

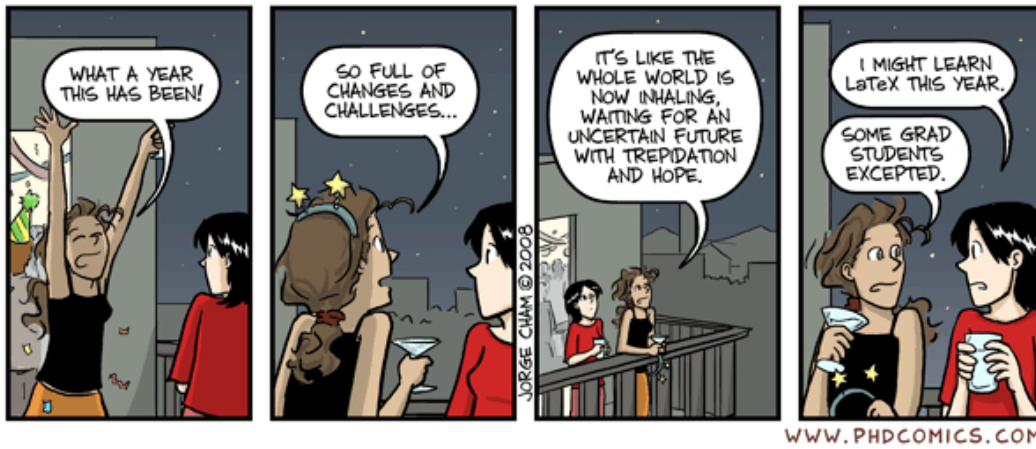
# Overview of L<sup>A</sup>T<sub>E</sub>X

## Why $\LaTeX$ ?

Output quality, standard for technical publications (especially in Math and Computer Science).

$\LaTeX$  For The Win!

<http://davidrupp.blogspot.com/search/label/LaTeX%20geek>



<http://www.phdcomics.com/comics.php?f=1115>

## What is $\LaTeX$ ?

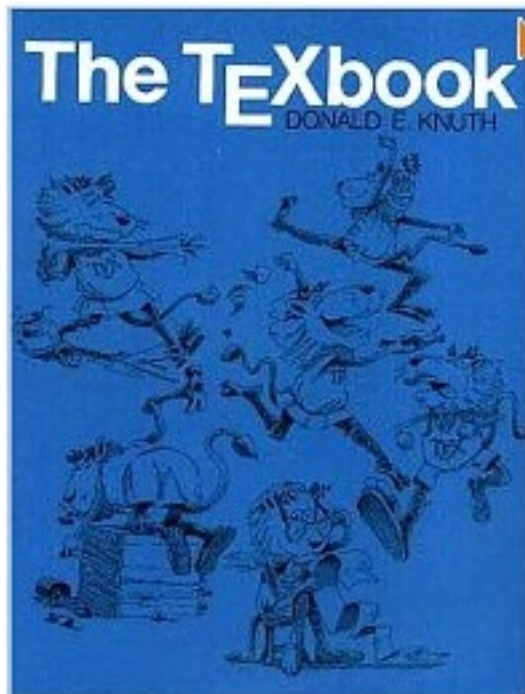
A structured set of macros that use the  $\TeX$  engine to produce documents (articles, books, reports, etc).<sup>1</sup>

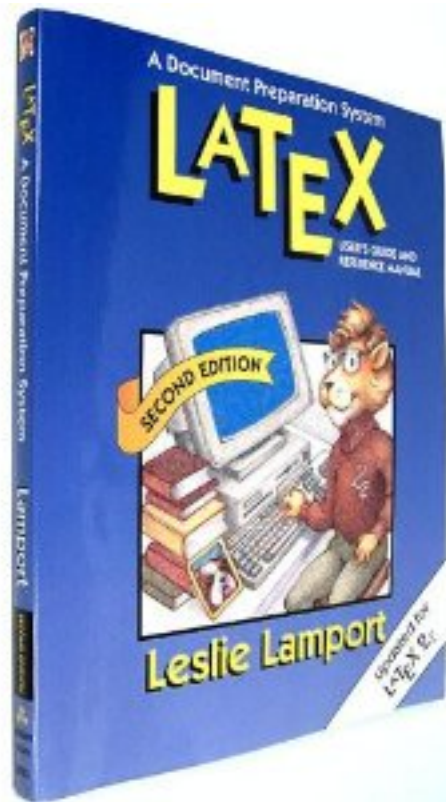
$\LaTeX$  created by Leslie Lamport.

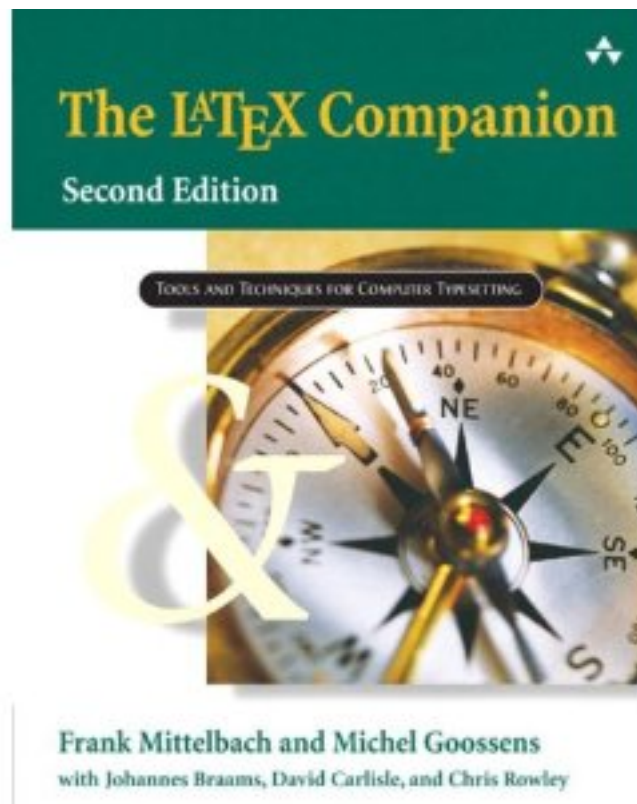
$\TeX$  created by Donald Knuth, Stanford. He is the author of TAOCP (The Art of Computer Programming) — the primary reason that he created  $\TeX$ . He also developed the concept of *literate programming* while writing  $\TeX$  and METAFONT.

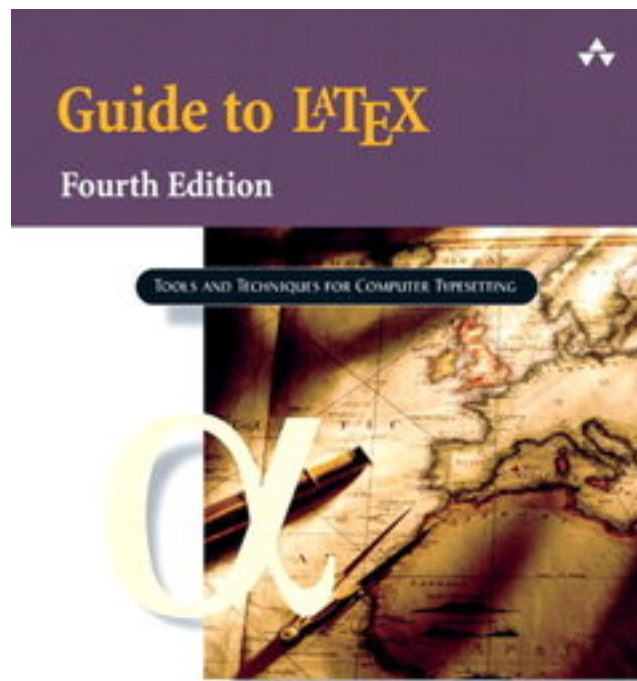
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<sup>1</sup><http://texblog.wordpress.com/2007/07/09/documentclassbook-report-article-or-letter/>









Helmut Kopka and Patrick W. Daly



## 1 Document Layout

```
% file.tex
```

```
\documentclass[12pt]{article}
```

```
\begin{document}
```

```
    Contents of your document.
```

```
\end{document}
```

*article* is probably the most common document style. Other styles: *report*, *letter*, *book*, and *slides*.

## 2 Commands

- Commands in  $\TeX$  and  $\LaTeX$  start with a  $\backslash$ .
- *Comments* can be placed in document using a  $\%$ . It behaves in a manner similar to  $//$  (inline comment in C++).
- Curly braces,  $\{$  and  $\}$ , are used to group or delimit text.

### 3 Section Commands

There are commands for automatically generating sections. This is done by placing the section title within the curly braces following one of the section commands.

```
\section{Main Section}
```

```
\subsection{A Subsection}
```

```
\subsubsection{A Subsubsection}
```

Sections are automatically numbered (renumbered) during the typesetting process.

### 3.1 Emphasizing Text

This text is *emphasized*.

This text is `\emph{emphasized}`.

This text is **bold**.

This text is `\textbf{bold}`.

This text is typewriter-like.

This text is `\texttt{typewriter}`-like.

## 3.2 Lists

Lists are created very easily using  $\LaTeX$ . The two most common lists are bulleted and enumerated.

### 3.2.1 Bulleted List

- Variables
  - naming conventions
  - types
    - \* char
    - \* integer
    - \* real numbers

The preceding list was created using:

```
\begin{itemize}
  \item Variables
  \begin{itemize}
    \item naming conventions
    \item types
    \begin{itemize}
      \item char
      \item integer
      \item real numbers
    \end{itemize}
  \end{itemize}
\end{itemize}
```

### 3.2.2 Enumerated List

1. character
2. integer
3. real numbers

The preceding list was created using:

```
\begin{enumerate}  
  \item character  
  \item integer  
  \item real numbers  
\end{enumerate}
```

## 4 Mathematics

One of the reasons many people use  $\text{\LaTeX}$  is the output of mathematical equations.

$$\int_0^{\frac{\pi}{4}} \cos x \, dx$$

from

```
\[  
\int_{0}^{\frac{\pi}{4}} \cos x \, dx  
\]
```

## 5 $\LaTeX$ on the CS Machine

To process your  $\LaTeX$  file:

```
latex file.tex
```

If your file is processed successfully, it will generate a number of files:

```
file.aux  auxiliary file  
file.dvi  DVI file  
file.log  a log
```



## 5.1 Viewing

It is a good idea to view your  $\TeX$  output before printing it. This is done using `xdvi`.

```
xdvi file.dvi
```

Note: It may be necessary to set your display variable for `xdvi` to work properly.

## 5.2 Printing

To print your output, you must convert from a DVI file to POSTSCRIPT. The utility for doing this is `dvips`

```
dvips file.dvi
```

The output of `dvips` is a file named `file.ps`. This file may be sent directly to the printer.

Convert POSTSCRIPT to PDF:

```
ps2pdf file.ps file.pdf
```

Painful process!

Better choices:

1. Install a  $\TeX$  distribution on your own machine.
2. Use a web/*cloud*-based solution.

## 6 References

### Online Tools

Overleaf (was write $\LaTeX$ )

<https://www.overleaf.com>

SHARE $\LaTeX$  (now part of Overleaf)

<https://www.sharelatex.com/>

Google  $\LaTeX$  Web Application (includes editor, compilers and PDF generation) — deprecated

<https://code.google.com/p/latex-lab/>

**Web References**

$\LaTeX$  — Wikibooks

<http://en.wikibooks.org/wiki/LaTeX>

$\TeX$  Showcase

<http://www.tug.org/texshowcase/>

The Beauty of  $\LaTeX$

<http://nitens.org/taraborelli/latex>

Top four  $\LaTeX$  mistakes

<http://www.johndcook.com/blog/2010/02/15/top-latex-mistakes/>

$\TeX$  –  $\LaTeX$  – StackExchange

<http://tex.stackexchange.com/>

Getting Started with Writing Mathematics in  $\LaTeX$

<http://jeromyanglim.blogspot.com/2010/10/getting-started-with-writing.html>

Short Math Guide for  $\LaTeX$

<http://www.ams.org/publications/authors/tex/amslatex>

Using listings to include code in  $\LaTeX$

<http://www.tjansson.dk/2008/11/using-lstlisting-to-include-code-in-latex/>

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

Or  $\LaTeX 2_{\epsilon}$  in 157 minutes

<http://www.ctan.org/tex-archive/info/lshort/english/lshort.pdf>

**Books**

Donald E. Knuth. *The  $\TeX$ book, Volume A of Computers and Typesetting*, Addison-Wesley, Reading, Massachusetts, second edition, 1984.

Leslie Lamport.  *$\LaTeX$ : A Document Preparation System*. Addison-Wesley, Reading, Massachusetts, second edition, 1994.

Frank Mittelbach, Michel Goossens, Johannes Braams, David Carlisle, Chris Rowley. *The  $\LaTeX$  Companion*. Addison-Wesley, Reading, Massachusetts, second edition, 2004.

Helmut Kopka and Patrick W. Daly. *Guide to  $\LaTeX$* . Addison-Wesley, Reading, Massachusetts, fourth edition, 2003.