The \LaTeX\ Beamer Class

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The LaTeX beamer class enables the creation of presentations, handouts and articles from the same source

- Slides of size 128x96 mm
- *Overlay* and *theme* support
- Regular LaTeX commands work
The first slide

\documentclass{beamer}
\begin{document}
\begin{frame}{A first title}
Simplicity is prerequisite to complexity.
\end{frame}
\end{document}
Beamer class options

\documentclass[options]{beamer}

Options

- 8pt, 9pt, 10pt, 11pt, 12pt, 14pt, 17pt, 20pt
- draft – no graphics, footlines, ...
- handout – no overlays

The beamer class automatically loads packages xcolor, amsmath, amsthm, calc, geometry, hyperref, extsizes, and others
Frames

\begin{frame}[options]{Title}{Subtitle}
...
\end{frame}

### Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>plain</td>
<td>no headlines, footlines, sidebars</td>
</tr>
<tr>
<td>squeeze</td>
<td>squeeze all vertical space</td>
</tr>
<tr>
<td>shrink=0..100</td>
<td>shrink everything by ( n ) percent</td>
</tr>
<tr>
<td>b, c, t</td>
<td>vertically align at bottom, center, top</td>
</tr>
<tr>
<td>fragile</td>
<td><strong>required</strong> when using macros (like verbatim)</td>
</tr>
<tr>
<td>allowframebreaks</td>
<td>auto-create new frames when necessary</td>
</tr>
<tr>
<td>label=...</td>
<td>label frame for reuse with \texttt{\textbackslash againframe}</td>
</tr>
</tbody>
</table>

Subtitle and title are optional
Titlepage

\documentclass{beamer}
\begin{document}
\author{Max Mustermann}
\title{A guide to the \LaTeX\ beamer class}
\date{\today}
\begin{frame}
\titlepage
\end{frame}
\end{document}
Environments

- Create bullet points with \textbf{itemize} and \textbf{enumerate} environments
- Include graphics with \textbf{figure} environment
- Include tables with \textbf{table} environment
- Include unprocessed text with \textbf{verbatim} environment
- Include math with \textbf{\(\ldots\)} or \textbf{\([\ldots\)]} environments
Blocks

Emphasize important information using block, alertblock, or exampleblock environments.

\begin{block}{title}
...
\end{block}

This is a Block
This is important information

\begin{alertblock}{title}
...
\end{alertblock}

This is an Alert block
This is an important alert

Appearance of different block types is defined by style templates. Title is mandatory. Use \begin{block}{}{} for empty title.
\begin{columns} \[c\] \% t,b,h
\column{.55\textwidth}
...
\column{.35\textwidth}
\includegraphics{gopher.png}
\end{columns}
Animations

Use the \pause command to make items appear on a slide.

We start our discussion with some concepts. \pause
The first concept we introduce originates with Erdős.

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Use \setbeamercolor{transparent} or \setbeamercolor{dynamic} to show covered parts.
Animations

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Use \setbeamercolor{transparent} or \setbeamercolor{dynamic} to show covered parts
Animations

\begin{itemize}
\item<1-> first
\item<2-> second
\item<3-> third
\end{itemize}

\begin{itemize}[<+->]
\item first
\item second
\item third
\end{itemize}

Explicitly set up individual items to appear on a particular slide within the frame using $<x-y>$ syntax (left), or use shorthand (right) to auto-increment.
Animations

Most environments allow overlay specification

\begin{itemize}
\item ...
\end{itemize}

\begin{block}
% only visible from second layer onwards
\end{block}

Many commands allow them, too

\textbf{bold}

\includegraphics[scale=0.3]{gopher}

...
Other useful commands to create animation/overlays
\only<x-y>{ only visible on slide x to y }
\alt<x-y>{ visible x to y }{ visible else }

The overlayarea environment prevents *wobbling* slides when using \only, \alt, ...
\begin{overlayarea}{.9\textwidth}{5em}
  ...
\end{overlayarea}
Embedding videos is possible, using the multimedia package

\usepackage{multimedia}
...
\movie[width=6cm, height=6cm, start=5s, duration=6s]
{\includegraphics{image}}{movie.avi}

But it might not work (depending on the PDF viewer)
Structuring

It is possible to structure the document using

- \section{My section}
- \subsection{My subsection}
- \subsubsection{My subsubsection}

before and between frames

These commands do not generate text on the slides, but appear in the \tableofcontents

In some themes, they appear in the sidebar or headline
Appendix

\section{...}
\begin{frame} ... \end{frame}
\appendix
\begin{frame} ... \end{frame}

Everything after \appendix does not appear in the ToC

However, it affects the page counter
Hyperlinks

First, add a target
\hypertarget{foo}{} or \hypertarget<2>{bar}{}

Then, link it somewhere else
\hyperlink{foo}{\beamergotobutton{go to foo}}

Button types
\beamergotobutton{foo}
\beamerskipbutton{bar}
\beamerreturnbutton{baz}
Beamer provides built-in themes

\usepackage{theme}

<table>
<thead>
<tr>
<th>Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>default</td>
</tr>
<tr>
<td>Antibes</td>
</tr>
<tr>
<td>Bergen</td>
</tr>
<tr>
<td>Berkeley</td>
</tr>
</tbody>
</table>
The DIY approach

You can create a custom theme by specifying

1. a colorscheme,
2. an innertheme,
3. an outertheme and
4. a fonttheme (not covered here)

separately
## Color theme

Choose a predefined color theme

\usecolortheme{colortheme}

<table>
<thead>
<tr>
<th>Color theme</th>
<th>Default</th>
<th>Beetle</th>
<th>Dove</th>
<th>Orchid</th>
<th>Seahorse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albatross</td>
<td>Crane</td>
<td>Fly</td>
<td>Rose</td>
<td>Whale</td>
<td></td>
</tr>
<tr>
<td>Beaver</td>
<td>Dolphin</td>
<td>Lily</td>
<td>Seagull</td>
<td>Wolverine</td>
<td></td>
</tr>
</tbody>
</table>

Color themes can be complete, inner or outer
Outer theme

Select an outertheme

\useoutertheme{outertheme}

The outertheme defines the head and footline of each slide

Outer themes

<table>
<thead>
<tr>
<th>infolines</th>
<th>miniframes</th>
<th>shadow</th>
<th>split</th>
</tr>
</thead>
<tbody>
<tr>
<td>sidebar</td>
<td>smoothbars</td>
<td>smoothtree</td>
<td>tree</td>
</tr>
</tbody>
</table>
Inner theme

Select an innertheme

`\useinnertheme{innertheme}`

The innertheme defines the appearance of blocks, enumerations and other environments inside the frame

Inner themes

<table>
<thead>
<tr>
<th>rectangles</th>
<th>circles</th>
<th>inmargin</th>
<th>rounded</th>
</tr>
</thead>
</table>

Custom theme example

The Madrid theme can be defined as

\usecolortheme{whale} \% outer color
\usecolortheme{orchid} \% inner color
\useinnertheme[shadow]{rounded}
\useoutertheme{infolines}
\usefonttheme{default}
The beamer user guide

Everything you need to know