

L A TEX

About L A TEX (pronounced either “Lay-tech” or “Lah-tech”) is a portable document formatting system based on TEX (pronounced “tech”), a typesetting language originally designed especially for math and science. It is also a programming language, which means you can create your own commands to simplify and customize it. TEX and L A TEX use by default a font family called “Computer Modern,” which includes a variety of styles such as serif, sans serif, typewriter, and a particularly rich set of mathematical symbols.

Structure of a LATEX File

```
\documentclass[ options ]{ article }  
(for L A TEX commands only)  
Preamble  
\begin{document}  
Document text  
(text with embedded L A TEX commands)  
\end{document}
```

The Document class determines the overall layout of the document. In addition to article class, which is a good all-purpose class, other commonly-used classes are:

- report – for longer documents containing chapters
- thesis – for writing an RPI thesis (see Preparing a Thesis with L A TEX).
- book – for books
- letter – for letters
- slides – for making transparencies

Among other things, the classes provide heading commands, such as `\part`, `\chapter`, `\section`.

Document Class Options & Packages

A document class may be modified by using options such as

```
\documentclass[options]{article}
```

Commonly-used options include:

11pt Prints document in 11pt type (default 10pt)

12pt Prints document in 12pt type

Example:

```
\documentclass[11pt]{article}
```

L A TEX Packages contain extra definitions that provide additional

formatting features. To load a package, include in the preamble.

The command:

```
\usepackage{packagename}
```

Some commonly-used packages are:

setspace Provides easy way to change linespacing

graphicx Provides commands to include graphics files

fancyhdr Customizes headers and footers

rotating Provides rotations, especially for figures & tables

color Provides a way to use colors

L A TEX Basic rules

Latex file name extension is “**tex**”

The backslash “ \ ” is used to begin all L A TEX commands. In the latex file words are separated by one or more blank spaces, paragraphs are separated by one or more blank lines. Commands are case-sensitive, Commands are all lowercase unless there’s a good reason to use uppercase for certain commands

For example:

```
\Delta → Δ
```

```
\delta → δ
```

Some commands take arguments, which are enclosed in braces:

```
\textbf{this text will be bold}
```

Certain characters have special meaning to L A TEX. The complete list is in Text Formatting with L A TEX; the most common are listed below.

Char	Input	Special TEX meaning
#	\#	Parameter in a macro
\$	\\$	Used to begin and end math mode
%	\%	Used for comments in the input file
&	\&	Tab mark, used in alignments
-	\-	Used in math mode for subscripts

Some L A TEX Commands

Mandatory arguments are included in braces {}

Optional arguments are enclosed in brackets []

Commands produce text or space:

`\hspace{2in}` and `\textit{some italic words}`

Declarations affect the following text:

`\large` prints the following text in a larger font.

Grouping `{ }` is often used to limit the scope of a declaration:

`{\large only this text is big}`

Environments receive special processing and are defined by

`\begin{ name } ... \end{ name } .`

Example: `\begin{quote} ... \end{quote}`

`\hspace{2in}` needs the information provided by the argument to generate the space.

`\documentclass[11pt]{article}` gives you 11-point type. (The default is 10-point type.)

***** indicates a variation on a command or environment.

**** indicates a line break

***** indicates a line break where a page cannot be broken.

Ex. 1

`%in` The Documentclass [size,type of paper, no fo columns in a page] is optional, {Type of Document} is mandatory

`\documentclass[11pt,a4paper,two column]{article}`

`\author{Srinivas K}`

`\title{Article with multicolum}`

`\begin{document}`

`\maketitle`

`\end{document}`

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```
%\begin center the text
```

```
\begin{center}  
Structure of a L A TEX File  
\end{center}
```

```
%\textsc{} changes the case to smallcaps.
```

```
\textsc{documentclass[ options ]{ article }}
```

(for L A TEX commands only)

```
Preamble  
begin{document}  
Document text  
(text with embedded L A TEX commands)  
end{document}
```

The Document class determines the overall layout of the document. In addition to article class, which is a good all-purpose class, **other commonly-used classes are:**

- report – for longer documents containing chapters
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Among other things, the classes provide heading commands, such as the part , chapter , section.

The document Class Options **&** Packages

A document class may be modified by using options such as the documentclass[options]{article}

Commonly-used options include:

11pt Prints document in 11pt type (default 10pt)

12pt Prints document in 12pt type

Example:

```
%\textit{} it changes to Italic font
```

`\textit{documentclass[11pt]{article}}`

`%\begin{Large}` and `\end{LARGE}` Increase the size

L A T E X `\begin{LARGE}`

Packages contain extra definitions that provide additional formatting features

`\end{LARGE}`

To load a package, include in the preamble.

The command:

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Some commonly-used packages are:

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`fancyhdr` Customizes headers and footers

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L A T E X Basics

The backslash “\” is used to begin all L A T E X commands. In the latex file words are separated by one or more blank spaces, paragraphs are separated by one or more blank lines. Commands are case-sensitive, Commands are all lowercase unless there’s a good reason to use uppercase for certain commands

For example:

Delta → Δ

delta → δ

Some commands take arguments, which are enclosed in braces:

`textbf{this text will be bold}`

Some L A T E X Vocabulary

Commands produce text or space:

`hspace{2in}` and `\textit{some italic words}`

Declarations affect the following text:

`large` prints the following text in a larger font.

Grouping `{ }` is often used to limit the scope of a declaration:

`{large only this text is big}`

Environments receive special processing and are defined by
`begin{ name } ... end{ name } .`

Example: `begin{quote} ... end{quote}`

Mandatory arguments are included in braces :

`hspace{2in}` needs the information provided by the argument to generate the space.

Optional arguments are enclosed in brackets []

`documentclass[11pt]{article}` gives you 11-point type. (The default is 10-point type.)

* indicates a variation on a command or environment.

`\end{document}` indicates a line break

* indicates a line break where a page cannot be broken.

`\end{document}`

Ex.2

%list creation using different bullets

```
\documentclass[10pt]{article}
```

```
\begin{document}
```

```
\begin{Huge}
```

Bullets

```
\end{Huge}
```

```
\begin{enumerate}
```

```
\item NewsPaper
```

```
\begin{itemize}
```

```
\item
```

Times

```
\item
```

Hindu

```
\end{itemize}
```

```
\item
```

Ennadu

```
\item
```

Varta

```
\begin{itemize}
```

```
\item[+]
```

plus

```
\item[-]
```

minus

```

\end{itemize}
\begin{itemize}
\item[fruits]
Apple\\
Orange
\item[Icecreams]
Venila\\
Pista\\
\end{itemize}
\end{enumerate}
\end{document}

```

Ex.3

```

%creation to link another file or web site
\documentclass[10pt]{report}
\usepackage{hyperref}
\title{Linking to another File or Web Site}
\author{Srinivas K}
\begin{document}
\maketitle
Using \href{file/url path}{label} \\
\href{file:/home/student/latex/1latex.tex}{click here to open another latex file}
\end{document}

```

Ex.4

```

%put an emage into the document
\documentclass[10pt]{article}
\usepackage{graphicx}
\begin{document}
\textbf{This about Image palcing in the document}
\includegraphics[scale=.50]{tt.jpg}
\end{document}

```

Ex.5

```

%creating objects
\documentclass[11pt]{article}
\usepackage{tikz}
\author{Srinivas K}

```

```

\title{shapes}
\date{11-3-2017}
\begin{document}
\maketitle
\begin{center}
Picture Circle,ellipse and line
\end{center}
\begin{figure}
\begin{tikzpicture}
\draw [red,fill=blue,dashed] (5,5) circle(3); \\\
\draw [white,fill=green,dashed](-2,-2) ellipse(2 and 1); \\\
\draw(0,0)-- (8,0);
\end{tikzpicture}
\end{figure}
\end{document}

```

Ex.6

```

%creating tabular form
\documentclass[10pt]{report}
\author{Srinivas K}
\title{Table creation}
\begin{document}
\maketitle
\begin{table}
\caption{Yearly Report }
\begin{tabular}{|l| c r l}
City & Year\\
\cline{2-4}
& 1960 & 1970 & 1980\\
\hline
A & 50 & 60 & 60\\
\hline
B & 70 & 80 & 90\\
\hline
C & 90 & 79 & 89\\
\hline
\end{tabular}
\end{table}
\end{document}

```

Ex.7

```

%Report in document class using Latex commands
\documentclass[10pt,a4paper,twocolumn]{report}

```

```

\usepackage{graphicx}
\usepackage{fancyhdr}
\usepackage{tikz}
\title{latex report}
\begin{document}
\maketitle
\begin{abstract}
This about how to use latex commands.
\pagestyle{fancy}
\lhead{Lhead}
\rhead{Rhead}
\lfoot{Lfoot}
\rfoot{Rfoot}
\part{Part One}
\chapter{Chapter One}
\section{Section}
This is about section
\subsection{Subsection}
This is about sub section
\paragraph{Paragraph}
\begin{center}
\textbf{This is using \emph{latex} commands preparing the document. It is
typesetting software.}
\end{center}
\part{Part Two}
\appendix{}
\end{abstract}
\tableofcontents{}
\listoffigures{}
\listoftables{}
\paragraph{latex}
latex is a typesetting language. latex files can be created with text editot.
%image drawing
\begin{figure}
\caption{Figure Circle}
\begin{tikzpicture}
\draw(3,16) ellipse(6 and 1);
\draw(3,16)-- (6,16);
\end{tikzpicture}
\end{figure}
%creating tabular form
\begin{table}
\caption{Yearly Report }
\begin{tabular} {l| c r l}
City & Year\\

```

```
\cline{2-4}
& 1960 & 1970 & 1980\\
\hline
A & 50 & 60 & 60\\
\hline
B & 70 & 80 & 90\\
\hline
C & 90 & 79 & 89\\
\hline
\end{tabular}
\end{table}
\begin{LARGE}

$$\frac{ax^2+bx+c}{a-b}$$

\end{LARGE}
\end{document}
```