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A Basic Beamer Power Up

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Intro

- Beamer is to Powerpoint as LATEX is to Word. So if you've facility with LATEX, you'll get Beamer quickly. If not, refer to the LATEX Power-up document.

- Beamer outputs a PDF, so your presentation will look the same every time, and should be able to be loaded on virtually any computer.

- As with LATEX, it outputs equations exquisitely. Graphics, however, are not Beamer's strong suit. But below there is a workflow that incorporates graphics acceptably.

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Basics

A Basic Frame

Example Frame

\begin{frame} [text alignment] {Frame Title}
Content of slide.
\end{frame}

Alignment can be t for placing the text directly at the top of the slide, c for vertically centered text (which is default), or b for placing text at the bottom of the slide.

Title Frame

In the header somewhere you may have the following lines of code. The bit in brackets will be on each subslide, and the bit in curly brackets will be on the title page. For example, my full name is on the title page while each slide displays only my last name.

Header Commands

\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}

Generate a title frame by putting \titlepage inside a frame.

Tables of Contents

- A table of contents is generated based on your sections and subsections automatically. You can create a table of contents slide by putting \tableofcontents inside a frame.

- A table of contents will <u>not</u> include sections or subsections that are generated with an asterisk:
  \section*{Section excluded from TOC}

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Navigation buttons

By default slides will come with a navigation bar at the bottom
right that allows you to move one slide forward or backward, move
to the next section, etc.

◀ □ ▶   ◀ ⮲ ▶   ◀ ≣ ▶   ◀ ≣ ▶   ≣   ⟳ ९ ⟲
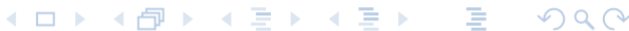
I find this distracting, so I eliminate it using the following
command: \beamertemplatenavigationsymbolsempty

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Roadmap slides

At the beginning of a section, I have a slide showing the title of the section. Many prefer to have at the start of each section a Table of Contents slide that highlights the piece we're at now. At the beginning of the Navigation section, it would look like so:

1 Basics

2 Navigation

3 Illustrating Ideas

4 Visuals

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Roadmap slides

The code for Roadmap slides is as follows:[1]

Roadmap

```
\AtBeginSection[ ]
{
\begin{frame}
\frametitle{Roadmap}
\tableofcontents[currentsection]
\end{frame}
}
```

―――――――――――――――――――

[1]This code is commented out in the TeX file, just below the code used for the current section-title introductions.

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Appendix Slides

One of the best parts of Beamer, is that you can have supplemental slides. This way, you can anticipate an audience-member's questions and have information to answer it, without littering your core presentation with it. It's excellent!

In the TeX file, you need to label both the slide in the presentation and the appendix slide. This will look like \label{identifiable-name-of-slide}. Then you can place a button to get you to the appendix slide by including \hyperlink{appendix-label}{\beamerbutton{Button}}

Example Appendix Button

Appendix Slides...and Page Numbers

Appendix slides can mess with your page numbers. If, as in this document, your pagination includes a Total (e.g. 11/30), you don't want the total to include the appendix slides.

\usepackasge{appendixnumberbeamer} in your header will correct the total number of slides.

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Coloring Text

One key tool in drawing attention to various pieces of text is color.
You can change the color of text by using \textcolor{red}{text
you want colored}

We'll cover, in the Formatting Section below, the various different
colors and how you can create your own.

Pauses: the Simplest Overlay

Overlays let parts of your slides show up incrementally.

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Pauses: the Simplest Overlay

Overlays let parts of your slides show up incrementally.
The most basic way to do this is with a \pause, where you put the
\pause before the piece that you want to show up later

An example with pauses

Step 1: Use forward-propogation to find the hypothesis and
compute the cost.
\pause
Step 2: Use back-propogation to compute the partial derivatives
\pause
Step 3: Check your gradient ...

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Overlays: Beyond Pauses

The problem with pauses is that they are all in top-to-bottom order. Sometimes you want something to appear higher up after something lower down in your slide has arrived. Overlays help.

An overlay is marked in pointed brackets and indicates which slide you want that text to appear on.

- \item<1-> means display on slide 1 onward.

- \item<-2> means display on slide 2 and before. Notice that there is room left for the bullet above to appear on the next slide.

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Overlays: Beyond Pauses

The problem with pauses is that they are all in top-to-bottom order. Sometimes you want something to appear higher up after something lower down in your slide has arrived. Overlays help.

An overlay is marked in pointed brackets and indicates which slide you want that text to appear on.

- \item<1-> means display on slide 1 onward.

- \item<3> means display on slide 3 only.

- \item<-2> means display on slide 2 and before. Notice that there is room left for the bullet above to appear on the next slide.

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Overlays: Onslide

To use overlays with text (rather than items), you can use
\onslide<>:

\onslide<1->{Shows up first}
\onslide<2->{This line of text shows up next}
\onslide<3->{Finally, this line pops up}

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Overlays and Tables

We can also use overlays to make parts of tables appear using the
\onslide<> before the relevant lines in the table:

Competitor	Round 1	Round 2	Round 3	Total
Cody	13:05	23:15	19:34	55:54
Nur	8:00	22:45	23:02	53:47

Table: Race Results

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Overlays and Tables

We can also use overlays to make parts of tables appear using the
\onslide<> before the relevant lines in the table:

Competitor	Round 1	Round 2	Round 3	Total
Cody	13:05	23:15	19:34	55:54
Nur	8:00	22:45	23:02	53:47
Alex	12:00	25:00	20:01	57:01
Ash	10:22	21:10	24:03	55:35

Table: Race Results

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Transparent Overlays

In order to hint at the upcoming overlays, you can have them appear slightly transparent on preceeding slides before turning solid when their own slide comes up. To have this effect use

$\setbeamercovered\{transparent\}$

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Formatting in Overlays

You can have formatting show up in an overlay. This is particularly helpful if you want a particular part of an equation to be colored in one slide then not in another.

For example, \textbf<2> will make text bold...but only on the second slide.

Likewise, \textcolor<2>{green}{text} will make text green...on the second slide.

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Handouts & Overlays

As you may have noticed, overlays generate multiple slides to create the illusion of material appearing on your slides when you click through them. This is great, except when you're printing handouts. Then your students want to murder you.

To avoid student-mutiny, try the Handout option: \documentclass[10pt,handout]{beamer}. It will create a pdf that has only the "final" slides of each overlay.

Overlays & Appendix Slides

If you have multiple frames in a slide, you probably want to get back to the correct one in the "Back" button on your appendix slide. To do that, you need to use \hypertarget, which lets you refer to which overlay you want.

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Images

As with LaTeX, insert images using
\includegraphics{picture.png}, perhaps with
\begin{center} if you want the image centered:

Images in columns

If you want to embed images in columns, use the following code:

```
\begin{columns}
\column{0.5\textwidth}
Text
\column{0.5\textwidth}
\includegraphics{picture.jpg}
\end{columns}
```

Images and Overlays

You can turn graphics into overlays by using \includegraphics<1>

Images and Overlays

You can turn graphics into overlays by using \includegraphics<1>

Images and Overlays

Likewise using
\visible<1>{\includegraphics}
will keep images in place
as more images appear.

Images and Overlays

Likewise using
\visible<1>{\includegraphics}
will keep images in place
as more images appear.

Really Wide Tables

Naturally, Beamer will keep the left margin intact and push a really big table to the right. It looks ugly:

	Model 1	Model 2	Model 3	Model
Our Main Variable of Interest	0.343	0.324	0.303	0.255
	(0.0445)	(0.133)	(0.0457)	(0.134
N	1045	1045	1045	1045

Really Wide Tables

You can either make the text size smaller:
{\small \input{table.tex}}

Or you can enclose the table in a box:
\makebox[\linewidth][c]{ \input{table.tex}}

	Model 1	Model 2	Model 3	Model 4
Our Main Variable of Interest	0.343	0.324	0.303	0.255
	(0.0445)	(0.133)	(0.0457)	(0.134)
N	1045	1045	1045	1045

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Output Folders

Perhaps all of your analyses produce images and tables to an Output folder...and your TeX doc doesn't live there. This can be very annoying because you don't want to hard-code in where your files live (especially if you're collaborating via Dropbox, say). The following lines in your preamble will be a blessing:

```
% Paths to Output Folder
\makeatletter
\def\input@path{{~/Dropbox/Project1/Analysis/output/}}
\makeatother
\graphicspath{{~/Dropbox/Project1/Analysis/output/}}
```

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Blocks

There are several built-in blocks that you can use by entering a
block environment via \begin{block}{Block Title}

A regular block

Just like this

Other block environments include example[Title]:

Example (With this title)

An Example is often shown in a different color.

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Blocks and Math

Certain built-in blocks are used specifically for math environments, such as theorem or corollary

Theorem (Pythagoras)

$a^2 + b^2 = c^2$

Corollary (About Text)

You can still write in these, but it'll be italics

Proof.

Proofs contain a box. ☐

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Font Defaults

- Default font size can be changed in the header line
  \documentclass[10pt]{beamer} to another number.
- Fonts can also be changed by including \usepackage{font}
  for the font you want. You're likely to have the following fonts
  in your installation: avant, bookman, chancery, charter,
  helvet, mathtime, mathptmx, palatino, pifont, serif, utopia

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Text Alignment

By default, text is displayed flush left.
You can center it or make it flush right with
\begin{center} or \begin{flushright}

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Themes

Themes change the layout of your slides: What items show up on each page? Do they note the slide number? Do they show what section you're in?

This is all defined by the theme that you use. Google search the theme-color matrix in order to determine which ones suit you best (knowing that you can change all the colors if you wish. See the next few slides).

A Snapshot of the Theme-Color Matrix

Color Schemes

You can change the colors of any theme if you so choose. Here, I've changed the Berlin theme so that there is a somewhat less bold blue. You can change these colors by defining the foreground (fg) and background (bg) colors for various elements of a slide

Changing Theme Colors

\setbeamercolor{palette primary}{bg=ltgray,fg=dkblue}
\setbeamercolor{palette secondary}{bg=blue,fg=dkblue}
\setbeamercolor{palette tertiary}{bg=dkblue,fg=ltgray}
\setbeamercolor{palette quaternary}{bg=blue,fg=ltgray}
\setbeamercolor{structure}{fg=blue} % items, enumerate, etc.
\setbeamercolor{section in toc}{fg=dkblue!150}

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Colors

If you use the package dvipsnames, you have access to a bunch of named colors.

Apricot	▭	Emerald	▭	OliveGreen	▭	RubineRed	▭
Aquamarine	▭	ForestGreen	▭	Orange	▭	Salmon	▭
Bittersweet	▭	Fuchsia	▭	OrangeRed	▭	SeaGreen	▭
Black	▭	Goldenrod	▭	Orchid	▭	Sepia	▭
Blue	▭	Gray	▭	Peach	▭	YellowOrange	▭
BlueGreen	▭	Green	▭	Periwinkle	▭	SkyBlue	▭
BlueViolet	▭	GreenYellow	▭	PineGreen	▭	SpringGreen	▭
BrickRed	▭	JungleGreen	▭	Plum	▭	Tan	▭
Brown	▭	Lavender	▭	ProcessBlue	▭	TealBlue	▭
BurntOrange	▭	LimeGreen	▭	Purple	▭	Thistle	▭
CadetBlue	▭	Magenta	▭	RawSienna	▭	Turquoise	▭
CarnationPink	▭	Mahogany	▭	Red	▭	Violet	▭
Cerulean	▭	Maroon	▭	RedOrange	▭	VioletRed	▭
CornflowerBlue	▭	Melon	▭	RedViolet	▭	White	▭
Cyan	▭	MidnightBlue	▭	Rhodamine	▭	WildStrawberry	▭
Dandelion	▭	Mulberry	▭	RoyalBlue	▭	Yellow	▭
DarkOrchid	▭	NavyBlue	▭	RoyalPurple	▭	YellowGreen	▭

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Colors

You can also define your own colors if you want. Here are the four methods:
\definecolor{mypink}{rgb}{0.85,0.18,0.48}
\definecolor{myblue}{RGB}{79,129,189}
\definecolor{mymagenta}{cmyk}{0, 0.78, 0.44, 0.14}
\definecolor{mygray}{gray}{0.6}

Using xcolor you can also mix colors. red!10!yellow!90! produces 10% red and 90% yellow. Likewise red!10 produces 10% red and 90% white.

An Appendix Slide

An appendix slide is a great place to explain a little more, or include a supplementary figure, or show robustness checks.

Don't forget to include a label for the slide in the TeX file so that you can link to it in the main document. And of course link back to the referring slide(s) using another button or so.

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