What is LaTeX?

- LaTeX is pronounced “lay-tech” or “lah-tech,” not “la-teks.”

What is LaTeX?

- LaTeX is a document markup language used to create documents in TeX.

- LATEX is the standard mathematical typesetting program

Typesetting can be defined as **the process of preparing and arranging text and images for printing**

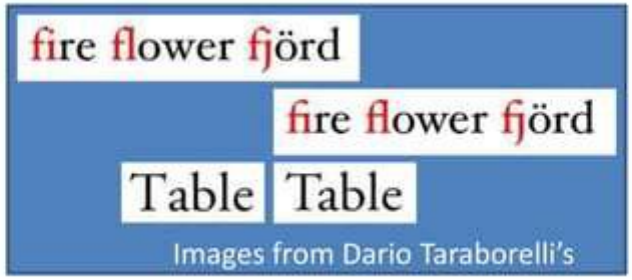
- A computer language that consists of easily understood keywords, names, or tags that help format the overall view of a page and the data it contains.

- Some examples of a **markup language** are HTML and XML.

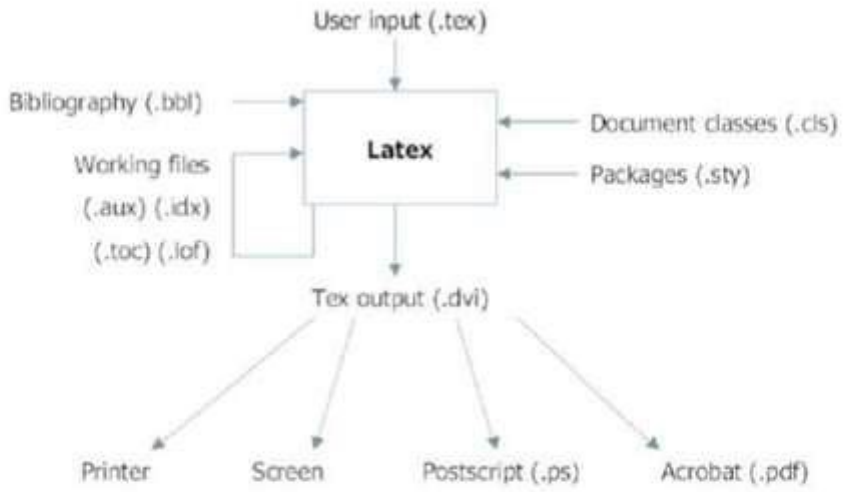
Latex was created by the American computer scientist named
Leslie Lamport in **1983**

Why Use LaTeX?

- Mathematical symbols and equations are easily integrated.
- Even complex structures such as footnotes, references, table of contents, and bibliographies can be generated easily.
- Creates more beautiful documents.
- Portable, compatible, flexible, and cheap (or free)!



The Mechanisms of "TeXing"



http://www.comp.leeds.ac.uk/andy/

Markup versus WYSIWYG

To someone familiar with MS Word /Open Office Writer ….Latex is that you do not interact with a graphical user interface (GUI), and you do not immediately see how your document will be typeset.

Consider a typical WYSIWYG ("what you see is what you get") word processor, such as Open Office Writer, shown in the screenshot below:

- https://www.ieee.org/conferences/publishing/templates.html

Installing LaTeX

- In Windows
- MiKTeX
  - MiKTeX is a typesetting system for the Windows.
  - Download from www.miktex.org for free
  - It is generally recommended to install MiKTeX first, then WinEdt.
- WinEdt
  - WinEdt is a text editor.
  - WinEdt creates the source file (.tex and others).
  - Download from www.winedt.com for free for 30 days.
  - WinEdt costs $30.

Installing LaTeX

- Other text editors
  - There are other text editors.
  - Winshell for free (http://www.winshell.de/)
  - Scientific Workplace
    - Combination of LaTeX and Mathematics program
    - Does a good job of calculating and graphing, very user friendly, but expensive

- In Mac
- TexShop
  - Download for free http://www.uoregon.edu/~koch/texshop/
  - Includes everything!

https://www.overleaf.com/

Source code of your first LaTeX document (test.tex)

```
\documentclass{article}
\begin{document}
This is my first Latex
\end{document}
```

\documentclass{article}, declares the document type known as its *class*, which controls the overall appearance of the document.

\begin{document} and \end{document},

Body of the document, is written between the begin and end tags.

Font Size: The point size can be described in the way **[10pt]**. The other font sizes are 8pt, 9pt, 10pt, 11pt, 12pt, 14pt, 17pt, 20pt.
The default font size for Latex is **10pt**.

The **paper types** with their dimensions are given below:

- **letterpaper** (11 x 8.5 in)
- **legalpaper** (14 x 8.5 in)
- **a5paper** (5.8 x 8.3 in)
- **a4paper** (8.3 x 11.7 in)
- **executivepaper** (10.5 x 7.25 in)
- **b5paper** (25 x 17.6 cm)

Command	Type Size
{\tiny} size	text
{\scriptsize} size	text
{\footnotesize} size	text
{\small} size	text
{\normalsize} size	text
{\large} size	text
{\Large} size	text
{\LARGE} size	text
{\huge} size	text

Font Styles:

Style	Command
Roman	\textrm{roman}
Typewriter	\texttt{typewriter}
Sans serif	\textsf{sans serif}

Style	Command
boldface	\textbf{boldface}
medium	\textmd{medium}
italic	\textit{italic}
slanted	\textsl{slanted}
upright	\textup{upright}
SMALL CAP	\textsc{small cap}

asic LaTeX is just text with typesetting commands. Typesetting commands are usually preceded by "\", nd any arguments are usually placed inside curly braces "{}".

TEX wraps text in adjacent lines as if they were part of the same paragraph. To start a new paragraph, sert an extra "return":

Source:

```
This is one paragraph.

This is another.
```

Output:

This is one paragraph.

This is another.

o get a newline without starting a new paragraph, use \\.

o get a comment, use the percent sign % at the beginning of a line. The rest of that particular line will be ommented out.

```
\documentclass[12pt]{article}
\begin{document}

\textit{\textbf{ Latex}}
\textrm{\textsl{ IT Workshop}}

\end{document}
```

Source:

```
\begin{tabular}{r|cl}
1st column & 2nd column & 3rd column\\
\hline
a & b & c
\end{tabular}
```

Output:

1st column	2nd column	3rd column
a	b	c

Note that the command is called `tabular` and *not* `table`. Important points:

- The "`{r|cl}`" after the tabular `\begin{tabular}` indicate the alignment of the three columns: right, center, and left. This is mandatory as it specifies the layout of the table. For more columns, type more alignment commands, e.g. for a table with 5 columns all aligned to the right, you would use `rrrrr`.
- The vertical bar `|` between the `r` and `c` indicates that a vertical line should be drawn between those columns.'
- The `&` separates the columns in the body of the table.
- A `\\` signifies the end of each line of the table.
- The command `\hline` means that a horizontal line should be inserted.

You can put stuff into ordered and unordered lists by using the **enumerate** and **itemize** commands, respectively. For example:

Source:

```
Unordered list:

\begin{itemize}
\item This is one item.
\item This is another.
\end{itemize}

Ordered list:

\begin{enumerate}
\item This is the first item.
\item This is the second.
\end{enumerate}
```

Output:

Unordered list:

- This is one item.
- This is another.

Ordered list:

1. This is the first item.
2. This is the second.

Math expressions are separate from text in LaTeX. To enter a math environment in the middle of text the dollar sign `$`, for example `$F = ma$` produces $F = ma$. Everything between the two `$` signs wi considered math formula.

To type a math expression that is on its own line and centered, use `$$`:

Source:

```
The following is an important equation:
$$E = mc^2$$
```

Output:

The following is an important equation:

$$E = mc^2$$

To give an equation a number and have it referable, use the **equation** environment and use a **\label** command:

Source:

```
The following is an important equation:
\begin{equation}
\label{emc}
E = mc^2
\end{equation}
Please memorize Equation \ref{emc}.
```

Output:

The following is an important equation:

$$E = mc^2 \tag{7.1}$$

Please memorize Equation 7.1.

The basic requirements to insert an image are:

- Including the **graphicx** package. The command will be written as **\usepackage{graphicx}**.

- You need to download the particular image from the browser and **save that image in the same folder where the Latex files are present.**

- **Example:**

```
\documentclass[12pt]{article}
\usepackage{graphicx}
\begin{document}

\includegraphics{computer.jpg}
 \end{document}
```

```
\documentclass{article}
\usepackage{graphicx}
\begin{document}
\begin{figure}
\includegraphics {boat.jpg}
\caption{A boat.}
\end{figure}

\end{document}
```

```
\documentclass[12pt]{article}
\usepackage{mathtools}
\begin{document}
\begin{equation}
x + y = 4 % there should be no gap between any of the two
 rows
\end{equation}
\end{document}
```

```
\documentclass[12pt]{article}
\usepackage{mathtools}
\begin{document}
\begin{equation}
x^2 +2x+ 6 = 0
\end{equation}
\end{document}
```

```
\documentclass[12pt]{article}
\usepackage{mathtools}
\begin{document}
\begin{equation}
1, 2, 3, 4, 5, 6..... \infty
\end{equation}
\end{document}
```

```
\documentclass[12pt]{standalone}
\usepackage{pgfplots}
\pgfplotsset{width=6.6cm,compat=1.7}
\begin{document}
\begin{tikzpicture}
\begin{axis}
[
ybar,
enlargelimits=0.15,
ylabel={\#Average Marks}, % the ylabel must precede a # symbol.
xlabel={\ Students Name},
symbolic x coords={Tom, Jack, Hary, Liza, Henry}, % these are the specification of
coordinates on the x-axis.
xtick=data,
nodes near coords, % this command is used to mention the y-axis points on the top
of the particular bar.
nodes near coords align={vertical},
]
\addplot coordinates {(Tom,50) (Jack,90) (Hary,70) (Liza,80) (Henry,60) };
\end{axis}
\end{tikzpicture}
\end{document}
```

Three Ways to Insert CSS

- External CSS
- Internal CSS
- Inline CSS

Inline CSS

An inline style may be used to apply a unique style for a single element.

```
<!DOCTYPE html>
<html>
<body>

<h1 style="color:blue;text-align:center;">This
is a heading</h1>
<p style="color:red;">This is a paragraph.</p>

</body>
</html>
```

Internal CSS

An internal style sheet may be used if one single HTML page

```
<!DOCTYPE html>
<html>
<head>
<style>
body {
  background-color: blue;
}

h1 {
  color: maroon;
 }
</style>
</head>
<body>

<h1>This is a heading</h1>
<p>This is a paragraph.</p>

</body>
</html>
```

External CSS

With an external style sheet, you can change the look of an entire website by changing just one file!

Each HTML page must include a reference to the external style sheet file inside the <link> element, inside the head section.

```
<!DOCTYPE html>
<html>
<head>
<link rel="stylesheet" href="my
style.css">
</head>
<body>

<h1>This is a heading</h1>
<p>This is a paragraph.</p>

</body>
</html>
```

mystyle.css

```
body {
  background-
color: lightblue;
}

h1 {
  color: navy;
  margin-left: 20px;
}
```