Introduction to Making Documents with LaTeX

Jupiter Subgroup

November 3, 2015

Introduction

What LaTeX is

- A cross-platform typesetting environment
- Best way to produce aesthetically pleasing, logically coherent documents, especially when dealing with mathematical equations
- Free and customizable

What LaTeX isn't

- WYSIWYG (What You See is What You Get)
  - MS Word, LibreOffice
- Bloated memory hog

How it Works

1. The TEX typesetting engine reads a plain text file, usually written using LATEX (a set of TEX macros)

```
\documentclass{article}
\begin{document}
Hello world
\end{document}
```

How it Works

1. The TEX typesetting engine reads a plain text file, usually written using LATEX (a set of TEX macros)
2. Produces a readable, formatted document image (.dvi)

```
craig@sonicboom ~/Documents/presentations/latex_intro $ latex hello.tex
This is pdfTeX, Version 3.1415926-2.4-1.40.13 (TeX Live 2012/Debian)
 restricted \write18 enabled.
entering extended mode
(./hello.tex
LaTeX2e <2011/06/27>
Babel <v3.8m> and hyphenation patterns for english, dumylang, nohyphenation, lo
aded.
(/usr/share/texlive/texmf-dist/tex/latex/base/article.cls
Document Class: article 2007/10/19 v1.4h Standard LaTeX document class
(/usr/share/texlive/texmf-dist/tex/latex/base/size10.clo)) (./hello.aux)
[1] (./hello.aux) )
Output written on hello.dvi (1 page, 232 bytes).
Transcript written on hello.log.
craig@sonicboom ~/Documents/presentations/latex_intro $ ls
hello.aux  hello.dvi  hello.log  hello.pdf  hello.tex  jupiter.pdf  jupiter.tex
```

How it Works

1. The TEX typesetting engine reads a plain text file, usually written using LATEX (a set of TEX macros)
2. Produces a readable, formatted document image (.dvi)
3. Convert to pdf (or straight to pdf using pdflatex)

Hello world

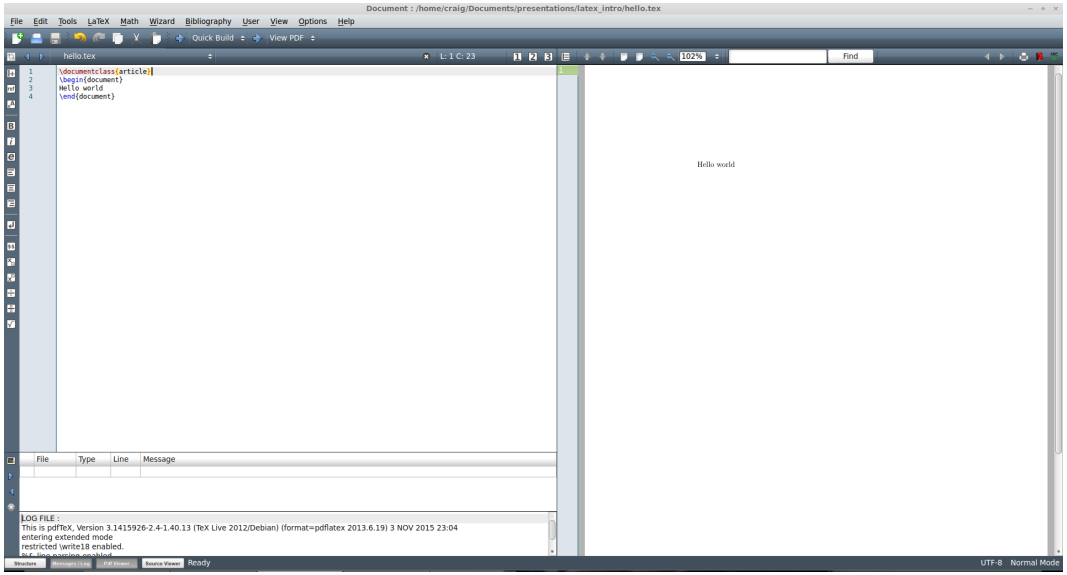
How it Works

1. The TEX typesetting engine reads a plain text file, usually written using LATEX (a set of TEX macros)
2. Produces a readable, formatted document image (.dvi)
3. Convert to pdf (or straight to pdf using pdflatex)

Separates design from content $\rightarrow$ enhanced logical structure

What you Need

1. Text editor or IDE
   - Texmaker, Vim/Emacs/gedit with plugins, Notepad++, Sublime
   - Look for built-in output viewer, code completion



What you Need

1. Text editor or IDE
   - Texmaker, Vim/Emacs/gedit with plugins, Notepad++, Sublime
   - Look for built-in output viewer, code completion
2. Sane LaTeX installation
   - Windows - MikTeX
   - Mac - MacTeX
   - Linux - texlive

Special Characters, commands, and comments

Input file structure and layout

Packages and external files

http://www.howtotex.com/packages/9-essential-latex-packages-everyone-should-use/

Typesetting

paragraphs, line and page breaks, hyphenation, sections, chapters, alignment, itemize, enumerate, font sizes (table 6.3, 6.4)

Some useful commands and characters

emph, bold, under, degree, tilde, quotation, ö, A^n, α_i

Some useful environments

verbatim, tabular

Mathematical Formulae

AMS math, inline, single line display (numbered/unnumbered), multiple line display

Some useful commands

Greek, super and sub script, sum (substack), integral, product operators, dots, frac, predefined functions, partial

Arrays and matrices

uses array environment for arrays, amsmath uses matrix environments

Graphics

use graphicx package (options), no real standard find what works, figure env. center, caption, includegraphics, remove extensions to avoid conflict b/w latex pdflatex

Bibliographies

Use BibTeX, keep main bib file w/ consistent naming convention, bibliography command at end, bibliographystyle at beginning

Cross referencing and citation

Cleveref package, cite, ref, naming labels

Custom commands

newcommand-name, num of args, definition, hashtag w/ number for arguments, bra, ket, braket, 2x2 matrix
newenvironment, renewenvironment to override existing commands

Chemistry specific packages

https://www.ctan.org/topic/chemistry, chemfig-rings, rxn, achemso

Putting it all together

Keep a universal header, bib, and main document template. Copy and edit as needed. Example file with header, equations, cross reference, citations, and sections

Resources

lshort, ctan, http://www.xm1math.net/texmaker/