Welcome to LaTeX.

A Brief Intro into the World of LaTeX

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What is LaTeX?

Not the Fetish Society Sort.

Pronounced as Lay-Teck

- LaTeX is a Typesetting System.
  - Meaning it is software used to define how a written document is laid out.
  - It is often used in academic writing, particularly in academic papers and reports.
  - LaTeX is also used to write Books, letters, CVs & even Presentations (Including this One).

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Why?

Why use LaTeX?

- LaTeX is a “What You See is What You Mean” Document Processing & Typesetting System.
- This is opposed to the Ubiquitous “What You See is What You Get” paradigm employed by tools like Microsoft Word or LibreOffice.
- The Result of this Difference is with LaTeX, you use special ‘escape sequences’ and ‘commands’ to describe your document layout whilst you write your document.
- Allowing you to focus on your writing whilst the Compiler focuses on the Layout.

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Editors & Compilers

LaTeX is an Open Source Project with a variety of Distributions available for its usage. Examples Include:

- Overleaf — An Online LaTeXEditor & Compiler.
- MikTeX — A Native Instance for Windows, macOS & Linux. (Sam's Personal Favourite for Windows)
- MacTeX — A Native Instance for Mac[1]
- TexLive — A Native Cross-Platform Version for just about anything.[1]
- VerbTex — An Android Instance.

[1] MacTeX & TeXLive have very Large Storage Footprints (4GB+) as they locally store and maintain entire copies of the CTAN locally.

Overleaf

For the Ease of Learning & so you don't need to download any software, we will be using Overleaf, however the Syntax is the Same Across the different LaTeX Distributions.

1. Create an Account on Overleaf. You can use your University Email Here.
2. Next create a Project In Overleaf. This is a bit like a folder where you will store all files relating to the document. Here we will start with selecting "Blank Project".
3. Now you are Ready. Please shout if you have any issues.

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Your First Document

When You create your Black Project you will be presented with a split screen of LaTeX Source Code & the PDF Output. Overleaf helpfully provides a bit of code like this to get you started:

```
\documentclass{article}
\usepackage[utf8]{inputenc}
\title{Learn1}
\author{Samuel Orman-Chan}
\date{February 2023}
\begin{document}
\maketitle
\section{Introduction}
\end{document}
```

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Edit the Code

You may notice that editing the code does not result in the preview updating. This is as LaTeX is a compiled Language and as such, you will need to click Recompile in Overleaf before you can see your changes.
Begin by Typing on the line below “\begin{document}” line. Try adding some newlines and some text.

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Escape Sequences

You have probably noticed that no matter how many newlines you put in, the spacing on the output doesn't seem to change. This is as LaTeX treats newlines a bit differently to how Word does.
In fact there are a couple ways to add vertical space between lines. You can use a double backslash or a backslash 'par', with the difference being that the latter also indents the next line to make paragraph demarcation a little more obvious.

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Accents

You may also note that typing characters with accents results in errors. This is as to type an accented character, like õ or ĥ you must escape it. This is done by:

1. Typing \ and the character that best matches the accent. Such as ˆ for a circumflex, a “ for an umlaut or a ‘c’ for cedilla.
2. The, without a space between them, type the letter you want accenting.

Note: If you wish to type the £ sign, you must type “backslash pounds”.
If you notice that spacing is weird between your escaped characters and your normal ones, swap the space at then end of the sequence with a tilde (~).

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Document Structures

In LaTeX Documents have a number of attributes, mostly declared in the Preamble, the area before the backslash begin{document} line. In this area you declare any packages you are going to use, any parameters for the packages, general document parameters like paper size or document class. Document Class is arguably one of the most important preamble commands, as the class of the document determines which commands & structures you may use as well as how the document will look overall. For instance, the Overleaf project you have made is an Article, whilst this Presentation is a Beamer Class document. Other Classes you can access include classes for Letters, Books and even an University of Lincoln Thesis.

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Referencing

LaTeX has both inbuilt and external Referencing Tools that are highly customisable. You can use the inbuilt referencing tool by using the cite command (obviously escaped) or a BibTex/BibLaTeX file and the appropriate post-processor. Please see the Further Reading for information on Referencing though as it can become very, very in depth.

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The Maths “Environment”

The Maths Environment is a special area of your document that you start and end with $ signs. Between the $ you can use LaTeX Maths Notation to write even very complex maths very easily. For instance, if I wanted to write “12 plus 144 plus 20 plus 3 times the square root of 4, divided by 7, all added to 5 times 11 is equal to 9 squared plus 0” I could write:
“$ \frac{12 + 144 + 20 + 3 \sqrt {4}}{7} + 9 \times 11 = 9^2 \+ 0 $”
Which would output:
$\frac{12+144+20+3\sqrt{4}}{7} + 9 \times 11 = 9^2 + 0$

Further Reading

https://en.wikibooks.org/wiki/LaTeX

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