

Latex Tutorial

Aleix Marin

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1 Source

Tutorial in <https://www.latex-tutorial.com/tutorials/first-document/>

2 Basics

2.1 Compilation

Compile using:

```
pdflatex FILENAME
```

2.2 Classes

LaTeX uses document classes, to influence the overall layout of your document. For instance, there's one class to layout articles, one class to layout books (called book) and many more. Use a class by writing:

```
\documentclass{CLASSNAME}
```

2.3 Environments

This second example differs slightly from the first one, since this command involves a `\begin` and `\end` statement. In fact this is not a command, but defines an environment. An environment is simply an area of your document where certain typesetting rules apply. It is possible (and usually necessary) to have multiple environments in a document, but it is imperative the document environment is the topmost environment.

```
\begin{document}
```

```
Hello World!
```

```
\end{document}
```

2.4 Preamble

Obviously the statements `\title`, `\date` and `\author` are not within the document environment, so they will not directly show up in our document. The area before our main document is called preamble.

```
\documentclass{article}
```

```
\title{My first document}
```

`\date{2013-09-01}`

`\author{John Doe}`

2.5 Special characters

Special characters in LaTeX are: `& % $ # - { } ~ ^ \`

The seven first can be escaped with a backslash, the other ones can be written using macros: `\textasciitilde \textasciicircum \textbackslash`

2.6 Page numbers

We can remove page number, by telling LaTeX to hide the page number for our first page. This can be done by adding the `\pagenumbering{gobble}` command and then changing it back to `\pagenumbering{arabic}` on the next page numbers.

gobble - no numbers

arabic - arabic numbers

roman - roman numbers

2.7 Sections

You can create different sections to structure the documents with the following commands `\section{}` `\subsection{}` `\subsubsection{}`
`\paragraph{}` `\subparagraph{}`

3 Packages

LaTeX offers a lot of functions by default, but in some situations it can become in handy to use so called packages. To import a package in LaTeX, you simply add the `\usepackage PACKAGENAME` directive to the preamble of your document. Packages add new functions to LaTeX. All packages must be included in the preamble. Packages add features such as support for pictures, links and bibliography

To typeset math, LaTeX offers (among others) an environment called equation. Everything inside this environment will be printed in math mode, a special typesetting environment for math.

`\begin{equation}`

$$f(x) = x^2$$

`\end{equation}`

To avoid using equation numbers we can use the package `amsmath` and the environment `equation*`

4 Math

4.1 Inline math

To make use of the inline math feature, simply write your text and if you need to typeset a single math symbol or formula, surround it with dollar signs.

4.2 Equation and align environment

To write equations and aligning them with a certain criteria use the `align` environment

`\begin{align*}`

$$1 + 2 \&= 3$$

$$1 \&= 3 - 2$$

`\end{align*}`

The `align` environment will align equations using the ampersand character. Single equations must be separated using a linebreak `\\`.

4.3 Math commands

Fractions `\frac{NUMERADOR}{DENOMINADOR}`

$$\frac{NUMERADOR}{DENOMINADOR}$$

Integrals `\int^COTASUPERIOR_COTAINFERIOR`

$$\int_B^A$$

Square roots `\sqrt{RADICAND}`

$$\sqrt{RADICAND}$$

Matrices

`\left[`

`\begin{matrix}`

`1 & 0 \\`

`0 & 1`

`\end{matrix}`

`\right]`

$$\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$