

# 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, this 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  $\TeX$ . [7] (`texdoc texbytopic`)

## $\text{\LaTeX}$

### Getting something out of $\text{\LaTeX}$ :

Create your first document in  $\text{\LaTeX}$ . [8] <https://ctan.org/pkg/first-latex-doc>

### The very short guide to typesetting with $\text{\LaTeX}$ :

A four-page introduction. [9] <https://ctan.org/pkg/latex-veryshortguide>

### Formatting Information:

A beginner's introduction to typesetting with  $\text{\LaTeX}$ . [10] <https://ctan.org/pkg/beginlatex>

### $\text{\LaTeX}$ for Complete Novices:

An extensive introduction for a non-technical person. [11] (texdoc dickimaw-novices)

### Using $\text{\LaTeX}$ to Write a PhD Thesis:

A followup to  *$\text{\LaTeX}$  for Complete Novices*, including extensive discussion about bibliographies, indexes, and glossaries. [12] (texdoc dickimaw-thesis)

### Writing Scientific Documents Using $\text{\LaTeX}$ :

An introduction to typesetting scientific documents. [13] <https://ctan.org/pkg/intro-scientific>

### The Not So Short Introduction to $\text{\LaTeX} 2_{\epsilon}$ :

Covers introductory material, customizations, and a simple package. [14] (texdoc lshort)

### $\text{\LaTeX} 2_{\epsilon}$ : An unofficial reference manual:

A thorough but concise reference manual for  $\text{\LaTeX} 2_{\epsilon}$ , available in several languages. [15] (texdoc -l latex2e-help)

### LaTeX WikiBook:

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

### Initiation à LATEX:

A French guide on  $\text{\LaTeX}$ —for beginners or advanced users. [16] <https://ctan.org/pkg/guide-latex-fr>

## Lua $\text{\LaTeX}$

### A guide to lua $\text{\LaTeX}$ :

An introduction. (texdoc luatex-doc)

### Lua $\text{\TeX}$ Reference:

The full manual. (texdoc luatex.pdf)

## X $\text{\LaTeX}$

### The X $\text{\LaTeX}$ reference guide:

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

### Font-change-xetex:

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

## $\text{\LaTeX} 3$ and expl3

### The $\text{\LaTeX} 3$ Interfaces:

Reference documentation for the expl3 programming environment. (texdoc interface3)

## Symbol references

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

### Comprehensive $\TeX$ Symbol List:

More than 14,000 symbols and  $\TeX$  commands. [17]

(texdoc symbols-letter)

(texdoc symbols-a4)

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

Unicode math symbols. [18]

(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. [19]

(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. [20] (texdoc macros2e)

## FAQs

### UK TUG FAQ:

A wide-ranging list of frequently-asked questions. [21] (texdoc letterfaq) (texdoc newfaq)

### Visual $\TeX$ FAQ:

Click on a visual element to learn how it is programmed. [22]

(texdoc visualFAQ)

## Accessing embedded information

### texdoc

A large amount of documentation is included in a  $\TeX$  distribution. Most can be accessed with the `texdoc` program. Enter “`texdoc -l <name>`” to search for 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. `texdoc` is also available online [23] at `texdoc.net`, with popular packages sorted by category.

### kpsewhich

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.

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

```
kpsewhich package.dtx
```

If it is not installed on your local system, it will be necessary to download the `.dtx` file from CTAN (see the next section).

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

- 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.
- 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 $\text{\TeX}$ Archive Network (CTAN)

The Comprehensive  $\text{\TeX}$  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. [24]

## Packages useful for programming $\text{\LaTeX}$

A number of packages are especially useful for  $\text{\LaTeX}$  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  $\text{\TeX}$ .

**xstring:** String manipulation.

**keyval, xkeyval, kvsetkeys:** Key/value arguments.

**etextools:** Adds to etoolbox. Strings, lists, and more.

**pgfkeys, pgfkeyx:** Another form of key/value arguments.

**xparse:** Define macros and environments with flexible argument types.

**kvoptions:** Key/value package options.

**expl3:**  $\text{\LaTeX}$ 3 programming.

**environ:** Process environment contents.

**l3keys, l3keys2e:** Key/value for  $\text{\LaTeX}$ 3.

**arrayjobx, fifo-stack, forarray, forloop, xfor:** Programming arrays, stacks, and loops.

**chktex:** Locates typographic errors.

**iftex:** Detect  $\text{\TeX}$  engine.

**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  $\text{\LaTeX}$  package:**

A tutorial. [25]

`(texdoc dtxtut)`

**$\LaTeX$  2<sub>ε</sub> for class and package writers:**

Programming a package or class. [26] (texdoc clsguide)

**The doc and shortvrb packages:**

Packages for documenting packages. [27] (texdoc doc)

**The DocStrip program:**The program which processes .dtx and .ins files to generate documentation and .sty files. [28]  
(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. [29]

**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. [30]

**How to develop your own document class—our experience:**

A comparison of developing class vs. package files. [31]

**Users groups** **$\TeX$  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>**French forums:****TeXnique.fr:** <http://texnique.fr>**Mailing lists:** <http://tug.org/mailman/listinfo>Several dozen, spanning a wide range of  $\TeX$ -related topics.**Newsgroup:** [comp.text.tex](mailto:comp.text.tex)

## Distributions — $\text{\LaTeX}$ for various operating systems

<b>TeXLive:</b> <a href="http://tug.org/texlive">http://tug.org/texlive</a>	Unix and Windows
<b>MiKTeX:</b> <a href="https://miktex.org">https://miktex.org</a>	Windows and Mac
<b>proTeXt:</b> <a href="http://tug.org/protext/">http://tug.org/protext/</a>	Windows
<b>MacTeX:</b> <a href="http://tug.org/mactex/">http://tug.org/mactex/</a>	Mac

## Change log

### 2017/03/06:

Initial version.

### 2017/10/04:

Added users groups, mailing lists, distributions, Lua $\text{\TeX}$ , X $\text{\TeX}$ , chktex. Organization and formatting improvements.

### 2017/10/14:

More information about accessing embedded documentation.

### 2018/01/18:

Added texdoc.net.

### 2018/01/21:

Added latex-veryshortguide, first-latex-doc, beginlatex, intro-scientific, guide-latex-fr.

### 2018/03/24:

Added interface3, dickimaw-novices, dickimaw-thesis.

### 2018/04/01:

Added TeXnique.fr.

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