

Learning L^AT_EX

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Abstract—While using WYSIWYG (“what you see is what you get”) text editor, like Microsoft Word or Google Docs, have you ever tried to format something to what you want, and getting frustrated because the result is not what you want, while the editor also messing up the rest of your works? Me too.

But there are better alternatives to write documents professionally. One of the alternatives is L^AT_EX. With this paper I would like to learn and use L^AT_EX to write this paper, and share the experiences in learning to use L^AT_EX.

I. INTRODUCTION

LaTeX (stylized as L^AT_EX), is a document preparation system as an improvement on TeX system created by Donald Knuth. When writing using LaTeX, the writer uses plain text instead of formatted text found in WYSIWYG text editor like Microsoft Word. The writer uses markup tagging to define the structure of a document, to stylize text in a document. The writer usually writes the document in a .tex file, and then use program to compile the document into output file (such as PDF or DVI).

Documents produced using LaTeX usually are of higher quality than documents produced using WYSIWYG editor. This is because when using LaTeX, the writer only focuses on the contents without caring about the formatting like margins, font and fontsize, styling, etc. Those are handled by LaTeX, so the writer could get high-quality and consistent document.

LaTeX is widely used in academia for publication of scientific documents in many fields.

II. LEARNING L^AT_EX

A. Installation

Steps to install LaTeX depends on your operating system.

If you use Windows, you could use MiKTeX (<https://miktex.org>), which is a Windows distribution of LaTeX that includes additional packages and a TeX editor called TeXworks.

On my system which uses Linux, specifically Arch Linux, where usually TeX Live is used. To install TeX Live in Arch Linux, you just run `pacman -S texlive-most` which already includes the LaTeX binary and additional packages.

You could write .tex document in any plain text editor, even notepad. But for ease, I use Visual Studio Code (<https://code.visualstudio.com/>) with LaTeX Workshop extension installed. The extension adds features that helps you writing .tex document, like auto-completion, auto-compile, and live document preview.

B. Your First Document

It's time to create your first latex document. Create a new file named `first.tex`, and fill it with:

Listing 1. `first.tex`

```
\documentclass{article}
\begin{document}
    This is my first latex document
\end{document}
```

Then open terminal in your current folder and run `pdflatex first.tex` to compile the document into a PDF file named `first.pdf`. Open the PDF file and you should file the text ‘This is my first latex document’ in it, and congratulations, you have created your first latex document.

C. Document Class

You should see that the document in previous subsection already have a lot of things set up for you, like margin, font and font size, spacing, etc, and you only have to write the text you wanted. That part is set up with `\documentclass{article}` part. That command lets you specify to the compiler that you want to create an article. There are many built-in document classes already specified for various uses. Class ‘article’ is for articles in scientific journals, presentations, etc, ‘book’ is for real book, ‘letter’ is for creating letters, ‘beamer’ for writing presentations, and many other for more specific uses.

D. Document environment

The next part is `\begin{document} ... \end{document}`. That pair of command specify an ‘environment’ in which the item inside it have some rules applied to it. In the example we used ‘document’ environment, which tells the compiler that it is our document and then everything inside the environment will be written in output document. This also means, any normal text outside of the document environment will not be printed. In fact, we will get an error when compiling if we have normal text outside of document environment.

There are many other environment for other specific uses, like ‘description’, ‘list’, ‘enumerate’ and ‘itemize’ to create various numbered and bulleted lists, ‘figure’ and ‘table’ to create figures and tables, ‘math’ and ‘displaymath’ to type math, ‘array’ to create array, ‘equation’ to type equations,

and many other more. We also could create our own custom environment or use environments created by other people by using packages.