LaTex

Because MS Word Sucks !

Lah-Tekh

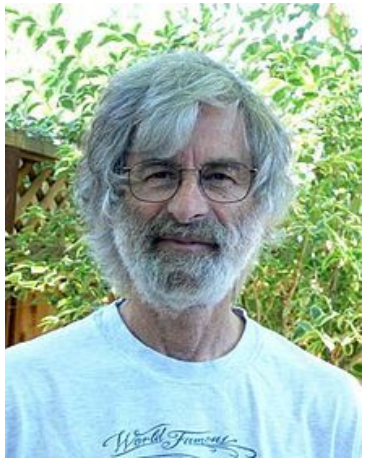
And MS Word Sucks !

Why it is called LaTex ?

Tex - a document formatting system made in 1978 by

Turing Award - 1974

Leslie **La**mport was first developer to implement Tex



Turing Award - 2013

FREE Video tutorials

- https://www.youtube.com/watch?v=SoDv0qhyysQ&list=PL1D4EAB31D3EBC449

Why learn LaTex ?

Think about writing this in Word

$$E_0 = mc^2$$

Think about writing this in Word

$$E = \frac{mc^2}{\sqrt{1 - \frac{v^2}{c^2}}}$$

Think about writing this in Word

$$\sum_{m=1}^{\infty} q_m(\omega) \int_0^L \left\{ (1+\mathrm{i}\eta) \frac{\mathrm{d}^2}{\mathrm{d}x^2} \left[k(x) \frac{\mathrm{d}^2 \psi_m(x)}{\mathrm{d}x^2} \right] - \omega^2 \psi_m(x) \right.$$
$$\left. \times \left[\rho_l(x) + \frac{\pi}{4} \rho_f b^2(x) \Gamma(\beta(x,\omega), \alpha(x)) \right] \right\} \psi_n(x)\, \mathrm{d}x$$
$$= \omega^2 \int_0^L \left\{ \hat{\theta}_{\mathrm{B}}(\omega)(x+L_0) \left[\rho_l(x) + \frac{\pi}{4} \rho_f b^2(x) \Gamma(\beta(x,\omega), \right. \right.$$
$$\left. \alpha(x)) \right] + \frac{\pi}{4} \rho_f b^2(x) \Delta \left(\beta(x,\omega), \frac{1}{b(x)} \left| \sum_{m=1}^{\infty} q_m(\omega) \psi_m(x) \right. \right.$$
$$\left. \left. + \hat{\theta}_{\mathrm{B}}(\omega)(x+L_0) \right|, \alpha(x) \right)$$
$$\left. \times \left[\sum_{m=1}^{\infty} q_m(\omega) \psi_m(x) + \hat{\theta}_{\mathrm{B}}(\omega)(x+L_0) \right] \right\} \psi_n(x)\, \mathrm{d}x. \quad (10)$$

It's not about writing maths

Think about 100 page document where you want to change the size of paragraphs from 11pt to 12pt keeping heading 14pt and sub-heading 13pt.

Installation

For Windows

- Install MiKTex
  - https://miktex.org/download
- Install TexMaker
  - http://www.xm1math.net/texmaker/download.html

For MAC

- Install MacTex
  - http://www.tug.org/mactex/mactex-download.html
- Install TexMaker
  - http://www.xm1math.net/texmaker/download.html

For Linux

- sudo apt-get install texlive-full
- sudo apt-get install texmaker

Creating your first file

```
\documentclass[12pt]{article}
\begin{document}
This is a test document.
\end{document}
```

LaTex commands

- Starts with \
- Works as tags in HTML

Changing lines

- Entering a soft return (Next line is same paragraph)
  - //
- Changing paragraphs
  - Leave an empty line

Simple in-line math equations

- Starts with $
- Ends with $

Math equation in separate lines

- Starts with $$
- Ends with $$

Common maths

- Superscripts
  - ^
- Subscripts
  - _
- Greek letters
  - \pi
  - \alpha
- Trigonometric functions
  - \sin(x)
- Log function
  - \log(x)
  - \ln(x)
- Roots
  - \sqrt{x}
  - \sqrt[a]{x}
- Fractions
  - \frac{x}{y}
  - \displaystype{\frac{x}{y}}
  -

Brackets

- Parenthesis
  - (x + 1)
- Square brackets
  - [x + 1]
- Curly brackets
  - Require backslash
  - \{a, b, c\}

Special cases

- Dollar sign
  - Needs backslash
- Full height parenthesis around fraction
  - \left(
  - \right)
- Absolute value
  - |x|
  - \left| x \right|
- Putting just one sided bracket
  - \left{ x^2 \right.

Table

- \begin{tabular}{no of columns required}
- Example
  - \begin {tabular}{ccc}
  - This means table with three columns
  - \end{tabular} to end the table
- Horizontal bar
  - \hline
- Vertical bar
  - \being {tabluar} {c|c|c}

Equation Array

- \begin {eqnarray}
- \end{eqnarray}
- Align all equations at =
  - &=&
- Change line
  - \\
- Hide line number of equations
  - \begin {eqnarray*}
  - \end{eqnarray*}

List

- Ordered list
  - \begin {enumerate}
  - \item
  - \item
  - \end {enumerate}
- Unordered list
  - \being {itemize}
  - \end {itemize}
- Lists can be nested
- Give own labels
  - \item[label name]

Inline formatting

- Italics
  - \textit{ text here}
- Bold
  - \textbf{ bold faced text}
- All caps
  - \textsc{ small caps}
- Typewriter font
  - \texttt{ text here}
- Large
  - \begin {large}
  - \begin {Large}
  - \begin {huge}
  - \begin {Huge}
- Small
  - \begin {small}
  - \begin {tiny}
- Justification
  - \begin {center}
  - \begin {flushleft}
  - \begin {flushright}

Title document

- \title {title here}
- \author {author name}
- Date
  - \date {\today}
  - \date {20-11-2016}
- \maketitle

Note: Last line is required to make the whole title work.

Sections and subsection

- \section {section name}
  - \subsection {subsection name}
  - \subsection {subsection name}
- \section {section name}

Sections will automatically be of bigger size, bold faced and numbered.

Table of contents

Just type \tableofcontents

And press build twice and it will generate the table of contents automatically.

Packages

- \usepackage {fullpage}
- \usepackage {top=1in, bottom=1in, left=1in, right=1in}{geometry}
  - Use call also use cm for centimeter instead of in for inches
- \usepackage {margin=1in, paperwidth=8.5in, paperheight=11in}
- \usepackage {amsfonts}
  - For sign of natural numbers etc
  - \mathbb{N} - for natural number symbol
  - \mathbb{R} - for real number symbol

Macros

- Making own commands
- \def\eq1{This is macro}
- Now \eq1 will print the macro

Graphics

- \usepackage {graphicx}
- \includegraphics [width=5in, height=4in] {filename.png}
- You can only use : png, jpeg, gif and pdf files
- No spaces in filenames are allowed.
- \includegraphics [angle=45] {filename.png}
- \includegraphics [scale=0.5] {filename.png}

Comments

- Starts with %
- % This is a comment