PHYS 395 Research Methods - Lecture 6

Typesetting technical documents with LaTeX

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Basic facts about LaTeX

- LaTeX is a document typesetting system
- The original TeX was developed by Donald Knuth back in the 1970s-1980s
- LaTeX was developed by Leslie Lamport in 1980s
- Current version is LaTeX 2_ε
- Based on a high-level descriptive markup language (similar concept as in HTML)
- Writer provides the content and defines structure. LaTeX takes care of actual rendering.
- Can handle very sophisticated mathematical expressions with ease
- Has a large number of packages that provide extensions
- Has a large community of active users

Installation

Open the terminal and type the following command:

Linux (Debian, Ubuntu, Mint)

sudo apt-get install texlive-full

Linux (Fedora)

yum install texlive-scheme-full

Linux (openSUSE)

zypper install texlive-scheme-full

Note: these are large and comprehensive distribution pacckages (a few GB) and may take a while to download and install. If available space is limited, smaller schemes (e.g. texlive-scheme-basic) can be used.

Installation

Windows

MiKTeX is the most popular LaTeX distribution for Microsoft Windows. The core part of the distribution can be downloaded (∼200 MB) and installed - just execute the installer and follow the straightforward installation instructions. Additional packages will be downloaded and installed on the fly as needed.
Depending on your LaTeX use model you may also need to download and install the Ghostscript software.

Installation

macOS

MacTeX is the most popular LaTeX distribution for macOS. After downloading move MacTeX.pkg to the desktop and double click it to install. MacTeX installs TeX Live and Ghostscipt.

Online LaTeXsystems

If you cannot install software on your computer or prefer to work in the cloud there are online LaTeX editors:

- Overleaf
- ShareLaTeX
- Papeeria

Editors

LaTeX source files are plain text files and can be edited with any text editor of your choice (e.g. nano or emacs in Linux or Notepad++ or Sublime Text in Windows)

There are many dedicated LaTeX editors that are specifically designed for convenient editing of tex-files. Examples are TeXmaker, TeXstudio, TeXworks, LyX (all are available for Linux, Windows, and macOS).

This lecturer's personal preference is a combination of **Kile** and **Okular** for editing and viewing respectively. These are available for both Linux and Windows. In Windows both these programs can be installed via Chocolatey package manager, which must be installed first.

References

There is aboundance of free online books, manuals, guides, and tutorials on LaTeX. Here are a few good resources:

- T. Oetiker *et al.* The Not So Short Introduction to LaTeX 2_ε
- LaTeX Wikibook
- George Grätzer *More* Math Into LaTeX (first section)
- N. Talbot LaTeX for Complete Novices
- LaTeX Tutorial - A Primer
- H. Greenberg A Simplified Introduction to LaTeX
- A. Roberts Getting to Grips with LaTeX
- P. Flynn Formatting Information - An Introduction to typesetting with LaTeX
- The TeXFrequently Asked Question List
- S. Pakin The Comprehensive LaTeX Symbol List
- Detexify - an neat app that converts a handritten symbol into a LaTeX command