LaTeX

A Hands-On Session

Nov 7, 2019

Hello World!

Figure 1: This will be today's first LaTeX output

Hello World!

Our first document

```
\documentclass{article}

\begin{document}
Hello World
\end{document}
```

Using any text editor of your choice, save the above lines in a file named '*sample.tex*'.

Hello World!

Our first document

```
\documentclass{article}

\begin{document}
Hello World
\end{document}
```

Using any text editor of your choice, save the above lines in a file named *'sample.tex'*.

```
pdflatex sample.tex
```

The above command will output a .pdf file

Hands-on

Create a folder 'handson1'

Create your own 'Hello World!' Latex document and compile it.

Document Class

First line of the *Hello World!* LaTeX program:

```
\documentclass{article}
```

Document Class

First line of the *Hello World!* LaTeX program:

```
\documentclass{article}
```

Base LaTeX offers four types of document classes.

```
book
report
article
letter
```

For each class, LaTeX provides a class file which can be loaded via the *documentclass* command at the top of the document.

Let's give it a title!

LaTeX Tutorial

Hello World

Let's give it a title!

```
\documentclass{article}
\title{LaTeX Tutorial}
```

Let's give it a title!

```
\documentclass{article}
\title{LaTeX Tutorial}


\begin{document}
    \maketitle
    Hello World
\end{document}
```

Some more information…

```
\documentclass{article}
\title{LaTeX Tutorial}
\author{Devi}
\date{\today}
```

Some more information...

```latex
\documentclass{article}
\title{LaTeX Tutorial}
\author{Devi}
\date{\today}

\begin{document}
    \maketitle
    Hello World
\end{document}
```

Create a new folder 'handson2'

Create a LaTeX document using the 'report' document class; add title, author names and date.

Do you see a difference between 'report' and 'article' document classes?

Let's add content to our document

Chapter 1

Introduction

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

Nulla malesuada porttitor diam. Donec felis erat, congue non, volutpat at, tincidunt tristique, libero. Vivamus viverra fermentum felis. Donec nonummy pellentesque ante. Phasellus adipiscing semper elit. Proin fermentum massa ac quam. Sed diam turpis, molestie vitae, placerat a, molestie nec, leo. Maecenas lacinia. Nam ipsum ligula, eleifend at, accumsan nec, suscipit a, ipsum. Morbi blandit ligula feugiat magna. Nunc eleifend consequat lorem. Sed lacinia nulla vitae enim. Pellentesque tincidunt purus vel magna. Integer non enim. Praesent euismod nunc eu purus. Donec bibendum quam in tellus. Nullam cursus pulvinar lectus. Donec et mi. Nam vulputate metus eu enim. Vestibulum pellentesque felis eu massa.

Quisque ullamcorper placerat ipsum. Cras nibh. Morbi vel justo vitae lacus tincidunt ultrices. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. In hac habitasse platea dictumst. Integer tempus convallis augue. Etiam facilisis. Nunc elementum fermentum wisi. Aenean placerat. Ut imperdiet, enim sed gravida sollicitudin, felis odio placerat quam, ac pulvinar orci magna sed pede. Nunc vitae tortor. Proin tempus nibh sit amet nisl. Vivamus quis tortor vitae risus porta vehicula.

1

Chapter 2

Explanation

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

2.1 Part 1

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetuer id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

2

Chapter 3

Experiments and Results

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

3.1 Experiment 1

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

3.1.1 Results

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetuer id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue

4

Let's add content to our document

```
\documentclass{report}
\title{LaTeX Tutorial}
\begin{document}
    \maketitle
    \chapter{Introduction}
    This chapter introduces the report content.
```

Let's add content to our document

```
\documentclass{report}
\title{LaTeX Tutorial}
\begin{document}
    \maketitle
    \chapter{Introduction}
    This chapter introduces the report content.

    \chapter{Explanation}
    This chapter explains the idea in detail
        \section{Part 1}
        Some content here.
```

Let's add content to our document

```latex
\documentclass{report}
\title{LaTeX Tutorial}
\begin{document}
    \maketitle
    \chapter{Introduction}
    This chapter introduces the report content.

    \chapter{Explanation}
    This chapter explains the idea in detail
        \section{Part 1}
        Some content here.

    \chapter{Experiments and Results}
    This chapter discusses the experiments and results.
        \section{Experiment 1}
        Details about the first experiment goes here.
            \subsection{Results}
    \chapter{Conclusion}This chapter concludes the report.
\end{document}
```

Create a folder 'handson3' and copy the earlier documents to it.

Add chapters, sections and subsections to your report document.

Can we keep the document modular?

From

```
sample.tex
```

To

```
main.tex
introduction.tex
chapter1.tex
chapter2.tex
conclusion.tex
```

Can we keep the document modular?

Contents of the file 'main.tex'

```
\documentclass{report}
\title{LaTeX Tutorial}
\begin{document}
    \maketitle
    \input{introduction}
    \input{chapter1}
    \input{chapter2}
    \input{conclusion}
\end{document}
```

Can we keep the document modular?

Contents of the file 'main.tex'

```
\documentclass{report}
\title{LaTeX Tutorial}
\begin{document}
    \maketitle
    \input{introduction}
    \input{chapter1}
    \input{chapter2}
    \input{conclusion}
\end{document}
```

Contents of the file 'introduction.tex'

```
\chapter{Introduction}
This chapter introduces the report content.
```

Can we keep the document modular?

Contents of the file 'main.tex'

```
\documentclass{report}
\title{LaTeX Tutorial}
\begin{document}
    \maketitle
    \input{introduction}
    \input{chapter1}
    \input{chapter2}
    \input{conclusion}
\end{document}
```

Contents of the file 'introduction.tex'

```
\chapter{Introduction}
This chapter introduces the report content.
```

Similarly, create *chapter1.tex, chapter2.tex* and *conclusion.tex.*
No separate preamble or \begin{document} in these files.

Create a folder 'handson4' and copy the earlier documents to it.

Make your report modular.

Part 1

- Typography, Fonts
- Ordered, Unordered Lists
- Images
- Tables
- Labels and References

`\textbf{boldface text}`

becomes

boldface text

Some font options…

Font Style	LaTeX command
Emphasize	\emph{Emphasize}

Some font options…

Font Style	LaTeX command
Emphasize	\emph{Emphasize}
Italic	\textit{Italic}
SMALLCAPS	\textsc{SmallCaps}
Bold	\textbf{Bold}
Bold Italic	\textbf{\textit{Bold Italic}}
BOLD SMALLCAPS	\textbf{\textsc{Bold SmallCaps}}

Some font options…

Font Style	LaTeX command
Emphasize	\emph{Emphasize}
Italic	\textit{Italic}
SMALLCAPS	\textsc{SmallCaps}
Bold	\textbf{Bold}
Bold Italic	\textbf{\textit{Bold Italic}}
BOLD SMALLCAPS	\textbf{\textsc{Bold SmallCaps}}
Footnote Size	\footnotesize{Footnote Size}
Small	{\small Small}
large	{\large large}
Large	{\Large Large}
LARGE	{\LARGE LARGE}
huge	{\huge huge}
Huge	{\Huge Huge}

Create a folder 'handson5' and copy the earlier documents to it.

Play with the font options.

Lists

Items

- Milk
- Eggs
- Potatos

Lists

Items
- Milk
- Eggs
- Potatos

Enumerations
1. First,
2. Second,
3. Last.

Lists

Items	Enumerations	Descriptions
• Milk	1. First,	**Table** A type of furniture.
• Eggs	2. Second,	**Plate** A type of utensil.
• Potatos	3. Last.	**Pencil** A stationary item.

Unordered List

- Milk

- Eggs

- Potatos

```
\begin{itemize}
  \item Milk
  \item Eggs
  \item Potatos
\end{itemize}
```

Ordered List using the environment Enumerate

Ordered List

1. First,
2. Second,
3. Last.

Ordered List

```
\begin{enumerate}
  \item First,
  \item Second,
  \item Last.
\end{enumerate}
```

A list of descriptions using the environment Description

Descriptions

      Table A type of furniture.

      Plate A type of utensil.

    Pencil A stationary item.

```
\begin{description}
    \item[Table] A type of furniture.
    \item[Plate] A type of utensil.
    \item[Pencil] A stationary item.
\end{description}
```

Create a folder 'handson6' and copy the earlier documents to it.

List down three of your favourite food items using
`itemize,` `enumerate` and `description`.

Figure 2: Donald Knuth, creator of TeX

Figures

```
\begin{figure}
    \includegraphics[width=0.5\textwidth]{./knuth.jpg}
    \caption{Donald Knuth, creator of TeX}
\end{figure}
```

Labels and References

```
\begin{figure}
    \includegraphics[width=0.5\textwidth]{./knuth.jpg}
    \caption{Donald Knuth, creator of TeX}
    \label{fig:knuth}
\end{figure}
```

`\label` should always come after `\caption`.

```
\begin{figure}
    \includegraphics[width=0.5\textwidth]{./knuth.jpg}
    \caption{Donald Knuth, creator of TeX}
    \label{fig:knuth}
\end{figure}
```

`\label` should always come after `\caption`.
`\label{knuth}` is also a valid label… 'fig:' is used as a good naming convention.

```
\begin{figure}
    \includegraphics[width=0.5\textwidth]{./knuth.jpg}
    \caption{Donald Knuth, creator of TeX}
    \label{fig:knuth}
\end{figure}
```

\label should always come after \caption.
\label{knuth} is also a valid label... 'fig:' is used as a good naming convention.

How to refer to a figure by its label?

```
\begin{figure}
    \includegraphics[width=0.5\textwidth]{./knuth.jpg}
    \caption{Donald Knuth, creator of TeX}
    \label{fig:knuth}
\end{figure}
```

\label should always come after \caption.
\label{knuth} is also a valid label... 'fig:' is used as a good naming convention.

How to refer to a figure by its label?
Figure \ref{fig:knuth} is that of Donald Knuth.

```
\begin{figure}
    \includegraphics[width=0.5\textwidth]{./knuth.jpg}
    \caption{Donald Knuth, creator of TeX}
    \label{fig:knuth}
\end{figure}
```

\label should always come after \caption.
\label{knuth} is also a valid label… 'fig:' is used as a good
naming convention.

How to refer to a figure by its label?
Figure \ref{fig:knuth} is that of Donald Knuth.

                         becomes

Figure 1 is that of Donald Knuth.

Create a folder 'handson7' and copy the earlier documents to it.

Include your image in the LaTeX document using the `figure` environment.

Give your figure a fitting caption using `\caption`.

Label your figure using `\label`.

Refer to your image by its label using `\ref` and write few lines about it.

Tables

Table 1: Largest cities in the world (source: Wikipedia)

City	Population
Mexico City	20,116,842
Shanghai	19,210,000
Peking	15,796,450
Istanbul	14,160,467

Tables

```
\begin{table}
\caption{Largest cities in the world (src: Wikipedia)}
    \begin{tabular}{ll}
        \hline
        City        &   Population\\
        \hline

        Mexico City &   20,116,842\\
        Shanghai    &   19,210,000\\
        Peking      &   15,796,450\\
        Istanbul    &   14,160,467\\
        \hline
    \end{tabular}
\end{table}
```

```
\begin{table}
    \begin{tabular}{cc}
        ... & ...
    \end{tabular}
    \caption{A dummy table}
    \label{tab:dummy}
\end{table}
```

`\label` should always come after `\caption`.

```
\begin{table}
    \begin{tabular}{cc}
        ... & ...
    \end{tabular}
    \caption{A dummy table}
    \label{tab:dummy}
\end{table}
```

\label should always come after \caption.
\label{dummy} is also a valid label... 'tab:' is used as a good naming convention.

```
\begin{table}
    \begin{tabular}{cc}
        ... & ...
    \end{tabular}
    \caption{A dummy table}
    \label{tab:dummy}
\end{table}
```

`\label` should always come after `\caption`.
`\label{dummy}` is also a valid label... 'tab:' is used as a good naming convention.

How to refer to a table by its label?

```
\begin{table}
    \begin{tabular}{cc}
        ... & ...
    \end{tabular}
    \caption{A dummy table}
    \label{tab:dummy}
\end{table}
```

`\label` should always come after `\caption`.
`\label{dummy}` is also a valid label... 'tab:' is used as a good naming convention.

How to refer to a table by its label?
Table `\ref{tab:dummy}` is a dummy table.

How to label a section?

How to label a section?

```
\section{Introduction \label{sec:intro}}
```

Referring to a section..

How to label a section?

```
\section{Introduction \label{sec:intro}}
```

Referring to a section..

Section `\ref{sec:intro}` introduces the proposed method.

Create a folder 'handson8' and copy the earlier documents to it.

Tabulate the roll numbers and names of 5 students using the `table` environment.

Give your table a fitting caption using `\caption`.

Label your table using `\label`.

Refer to your table by its label using `\ref` and write few lines about it.

- Math
- Packages
- Citations and Bibliography

Inline Math Usage

"This report discusses the function $y = x$ and its properties."

Inline Math Usage

"This report discusses the function $y = x$ and its properties."

```
This report discusses the function $ y=x $ and
its properties
```

`$..$` marks the beginning and end of the inline math environment.

Inline Math Usage

"The next function to be discussed is $y = x^2$."

Inline Math Usage

"The next function to be discussed is $y = x^2$."

```
The next function to be discussed is $ y=x^2 $.
```

Math

Math Equation

This report discusses the below equation.

$$y = x^2 \tag{1}$$

Math Equation

This report discusses the below equation.

$$y = x^2 \tag{1}$$

```
This report discusses the below equation.
\begin{equation}
    y= x^2
\end{equation}
```

Math

Math Equation

This report discusses the below equation.

$$y = x^2 \tag{1}$$

```
This report discusses the below equation.
\begin{equation}
    y= x^2
\end{equation}
```

Math Equation

This report discusses the below equation.

$$y = x^2$$

Math

Math Equation

This report discusses the below equation.

$$y = x^2$$

```
This report discusses the below equation.
\begin{equation*}
    y= x^2
\end{equation*}
```

Math

Math Equation

This report discusses the below equation.

$$y = x^2$$

```
This report discusses the below equation.
\begin{equation*}
    y= x^2
\end{equation*}
```

equation* suppresses the numbering.

Math Equation

Equation 2 demonstrates how to write fractions in LaTeX.

$$y = \frac{1}{x} \tag{2}$$

Math Equation

Equation 2 demonstrates how to write fractions in LaTeX.

$$y = \frac{1}{x} \tag{2}$$

```
Equation \ref{eq:xsquare} demonstrates how to write fractions

\begin{equation}
    y= \frac{1}{x}
    \label{eq:frac}
\end{equation}
```

Math

An example to inspire the use of LaTeX for mathematical writing.

$$\text{Value of } e = \lim_{n \to \infty} \left(1 + \frac{1}{n}\right)^n$$

Math

An example to inspire the use of LaTeX for mathematical writing.

$$\text{Value of } e = \lim_{n \to \infty} \left(1 + \frac{1}{n} \right)^n$$

```
\begin{equation}
    \mbox{Value of} e = \lim_{n \to \infty} \left(1
                        + \frac{1}{n} \right)^n
\end{equation}
```

Math

An example to inspire the use of LaTeX for mathematical writing.

$$\text{Value of } e = \lim_{n \to \infty} \left(1 + \frac{1}{n}\right)^n$$

```
\begin{equation}
    \mbox{Value of} e = \lim_{n \to \infty} \left(1
                      + \frac{1}{n} \right)^n
\end{equation}
```

Symbol	LaTeX command
Text inside equations	\mbox
$\to$	\to
∞	\infty
(	\left(
$\frac{1}{n}$	\frac{1}{n}
x^n	x^n

Math

Equation array using `eqnarray`. No need to include any packages. Comes with base LaTeX.

$$\begin{eqnarray}
(x+y)^3 & = & (x+y)(x+y)^2 \\
& = & (x+y)(x^2+2xy+y^2) \\
& = & x^3+3x^2y+3xy^3+x^3.
\end{eqnarray}$$

(3)

(4)

(5)

Math

Equation array using **eqnarray**. No need to include any packages. Comes with base LaTeX.

$$
\begin{array}{rcl}
(x+y)^3 & = & (x+y)(x+y)^2 \qquad\qquad (3)\\
        & = & (x+y)(x^2+2xy+y^2) \qquad (4)\\
        & = & x^3+3x^2y+3xy^3+x^3. \qquad\quad (5)
\end{array}
$$

```
\begin{eqnarray}
    (x+y)^3 &=& (x+y)(x+y)^2          \\
            &=& (x+y)(x^2+2xy+y^2)  \\
            &=& x^3+3x^2y+3xy^3+x^3.
\end{eqnarray}
```

Math

Equation array using `align`. Must include
`\usepackage{amsmath}`.

$$
\begin{align}
(x+y)^3 &= (x+y)(x+y)^2 \\
&= (x+y)(x^2 + 2xy + y^2) \\
&= x^3 + 3x^2y + 3xy^3 + x^3.
\end{align}
$$

Math

Equation array using `align`. Must include
`\usepackage{amsmath}`.

$$
\begin{align}
(x+y)^3 &= (x+y)(x+y)^2 \tag{6} \\
&= (x+y)(x^2 + 2xy + y^2) \tag{7} \\
&= x^3 + 3x^2y + 3xy^3 + x^3. \tag{8}
\end{align}
$$

```
\begin{align}
    (x+y)^3 &= (x+y)(x+y)^2           \\
            &= (x+y)(x^2+2xy+y^2)  \\
            &= x^3+3x^2y+3xy^3+x^3.
\end{align}
```

Create a folder 'handson9' and copy the earlier documents to it.

Try the following:

Let a and b be two variables. Then $(a+b)^2$ can be calculated as follows:

$$
\begin{eqnarray}
(a+b)^2 &=& (a+b)(a+b) \\
&=& a^2 + ab + ba + b^2 \\
&=& a^2 + 2ab + b^2
\end{eqnarray}
$$

(9)
(10)
(11)

```
Let $a$ and $b$ be two variables. Then $(a+b)^2$ can be
calculated as follows:

\begin{eqnarray}
(a+b)^2 &=& (a+b)(a+b) \\
        &=& a^2 + ab + ba + b^2 \\
        &=& a^2 + 2ab + b^2
\end{eqnarray}
```

Packages

`https://www.ctan.org/pkg/`

Some packages...
graphicx
amsmath
amsfonts
hyperref
beamer
tikz
geometry
xcolor
pgfplots
subfigure
natbib

Package amsmath

```
\usepackage{amsmath}
```

$$
\begin{matrix} a & b \\ c & d \end{matrix} \quad
\begin{pmatrix} a & b \\ c & d \end{pmatrix} \quad
\begin{bmatrix} a & b \\ c & d \end{bmatrix} \quad
\begin{vmatrix} a & b \\ c & d \end{vmatrix} \quad
\begin{Vmatrix} a & b \\ c & d \end{Vmatrix}
$$

Package amsmath

```
\usepackage{amsmath}

\begin{matrix}
a & b \\
c & d
\end{matrix}
```

$$\begin{matrix} a & b \\ c & d \end{matrix}$$

```
\begin{pmatrix}
a & b \\
c & d
\end{pmatrix}
```

$$\begin{pmatrix} a & b \\ c & d \end{pmatrix}$$

```
\begin{bmatrix}
a & b \\
c & d
\end{bmatrix}
```

$$\begin{bmatrix} a & b \\ c & d \end{bmatrix}$$

Package amsmath

```
\usepackage{amsmath}

\begin{vmatrix}
a & b \\
c & d
\end{vmatrix}

\begin{Vmatrix}
a & b \\
c & d
\end{Vmatrix}
```

$$\begin{vmatrix} a & b \\ c & d \end{vmatrix}$$

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To get started with TikZ we need to load up the tikz package:

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\usepackage{tikz}
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\end{tikzpicture}
```

Nice tutorial for beginners here:

```
https://www.overleaf.com/learn/latex/LaTeX_Graphics_using_TikZ:
_A_Tutorial_for_Beginners_(Part_1)%E2%80%94Basic_Drawing
```

Instead of WYSIWYG editors, typesetting systems like TeX[1] or LaTeX [2] can be used.

References

[1] Paul W. Abrahams, Kathryn A. Hargreaves, and Karl Berry. $T_EX$for the Impatient, 2003.

[2] Leslie Lamport. $\text{\LaTeX}$: A Document Preparation System. Addison Wesley, second edition, 1994.

Citations and Bibliography

Get the *bibTeX* entries for the references.

```
@book{golumbic2004algorithmic,
        title={Algorithmic graph theory and perfect grap
        author={Golumbic, Martin Charles},
        volume={57},
        year={2004},
        publisher={Elsevier}
}
```

You can use *bibtex generators, google scholar, dblp, etc* to get the above file.

Create a *.bib* file with the bibTeX entries.

Citations and Bibliography

```
\documentclass{report}
\usepackage{biblatex}
\begin{document}
    \section{Introduction}
    A good introduction to graph algorithms can be
    found in \cite{golumbic2004algorithmic}.
    ....
```

Citations and Bibliography

```
\documentclass{report}
\usepackage{biblatex}
\begin{document}
    \section{Introduction}
    A good introduction to graph algorithms can be
    found in \cite{golumbic2004algorithmic}.
    ....

    \bibliographystyle{plain}
    \bibliography{ref}
\end{document}
```

We assume that your bibliography file is *ref.bib*. To Compile:

```
pdflatex -> bibtex -> pdflatex -> pdflatex
```

Create a folder 'handson10' and copy the earlier documents to it.

Create a .bib file with a single bibTeX entry

Cite it and write a few lines in the main LaTeX document.

Overleaf

Standalone LaTeX Editors

TeXmaker

TeXStudio

TeXShop

Lyx

TeXpen

Gummi

…

Advanced

Macros - user defined short-hands for complex LaTeX formulas

Beamer - package to create LaTeX presentations

pgfplots - package for creating graphs, figures, etc