Written & Oral Presentation: Computer Tools

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LaTeX

What is LaTeX?

Some content taken from Wikipedia.

- TeX is a **typesetting** system: “allow anybody to produce high-quality books using minimal effort, and to provide a system that would give exactly the same results on all computers, at any point in time.” Knuth had the idea to use mathematics to typeset mathematics!

- LaTeX is a **markup language** for technical writing, with special emphasis on math-heavy writing, built on top of Tex: “TeX handles the layout side, while LaTeX handles the content side for document processing.”

- What’s a markup language and how does it differ from WYSIWYG (“what you see is what you get”) word processors like Microsoft Word? Compare to html, and contrast interpreted versus compiled languages.

- Using LaTeX: **write-format-preview** (compare to code-compile-execute).
Why LaTeX?

- Advantages of LaTeX: (interactive)
  - Abstract: Separate presentation from content: **focus on the content** and not visual appearance.
  - Portable: LaTeX files are **simple text files** so perfectly portable and easy to open/edit/share/diff.
  - Flexible: Change appearance/format by changing one word, e.g., the **document class**.
  - Extensible: **macros** allow one to add new functionality.

- Any advantages of WYSIWYG? (interactive)
  - **LyX** is a combination of the two: Focus on content but also see it on your screen! (Lyx Demo).
    LyX files are still text files, in yet another markup language.
  - **Overleaf/sharelatex** (soon to merge!) is an alternative (Overleaf demo)
    Think of google docs versus Word.
How to LaTex

- Just like code, LaTex files need to be formatted to be organized, clear, readable by others:
  Yes, there is such a thing as bad LaTex just like there is bad code!
- If not using LyX/Overleaf, find a good LaTex editor (same as coding!).
  xemacs for “experts”, or, follow links from course homepage to atom and sublime with LaTex plugins.
- What does a good editor provide? (interactive)?
  - Syntax highlighting
  - Indentation tools (automatic, select and indent, etc.)
  - Delimiter matching
  - Sophisticated find/replace with regular expression matching
  - Shortcuts to compile/preview
Producing PDF output from LaTeX

- Install a **LaTeX engine** ASAP (see links on homepage)
  - For Windows/linux use TexLive (usually pre-installed on linux)
  - For OS X use MACTex and consider installing homebrew
- Use `pdflatex` to compile/typeset (why?) and not `latex`
- Beware of **font issues** (PDF not actually as portable as dvi).
  Recommend inserting `\usepackage{ae,aecompl}` in latex preamble
  so PostScript-\>PDF looks nice also.
- Learn how to use **BibTex+Mendeley** (demo, google scholar).
- For presentations in LaTeX, use the **beamer class** (demo).
- How about **PowerPoint** or **keynote**? (interactive)
  Use **LatexIt** to format equations in latex as images.
- In LyX/Overleaf use **templates** to get started. Read **documentation**!
- What is **github** and **git/svn** all about?