Program 1 : **Develop a LaTeX script to create a simple document that consists of 2 sections [Section1, Section2], and a paragraph with dummy text in each section. And also include header [title of document] and footer [institute name, page number] in the document.**

```
\documentclass{article}

% Packages
\usepackage{fancyhdr} % For header and footer
\usepackage{lipsum} % For dummy text

% Header and footer settings
\pagestyle{fancy}
\fancyhf{}
\rfoot{\thepage}
\lhead{\textit{First Program using LaTex}}
\lfoot{\textit{SHREEDEVI INSTITUTE OF TECHNOLOGY}}

% Document
\begin{document}

    \section{Section 1}
    \lipsum[1] % Dummy text

    \section{Section 2}
    \lipsum[2] % Dummy text

\end{document}
```

program 2 : Develop a LaTeX script to create a document that displays the sampleAbstract/Summary.

```
\documentclass{article}
\usepackage{lipsum}

\title{Sample Abstract/Summary}
\author{}
\date{}

\begin{document}

    \maketitle

    \section*{Abstract}
    \lipsum[1]

    \vspace{0.5cm}

  \lipsum[3]
\end{document}
```

Program 3 : Develop a LaTeX script to create a simple title page of the VTUproject Report [Use suitable Logos and text formatting]

```
\documentclass[12pt,a4paper]{article}
\usepackage{graphicx}
\usepackage{geometry}
\usepackage{background}
\geometry{a4paper,total={180mm,250mm},left=20mm,top=30mm,}
    \usepackage{tikz}
        \usetikzlibrary{calc}
        \thispagestyle{empty}
\       backgroundsetup{
        scale=8,
        angle=0,
        firstpage=true,
        opacity=0.1,
        color=red,
        contents={\begin{tikzpicture}[remember picture,overlay]
        \node at ([yshift=1pt,xshift=0pt]current page.center)
        {\includegraphics[width=1.5cm]{vtu.jpg}};
    \end{tikzpicture}}}
\begin{document}
        \begin{tikzpicture}[remember picture,overlay]
         \draw[line width = 2pt] ($(current page.north west) + (1in,-0.5in)$) rectangle
        ($(current page.south east) + (-0.5in,0.5in)$);
\end{tikzpicture}
\begin{center}
        \textbf{\large{VISVESVARAYA TECHNOLOGICAL UNIVERSITY}}\\
        Jnana Sangama,Belgaum-590018\\
        \vspace{0.2in}
        \includegraphics[scale=0.8]{vtu.jpg}\\
        A PROJECT REPORT\\ON\\
        \textbf{"XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX"}\\
        \textit{Submitted in partial fulfillment of the requirements for the award of the
        degree of}\\
        \vspace{0.1in}
```

```
        \textbf{BACHELOR OF ENGINEERING}\\
        \textbf{IN}\\
        \textbf{COMPUTER SCIENCE AND ENGINEERING}\\
        Submitted by\\
        \vspace{0.5cm}
        \textbf{Student 1 \hspace{8cm} USN1\\
        Student 2 \hspace{8cm} USN2\\
        Student 3 \hspace{8cm} USN3\\
        Student 4 \hspace{8cm} USN4\\}
        \vspace{1cm}
        \textbf{Under the Guidance of}\\
        \vspace{0.2cm}
        Mr.Sanjay M {\tiny B.E, M.Tech}\\
        Asst Professor, Department of CSE\\
        RIT ,HASSAN\\
        \vspace{1cm}
        \includegraphics[scale=0.5]{vtu.jpg}\\
        \vspace{0.4cm}
        DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING\\
        \vspace{0.2cm}
        \textbf{\large{RAJEEV INSTITUTE OF TECHNOLOGY}}\\
        \vspace{0.2cm}
        B M ROAD BYPASS, HASSAN - 573201 2024-25\\
    \end{center}
\end{document}
```

Program 4 :Develop a LaTeX script to create the Certificate Page of the Report [Use suitable commands to leave the blank spaces for user entry].

```
\documentclass[11pt,a4paper]{article}
\usepackage{graphicx}
\usepackage{tikz}
\usepackage{background}
\usetikzlibrary{calc}
\usepackage[margin=1in,left=1.5in,includefoot]{geometry}
\thispagestyle{empty}
\backgroundsetup{
```

```
scale=.8,
angle=0,
firstpage=true,
opacity=0.1,
color=black,
contents={\begin{tikzpicture}[remember picture,overlay]
\node at ([yshift=10pt,xshift=18pt]current page.center)
{\includegraphics[width=10cm]{logo.jpg}};
\end{tikzpicture}}
}
\begin{document}
\begin{tikzpicture}[remember picture,overlay]
 \draw[line width = 2pt] ($(current page.north west) + (1in,-0.5in)$) rectangle ($(current
page.south east) + (-0.5in,0.5in)$);
 \end{tikzpicture}
\begin{center}
\large {\textbf{RAJEEV INSTITUTE OF TECHNOLOGY}} \\
\scriptsize{B M ROAD,BYPASS NEAR INDUSTRIAL AREA HASSAN -573201} \\
\normalsize{\textbf{Department of Computer Science and Engineering }}\\
\vspace{0.2in}
\includegraphics[scale=0.3]{logo.jpg}\\
\vspace{0.2in}
\large{\textbf{CERTIFICATE}}\\
\vspace{0.01in}
\end{center}
Certified that the project work entitled \textbf{"XXXXXXXXXXX"} is a bonefide work carried
out by
\begin{tabular}{l l l}
%\textbf{xxxxxxxxx} & \hspace{3in} \textbf{4CB15ECxxx}\\
%\textbf{xxxxxxxxx} & \hspace{3in} \textbf{4CB15ECxxx}\\
%\textbf{xxxxxxxxx} & \hspace{3in} \textbf{4CB15ECxxx}\\
\textbf{xxxxxxxxx} \textbf{4CB15ECxxx}
\end{tabular}
```

in partial fulfillment for the award of Bachelor of Engineering in Computer Science and Engineering of the Visvesvaraya Technological University, Belgaum during the year 2024-2025. It is certified that all corrections/suggestions indicated for internal assessment have been incorporated in the report deposited in the department library.The project report has been approved as it is satisfied the academic requirements in respect of project work prescribed for the said Degree.\\

```
\vspace{0.01in}
\begin{center}
\begin{tabular}{c c c}
\textbf{Name of Guide} & \hspace{2cm} \textbf{Coordinator Name} & \hspace{1.5cm}
\textbf{Name of HOD}\\
Guide & \hspace{2cm} Project Coordinator & \hspace{1.5cm} Head of the Department\\
\end{tabular}\\
\vspace{0.5in}
\textbf{Dr. Principal's Name}\\Principal
\end{center}
\vspace{3in}
NAME:\\
\vspace{1cm}
USN:\hspace{1cm} \begin{tabular}{|ll|ll|ll|ll|ll|ll|ll|ll|ll|ll|ll|ll|ll|ll|ll|} \hline
& & & & & & & & & & & & & & & & & & & & \\
\hline
\end{tabular}
\end{document}
```

Program 5 : Develop a LaTeX script to create a document that contains the followingtable with proper labels.

```
\documentclass{article}
\usepackage[utf8]{inputenc}
\begin{document}
\begin{tabular}{|c|c|c|c|c|c|}
\hline
$Sl.No$ & $USN$& $Student name$ &\multicolumn{3}{c|}{Marks}\\ \cline{4-6}
& & & Subject1 & Subject2 &Subject3 \\ \hline
1& 4XX22XX001&Name1 &89 &60 &90 \\ \hline
2& 4XX22XX002&Name2 &78 &45 &98 \\ \hline
3& 4XX22XX003&Name3 &67 &55 &59 \\ \hline
\end{tabular}
\end{document}
```

Program 6 : Develop a LaTeX script to include the side-by-side graphics/pictures/figures in the document by using the subgraph concept.

```
\documentclass{standalone}
\usepackage{tikz}
\usetikzlibrary{graphs.standard}
\begin{document}
    \begin{tikzpicture}
        \graph[nodes={circle,draw},simple]
        {
            subgraph K_n [n=8,clockwise];
        };
    \end{tikzpicture}
    \begin{tikzpicture}
        \graph[nodes={circle,draw},simple]
        {
            subgraph K_n [n=8, clockwise] -> mid;
        };
    \end{tikzpicture}
    \begin{tikzpicture}
```

```
            \graph[nodes={circle,draw},simple]
            {
                  subgraph K_n [n=8,clockwise];
                   8 -!- 3 -!- 4 -!- 5 -!- 2;
            };
      \end{tikzpicture}
\end{document}
```

Program 7 : Develop a LaTeX script to create a document that consists of the following two mathematical equations.

```
\documentclass[10pt,a4paper]{article}
\usepackage[utf8]{inputenc}
\usepackage{amsmath,nccmath}
\usepackage{amsfonts}
\usepackage{amssymb}
\usepackage[left=2cm,right=2cm,top=2cm,bottom=2cm]{geometry}
\begin{document}
      \begin{center}
            \Large{\textbf{Equations in \LaTeX}}
      \end{center}
      \section*{Equation 1}
      \begin{fleqn}
            \[x = \frac{-b \pm \sqrt{b^{2}-4ac}}{2a}\]
            \[= \frac{-2 \pm \sqrt{2^{2}-4*(1)*(-8)}}{2*1}\]
            \[= \frac{-2 \pm \sqrt{4+32}}{2}\]
      \end{fleqn}
\section*{Equation 2}
      \begin{fleqn}
            \[\varphi^{\lambda}_{\sigma}A_{t} = \sum_{\pi \in C_{t}}
            sgn(\pi)\varphi^{\lambda}_{\sigma}\varphi^{\lambda}_{\pi}\]

            \[= \sum_{\tau \in C_{\sigma t}} sgn(\sigma^{-
      1}\tau\sigma)\varphi^{\lambda}_{\sigma}\varphi^{\lambda}_{\sigma^{-
      1}\tau\sigma}\]

      \[= A_{\sigma t} \varphi^{\lambda}_{\sigma}\]
```

```
    \end{fleqn}
\end{document}
```

Program 8 : Develop a LaTeX script to demonstrate the presentation of Numbered theorems, definitions, corollaries, and lemmas in the document.

```
\documentclass{article}
\usepackage{amsthm}

% Define theorem-like environments
\newtheorem{theorem}{Theorem}[section]          % Theorems numbered within sections
\newtheorem{definition}[theorem]{Definition} % Definitions share numberingwith theorems
\newtheorem{corollary}[theorem]{Corollary} % Corollaries share numberingwith theorems
\newtheorem{lemma}[theorem]{Lemma} % Lemmas share numbering with theorems

    \begin{document}
        \section{Introduction}
        \begin{theorem}
            This is a theorem.
        \end{theorem}

        \begin{definition}
            This is a definition.
        \end{definition}

        \begin{corollary}
            This is a corollary.
        \end{corollary}

        \begin{lemma}
            This is a lemma.
        \end{lemma}

        \section{Another Section}
            \begin{theorem}
            Another theorem.
         \end{theorem}
\end{document}
```