Quick Introduction to TEX and \LaTeX

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What is \LaTeX

- \LaTeX is a document markup language
- Pronounced Lay-Tech or Lah-Tech (not latex)
- Typeset using \TeX (written by Knuth)
- Best for typesetting math and documents
- Markup is plain text; can be piped around
A History of \LaTeX

- \TeX\ written in 1970 by Donald Knuth
- Designed for making *pretty* documents
- For mathematics and engineering people
- \LaTeX\ is a set of macros for \TeX
- Written in 1890’s by Leslie Lamport
Things to do with \LaTeX

- Type equations

  $\hbar \frac{\partial}{\partial t} \Psi(\vec{r},t) = \frac{-\hbar^2}{2m} \nabla^2 \Psi(\vec{r},t) + U(\vec{r},t)\Psi(\vec{r},t)$

- Write reports (examples)

- Make presentations (maybe)
Don’t do with \LaTeX

- Create posters/flyers (design work)
- Make diagrams/drawings (except with PSTricks)
- Both are possible; may not be good idea
Getting Started

- Start LaTeX document with a `\documentclass`
- Visible markup goes inside document environment
- Stuff before document is the document “header”
- Header used for package imports and macro definitions
- Example document:

  ```latex
  \documentclass{article}
  \usepackage[version=3]{mhchem}
  \def\hydronium{\ce{H3O+}}
  \begin{document}
  Hello World! \ \\
  neat: \hydronium
  \end{document}
  ```
Typesetting

- Lot like compiling a program
- Run file through \texttt{latex}
- Produces device-independent (DVI) file
- Use \texttt{dvips} or \texttt{dvipdf}
- Or just use \texttt{pdf\LaTeX}
Writing Math

- Inline mathematics: \( \frac{1}{2} \int_0^\infty \psi^2(x)dx \)
- Enclose in $ signs; code for line above:
  \[ \frac{1}{2} \int_0^\infty \psi^2(x)dx \]
- displaystyle (block) mathematics mode
- Enclose in escaped brackets; typeset differently:
  \[
  \frac{1}{2} \int_0^\infty \psi^2(x)dx
  \]
- Another example: Schrödinger Equation from before