Outline
Types of documents
Basic formatting in LaTex
Detail formatting in LaTex

Tutorial on
Document Preparation in LaTeX

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Outline
Types of documents
Basic formatting in LaTex
Detail formatting in LaTex

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Types of document prepared in LaTex

1. Article

2. Report

3. Letter

4. Book

5. Presentation

6. Lecture

We will discuss some formatting codes here.

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4. Book
5. Presenatation
6. Others.

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Creating title page of an article

```latex
\documentclass{article}
\title{Introduction to Latex}
\author{Name of the Author}
\date{\today}
\begin{document}
\maketitle   %It will be including title info into
the document. Check for report also
\end{document}
\begin{comment}
    The title page can also be created by
    \begin{titlepage}
    content...
    \end{titlepage}
\end{comment}
```

Figure: Creating title page

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Creating title page contd...

Introduction to Latex

Name of the Author

March 16, 2019

Figure: Creating title page

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Article with one column

```
\documentclass{article}
\begin{document}
    \begin{center}
        \textbf{Content with center aligned}
    \end{center}
LaTeX is a document preparation system and document markup
language. LaTeX uses the TeX typesetting program for
formatting its output, and is itself written in the TeX
macro language. LaTeX is not the name of a particular
editing program, but refers to the encoding or tagging
conventions that are used in LaTeX documents
\end{document}

%\par used for create new paragraph
%\begin{flushleft} \end{flushleft}
%\begin{flushleft} \end{flushleft}
```

Figure: Article with One column

Article with one column contd...

Content with center aligned

LaTeX is a document preparation system and document markup language. La-
TeX uses the TeX typesetting program for formatting its output, and is itself
written in the TeX macro language. LaTeX is not the name of a particular edit-
ing program, but refers to the encoding or tagging conventions that are used in
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Figure: Article with One column

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Paragraph indentation

```
\documentclass{article}
\begin{document}
    \begin{center}
        Paragraph Indentation
    \end{center}

    \setlength{\parindent}{10ex}This is the text in first
    paragraph. This is the text in first paragraph. This is the
    text in first paragraph. \par
    \noindent %The next paragraph is not indented
    This is the text in second paragraph. This is the text in
    second paragraph. This is the text in second paragraph.

\end{document}

%\setlength{\parskip}{1em}   determines space between paragraph
and preceeding text
```

Figure: Paragraph Indentation

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Paragraph indentation contd...

Paragraph Indentation

This is the text in first paragraph. This is the text in first paragraph. This is the text in first paragraph.

This is the text in second paragraph. This is the text in second paragraph. This is the text in second paragraph.

Figure: Paragraph Indentation

Multi-column article

```
\documentclass{article}
\usepackage{multicol}
\begin{document}
    \begin{center}
        Multi Column Paragraphs
    \end{center}
    \emph{Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor
    incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud
    exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor
    in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur
    sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est
    laborum.}
\begin{multicols}{2}
        Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor
        incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud
        exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure
        dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur.
        Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt
        mollit anim id est laborum.Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed
        do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam,
        quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis
        aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla
        pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia
        deserunt mollit anim id est laborum.
\end{multicols}

\end{document}
```

Figure: Multi column Paragraph

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Multi-column article contd...

Multi Column Paragraphs

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Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

Figure: Multi-column Paragraph

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Inserting list to the article

```
\documentclass{article}
\usepackage{multicol}
\begin{document}
    \begin{center}
        \textbf{Inserting list in the paragraphs}
    \end{center}
    Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod
    tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim
    veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea
    commodo consequat. Duis aute irure dolor in reprehenderit in voluptate
    velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat
    cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id
    est laborum.
    \paragraph{List in the document}
    \begin{itemize}
        \item Item1
        \item Item2
        \begin{enumerate}
            \item Number1
            \item Number2
            \item Number3
        \end{enumerate}
    \end{itemize}
\end{document}
```

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List formatting
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Section formatting

Inserting list to the article contd...

Inserting list in the paragraphs

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

List in the document

- Item1

- Item2

  1. Number1
  2. Number2
  3. Number3

Figure: Inserting list to the article

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Inserting table to the article

```latex
\documentclass{article}
\usepackage{multicol}
\begin{document}
    \begin{center}
        \textbf{Inserting table in the paragraphs}
    \end{center}
    Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor
    incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud
    exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure
    dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla
    pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia
    deserunt mollit anim id est laborum.
    \paragraph{Table in the document}
    \begin{center}
        \begin{tabular}{| c | c | c |}
            \hline
            cell1 & cell2 & cell3 \\
            cell4 & cell5 & cell6 \\
            cell7 & cell8 & cell9  \\
            \hline
        \end{tabular}
    \end{center}
    Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex
    ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse
    cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non
    proident, sunt in culpa qui officia deserunt mollit anim id est laborum.
\end{document}
```

Figure: Inserting table to the article

Inserting table to the article contd...

Inserting table in the paragraphs

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

Table in the document

cell1	cell2	cell3
cell4	cell5	cell6
cell7	cell8	cell9

Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

Figure: Inserting table to the article

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Inserting table to the multi-column article

```
\documentclass{article}
\usepackage{multicol}
\begin{document}
    \begin{center}
        \textbf{Inserting table in the paragraph with multiple column}
    \end{center}
    Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor
    incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud
    exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. est laborum.
    \begin{multicols}{2}
    \paragraph{Table in the document}
    Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex
    ea commodo consequat.
    \begin{center}
        \begin{tabular}{| c | c | c |}
            \hline
            cell1 & cell2 & cell3 \\
            cell4 & cell5 & cell6 \\
            cell7 & cell8 & cell9 \\
            \hline
        \end{tabular}
    \end{center}
    Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex
    ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse
    cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non
    proident, sunt in culpa qui officia deserunt mollit anim id est laborum.
\end{multicols}
\end{document}
```

Figure: Inserting table to the multi-column article

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Inserting table to the multi-column article contd...

Inserting table in the paragraph with multiple column

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. est laborum.

Table in the document Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.

cell1	cell2	cell3
cell4	cell5	cell6
cell7	cell8	cell9

Ut enim ad minim veniam, quis nos-

trud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

Figure: Inserting table to the multi-column article

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Table spreading multi-column in an article

```latex
\documentclass{article}
\usepackage{multicol}
\begin{document}
    \begin{center}
        \textbf{Inserting table spreading multiple columns}
    \end{center}
    Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor
    incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud
    exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. est laborum.
    \begin{multicols}{2}
    \paragraph{Table in the document}
        \begin{table*}[t]
            \caption{Wide single-column table in a twocolumn document.}
            \centering
            \begin{tabular}{p{0.25\linewidth}p{0.25\linewidth}p{0.25\linewidth}}
                \hline
                column 1 & column 2 & column 3\\
                \hline
                cell 1 & cell 2 & cell 3\\
                cell 1 & cell 2 & cell 3\\
                \hline
            \end{tabular}
        \end{table*}
    Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip
    ex ea commodo consequat. Lorem ipsum dolor sit amet, consectetur adipiscing elit,
    sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.\par Ut enim ad
    minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea
    commodo consequat. est laborum.
```

Figure: Table spreading multi-column in an article

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Table spreading multi-column in an article contd...

Table 1: Wide single-column table in a twocolumn document.

column 1	column 2	column 3
cell 1	cell 2	cell 3
cell 1	cell 2	cell 3

culpa qui officia deserunt mollit anim id est laborum.Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam,

ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et do-

Figure: Table spreading multi-column in an article

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List formatting
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Equation formatting
Section formatting

Inserting image in an article

```
\documentclass[11pt]{article}
\usepackage{multicol,graphicx}
\begin{document}
Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor
incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud
exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.Lorem ipsum dolor
sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et
dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris
nisi ut aliquip ex ea commodo consequat.Lorem ipsum dolor sit amet, consectetur
adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.
\begin{figure}[h] %h for here, t for top and b for bottom
    \centering
    \includegraphics[width =.75\linewidth]{parabola}
    \caption{Inserting image in the article}
\end{figure}
Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor
incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud
exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.Lorem ipsum dolor
sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et
dolore magna aliqua.

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor
```

Figure: Inserting image in an article

Inserting image in an article contd...

ea commodo consequat.Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod
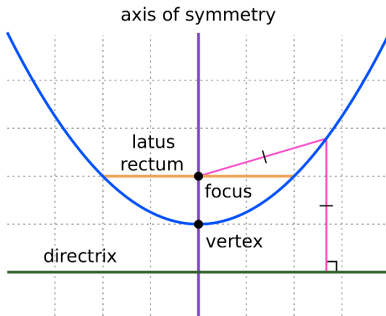
axis of symmetry

latus
rectum

focus

vertex

directrix

Figure 1: Inserting image in the article

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Section formatting

Inserting image in a two-column article

```
\documentclass[11pt,twocolumn]{article}
\usepackage{multicol,graphicx}

\begin{document}
Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor
incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud
exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.Lorem ipsum dolor
sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et
dolore magna aliqua.
\begin{figure}[h] %h for here, t for top and b for bottom
    \centering
    \includegraphics[width =.75\linewidth]{parabola}
    \caption{Image spreading one column of the article}
\end{figure}
Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor
incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud
exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.Lorem ipsum dolor
sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et
```

Figure: Inserting image in a two-column article

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Inserting image in a two-column article contd...

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Lorem ipsum

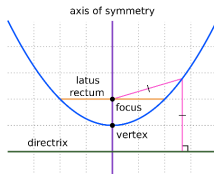
Figure 1: Image spreading one column of the article

consequat.Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor in-

Figure: Inserting image in a two-column article

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Section formatting

Image spreading two-column article

```latex
\documentclass[11pt]{article}
\usepackage{multicol,graphicx}
\begin{document}
Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor
incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis
nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo
consequat.Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do
eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim
veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea
commodo consequat.Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed
do eiusmod tempor incididunt ut labore et dolore magna aliqua.
\begin{multicols}{2}
Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor
incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis
nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo
consequat.Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do
eiusmod tempor incididunt ut labore et dolore magna aliqua.
    \begin{figure*}[t] %h for here, t for top and b for bottom
        \centering
        \includegraphics[width=.65\linewidth]{parabola}
        \caption{Image spreading more than one column}
    \end{figure*}
Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor
```

Figure: Image spreadign two-column article

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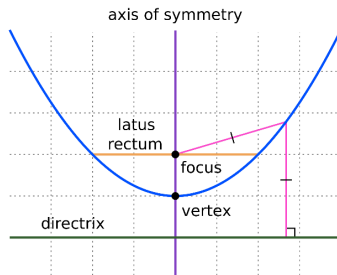# Image spreading two-column article contd...

axis of symmetry

latus
rectum

focus

vertex

directrix

Figure 1: Image spreading more than one column

tion ullamco laboris nisi ut aliquip ex ea commodo consequat.Lorem ipsum dolor sit amet, consectetur adipisc- consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut

Figure: Image spreadign two-column article

Equations in article

```
The equation\ref{eq} is reffered here.
Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor
incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis
nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.m
veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea
commodo consequat.
    \begin{center}
    \begin{equation}
        a=b
    \end{equation}
    \begin{equation}
        E=mc^2
    \end{equation}
    \begin{equation}
        ax^2 + bx + c = 0 \nonumber
    \end{equation}
    \begin{equation}
        x^2 + y^2 = z^2 \label{eq}
    \end{equation}
    \end{center}
Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor
incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis
```

Figure: Equations in article

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Equations in article contd...

The equation3 is reffered here. Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.m veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.

$$a = b \tag{1}$$

$$E = mc^2 \tag{2}$$

$$ax^2 + bx + c = 0$$
$$x^2 + y^2 = z^2 \tag{3}$$

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Figure: Equations in article

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Equation with cases in article

```
\usepackage{amsmath}
\usepackage{systeme} %\systeme{eq1,eq1,eq3} used for
equation set
\begin{document}
Lorem ipsum dolor sit amet, consectetur adipiscing elit,
sed do eiusmod tempor incididunt ut labore et dolore
magna aliqua. Ut enim ad minim veniam, quis nostrud
exercitation ullamco laboris nisi ut aliquip ex ea
commodo consequat.m veniam, quis nostrud exercitation
ullamco laboris nisi ut aliquip ex ea commodo consequat.
    \begin{equation}
        f(n) =  \begin{cases}
                    n/2, & \mbox{if } n\mbox{ is even} \\
                    3n+1, & \mbox{if } n\mbox{ is odd}
                \end{cases}
    \end{equation}
```

Figure: Equation set in article

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Equation with cases in article contd...

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$$f(n) = \begin{cases} n/2, & \text{if } n \text{ is even} \\ 3n+1, & \text{if } n \text{ is odd} \end{cases} \tag{1}$$

Figure: Equation set in article

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Big Equation in two column article

```
\documentclass[twocolumn]{article}
\usepackage{amsmath}
\usepackage{blindtext}
\begin{document}
\textbf{\emph{Equation spreading more than one column:}}
\blindtext

    \begin{align*} % Here equation* will not work
        f(x) = x^{10} - 2x^9 + 3x^8 + 10x^7 - 5x^6 - 6x^5 - 3x^4 \\
        \nonumber
        + 4x^3 + 2x^2 + 7x + 8
    \end{align*}

\blindtext[4] % It creates blindtext 4 times

\end{document}
```

Figure: Big Equation in two column article

Big Equation in two column article contd...

Equation spreading more than one column: Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper.

$$f(x) = x^{10} - 2x^9 + 3x^8 + 10x^7 - 5x^6 - 6x^5 - 3x^4$$
$$+ 4x^3 + 2x^2 + 7x + 8$$

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tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem.

Figure: Big Equation in two column article

Big Equation resize in two column article

```
\documentclass[twocolumn]{article}
\usepackage{amsmath}
\usepackage{lipsum}
\usepackage{graphics}
\begin{document}
\lipsum[1]
\begin{equation}
\resizebox{0.5\textwidth}{!}{$\sum_{q_\mathrm{total}=0}^{q
_A+N_A+q_B+N_B-2}\left(\sum_{q_A=0}^{q_\mathrm{total}}\lef
t(\binom{q_A+N_A-1}{q_A}\binom{q_B+N_B-1}{q_B}\right)\righ
t)x^{q_\mathrm{total}}$}
\end{equation}
\lipsum[2-4]
\end{document}
```

Figure: Big Equation resize in two column article

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Big Equation resize in two column article contd...

sectetuer 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.

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 elit purus eget enim. Nunc vitae tortor. Proin tempus nibh sit amet nisl. Vivamus quis tortor vitae risus porta vehicula.

$$\sum_{q_{\text{total}}=0}^{q_A+N_A+q_B+N_B-2} \left(\sum_{q_A=0}^{q_{\text{total}}} \left(\binom{q_A+N_A-1}{q_A} \binom{q_B+N_B-1}{q_B} \right) \right) x^{q_{\text{total}}}$$
(1)

Nam dui ligula, fringilla a, euismod sodales, sollici-

Figure: Big Equation resize in two column article

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Article section and sub-section

```
\documentclass[12]{article}
\usepackage{amsmath}
\usepackage{lipsum}
\usepackage{graphics}
\begin{document}
\section{First section of the document}
\subsection{First sub section}
Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit,
vestibu-lum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida
mauris.Nam arcu libero, nonummy eget, consectetuer id, vulputate a, magna.
\subsection{Second subsection}
\lipsum[2]
\section{Second section of the document}
\subsection{Sub section}
Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit,
vestibu-lum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida
mauris.Nam arcu libero, nonummy eget, consectetuer id, vulputate a, magna.
\subsection{Subsection}
Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit,
vestibu-lum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida
mauris. Nam arcu libero, nonummy eget, consectetuer id, vulputate a, magna.
\subsubsection{Sub-sub section in article1}
Enter your text here
\subsubsection{Sub-sub section in article2}
Enter your text here
\end{document}
```

Figure: Article section and sub-section

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Article section and sub-section contd...

1   First section of the document

1.1   First sub section

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.

1.2   Second subsection

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   Second section of the document

2.1   Sub section

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.

2.2   Subsection

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.

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Report with chapters

```
\documentclass[12]{report}
\usepackage{amsmath}
\usepackage{lipsum}
\usepackage{graphics}
\begin{document}

\chapter{Title of the chapter} % Chapter begins with a new page
\section{First section }
\subsection{First sub section}
Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit,
vestibu-lum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida
mauris.Nam arcu libero, nonummy eget, consectetuer id, vulputate a, magna.
\subsection{Second subsection}
\lipsum[2]
\section{Second section}
\subsection{Sub section}
Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit,
vestibu-lum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida
mauris.Nam arcu libero, nonummy eget, consectetuer id, vulputate a, magna.
\subsection{Subsection}
Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit,
vestibu-lum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida
mauris. Nam arcu libero, nonummy eget, consectetuer id, vulputate a, magna.
\chapter{Title of the second chapter}
\end{document}
```

Figure: Report with chapters

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Report with chapters contd...

Chapter 1

Title of the chapter

1.1   First section

1.1.1   First sub section

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.

1.1.2   Second subsection

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.

1.2   Second section

1.2.1   Sub section

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.

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Unorder List

- Item One
  - subitem1
  - subitem2
  - subitem3
- Item Two
  - subitem1
  - ∗ subitem2
  - subitem3
- Item Three
  - subitem1
  - subitem2
  - subitem3

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Bulleted List

```latex
\begin{itemize}
    \item Item One
    \begin{itemize}
        \item subitem1
        \item subitem2
        \item subitem3
    \end{itemize}
    \item Item Two
    \begin{itemize}
        \item subitem1
        \item subitem2
        \item subitem3
    \end{itemize}
    \item Item Three
    \begin{itemize}
        \item subitem1
        \item subitem2
        \item subitem3
    \end{itemize}
\end{itemize}
```

Figure: Unorder-list

- Item One
  - subitem1
  - subitem2
  - subitem3
- Item Two
  - subitem1
  - subitem2
  - subitem3
- Item Three
  - subitem1
  - subitem2
  - subitem3

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Enumeration

1. Item One
    I subitem1
    II subitem2
    III subitem3
2. Item Two
    (a) subitem1
    (b) subitem2
    (c) subitem3
3. Item Three
    1. subitem1
    2. subitem2
    3. subitem3

Outline
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```latex
\begin{enumerate}
    \item Item One
    \begin{enumerate}[I]
        \item subitem1
        \item subitem2
        \item subitem3
    \end{enumerate}
    \item Item Two
    \begin{enumerate}[(a)]
        \item subitem1
        \item subitem2
        \item subitem3
    \end{enumerate}
    \item Item Three
    \begin{enumerate}
        \item subitem1
        \item subitem2
        \item subitem3
    \end{enumerate}
\end{enumerate}
```

Figure: order-list

1 Item One

    I subitem1

   II subitem2

  III subitem3

2 Item Two

  (a) subitem1

  (b) subitem2

  (c) subitem3

3 Item Three

  1 subitem1

  2 subitem2

  3 subitem3

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Table Creation

Simple table with 3 rows and 3 columns

cell1	cell2	cell3
cell4	cell5	cell6
cell7	cell8	cell9

Outline
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Table Creation

Simple table with 3 rows and 3 columns

```
\begin{center}
    \begin{tabular}{ c c c }
        cell1 & cell2 & cell3 \\
        cell4 & cell5 & cell6 \\
        cell7 & cell8 & cell9  \\
    \end{tabular}
\end{center}
```

cell1	cell2	cell3
cell4	cell5	cell6
cell7	cell8	cell9

Figure: Table syntax

Outline
Types of documents
Basic formatting in LaTex
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List
Table
Figures and graphics
Mathematical typesetting

Table Creation (contd..)

Table with lines in between each column

cell1	cell2	cell3
cell4	cell5	cell6
cell7	cell8	cell9

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Types of documents
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List
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Table Creation

Table with lines in between each column

```
\begin{center}
    \begin{tabular}{ |c|c|c| }
        \hline
        cell1 & cell2 & cell3  \\
        cell4 & cell5 & cell6 \\
        cell7 & cell8 & cell9  \\
        \hline
    \end{tabular}
\end{center}
```

cell1	cell2	cell3
cell4	cell5	cell6
cell7	cell8	cell9

Figure: Table syntax

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Table Creation (contd..)

Table with matrix format and with different alignments

cell1	cell2	cell3
cell4	cell5	cell6
7	8	9

Outline
Types of documents
Basic formatting in LaTex
Detail formatting in LaTex

List
Table
Figures and graphics
Mathematical typesetting

Table Creation

Table with matrix format and with different alignments

```
\begin{center}
    \begin{tabular}{ |r|c|l| }
        \hline
        cell1 & cell2 & cell3  \\
        \hline
        cell4 & cell5 & cell6 \\
        \hline
        7 & 8 & 9  \\
        \hline
    \end{tabular}
\end{center}
```

cell1	cell2	cell3
cell4	cell5	cell6
7	8	9

Figure: Table syntax

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Table Creation (contd..)

Table with Multicolumn feature

Fruit Details		Cost Calculations		
Fruit	Grade	No. of Units	cost/unit	cost(Rs.)
Mango	A	20	75	1500
Jackfruits	B	10	50	500
Banana	A	10	20	200

Outline
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Table Creation (contd..)

Table with Multicolumn feature

```
\begin{tabular}{|| l | c | c |c|r||}\hline
    \multicolumn{2}{||c|}{Fruit Details} & \multicolumn{3}{c||}{Cost
    Calculations}\\ \hline
    Fruit & Grade & No. of Units & cost/unit & cost(Rs.)\\\hline
    Mango & A &20 & 75& 1500\\ \hline
    Jackfruits & B&10 & 50 & 500\\ \hline
    Banana & A & 10 & 20 & 200\\ \hline
\end{tabular}
```

Figure: Table syntax

Fruit Details		Cost Calculations		
Fruit	Grade	No. of Units	cost/unit	cost(Rs.)
Mango	A	20	75	1500
Jackfruits	B	10	50	500
Banana	A	10	20	200

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Figure with caption

```
\begin{figure}
    \centering
    \includegraphics[width=0.5\linewidth]{logo}
    \caption{IITG logo}
\end{figure}
```

Figure: Insert Graphics

Figure: IITG logo

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Figure with angle

Figure: IITG logo

```
\begin{figure}
    \centering
    \includegraphics[width=0.5\textwidth,angle=-90]{logo}
    \caption{IITG logo}
\end{figure}
```

Figure: Graphics with angle

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Mathematical typesetting

Graphics Alignment

The default alignment is left.


```latex
\begin{figure}
    \includegraphics[width=0.2\textwidth, right]{logo}
\end{figure}
```

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Multiple images in one figure

(a) logo

(b) Zoomout

Figure: Caption for this figure with two images

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Multiple images in one figure(contd...)

```
\begin{figure}
    \begin{subfigure}[c]{0.45\textwidth}
        \includegraphics[width=0.5\linewidth, center]{logo}
        \caption{logo}
        %\label{fig:subim1}
    \end{subfigure}
    \hfill
    \begin{subfigure}[c]{0.45\textwidth}
        \includegraphics[width=0.4\linewidth, center]{logo}
        \caption{Zoomout}
        %\label{fig:subim2}
    \end{subfigure}

    \caption{Caption for this figure with two images}
    %\label{fig:image2}
\end{figure}
```

Figure: Inserting figure with two images

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Symbols

Dollar symbols are used to keep the font different from the other charaters.

$\alpha\beta\gamma\sigma$

Product of α and A : αA or $\alpha\,A$ or $\alpha\,A$

$\alpha\quad A$

$\alpha\qquad A$

$\alpha\qquad\qquad A$

$\alpha\hspace{6cm}A$

Negative of α is -α. It is the wrong method

Negative of α is $-\alpha$. It is the right method

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```latex
\begin{frame}
    \frametitle{Symbols}
    Dollar symbols are used to keep the font different from the other
    charaters.\\
    $\alpha                  \beta                     \gamma \sigma$ \\
    Product of $\alpha$ and A : $\alpha A$ or $\alpha\ A$ or $\alpha\, A$ \\
    $\alpha\quad A$ \\
    $\alpha\qquad A$  \\
    $\alpha\qquad\qquad A$  \\
    $\alpha\hspace{5.4cm} A$\\
    Negative of $\alpha$ is -$\alpha$. It is the wrong method\\
    Negative of $\alpha$ is $-\alpha$. It is the right method\\
\end{frame}
```

Figure: Pie Chart Demo

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Fraction

\frac command is used to include fractions in the equations

- A devided by B is represted by $\frac{A}{B}$
- A devided by B is represted by $\frac{A}{B}$
- AB devided by CD is represted by $\frac{AB}{CD}$
- AB devided by one plus CD devided by EF is represted by $\frac{AB}{1+\frac{CD}{EF}}$

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Fraction Contd...

```
|
\frametitle{Fractions}
$\backslash$frac command is used to include fractions in the equations\\
\begin{itemize}
    \item $A$ devided by $B$ is represted by $\frac A B$ \\

    \item $A$ devided by $B$ is represted by $\frac AB$ \\

    \item $AB$ devided by $CD$ is represted by $\frac {AB}{CD}$ \\

    \item $AB$ devided by one plus $CD$ devided by $EF$ is represted by
    $\frac {AB}{1+\frac {CD}{EF}}$  \\
\end{itemize}
```

Figure: Fraction Demo

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Subscripts and Superscripts

The symbol ^ is used for superscript and _ is used for subcript

- Subscripts: x_a x_{ab}
- Superscripts: x^2 x^{10}
- Subscripts and Superscipts both: $X_a^{b^2}$

```
\item Subscripts: $x_a$  $x_{ab}$
\item Superscripts: $x^2$  $x^{10}$
\item Subscripts and Superscipts both: $X^{b^2}_a$
```

Figure: Subscript and Superscript

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Some more symbols

- $a = b$, $a \neq b$, $a > b$, $a \geq b$, $a \gg b$
- $a < b$, $a \leq b$, $a \ll b$
- $a \rightarrow b$, $a \leftarrow b$, $a \leftrightarrow b$

```
\item $a=b$, $a\ne b$, $a>b$, $a\ge b$, $a \gg b$
\item $a<b$, $a\le b$, $a\ll b$\\
\item $a\rightarrow b$, $a\leftarrow b$, $a\leftrightarrow
b$
```

Figure: Assignment and comparision

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Some more symbols

- $a \times b$, ∞
- $\sum$, $\prod$
- $\int$
- $a + \cdots + b$, $a, \ldots, b$

```
\item $a \times b$, $\infty$
\item $\sum$, $\prod$
\item $\int$
\item $a + \cdots + b$, $a, \ldots , b$
```

Figure: Some more symbol

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Matrices

- A simple matrix is $\begin{matrix} a & b \\ d & e & f \end{matrix}$

- A simple matrix is $\begin{pmatrix} a & b & c \\ d & e & f \end{pmatrix}$

- Assignment question $\begin{Bmatrix} a & b & \cdots & z \\ a^2 & b^2 & \cdots & z^2 \\ \vdots & & \ddots & \\ a^n & b^n & \cdots & z^n \end{Bmatrix}$

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Matrices Contd...

```latex
\begin{itemize}
\item A simple matrix is $\begin{matrix}
    a & b \\
    d & e & f\\
\end{matrix}$
\item A simple matrix is $\begin{pmatrix}
    a & b & c\\
    d & e & f\\
\end{pmatrix}$
\item Assignment question
$\begin{Bmatrix} %bmatrix,pmatrix can be used
    a & b & \cdots & z\\
    a^2 & b^2 & \cdots & z^2\\
    \vdots & & \ddots \\
    a^n & b^n & \cdots & z^n\\
\end{Bmatrix}$
\end{itemize}
```

Figure: Matrices Demo

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Big Equations

$$u(n) - u(n-1) = K\left[e(n) - e(n-1) + \frac{T_s}{2\tau_i}\{e(n) + e(n-1)\}\right.$$
$$\left.+\frac{\tau_d}{T}\{e(n) - 2e(n-1) + e(n-2)\}\right] \tag{1}$$

```
\frametitle{Big Equations}
    \begin{align}
    u(n) - u(n-1) &= K\left[e(n)-e(n-1)+\frac{T_s}{2\tau_i}
    \{e(n)+e(n-1)\}  \nonumber\right.\\    & \left.
    +\frac{\tau_d}{T}\{ e(n)-2e(n-1)+e(n-2) \}\right]
    \end{align}
```

Figure: Big Equation

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Sample Algorithm in LaTex

Algorithm 1: While loop with If/Else condition

Result: Write here the result
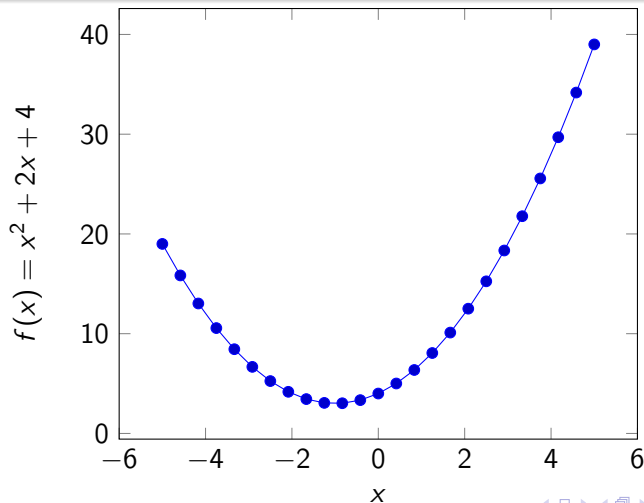**Input** : Write here the input
Output: Write here the output

1 **while** *While condition* **do**
2 | instructions
3 | **if** *condition* **then**
4 | | instructions1
5 | | instructions2
6 | **else**
7 | | instructions3
8 | **end**
9 **end**

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Sample Algorithm in LaTex

```
\begin{algorithm}[H] %\usepackage{algorithm2e}
    \DontPrintSemicolon
    \SetAlgoLined
    \KwResult{Write here the result}
    \SetKwInOut{Input}{Input}\SetKwInOut{Output}{Output}
    \Input{Write here the input}
    \Output{Write here the output}
    \BlankLine
    \While{While condition}{
        instructions\;
        \eIf{condition}{
            instructions1\;
            instructions2\;
        }{
            instructions3\;
        }
    }
    \caption{While loop with If/Else condition}
\end{algorithm}
```

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Plotting graph from the equation

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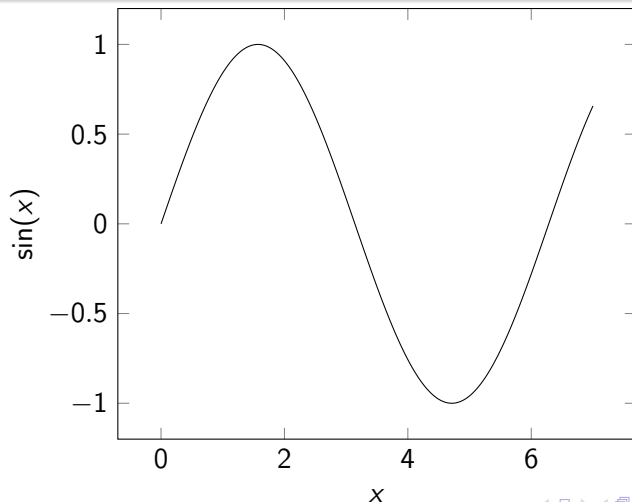Table
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Plotting graph from the equation Demo

```
\begin{tikzpicture}
\begin{axis}[
xlabel=$x$,
ylabel={$f(x) = x^2 + 2x + 4$}
]
\addplot {x^2 + 2*x +4};

\end{axis}
\end{tikzpicture}
```

Figure: Graph with equation

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Plotting graph from the equation contd...

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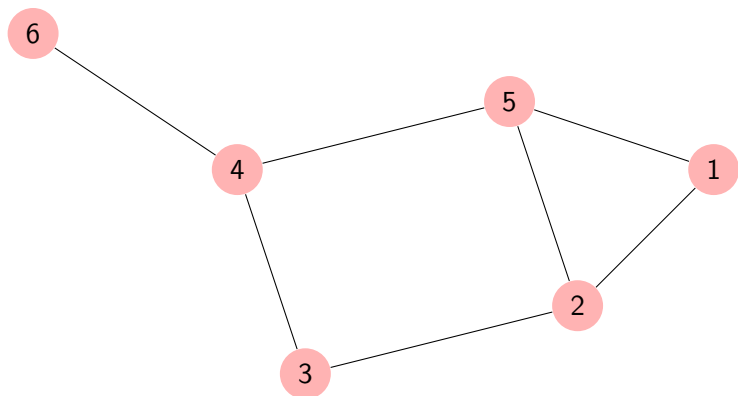Table
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Plotting graph from the equation Demo

```
\begin{tikzpicture}
\begin{axis}[
xlabel=$x$,
ylabel=$\sin(x)$
]
\addplot[domain=0:7,samples=1000,id=sin]{sin(deg(x)
)};
%\addplot{sin(deg(x))};
\end{axis}
\end{tikzpicture}
```

Figure: Graph with sine fuction

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Drawing graph in LaTex

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Drawing graph in LaTex*contd*...

```
\begin{tikzpicture} %\usepackage{tikz}
[scale=.9,auto=left,every node/.style={circle,fill=red!30}]
\node (n6) at (1,10) {6};
\node (n4) at (4,8)  {4};
\node (n5) at (8,9)  {5};
\node (n1) at (11,8) {1};
\node (n2) at (9,6)  {2};
\node (n3) at (5,5)  {3};

\foreach \from/\to in {n6/n4,n4/n5,n5/n1,n1/n2,n2/n5,n2/n3,n3/n4}
\draw (\from) -- (\to);

\end{tikzpicture}
```

Figure: Inserting graph in LaTex