

Programming \LaTeX — A survey of documentation and packages

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Abstract

A survey of programming-related documentation for \LaTeX . Included are references to printed and electronic books and manuals, symbol lists, FAQs, the \LaTeX source code, CTAN and distributions, programming-related packages, users groups and online communities, and information on creating packages and documentation.

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Introduction

Reinventing the wheel may be useful if you think that you can do it better. Worse, though, is not even being aware that the wheel has already been invented in the first place, which can be an embarrassing waste of time. Such can be the case both for a new \LaTeX programmer who isn't aware of the many ways things may be done, but also for someone, the author included, who learned \LaTeX many years ago but may have missed some of the recent advancements in package code and documentation.

A wealth of information is available, not only in print and online, but also directly embedded in the typical \LaTeX distribution. The following is meant to be a broad overview of some of today's resources for \LaTeX programmers.

(The latest version of this document is available in the docsurvey package.)

Printed books

Even in an electronic/online era, printed books still have the advantage of being able to be opened for reference without taking up space on the screen. Printed books also provide extended discussion of useful topics, have extensive human-edited indexes which are more useful than a simple document-wide search function, and some are also available in electronic format.

\LaTeX : A Document Preparation System:

The classic introduction to \LaTeX , in continuous reprint for decades. [1]

Guide to \LaTeX :

An introduction and more advanced material, including an extensive reference guide. Fourth edition: 2004. [2]

More Math into \LaTeX :

Updated to a fifth edition in 2016. [3]

\LaTeX Beginner's Guide:

An overview with numerous examples. [4]

\LaTeX Cookbook:

More examples. [5]

The \LaTeX Companion:

Provides extended discussion and examples of the inner workings of \LaTeX and numerous useful packages. Second edition: 2004. [6]

Additional books:

Listed at the UK TUG FAQ.

<http://www.tex.ac.uk/FAQ-latex-books.html>

Electronic books and documentation

Most of these are provided with the \TeX distribution, and may be updated with each release. Access the embedded documentation from a command line using the `texdoc` program.

\TeX

\TeX by Topic, A \TeX nician's Reference:

A reference for \TeX . This may be useful for understanding the source code of \LaTeX packages, many of which are quite old and written in low-level \TeX . [9] (`texdoc texbytopic`)

\TeX

The Not So Short Introduction to $\TeX 2_{\epsilon}$:

Covers introductory material, customizations, and a simple package. [7] (texdoc lshort)

$\TeX 2_{\epsilon}$: An unofficial reference manual:

A thorough but concise reference manual for $\TeX 2_{\epsilon}$, available in several languages. [8]
(texdoc -l latex2e-help)

LaTeX WikiBook:

An online book, includes information about creating \TeX packages and classes.
<https://en.wikibooks.org/wiki/LaTeX>

Lua \TeX

A guide to lua \TeX :

An introduction. (texdoc lua \TeX -doc)

Lua \TeX Reference:

The full manual. (texdoc luatex.pdf)

X \TeX

The X \TeX reference guide:

A summary of additional features. (texdoc xetex-reference)

Font-change-xetex:

Macros for using fonts. (texdoc font-change-xetex)

Symbol references

These are lists of the \TeX commands which produce symbols.

Comprehensive \TeX Symbol List:

More than 14,000 symbols and \TeX commands. [10]
(texdoc symbols-letter)
(texdoc symbols-a4)

Every symbol (most symbols) defined by unicode-math:

Unicode math symbols. [11] (texdoc unimath-symbols)

Source code

The source code for $\TeX 2_{\epsilon}$ itself is also included in the distribution.

The $\TeX 2_{\epsilon}$ sources:

Occasionally useful for figuring out how something really works. [14]
(texdoc source2e)

List of internal $\TeX 2_{\epsilon}$ macros useful to package authors:

A list of the core \TeX macros, each of which is linked to the source code. [15] (texdoc macros2e)

FAQs

UK TUG FAQ:

A wide-ranging list of frequently-asked questions. [12] (`texdoc letterfaq`) (`texdoc newfaq`)

Visual \TeX FAQ:

Click on a visual element to learn how it is programmed. [13]

(`texdoc visualFAQ`)

Accessing embedded documentation

A large amount of documentation is included in a \TeX distribution. Most can be accessed with the `texdoc` program. Use `texdoc -l name` to select from many choices of matching package, file, or program names. In some cases the same document is available in both letter or A4 paper sizes, or in several languages.

The program `kpsewhich` may be used to find out where a file is located. `kpsewhich filename` searches for and returns the path to the given filename.

`kpsewhich` can also return directories, such as:

```
kpsewhich -var-value TEXMFROOT
kpsewhich -var-value TEXMFDIST
kpsewhich -var-value TEXMFLOCAL
```

Some package authors choose not to include the source code in the package documentation. To view the source code:

1. To locate and read a package's `.sty` file:

```
kpsewhich package.sty
```

Usually these files have their comments removed, so it is better to use the `.dtx` file instead.

2. The `.dtx` file is usually available, and will have the package's source code.

```
kpsewhich package.dtx
```

The comments are not yet typeset and so will not be as easily read.

3. To typeset the documentation with the source code, copy the `.dtx` file and any associated image files somewhere local and then look for `\OnlyDescription` in the source. This command tells the `ltxdoc` package not to print the source code.

4. Remove `\OnlyDescription`, then process the `.dtx` file with

```
pdflatex package.dtx
```

Barring unusual circumstances, this will create a new documentation `.pdf` file with the package source code included.

Obtaining packages — Comprehensive \TeX Archive Network (CTAN)

The Comprehensive \TeX Archive Network (CTAN) provides a master collection of packages. A search function is available, which is useful when you know the name of a package or its author, and a list of topics is also provided. There are so many topics, however, that finding the right topic can be a problem in itself. One useful method to find what you are looking for is to search for a related package you may already know about, then look at its description on CTAN to see what topics are shown for it. Selecting these topics then shows you related packages. [16]

Packages useful for programming \LaTeX

A number of packages are especially useful for \LaTeX programmers: (texdoc <packagename>)

xifthen: Conditionals.	ifplatform: Detect operating system.
etoolbox: A wide range of programming tools, often avoiding the need to resort to low-level \TeX .	xstring: String manipulation.
etextools: Adds to etoolbox. Strings, lists, and more.	keyval, xkeyval, kvsetkeys: Key/value arguments.
xparse: Define macros and environments with flexible argument types.	pgfkeys, pgfkeyx: Another form of key/value arguments.
environ: Process environment contents.	kvoptions: Key/value package options.
arrayjobx, fifo-stack, forarray, forloop, xfor: Programming arrays, stacks, and loops.	expl3: \LaTeX 3 programming.
iftex: Detect \TeX engine.	l3keys, l3keys2e: Key/value for \LaTeX 3.
	chktex: Locates typographic errors.
	CTAN topic macro-supp: An entire topic of useful programming macros.

Creating and documenting new packages

How-to

Documentation for those interested in creating their own package or class:

How to package your \LaTeX package: A tutorial. [17]	(texdoc dtxtut)
\LaTeX 2ϵ for class and package writers: Programming a package or class. [18]	(texdoc clsguide)
The doc and shortvrb packages: Packages for documenting packages. [19]	(texdoc doc)
The DocStrip program: The program which processes .dtx and .ins files to generate documentation and .sty files. [20]	(texdoc docstrip)

Published articles about creating \LaTeX packages

Related articles from *TUGboat*:

Rolling your own Document Class: Using \LaTeX to keep away from the Dark Side: An overview of the article class. [21]
Good things come in little packages: An introduction to writing .ins and .dtx files: How and why to create your own .dtx and .ins files. [22]
How to develop your own document class — our experience: A comparison of developing class vs. package files. [23]

Users groups

T ϵ X Users Group: <http://tug.org>

List of international users groups: <http://tug.org/usergroups.html>

Online communities

English forums:

TeX— \LaTeX Stack Exchange: <http://tex.stackexchange.com/>
Almost any question has already been asked, and a quick web search will find answers, ranked by vote.

\LaTeX Community: <http://www.latex-community.org/>
A traditional forum with quick replies to your questions

German forums:

TeXwelt: <http://texwelt.de/wissen/>

goLaTeX: <http://golatex.de/>

Mailing lists: <http://tug.org/mailman/listinfo>
Several dozen, spanning a wide range of T ϵ X-related topics.

Newsgroup: `comp.text.tex`

Distributions — \LaTeX for various operating systems

TeXLive: <http://tug.org/texlive/> Unix and Windows

MiKTeX: <https://miktex.org/> Windows and Mac

proTeXt: <http://tug.org/protext/> Windows

MacTeX: <http://tug.org/mactex/> Mac

Change log

2017/03/06:
Initial version.

2017/10/04:
Added users groups, mailing lists, distributions, LuaT ϵ X, X \LaTeX , chktex. Organization and formatting improvements.

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 - [9] \TeX by Topic, A \TeX nician's Reference, Victor Eijkhout, Addison-Wesley UK, 1991, ISBN 0201568829, <http://eijkhout.net/texbytopic/texbytopic.html>
 - [10] The Comprehensive \LaTeX Symbol List, Scott Pakin, <https://ctan.org/pkg/comprehensive>
 - [11] Every symbol (most symbols) defined by unicode-math, Will Robertson, <https://ctan.org/pkg/unicode-math>
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