LaTeX – A document preparation system

LaTeX is a high-quality typesetting system; it includes features designed for the production of technical and scientific documentation. LaTeX is the de facto standard for the communication and publication of scientific documents. LaTeX is available as free software.

LaTeX, which is pronounced «Lah-tech» or «Lay-tech» (to rhyme with «blech» or «Bertolt Brecht»), is a document preparation system for high-quality typesetting. It is most often used for medium-to-large technical or scientific documents but it can be used for almost any form of publishing.

1. LaTeX Features:

- Typesetting journal articles, technical reports, books, and slide presentations.
- Control over large documents containing sectioning, cross-references, tables and figures.
- Typesetting of complex mathematical formulas.
- Advanced typesetting of mathematics with AMS-LaTeX.
- Automatic generation of bibliographies and indexes.
- Multi-lingual typesetting.
- Inclusion of artwork, and process or spot colour.
- Using PostScript or Metafont fonts.

2. Structure of latex document:

```
\documentclass [options]{document Type}

\usepackage{packageName}

\begin{document}

…….Content of the Document……


\end{document}
```

-> Document class determines the layout of the document(i.e which type of Document we want like article,book,report,……..)

-> Package is used to add the additional Features to the Document like color,graphicx,setspace,rotating and fancyhdr etc……..

-> **the** content of the Document will comes in between \begin{document} and \end{document}

3. Creating a document in LaTeX:

LATEX is a great tool to create documents, it's based on the (what you see is what you mean) idea, meaning you only have focus on the contents of your document and the computer will take care of the formatting. With LATEX is very easy to create professional-looking material.

```
\documentclass{article}

\begin{document}

First document. This is a simple example, with no
extra parameters or packages included.

\end{document}
```

4. Creating a Title:

The **\maketitle** command creates a title. You need to specify the title of the document. If the date is not specified today's date is used. Author is optional.

Syntax:

```
\title{titlename}
\maketitle
```

Example program:

```
\documentclass{article}
\begin{document}
\title{My First Document}
\author{My Name}
\date{\today}
\maketitle
\end{document}
```

5. Typesetting Text:

5.1. Font Effects:

There are LATEX commands for a variety of font effects:

Syntax:

1.\textit{words in italics} -words in italics
2.\textsl{words slanted} -words slanted
3.\textsc{words in smallcaps} -words in smallcaps
4.\textbf{words in bold} -words in bold
5.\texttt{words in teletype} -words in teletype
6.\textsf{sans serif words}- sans serif words
7.\textrm{roman words} -roman words
8.\underline {underlined words} -underlined words

Example program:

```
\documentclass{article}

\begin{document}

        Some of the \textbf{greatest} discoveries in \underline{science}
        were made by \textbf{\textit{accident}}.


\end{document}
```

5.2. Coloured Text

To put coloured text in your document you need to use a package. There are many packages that can be used with LATEX to enhance its functionality. Packages are included in the preamble (i.e. before the \begin{document} command). Packages are activated using the \usepackage[options The basic colour names that \usepackage{color} knows about are black,red, green, blue, cyan, magenta, yellow and white.

Syntax:

```
\usepackage{color}
\color{colorname}
```

```
\documentclass{article}
\usepackage[utf8]{inputenc}
\usepackage[english]{babel}
 \usepackage{color}

\begin{document}
 \color{blue}
   Welcome to iiit srikakulam
\end{document}
```

5.3. Font Sizes:

There are LATEX commands for a range of font sizes:

Syntax:

1. {\tiny tiny words} - tiny words
2. {\scriptsize scriptsize words} -scriptsize words
3. {\footnotesize footnotesize words} -footnotesize words
4. {\small small words} -small words
5. {\normalsize normalsize words} -normalsize words
6. {\large large words} - large words
7. {\Large Large words}-Large words
8. {\LARGE LARGE words} -LARGE words
9. {\huge huge words} -huge words

Example Program:

```
\documentclass{article}

\begin{document}

        {\tiny srikakulam}

        {\footnotesize latex}

        {\Large cse}

        {\LARGE pucit}

        {\huge puc}

\end{document}
```

6. Lists:

List are basic elements in a document, when used correctly they keep concepts organized and structured. Lists are different types that are order lists and unordered lists

6.1. Unordered lists:

The unordered (unnumbered) lists are produced by the **itemize** environment. Each entry must be preceded by the control sequence **\item**.

Syntax:

```
\begin{itemize}
    \item itemname
    \item itemname
\end{itemize}
```

Example program:

```
\documentclass{article}
\begin{document}
    \begin{itemize}
        \item srikakulam
        \item nuzvid
    \end{itemize}
\end{document}
```

6.2. Ordered lists

Ordered list have the same syntax inside a different environment:

Syntax:

\begin{enumerate}

\item itemname

\item itemname

\end{enumerate}

Example program:

```
\documentclass{article}
\begin{document}
    \begin{enumerate}
        \item  cse
        \item ece
        \end{enumerate}
\end{document}
```

7. Sections:

You should divide your document into chapters (if needed), sections and subsections.
The following sectioning commands are available for the article class:

Syntax:

→ \section{...}
→\subsection{...}
→\subsubsection{...}
→\paragraph{...}
→\subparagraph{...}
The title of the section replaces the dots between the curly brackets.

Example Program:

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

\begin{document}

\title{My First Document}
\author{My Name}
\date{\today}
\maketitle

\section{Introduction}
This is the introduction.

\section{Methods}

\subsection{Stage 1}
The first part of the methods.

\subsection{Stage 2}
The second part of the methods.

\section{Results}
Here are my results.

\end{document}
```

8. Paragraphs:

To start a new paragraph in LaTeX, you must leave a blank line in between. There's another way to start a new paragraph, look at the following code snippet.

- ➔ To ctrate paragraph we use \par
- ➔ Another way to create paragraph that is \paragraph{paragraph Name}

Syntax:

\par (or) \paragraph{paragraphname}

Example Program:

```
\documentclass{article}

\begin{document}

    This is the text in first paragraph. This is the text in first paragraph. This is the text in first paragraph. \par this is the text in second paragraph. This is the text in second paragraph. \paragraph{LaTeX} is a document preparation system and document marku language.LaTeX uses the TeX typesetting program for formatting its output, and is itself written in the TeX macro language.

\end{document}
```

9. Tables:

Tables are common elements in most scientific documents, LATEX provides a large set of tools to customize tables, change the size, combine cells, and change the colour of cells and so on.

Syntax:

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

Example Program:

```
\documentclass{article}
\begin{document}

    \begin{center}
        \begin{tabular}{ |c|c|c| }
            \hline
            ramana & raju & ramesh \\
            \hline
            suresh & mahesh & sateesh \\
            \hline
            niteesh & lokesh & jagadeesh \\
            \hline
        \end{tabular}
    \end{center}
\end{document}
```

→\hline refers to horizontal line in a table.

10. Footnotes:

In some documents it's necessary to put annotations at the bottom of the page.

Adding a footnote to your document

Syntax:

```
I'm writing something here to test \footnote{footnotes working fine} several features.
```

Example Program:

```
\documentclass{article}
\begin{document}
    I'm writing something here to test \footnote{footnotes working fine} several features.
\end{document}
```

11. Comments:

Sometimes it's necessary to add comments to your LATEX code for readability. This is straightforward, put a % before the comment and LATEX will ignore that text.

Syntax:

```
Use % symbol before text
Or
\begin{comment}
------content-------
\end{comment}
```

```
\documentclass{article}
\usepackage[utf8]{inputenc} %codification of the document
\usepackage{comment}
%Here begins the body of the document
\begin{document}
This documents contains a lot of comments, non of them will appear here, only this text..
\begin{comment}
This text won't show up in the compiled pdfthis is just a multi-line comment. Useful
\end{comment}
\end{document}
```