## LaTeX session Basic Commands & Macros

January 25, 2017

Gowtham S. (SC13B020)

FOSS Group, IIST Indian Institute of Space Science and Technology Thiruvananthapuram





## System/Program info



Operating system: Xubuntu 16.0.1 LTS

MFX automator: latexmk 4.41

Text Editor: GNU Emacs 24.5.1

Beamer template: Aalborg University Beamer

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Comment

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Macros

## Outline



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## Comments



- % does the magic!
- ▶ To insert %, escape it with \
- ► Special characters needs escaping (#\$ & ...)
- ► How to insert \?

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## Comments



- % does the magic!
- ► To insert %, escape it with \
- ► Special characters needs escaping (#\$ & ...)
- ► How to insert \?

### \\Or\newline

- Single line break ≠ Single empty line
- ► Multiple empty lines ~ Single empty line
- ▶ Multiple spaces ~ Single space

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## itemize



itemize environment adds un-numbered 1 lists

```
\begin{itemize}
  \item Item no 2
  \item Item no 4
  \item Item no 1
  \item Item no 3
\end{itemize}
```

- ▶ Item no 2
- ▶ Item no 4
- ▶ Item no 1
- ▶ Item no 3

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<sup>&</sup>lt;sup>1</sup>Stuff put into unordered list

## itemize



itemize environment adds un-numbered 1 lists

```
\begin{itemize}
  \item Item no 2
  \item Item no 4
  \item Item no 1
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\end{itemize}
```

- ► Item no 2
- ▶ Item no 4
- ▶ Item no 1
- ▶ Item no 3

### \footnote

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<sup>&</sup>lt;sup>1</sup>Stuff put into unordered list

## enumerate



enumerate adds numbered <sup>2</sup> lists

```
\begin{enumerate}
  \item Item no 1
  \item Item no 2
  \item Item no 3
  \item Item no 4
\end{enumerate}
```

- 1. Item no 1
- 2. Item no 2
- 3. Item no 3
- 4. Item no 4

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<sup>&</sup>lt;sup>2</sup>Stuff put into ordered list

## **Inserting Figures**



Add the graphicx package

\includegraphics[scale = 0.1]{logo}



## Optional arguments

- ▶ scale
- width, height
- angle

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## Positioning figures



Use figure environment to make as floating elements

```
\begin{figure}[h]
  \includegraphics[width=8cm]{logo}
\end{figure}
```

### More control

- h Place the float here
- t Position at the top of the page
- b Position at the bottom of the page
- ! Override internal parameters
- H Place precisely here <sup>3</sup>

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<sup>&</sup>lt;sup>3</sup>required float package

## Labels, references



```
\begin{figure}[h]
  \includegraphics[scale=0.1]{logo}
  \caption{FOSS Group, IIST Logo}
  \label{fig: foss_logo}
\end{figure}
```



Figure: FOSS Group, IIST Logo

Figure \ref{fig: foss\_logo}

produces output: Figure 14

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<sup>&</sup>lt;sup>4</sup>invoke latex twice when using labels, refs

## Tabulating stuff



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

## Output:

1st column	2nd column	3rd column
а	b	С

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## Tabulating stuff



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

## **Output:**

1st column	2nd column	3rd column	
а	b	С	

## More control

Use table environment to get more control

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## Including codes



```
Add listings<sup>5</sup> package to the preamble
 \lstinputlisting[language=C++]{hello.cpp}
Output:
#include <iostream>
using namespace std;
int main(int argc, char const *argv()){
         cout<< "Hello world!!":
         return 0:
```

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<sup>&</sup>lt;sup>5</sup>Comes with colors and code styles too!



► Most important reason to use ATEX

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- ▶ Most important reason to use धा=X
- ▶ Use \$ to enter math mode. F=ma\$ produces F=ma

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- ▶ Most important reason to use धा=X
- ▶ Use \$ to enter math mode. \$F=ma\$ produces F = ma
- Use \$\$ for a math expression on its own line and centered

$$E = mc^2$$

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- ► Most important reason to use ŁAĘX
- ▶ Use \$ to enter math mode. \$F=ma\$ produces F = ma
- Use \$\$ for a math expression on its own line and centered

$$$E = m c^2$ produces$$

$$E = mc^2$$

► Look into equation, align environments<sup>6</sup>

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## More Math:(



► Greek letters: \alpha, \Alpha

► Fractions: \frac, \dfrac

► Series: \sum, \int

► Matrix: \bmatrix, \pmatrix

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## More Math:(



- ► Greek letters: \alpha, \Alpha
- ► Fractions: \frac.\dfrac
- ► Series: \sum, \int
- ► Matrix: \bmatrix, \pmatrix
- ► Spacing in math environment
  - \, thinspace
  - \: mediumspace
  - \; thickspace

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## Math Exercises:P



$$e^{\pm i\theta} = \cos\theta \pm i\sin\theta$$

$$\frac{\partial\rho}{\partial t} + \overrightarrow{\nabla} \cdot (\rho \overrightarrow{u}) = 0$$

$$g^{\mu\nu}R_{\mu\nu} - \frac{1}{2}g^{\mu\nu}g_{\mu\nu}R = \frac{8\pi G}{c^4}g^{\mu\nu}T_{\mu\nu}$$

$$\oint_C E \cdot d\ell = -\frac{d}{dt}\int_S B_n dA$$

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## Math Exercises:P



$$e^{\pm i\theta} = \cos\theta \pm i\sin\theta$$

$$\frac{\partial\rho}{\partial t} + \overrightarrow{\nabla} \cdot (\rho \overrightarrow{U}) = 0$$

$$g^{\mu\nu}R_{\mu\nu} - \frac{1}{2}g^{\mu\nu}g_{\mu\nu}R = \frac{8\pi G}{C^4}g^{\mu\nu}T_{\mu\nu}$$

Saviour: Math equations in Wikipedia articles are written in LaTeX

 $\oint_C E \cdot d\ell = -\frac{d}{dt} \int_c B_n dA$ 

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Macros newcommand

## Macros Inbuilt commands



```
\centering
\author{}
\dots
\small{},\large{},\Large{},\huge{},\Huge{}
\tableofcontents
\listoffigures
\textbf{}
\hspace{}
\pagebreak
\fbox{}
\include{}
\setlength\itemsep{}
```

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## Macros



\newcommand{name} [num] {definition}

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## Macros



```
\newcommand{name}[num] {definition}
```

## **Examples:**

```
\newcommand{\etal}{et al.}
```

\etal produces et al.

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## Macros \newcommand



\newcommand{name}[num]{definition}

## **Examples:**

\newcommand{\awesome}[1]{ #1 is Awesome stuff!!}

\awesome{\LaTeX} produces \text{MEX} is Awesome stuff!! \awesome{Linux} produces Linux is Awesome stuff!!

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## Macros \newenvironment



\newenvironment{name}[num]{before}{after}

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\newenvironment{name}[num]{before}{after}

## Example $^7$ :

```
\newenvironment{king}
{ \rule{1ex}{1ex}\hspace{\stretch{1}}} }
{ \hspace{\stretch{1}}\rule{1ex}{1ex} }
```

\begin{king} My humble subjects \ldots \end{king}

Output:

My humble subjects . . .

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Adopted from https://en.wikibooks.org/wiki/LaTeX/Macros

# Thank You!