Introduction to LaTeX
A document preparation system

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Prepared using LaTeX

LaTeX is a document preparation system
It helps you to:

- **typeset a document**
- **create ToC, table of figures, index, etc.**
- **create good-looking equations**
- **cite references properly and list them**
- **manage cross-references**

and more ...

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You prepare a text file and then compile it

LaTeX is really a set of macros for the TeX system created by Prof. Donald Knuth

LaTeX was created by Leslie Lamport

There are other similar systems also, such as ConTeXt, XeTeX and LuaTeX.

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Let us look at a sample document .....

Here is how we can write a simple LaTeX file:

```
\documentclass[a4paper,12pt]{article}

\begin{document}

The true spirit of delight, the exaltation, the sense of being
more than man, which is the touchstone of the highest excellence, is
to be found in Mathematics as surely as in poetry...

\end{document}
```

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The result will be a file called `mydoc.dvi`

The `.dvi` file can be converted to a postscipt or pdf file using simple commands.

Alternatively, we could simply do

```
pdflatex mydoc.tex
```

and get a pdf file.

A LaTeX document normally has two parts:

1. a preamble — what comes before the `\begin{document}` command
2. the body — what comes between `\begin{document}` and `\end{document}`

The preamble contains document specifications and list of packages used. Example:

```
\documentclass[a4paper,12pt]{article}
\usepackage[hmargin=1in,vmargin=1in]{geometry}
\usepackage{color}
\usepackage{graphicx}
\usepackage{fancyhdr}
\cfoot{}
\rhead{\thepage}
```

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For instance, the `geometry` package makes it easy to set margins:

```
\usepackage[vmargin=2cm,hmargin=1in]{geometry}
```

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- article
- report
- book
- letter
- beamer (for presentations)

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Each has its own features.

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command [options]{arguments}
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For example:

```
\includegraphics[scale]{path/filename}
```

Just as in a programming language, there are special characters in LaTeX too. These are:

\	backslash, used for commands
{}	braces, used for command arguments
%	percent, to mark comments
$	dollar sign, to denote math typesetting
^	math superscript
_	math subscript
&	ampersand, to separate columns in tables
#	hash, macro parameters
~	non-breaking space

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They cannot be used directly in the body

To get these characters in your LaTeX document, use:

To get:	Use:
\	\textbackslash
{}	\{ \}
%	\%
$	\$
^	\textasciicircum
_	_
&	\&
#	\#
~	\textasciitilde

LaTeX is especially good for structured documents. It supports commands like

- \part
- \chapter
- \section
- \subsection

depending on the documentclass

LaTeX uses *environments* for different purposes:

- `lists`
- `quotations`
- `figures`
- `tables`
- `equations`

Environments begin with a `\begin` command and end with an `\end` command:

```
\begin{tabular}{|r|l|p{3cm}|}
   \hline\hline\\
   & {\bf Planet} & {\bf Atmosphere}\\
   \hline \hline
   1 & Mercury & No atmosphere\\
   2 & Venus & Heavy atmosphere \\
   \hline\hline
\end{tabular}
```

This is how the table would look

No.	Planet	Atmosphere
1	Mercury	No atmosphere
2	Venus	Heavy atmosphere

Long Table

A table like this will not flow beyond a page

If you need a table that goes beyond a page,

you need to use a `longtable`

The Figure environment is another example:

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```
 \begin{figure}
\includegraphics[scale=scale]{\path\filename.ps}
\caption{This is the figure caption.}
\end{figure}
```

To insert a graphics file in your document, add the statement \usepackage{graphicx} in the preamble and use the command `pdflatex <filename>` to directly get a pdf file. In this case, you can use graphics files in different formats, such as jpeg, png, pdf, etc.

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MS Windows:

- WinEdit

This is just an introduction to basic LaTeX .

There is a lot more to learn

But, hopefully, you will find it interesting and convenient as we move on

In the next sessions, we will see how to create lists and boxes, prepare question papers and write mathematics in LaTeX like the statement:

Thus, $\lim_{x\to\infty} \int_0^x \frac{\sin x}{x} dx = \frac{\pi}{2}$ and so, by definition,

$$\int_0^\infty \frac{\sin x}{x} dx = \frac{\pi}{2}$$

Thank You
Merci
Danke
Grazie

This presentation was created using LaTeX . The source code can be obtained from the author (sasi.fsf@gmail.com).