Tutorial 1: Welcome! Introduction to LaTeX

MATH 1200: Problems, Conjectures, and Proofs

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Contents

Introduction

- Name: Joe
- Graduate Studies: Pure Mathematics
- Undergraduate Studies: Mathematics for Education (graduated in June of this year)
- President of Club Infinity (the math club at York)

General Logistics

1. Attendance is taken during tutorial, as it is mandatory that you attend. You must attend at least 60% of the tutorials (7 out of 12 tutorials) in order to obtain a participation score of 5% towards the overall participation grade 20%.
2. I will show the agenda for each tutorial, basically going over what is going to be covered each session.
3. I will also make any reminders, or announcements either at the beginning or the end of the tutorial session.
4. Participation is strongly encouraged in this tutorial. A lot of the prompts will be group discussions, so it's a good idea to get to know one another!
5. At the end of each tutorial, sometime in the afternoon or evening, I will send a followup email about what was covered in each tutorial session, in case anyone missed the tutorial. However, this does not mean you can simply skip the tutorial!
6. During the month of November, you will have the opportunity to do an oral presentation, that is worth 5% towards overall participation grade 20%. More to come!

Announcements

- Join Club Infinity! This is the Math Club at York University, where we will host games, social events, competitions, and many more!

- First Assignment on getting started with LaTeX due September 19, 2024 at 11:59 PM

LaTeX Introduction

- Powerful typesetting system used for producing scientific and mathematical documents.
- Allows you to create professional-looking documents.
- It may seem difficult at first, but you will get the hang of it after this semester.

Installing LaTeX

A LaTeXdistribution is a collection of software that includes the LaTeXprogram and necessary tools.

- **Windows:** Install MiKTeX
- **macOS:** Install MacTeX
- **Linux:** Use the TeX Live distribution. You can install it using your package number (e.g. `sudo apt-get install texlive-full` on Ubuntu).

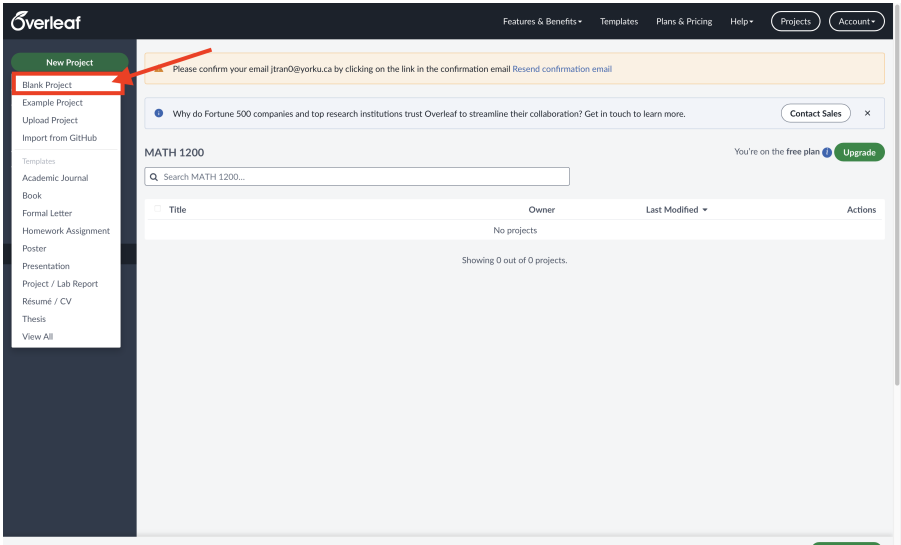
LaTeX Editor

A LaTeXeditor helps you write and compile your LaTeXcode. Here are some popular editors:

- TeXShop (macOS)
- TeXworks (Windows, Linux)
- Overleaf (web-based, no installation required)
- Texmaker (cross-platform)
- VS Code with LaTeX Workshop extension (cross-platform)

Choose an editor that fits your needs. If you're just starting out, Overleaf is an excellent option since it's web-based and requires no setup.

Overleaf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Account
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Blank Project
Example Project
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Writing Your First LaTeX Document

Let's create a simple document that includes text, a section header, and a mathematical equation. A basic LaTeX document follows a simple structure:

```
\documentclass{article}
\usepackage[utf8]{inputenc}

\title{My First LaTeX Document}
\author{Author}
\date{\today}

\begin{document}

\maketitle

\section{Introduction}

This is my first document.  Here is an example of a simple mathematical equation:
\begin{equation}
E = mc^2
\end{equation}

\end{document}
```

- `\documentclass{article}` specifies the type of document. Common options include `article`, `amsart`, `report`, and `book`.
- `\begin{document}` and `\end{document}` enclose the content of your document.
- `\title`, `\author`, `\date` define the title, author, and date of your document. These are displayed using the `\maketitle` command.
- `\section{Introduction}` creates a section heading.
- `\begin{equation}` and `\end{equation}` encloses a mathematical equation that is centered on the page, producing $E = mc^2$.

After writing the code, you need to compile it to generate the PDF document.

- In Overleaf, click the `[Recompile]` button.
- In desktop editors, look for the `[Compile]` or `[Build]` button.

Text Formatting

- **Bold:** `\textbf{bold text}`
- **Italic:** `\textit{italic text}`
- **Underline:** `\underline{underlined text}`

Lists

Unordered List:

```
\begin{itemize}
\item First item
\item Second item
\end{itemize}
```

Ordered List:

```
\begin{enumerate}
\item First item
\item Second item
\end{enumerate}
```

Tables

Here's how you can create a simple table:

```
\begin{tabular}{|c|c|} \hline
Data 1 & Data 2 \\
Data 3 & Data 4 \\ \hline
\end{tabular}
```

- `|c|c|` defines two centered columns with vertical lines.
- `\hline` inserts a horizontal line.

Figures

To add images to your document, use the `graphicx` package and the `\includegraphics` command:

```
\usepackage{graphicx}


\begin{figure}[h]
\centering
\includegraphics[width=0.5\linewidth]{example-image}
\caption{An example image.}
\end{figure}
```

Replace `example-image` with your image file name.

Equations

LaTeX excels at typesetting mathematics. Here are some common examples:

Use `$...$` to include mathematics within text:

```
The quadratic formula is given by $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$.
```

Use `\(...\)` or the `equation` environment for centered equation:

```
\(
\int_{a}^{b} f(x) dx
\)
```

Common Symbols

- Greek letters: `\alpha`, `\beta`, `\gamma`, etc.
- Common symbols: `\times`, `\div`, `\pm`, `\infty`, etc.

Resources

As you continue learning, these resources may be helpful:

- Overleaf Documentation: Comprehensive guide and examples.
- LaTeX Wikibook: A detailed online book about LaTeX.
- Detexify: A tool to help you find LaTeX commands for symbols by drawing them.