LaTeX Workshop for an Academic Setting

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Outline

LaTeX and Overleaf

- LaTeX is a Typesetting Programming Language
- Overleaf is a Web Application to manage LaTeX documents in the cloud
  - collaborate easier
  - save headaches (about saving)

Typesetting

- What is `Typesetting`?
- What are some of the struggles of typesetting for academic work?
- What are some of the unique concerns of typesetting for homework?

Examples

- Style, font, and sizing
- Space usage
- Given constraints and learning a template

General LaTeX structure

- Commands and Parameters
- Blocks, Environments (Begin and End)
- Document and Class
- Comments

Examples

TODO: Make the following in a new blank document or identify the following in a new project from an overleaf template.

- Add a document class
- begin and end document
- setup sections

Fonts

- Fonts
- Size
- Word Spacing and Kerning
- Italics, Bold, and other Inline Changes

Paragraphs and Spacing

- New Paragraphs and Indentation
- Borders and other Spacing Elements

Homework Page layout

- Title, Subtitle, Name, and Date
- Sections and Subsections
- Page Layout

Itemized lists and Parameters

- Making a list
- Making a nested list
- Bullets and other Stylings

Tables and Figures

- Use `tabular` for basic tables — see Table 1, for example.
- You can upload a figure (JPEG, PNG or PDF) using the files menu.
- To include it in your document, use the `includegraphics` command (see the comment below in the source code).

Item	Quantity
Widgets	42
Gadgets	13

Table 1: An example table.

Mathematics and Math Mode

- Entering math mode with $
- Common Math formatting
- $ and $$ and using an environment
- Formatting and Styling inside Math Mode

Readable Mathematics

Let $X_1, X_2, \ldots, X_n$ be a sequence of independent and identically distributed random variables with $\mathrm{E}[X_i] = \mu$ and $\mathrm{Var}[X_i] = \sigma^2 < \infty$, and let

$$S_n = \frac{X_1 + X_2 + \cdots + X_n}{n} = \frac{1}{n} \sum_i^n X_i$$

denote their mean. Then as n approaches infinity, the random variables $\sqrt{n}(S_n - \mu)$ converge in distribution to a normal $\mathcal{N}(0, \sigma^2)$.

Academic Paper Layout

- Common Templates
- Automatically Generate ToC
- two column style
- bibliography

Macros and Helpers

- ▶ The \newcommand Command
- ▶ Making a new environment
- ▶ Conditionals and Loops

Useful Packages

- Algorithms Package
- Rule template
- Beamer
- LaTeX Cheat Sheet