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# Introduction to LaTeX

Beamer

## Contents

- (very)Basics: `slides` class
- Beamer basics
- Frame
- Overlays
- Structuring frames
- Themes
- Extra

## slides

- Documentclass `slides` is sufficient for simple slides with text and images.
- `\documentclass[landscape]{slides}`
- Troubleshooting:
  - Changing the whole document to “landscape” can be done be using the geometry-package:

    `\usepackage[landscape]{geometry}`



## slides

- Define slides inside the document-environment:
- `\begin{document}`
- `\begin{slide}`
- …
- `\end{slide}`
- `\begin{slide}`
- …
- `\end{slide}`
- `\end{document}`

## slides

- bullets can be achieved with the command “itemize”:
- `\begin{itemize}`
- `\item My first point`
- `\item My second point`
- `\item My third point`
- `\end{itemize}`

- *File: slides_1.tex*



## Beamer

Why?

- (re)Use your LaTeX code
- Elegant templates
- Follow the structure/progress of the presentation (navigation bars)
- Boxes for theorems, definitions, etc.
- Supports pdflatex

But

- Not WYSIWYG
- Requires some (re)search on documentation and testing

# When to use Beamer?

Beamer is **not so useful** for:

- Fancy presentations with lot of animations
- Short report presentations

Beamer is **useful** for:

- Huge presentations (where logical subdivision is required)
- Technical presentations (proposal, defense, final projects,…)

http://www.prism.gatech.edu/~mcarrara3/misc.html



# Beamer

- Beamer documents look pretty much the same as any regular LaTeX document.
- If anything else fails: read the manual
  beamer userguide >200 pages
- A presentation file:
  - an initial invocation of the beamer class
  - a preamble (selecting the 'theme' to use, and fixing e.g. the overall title of the presentation, etc.)
  - the body of the presentation
    with some (optional) structuring commands to divide the presentation into sections.

# Beamer

- The Fastest way to get started with Beamer is to start from an example file
- Just copy the template file, paste it in the desired location, and modify the contents.
- Check: Andrew Mertz, “Beamer by example”



# documentclass

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

Some options:

- `[t, c` or `b]`: Place text of slides at the **t**op, **c**entered (= default) or **b**ottom)of the slides
- `[compress]`: tries to make all navigation bars as small as possible (default is un-compressed).
- `[handout]`: for PDF handouts.
- `[trans]`: for PDF transparencies.
- `[Font Size]`: default is 11pt but may take following values: 8pt, 9pt, 10pt, 11pt, 12pt, 14pt, 17pt, 20pt
- `[red]` changes navigation bars and titles to reddish color **blue** (default), **red**, **brown**, **blackandwhite**

# Beamer: title

- Key information on your presentation.
- in the preamble of the .tex file.

```
\title[short title]{long title}
\subtitle[short subtitle]{long subtitle}
\author[short name]{long name}
\date[short date]{long date}
\institution[short name]{long name}
\titlegraphic{\includegraphics[scale=0.3]{graphic.jpg}}
```



# Beamer: title

- Generate the title page (from data in preamble)

```
\begin{frame}
 \titlepage
\end{frame}
```

- *File: beamer_title.tex*

# Beamer: frames

- A presentation consists of **frames**.
  - frame consists of slides (usually 1 frame = 1 slide)
  - Overlays produce multiple slides in a frame
- a beamer document will look like:

```
\documentclass{beamer}
\begin{document}
\frame{}
...
\frame{}
\end{document}
```

- *File: beamer_basics.tex*
- *File: beamer_simple.tex*



# Frame: syntax

- Frames can be written in both formats:
  as environment and as command.
- As an environment:

```
\begin{frame}[options]
... slide contents ...
\end{frame}
```

- As a command:

```
\frame[options]{
... slide contents ...
}
```

## Frame: extra

- A frame title can be generated with

```
\frametitle{A Title}
\framesubtitle{A subtitle}
```

- The contents of the frame can be any LaTeX stuff:
  - Usual environments like theorem, definition, etc.
  - Lists, etc.
  - Formulas
  - Graphics
  - Etc.



## Frame: organization

- Presentations are divided into Sections, Subsections, and Sub-Subsections.
- Each call to a section command:
  - Inserts a new entry into the Table of Contents at the appropriate tree-level.
  - Inserts a new entry into the navigation bars.
  - Sectioning commands can only be placed between frames
  - There must be at least 1 frame following the last sectioning command
- ***** version command,

`\subsection*{subsection name}`, only adds an entry in the navigation bars, not the Table of Contents.

# Frame: organization

- Organization can be expressed in a table of contents holding the sections and subsections of the presentation
- Can be implemented as:

```
\begin{frame}
\tableofcontents
\end{frame}
```

- Generate a table of contents in between

```
\frame{
\frametitle{Table of contents}
\tableofcontents[current]
}
```

`[current]` highlights the current section, other sections are greyed out.



# Hands-on

- Use an example file to compile and to check the result
- Add some more frames
- Add a table of contents

# Overlays – uncovering information piecewise

- Guide the audience by bringing incrementally the information to their attention.
- Overlays control the order in which parts of the frame appear



# Overlays

- the most simple, but not very flexible way is to use `\pause`

```
\begin{itemize}
\pause \item Beamer is a wonderful class
\pause \item One can make animations
\pause \item One uses the\textbf{pause} command, for
 example
\pause \item in order to bring in important ideas
\end{itemize}
```

- `\pause` creates multiple separate slides. The first slide displays the information contained above the first `\pause`, the second slide displays the information down to the second, etc.

# Automatically revealing

- Overlay specifications are given in pointed brackets (<,>)
- Automatically revealing bullet points:
  bullet points to appear one by one in sequence as you click through the presentation, use `[<+->]`

```
\frame
{
\frametitle{Title}
\begin{itemize}[<+->]
\item ...
\item ...
\item ...
\end{itemize}
}
```

- *File: beamer_overlay*



# Overlay specifications

- For more hand-tuning
- numerically qualify various commands with overlay specifications like <1>, <2>, <3>, …
- <1> will only appearing on the first slide
- <2-> will appear from slide 2 on
- <-2> will appear up to slide 2
- <2-4> will appear on slides 2 to 4.
- `\textbf<2>{Sample}`
- `\textit<1-5>{Sample}`
- `\textsl<10->{Sample}`
- `\alert<1-3, 6, 10->{Sample}`
- *File: beamer_overlay_spec*

# Overlay specifications: specials

- `\uncover`
  - `\uncover<n->` displays the text from slide n on
  - `\uncover<n-m>` displays the text from slide n to m.
  - `\uncover<p>` displays the text on slide p.
  - the argument of `\uncover` is either transparent or invisible outside slides for which it is not specified
- `\only`
  - `\only<n->` displays the text from slide n on
  - `\only<n-m>` displays the text element from slide n to m.
  - `\only<p>` displays the text on slide p.
  - the argument of `\only` is simply discarded on slides where it's not shown, i.e., **it occupies no space**
- `\invisible<n>` makes text invisible on slide n
- *File: beamer_overlay_specials*



# Useful Commands that Work with Specifications

| | | | |
|---|---|---|---|
| `\textbf<>{}` | controls when to bold text | `\only<>{}` | controls when to reveal text, occupies NO space otherwise |
| `\textit<>{}` | controls when to italicize text | `\uncover<>{}` | controls when to reveal text, DOES occupy space otherwise |
| `\color<>[]{}` | controls when to change color of Text | `\alt<>{}{}` | reveals first argument when specification is true, otherwise reveals second argument |
| `\alert<>{}` | controls when to highlight text (default red) | `\item<>` | controls when an item is shown |

*web.mit.edu/rsi/www/pdfs/beamer-tutorial.pdf*

## Hands-on

- Use an example file beamer_overlay…
- Change the presentation theme
- Play around with the dynamic features of overlays
- Add some more frames



## Structuring frames

- Beamer provides ways to structure the frames:
  - Columns
  - Blocks
  - Boxes (Borders)

# Columns

- It can be useful to spread the contents of a slide over columns
- Use `columns` environment

```
\begin{columns}[pos]
\begin{column}[pos]{width}
... text ...
\end{column}
\begin{column}[pos]{width}
... or figure ...
\end{column}
\end{columns}
```

- pos= placement (b, c, T)
- width=width `in mm, in, cm, …`or `.xx \textwidth`
- *File: beamer_columns*



# Block

- Highlight a word with `\alert`
- block environments is useful for arranging text on a slide.
- they are aware of overlays
- their color schemes are theme dependent

```
\begin{block}{Block title}
        text…\\
             and more.
\end{block}
```

- *File: beamer_block*

# Other block environments

- Other block environments are also available.
- Each environment has its own color scheme

| Content Type Generic block | Corresponding Environment |
|---|---|
| Theorems | theorem |
| Generic | block |
| Lemmas | lemma |
| Proofs | proof |
| Corollaries | corollary |
| Examples | example |
| Hilighted Title | alertblock |



# boxes

- Borders can also be used to add structure
- To access these commands, `\usepackage{fancybox}` must be added in the
- some examples
  - `\shadowbox{Sample Text}`
  - `\fbox{Sample Text}`
  - `\doublebox{Sample Text}`
  - `\ovalbox{Sample Text}`
  - `\Ovalbox{Sample Text}`

# Themes

- Themes can change the entire look and feel of the presentation.
- A presentation theme is composed out of color, font, inner and outer (change them if you do not like the default)
- Different themes can be selected by changing the `\usetheme` command.
- https://hartwork.org/beamer-theme-matrix/

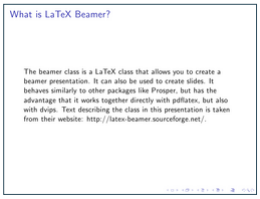


# Themes

- 5 different theme types:
  - Presentation (cities)
    define all aspects of your slides: fonts, colors, labels for itemized list, etc.
    `\usetheme{themename}`
  - Color (birds, flowers, see animals)
    only define the colours used
    `\usecolortheme{seahorse}`
  - Font
    only define the fonts used
    `\usefonttheme{serif}`
  - Inner
    only define elements “inside” of the frame, e.g. enumerations, itemize environments, the table of contents, etc.
    `\useinnertheme{rounded}`
  - Outer
    only define “outside” elements of the frame, e.g. headline, footline, or sidebars
    `\useoutertheme{sidebar}`

# Presentation themes

- Without navigation bar: *default, boxes, Bergen, Madrid, Pittsburgh, Rochester*
- With a treelike navigation bar: *Antibes, JuanLesPins, Montpellier.*




Default


Antibes

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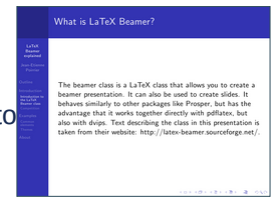
# Presentation themes

- With a TOC sidebar: *Berkeley, PaloAlto, Goettingen, Marburg, Hannover*
- With a mini frame navigation: *Berlin, Ilmenau, Dresden, Darmstadt, Frankfurt, Singapore, Szeged*
- With section and subsection titles: *Copenhagen, Luebeck,Malmoe, Warsaw*

Palo Alto




Berlin


Warsaw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# Hands-on

- Use an example file and choose a theme
- Compile and check the result



# Inner theme

- Usage
  `\useinnertheme[Option]{inner theme}`
  - Inner theme
    - default
    - circles
    - rectangle
    - rounded
    - inmargin
  - Option
    - shadow
- Is influencing
  - Titlepage
  - Environments
  - Block

## Outer theme

- Usage
  `\useoutertheme[Option]{outer theme}`
  - default
  - miniframes
  - sidebar
  - tree
  - Etc.
- Influencing
  - Sidebars
  - Frame title
  - Footer and header parts



## Color theme

- Usage
  `\usecolortheme{color theme}`
- Some themes influence whole presentation
  - default
  - albatross
  - crane
- Some only the inner part
  - lilly
  - orchid
  - rose
- Some only the out part
  - whale
  - seahorse
  - dolphin

## Font theme

- Usage
  `\usefonttheme{font}`
  - serif
  - structurebold
  - structureitalicserif
  - structuresmallcapsserif
  - professionalfonts
- Influencing
  - font



## Hands-on

- Use an example file and change the inner, outer, color theme and check the result.
- Slides come default with clickable small navigation icons `\beamertemplatenavigationsymbolsempty` will remove these (in default theme)

## Extra: notes

- `\note{}` enables to make some additional notes to the slide.
- `\documentclass[notes=show]{beamer}` will show the notes
- *beamer_notes*

- When using overlays, the pdf contains a lot of pages. To print the presentation use `\documentclass[handout]{beamer}`
- *beamer_handout*

- Default: PDF screen (size 128mm  96 mm)



## Extra: logo

- Placing a logo, in the lower right corner of each page (in preamble)

```
\pgfdeclareimage[height=1.0cm]{logo}{logo}
  \logo{ \pgfuseimage{logo} }
```

- Placing a logo on the title page (in preamble) `\titlegraphic{ \center\pgfimage[height=0.6cm]{logo} }`

# Extra: Recurring TOC

- Use this code (in preamble) to have a recurrent table of contents
- At each section

```
\AtBeginSection[ ]
{
\begin{frame}<beamer>
\frametitle{Plain}
\tableofcontents[currentsection]
\end{frame}
}
```

- At each subsection

```
\AtBeginSubsection[ ]
{
\begin{frame}<beamer>
\frametitle{Plain}
\tableofcontents[currentsection,currentsubsection]
\end{frame}
}
```

- *beamer_recurringtoc*



# Extra: input

- Structuring your beamer source code

```
\documentclass{beamer}
\input{preamble.tex}
\begin{document}
\input{sec_1.tex}
\input{sec_2.tex}
\end{document}
```

# Extra: Navigation bar

- By default BEAMER displays a set of navigation symbols.
  - A slide icon—a single rectangle
  - A frame icon—a stack of three slide icons
  - A subsection icon—a highlighted section in a table of contents
  - A section icon—a highlighted section with subsections
  - A presentation icon—a completely highlighted table of contents
  - Back and forward arrows—curved arrows
  - A search icon—magnifying glass
- `\beamertemplatenavigationsymbolsempty` to remove them.



# Extra: background

- It is possible to use a different background template, e.g. an empty Powerpoint file that is converted to PNG, JPG, EPS or PDF.
- ```
  \usebackgroundtemplate{
  \includegraphics[width=\paperwidth,
  height=\paperheight]{my_image}
  }
  ```
- Source: http://mprnotes.wordpress.com/2009/08/14/changing-background-image-of-latex-beamer/
  ```

# Extra: background on 1 slide

- if you want to change the background only for one specific frame, then you have to create a block and set an image as the background of this block (Write `\usebackgroundtemplate` before the frame, not within):

```
{
\usebackgroundtemplate{\includegraphics[width=\paperwidth]{my_image}}
\begin{frame}
\frametitle{Frame with nice background}
\begin{itemize}
\item 1
\item 2
\item 3
\end{itemize}
\end{frame}
}
```



# Extra: Selective compilation

- Use `\documentclass[draft]{beamer}` to bypass proper headline/footline updating.
- Label a frame:

`\frame[label=this_label_for_frame]{...`

- gives you a handle on the frame:

`\includeonlyframes{this_label_for_frame}`

- compile only the frame you are looking at.
- quickly change the scope of the presentation.