referenced, and <node-spec> gives the node or anchor within that manual.

The second form has a descriptive label. A cross-reference in this form should usually be terminated with a comma or period, to make it feasible to find the end of the <id>.

If <label> contains a colon character (:), it should be surrounded with a pair of characters. Likewise, quoting characters may be used for the node name if it contains problematic characters; then a terminating comma or period is not needed. As stated earlier, this quoting mechanism is not supported in all Info-reading programs.

The format does not prescribe how to find other manuals to resolve such references.

Here are some examples:

```
*note GNU Free Documentation License::
*note Tag table: Info Format Tag Table, for details.
*Note Overview: (make)Top.
*Note ^?:^?: (bash) Bourne Shell Builtins.
*Note alloca.h: (gnulib)^?alloca.h^?.
```

The first shows a reference to a node in the current manual using the short form.

The second also refers to a node in the current manual, namely ‘Info Format Tag Table’; the ‘Tag table’ before the ‘:’ is only a label on this particular reference, and the ‘for details.’ is text belonging to the sentence, not part of the reference.

The third example refers to the node ‘Top’ in another manual, namely ‘make’, with ‘Overview’ being the label for this cross-reference.

The fourth example shows a colon character being quoted in a label, and the fifth example shows a period being quoted in a node name.

See Chapter 5 [Cross References], page 44.

Appendix G GNU Free Documentation License

Version 1.3, 3 November 2008

Copyright © 2000, 2001, 2002, 2007, 2008 Free Software Foundation, Inc.

<https://fsf.org/>

Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.

0. PREAMBLE

The purpose of this License is to make a manual, textbook, or other functional and useful document *free* in the sense of freedom: to assure everyone the effective freedom to copy and redistribute it, with or without modifying it, either commercially or noncommercially. Secondly, this License preserves for the author and publisher a way to get credit for their work, while not being considered responsible for modifications made by others.

This License is a kind of “copyleft”, which means that derivative works of the document must themselves be free in the same sense. It complements the GNU General Public License, which is a copyleft license designed for free software.

We have designed this License in order to use it for manuals for free software, because free software needs free documentation: a free program should come with manuals providing the same freedoms that the software does. But this License is not limited to software manuals; it can be used for any textual work, regardless of subject matter or whether it is published as a printed book. We recommend this License principally for works whose purpose is instruction or reference.

1. APPLICABILITY AND DEFINITIONS

This License applies to any manual or other work, in any medium, that contains a notice placed by the copyright holder saying it can be distributed under the terms of this License. Such a notice grants a world-wide, royalty-free license, unlimited in duration, to use that work under the conditions stated herein. The “Document”, below, refers to any such manual or work. Any member of the public is a licensee, and is addressed as “you”. You accept the license if you copy, modify or distribute the work in a way requiring permission under copyright law.

A “Modified Version” of the Document means any work containing the Document or a portion of it, either copied verbatim, or with modifications and/or translated into another language.

A “Secondary Section” is a named appendix or a front-matter section of the Document that deals exclusively with the relationship of the publishers or authors of the Document to the Document’s overall subject (or to related matters) and contains nothing that could fall directly within that overall subject. (Thus, if the Document is in part a textbook of mathematics, a Secondary Section may not explain any mathematics.) The relationship could be a matter of historical connection with the subject or with related matters, or of legal, commercial, philosophical, ethical or political position regarding them.

The “Invariant Sections” are certain Secondary Sections whose titles are designated, as being those of Invariant Sections, in the notice that says that the Document is released

under this License. If a section does not fit the above definition of Secondary then it is not allowed to be designated as Invariant. The Document may contain zero Invariant Sections. If the Document does not identify any Invariant Sections then there are none.

The “Cover Texts” are certain short passages of text that are listed, as Front-Cover Texts or Back-Cover Texts, in the notice that says that the Document is released under this License. A Front-Cover Text may be at most 5 words, and a Back-Cover Text may be at most 25 words.

A “Transparent” copy of the Document means a machine-readable copy, represented in a format whose specification is available to the general public, that is suitable for revising the document straightforwardly with generic text editors or (for images composed of pixels) generic paint programs or (for drawings) some widely available drawing editor, and that is suitable for input to text formatters or for automatic translation to a variety of formats suitable for input to text formatters. A copy made in an otherwise Transparent file format whose markup, or absence of markup, has been arranged to thwart or discourage subsequent modification by readers is not Transparent. An image format is not Transparent if used for any substantial amount of text. A copy that is not “Transparent” is called “Opaque”.

Examples of suitable formats for Transparent copies include plain ASCII without markup, Texinfo input format, LaTeX input format, SGML or XML using a publicly available DTD, and standard-conforming simple HTML, PostScript or PDF designed for human modification. Examples of transparent image formats include PNG, XCF and JPG. Opaque formats include proprietary formats that can be read and edited only by proprietary word processors, SGML or XML for which the DTD and/or processing tools are not generally available, and the machine-generated HTML, PostScript or PDF produced by some word processors for output purposes only.

The “Title Page” means, for a printed book, the title page itself, plus such following pages as are needed to hold, legibly, the material this License requires to appear in the title page. For works in formats which do not have any title page as such, “Title Page” means the text near the most prominent appearance of the work’s title, preceding the beginning of the body of the text.

The “publisher” means any person or entity that distributes copies of the Document to the public.

A section “Entitled XYZ” means a named subunit of the Document whose title either is precisely XYZ or contains XYZ in parentheses following text that translates XYZ in another language. (Here XYZ stands for a specific section name mentioned below, such as “Acknowledgements”, “Dedications”, “Endorsements”, or “History”.) To “Preserve the Title” of such a section when you modify the Document means that it remains a section “Entitled XYZ” according to this definition.

The Document may include Warranty Disclaimers next to the notice which states that this License applies to the Document. These Warranty Disclaimers are considered to be included by reference in this License, but only as regards disclaiming warranties: any other implication that these Warranty Disclaimers may have is void and has no effect on the meaning of this License.

2. VERBATIM COPYING

You may copy and distribute the Document in any medium, either commercially or noncommercially, provided that this License, the copyright notices, and the license notice saying this License applies to the Document are reproduced in all copies, and that you add no other conditions whatsoever to those of this License. You may not use technical measures to obstruct or control the reading or further copying of the copies you make or distribute. However, you may accept compensation in exchange for copies. If you distribute a large enough number of copies you must also follow the conditions in section 3.

You may also lend copies, under the same conditions stated above, and you may publicly display copies.

3. COPYING IN QUANTITY

If you publish printed copies (or copies in media that commonly have printed covers) of the Document, numbering more than 100, and the Document's license notice requires Cover Texts, you must enclose the copies in covers that carry, clearly and legibly, all these Cover Texts: Front-Cover Texts on the front cover, and Back-Cover Texts on the back cover. Both covers must also clearly and legibly identify you as the publisher of these copies. The front cover must present the full title with all words of the title equally prominent and visible. You may add other material on the covers in addition. Copying with changes limited to the covers, as long as they preserve the title of the Document and satisfy these conditions, can be treated as verbatim copying in other respects.

If the required texts for either cover are too voluminous to fit legibly, you should put the first ones listed (as many as fit reasonably) on the actual cover, and continue the rest onto adjacent pages.

If you publish or distribute Opaque copies of the Document numbering more than 100, you must either include a machine-readable Transparent copy along with each Opaque copy, or state in or with each Opaque copy a computer-network location from which the general network-using public has access to download using public-standard network protocols a complete Transparent copy of the Document, free of added material. If you use the latter option, you must take reasonably prudent steps, when you begin distribution of Opaque copies in quantity, to ensure that this Transparent copy will remain thus accessible at the stated location until at least one year after the last time you distribute an Opaque copy (directly or through your agents or retailers) of that edition to the public.

It is requested, but not required, that you contact the authors of the Document well before redistributing any large number of copies, to give them a chance to provide you with an updated version of the Document.

4. MODIFICATIONS

You may copy and distribute a Modified Version of the Document under the conditions of sections 2 and 3 above, provided that you release the Modified Version under precisely this License, with the Modified Version filling the role of the Document, thus licensing distribution and modification of the Modified Version to whoever possesses a copy of it. In addition, you must do these things in the Modified Version:

- A. Use in the Title Page (and on the covers, if any) a title distinct from that of the Document, and from those of previous versions (which should, if there were any,

- be listed in the History section of the Document). You may use the same title as a previous version if the original publisher of that version gives permission.
- B. List on the Title Page, as authors, one or more persons or entities responsible for authorship of the modifications in the Modified Version, together with at least five of the principal authors of the Document (all of its principal authors, if it has fewer than five), unless they release you from this requirement.
 - C. State on the Title page the name of the publisher of the Modified Version, as the publisher.
 - D. Preserve all the copyright notices of the Document.
 - E. Add an appropriate copyright notice for your modifications adjacent to the other copyright notices.
 - F. Include, immediately after the copyright notices, a license notice giving the public permission to use the Modified Version under the terms of this License, in the form shown in the Addendum below.
 - G. Preserve in that license notice the full lists of Invariant Sections and required Cover Texts given in the Document's license notice.
 - H. Include an unaltered copy of this License.
 - I. Preserve the section Entitled "History", Preserve its Title, and add to it an item stating at least the title, year, new authors, and publisher of the Modified Version as given on the Title Page. If there is no section Entitled "History" in the Document, create one stating the title, year, authors, and publisher of the Document as given on its Title Page, then add an item describing the Modified Version as stated in the previous sentence.
 - J. Preserve the network location, if any, given in the Document for public access to a Transparent copy of the Document, and likewise the network locations given in the Document for previous versions it was based on. These may be placed in the "History" section. You may omit a network location for a work that was published at least four years before the Document itself, or if the original publisher of the version it refers to gives permission.
 - K. For any section Entitled "Acknowledgements" or "Dedications", Preserve the Title of the section, and preserve in the section all the substance and tone of each of the contributor acknowledgements and/or dedications given therein.
 - L. Preserve all the Invariant Sections of the Document, unaltered in their text and in their titles. Section numbers or the equivalent are not considered part of the section titles.
 - M. Delete any section Entitled "Endorsements". Such a section may not be included in the Modified Version.
 - N. Do not retitle any existing section to be Entitled "Endorsements" or to conflict in title with any Invariant Section.
 - O. Preserve any Warranty Disclaimers.

If the Modified Version includes new front-matter sections or appendices that qualify as Secondary Sections and contain no material copied from the Document, you may at your option designate some or all of these sections as invariant. To do this, add their

titles to the list of Invariant Sections in the Modified Version’s license notice. These titles must be distinct from any other section titles.

You may add a section Entitled “Endorsements”, provided it contains nothing but endorsements of your Modified Version by various parties—for example, statements of peer review or that the text has been approved by an organization as the authoritative definition of a standard.

You may add a passage of up to five words as a Front-Cover Text, and a passage of up to 25 words as a Back-Cover Text, to the end of the list of Cover Texts in the Modified Version. Only one passage of Front-Cover Text and one of Back-Cover Text may be added by (or through arrangements made by) any one entity. If the Document already includes a cover text for the same cover, previously added by you or by arrangement made by the same entity you are acting on behalf of, you may not add another; but you may replace the old one, on explicit permission from the previous publisher that added the old one.

The author(s) and publisher(s) of the Document do not by this License give permission to use their names for publicity for or to assert or imply endorsement of any Modified Version.

5. COMBINING DOCUMENTS

You may combine the Document with other documents released under this License, under the terms defined in section 4 above for modified versions, provided that you include in the combination all of the Invariant Sections of all of the original documents, unmodified, and list them all as Invariant Sections of your combined work in its license notice, and that you preserve all their Warranty Disclaimers.

The combined work need only contain one copy of this License, and multiple identical Invariant Sections may be replaced with a single copy. If there are multiple Invariant Sections with the same name but different contents, make the title of each such section unique by adding at the end of it, in parentheses, the name of the original author or publisher of that section if known, or else a unique number. Make the same adjustment to the section titles in the list of Invariant Sections in the license notice of the combined work.

In the combination, you must combine any sections Entitled “History” in the various original documents, forming one section Entitled “History”; likewise combine any sections Entitled “Acknowledgements”, and any sections Entitled “Dedications”. You must delete all sections Entitled “Endorsements.”

6. COLLECTIONS OF DOCUMENTS

You may make a collection consisting of the Document and other documents released under this License, and replace the individual copies of this License in the various documents with a single copy that is included in the collection, provided that you follow the rules of this License for verbatim copying of each of the documents in all other respects.

You may extract a single document from such a collection, and distribute it individually under this License, provided you insert a copy of this License into the extracted document, and follow this License in all other respects regarding verbatim copying of that document.

7. AGGREGATION WITH INDEPENDENT WORKS

A compilation of the Document or its derivatives with other separate and independent documents or works, in or on a volume of a storage or distribution medium, is called an “aggregate” if the copyright resulting from the compilation is not used to limit the legal rights of the compilation’s users beyond what the individual works permit. When the Document is included in an aggregate, this License does not apply to the other works in the aggregate which are not themselves derivative works of the Document.

If the Cover Text requirement of section 3 is applicable to these copies of the Document, then if the Document is less than one half of the entire aggregate, the Document’s Cover Texts may be placed on covers that bracket the Document within the aggregate, or the electronic equivalent of covers if the Document is in electronic form. Otherwise they must appear on printed covers that bracket the whole aggregate.

8. TRANSLATION

Translation is considered a kind of modification, so you may distribute translations of the Document under the terms of section 4. Replacing Invariant Sections with translations requires special permission from their copyright holders, but you may include translations of some or all Invariant Sections in addition to the original versions of these Invariant Sections. You may include a translation of this License, and all the license notices in the Document, and any Warranty Disclaimers, provided that you also include the original English version of this License and the original versions of those notices and disclaimers. In case of a disagreement between the translation and the original version of this License or a notice or disclaimer, the original version will prevail.

If a section in the Document is Entitled “Acknowledgements”, “Dedications”, or “History”, the requirement (section 4) to Preserve its Title (section 1) will typically require changing the actual title.

9. TERMINATION

You may not copy, modify, sublicense, or distribute the Document except as expressly provided under this License. Any attempt otherwise to copy, modify, sublicense, or distribute it is void, and will automatically terminate your rights under this License.

However, if you cease all violation of this License, then your license from a particular copyright holder is reinstated (a) provisionally, unless and until the copyright holder explicitly and finally terminates your license, and (b) permanently, if the copyright holder fails to notify you of the violation by some reasonable means prior to 60 days after the cessation.

Moreover, your license from a particular copyright holder is reinstated permanently if the copyright holder notifies you of the violation by some reasonable means, this is the first time you have received notice of violation of this License (for any work) from that copyright holder, and you cure the violation prior to 30 days after your receipt of the notice.

Termination of your rights under this section does not terminate the licenses of parties who have received copies or rights from you under this License. If your rights have been terminated and not permanently reinstated, receipt of a copy of some or all of the same material does not give you any rights to use it.

10. FUTURE REVISIONS OF THIS LICENSE

The Free Software Foundation may publish new, revised versions of the GNU Free Documentation License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns. See <https://www.gnu.org/licenses/>.

Each version of the License is given a distinguishing version number. If the Document specifies that a particular numbered version of this License “or any later version” applies to it, you have the option of following the terms and conditions either of that specified version or of any later version that has been published (not as a draft) by the Free Software Foundation. If the Document does not specify a version number of this License, you may choose any version ever published (not as a draft) by the Free Software Foundation. If the Document specifies that a proxy can decide which future versions of this License can be used, that proxy’s public statement of acceptance of a version permanently authorizes you to choose that version for the Document.

11. RELICENSING

“Massive Multiauthor Collaboration Site” (or “MMC Site”) means any World Wide Web server that publishes copyrightable works and also provides prominent facilities for anybody to edit those works. A public wiki that anybody can edit is an example of such a server. A “Massive Multiauthor Collaboration” (or “MMC”) contained in the site means any set of copyrightable works thus published on the MMC site.

“CC-BY-SA” means the Creative Commons Attribution-Share Alike 3.0 license published by Creative Commons Corporation, a not-for-profit corporation with a principal place of business in San Francisco, California, as well as future copyleft versions of that license published by that same organization.

“Incorporate” means to publish or republish a Document, in whole or in part, as part of another Document.

An MMC is “eligible for relicensing” if it is licensed under this License, and if all works that were first published under this License somewhere other than this MMC, and subsequently incorporated in whole or in part into the MMC, (1) had no cover texts or invariant sections, and (2) were thus incorporated prior to November 1, 2008.

The operator of an MMC Site may republish an MMC contained in the site under CC-BY-SA on the same site at any time before August 1, 2009, provided the MMC is eligible for relicensing.

ADDENDUM: How to use this License for your documents

To use this License in a document you have written, include a copy of the License in the document and put the following copyright and license notices just after the title page:

```
Copyright (C)  year  your name.
Permission is granted to copy, distribute and/or modify this document
under the terms of the GNU Free Documentation License, Version 1.3
or any later version published by the Free Software Foundation;
with no Invariant Sections, no Front-Cover Texts, and no Back-Cover
Texts. A copy of the license is included in the section entitled ``GNU
Free Documentation License''.
```

If you have Invariant Sections, Front-Cover Texts and Back-Cover Texts, replace the “with. . . Texts.” line with this:

```
with the Invariant Sections being list their titles, with
the Front-Cover Texts being list, and with the Back-Cover Texts
being list.
```

If you have Invariant Sections without Cover Texts, or some other combination of the three, merge those two alternatives to suit the situation.

If your document contains nontrivial examples of program code, we recommend releasing these examples in parallel under your choice of free software license, such as the GNU General Public License, to permit their use in free software.

Command and Variable Index

This is an alphabetical list of all the @-commands, assorted Emacs Lisp functions, and several variables. To make the list easier to use, the commands are listed without their preceding '@'.

!	^
! (end of sentence)..... 102	^ (circumflex accent)..... 104
"	‘
" (umlaut accent)..... 104	‘ (grave accent) 104
&	@
& (literal '&')..... 99	@ (literal '@')..... 98
’	\
’ (acute accent) 104	\ (literal '\ in math)..... 99
*	{
* (force line break) 114	{ (literal '{')..... 98
¸	}
¸ (cedilla accent) 104	} (literal '}')..... 98
—	~
- (discretionary hyphen) 115	~ (tilde accent) 104
.	
. (end of sentence)..... 102	
/	
/ (allow line break)..... 114	
:	
: (suppress end-of-sentence space)..... 101	
=	
= (macron accent) 104	
?	
? (end of sentence)..... 102	

A

aa	104
AA	104
abbr	61
acronym	62
ae	104
AE	104
afivepaper	281
afourlatex	281
afourpaper	281
afourwide	281
alias	150
allowcodebreaks	115
ampchar	99
anchor	50
appendix	40
appendixsec	41
appendixsection	41
appendixsubsec	41
appendixsubsubsec	42
apply	129
arrow	112
asis	80
atchar	98
author	19

B

b (bold font)	64
\backslash	99
backslashchar	99
bsixpaper	281
bullet	108
bye	26

C

c	10
caption	85
cartouche	74
center	20
centerchap	40
chapheading	40
chapter	39
cindex	91
cite	53
clear	138
click	112
clicksequence	112
clickstyle	112
code	56
codequotebacktick	100
codequoteundirected	100
columnfractions	82
comma	98
command	61
comment	10
complete_tree_nodes_menus	189

complete_tree_nodes_missing_menu	189
contents	22
copying	17
copyright	107
cpindex	91

D

defblock	127
defcodeindex	96
defcv	125
defcvx	120
deffn	120
deffnx	120
defindex	96
definfoenclose	152
defivar	126
defivarx	120
defline	127
defmac	121
defmacx	120
defmethod	127
defmethodx	120
defop	126
defopt	124
defoptx	120
defopx	120
defspec	121
defspecx	120
deftp	124
deftpx	120
deftypecv	125
deftypecvx	120
deftypefn	121
deftypefnnewline	123
deftypefnx	120
deftypefun	123
deftypefunx	120
deftypeivar	126
deftypeivarx	120
deftypeline	127
deftypemethod	127
deftypemethodx	120
deftypeop	127
deftypeopx	120
deftypevar	124
deftypevarx	120
deftypevr	124
deftypevrx	120
defun	121
defunx	120
defvar	123
defvarx	120
defvr	123
defvrx	120
DEL (comment character)	10
detailmenu	23
dfn	61

dh 104
 DH 104
 dircategory 16
 direntry 198
 display 70
 displaymath 106
 dmn 103
 docbook 136
 documentdescription 207
 documentencoding 132
 documentlanguage 131
 dotaccent 104
 dotless 104
 dots 107

E

email 63
 \emergencystretch 163
 emph 63
 end 217
 enddots 107
 enumerate 78
 env 60
 equiv 111
 error 110
 errormsg 135
 errormsg, and line numbers in \TeX 154
 euro 108
 evenfooting 278
 evenfootingmarks 279
 evenheading 278
 evenheadingmarks 279
 everyfooting 278
 everyfootingmarks 279
 everyheading 278
 everyheadingmarks 279
 example 68
 exampleindent 280
 exclamdown 104
 exdent 71
 expansion 109

F

file 60
 fill_gaps_in_sectioning 189
 finalout 163
 findex 91
 firstparagraphindent 280
 float 84
 flushleft 71
 flushright 71
 fnindex 91
 fn-name 119
 fonttextsize 64
 foo 100
 foobar 119, 122

footnote 88
 footnotestyle 90
 format 70
 forward-word 118
 frenchspacing 102
 ftable 81

G

\gdef within @tex 136
 geq 108
 \globaldefs within @tex 136
 group 116
 guillemetleft 105
 guillemetright 105
 guillemotleft 105
 guillemotright 105
 guilsinglleft 105
 guilsinglright 105

H

H (Hungarian umlaut accent) 104
 hashchar 99
 hbox 163
 heading 41
 headings 276
 headitem 82
 headitemfont 82
 html 136
 hyphenation 115

I

i (italic font) 64
 ifclear 140
 ifcommanddefined 141
 ifcommandnotdefined 141
 ifdocbook 134
 ifhtml 134
 ifinfo 134
 iflatex 134
 ifnotdocbook 135
 ifnohtml 135
 ifnotinfor 135
 ifnotlatex 135
 ifnotplaintext 135
 ifnottex 135
 ifnotxml 135
 ifplaintext 134
 ifset 139
 iftex 134
 ifxml 134
 ignore 10
 image 86
 include 155
 indent 73
 indentedblock 68

index..... 120
 indicateurl..... 63
 inforef..... 51
 Info-validate..... 272
 inlinfmt..... 137
 inlinfmtifelse..... 137
 inlineifclear..... 140
 inlineifset..... 140
 inlineraw..... 137
 \input (raw T_EX startup)..... 10
 insert_nodes_for_sectioning_commands..... 189
 insertcopying..... 18
 isearch-backward..... 120
 isearch-forward..... 120
 item in @itemize..... 77
 item in @multitable..... 82
 item in @table..... 80
 itemize..... 77
 itemx..... 81

K

kbd..... 57
 kbinputstyle..... 57
 key..... 58
 kindex..... 91
 kyindex..... 91

L

l..... 104
 latex..... 136
 LaTeX..... 107
 lbracechar..... 98
 leq..... 108
 linemacro..... 151
 link..... 51
 \linkcolor..... 54
 lisp..... 70
 listoffloats..... 86
 lowersections..... 43
 L..... 104

M

macro..... 144
 \mag (raw T_EX magnification)..... 282
 majorheading..... 40
 makeinfo-buffer..... 261
 makeinfo-kill-job..... 262
 makeinfo-recenter-output-buffer..... 262
 makeinfo-region..... 261
 math..... 106
 \mathopsup..... 107
 menu..... 34
 microtype..... 282
 minus..... 108
 move_index_entries_after_items..... 189

multitable..... 81

N

need..... 117
 <newline>..... 101
 next-error..... 261
 node..... 27
 nodedescription..... 33
 nodedescriptionblock..... 33
 noindent..... 73
 novalidate..... 160

O

o..... 104
 occur..... 255
 occur-mode-goto-occurrence..... 254
 oddfooting..... 278
 oddfootingmarks..... 279
 oddheading..... 278
 oddheadingmarks..... 279
 oe..... 104
 OE..... 104
 ogonek..... 104
 option..... 61
 ordf..... 104
 ordm..... 104
 O..... 104

P

page..... 116
 page, within @titlepage..... 19
 pagesizes..... 281
 paragraphindent..... 280
 part..... 42
 pgindex..... 91
 phoo..... 152
 pindex..... 91
 point..... 111
 pounds..... 108
 print..... 110
 printindex..... 94
 process..... 123
 push..... 122
 pxref..... 50

Q

questiondown..... 104
 quotation..... 67
 quotedblbase..... 105
 quotedblleft..... 105
 quotedblright..... 105
 quoteleft..... 105
 quoteright..... 105
 quotesinglbase..... 105

R

<code>r</code> (roman font).....	65
<code>raggedright</code>	72
<code>raisesections</code>	43
<code>rbracechar</code>	98
<code>ref</code>	49
<code>@refill</code>	241
<code>regenerate_master_menu</code>	190
<code>registeredsymbol</code>	107
<code>relate_index_entries_to_table_entries</code>	190
<code>result</code>	109
<code>ringaccent</code>	104
<code>rmacro</code>	145

S

<code>samp</code>	58
<code>sansserif</code>	65
<code>sc</code>	64
<code>section</code>	40
<code>sealso</code>	93
<code>seeentry</code>	93
<code>set</code>	138
<code>setchapternewpage</code>	275
<code>@setcontentsaftertitlepage</code>	241
<code>setfilename</code>	13
<code>@setshortcontentsaftertitlepage</code>	241
<code>settitle</code>	14
<code>shortcaption</code>	85
<code>shortcontents</code>	22
<code>shorttitlepage</code>	19
<code>simple_menu</code>	190
<code>slanted</code>	65
<code>smallbook</code>	281
<code>smalldisplay</code>	75
<code>smallexample</code>	75
<code>smallformat</code>	75
<code>smallindentedblock</code>	75
<code>smalllisp</code>	75
<code>smallquotation</code>	75
<code>sortas</code>	92
<code>sp</code>	116
<code>sp</code> (titlepage line spacing).....	20
<code><space></code>	101
<code>ss</code>	104
<code>strong</code>	63
<code>sub</code>	106
<code>subentry</code>	93
<code>subheading</code>	41
<code>subsection</code>	41
<code>subsubheading</code>	42
<code>subsubsection</code>	42
<code>subtitle</code>	19
<code>summarycontents</code>	22
<code>sup</code>	106
<code>syncodeindex</code>	95
<code>synindex</code>	96

T

<code>t</code> (typewriter font).....	65
<code>tab</code>	82
<code><tab></code>	101
<code>table</code>	79
<code>tex</code>	136
<code>texinfo-all-menus-update</code>	258
<code>texinfo-every-node-update</code>	257
<code>texinfo-format-buffer</code>	262
<code>texinfo-format-region</code>	262
<code>texinfo-indent-menu-description</code>	261
<code>texinfo-insert-braces</code>	253
<code>texinfo-insert-@code</code>	252
<code>texinfo-insert-@dfn</code>	252
<code>texinfo-insert-dwim-@ref</code>	252
<code>texinfo-insert-@end</code>	252
<code>texinfo-insert-@example</code>	253
<code>texinfo-insert-@item</code>	252
<code>texinfo-insert-@kbd</code>	252
<code>texinfo-insert-@node</code>	252
<code>texinfo-insert-node-lines</code>	260
<code>texinfo-insert-@noindent</code>	252
<code>texinfo-insert-@samp</code>	252
<code>texinfo-insert-@table</code>	252
<code>texinfo-insert-@var</code>	252
<code>texinfo-make-menu</code>	257
<code>texinfo-master-menu</code>	257
<code>texinfo-multiple-files-update</code>	259
<code>texinfo-sequential-node-update</code>	261
<code>texinfo-show-structure</code>	254
<code>texinfo-start-menu-description</code>	253
<code>texinfo-tex-buffer</code>	263
<code>texinfo-update-node</code>	257
<code>textdegree</code>	108
<code>TeX</code>	107
<code>th</code>	104
<code>thischapter</code>	279
<code>thischaptername</code>	278
<code>thischapternum</code>	278
<code>thisfile</code>	279
<code>thispage</code>	278
<code>thissection</code>	278
<code>thissectionname</code>	278
<code>thissectionnum</code>	278
<code>thistitle</code>	279
<code>TH</code>	104
<code>tie</code>	116
<code>tieaccent</code>	104
<code>tindex</code>	91
<code>title</code>	19
<code>titlefont</code>	20
<code>titlepage</code>	18
<code>today</code>	279
<code>top</code>	31
<code>tpindex</code>	91

U

<code>u</code> (breve accent)	104
<code>ubaraccent</code>	104
<code>udotaccent</code>	104
<code>unmacro</code>	145
<code>unnumbered</code>	40
<code>unnumberedsec</code>	41
<code>unnumberedsubsec</code>	41
<code>unnumberedsubsubsec</code>	42
<code>up-list</code>	253
<code>uref</code>	52
<code>urefbreakstyle</code>	53
<code>\urefurlonlylinktrue</code>	53
<code>url</code>	51
<code>\urlcolor</code>	54
U	112

V

<code>v</code> (caron)	104
<code>value</code>	138
<code>var</code>	59
<code>verb</code>	59
<code>verbatim</code>	69
<code>verbatiminclude</code>	156
<code>vindex</code>	91
<code>vrindex</code>	91
<code>vskip</code> <small>TEX</small> vertical skip	21
<code>vtable</code>	81

W

<code>w</code>	115
----------------------	-----

X

<code>xml</code>	136
<code>xref</code>	49
<code>xrefautomaticsectiontitle</code>	47

General Index

- !**
! 104
- "**
" (double low-9 quotation mark) 105
" (undirected double quote character) 105
- #**
'#line' directive 153
 not processing with T_EX 153
 syntax details 154
- \$**
\$Id expansion, preventing 116
- &**
'&#xhex;', output from @U 112
- '**
' 105
" 105
- (**
(dir) as Up node of Top node 30
- ,**
, (single low-9 quotation mark) 105
- - (in image alt string) 87, 115
- <**
< 105
« 105
- >**
> 105
» 105
- ?**
¿ 104
- -, breakpoint within @code 115
- ‘**
‘ 105
’ 105
- @**
‘@’ as continuation in definition commands 119
- 8**
8-bit characters, in HTML cross-references 213
- A**
 \underline{a} 104
A4 paper, printing on 281
A5 paper, printing on 281
 \grave{a} 104
 \AA 104
Abbreviations for keys 58
Abbreviations, tagging 61
Abstract of document 207
Abstract syntax tree representation of documents . 7
Accents, inserting 103
accesskey,
 customization variable for 179
 in HTML output of menus 35
 in HTML output of nodes 31
<acknowledgements> DocBook tag 40
Acronyms, tagging 62
Acute accent 104
Adding a new Info file 196
Additional output formats 5
--add-once, for **install-info** 199
Advanced indexing 93
Advice on writing entries 93
 \ae 104
 \AE 104
after, value for @urefbreakstyle 53
AFTER_BODY_OPEN 175
AFTER_SHORT_TOC_LINES 175
AFTER_TOC_LINES 175
Aliases, command 150
--align=column, for **install-info** 199
Allow line break 114
All-permissive copying license 249
Alphabetical @-command list 218
Alt attribute for images 87
Ampersand, inserting 99
Anchors 50

Angle quotation marks 105
 Another Info directory 197
 --append-new-sections, for `install-info` 199
 Archive::Zip, for EPUB file output 208
 Arguments, repeated and optional 119
 ASCII text output with --plaintext 169
 ASCII, source document portability using 112
 ASCII_DASHES_AND_QUOTES 183
 ASCII_GLYPH 183
 ASCII_PUNCTUATION 183
 Aspect ratio of images 87
 @-commands 9
 customization variables for 172
 in node names 29
 list of 218
 syntax 217
 At sign, inserting 98
 Auk, bird species 105
 AUTO_MENU_DESCRIPTION_ALIGN_COLUMN 183
 AUTO_MENU_MAX_WIDTH 183
 automake, and version info 247
 Automatic pointer creation with `texi2any` 27
 Automatic quoting of commas for some macros 146
 Automatically insert nodes, menus 256
 Auxiliary files, omitting 160
 AVOID_MENU_REDUNDANCY 174

B

B5 paper, printing on 281
 Back-end output formats 3
 Backslash in macros 144
 Backslash, and macros 145
 Backslash, in macro arguments 146
 Backslash, inserting 99
 Backtick 100
 Badly referenced nodes 272
 BASEFILENAME_LENGTH 175
 Bastard title page 19
 Batch formatting for Info 274
 Beebe, Nelson 4
 before, value for `@urefbreakstyle` 53
 BEFORE_SHORT_TOC_LINES 175
 BEFORE_TOC_LINES 175
 Beginning line of a Texinfo file 13
 Berry, Karl 6
 Big points 88
 BIG_RULE 175
 Black rectangle in hardcopy 163
 Blank lines 116
 <blockquote> DocBook tag 67
 Body of a macro 144
 <body> text, customizing 175
 BODYTEXT 175
 Bold font 64
 Bolio 6
 Book characteristics, printed 5
 Book, printing small 281

border-pattern of Window 125, 126
 BoTeX 6
 Box with rounded corners 74
 Box, ugly black in hardcopy 163
 Brace-delimited conditional text 137
 Brace-delimited flag conditionals 140
 Braces and argument syntax 218
 Braces, in index entries 161
 Braces, in macro arguments 146
 Braces, inserting 98
 Braces, when to use 9
 Breakpoints within URLs 53
 Breaks in a line 114
 Breaks, within `@code` 115
 Breve accent 104
 Buffer formatting and printing 263
 Bugs, reporting 2
 Bzipped dir files, reading 199

C

-c *var=value* 169
 --calign=*column*, for `install-info` 199
 Capitalization of index entries 93
 Captions, for floats 85
 Caron 104
 Cascading Style Sheets, and HTML output 206
 Case in node name 30
 Case, not altering in `@code` 56
 CASE_INSENSITIVE_FILENAMES 175
 Catching errors with Info formatting 269
 Catching errors with TeX formatting 270
 Catching mistakes 269
 Catcode for comments in TeX 10
 Categories, choosing 16
 Category codes, of plain TeX 136
 <caution> DocBook tag 67
 Caveats for macro usage 147
 Cedilla accent 104
 Centimeters 88
 Chapter structuring 38
 <chapter> DocBook tag 40
 CHAPTER_HEADER_LEVEL 175
 Chapters, formatting one at a time 160
 Character set, declaring 132
 Characteristics, printed books or manuals 5
 Characters, basic input 9
 Characters, invalid in node name 29
 ‘@charset’ specification, in CSS files 206
 Chassell, Robert J. 6
 Check accent 104
 CHECK_HTMLXREF 175
 CHECK_MISSING_MENU_ENTRY 183
 CHECK_NORMAL_MENU_STRUCTURE 184
 Checking for badly referenced nodes 272
 Checking for Texinfo commands 141
 Checklist for bug reports 2
 Ciceros 88

- Circumflex accent 104
- `CLASS_BEGIN_USEPACKAGE` 182
- Click sequences 112
- `CLOSE_DOUBLE_QUOTE_SYMBOL` 184
- `CLOSE_QUOTE_SYMBOL` 184
- Closing punctuation, and sentence ending 102
- CM-Super fonts 105
 - for `LATEX` 282
 - installing 162
- Code point of Unicode character, inserting by 112
- `code`, value for `@kbdinputstyle` 57
- Collapsing whitespace around continuations 119
- Colon in node name 29
- Colon, last in `INFOPATH` 197
- `<colophon>` DocBook tag 40
- Colored links, in PDF output 54
- Column widths, defining for multitable 82
- Combining indices 95
- Comma after cross-reference 45
- Comma in node name 29
- Comma, in macro arguments 145
- Comma, inserting 98
- Command aliases 150
- Command definitions 120
- Command names, indicating 61
- Command syntax 217
- `--command`, for `texi2dvi` 158
- `COMMAND_LINE_ENCODING` 184
- Command-line options of `texi2html` 194
- Commands in node names 29
- Commands to insert special characters 98
- Commands using raw `TEX` 136
- Commands, inserting them 252
- Commands, testing for Texinfo 141
- `--commands-in-node-names` 164
- Comments 10
 - Comments, in CSS files 207
 - compatibility, with `texi2html` 188
 - Compile command for formatting 265
 - `COMPLEX_FORMAT_IN_TABLE` 175
 - Compressed dir files, reading 199
 - Computer Modern fonts 133
 - Conditional commands, inline 137
 - Conditionally visible text 134
 - Conditionals, nested 142
 - Conditions for copying Texinfo 1
 - `--conf-dir=dir` 165
 - Configuration, for HTML cross-manual
 - references 214
 - Cons, Lionel 7, 194
 - Container directory for EPUB 208
 - Contents, after title page 241
 - Contents, table of 22
 - `CONTENTS_OUTPUT_LOCATION` 175
 - Contents-like outline of file structure 254
 - Contexts, of `@`-commands 240
 - Continuation lines in definition commands 119
 - Control keys, specifying 58
 - Controlling line breaks 114
 - Conventions for writing definitions 128
 - Conventions, syntactic 9
 - `CONVERT_TO_LATEX_IN_MATH` 176
 - `COPIABLE_LINKS` 176
 - Copying conditions 1
 - Copying permissions 16
 - Copying text, including 18
 - Copyright holder for FSF works 17
 - Copyright page 21
 - Copyright symbol 107
 - Copyright word, always in English 17
 - Correcting mistakes 269
 - Country codes 131
 - `cp` (concept) index 91
 - `CPP_LINE_DIRECTIVES` 184
 - Create nodes, menus automatically 256
 - Creating an unsplit file 273
 - Creating index entries 92
 - Creating pointers with `texi2any` 27
 - Critical editions 89
 - Cross-reference configuration, for HTML 214
 - Cross-reference parts 44
 - Cross-reference targets, arbitrary 50
 - Cross-references 44
 - Cross-references using `@inforef` 51
 - Cross-references using `@link` 51
 - Cross-references using `@pxref` 50
 - Cross-references using `@ref` 49
 - Cross-references using `@xref` 49
 - Cross-references, in HTML output 209
 - Cross-references, in Info format 288
 - `.cshrc` initialization file 162
 - CSS, and HTML output 206
 - `--css-include` 165
 - `--css-ref` 165
 - `CTRL-l` 9
 - Custom page sizes 281
 - Customization variables for `@`-commands 172
 - Customization variables for options 173
 - Customize Emacs package
 - (`Development/Docs/Texinfo`) 265
 - Customizing of `TEX` for Texinfo 162

D

 - `-D var` 165
 - Dash, breakpoint within `@code` 115
 - Dashes in source 9
 - `DATE_IN_HEADER` 176
 - `--debug`, for `install-info` 199
 - debugging document, with tree representation 174
 - Debugging the Texinfo structure 269
 - Debugging with Info formatting 269
 - Debugging with `TEX` formatting 270
 - `DEBUG` 184
 - `<dedication>` DocBook tag 40
 - `DEF_TABLE` 176

- Default font 65
 - DEFAULT_RULE 176
 - Defining indexing entries 92
 - Defining macros 144
 - Defining new indices 96
 - Defining new Texinfo commands 144
 - Definition command headings, continuing 119
 - Definition commands 118
 - Definition conventions 128
 - Definition lists, typesetting 79
 - Definition of Info format 283
 - Definition template 118
 - Definitions grouped together 120
 - Degree symbol 108
 - delete, for `install-info` 199
 - Delimiter character, for verbatim 59
 - Depth of text area 281
 - Description for menu, start 253
 - Description of document 207
 - description=*text*, for `install-info` 200
 - Detailed menu 23
 - Details of macro usage 147
 - detexinfo 174
 - Didôt points 88
 - Different cross-reference commands 44
 - Dimension formatting 103
 - Dimensions and image sizes 87
 - Dir categories, choosing 16
 - dir directory for Info installation 196
 - dir file listing 196
 - dir file, creating your own 197
 - dir files and Info directories 197
 - Dir files, compressed 199
 - dir, created by `install-info` 199
 - Direct formatting of Info files 268
 - dir-file=*name*, for `install-info` 200
 - disable-encoding 165
 - Display formatting 70
 - Displayed equation, in plain TeX 136
 - Displayed equations 106
 - distinct, value for `@kbdinputstyle` 57
 - Distorting images 87
 - DO_ABOUT 176
 - DOC_ENCODING_FOR_INPUT_FILE_NAME 184
 - DOC_ENCODING_FOR_OUTPUT_FILE_NAME 184
 - docbook 165
 - DocBook and prefatory sections 40
 - DocBook output, overview 4
 - DocBook, including raw 136
 - DOCTYPE 185
 - Document description 207
 - Document input encoding 132
 - Document language, declaring 131
 - Document permissions 16
 - Document strings, internationalization of 190
 - Document strings, translation of 131
 - Document structure, of Texinfo 31
 - Document title, specifying 14
 - document-language 165
 - documentlanguage customization variable 190
 - Dot accent 104
 - Dotless i, j 104
 - Dots, inserting 107
 - Double angle quotation marks 105
 - Double guillemets 105
 - Double left-pointing angle quotation mark 105
 - Double low-9 quotation mark 105
 - Double quotation marks 105
 - Double right-pointing angle quotation mark 105
 - Double structure, of Texinfo documents 31
 - Double-colon menu entries 37
 - dry-run, for `install-info` 200
 - DTD, for Texinfo XML 4
 - Dumas, Patrice 7, 209
 - DUMP_TEXI 185
 - DUMP_TREE 185
 - dvi 165
 - DVI file 159
 - DVI output, overview 3
 - DVI, output in 157
 - dvipdf 165
 - dvipdf, for `texi2dvi` 158
 - dvipdfmx 158
 - dvips 158
 - dvips (program) 3
 - ð 104
 - Ð 104
- ## E
- e *limit* 165
 - E *file* 167
 - EC fonts 105
 - EC fonts, installing 162
 - Ellipsis, inserting 107
 - Em dash, compared to minus sign 108
 - Em dash, producing 9
 - Emacs 251
 - Emacs shell, format, print from 157
 - Emphasizing text 63
 - Emphasizing text, font for 63
 - En dash, producing 9
 - enable 124
 - ENABLE_ENCODING 165
 - enable-encoding 165
 - Encoding,
 - input file names 186
 - output file names 187
 - Encoding, declaring 132
 - 'end' node footnote style 89
 - End of header line 15
 - END_USEPACKAGE 182
 - Ending a Sentence 102
 - Ending a Texinfo file 26
 - Entity reference in HTML et al. 112
 - Entries for an index 92

- Entries, making index 93
 - `--entry=text`, for `install-info` 200
 - Enumeration 78
 - Environment indentation 280
 - Environment variable `INFOPATH` 197
 - Environment variable `TEXINFO_OUTPUT_FORMAT` . 170
 - Environment variable `TEXINPUTS` 162
 - `eps image format` 86
 - `epsf.tex` 88
 - `epsf.tex`, installing 162
 - `--epub3` 165
 - EPUB 3 output, overview 3
 - EPUB Container directory 208
 - EPUB output file 208
 - EPUB, generating 208
 - `EPUB_CREATE_CONTAINER_FILE` 185
 - avoiding Archive::Zip dependency 208
 - `EPUB_KEEP_CONTAINER_FOLDER` 185
 - Equation, displayed, in plain \TeX 136
 - Equations, displayed 106
 - Equivalence, indicating 111
 - Error message, indicating 110
 - Error messages, line numbers in 153
 - `ERROR_LIMIT` 165
 - `--error-limit=limit` 165
 - Errors, parsing 261
 - Escaping to HTML 205
 - Es-zet 104
 - `etex` 159
 - Eth 104
 - Euro font 108
 - Euro font, installing 162
 - Euro symbol, and encodings 132
 - Euro symbol, producing 108
 - European A4 paper 281
 - European Computer Modern fonts 105
 - installing 162
 - Evaluation glyph 109
 - Example indentation 280
 - Example menu 35
 - `example`, value for `@kbinputstyle` 57
 - Examples in smaller fonts 75
 - Examples, formatting them 68
 - Examples, glyphs for 109
 - Expanding macros 145
 - Expansion of 8-bit characters in HTML
 - cross-references 213
 - Expansion of macros, contexts for 147
 - Expansion, indicating 109
 - expansion, of node names in HTML
 - cross-references 211
 - Expressions in a program, indicating 56
 - `EXTENSION` 185
 - External macro processors 153
 - `EXTERNAL_CROSSREF_EXTENSION` 176
 - `EXTERNAL_CROSSREF_SPLIT` 176
 - `EXTERNAL_DIR` 176
 - `EXTRA_HEAD` 176
- ## F
- `-f width` 165
 - Family names, in all capitals 62
 - Features of Texinfo, adapting to 141
 - Feminine ordinal 104
 - `feymr10` 108
 - installing 162
 - File ending 26
 - File name collision 14
 - file recorder for \TeX 159
 - File sectioning structure, showing 254
 - `--fill-column=width` 165
 - `FILLCOLUMN` 165
 - filll \TeX dimension 21
 - `-F` 166
 - Final output 162
 - Finding badly referenced nodes 272
 - Fine-tuning, and hyphenation 115
 - First line of a Texinfo file 13
 - First node 30
 - First paragraph, suppressing indentation of . . . 280
 - Fixed-width font 65
 - Flag conditionals, brace-delimited 140
 - Float environment 84
 - Floating accents, inserting 103
 - Floating, not yet implemented 84
 - Floats 84
 - list of 86
 - making unnumbered 84
 - numbering of 85
 - Flooding 50
 - `fn` (function) index 91
 - Font for multitable heading rows 82
 - Font size, reducing 64
 - Fonts for indices 96
 - Fonts for printing 64
 - Footings 276
 - Footnote style,
 - `'end'` 89
 - `'separate'` 89
 - `FOOTNOTE_END_HEADER_LEVEL` 176
 - `FOOTNOTE_SEPARATE_HEADER_LEVEL` 176
 - Footnotes 88
 - `footnotestyle` 166
 - `--footnote-style=style` 166
 - `--force` 166
 - Force line break 114
 - `FORCE` 166
 - Forcing indentation 73
 - Forcing line and page breaks 114
 - Form feed character 9
 - Format a dimension 103
 - Format and print hardcopy 157
 - Format and print in Texinfo mode 263
 - Format with the compile command 265
 - Format, print from Emacs shell 157
 - `FORMAT_MENU` 185
 - Formats for images 86

Formatting commands	9
Formatting examples	68
Formatting for Info	261
Formatting headings and footings	276
Formatting partial documents	160
Formatting requirements	10
Formatting with <code>tex</code> and <code>texindex</code>	159
Formulas, mathematical	106
Four- and five argument forms of cross-references	47
Fox, Brian	6
<code>FRAMES</code>	177
<code>FRAMESET_DOCTYPE</code>	177
Free Documentation License, including entire ..	247
Free software	1
French quotation marks	105
French spacing	102
Frequently used commands, inserting	252
Frontmatter, text in	24
Full texts, GNU	247
Function definitions	120
Functions, in typed languages	121
Future of Texinfo implementations	8

G

General syntactic conventions	9
Generating EPUB	208
Generating HTML	205
Generating menus with indices	94
Generating page headings	22
Generating plain text files with <code>--no-headers</code> ..	167
Generating plain text files with <code>--plaintext</code> ..	169
German quotation marks	105
German S	104
Global Document Commands	275
Globbering	160
Glyphs for programming	109
Glyphs for text	107
GNU Emacs	251
GNU Emacs shell, format, print from	157
GNU Free Documentation License, including entire	247
GNU sample texts	247
Going to other Info files' nodes	37
Grave accent	104
standalone	100
vs. left quote	105
Group (hold text together vertically)	116
Grouping two definitions together	120
GUI click sequence	112
Guillemets	105
Guillemots	105

H

<code>-h</code>	166
Hacek accent	104
Hardcopy, printing it	157
Hash sign, inserting	99
' <code>hbox</code> ', overfull	162
<code><head></code> HTML tag, and <code><link></code>	180
Header for Texinfo files	12
Header of a Texinfo file	13
<code>HEADER_IN_TABLE</code>	177
<code>HEADERS</code>	167
Heading row, in table	82
Headings	276
Headings, indentation after	280
Height of images	87
Height of text area	281
<code>--help</code> , for <code>texi2any</code>	166
<code>--help</code> , for <code>texindex</code>	200
<code>help2man</code>	6
Hierarchical documents, and menus	35
<code>HIGHLIGHT_SYNTAX</code>	185
<code>HIGHLIGHT_SYNTAX_DEFAULT_LANGUAGE</code>	185
Highlighting text	55
Highlighting, customized	152
Hints	242
History of Texinfo	6
Holder of copyright for FSF works	17
Holding text together vertically	116
<code>href</code> , producing HTML	51
<code>--html</code>	166
HTML cross-references	209
8-bit character expansion	213
command expansion	212
configuration	214
link basics	210
mismatch	214
node name expansion	211
HTML output, and encodings	132
HTML output, browser compatibility of	205
HTML output, overview	3
HTML output, split	206
HTML translation	205
HTML, and CSS	206
HTML, including raw	136
<code>HTML_MATH</code>	177
<code>HTML_ROOT_ELEMENT_ATTRIBUTES</code>	177
<code>htmlxref.cnf</code>	214
<code>HTMLXREF_FILE</code>	177
<code>HTMLXREF_MODE</code>	177
<code>http-equiv</code> , and charset specification	132
Hungarian umlaut accent	104
Hurricanes	49
Hyphen, breakpoint within <code>@code</code>	115
Hyphen, compared to minus	108
Hyphenation patterns, language-dependent ...	131
Hyphenation, helping \TeX do	115
Hyphenation, preventing	116
Hyphens in source, two or three in a row	9

I

- `i` (dotless `i`) 104
- `-I dir` 166
- I18n, of document strings 190
- Icelandic 104
- ICONS 177
- If text conditionally visible 134
- `--ifdocbook` 166
- `--ifhtml` 166
- `--ifinfo` 166
- `--iflatex` 166
- `--ifplaintext` 166
- `--iftex` 166
- `--ifxml` 166
- IGNORE_REF_TO_TOP_NODE_UP 178
- IGNORE_SPACE_AFTER_BRACED_COMMAND_NAME 185
- Ignored before `@setfilename` 13
- Ignored text 10
- Image formats 86
- IMAGE_LINK_PREFIX 177
- Images 86
 - alternate text for 87
 - in Info format 286
 - scaling 87
- Implementation, `texi2any` as reference 8
- Implicit pointer creation with `texi2any` 27
- '`import`' specifications, in CSS files 207
- `<important>` DocBook tag 67
- Inches 88
- `@include` file sample 155
- Include file sample 155
- Include files 155
- Include files requirements 260
- Include files, and section levels 43
- Including a file verbatim 156
- Including permissions text 18
- Indentation undoing 71
- Indentation, forcing 73
- Indentation, omitting 73
- Indented text block 68
- Indenting environments 280
- Indenting paragraphs, control of 280
- Indenting, suppressing of first paragraph 280
- Index entries 92
- Index entries, advice on writing 93
- Index entries, making 93
- Index file names 159
- Index font types 92
- index sorting 92
- INDEX_ENTRY_COLON 177
- INDEX_SPECIAL_CHARS_WARNING 186
- Indexing table entries automatically 81
- Indexing, advanced 93
- Indicating commands, definitions, etc. 55
- Indicating evaluation 109
- Indices 91
- Indices, combining them 95
- Indices, defining new 96
- Indices, in Info format 287
- Indices, printing and menus 94
- Indices, sorting 157
- Indices, two letter names 95
- Indirect subfiles 201
- Indirect table, in Info format 284
- `--info` 167
- Info batch formatting 274
- Info file name, choosing 14
- Info files 4
 - installation 196
 - listing a new 196
 - making a tag table 268
 - splitting manually 268
- Info format specification 283
- Info format, and menus 36
- Info formatting 261
- Info installed in another directory 197
- Info nodes, in Info format 285
- Info output, and encoding 132
- Info output, overview 3
- Info validating a large file 272
- Info; other files' nodes 37
- INFO_JS_DIR 177
- INFO_SPECIAL_CHARS_QUOTE 186
- INFO_SPECIAL_CHARS_WARNING 186
- `--info-dir=dir`, for `install-info` 200
- `--info-file=file`, for `install-info` 200
- INFOPATH 197
- `--init-file=file` 167
- Initialization file for `TEX` input 162
- Inline conditionals 137
- INLINE_CSS_STYLE 178
- Input encoding, declaring 132
- '`\input`' source line ignored 13
- INPUT_FILE_NAME_ENCODING 186
- Insert nodes, menus automatically 256
- Inserting `@` (literal '`@`') 98
- Inserting `#` 99
- Inserting `&` 99
- Inserting accents 103
- Inserting dots 107
- Inserting ellipsis 107
- Inserting frequently used commands 252
- Inserting indentation 73
- Inserting quotation marks 104
- Inserting quote characters 100
- Inserting space 101
- Inserting special characters and symbols 98
- INSTALL file, generating 169
- `install-info` 199
- Installing an Info file 196
- Installing Info in another directory 197
- Internal links, of HTML 167
- INTERNAL_LINKS 167
- `--internal-links=file` 167
- Internationalization 131
- Internationalization of document strings 190

- Introduction to Texinfo 2
- Invalid characters in node names 29
- Invoking macros 145
- Invoking nodes, including in dir file 199
- Invoking `pod2texi` 192
- ISO 3166 country codes 131
- ISO 639-2 language codes 131
- Italic font 64
- `--item=text`, for `install-info` 200
- Itemization 77

- J**
- `j` (dotless `j`) 104
- `jpeg image format` 86
- `JS_WEBLABELS` 178
- `JS_WEBLABELS_FILE` 178

- K**
- `--keep-old`, for `install-info` 200
- Keyboard input 57
- Keys, recommended names 58
- Keyword expansion, preventing 116
- Keywords, indicating 56
- Knuth, Donald 5
- `ky` (keystroke) index 91

- L**
- `l` 104
- `L2H_CLEAN` 181
- `L2H_FILE` 181
- `L2H_HTML_VERSION` 181
- `L2H_L2H` 181
- `L2H_SKIP` 181
- `L2H_TMP` 181
- `lang`, HTML attribute 175
- Language codes 131
- Language, declaring 131
- `--language`, for `texi2dvi` 158
- Larger or smaller pages 282
- `--latex` 167
- L^AT_EX logo 107
- LaTeX output, overview 4
- L^AT_EX, including raw 136
- L^AT_EX, processing with `texi2dvi` 158
- Left quotation marks 105
- Left-pointing angle quotation marks 105
- Legal paper, printing on 281
- Length of file names 14
- Less cluttered menu entry 37
- `libintl-perl` Gettext implementation 190
- Libre software 1
- License for all-permissive copying 249
- License for verbatim copying 249
- Limited scope of Texinfo 2

- Line breaks,
 - awkward 114
 - controlling 114
 - URLs 53
- Line breaks, preventing 115
- Line length, column widths as fraction of 82
- Line macros 151
- Line numbers, in error messages 153
- Line spacing 116
- `<link>` HTML tag, in `<head>` 180
- `Ł` 104
- Links, coloring in PDF output 54
- Lisp example 70
- Lisp examples in smaller fonts 75
- List of `@`-commands 218
- List of floats 86
- Listing a new Info file 196
- Lists and tables, making 76
- Literate programming, with Texinfo and `awk` .. 161
- Local variable section, in Info format 285
- Local variables 265
- Local Variables section, for encoding 132
- Locale, declaring 131
- `LOCALE_ENCODING` 186
- Location of menus 36
- Logos, T_EX 107
- Longest nodes, finding 188
- Looking for badly referenced nodes 272
- Lowering and raising sections 43
- `lpr` (DVI print command) 161
- `lpr-d`, replacements on
 - MS-DOS/MS-Windows 161
- Lzip-compressed dir files, reading 199
- LZMA-compressed dir files, reading 199

- M**
- Macro definitions, programming-language 120
- Macro definitions, Texinfo 144
- Macro details 147
- Macro expansion, contexts for 147
- Macro expansion, indicating 109
- Macro invocation 145
- Macro names, valid characters in 144
- Macro processors, external 153
- `MACRO_EXPAND` 167
- `--macro-expand=file` 167
- Macron accent 104
- Macros 144
- Macros taking whole line as an argument 151
- Macros, undefining 145
- Magnified printing 282
- Mailto link 63
- `makeinfo` 164
- `makeinfo` inside Emacs 261
- `makeinfo` options 164
- Making a printed manual 157
- Making a tag table manually 268

- Making cross-references 44
 - Making line and page breaks 114
 - Making lists and tables 76
 - Man page output, not supported 6
 - Man page, reference to 52
 - Manual characteristics, printed 5
 - Manual, referring to as a whole 48
 - Margins on page, not controllable 282
 - Marking text within a paragraph 55
 - Marking words and phrases 55
 - Masculine ordinal 104
 - Master menu 23
 - Math output for HTML 106
 - Mathematical expressions, inserting 106
 - MATHJAX_SCRIPT 181
 - MATHJAX_SOURCE 181
 - MAX_HEADER_LEVEL 178
 - MAX_MACRO_CALL_NESTING 186
 - max-width=*column*, for `install-info` 200
 - Menu description, start 253
 - Menu entries with two colons 37
 - Menu example 35
 - Menu location 36
 - Menu parts 36
 - @menu parts 36
 - Menu writing 34
 - Menu, master 23
 - MENU_ENTRY_COLON 178
 - MENU_SYMBOL 178
 - menuentry=*text*, for `install-info` 200
 - Menus 34
 - Menus generated with indices 94
 - Menus, in Info format 286
 - Menus, omitting with `--no-headers` 167
 - Menus, omitting with `--plaintext` 169
 - MESSAGE_ENCODING 186
 - Meta keys, specifying 58
 - <meta> HTML tag, and charset specification .. 132
 - <meta> HTML tag, and document description . 207
 - META key 58
 - Meta-syntactic chars for arguments 119
 - Methods, object-oriented 126
 - Millimeters 88
 - Mils, argument to @need 117
 - Minimal requirements for formatting 10
 - Minimal Texinfo file (requirements) 10
 - Minus sign 108
 - Mismatched HTML cross-reference source and target 214
 - Mistakes, catching 269
 - Mode, using Texinfo 251
 - monolithic manuals, for HTML cross-references . 215
 - MONOLITHIC 178
 - Monospace font 65
 - Multiple dashes in source 9
 - Multiple spaces 101
 - Multitable column widths 82
 - Multitable rows 82
- ## N
- name=*text*, for `install-info` 200
 - Names for indices 95
 - Names of index files 159
 - Names of macros, valid characters of 144
 - Names recommended for keys 58
 - NASA, as acronym 62
 - Navigation bar, in HTML output 205
 - Navigation footer 180
 - Navigation links, omitting 167
 - Navigation panel, bottom of page 180
 - Need space at page bottom 117
 - Nested footnotes 89
 - Nesting conditionals 142
 - New index defining 96
 - New Info file, listing it in `dir` file 196
 - New Texinfo commands, defining 144
 - Newlines, avoiding in conditionals 137
 - NEWS file for Texinfo 142
 - Next node of Top node 30
 - NLS 6
 - NO_CSS 178
 - NO_CUSTOM_HTML_ATTRIBUTE 178
 - NO_NUMBER_FOOTNOTE_SYMBOL 179
 - NO_TOP_NODE_OUTPUT 186
 - NO_USE_SETFILENAME 187
 - NO_WARN 168
 - Node line requirements 29
 - @node line writing 27
 - Node line writing 27
 - node name expansion, in HTML
 - cross-references 211
 - Node names must be unique 29
 - Node names, choosing 28
 - Node names, invalid characters in 29
 - Node separators, omitting with `--no-headers` . 167
 - Node separators, omitting with `--plaintext` .. 169
 - Node, defined 27
 - Node, 'Top' 23
 - NODE_FILES 167
 - NODE_NAME_IN_INDEX 179
 - NODE_NAME_IN_MENU 187
 - node-files 167
 - node-files, and HTML cross-references ... 216
 - Nodes in other Info files 37
 - Nodes, catching mistakes 269
 - Nodes, checking for badly referenced 272
 - Nodes, deleting or renaming 51
 - no-headers 167
 - no-ifdocbook 167
 - no-ifhtml 167
 - no-ifinfo 167
 - no-iflatex 167
 - no-ifplaintext 167
 - no-iftex 167
 - no-ifxml 167
 - no-indent, for `install-info` 201
 - Non-breakable space, fixed 115

- Non-breakable space, variable 116
 - `none`, value for `@urefbreakstyle` 53
 - `--no-node-files` 167
 - nonsplit Info file 201
 - Nonsplit manuals, Info format of 283
 - `--no-number-footnotes` 168
 - `--no-number-sections` 168
 - `--no-pointer-validate` 168
 - Normalization Form C, Unicode 214
 - `--no-split` 170
 - Not ending a sentence 101
 - `<note>` DocBook tag 67
 - `--no-validate` 168, 173
 - `--no-warn` 168
 - Number sign, inserting 99
 - `NUMBER_FOOTNOTES` 168
 - `NUMBER_SECTIONS` 168
 - Numbering of floats 85
 - `--number-sections` 168
- O**
- \emptyset 104
 - `-o file` 168
 - O’Dea, Brendan 6
 - Object-oriented programming 125
 - Oblique font 65
 - Obtaining T_EX 157
 - Occurrences, listing with `@occur` 255
 - Octotherp, inserting 99
 - œ 104
 - Ø 104
 - Œ 104
 - Ogonek diacritic 104
 - Omitting indentation 73
 - One-argument form of cross-references 45
 - `OPEN_DOUBLE_QUOTE_SYMBOL` 187
 - `OPEN_QUOTE_SYMBOL` 187
 - ‘`\openout`’ line in log file 159
 - Optional and repeated arguments 119
 - Options for `makeinfo` 164
 - Options for `texi2any` 164
 - Options of `texi2html` 194
 - Options, customization variables for 173
 - Ordinals, Romance 104
 - Ordinary T_EX commands, using 136
 - Orphans, preventing 117
 - Other Info files’ nodes 37
 - `OUTFILE` 168
 - Outline of file structure, showing 254
 - Output document strings, internationalization
 - of 190
 - output file name 13
 - Output file splitting 170
 - Output formats 3
 - Output formats, supporting more 5
 - Output, in PDF 157
 - Output, printed through `texi2any` 171
 - `--output=file` 168
 - `OUTPUT_CHARACTERS` 187
 - `OUTPUT_ENCODING_NAME` 187
 - `OUTPUT_FILE_NAME_ENCODING` 187
 - `--outputindent` 169
 - Outputting EPUB 208
 - Outputting HTML 205
 - Overfull ‘`hboxes`’ 162
 - Overview of Texinfo 2
 - Owner of copyright for FSF works 17
- P**
- `-p indent` 169
 - `-P path` 169
 - `PACKAGE` 188
 - `PACKAGE_AND_VERSION` 188
 - `PACKAGE_NAME` 188
 - `PACKAGE_URL` 188
 - `PACKAGE_VERSION` 188
 - Page breaks, awkward 114
 - Page breaks, forcing 116
 - Page delimiter in Texinfo mode 254
 - Page headings 276
 - Page numbering 276
 - Page sizes for books 281
 - Page sizes, customized 281
 - `page-delimiter` 254
 - Pages, starting odd 275
 - Paper size, A4 281
 - Paragraph indentation control 280
 - Paragraph, marking text within 55
 - `paragraphindent` 173
 - `--paragraph-indent=indent` 169
 - Parameters to macros 144
 - Parentheses in node name 29
 - Parsing errors 261
 - Part of file formatting and printing 263
 - Part pages 42
 - Partial documents, formatting 160
 - Parts of a cross-reference 44
 - Parts of a master menu 23
 - Parts of a menu 36
 - Patches, contributing 3
 - PCL file, for printing 161
 - `--pdf` 169
 - `pdf image inclusions` 86
 - `--pdf`, for `texi2dvi` 157
 - PDF output 157
 - PDF output of URLs 53
 - PDF output, overview 4
 - `pdftex` 160
 - `pdftex`, and images 86
 - `pdftexi2dvi` 157
 - Period in node name 29
 - Periods, inserting 101
 - Perl extension modules (XS) 171
 - Perl format strings for translation 190

- Perl Pod, converting to Texinfo 192
 - Permissions text, including 18
 - Permissions, printed 21
 - pg (program) index 91
 - Picas 88
 - Pictures, inserting 86
 - Plain hyperlink 51
 - Plain link 51
 - Plain text output with `--plaintext` 169
 - Plain text output, overview 3
 - Plain \TeX 136
 - `--plaintext` 169
 - png image format 86
 - Pod, converting to Texinfo 192
 - pod2texi 192
 - Point, indicating in a buffer 111
 - Pointer creation with `texi2any` 27
 - Pointer validation 168
 - suppressing 160
 - Points (dimension) 87
 - PostScript output, overview 3
 - Pounds symbol 108
 - `PRE_BODY_CLOSE` 179
 - Preamble 14
 - Preamble, in Info format 284
 - Predefined names for indices 95
 - Preface, etc., and DocBook 40
 - `<preface>` DocBook tag 40
 - `PREFIX` 188
 - Preparing for \TeX 162
 - Prev node of Top node 30
 - Preventing first paragraph indentation 280
 - Preventing line and page breaks 114
 - Print and format in Texinfo mode 263
 - Print, format from Emacs shell 157
 - Printed book and manual characteristics 5
 - Printed output, indicating 110
 - Printed output, through `texi2any` 171
 - Printed permissions 21
 - Printing a region or buffer 263
 - Printing an index 94
 - Printing cost, reducing 64
 - Printing DVI files, on MS-DOS/MS-Windows . 161
 - Printing hardcopy 157
 - Problems, catching 269
 - `.profile` initialization file 162
 - Program names, indicating 61
 - `PROGRAM_NAME_IN_ABOUT` 179
 - `PROGRAM_NAME_IN_FOOTER` 179
 - Programming, glyphs for 109
 - `PROGRAM` 188
 - Pronunciation of Texinfo 2
 - Prototype row, column widths defined by 82
 - `--ps` 169
 - `--ps`, for `texi2dvi` 158
- ## Q
- `--quiet`, for `install-info` 201
 - Quotation characters (‘’), in source 104
 - Quotation marks, French 105
 - Quotation marks, German 105
 - Quotation marks, inserting 104
 - Quotations 67
 - Quotations in smaller fonts 75
 - Quote characters, inserting 100
 - Quoting, automatic for some macros 146
- ## R
- Ragged left, without filling 71
 - Ragged right, with filling 72
 - Ragged right, without filling 71
 - Raising and lowering sections 43
 - Raw formatter commands 136
 - Raw HTML 205
 - raw text output 174
 - Recommended names for keys 58
 - Rectangle, black in hardcopy 163
 - Recursive macro invocations 145
 - Reducing font size 64
 - Reference implementation 8
 - Reference to @-commands 218
 - References 44
 - References using `@inforef` 51
 - References using `@pxref` 50
 - References using `@ref` 49
 - References using `@xref` 49
 - Referring to an entire manual 48
 - Referring to other Info files 37
 - `--regex=regex`, for `install-info` 201
 - Region formatting and printing 263
 - Region printing in Texinfo mode 263
 - Registered symbol 107
 - Regular expression, for ‘#line’ 154
 - Reid, Brian 6
 - `--remove`, for `install-info` 201
 - `--remove-exactly`, for `install-info` 201
 - Repeated and optional arguments 119
 - Reporting bugs 2
 - Required in Texinfo file 10
 - Requirements for formatting 10
 - Requirements for include files 260
 - Requirements for updating commands 258
 - Reserved words, indicating 56
 - Restrictions on node names 29
 - Result of an expression 109
 - Return type, own line for 123
 - RGB color specification 54
 - `ridt.eps` 88
 - Right quotation marks 105
 - Right-pointing angle quotation marks 105
 - Ring accent 104
 - Robbins, Arnold 161
 - Roman font 65

- Romance ordinals..... 104
 - Rounded rectangles, around text..... 74
 - Rows, of a multitable..... 82
 - Running an Info formatter..... 261
 - Running macros..... 145
 - Running `makeinfo` in Emacs..... 261
 - Running `texi2any` in Emacs..... 261
- S**
- `-s style`..... 166
 - Sample function definition..... 129
 - Sample `@include` file..... 155
 - Sample Texinfo file, no comments..... 11
 - Sample Texinfo files..... 247
 - Sample texts, GNU..... 247
 - Sans serif font..... 65
 - Scaled points..... 88
 - Scaling images..... 87
 - Scribe..... 6
 - Sea surges..... 49
 - `--section regex sec`, for `install-info`..... 201
 - `--section=sec`, for `install-info`..... 201
 - `SECTION_NAME_IN_TITLE`..... 179
 - Sectioning..... 38
 - Sectioning structure of a file, showing..... 254
 - Sections, raising and lowering..... 43
 - Semantic markup..... 2
 - Sentence ending punctuation..... 102
 - Sentence non-ending punctuation..... 101
 - Sentences, spacing after..... 102
 - '`separate`' footnote style..... 89
 - Sequence of clicks..... 112
 - `--set-customization-variable var=value`..... 169
 - S-expressions, output format..... 174
 - SGML-tools output format..... 5
 - Sharp sign (not), inserting..... 99
 - Sharp S..... 104
 - Shell formatting with `tex` and `texindex`..... 159
 - Shell printing, on MS-DOS/MS-Windows..... 161
 - Shell, format, print from..... 157
 - Shell, running `makeinfo` in..... 261
 - Shell, running `texi2any` in..... 261
 - Short captions, for lists of floats..... 85
 - Short table of contents..... 22
 - `SHORT_TOC_LINK_TO_TOC`..... 179
 - `SHOW_BUILTIN_CSS_RULES`..... 179
 - `SHOW_TITLE`..... 179
 - Showing the sectioning structure of a file..... 254
 - Showing the structure of a file..... 254
 - Shrubbery..... 139
 - `--silent`, for `install-info`..... 201
 - `SIMPLE_MENU`..... 179
 - Single angle quotation marks..... 105
 - Single guillemets..... 105
 - Single left-pointing angle quotation mark..... 105
 - Single low-9 quotation mark..... 105
 - Single quotation marks..... 105
 - Single right-pointing angle quotation mark..... 105
 - Site-wide Texinfo configuration file..... 162
 - Size of printed book..... 281
 - Slanted font..... 65
 - Slanted typewriter font, for `@kbd`..... 57
 - Small book size..... 281
 - Small caps font..... 64
 - Small examples..... 75
 - Small verbatim..... 70
 - `<small>` tag..... 64
 - Smaller fonts..... 64
 - Smith, Gavin..... 6
 - sort keys for index entries..... 92
 - `SORT_ELEMENT_COUNT`..... 188
 - `SORT_ELEMENT_COUNT_WORDS`..... 188
 - Sorting indices..... 157
 - Sorting nodes by size..... 188
 - Source file format..... 2
 - Source files, characters used..... 9
 - `source-highlight`..... 209
 - Space, after sentences..... 102
 - Space, inserting horizontal..... 101
 - Space, inserting vertical..... 116
 - Spaces in macros..... 145
 - Spaces in node name..... 30
 - Spaces, in menus..... 35
 - Spacing, at ends of sentences..... 102
 - Spacing, in the middle of sentences..... 101
 - Spacing, inserting..... 101
 - Special characters, inserting..... 98
 - Special displays..... 84
 - Special insertions..... 98
 - Specification of Info format..... 283
 - Specifying index entries..... 92
 - spell checking..... 174
 - Spelling of Texinfo..... 2
 - Split HTML output..... 206
 - split Info file..... 201
 - split manuals, for HTML cross-references..... 215
 - Split manuals, Info format of..... 283
 - `--split=how`..... 170
 - `SPLIT`..... 170
 - `SPLIT_SIZE`..... 170
 - `--split-size=num`..... 170
 - Splitting an Info file manually..... 268
 - Splitting of output files..... 170
 - ß..... 104
 - Stallman, Richard M..... 6
 - Start of header line..... 15
 - Starting chapters..... 275
 - stripping Texinfo commands..... 174
 - Structure of a file, showing..... 254
 - Structure, catching mistakes in..... 269
 - Structure, of Texinfo documents..... 31
 - Structuring of chapters..... 38
 - `SUBDIR`..... 168
 - Subscripts and superscripts, text..... 106
 - Subsection-like commands..... 41

Subsub sectioning commands 42
 Suggestions for Texinfo, making 2
 Summary of document 207
 Suppressing first paragraph indentation 280
 Suppressing indentation 73
 SVG images, used in DocBook 87
 SXML output 174
 Syntactic conventions 9
 Syntactic tokens, indicating 56
 Syntax details, ‘#line’ 154
 Syntax tree representation of documents 7
 Syntax, of @-commands 217
 Syntax, optional & repeated arguments 119
 SystemLiteral 184

T

T4H_LATEX_CONVERSION 182
 T4H_MATH_CONVERSION 182
 T4H_TEX_CONVERSION 182
 Table of contents 22
 Table of contents, after title page 241
 Table of contents, for floats 86
 Tables and lists, making 76
 Tables with indexing 81
 Tables, making multi-column 81
 Tables, making two-column 79
 Tag table 201
 Tag table, in Info format 285
 Tag table, making manually 268
 Targets for cross-references, arbitrary 50
 Template for a definition 118
 --test, for install-info 201
 Testing for Texinfo commands 141
 Tests, of Texinfo language 8
 TEST 188
 T_EX and ‘#line’ directives 153
 T_EX commands, using ordinary 136
 T_EX index sorting 157
 T_EX input initialization 162
 T_EX logo 107
 T_EX, how to obtain 157
 texi2any 164
 texi2any inside Emacs 261
 texi2any options 164
 texi2any, as reference implementation 8
 texi2dvi (shell script) 157
 texi2html 194
 texi2oldapi.texi, for texi2html 195
 texi2pdf (shell script) 157
 TEXI2DVI 188
 TEXI2HTML 188
 texi-elements-by-size 188
 texindex 159
 Texinfo commands, defining new 144
 Texinfo commands, testing for 141
 Texinfo document structure 31
 Texinfo file ending 26
 Texinfo file header 12
 Texinfo file minimum 10
 Texinfo file sectioning structure, showing 254
 Texinfo history 6
 Texinfo language tests 8
 Texinfo mode 251
 Texinfo overview 2
 Texinfo parsers, discouraging more 6
 Texinfo Preamble 14
 Texinfo printed book characteristics 5
 Texinfo XML output, overview 4
 Texinfo, and literate programming 161
 Texinfo, introduction to 2
 texinfo.cnf installation 162
 texinfo.dtd 4
 texinfo.tex, installing 162
 texinfo_document Gettext domain 190
 TEXINFO_DTD_VERSION 188
 TEXINFO_OUTPUT_FORMAT 173
 TEXINFO_XS 171
 TEXINFO_XS_PARSER 171
 TEXINPUTS 162
 texiwebjr 161
 Text width and height 281
 Text, conditionally visible 134
 Text, marking up 55
 Text::Unidecode 190
 TEXTCONTENT_COMMENT 188
 Textual glyphs 107
 þ 104
 <thead> HTML/DocBook tag 82
 Thin space between number, dimension 103
 Thorn 104
 Three-argument form of cross-references 46
 P 104
 ti.twjr 161
 Tie-after accent 104
 Tied space 116
 Tilde accent 104
 time-stamp.el 247
 <tip> DocBook tag 67
 Tips 242
 Title page 18
 bastard 19
 <title> HTML tag 14
 TOC_LINKS 179
 Top node 23
 Top node example 23
 Top node is first 30
 TOP_FILE 179
 TOP_NODE_FILE_TARGET 179
 TOP_NODE_UP 189
 TOP_NODE_UP_URL 179
 tp (data type) index 91
 Translating strings in output documents 190
 TRANSLITERATE_FILE_NAMES 170
 --transliterate-file-names 170

Transliteration of 8-bit characters in HTML
 cross-references 213
 Tree representation of documents 7
 tree representation, for debugging 174
 Tree structuring 38
TREE_TRANSFORMATIONS 189
 Two ‘First’ Lines for **@defn** 120
 Two letter names for indices 95
 Two named items for **@table** 81
 Two part menu entry 37
 Two-argument form of cross-references 46
txi-cc.tex 131
txicodequotebacktick 100
txicodequoteundirected 100
txicommandconditionals 142
txidefnamenspace 120
txiindexatsignignore 92
txiindexbackslashignore 92
txiindexhyphenignore 92
txiindexlessthanignore 92
txixml2texi 4
 Typed functions 121
 Typed variables 124
 Typewriter font 65

U

Ugly black rectangles in hardcopy 163
 Umlaut accent 104
 Unbreakable space, fixed 115
 Unbreakable space, variable 116
 Uncluttered menu entry 37
 Undefining macros 145
 Underbar accent 104
 Underdot accent 104
 Underscore, breakpoint within **@code** 115
 undirected single quote 100
 Unicode and **T_EX** 112
 Unicode character, inserting 112
 Unicode quotation characters 105
 Unique index entries 94
 Unique node names requirement 29
 Unnumbered float, creating 84
 Unprocessed text 10
 Unsplit file creation 273
 Up node of Top node 30
UPDATED Automake variable 247
UPDATED-MONTH Automake variable 247
 Updating nodes and menus 256
 Updating requirements 258
 URI syntax for Info 5
@url, examples of using 52
 URL,
 examples of displaying 52
 indicating 63
 referring to 51
<URL...> convention, not used 53
 URLs, coloring in PDF output 54

URLs, PDF output of 53
 Usage tips 242
 us-ascii encoding, and translations 191
USE_ACCESSKEY 180
USE_ISO 180
USE_LINKS 180
USE_NEXT_HEADING_FOR_LONE_NODE 180
USE_NODE_DIRECTIONS 180
USE_NODES 190
USE_NUMERIC_ENTITY 190
USE_REL_REV 180
USE_SETFILENAME_EXTENSION 190
USE_TITLEPAGE_FOR_TITLE 180
USE_UNIDECODE 190
USE_UP_NODE_FOR_ELEMENT_UP 190
USE_XML_SYNTAX 180
 User input 57
 User options, marking 124
 User-defined Texinfo commands 144
 Using **Info-validate** 272
 Using Texinfo in general 2

V

Validating a large file 272
 Value of an expression, indicating 109
 Variables, in typed languages 124
 Variables, object-oriented 125
 Verbatim copying license 249
 Verbatim environment 69
 Verbatim in-line text 59
 Verbatim, include file 156
 Verbatim, small 70
--verbose 170
-v 170
VERBOSE 170
 Version control keywords, preventing expansion
 of 116
 Version number, for **install-info** 201
--version, for **install-info** 201
--version, for **texi2any** 170
VERSION Automake variable 247
 Versions of Texinfo, adapting to 141
VERTICAL_HEAD_NAVIGATION 180
 Vertically holding text together 116
 Visibility of conditional text 134
vr (variable) index 91

W

`@w`, for blank items 77
`<warning>` DocBook tag 67
 White space in node name 30
 Whitespace in macros 145
 Whitespace, collapsed around continuations ... 119
 Whitespace, controlling in conditionals 137
 Whitespace, inserting 101
 Whole manual, in Info format 283
 Width of images 87
 Width of text area 281
 Widths, defining multitable column 82
 Wildcards 160
 word counting 174
 Words and phrases, marking them 55
`WORDS_IN_PAGE` 180
 Writing a menu 34
 Writing a `@node` line 27

Writing index entries 93

X

`xdvi` 3
`--xml` 170
 XML DocBook output, overview 4
 XML Texinfo output, overview 4
 XML, including raw 136
`--Xopt str` 170
`XPM image format` 87
`XREF_USE_FLOAT_LABEL` 180
`XREF_USE_NODE_NAME_ARG` 180
 XZ-compressed dir files, reading 199

Y

Years, in copyright line 17