Hello LaTeX

An Introduction to the Typesetting Tool

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- introduce myself
- name
- phd student
- research in fusion
- like open source

Workshop Series

Workshop 1: An introduction to LaTeX
Workshop 2: More Powerful LaTeX Features
Workshop 3: Modularity and LaTeX in Different Environments
Workshop 4: Reproducibility and Experimental LaTeX Usage

- Introduce workshop series
- broken up into 4
- will explore increasingly sophisticated use
- describe sessions

Workshop Layout

1. Introduction to and Motivation for Learning LaTeX
2. Pizza Break
3. Live coding walkthrough
4. Let's Go!

- describe this session

Motivation

Setting the Stage

- Bad documents cost the reader energy
- Good documents cost the writer energy
- Eliminate (or mitigate) the tradeoff with LaTeX

- bad doc
  - inconsistent notation
  - inconsistent font
  - out of date references to material
  - inaccurate values
  - inconsistent units
- good doc cost examples
- revisiting your work carries double cost
- assumes word processors are the only choice

- A typesetting tool - Not WYSIWYG
- Decouples content from formatting
- The de facto standard in research and academia
- One of the most sophisticated typesetting tools available

- A different approach to word processors
- latex takes that and compiles it
- originally developed in the 80's repeatedly shown to be the most powerful

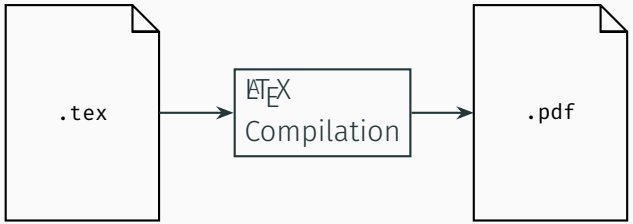
Notable Features of LaTeX

- Consistent high quality documents
- Reduce your cognitive load - when reading and writing
- Automation
- Modularize your work
- Open source
- Extensible

- programmatic, enforces consistency
- you define what you want, and how you want it
- latex takes that and compiles it
- not constrained to metaphors of real world documents
- use the computer to take the burden of minutiae
- highly modular, reuse your work
- open source, extensible
- explore examples

Basics of Preparing a LaTeX Document

The LaTeX Procedure



The Environment - Overleaf

- Cloud based - consistent build environments
- Collaborative editing capabilities
- Good place to start

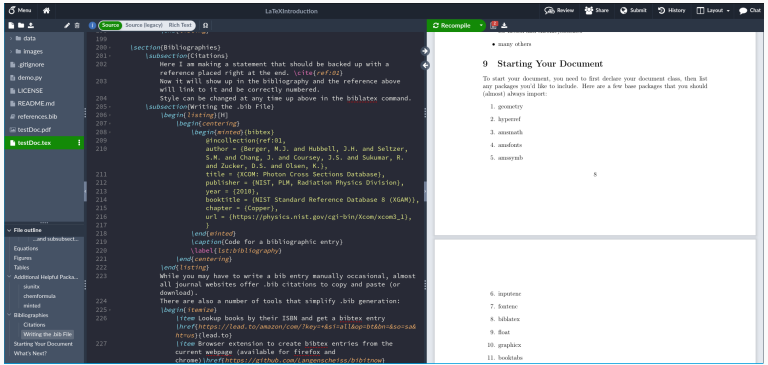


Figure 1: The Overleaf editing environment

Commands

```
\command[<some options>]{<arguments>}
```

- Differentiate LaTeX instructions from text
- Optional arguments passed in `[]`
- Required arguments passed in `{}`

The .tex File

- A plain-text file
- Two main parts

```
\documentclass[hidelinks,
↪  12pt]{article}
\usepackage{geometry}
\usepackage{hyperref}
\usepackage[tbtags]{amsmath}
\usepackage{amsfonts}
\usepackage{amssymb}
\usepackage[utf8]{inputenc}
\usepackage[T1]{fontenc}
\begin{document}
    <your document code>
\end{document}
```

The .tex File

- A plain-text file
- Two main parts
- Preamble - Setup

```
\documentclass[hidelinks,
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```

The .tex File

- A plain-text file
- Two main parts
- Preamble - Setup
- Body - Content

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```

Preamble Elements

- Document class

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\usepackage{amsfonts}
\usepackage{amssymb}
\usepackage[utf8]{inputenc}
\usepackage[T1]{fontenc}
...
\title{My First Document}
\date{\today}
\author{Aaron English}
```

Preamble Elements

- Document class
- Packages imports

```
\documentclass[hidelinks,
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Preamble Elements

- Document class
- Packages imports
- Additional document setup

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Body Elements

- Begin document

```
\begin{document}

\end{document}
```

Body Elements

- Begin document
- Add title

```
\begin{document}
  \maketitle
\end{document}
```

Body Elements

- Begin document
- Add title
- Add table of contents

```
\begin{document}
  \maketitle
  \tableofcontents
\end{document}
```

Body Elements

- Begin document
- Add title
- Add table of contents
- Sections
- … and subsections

```
\begin{document}
  \maketitle
  \tableofcontents
  \section{Introduction}
    \subsection{Sub-Intro}
\end{document}
```

Body Elements

- Begin document
- Add title
- Add table of contents
- Sections
- … and subsections
- Add text

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    Some actual text content
\end{document}
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Body Elements

- Begin document
- Add title
- Add table of contents
- Sections
- … and subsections
- Add text
- Environments
  - Equations
  - Figures
  - Tables
  - Code blocks
  - and more

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\begin{document}
  \maketitle
  \tableofcontents
  \section{Introduction}
    \subsection{Sub-Intro}
    Some actual text content
    \begin{equation}
      a^{2} = b^{2} + c^{2}
      \label{eqt:pytha}
    \end{equation}
\end{document}
```

Body Elements

- Begin document
- Add title
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