NANYANG TECHNOLOGICAL UNIVERSITY

LaTeX Workshop

Presented by

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March 29, 2018

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1. Introduction
2. Getting Started
3. Mathematical content
4. Floating Environments
   - Figures
   - Tables
5. Cross References and Bibliography
6. Hands-on Exercise
7. Conclusion

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Outline

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Why LaTeX?

- Open source.
- Available for almost all OS (Windows/Linux/Mac/etc) and even online (Overleaf, ShareLatex).
- You can use any text editor of your choice. (Atom/Notepad++/gedit/vim/etc).
- Automated typesetting, ease of cross-referencing, citations,...
- You can write your own commands for repetitive tasks.
- Templates for almost all journals/conferences/thesis are available.

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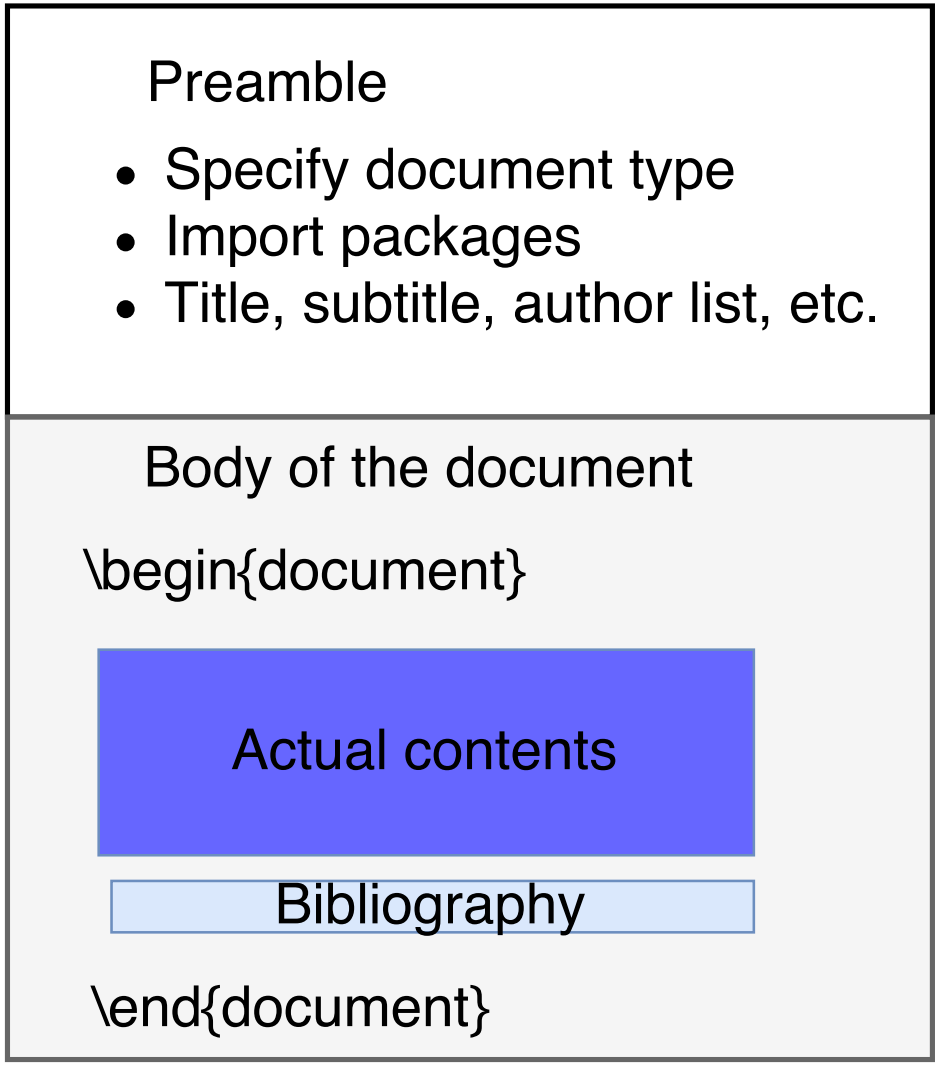
Document organization



Placing Text

- Just typing text gets rendered by LaTeXas a **paragraph**.
- To create a new paragraph, just put a blank line between the text. Note: Multiple blank lines in LaTeX is rendered as a Single paragraph break.
- Similarly, multiple spaces are rendered as a single space.

```
This is a new section. Tex can be used as a standalone
document preparation system or as an intermediate format.

This is a new paragraph. Note the blank line between the
two paragraphs.  Some more text.
```

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- Similarly, multiple spaces are rendered as a single space.
- For extra lines, use \\
- For extra space, use ~

Rendered Text

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Formatting Text

- To make text in **bold**:

  `\textbf{bold}`
- To make text in *italics*:

  `\textit{italics}`
- To make text in underlined:

  `\underline{underline}`

- To make text colorful:

  `\textcolor{red}{colorful}`
- To use colors, a package has to be imported.

  `\usepackage{xcolor}`

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Lists

There are two types of lists — numbered list and unnumbered lists.

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Enumeration!!!

1. Numbered Item 1
2. Numbered Item 2

```
\begin{enumerate}
\item Numbered Item 1
\item Numbered Item 2
\end{enumerate}
```

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\begin{enumerate}
\item Numbered Item 1
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```

Itemize!!!

- Item 1
- Item 2

```
\begin{itemize}
\item  Item 1
\item  Item 2
\end{itemize}
```

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Organization

Content can be organized into **Sections**, **Subsections** and **Subsubsections**.

- `\section{Section Title}`
  `Section text...`
- `\subsection{Subsection Title}`
  `Subsection text...`
- `\subsubsection{Subsubection Title}`
  `Subsubsection text...`

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Mathematical Content

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- To simply write inline content $Eq_1 : a^2 + b^2 = c^2$.

```
$Eq_1: a^2 + b^2 = c^2$
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```
$Eq_1: a^2 + b^2 = c^2$
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- For equation,

$$Eq_1 : a^2 + b^2 = c^2 \qquad (1)$$

```
\begin{equation}
Eq_1: a^2 + b^2 = c^2
\end{equation}
```

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```
\begin{equation}
Eq_1: a^2 + b^2 = c^2
\end{equation}
```

- For a aligned set of equations,

$$a^2 + b^2 = c^2$$
$$sin^2\Theta + cos^2\Theta = 1$$

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```
\begin{equation}
Eq_1: a^2 + b^2 = c^2
\end{equation}
```

- For a aligned set of equations,

$$a^2 + b^2 = c^2$$
$$sin^2\Theta + cos^2\Theta = 1$$

```
\begin{align*}
a^2 + b^2 &= c^2 \\
sin^2\Theta + cos^2\Theta &= 1 \\
\end{align*}
```

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Figure

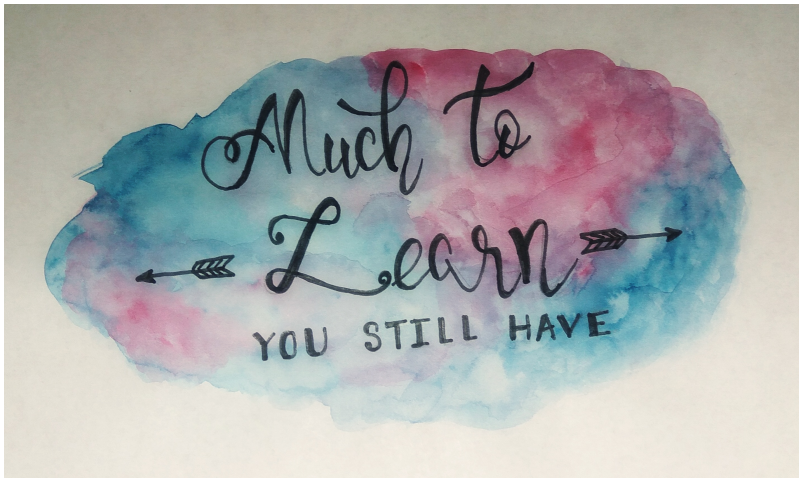

Figure: Here is a figure caption.

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Figure

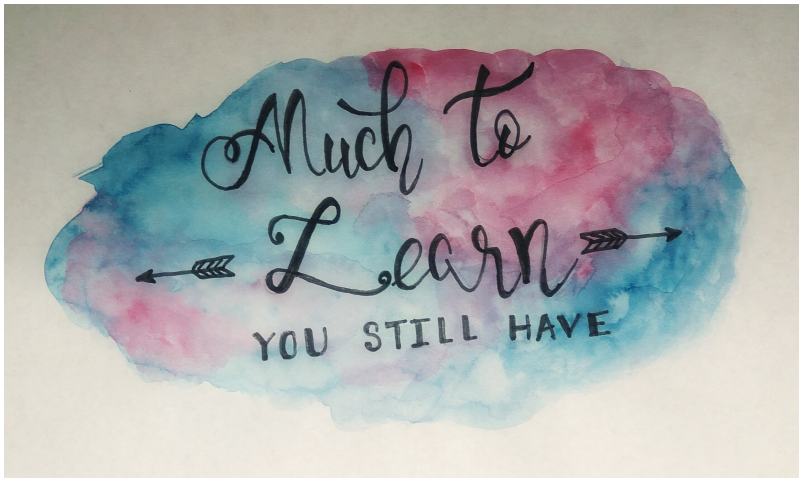

Figure: Here is a figure caption.

```
\begin{figure}[]
\includegraphics[width=2in]{doodle.jpg}
\caption{Here is a figure caption.}
\label{fig:doodle}
\end{figure}
```

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Figure

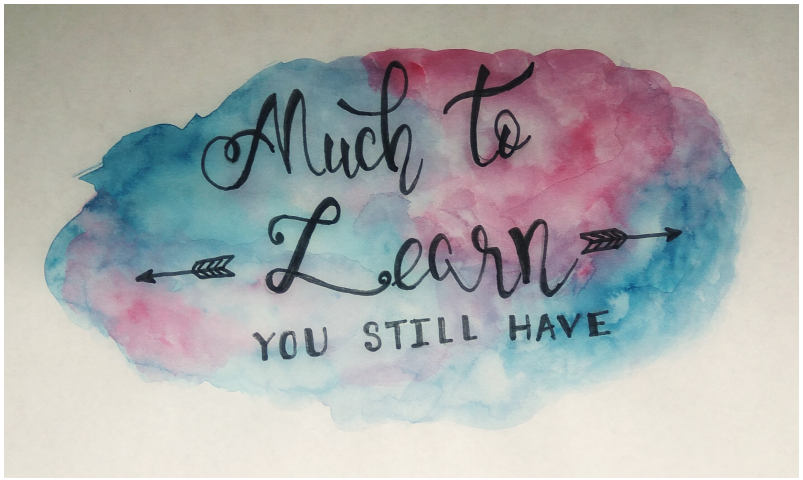

Figure: Here is a figure caption.

- Warning : Absolute placement of Figures in LaTeX is hard, but not impossible.
- $[!htp]$ can be used

```
\begin{figure}[]
\includegraphics[width=2in]{doodle.jpg}
\caption{Here is a figure caption.}
\label{fig:doodle}
\end{figure}
```

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Multiple Figures

(a) Doodle.

(b) Repeat.

(c) Rotate.

Figure: Some subfigures in LaTeX.

```
\begin{figure}[ht]
\centering
\begin{subfigure}{2.5cm}
\caption{Doodle.}
\label{fig:orig}
\includegraphics[width=2cm]{doodle.jpg}
\end{subfigure}
\begin{subfigure}{2.5cm}
\caption{Repeat.}
\label{fig:repeat}
\includegraphics[width=2cm]{doodle.jpg}
\end{subfigure}\\
```

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Multiple Figures

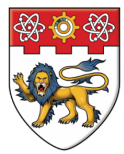
(a) Doodle.

(b) Repeat.

(c) Rotate.

Figure: Some subfigures in LaTeX.

```
\begin{subfigure}{4cm}
\centering
\caption{Rotate.}
\label{fig:rotated}
\includegraphics
[angle=90,origin=c,width=2.5cm]
{doodle.jpg}
\end{subfigure}
\caption{Some subfigures in \LaTeX.}
\label{fig:combined}
\end{figure}
```



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Simple Table

Table: Some participants of the workshop.

1	Bhargy	Sharma	SBS	LaTeX noob.
2	Debjyoti	Bhattacharjee	SCSE	LaTeX enthusiast.

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Simple Table

Table: Some participants of the workshop.

1	Bhargy	Sharma	SBS	LaTeX noob.
2	Debjyoti	Bhattacharjee	SCSE	LaTeX enthusiast.

```
\begin{table} [ht]
\centering
\caption{Some participants of the workshop.}
\label{table:org}
\begin{tabular}{|r|l l| c|p{5cm} | } \hline
1 & Bhargy & Sharma & SBS & \LaTeX noob. \\ \cline{2-3} \cline{5-5}
2 & Debjyoti & Bhattacharjee & SCSE & \LaTeX enthusiast. \\ \hline
\end{tabular}
\end{table}
```

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Complicated Table

Table: Weather forecast of two cities

City	Today		Tomorrow	
Singapore	33	24	33	24
	Afternoon thundery showers.		Afternoon thundery showers.	
Kolkata	34	21	34	22
	Mostly clear and humid.		Hazy sun, warm and less humid.	

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	Mostly clear and humid.		Hazy sun, warm and less humid.	

```
\begin{table} [ht]
\caption{Weather forecast of two cities}
\label{table:weather}
\begin{tabular}{|c|cc|cc|} \hline
\textbf{City} & \multicolumn{2}{|c|}{\textbf{Today}} &
 \multicolumn{2}{|c|}{\textbf{Tomorrow}} \\ \hline
\multirow{2}{*}{Singapore} &  33 & 24 & 33 & 24 \\  \cline{2-5}
& \multicolumn{2}{|c|}{Afternoon thundery showers.} &
  \multicolumn{2}{|c|}{Afternoon thundery showers.} \\ \hline
```

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Cross References

- This is one of the most simple things to learn in LaTeX.
- Figure 1 is the figure with the doodle.

  ```
  Figure~\ref{fig:doodle}
  ```
- Table 2 is a table about weather.

  ```
  Table~\ref{table:weather}
  ```
- Section 4 is the section on floating environments.

  ```
  Section~\ref{sec:float}
  ```

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Bibliography

- The bibliography is stored in a .bib file.
- `\bibliographystyle{apalike}`
  `\bibliography{reference}`
- apalike is the style type used for bibliography.
  [Multiple formats are available]
- reference.bib is the file that has the bib entries.
- To cite an entry, use cite command.

  `~\cite{lamport1986document}`

- ```
  @misc{lamport1986document,
  title={Document Preparation System},
  author={Lamport, Leslie and LaTEX, A},
  year={1986},
  publisher={Addison-Wesley Reading Mass}
  }
  ```
- Bib entries can be directly downloaded from Google Scholar and other sources as well.

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  ```

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Hands-on Exercise

- Register on Overleaf.com!
- Download the template files provided in a zip.
- Create a new project on Overleaf and upload the files to the project.

GOAL : Fill the template files to create a replica of the provided pdf file. Post your queries on : goo.gl/Lk3zxr

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Conclusion

- **Thanks** for attending!
- Write your projects in LaTeX from now on [Or atleast try!]
- Seek help from a vibrant helpful community [WikiLatex, StackExchange, etc].
- Resources:
  - `https://www.latex-project.org/get/`
  - `https://www.tug.org/begin.html`
  - `https://en.wikibooks.org/wiki/LaTeX`
  - `https://tex.stackexchange.com/`
- About me — `http://blogs.ntu.edu.sg/debjyoti001/`

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