Fun with Beamer

An Epic Quest To Create the Perfect Presentation

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   - About Beamer
   - Basic Structure
2. Overlaying Concepts
   - Specifications
   - Examples: Lists, Graphics, Tables
3. Adding that Sparkle
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What Is Beamer?

- Beamer is a flexible LaTeX class for making slides and presentations.
- It supports functionality for making PDF slides complete with colors, overlays, environments, themes, transitions, etc.
- Adds a couple new features to the commands you've been working with.

What Is Beamer?

- Beamer is a flexible LaTeX class for making slides and presentations.
- It supports functionality for making PDF slides complete with colors, overlays, environments, themes, transitions, etc.
- Adds a couple new features to the commands you've been working with.
- As you probably guessed, this presentation was made using the Beamer class.

Document Template: slides.tex

```
\documentclass[pdf]
          {beamer}
\mode<presentation>{}
%% preamble
\title{The title}
\subtitle{The subtitle}
\author{your name}

\begin{document}
```

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

%% normal frame
\begin{frame}{Frame title}
    The body of the frame.
\end{frame}

\end{document}
```

```
athena% make slides.pdf
```

What would you like in your sandwich?

- So what can you do between `\begin{frame}` and `\end{frame}`?

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- Pretty much anything you can do in a normal LaTeX document:

What would you like in your sandwich?

- So what can you do between `\begin{frame}` and `\end{frame}`?
- Pretty much anything you can do in a normal LaTeX document:
  - figures, tables, equations, normal text, etc.

Don't Do This

- Here is a well-known formula:
$$\sum_{k=0}^{n} k = \frac{n(n+1)}{2}$$
- Here is a less well-known, but still useful, formula:
$$\sum_{k=0}^{n} k^2 = \frac{n(n+1)(2n+1)}{6}$$
- This is pretty well-known, too:
$$\sum_{k=0}^{n} k^3 = \left(\frac{n(n+1)}{2}\right)^2$$
- Who knows about this one?
$$\sum_{k=0}^{n} k^4 = \frac{n(6n^4+15n^3+10n^2+1)}{30}$$
- Have fun factoring the quartic expression!

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The Rudimentary pause

Watch this slide grow.

The Rudimentary pause

Watch this slide grow.

- Hello, World!

The Rudimentary pause

Watch this slide grow.

- Hello, World!
- Hello, Mars!

The Rudimentary pause

Watch this slide grow.

- Hello, World!
- Hello, Mars!
- Hello, Alpha Centauri!

The Rudimentary pause: Backstage

```
Watch this slide grow.
\pause
\begin{itemize}
  \item Hello, World!
  \pause
  \item Hello, Mars!
  \pause
  \item Hello, Alpha Centauri!
\end{itemize}
```

The Specification

- Professor: I want you to read the textbook to prepare for tomorrow's lecture.

The Specification

- Professor: I want you to read the textbook to prepare for tomorrow's lecture.
- Student: Which chapter should I read?

The Specification

- Professor: I want you to read the textbook to prepare for tomorrow's lecture.
- Student: Which chapter should I read?
- Professor: *Specifically*, Chapters `<1-3, 6, 10->`.

Specificationizing the Rudimentary pause

Watch this slide grow.

Specificationizing the Rudimentary pause

Watch this slide grow.

- Hello, World!

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Specificationizing the Rudimentary pause

Watch this slide grow.

- Hello, World!
- Hello, Mars!
- Hello, Alpha Centauri!

Specificationizing the Rudimentary pause: Backstage

```
Watch this slide grow.
\begin{itemize}
  \item<2-> Hello, World!
  \item<3-> Hello, Mars!
  \item<4-> Hello, Alpha Centauri!
\end{itemize}
```

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

Lists: The $1,000,000 Question

Which president said, "Most folks are about as happy as they make up their minds to be"?

Hints:

Lists: The $1,000,000 Question

Which president said, "Most folks are about as happy as they make up their minds to be"?

A James Madison

Hints:
James Madison ate broccoli.

Lists: The $1,000,000 Question

Which president said, "Most folks are about as happy as they make up their minds to be"?

A James Madison

B Harry Truman

Hints:
James Madison ate broccoli.
Harry Truman drank milk.

Lists: The $1,000,000 Question

Which president said, "Most folks are about as happy as they make up their minds to be"?

A James Madison

B Harry Truman

C Abraham Lincoln

Hints:
James Madison ate broccoli.
Harry Truman drank milk.
Abe Lincoln raised bees.

Lists: The $1,000,000 Question

Which president said, "Most folks are about as happy as they make up their minds to be"?

A James Madison

B Harry Truman

C Abraham Lincoln

D Calvin Coolidge

Hints:
James Madison ate broccoli.
Harry Truman drank milk.
Abe Lincoln raised bees.
And Cal Coolidge grew silk.

Lists: The $1,000,000 Question

Which president said, "Most folks are about as happy as they make up their minds to be"?

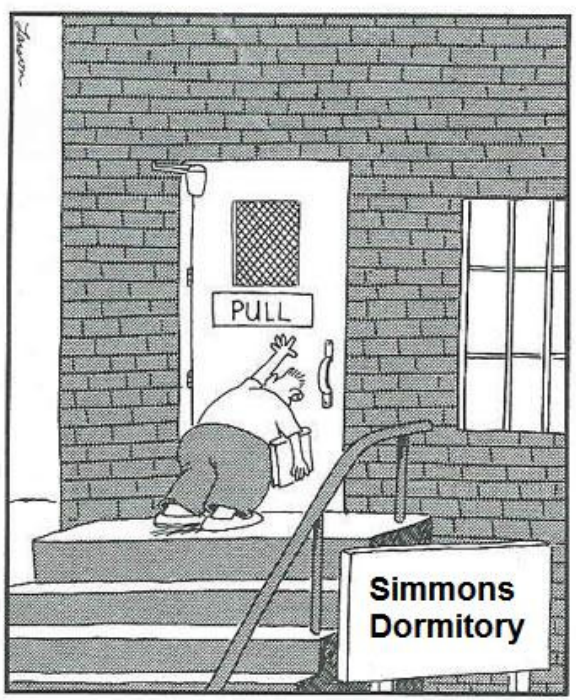
C Abraham Lincoln

Lists: The $1,000,000 Question: Backstage

```
\begin{enumerate}[A]
    \item<2-5> James Madison
    \item<3-5> Harry Truman
    \item<4-> \color<6>[rgb]{0,0.6,0}Abraham Lincoln
    \item<5-5>  Calvin Coolidge
\end{enumerate}

\uncover<1-5>{Hints:}\\
\uncover<2-5>{James Madison ate broccoli.}\\
\uncover<3-5>{Harry Truman drank milk.}\\
\uncover<4-5>{Abe Lincoln raised bees.}\\
\uncover<5-5>{And Cal Coolidge grew silk.}\\
```

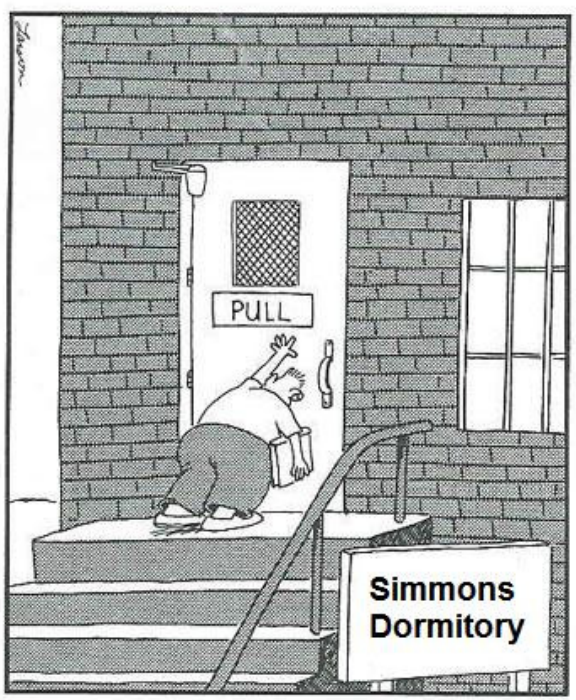
Columns and Blocks



[a]

[a] Apologies to Gary Larson

Columns and Blocks



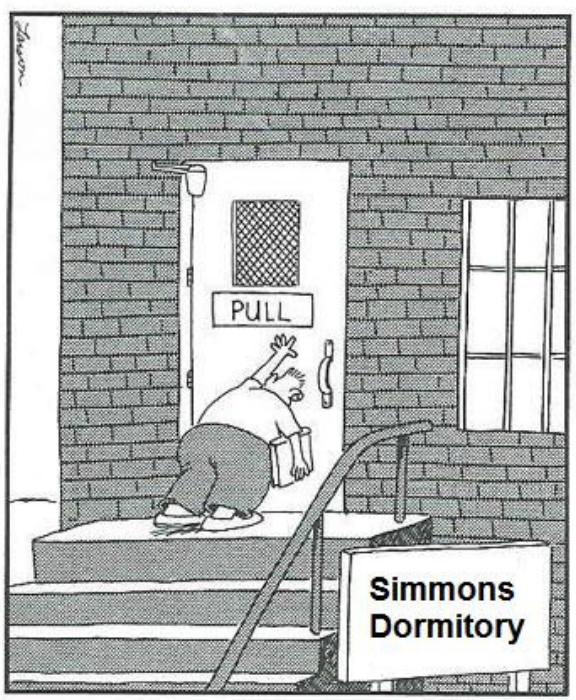
[a]

Observation

Simmons Ha
metal and c

[a] Apologies to Gary Larson

Columns and Blocks



[a]

Observation

Simmons Ha
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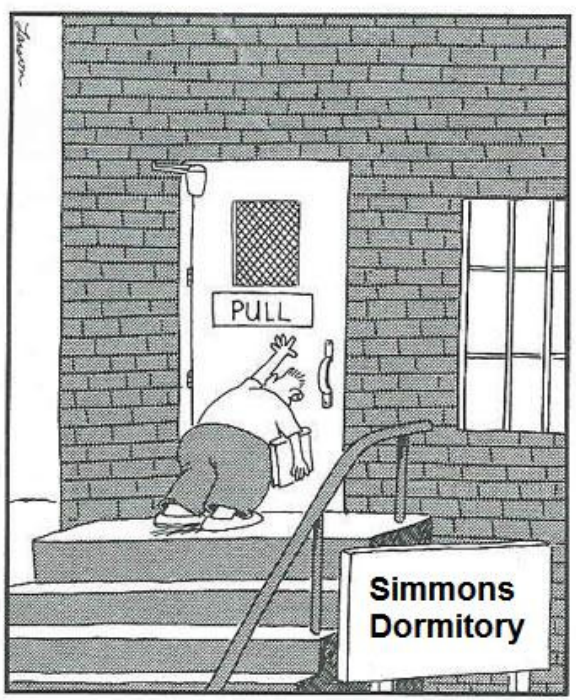
Observation

Simmons Do
of brick.

[a] Apologies to Gary Larson

Columns and Blocks



a

[a] Apologies to Gary Larson

Observation

Simmons Ha
metal and c

Observation

Simmons Do
of brick.

Conclusion

Simmons Ha
Dormitory.

Columns and Blocks: Backstage I

```
\begin{columns}
  \column{0.5\textwidth}
    \begin{figure}[ht]
    \begin{center}
        \includegraphics[height=2in]{LarsonGifted.eps}
            ~\footnote{Apologies to Gary Larson}
    \end{center}
    \end{figure}
```

Columns and Blocks: Backstage II

```
    \column{0.5\textwidth}
        \begin{block}<2->{Observation 1}
            Simmons Hall is composed of metal and concrete.
        \end{block}
        \begin{block}<3->{Observation 2}
            Simmons Dormitory is composed of brick.
        \end{block}
        \begin{block}<4->{Conclusion}
            Simmons Hall $\not=$ Simmons Dormitory.
        \end{block}
\end{columns}
```

Math stuff

Easy Theorem

The equation

$$x^n + y^n = z^n,$$

has no integer solutions for $n > 2$ *where* $x, y, z \neq 0$.

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Remark

This problem was first posed in $10,000$ *B.C.*

Math stuff

Easy Theorem

The equation

$$x^n + y^n = z^n,$$

has no integer solutions for $n > 2$ *where* $x, y, z \neq 0$.

Proof

The proof is trivial and left as an exercise for the reader.

Remark

This problem was first posed in $10,000$ *B.C.*

Math stuff: Backstage

```
\newtheorem{thm}{Easy Theorem}
\newtheorem{pf}{Proof}
\newtheorem{rmk}{Remark}

\begin{thm}<1->
    $$x^n+y^n=z^n,$$
    has no integer solutions for $n>2$
    where $x,\,y,\,z\,\neq\,0$.
\end{thm}
\begin{pf}<3->
    The proof is trivial and left as an exercise.
\end{pf}
\begin{rmk}<2->
    This problem was first posed in $10,000$ B.C.
\end{rmk}
```

Building Tables

Ice Cream Store	Location	How to Get There

Building Tables

Ice Cream Store	Location	How to Get There
Toscanini's	Central Square	Just walk!

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Ice Cream Store	Location	How to Get There
Toscanini's	Central Square	Just walk!
Herrell's	Harvard Square	Red Line

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Toscanini's	Central Square	Just walk!
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J.P. Licks	Davis Square	Red Line

Building Tables

Ice Cream Store	Location	How to Get There
Toscanini's	Central Square	Just walk!
Herrell's	Harvard Square	Red Line
J.P. Licks	Davis Square	Red Line
Ben & Jerry's	Newbury Street	Green Line

Building Tables: Backstage

```
\begin{table}[bt]
\begin{tabular}{|l|c|c|} \hline
  \textbf{Ice Cream Store}      & \textbf{Location}
                                & \textbf{How to Get There}   \\ \hline
  \uncover<2->{Toscanini's}     & \uncover<2->{Central Square}
                                & \uncover<2->{Just walk!}    \\
  \uncover<3->{Herrell's}       & \uncover<3->{Harvard Square}
                                & \uncover<3->{Red Line}      \\
  \uncover<4->{J.P. Licks}      & \uncover<4->{Davis Square}
                                & \uncover<4->{Red Line}      \\
  \uncover<5->{Ben \& Jerry's}  & \uncover<5->{Newbury Street}
                                & \uncover<5->{Green Line}    \\ \hline
\end{tabular}
\end{table}
```

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Using Sections

- Treat sections just like you would in a paper.

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- Treat sections just like you would in a paper.
- Use `\tableofcontents[`*section*`]` to keep audience informed of your talk's general plan.
- Use `\AtBeginSection[]{`*specialframe*`}` to help audience follow the structure of your talk.

Using Sections: Backstage I

```
\section{Intro to Beamer}
\subsection{About Beamer}
\subsection[Basic Structure]{Basic Structure}
\subsection{How to Compile}

\section{Overlaying Concepts}
\subsection{Specifications}
\subsection[Examples]{Examples: Lists, Graphics, Tables}

\section[Sparkle]{Adding that Sparkle}
\subsection{Sections}
\subsection{Themes}

\section*{References}
```

Using Sections: Backstage II

```
\AtBeginSection[]
{
    \begin{frame}{Table of Contents}
        \tableofcontents[currentsection]
    \end{frame}
}
```

See, I can get a ToC anywhere!

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Pre-customized Templates

- To make your presentation use a shiny theme like ours:
  - Find `\mode<presentation>{}` at the top of your file
  - Insert `\usetheme{Warsaw}` into the `{}`
- Also available within each Presentation Theme:
  - **Color themes:** `\usecolortheme{`*colorthemename*`}`
    control colors for bullets, background, text, etc.
  - **Inner themes:** `\useinnertheme{`*innerthemename*`}`
    control main title, environments, figures and tables, footnotes, etc.
  - **Outer themes:** `\useoutertheme{`*outerthemename*`}`
    control head-/foot-lines, sidebars, frame titles, etc.

A Sampling of Themes

- **General themes:**

default	Antibes	Berlin	Copenhagen
Madrid	Montpelier	Ilmenau	Malmoe
CambridgeUS	Berkeley	Singapore	Warsaw

- Also available:
  - **Color themes:**
    beetle, beaver, orchid, whale, dolphin
  - **Inner themes:**
    circles, rectanges, rounded, inmargin
  - **Outer themes:**
    infolines, smoothbars, sidebar, split, tree
- See The Beamer Theme Matrix

Good sites to visit for Beamer help

- The Beamer User Guide
- The Beamer Homepage
- A Quick Tutorial
- A Beamer Quickstart
- A Long Tutorial
- LaTeX + Beamer Examples
- A Beamer Presentation on Beamer