

What is  $\text{\LaTeX}$ .

What you need to Begin.

Further Readings & Useful Commands.

The End.

# Welcome to $\text{\LaTeX}$ .

The What, the Why, and the How of the Premier WYSIWYM  
Text Processor.

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# Outline

## 1 What is $\text{\LaTeX}$ .

- What is  $\text{\LaTeX}$
- Why use  $\text{\LaTeX}$

## 2 What you need to Begin.

- First Steps
- Escape Sequences
- Structure

## 3 Further Readings & Useful Commands.

## 4 The End.

# What is $\text{\LaTeX}$ ?

Not the Fetish Society Sort.

*Pronounced as Lay-Teck*

- $\text{\LaTeX}$  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.
  - $\text{\LaTeX}$  is also used to write Books, letters, CVs & even Presentations (Including this One).

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# Why?

## Why use $\text{\LaTeX}$ ?

- $\text{\LaTeX}$  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  $\text{\LaTeX}$ , 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

$\text{\LaTeX}$  is an Open Source Project with a variety of Distributions available for its usage. Examples Include:

- Overleaf — An Online  $\text{\LaTeX}$  Editor & Compiler.
- MikTeX — A Native Instance for Windows, macOS & Linux. (Sam's Personal Favourite for Windows)
- MacTeX — A Native Instance for Mac<sup>1</sup>
- TexLive — A Native Cross-Platform Version for just about anything.<sup>1</sup>
- VerbTex — An Android Instance.

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<sup>1</sup>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  $\text{\LaTeX}$  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.



# Your First Document

When You create your Blank Project you will be presented with a split screen of L<sup>A</sup>T<sub>E</sub>X Source Code & the PDF Output. Overleaf helpfully provides a bit of code like this to get you started:

```
\documentclass{ article }  
\usepackage[ utf 8]{ inputenc }  
\ title { Learn 1 }  
\ author { Samuel Orman-Chan }  
\ date { February 2023 }  
\ begin { document }  
\ maketitle  
\ section { Introduction }  
\ end { document }
```

# Edit the Code

You may notice that editing the code does not result in the preview updating. This is as  $\text{\LaTeX}$  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  $\text{\LaTeX}$  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.

# Accents

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

- 1 Typing `\` and the character that best matches the accent. Such as `^` for a circumflex, `¨` for an umlaut or a `˘` for cedilla.
- 2 Then, without a space between them, type the letter you want accenting.

*Note:* If you wish to type the £ sign, you must type `"\pounds"`. If you notice that spacing is weird between your escaped characters and your normal ones, swap the space immediately after the escape sequence with a tilde (~).



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# Your Preamble

When you use  $\text{\LaTeX}$  you will notice that unlike a plain text or even a word doc, there are areas of the source file that are not output. The most important of these is the Preamble.

This part of your document works a bit like a configuration file, instructing the  $\text{\LaTeX}$  compiler on things like page size, document class, packages in use etc.

However, if you use a template, you rarely need to touch the preamble unless you use a package.

# Document Classes

In L<sup>A</sup>T<sub>E</sub>X the type of document you are writing is indicated with the Document Class. A Class determines the layout attributes of a document, such as whether it will include a postal address at the top or a page number at the bottom.

Types of Document Class Include:

- Article — The default for most. If in doubt, use this one.
- Letter — Used for writing letters and other correspondence.
- Beamer — Used for creating presentations like this.
- Book — Used for creating books.
- KOMA Letter — A variant of the Letter Class with the KOMA Macros.
- Memoir — A variant of Book Class.



# Environments

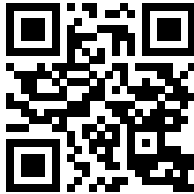
In  $\text{\LaTeX}$  concepts like slides, centre-aligned areas, figures, lists & tables are created within and using ‘Environments’.

Environments are created using the `\begin{Environment Type}` & `\end` commands. With environments, you can use specialist commands and/or benefit from specialised formatting that is not available within the wider document environment.

An example of this is the ‘itemize’ environment that lets you create a bulleted list, and adds the ‘`\item`’ command, which allows you to indicate that the piece of text is an item of the list.

# Referencing

$\text{\LaTeX}$  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.



Further Reading on Referencing in  $\text{\LaTeX}$ .

# 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 L<sup>A</sup>T<sub>E</sub>X 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:

$$\frac{12+144+20+3\sqrt{4}}{7} + 9 \times 11 = 9^2 + 0$$

# Images

In L<sup>A</sup>T<sub>E</sub>X Images are supported using the ‘graphicx’ package. To use this package:

- 1 Declare ‘graphicx’ in the preamble with the ‘usepackage’ command.
- 2 Optional Set the `\graphicspath` to the directory where images/graphics are kept.
- 3 At the location you want the image to appear, type `\includegraphics[size either as a measurement of height and/or width, or scale]{image path, either from the graphics path, the relative path to the TEX file or the absolute path from the drive root}`.
- 4 Compile and check it looks right.

# Further Reading

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



<https://www.overleaf.com/learn>



<https://lncn.ac/3p3t>



<https://lncn.ac/zk1qu>



# Accents Reference

LaTeX command	Sample	Description
<code>\`{o}</code>	ò	grave accent
<code>\' {o}</code>	ó	acute accent
<code>\^ {o}</code>	ô	circumflex
<code>\" {o}</code>	ö	umlaut, trema or dieresis
<code>\H{o}</code>	ő	long Hungarian umlaut (double acute)
<code>\~{o}</code>	õ	tilde
<code>\c{c}</code>	ç	cedilla
<code>\k{a}</code>	ą	ogonek
<code>\l{l}</code>	ł	barred l (l with stroke)
<code>\={o}</code>	ō	macron accent (a bar over the letter)
<code>\. {o}</code>	ó	dot over the letter
<code>\d{u}</code>	u	dot under the letter
<code>\r{a}</code>	å	ring over the letter (for å there is also the special command <code>\aa</code> )
<code>\u{o}</code>	ö	breve over the letter
<code>\v{s}</code>	š	caron/háček ("v") over the letter
<code>\o{}{}</code>	ø	slashed o (o with stroke)
<code>{i}</code>	ı	dotless i (i without tittle)

Table: Table of Accent Escapes

# Thanks to:

- Wikibooks Community for the Invaluable, Straightforward & Comprehensive wiki-book on Learning L<sup>A</sup>T<sub>E</sub>X
- Overleaf for Useful, Well Organised & Detailed Support Articles on the L<sup>A</sup>T<sub>E</sub>X Language.
- T<sub>E</sub>X Stack Exchange for almost universally having answers to any questions that can arise from L<sup>A</sup>T<sub>E</sub>X Usage.

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# Download this Presentation



<https://github.com/SJO-C/presentLatex/raw/main/presentLaTeX.pdf>