

How to make a presentation with \LaTeX ?

Introduction to Beamer

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- \LaTeX (pronounced /'la:tɛx/, /'la:tɛk/, /'leitɛx/, or /'leitɛk/) (Wikipedia) is a computer program for typesetting text and mathematical formulas.
- Uses commands to create mathematical symbols.
- Not a WYSIWYG program. It is a WYWIWYG (what you want is what you get) program!
- The document is written as a source file using a markup language.
- The final document is obtained by compiling the source file.

Advantages of Using \LaTeX

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- Professional typesetting: Best output.
- It is the standard for scientific documents.
- Processing mathematical (& other) symbols.
- Meaning based structuring (rather than appearance).
- Knowledgeable and helpful user group.
- Its FREE!
- Platform independent.

Installing L^AT_EX

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- Linux:
 - 1 Install TeXLive from your package manager.
 - 2 Install a L^AT_EX editor of your choice: TeXstudio, TexMaker, etc.
- Windows:
 - 1 Install MikTeX from <http://miktex.org> (this is the L^AT_EX compiler).
 - 2 Install a L^AT_EX editor of your choice: TeXstudio, TeXnicCenter, etc.
- Mac OS:
 - 1 Install MacTeX (this is the L^AT_EX compiler for Mac).
 - 2 Install a L^AT_EX editor of your choice.

Structure of a \LaTeX Document

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All latex documents have the following structure:

```
\documentclass [... ]{...}  
\usepackage {...}  
  
\begin{document}  
...  
\end{document}
```

- Always begin with a backslash `\`: `\documentclass`, `\usepackage`.
- Case sensitive.
- Consist of letters only.
- Some have parameters.
- Square brackets `[]` after the command name are for optional parameters.
- Curly braces `{ }` after the command name are for required parameters

The Command: `\documentclass`

```
\documentclass [options]{ article  
report  
beamer }  
book  
letter  
...
```

- First line of all \LaTeX documents.
- Specifies the type of the document:
 - article: Research paper.
 - report: Multi-chapter document.
 - book: For books.
 - letter: For letters.
- **[options]** can be used to set font size (10, 11, or 12 pt), set paper size, use one or two columns, etc.
- Most science publishers (Springer, Elsevier, IEEE, ACM etc.) have their own document classes. These are predefined classes.

Packages

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```
\usepackage{package}
```

- Packages add new features and commands to LaTeX.
- Common packages:
 - amsmath, amssymb: for math symbols.
 - graphicx: for including graphics and images.
- Can also define new commands in the preamble, specify page numbering, etc.

Input the Text

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The body of the text is written after the `\begin{document}` command:

```
\begin{document}  
Enter the document content here  
\end{document}
```

Remark

`\begin{...}` commands always need to be followed (eventually) by `\end{...}` commands.

A Simple L^AT_EX Document

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The following is a very basic
L^AT_EX document:

```
\documentclass{article}  
\usepackage{graphicx}  
\begin{document}  
    This is some  
        sample text.  
\end{document}
```

This gives the following
output:

This is some sample text.

Sections of a Paper

First thing: you have to indicate the title and the author(s) of the paper:

```
\title{title}  
\author{authors}  
\date{date}  
\maketitle
```

Remark

Without `\maketitle`, the title and authors do not appear in the output.

Example

```
\title{The Theory of Relativity}  
\author{Albert Einstein}  
\date{01/01/1926}  
\maketitle
```

Sections of a Paper

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```
\thanks {...}  
\begin{abstract} .... \end{abstract}  
\begin{keywords} ... \end{keywords}
```

`\thanks` creates a footnote with whatever is in the braces.
Usually used after authors' names for academic information

Example

```
\thanks{I want to thank the University of Princeton  
for supporting this work.}  
\begin{abstract}  
In this paper, I introduce a new theory to explain  
how time and space are related.  
\end{abstract}  
\begin{keywords} Relativity; space; time \end{  
keywords}
```

A Simple L^AT_EX Document

The following is a sample L^AT_EX document:

```
\documentclass{article}
\usepackage{graphics,amsmath,amssymb}
\begin{document}
\title{The Theory of Relativity}
\author{Albert Einstien}
\date{01/01/1926}
\maketitle
\begin{abstract}
In this paper, I introduce a new theory to explain
...
\end{abstract}
\section{Introduction}
What is time and space?...
\section{The Theory}
Time and space are linked...
\subsection{Proof}
This the proof to my theory
\end{document}
```

Sections

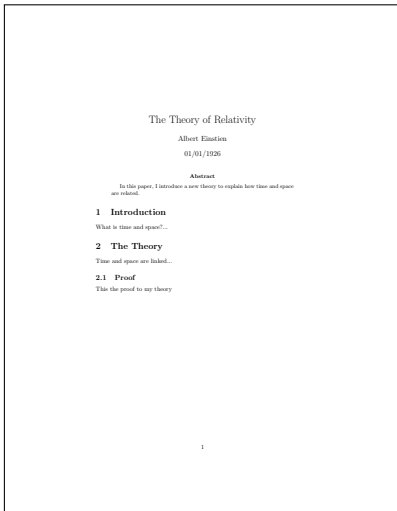
The document should be divided into sections, subsections, etc.
Important commands:

```
\section{Title of first section}  
...  
\subsection{...}  
...  
\section{Title of second section}  
...  
\subsection{...}  
...  
\subsubsection{...}  
...
```

\LaTeX formats the section titles and numbers them according to the document class being used.

A Simple L^AT_EX Document

This gives the following output:



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Cross-referencing

Cross references can be made using the commands `\label` and `\ref`.

Example

```
\section{Introduction}  
\label{sec:intro}  
This is the introduction ...  
\section{Conclusion}  
As mentioned in Section \ref{sec:intro}, we have ...
```

- \LaTeX updates the references automatically.
- It is possible to use any identifier as a label.
- It is custom to use the prefixes: `sec:xxx` for section labels, `fig:xxx` for figure labels, `chap:xxx` for chapter labels, `tab:xxx` for table labels, `eq:xxx` for equation labels.

Inserting Tables

To include tables, you must use the following commands.

Example

```
Table \ref{table_example}
      shows a table.
\begin{table}
\caption{An Example of a
         Table}
\label{table_example}
\centering
\begin{tabular}{|c|c|}
\hline Student & Grade \\
\hline 12 & 13 \\
\hline
\end{tabular}
\end{table}
```

Table 1 shows a table.

Table : An Example of a Table

Student	Grade
12	13

Inserting Images

To include images, you must use a graphics package. The most common is *graphicx*.

Example

```
Figure \ref{fig:monalisa}
      shows the painting.

\begin{figure}
\centering % To center
           the image
\includegraphics[width
                 =2.5cm]{monalisa.jpg}
           % Path and file name
\caption{The Monalisa}
\label{fig:monalisa}
\end{figure}
```

Figure 1 shows the painting.

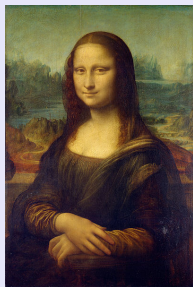


Figure : The Monalisa

Inserting Images

In general, a figure is included using:

```
\begin{figure}[options]
\centering
\includegraphics[options]{file name}
\caption{Figure title}
\label{label}
\end{figure}
```

- In `\begin{figure}[options]`, you can specify the position option:
 - 1 t: top of page.
 - 2 h: here.
 - 3 !: let the compiler decide.
 - 4 Any combination can be used.
- The compiler tries its best to fulfill your wish, but not necessarily.
- In `\includegraphics[options]`, you can specify the height, the width, the angle of rotation of the image.

Typesetting Mathematical Equations

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- Latex is extremely good at typesetting math equations.
- Equations are written as text.
- Inline equations (equations within the text) are written between $\$$ and $\$$.

Example

Code:

```
Assume that  $\backslash\alpha x + \backslash\beta y = 1$ , then
```

Output:

Assume that $\alpha x + \beta y = 1$, then

Typesetting Mathematical Equations

- Equations on a separate line are enclosed between `\[` and `\]`.

Example

Code:

```
Assume that :  
\[  
\alpha x + \beta y = 1,  
\]  
then ...
```

Output:

Assume that:

$$\alpha x + \beta y = 1,$$

then ...

Typesetting Mathematical Equations

- Numbered equations are written within the *equation* environment.

Example

Code:

```
Assume that:  
\begin{equation}  
\label{eq:my-equation} % <= The equation label  
\alpha x + \beta y = 1,  
\end{equation}  
then ...
```

Output:

Assume that:

$$\alpha x + \beta y = 1, \tag{1}$$

then ...

Typesetting Mathematical Equations

- To refer a numbered equation, use the command `\eqref`. The equation numbers are updated automatically.

Example

Code:

By using Equation `\eqref{eq:my-equation}`, we obtain:...

```
\begin{equation}
\label{eq:my-equation2}
\alpha x = 1 - \beta y.
\end{equation}
```

Output:

By using Equation (1), we obtain:

$$\alpha x = 1 - \beta y. \tag{2}$$

Using Graphical Equation Editors

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- The best way to write an equation is to write it directly as text: it is faster and you have more control.
- You can, however, use some graphical editors to help you write the equations until you master \LaTeX .
- Some \LaTeX editors (like TexStudio) offer some tool-bars with buttons that can help you write math symbols or even draw the math symbols (like the Math wizard in TexStudio).
- There are also online \LaTeX equation editors, for example: <http://www.codecogs.com/latex/eqneditor.php>.

Introduction to Beamer?

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- Beamer is a flexible \LaTeX class for making slides and presentations.
- It supports functionality for making PDF slides complete with colors, themes, transitions, overlays, etc.
- Adds a couple new features to the commands already you know about \LaTeX .
- This presentation was made using the Beamer class.

Why using \LaTeX for presentations?

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to Beamer

- Professional slides.
- Processing mathematical (& other) symbols.
- You care about the content and not about how the slides look.
- A lot of templates are available for download.
- Free.
- A lot of help.
- Easy to prepare handouts.

Installing the package Beamer

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If you want to prepare a presentation using LaTeX, you need to use Beamer package.

- Linux: Under Debian or Ubuntu, you can type the following command: **apt-get install latex-beamer**
- Windows: Click the MikTeX in your Windows "start menu" and then Maintenance. Then click on Package manager, look for Beamer and install it. You can also download it from here:
<https://bitbucket.org/rivanvx/beamer/downloads>
- Mac OS: Already installed in MacTex

Structure of a \LaTeX presentation

All latex presentations using Beamer have the following structure:

```
\documentclass{beamer}
\usepackage{graphicx} %include your packages here
\usetheme{Warsaw} %choose a theme:default ,Antibes ,
    Warsaw ...
\title[Introduction to Beamer]{How to make a
    presentation with LaTeX?}
\author{Hafida Benhidour}
\institute[Hafida Benhidour]{Department of computer
    science\\King Saud University}
\date{November 17, 2014}
\begin{document}

%Insert the slides here
.....
\end{document}
```

How to add the title slide?

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```
\documentclass{beamer}
\usepackage{graphicx}
\usetheme{Warsaw}
\title[Introduction to Beamer]{How to make a
  presentation with LaTeX?}
\author{Hafida Benhidour}
\institute[KSU]{Department of computer science\\King
  Saud University}
\date{November 17, 2014}
\begin{document}
%Insert the first slide containing the title of the
  presentation
\begin{frame}
\titlepage
\end{frame}
.....
\end{document}
```

How to add the title slide?

Output

How to make a presentation with LaTeX?

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King Saud University

November 17, 2014



How to add a slide?

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```
.....  
\begin{frame}{Title of your slide}  
this is an example  
\end{frame}  
.....
```

Output



How to add a bulleted list?

Add a list environment between the command `\begin{frame}` followed by the title of the slide and the command `\end{frame}`.

```
\begin{itemize}
\item This is the first point
\item This is the second point
\end{itemize}
```

Output

- This is the first point
- This is the second point

How to animate a bulleted list?

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Add `\pause` before each item.

```
\begin{itemize}
\pause
\item This is the first point
\pause
\item This is the second point
\end{itemize}
```

Output

How to animate a bulleted list?

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Add `\pause` before each item.

```
\begin{itemize}
\pause
\item This is the first point
\pause
\item This is the second point
\end{itemize}
```

Output

- This is the first point

How to animate a bulleted list?

Add `\pause` before each item.

```
\begin{itemize}
\pause
\item This is the first point
\pause
\item This is the second point
\end{itemize}
```

Output

- This is the first point
- This is the second point

How to add a numbered list?

Add a list environment between the command `\begin{frame}` followed by the title of the slide and the command `\end{frame}`.

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

Output

- 1 This is the first point
- 2 This is the second point

How to animate a numbered list?

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Add `\pause` before each item.

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

Output

How to animate a numbered list?

Add `\pause` before each item.

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

Output

- 1 This is the first point

How to animate a numbered list?

Add `\pause` before each item.

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

Output

- 1 This is the first point
- 2 This is the second point

Another way to create pauses

This method works for both bulleted and numbered lists.

```
\begin{itemize}  
\item<3-> This is the first point  
\item<2-> This is the second point  
\item<1-> This is the third point  
\end{itemize}
```

Output

- This is the third point

Another way to create pauses

This method works for both bulleted and numbered lists.

```
\begin{itemize}
\item<3-> This is the first point
\item<2-> This is the second point
\item<1-> This is the third point
\end{itemize}
```

Output

- This is the second point
- This is the third point

Another way to create pauses

This method works for both bulleted and numbered lists.

```
\begin{itemize}  
\item<3-> This is the first point  
\item<2-> This is the second point  
\item<1-> This is the third point  
\end{itemize}
```

Output

- This is the first point
- This is the second point
- This is the third point

How to add a text area?

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Useful if you need to add a definition for example.

```
\begin{block}{Definition}  
Write the definition here.  
\end{block}
```

Definition

Write the definition here.

Dividing the slide into two parts

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Good for displaying a text on one side and a picture on the other.

Here is the displayed equation:

$$f(x) = 2x^3 - 7x + 3$$

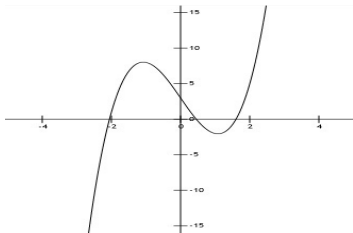


Figure : Equation plot

Dividing the slide into two parts

Use `\begin{columns}` with corresponding end for the columns environment. Use `\begin{column}` with corresponding end to make the individual columns.

```
\begin{frame}{Dividing the slide into two parts}
\begin{columns}
\begin{column}{0.5\textwidth}
Here is the displayed equation: 
$$f(x)=2x^3-7x+3$$

\end{column}
\begin{column}{0.5\textwidth}
\begin{figure}
\includegraphics[width=0.7\linewidth,height=3cm]{./equaplot}
\caption{Equation plot}
\end{figure}
\end{column}
\end{columns}
\end{frame}
```

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Introduction to \LaTeX

- ▶ LaTeX is a computer program for typesetting text and mathematical formulas.
- ▶ Uses commands to create mathematical symbols.
- ▶ Not a WYSIWYG program. It is a WYWIWYG (what you want is what you get) program!
- ▶ The document is written as a source file using a markup language (like HTML).
- ▶ The final document is obtained by compiling the source file.

Advantages of Using \LaTeX

- ▶ Professional typesetting: Best output.
- ▶ It is the standard for scientific documents.
- ▶ Processing mathematical (& other) symbols.
- ▶ Meaning based structuring (rather than appearance).
- ▶ Knowledgeable and helpful user group.
- ▶ Its FREE!
- ▶ Platform independent.

Handouts

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In the beginning of your latex document add the handout option and use the theme **default**.

To print several pages use the package **pgfpages**.

```
\documentclass[handout]{beamer}  
\usetheme{default}  
\usepackage{pgfpages}  
\pgfpagesuselayout{4 on 1}[border shrink=2mm]
```


- Forums.
- en.wikibooks.org, search for the command that you do not know how to use it, you will find a lot of examples.