Tutorial on
Document Preparation in LaTeX

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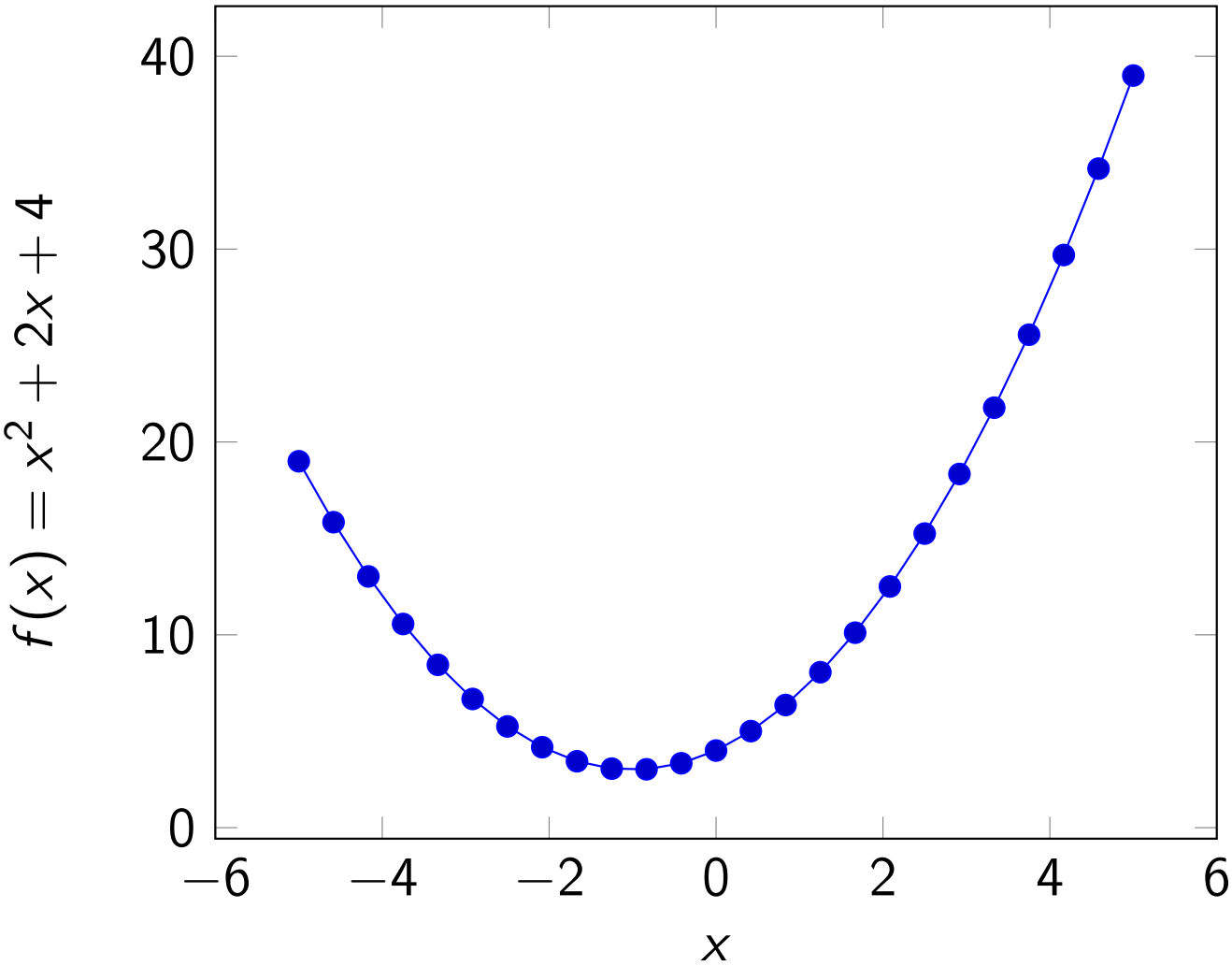
Plotting graph from the equation



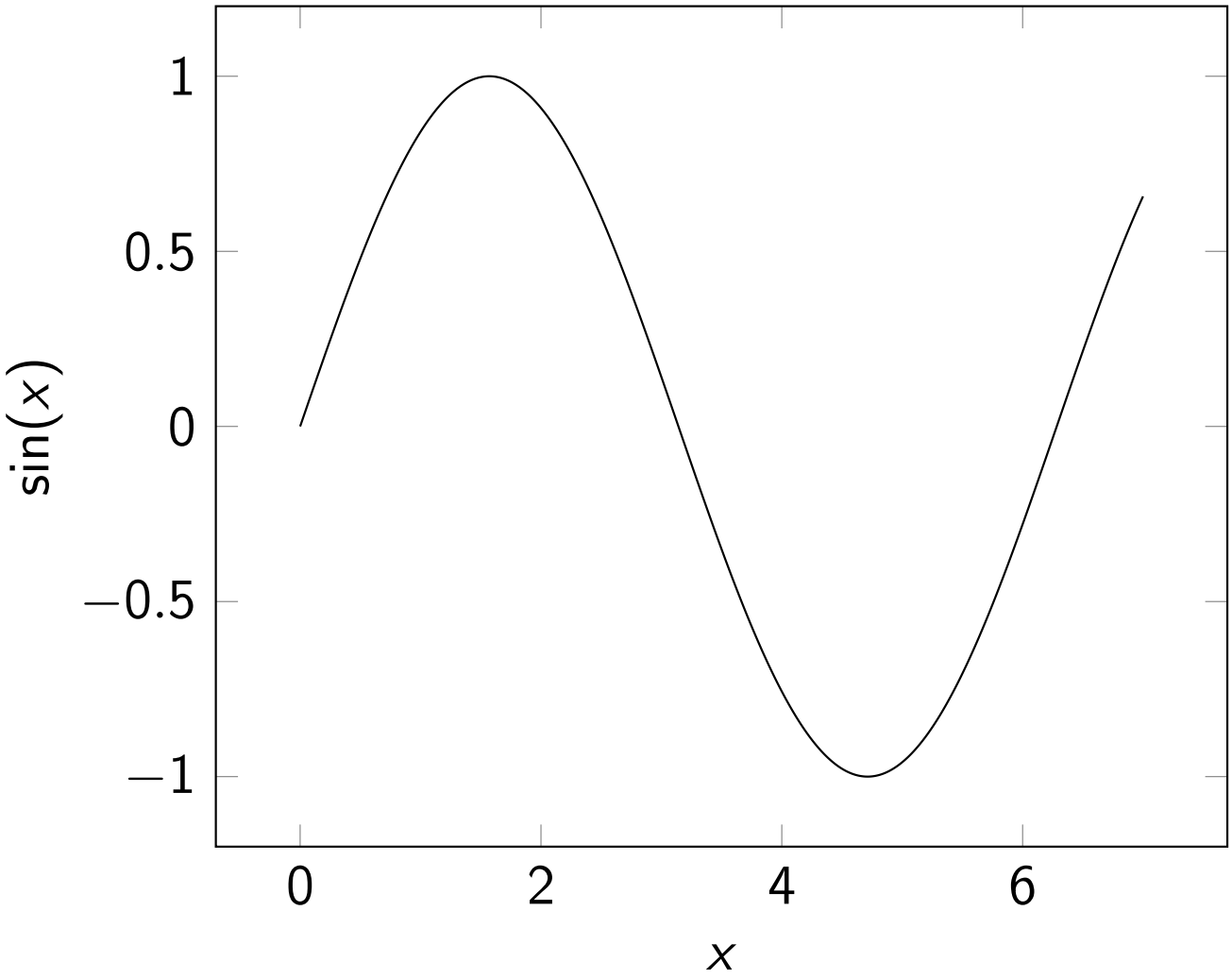
Plotting graph from the equation Demo

```
\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

Plotting graph from the equation contd...



Plotting graph from the equation Demo

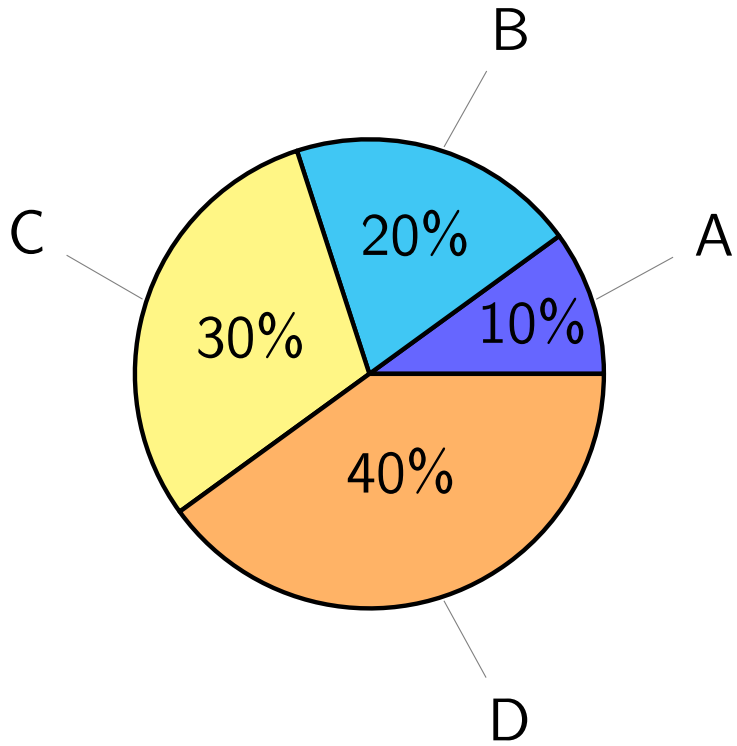
```
\begin{tikzpicture}
\begin{axis}[
xlabel=$x$,
ylabel=$\sin(x)$
]
\addplot[domain=0:7,samples=1000,id=sin]{sin(deg(x)
)};
%\addplot{sin(deg(x))};
\end{axis}
\end{tikzpicture}
```

Figure: Graph with sine fuction

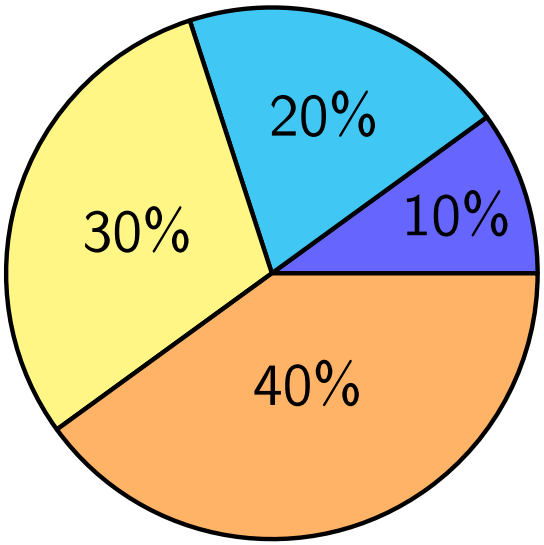
Pie chart from the data

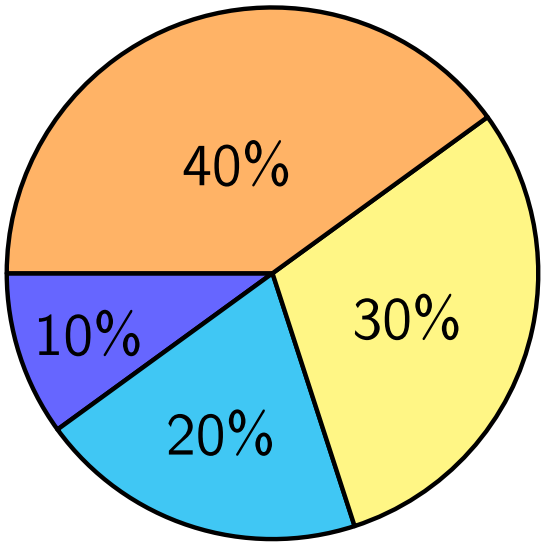
```
\begin{tikzpicture}
\pie[text = pin, radius=2]{10/A , 20/B , 30/C , 40/D }
\end{tikzpicture}
```

Figure: Pie Chart Demo



Pie Chart with rotation and position





Keep in mind

Use the package pgf-pie along with tikzpicture

Pie Chart with rotation and position

```
\begin{tikzpicture}
\pie {10/ , 20/ , 30/ , 40/}
\pie [pos ={8 ,0} , rotate =180]{10/ , 20/ , 30/ ,40/}
\end{tikzpicture}
```

Figure: Pie Chart Demo

Indexing in document

List of Tables

List of Figures

Figure: List of tables and figures

Indexing in document contd...

```
\documentclass{article}
\begin{document}
    \listoftables
    \listoffigures
    \section{Introduction to \LaTeX}
    \section{Lists }
    \section{Graphics}
    \section{Tables}
```

Figure: List of tables and figures

Bibliography in LaTex

- Bibliography is created by using BibTex
- BibTeX is reference management software for formatting lists of references
- The BibTeX is a stand-alone utility or tool typically used together with the LaTeX document preparation system
- It was developed by Oren Patashnik

Steps for incude Bibliography in LaTex

1. Include the package cite before beginging the document
2. Create file with .bib as extension. It is called database of references
3. List all the refereces with a fomat specified in the screenshot
4. Each reference should have a unique keyword to begin with

Steps for incude Bibliography in LaTex contd...

5. Include \bibliography{bib_file} before end document
6. Specify the bibliography style to be followed in the document at before the \begin{document} command
7. eg. \bibliographystyle{plain}
8. Try to explore different bibliography style available in latex such as "unsrt","alpha","ifac".
9. \citeasnoun{} can be used to place the name of the author in the running text

Compilation with BibTex

Following steps has to be followed if terminal is used:

1. Compile the tex file once by using the command pdflatex tex_file
2. Compile the .bib file by command bibtex bib_file
3. Compile the tex file twice by using the command pdflatex tex_file

The content of ref.bib

```
@Book{ll,
    author = {Leslie Lamport},
    title = {LaTex: A document preparation system: User's guide and reference manual.},
    publisher = {Addison Wesley},
    edition = {2nd},
    year = 1994,
}
@Book{fm04,
    author = {F.Mittelbach, M.Goossens},
    title = {The LaTex companion},
    publisher = {MA, USA},
    edition = {2nd},
    year = 2004,
}

@InProceedings{st17,
    author = {Sam Tregillus, Majed Al Zayer, Eelke Folmer},
    title = {Handsfree omnidirectional VR navigation using head tilt.},
    booktitle = {Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems},
    publisher = {ACM},
    address = {Denver, CO, USA},
    month = {May},
    year = {2017},
    doi = {http://dx.doi.org/10.1145/3025453.3025521},
    isbn = {978-1-4503-4655-9/17/05.},
}
@Article{ab2016,
    author =    {Andrea Baldacci, Daniele Bernabei, Massimiliano Corsini, Fabio Ganovelli,
    Roberto Scopigno},
    title =     {3D reconstruction for featureless scenes with curvature hints},
    journal =   {The Visual Computer}
```

The reference ordering using "alpha"

```
\documentclass{article}
\usepackage{cite}
\title{Bibliography Demo}
\bibliographystyle{alpha} %"unsrt","alpha","ifac","plain"
\begin{document}
    \maketitle
    \section{Introduction}
    The content of this slide is dummy.Only focus on the
    numbering part.\\

    The references can be included like \cite{ll} in to the
    slides.The advanced user may follow \cite{fm04} book.
    Tee proceeding included here \cite{wg16}. Anather
    proceeding reference is \cite{st17}.The journal
    references are here\cite{r6,sf10}
    \bibliography{ref}
\end{document}
```

Figure: The reference ordering using alpha

The reference ordering using "alpha"

Bibliography Demo

March 23, 2019

1 Introduction

The content of this slide is dummy.Only focus on the numbering part.

The references can be included like [Lam94] in to the slides.The advanced user may follow [F.M04] book. Tee proceeding included here [WGH16]. Anather proceeding reference is [ST17].The journal references are here [SZ10, Fre10]

References

[F.M04] M.Goossens F.Mittelbach. *The LaTex companion*. MA, USA, 2nd edition, 2004.

[Fre10] Scott Frees. Context-driven interaction in immersive virtual environments. *Virtual reality*, 14:277, 2010.

[Lam94] Leslie Lamport. *LaTex: A document preparation system: Users guide and reference manual*. Addison Wesley, 2nd edition, 1994.

[ST17] Eelke Folmer Sam Tregillus, Majed Al Zayer. Handsfree omnidirectional vr navigation using head tilt. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems*, Denver, CO, USA, May 2017. ACM.

[SZ10] A. C. Seabaugh and Q. Zhang. Low-voltage tunnel transistors for beyond cmos logic. *Proceedings of the IEEE*, 98(12):2095–2110, Dec

The reference ordering using "unsrt"

```
\documentclass{article}
\usepackage{cite}
\title{Bibliography Demo}
\bibliographystyle{unsrt} %"unsrt","alpha","ifac","plain"
\begin{document}
    \maketitle
    \section{Introduction}
    The content of this slide is dummy.Only focus on the
    numbering part.\\

    The references can be included like \cite{ll} in to the
    slides.The advanced user may follow \cite{fm04} book. Tee
    proceeding included here \cite{wg16}. Anather proceeding
    reference is \cite{st17}.The journal references are
    here\cite{r6,sf10}
    \bibliography{ref}
\end{document}
```

Figure: The reference ordering using "unsrt"

The reference ordering using "unsrt"

1 Introduction

The content of this slide is dummy.Only focus on the numbering part.

The references can be included like [1] in to the slides.The advanced user may follow [2] book. Tee proceeding included here [3]. Anather proceeding reference is [4].The journal references are here [5, 6]

References

[1] Leslie Lamport. *LaTex: A document preparation system: Users guide and reference manual.* Addison Wesley, 2nd edition, 1994.

[2] M.Goossens F.Mittelbach. *The LaTex companion.* MA, USA, 2nd edition, 2004.

[3] James Manning William Goddard, Alexander Muscat and Jussi Holopainen. Interactive dome experiences: Designing astrosurf. In *Proceedings of the 20th International Academic Mindtrek Conference*, pages 393–402, Tampere, Finland, Oct 2016.

[4] Eelke Folmer Sam Tregillus, Majed Al Zayer. Handsfree omnidirectional vr navigation using head tilt. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems*, Denver, CO, USA, May 2017. ACM.

[5] A. C. Seabaugh and Q. Zhang. Low-voltage tunnel transistors for beyond cmos logic. *Proceedings of the IEEE*, 98(12):2095–2110, Dec 2010.

[6] Scott Frees. Context-driven interaction in immersive virtual environments. *Virtual reality*, 14:277, 2010.

Presentation using beamer

- LaTex uses beamer to create the presentation slides
- It is a document class in LaTex
- It has special syntax for defining "slides" known as "frames"
- Beamer uses theme to create beautiful slides in LaTex

Title page in LaTeX

```
\documentclass{beamer}
\usepackage{graphicx}
\author{Names of the author}
\title[short title]{Title of the presentation}
\subtitle[short subtitle]{subtitle}
\institute[IITG]{Indian Institute of Technology Guwahati\\ Assam, India.}
\titlegraphic{\includegraphics[width=2cm]{IITG-logo}}
\date{March 23, 2019}
\begin{document}
\maketitle
\end{document}
```

Figure: Title page in LaTex

Title of the presentation

subtitle

Names of the author

Indian Institute of Technology Guwahati
Assam, India.

March 23, 2019

Adding frame in LaTeX

```
\documentclass{beamer}
\usepackage{graphicx}
\author{Names of the author}
\title[short title]{Title of the presentation}
\subtitle[short subtitle]{subtitle}
\institute[IITG]{Indian Institute of Technology Guwahati\\ Assam, India.}
\titlegraphic{\includegraphics[width=2cm]{IITG-logo}}
\date{March 23, 2019}
\begin{document}
\maketitle
\begin{frame}{Title of the presentation 1st slide}
    The content of the slide1 goes here
\end{frame}
\begin{frame}{Title of the presentation 2nd slide}
    The content of the slide2 goes here
\end{frame}
\end{document}
```

Figure

Title of the presentation 1st slide

The content of the slide1 goes here

Title of the presentation 2nd slide

The content of the slide2 goes here

Adding section and subsection

```
\documentclass{beamer}
\begin{document}
\section[short title]{section1 of the presentation}
\subsection{Subsection1}
\begin{frame}{Title of the presentation 1st slide in this section}
    The content of the slide1 goes here
\end{frame}
\subsection{Subsection2}
\begin{frame}{Title of the presentation 2nd slide in this section}
    The content of the slide2 goes here
\end{frame}
\section[short title]{section2 of the presentation}
\begin{frame}{Title of the presentation 1st slide in this section}
    The content of the slide1 goes here
\end{frame}
\begin{frame}{Title of the presentation 2nd slide in this section}
    The content of the slide2 goes here
\end{frame}
\end{document}
```

Figure: Section subsection in presetation

Adding table of content

```
\documentclass{beamer}
\begin{document}
    \section*{Outline}
    %\frame{\tableofcontents}
    \begin{frame}{Outline}
        \tableofcontents
    \end{frame}
    \section[short title]{Section1 of the presentation}
    \subsection{Subsection1}
    \begin{frame}{Title of the presentation 1st slide in this section}
        The content of the slide1 goes here
    \end{frame}
    \subsection{Subsection2}
    \begin{frame}{Title of the presentation 2nd slide in this section}
        The content of the slide2 goes here
    \end{frame}
    \section[short title]{Section2 of the presentation}
    \begin{frame}{Title of the presentation 1st slide in this section}
        The content of the slide1 goes here
    \end{frame}
    \begin{frame}{Title of the presentation 2nd slide in this section}
        The content of the slide2 goes here
    \end{frame}
\end{document}
```

Adding table of content

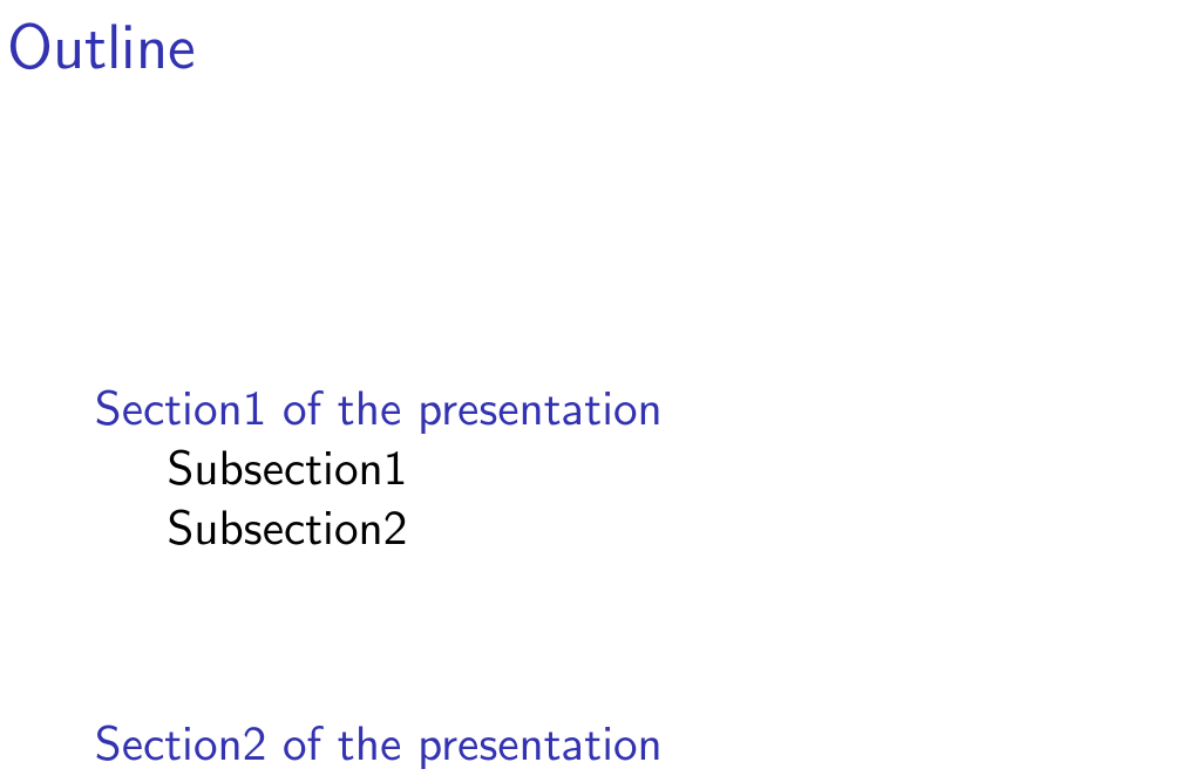


Figure: Table of content in presetation

Theme in LaTeX

```
\usetheme{CambridgeUS}
%CambridgeUS, PaloAlto,AnnArbor, Warsaw
\begin{document}
    \section*{Outline}
    %\frame{\tableofcontents}
    \begin{frame}{Outline}
        \tableofcontents
    \end{frame}
    \section[short title]{Section1 of the presentation}
    \subsection{Subsection1}
    \begin{frame}{Title of the presentation 1st slide in this section}
        The content of the slide1 goes here
    \end{frame}
    \subsection{Subsection2}
    \begin{frame}{Title of the presentation 2nd slide in this section}
        The content of the slide2 goes here
    \end{frame}
    \section[short title]{Section2 of the presentation}
    \begin{frame}{Title of the presentation 1st slide in this section}
        The content of the slide1 goes here
    \end{frame}
    \begin{frame}{Title of the presentation 2nd slide in this section}
        The content of the slide2 goes here
    \end{frame}
\end{document}
```

CambridgeUS theme in LaTeX

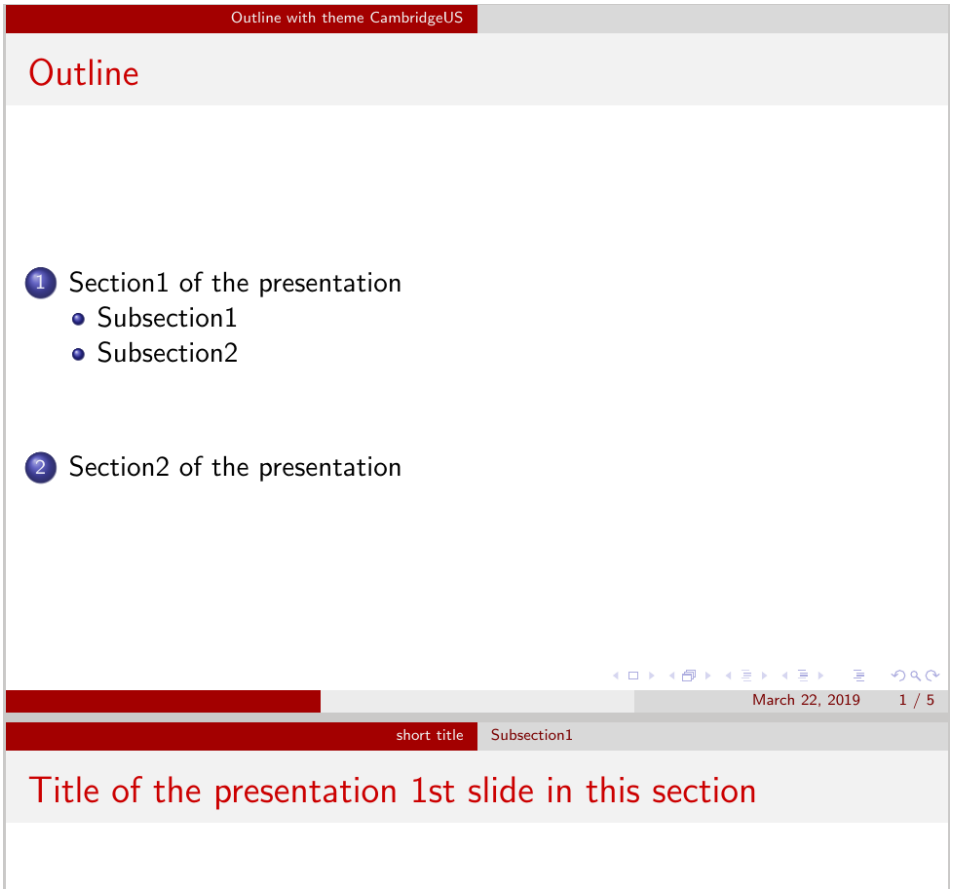


Figure: CambridgeUS theme in presetation

PaloAlto theme in LaTeX

Figure: PaloAlto theme in presetation

AnnArbor theme in LaTeX

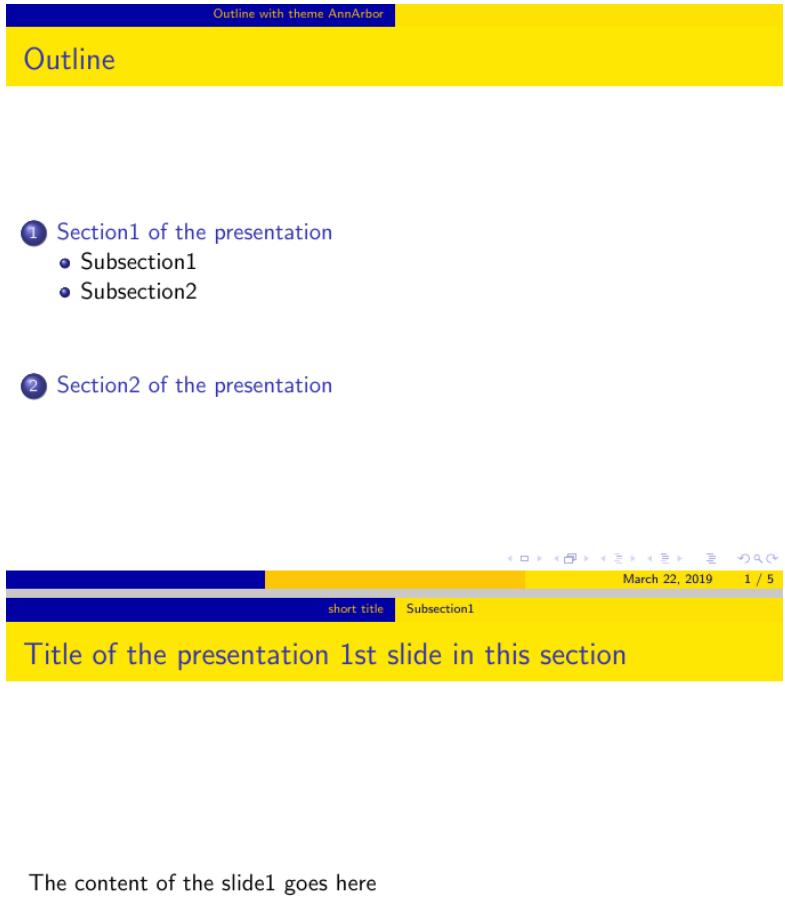


Figure: AnnArbor theme in presetation

Highlighting important sentences/words

In this slide, some important text will be highlighted because it's important. Please, don't abuse it.

Remark

Sample text

Important theorem

Sample text in red box

Examples

Sample text in green box. The title of the block is "Examples".

Highlighting important sentences/words contd...

```
\begin{block}{Remark}
    Sample text
\end{block}

\begin{alertblock}{Important theorem}
    Sample text in red box
\end{alertblock}

\begin{examples}
    Sample text in green box. The title of the block is
    ``Examples".
\end{examples}
```

Figure: Highlight in LaTex

List without color

Here the list items appear one after another on click.

- Item1
- Item2
- Item3
- Item4

List without color

Here the list items appear one after another on click.

- Item1
- Item2
- Item3
- Item4

List without color

Here the list items appear one after another on click.

- Item1
- Item2
- Item3
- Item4

List without color

Here the list items appear one after another on click.

- Item1
- Item2
- Item3
- Item4

List without color

Here the list items appear one after another on click.

- Item1
- Item2
- Item3
- Item4

List without color

```
\frametitle{List without color}
Here the list items appear one after another on click.\pause
\begin{itemize}
    \item<+-> Item1
    \item<+-> Item2
    \item<+-> Item3
    \item<+-> Item4
\end{itemize}
```

Figure: List without colour

List with color

Here the list items appear one after another on click.

- Item1
- Item2
- Item3
- Item4

List with color

Here the list items appear one after another on click.

- Item1
- Item2
- Item3
- Item4

List with color

Here the list items appear one after another on click.

- Item1
- Item2
- Item3
- Item4

List with color

Here the list items appear one after another on click.

- Item1
- Item2
- Item3
- Item4

List with color

Here the list items appear one after another on click.

- Item1
- Item2
- Item3
- Item4

List with color

```
\frametitle{List with color}
Here the list items appear one after another on click.\pause
\begin{itemize}
    \item<+-|alert@+> Item1
    \item<+-|alert@+> Item2
    \item<+-|alert@+> Item3
    \item<+-|alert@+> Item4
\end{itemize}
```

Figure: List with colour

Basic animation in Theorem

Theorem

There is no largest prime number

Proof.

1. Suppose p were the largest prime number.
2. Let q be the product of first p numbers.
3. Then $q + 1$ is not divisible by any of them.
4. Thus $q + 1$ is also prime and greater than p.

Basic animation in Theorem

Theorem

There is no largest prime number

Proof.

1. Suppose p were the largest prime number.
2. Let q be the product of first p numbers.
3. Then $q + 1$ is not divisible by any of them.
4. Thus $q + 1$ is also prime and greater than p.

Basic animation in Theorem

Theorem

There is no largest prime number

Proof.

1. Suppose p were the largest prime number.
2. Let q be the product of first p numbers.
3. Then $q + 1$ is not divisible by any of them.
4. Thus $q + 1$ is also prime and greater than p.

Basic animation in Theorem

```
\begin{theorem}
    There is no largest prime number
\end{theorem}
\begin{proof}
    \begin{enumerate}
        \item<1-|alert@1> Suppose $p$ were the largest prime number.
        \item<2-> Let $q$ be the product of first $p$ numbers.
        \item<3-> Then $q+1$ is not divisible by any of them.
        \item<1-> Thus $q+1$ is also prime and greater than $p$.
    \end{enumerate}
\end{proof}
```

Figure: Basic animation in Theorem

Class vs Package

- A **class** sets the overall document format like the available sectioning structure
- Defines some basic font related macros.
  e.g. \chapter is provided by book and report but not by article
- The class definition is stored in the .cls file known as class file
  e.g. article, report, book etc.
- A **package** adds more functionality and modify the style of the document.
- The commands specified in the package can be used with any document class
- The package stores the content in .sty file called style file
  e.g. graphics,tikz,xcolor etc

How to create and use package in Latex

Steps for creating and using package:

1. Create one style file and save with "stylefile.sty" extention
2. Create one tex file and include "stylefile" as a package
   e.g. \usepackage{stylefile}
3. Compile the tex file

Creating a style file

```
\NeedsTeXFormat{LaTeX2e}[2016/02/1]
\ProvidesPackage{iitg}[2019/03/22 iitg Package]

\RequirePackage{xcolor}
%\usepackage{xcolor}

\definecolor{iitgcolor}{rgb}{255,0,0}
\newcommand{\iitgindent}{
            \setlength{\parindent}{2cm} }
```

Figure: Creating a style file

Creating a style file contd...

- The command \NeedsTeXFormat{LaTeX2e} sets the LaTeX version for the package to work
- The command \ProvidesPackage{examplepackage}[...] identifies this package as stylefile package
- The release date and some additional information is included inside the squre brackets. The date should be in the form YYYY/MM/DD
- The command \RequirePackage is very similar to the well-known \usepackage
- It is used to include the packages needed for creating style file

Creating a tex file

```
\documentclass{article}
\usepackage{iitg}
\begin{document}
\begin{center}
    \iitgindent{Custom indentation demo}\\
%   \textcolor{iit}{testing}\\
    \textcolor{iitgcolor}{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.}\\
\end{center}
This color is defined in the iitg.sty file
\end{document}
```

Figure: Creating a tex file

Output after using style file

Custom indentation demo

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.

This color is defined in the iitg.sty file

Figure: Output after using style file

Thank You