Learn LaTeX in Y Minutes!

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Contents

Abstract

LaTeX documentation written as LaTeX! How novel and totally not my idea!

1 Introduction

Hello, my name is Colton and together we're going to explore LaTeX!

2 Another section

This is the text for another section. I think it needs a subsection.

2.1 This is a subsection

I think we need another one.

2.1.1 Pythagoras

Much better now.

This is an unnumbered section

However not all sections have to be numbered!

3 Some Text notes

LaTeX is generally pretty good about placing text where it should go. If a line
needs
to
break
you add \\ to the source code.

Separate paragraphs by empty lines.

You need to add a tilde after abbreviations (if not followed by a comma) for a non-breaking space, because otherwise the spacing after the dot is too large: E.g., i.e., etc. are are such abbreviations.

4 Lists

Lists are one of the easiest things to create in LaTeX! I need to go shopping tomorrow, so let's make a grocery list.

1. Salad.
2. 27 watermelon.
3. A single jackrabbit.

how many? Medium sized squirt guns.

Not a list item, but still part of the enumerate.

5 Math

One of the primary uses for LaTeX is to produce academic articles or technical papers. Usually in the realm of math and science. As such, we need to be able to add special symbols to our paper!

Math has many symbols, far beyond what you can find on a keyboard; Set and relation symbols, arrows, operators, and Greek letters to name a few.

Sets and relations play a vital role in many mathematical research papers. Here's how you state all x that belong to X, $\forall x \in X$.

$$a^2 + b^2 = c^2$$

My favorite Greek letter is ξ. I also like β, γ and σ. I haven't found a Greek letter yet that LaTeX doesn't know about!

Operators are essential parts of a mathematical document: trigonometric functions (sin, cos, tan), logarithms and exponentials (log, exp), limits (lim), etc. have pre-defined LaTeX commands. Let's write an equation to see how it's done: $\cos(2\theta) = \cos^2(\theta) - \sin^2(\theta)$

Fractions (Numerator-denominators) can be written in these forms:

$$^{10}/_{7}$$

$$\frac{n!}{k!(n-k)!}$$

We can also insert equations in an "equation environment".

$$c^2 = a^2 + b^2. \tag{1}$$

We can then reference our new equation! Eqn. 1 is also known as the Pythagoras Theorem which is also the subject of Sec. 2.1.1. A lot of things can be labeled: figures, equations, sections, etc.

Summations and Integrals are written with sum and int commands:

$$\sum_{i=0}^{5} f_i \tag{2}$$

$$\int_0^\infty \mathrm{e}^{-x}\mathrm{d}x \tag{3}$$

6 Figures

Let's insert a figure. Figure placement can get a little tricky. Basic options are [t] for top, [b] for bottom, [h] for here (approximately). I definitely have to lookup the placement options each time.

Figure 1: Right triangle with sides a, b, c

6.1 Table

We can also insert Tables in the same way as figures.

Table 1: Caption for the Table.

Number	First Name	Last Name
1	Biggus	Dickus
2	Monty	Python

7 Getting LaTeX to not compile something (i.e. Source Code)

Let's say we want to include some code into our LaTeX document, we would then need LaTeX to not try and interpret that text and instead just print it

to the document. We do this with a verbatim environment.

```
print("Hello World!")
a%b; % look! We can use % signs in verbatim.
random = 4; #decided by fair random dice roll, https://www.xkcd.com/221/
See https://www.explainxkcd.com/wiki/index.php/221:_Random_Number
```

8 Compiling

By now you're probably wondering how to compile this fabulous document and look at the glorious glory that is a LaTeX pdf. (Yes, this document actually does compile).

Getting to the final document using LaTeX consists of the following steps:

1. Write the document in plain text (the "source code").
2. Compile source code to produce a pdf. The compilation step looks like this (in Linux):

```
> pdflatex learn-latex.tex
```

A number of LaTeX editors combine both Step 1 and Step 2 in the same piece of software. So, you get to see Step 1, but not Step 2 completely. Step 2 is still happening behind the scenes[1].

You write all your formatting information in plain text in Step 1. The compilation part in Step 2 takes care of producing the document in the format you defined in Step 1.

9 Hyperlinks

We can also insert hyperlinks in our document. To do so we need to include the package hyperref into preamble with the command:

```
\usepackage{hyperref}
```

[1] In cases, where you use references (like Eqn. 1), you may need to run Step 2 multiple times, to generate an intermediary *.aux file.

There exists two main types of links: visible URL
`https://learnxinyminutes.com/docs/latex/`, or shadowed by text

This package also produces list of thumbnails in the output PDF document and active links in the table of contents.

10 Writing in ASCII or other encodings

By default, historically LaTeX accepts inputs which are pure ASCII (128), but not extended ASCII, meaning without accents (à, è etc.) and non-Latin symbols.

It is easy to insert accents and basic Latin symbols, with backslash shortcuts Like c, é, À, æand œetc.

To write directly in UTF-8, when compiling with pdflatex, use

```
\usepackage[utf8]{inputenc}
```

The selected font has to support the glyphs used for your document, you have to add

```
\usepackage[T1]{fontenc}
```

Since LuaTeX and XeLaTeX were designed with built-in support for UTF-8, making life easier for writing in non-Latin alphabets.

11 End

That's all for now!

References

[1] The amazing LaTeX wikibook: *https://en.wikibooks.org/wiki/LaTeX*

[2] An actual tutorial: *http://www.latex-tutorial.com*