Latex: Presentations Using Beamer and Tikz

Biometry 789-02

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April 18, 2013

Outline

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What is Beamer?

- Beamer is a LaTeX document class for producing slides created by Til Tantau at the University of Leubeck
- Original version from 2003
- Makes creating PDF presentations with bells and whistles straightforward
- A guide to help you get started can be found: `http://www.math.umbc.edu/~rouben/beamer/quickstart.html`
- You have learned `\documentclass{article}`
- Today we are discussing `\documentclass{beamer}`

Beamer: Advantages

- Unlike PowerPoint (particularly when using Equation Editor or importing figures), presentation will appear the same regardless of computer (MAC, PC)
- Once you learn basic LaTeX commands, you can create presentations with varying layouts etc
- Creates an automatic table of contents with clickable links (see header)
- Themes allow changing appearance of the presentation
- Inclusion of overlays and dynamic effects

Beamer: Advantages

- If you are writing your dissertation in LaTeX it is easy to cut and paste code to make conference/defense presentations or vice versa
- Useful templates available with the Beamer download:

  `C:\Program Files\MikTex 2.9\doc\latex\beamer\solutions\`
- A 247 page user guide is also available in the same folder:

  `C:\Program Files\MikTex 2.9\doc\latex\beamer\doc\beameruserguide.pdf`

Beamer: Templates

- Let's try a template
- Open template from class website and copy into WinEdt
- Select tab "Tex" and PDF and PDFtexify
- Nice elements not available in PowerPoint - table of contents, links to sections and subsections, etc

Beamer: Themes

- Beamer document class allows the user to select one of many themes to specify appearance
- This lecture uses the theme Darmstadt
- Many other themes are available: default, Boadilla, Madrid, Pittsburgh, Rochester, Copenhagen, Warsaw, Singapore, Malmoe, etc

Colors

To change the colors of the presentation you need to change `\usecolortheme{default}` in the preamble (before you begin the document)

Color Options

albatross crane beetle dove fly seagull wolverine beaver

Title Page

- Very easy to change `\title`, `\subtitle`, `\author`, `\institute`, `\date` in template
- Notice [short paper title] for shorter titles, dates etc that display throughout presentation
- Notice % for commenting code

Frames

- Each slide is coded as a frame: `\begin{frame}` and `end{frame}`
- Can also code as `\frame{ ... }`
- Notice how `\titlepage` and `\tableofcontents` are specified
- Sometimes I use the `[pausesections]` option after `\tableofcontents`
- Specify titles on each slide with `\frametitle{}` or with `\begin{frame}{TITLE}`
- Notice I can get rid of headers and footers with the frame option `[plain]`

Sections and Subsections

- To create a section: `\section{TITLE}`
- Notice my sections in the header: Introduction to Beamer, Getting Started, etc
- Also determines entries in the table of contents
- Section and subsection commands are given *outside* of frames!

Environments: Definitions

- If you want to define something, specify `\begin{definition}` and `\end{definition}`:

Definition

π is a mathematical constant that is the ratio of a circle's circumference to it's diameter.

Environments: Theorems, Lemmas, Proofs, Corollaries, Examples

- If you want to highlight an example, specify `\begin{example}` and `\end{example}`:

Example

PDF for the Cauchy Distribution

$$f(x) = \frac{1}{\pi(1 + x^2)}$$

Generic Environments: Block

- If you want to highlight any text, specify `\begin{block}{TITLE}` and `\end{block}`:

PDF for the Cauchy Distribution

$$f(x) = \frac{1}{\pi(1 + x^2)}$$

Frame Layout

Column 1 can be specified with `\begin{columns}` and `\column{.5\textwidth}`

Column 2 specified by with `\column{.5\textwidth}` and `\end{columns}`

Overlays

- I use bullets on most slides with: `\begin{itemize}` and `\end{itemize}`

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- This allows showing each bullet incrementally

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4. This allows showing each number incrementally

Getting Complicated: Overlays

- Show only the 1st item with `\item<1->`

- and last item with `\item<1->`!

Getting Complicated: Overlays

- Show only the 1st item with `\item<1->`
- Then add each additional item by specifying `\item<2->`

- and last item with `\item<1->`!

Getting Complicated: Overlays

- Show only the 1st item with `\item<1->`
- Then add each additional item by specifying `\item<2->`
- Then add each item with with `\item<3->`

- and last item with `\item<1->`!

Getting Complicated: Overlays

- Show only the 1st item with `\item<1->`
- Then add each additional item by specifying `\item<2->`
- Then add each item with with `\item<3->`
- You don't need `\pause` just specify the order in the `<>`
- and last item with `\item<1->`!

Getting Complicated: Overlays without Itemizing

Without bullets use *uncover*

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Getting Complicated: Overlays without Itemizing

Without bullets use *uncover* instead of *item*. Or you can use *only* instead of *item*. You still need to specify on which slide the text should appear. But this is less readable.

Getting Complicated: More Overlays

- Highlight only on some slides
- For example only highlight this slide 2
- To do this use `\alert<2>{}`

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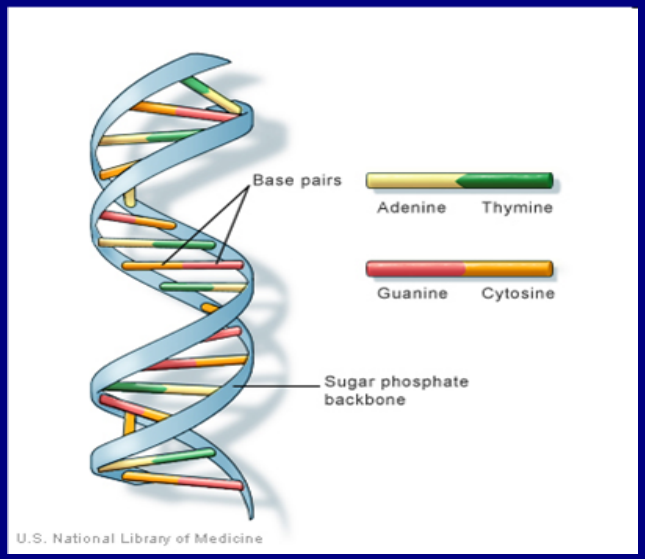
Graphics

Let's add an image with code:
`\includegraphics[height]{filename}`



Hyperlinks

Let's add an hyperlink with code:
`\url{http://people.musc.edu/~elg26/teaching/...}`

http://people.musc.edu/~elg26/teaching/statcomputing.2012/statcomputingI.2012.htm

Handouts

- Sometimes it's nice to provide handouts for your presentation
- Need to change the document class option to `documentclass[handout]{beamer}`
- You also probably want to save paper by printing multiple slides/page

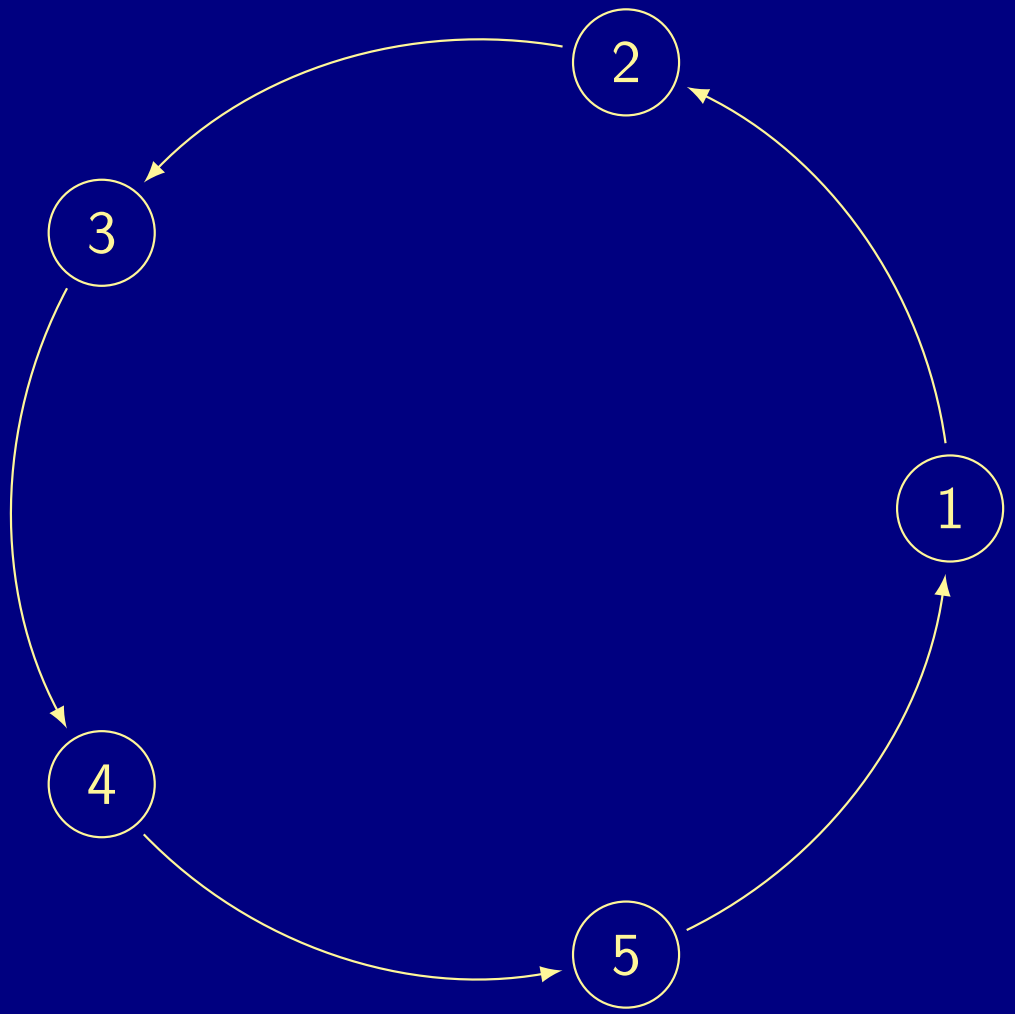
```
\usepackage{pgfpages}
\pgfpagesuselayout{4 on 1}
[landscape,letterpaper,border shrink=2.5mm]
```

Drawing in Beamer

- You can even draw in Beamer!
- Need to add the tikz package `\usepackage{tikz}`
- To start drawing `\begin{tikzpicture}` and you know how to end the picture
- You need to end tikz commands with ;

devilish

More Realistically



Questions?