Week 4 - LaTeX Configuration & Usage

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Week 4's seminar is partly based on Week00 of ToolsSeminar held in PKU.

1 Installation and configuration

For TeX distribution, TeX Live is an official comprehensive TeX distribution system, which provides system-specific supports.

For Windows and Linux, reading through installing TeX Live over the Internet is recommended. A (non-necessary) introduction to TeX Live on Windows is provided here. If you are going to install TeX Live on Linux, please read this page first, which gives detailed guidance. Installing on your home directory (`/home/someone/texlive/2017` to be exact) instead of default `/usr/local/texlive/2017` is recommended in case of authority issues.

For macOS, please install MacTeX, which is specially adapted to macOS and includes TeX Live.

Installation information can also be found in *LaTeX 入门*.

Note that there are also alternatives for installation, like CTeX, which a suite specialized to Chinese and can be downloaded here. However, CTeX is somehow out-of-date now and has no advantages due to the development of XeTeX and LuaTeX. PdfTex, XeTeX, and LuaTeX are the most widely used LaTeX engines, which have all been integrated into TeX Live. The differences between them can be found in *The TeX family tree: LaTeX, pdfTeX, XeTeX, LuaTeX and ConTeXt*.

VS Code has a LaTeX extension called LaTeX Workshop, which is extremely powerful with lots of functions like different engines support, side view of PDF file, and snippet panel. Sublime Text also has LaTeX support by LaTeXTools package.

If you do not want to install LaTeX distributions on your computer, you can use online LaTeX editors like Overleaf and ShareLaTeX[1], which are very useful when you write papers or experimental reports with others. The main drawback is that their servers are mostly abroad, which leads to frequent network breakdown. Moreover, Overleaf only supports two people collaboration if you use the free version.

[1] ShareLaTeX has been merged with Overleaf and becomes Overleaf v2. Our server installed the open-sourced ShareLaTeX, and you can register from the webpage.

2 Introductions and Tutorials

The book *LaTeX 入门* is a useful book for anyone using LaTeX. Not only is the book a complete tutorial, but it also works as an index to frequently used packages. Only chapter 1 is suggested for the first reading, while other chapters, which are filled with details, may be used as a manual.

The Wikibook *LaTeX* is featured on Wikibooks, providing a brief introduction to LaTeX. Overleaf's *Learn LaTeXin 30 Minutes* also gives basic usage of LaTeX, and its main page can be used for manual and guidance. 一份其实很短的 LaTeX 入门文档 is a very easy-to-understand tutorial of LaTeX in Chinese.

Note that TeX Live itself includes a documentation system, which can be accessed by the command `texdoc <name>`.

The famous *The not so Short Introduction to LaTeX* is an introduction of moderate length. There is also a Chinese translation. It can be directly accessed by `texdoc lshort` and `texdoc lshort-chinese`.

By utilizing `texdoc`, one may access the document of packages and document classes. For example, executing `texdoc ctex` on a terminal, the documentation of the package `ctex` shows up.

Some other important reference can be accessed by `texdoc`. *The Comprehensive LaTeX Symbol List* can be accessed by `texdoc comprehensive`, which lists many symbols. *Summary of Mathmatical Symbols available in LaTeX* can be accessed by `texdoc symbols`, which is a compact summary of LaTeX symbols. Further information of TeX Live can be found by `texdoc texlive`.

For websites, TeX StackExchange is a community for TeX and LaTeX users, which is very helpful for hard TeX and LaTeX questions and practical tricks. Zhihu also has lots of topics on LaTeX, and the author of *LaTeX 入门* is active on it.

3 Packages and Templates

TeXLive has pre-installed most of the packages you need to use, so you only need to include them by `\usepackage{...}` in the preamble part. For templates, you can find a lot on . Or you can download the LaTeX templates designed by me for daily note, slide, and class reports usage. You can also find these templates in `TeXTemplate` of the seminar folder.

Once you download others' templates (`.cls` or `.sty`), you can put them in the current folder with your document and directly include them, or you can put them in the `texmf` folder to make them work globally (refer to this page).

Beamer is the document class for making slides, you can refer to Overleaf's tutorial for more details. Default themes can be found in Beamer theme gallery and Beamer theme matrix. For

beamer templates, you can find here.

The commonly used packages are listed in the slide. For most of the packages, you can find their manuals and documentation on CTan. If you don't know how to format some paragraphs with specific styles, use Google to search for that.

4 Other Useful Things

If you carefully configure LaTeX environment and define macros, you can definitely use LaTeX to take notes at school. As an example, you can see the math notes taken by me, which are all in LaTeX format. About how to take LaTeX notes quickly, you can see this blog, the author of which use LaTeX and Vim to take more than 1700 pages of notes on his math courses.

Apart from the snippet panel provided by VS Code's extension, another quick page searching math functions can be found here. Once you use them frequently, you will easily remember their abbreviations and write LaTeX documents much faster.

Some Optical Character Recognition (OCR) techniques are used to free programmers from tedious LaTeX formula typing, including Mathpix and Detexify. Also, Mathematica supports direct translation from Wolfram formulas to LaTeX commands.

Tables Generator and Excel2LaTeX (online, macro) are used for generating tables from Excels to LaTeX quickly. But these tools both cannot handle complex tables with lots of merged units.

Markdown inherently supports LaTeX if the website has included the script of KaTeX or MathJax. You can write LaTeX symbols in Markdown as if in LaTeX editors. Inline formulas are enclosed by `$...$`, while `$$...$$` is used for displayed ones.

Last but not least, when you are writing LaTeX in Chinese or English, there are lots of specifications you need to pay attention to, which can be referred by this article.

5 Assignment