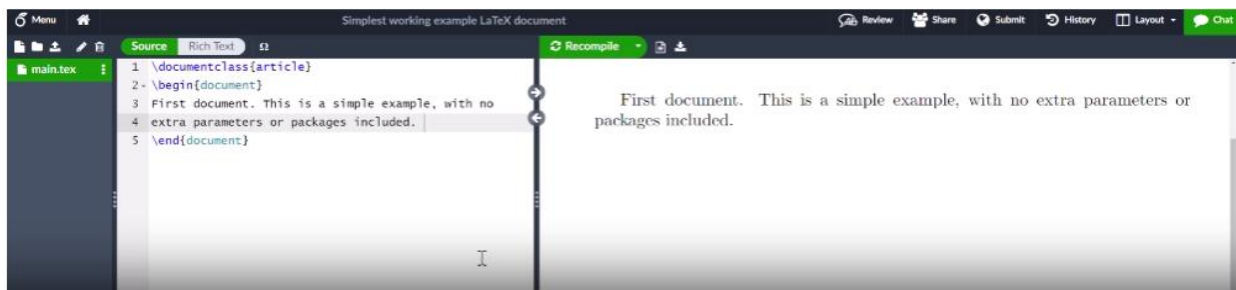# LaTeX

What is LaTeX?

LaTeX is a typesetting system that allows users to create professional-quality documents by writing plain text interspersed with formatting commands. Unlike WYSIWYG editors like Microsoft Word or LibreOffice Writer, which provide a visual interface for styling content, LaTeX requires users to write source code in a **.tex file** using specific commands to define structure and appearance. This file is then processed by a TeX engine, which interprets the commands and generates a well-formatted PDF File. By separating content from formatting, LaTeX enables users to focus on writing while ensuring consistent, high-quality typesetting.

Learn LaTeX in 10 easy steps

*1. Basic structure of LaTeX

*2. \documentclass[12pt, letterpaper]{article}

\usepackage{graphicx}

---→

- 12pt sets the font size
- letterpaper sets the paper size

(here, [graphicx](#)) to extend LaTeX's capabilities, enabling it to import external graphics files.

*3. Adding a title, author and date to our document requires three more lines in the *preamble* (*not* the main body of the document). Those lines are:

- **\title{My first LaTeX document}:** the document title
- **\author{Hubert Farnsworth}:** here you write the name of the author(s) and, optionally, the \thanks command within the curly braces:
  - **\thanks{Funded by the Overleaf team.}:** can be added after the name of the author, inside the braces of the author command. It will add a superscript and

a footnote with the text inside the braces. Useful if you need to thank an institution in your article.

- **\date{August 2022}:** you can enter the date manually or use the command \today to typeset the current date every time the document is compiled

- use the **\maketitle** command within the ***body* of the document**

Example.

```
 8  %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
 9  \documentclass[12pt, letterpaper]{article}
10  \title{My first LaTeX document}
11  \author{Hubert Farnsworth\thanks{Funded by the Overleaf team.}}
12  \date{August 2022}
13  \begin{document}
14  \maketitle
15  We have now added a title, author and date to our first \LaTeX{} document!
16  \end{document}
```

My first LaTeX document

Hubert Farnsworth*

August 2022

We have now added a title, author and date to our first LaTeX document!

*Funded by the Overleaf team.

1

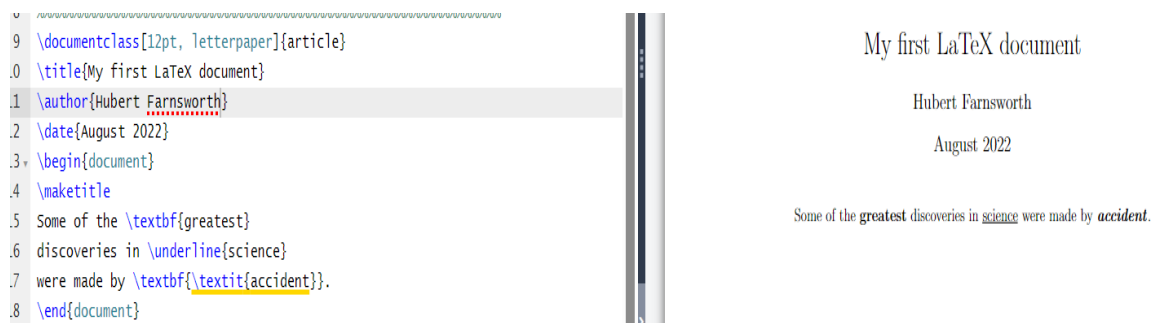***4. Comment out : use "%"- sign**

Example:

'' % This line here is a comment. It will not be typeset in the document. ''

*5. Bold, italics and underlining

Next, we will now look at some text formatting commands:

- **Bold**: bold text in LaTeX is typeset using the \textbf{...} command.

- *Italics*: italicised text is produced using the \textit{...} command.

- Underline: to underline text use the \underline{...} command.

Example :

```
 9  \documentclass[12pt, letterpaper]{article}
10  \title{My first LaTeX document}
11  \author{Hubert Farnsworth}
12  \date{August 2022}
13  \begin{document}
14  \maketitle
15  Some of the \textbf{greatest}
16  discoveries in \underline{science}
17  were made by \textbf{\textit{accident}}.
18  \end{document}
```

My first LaTeX document

Hubert Farnsworth

August 2022

Some of the **greatest** discoveries in science were made by ***accident***.

*Another very useful command is **\emph**{*argument*}, whose effect on its *argument* depends on the context. Inside normal text, the emphasized text is italicized, but this behaviour is reversed if used inside an italicized text—see the next example:

Example

```
\documentclass[12pt, letterpaper, twoside]{article}
\title{My first LaTeX document}
\author{Hubert Farnsworth\thanks{Funded by the Overleaf team.}}
\date{August 2022}
\begin{document}
\parindent0pt% To remove the paragraph indentation
\maketitle
Some of the greatest \emph{discoveries} in science
were made by accident.

\textit{Some of the greatest \emph{discoveries}
in science were made by accident.}

\textbf{Some of the greatest \emph{discoveries}
in science were made by accident.}
\end{document}
```

*6. Adding images

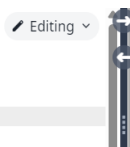In this section we will look at how to add images to a LaTeX document. Overleaf supports three ways to insert images:

1. Use the **Insert Figure** button(   ), located on the editor toolbar, to insert an image into **Visual Editor** or **Code Editor**.

2. Copy and paste an image into **Visual Editor** or **Code Editor**.

3. Use **Code Editor** to write LaTeX code that inserts a graphic.

   Example:

```
1  \documentclass{article}
2  \usepackage{graphicx}% LaTeX package to import graphics
3  \graphicspath{{images/}} % configuring the graphicx package
4  \begin{document}
5  \includegraphics{universe}
6  There is a picture of a galaxy above.
7  \end{document}
```

*7. Lists

*7. i)

Unordered lists

Unordered lists are produced by the `itemize` environment. Each list entry must be preceded by the `\item` command, as shown below:

```
\documentclass{article}
\begin{document}
\begin{itemize}
  \item The individual entries are indicated with a black dot, a so-called bullet.
  \item The text in the entries may be of any length.
\end{itemize}
\end{document}
```

↪ Open this example in Overleaf.

This example produces the following output:

- The individual entries are indicated with a black dot, a so-called bullet.
- The text in the entries may be of any length.

*7.ii)

Ordered lists

Ordered lists use the same syntax as unordered lists but are created using the `enumerate` environment:

```
\documentclass{article}
\begin{document}
\begin{enumerate}
  \item This is the first entry in our list.
  \item The list numbers increase with each entry we add.
\end{enumerate}
\end{document}
```

↪ Open this example in Overleaf.

This example produces the following output:

1. This is the first entry in our list.
2. The list numbers increase with each entry we add.

8. Adding math to LaTeX   (Not much imp for resume)

Inline Mode

i)   Use ' $---- math portion -----$'

   Example: $E=mc^2$

Output: E=mc^2

ii)   Use   **\begin{math}**
             E=mc^2
             \end{math}

Output: E=mc^2

Display math mode

Use   **\begin{equation}**

      E= mc^2

      \end{equation}

Output: E=mc^2

Extras : This is also the same:

\begin{displaymath}

\sqrt{x^2+1}

\end{displaymath}

Or, **\begin{equation*}**

      \sqrt{x^2+1}

      \end{equation*}

   Both output: $\sqrt{x^2 + 1}$

*9. Use Hyperlink on LaTeX:

\userpackage{hyperref}

\begin{document}

\href{www.google.com}{Google}

\end{document}

=== this makes **"Google"** word clickable and redirects to the assigned address

*10. For paragraph and new line , use the commands \\ and \newline:

```
 9  \documentclass{article}
10  \begin{document}
11
12  \begin{abstract}
13  This is a simple paragraph at the beginning of the
14  document. A brief introduction about the main subject.
15  \end{abstract}
16
17  After our abstract we can begin the first paragraph, then press ``enter''
    twice to start the second one.
18
19  This line will start a second paragraph.
20
21  I will start the third paragraph and then add \\ a manual line break which
    causes this text to start on a new line but remains part of the same
    paragraph. Alternatively, I can use the \verb|\newline|\newline command to
    start a new line, which is also part of the same paragraph.
22  \end{document}
```

Abstract

This is a simple paragraph at the beginning of the document. A brief introduction about the main subject.

After our abstract we can begin the first paragraph, then press "enter" twice to start the second one.
This line will start a second paragraph.
I will start the third paragraph and then add a manual line break which causes this text to start on a new line but remains part of the same paragraph. Alternatively, I can use the \newline command to start a new line, which is also part of the same paragraph.

11. Creating a basic table in LaTeX (Not much imp for resume)

```
\begin{center}
\begin{tabular}{c c c}
 cell1 & cell2 & cell3 \\
 cell4 & cell5 & cell6 \\
 cell7 & cell8 & cell9
\end{tabular}
\end{center}
```

➡ Open this example in Overleaf.

This example produces the following output:

cell1	cell2	cell3
cell4	cell5	cell6
cell7	cell8	cell9

For Adding borders

Use the argument {|c|c|c|} relacing {c c c}

cell1	cell2	cell3
cell4	cell5	cell6
cell7	cell8	cell9

-----Learn LaTeX From Overleaf WebSite : Overleaf/LaTeX-----