Making Slides

...and doing it with Beamer

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Table of Contents

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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!

Table of Contents

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.

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- 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.

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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"?

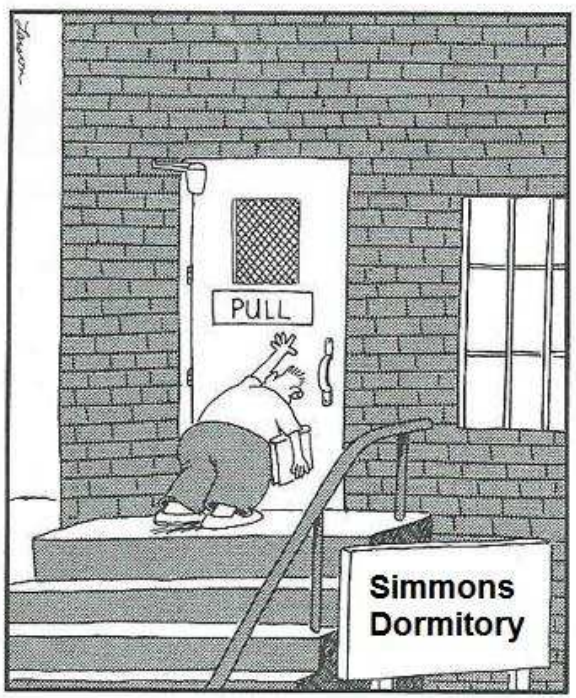
C Abraham Lincoln

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.}\\
```

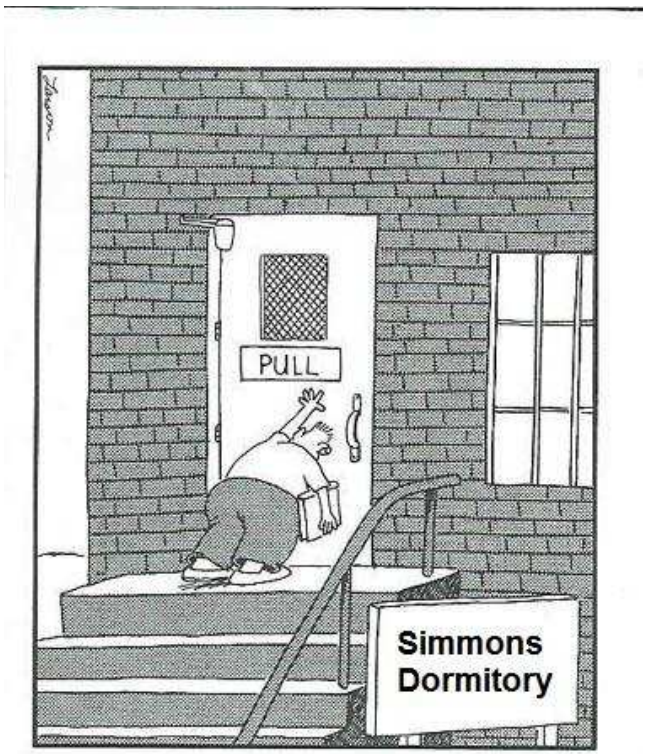
Columns and Blocks



[a]

[a] Apologies to Gary Larson

Columns and Blocks



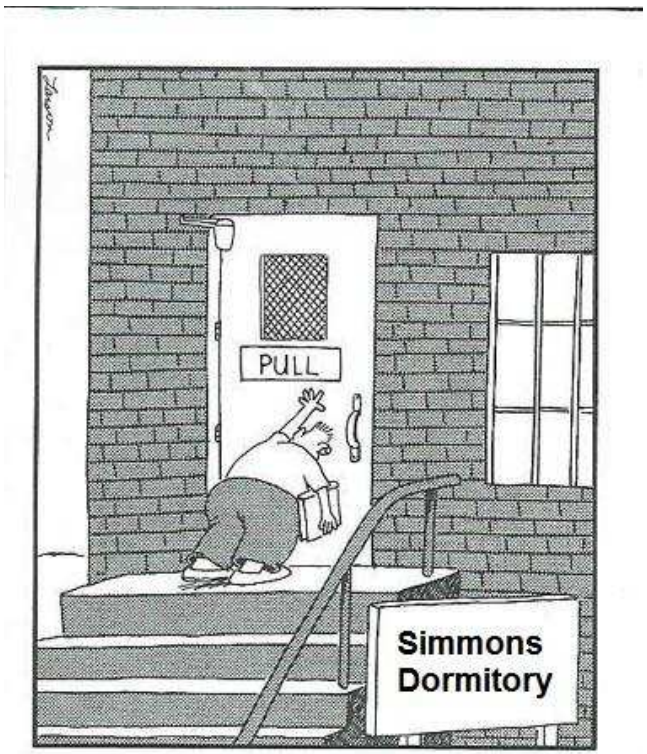
[a]

Observation 1

Simmons Hall is composed of metal and concrete.

[a] Apologies to Gary Larson

Columns and Blocks



[a]

[a] Apologies to Gary Larson

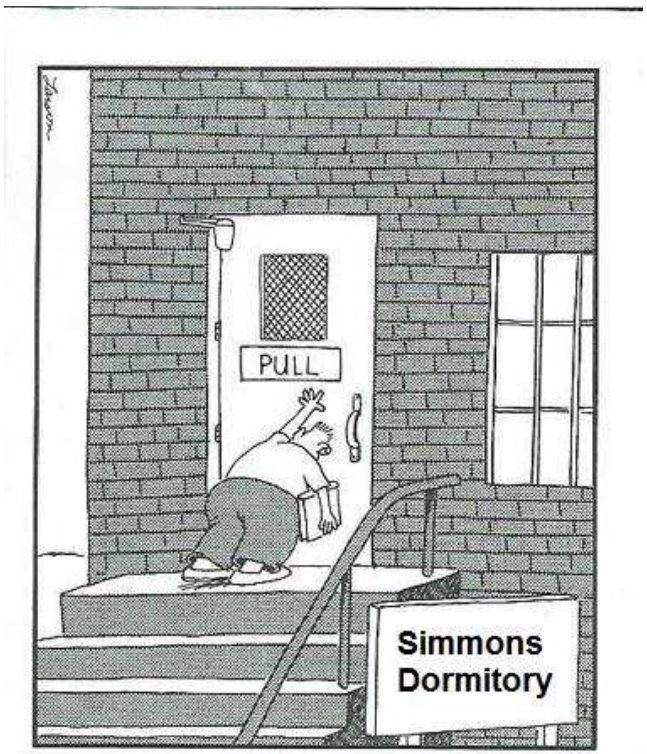
Observation 1

Simmons Hall is composed of metal and concrete.

Observation 2

Simmons Dormitory is composed of brick.

Columns and Blocks



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[a] Apologies to Gary Larson

Observation 1

Simmons Hall is composed of metal and concrete.

Observation 2

Simmons Dormitory is composed of brick.

Conclusion

Simmons Hall $\neq$ Simmons 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

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

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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}
```

Table of Contents

Using Sections

- Treat sections just like you would in a paper.

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- Use `\tableofcontents[`*section*`]` to keep audience informed of your talk's general plan.

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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!

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