

A GUIDE TO USING BEAMER

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INTRODUCTION

Beamer is an excellent way of making a presentation using LaTeX. The user programs the code similar to making a normal LaTeX document. Once compiled the result is a pdf slide show similar to Powerpoint, with the advantage of superior mathematical documentation capabilities.

GETTING STARTED WITH BEAMER

The very first step to making a presentation is to make the document class *beamer* in the preamble (before the `\begin{document}`).

```
\documentclass{beamer}
```

With just this command we can now create a very basic looking presentation.

In order to create each slide we use the command:

```
\begin{frame}
```

Insert slide contents here

```
\end{frame}
```

In the pdf file, you can move from slide to slide using the navigation bar along the bottom of the slides, the keyboard or the mouse.

BASIC COMMANDS IN BEAMER

Using Beamer we can still use the basic commands of LaTeX. The commands for *itemize*, *enumerate* and *description* are the very same as in any LaTeX document. A nice feature of Beamer is that all of the information on the slide does not need to come up at once.

Use the command

```
\pause
```

to stop the information on the slide at that point.

For example,

```
\begin{itemize}
\item Step 1
\pause
\item Step 2
\vdots
```

will show *Step 1*, then the slide show must be prompted to show *Step 2*. The above commands will actually create 2 slides. The first slide will simply have *Step 1*, and the second will have both *Step 1* and *Step 2*. The file that is created after compiling will have two slide counts. One will be the total number of slides (taking into account each time the `\begin{frame}` and `\pause` commands are used), and the other will be the total number of frames (only taking into account each time the `\begin{frame}` command is used).

GRAPHICS IN BEAMER

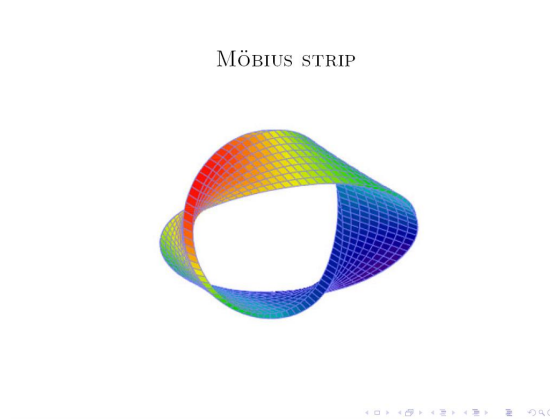
To insert graphics into a Beamer presentation, first call the package *graphicx*,

```
\usepackage{graphicx}
```

then use the command,

```
\includegraphics[*]{picture name}
```

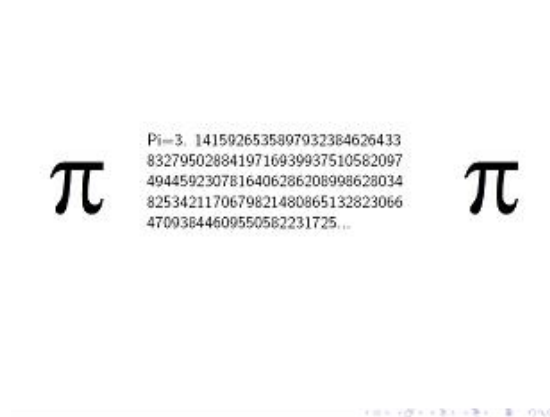
where * includes the usual commands about the width, height, trimming, etc.



It is nice to be able to include text with graphics. To do this, we can create columns in our frame using the *columns* and *column* commands.

```
\begin{columns}
\begin{column}{0.5\textwidth}
Text here
\end{column}
\begin{column}{0.5\textwidth}
\includegraphics[width=0.9\textwidth]{picture name}
\end{column}
\end{columns}
```

The result of these commands will produce a frame with two equal sized columns, text on the left and graphics on the right. The size of the columns can be changed by replacing the 0.5 with other values between 0 and 1 exclusive. More than two columns can be made in the same fashion.



Note that when the command `width=0.9\textwidth` is used for the graphics, this is the width of the column (not the width of the frame). The `\pause` command can be used just as before when using columns.

TEXT IN BEAMER

COLOURED TEXT

In order to change the colour of text use the command,

`\textcolor{text colour}{text}`

To highlight text use the command,

`\colorbox{highlight colour}{text}`

To highlight text of a different colour,

`\colorbox{highlight colour}{\textcolor{text color}{text}}`

To create a text box with a border,

`\fcolorbox{border colour}{highlight colour}{text}`



The standard colours that Beamer recognizes are:

<i>red</i>	<i>green</i>	<i>blue</i>	<i>yellow</i>
<i>orange</i>	<i>purple</i>	<i>violet</i>	<i>magenta</i>
<i>cyan</i>	<i>brown</i>	<i>black</i>	<i>white</i>
<i>darkgray</i>	<i>lightgray</i>	<i>gray</i>	

More colours can be obtained by defining your own colours in the preamble.

One command is,

```
\definecolor{colour name}{rgb}{*, *, *}
```

where $0 \leq * \leq 1$. Another command,

```
\definecolor{colour name}{RGB}{†, †, †}
```

can be used, where $0 \leq † \leq 255$.

For example, the commands,

```
\definecolor{MyPurple}{RGB}{200, 0, 230}
```

```
\definecolor{MyLightBlue}{rgb}{0.3, 0.6, .7}
```

```
:
```

```
\textcolor{MyPurple}{Leonardo Fibonacci Pisano} \\
```

```
\textcolor{MyLightBlue}{Blaise Pascal}
```

will result in,

Leonardo Fibonacci Pisano
Blaise Pascal

TITLES

To add titles and subtitles to the frame use the commands

```
\frametitle{Title}
```

```
\framesubtitle{Subtitle}
```

after the `\begin{frame}` command.

Pierre de Fermat

Fermat's Little Theorem

Theorem

Let p be a prime which does not divide the integer a , then
 $a^{p-1} \equiv 1 \pmod{p}$.

Proof:

Start by listing the first $p-1$ positive multiples of a :

$a, 2a, 3a, \dots, (p-1)a$

Suppose that ra and sa are the same modulo p , then we have $r \equiv s \pmod{p}$, so the $p-1$ multiples of a above are distinct and nonzero; that is, they must be congruent to $1, 2, 3, \dots, p-1$ in some order.

\vdots



Fonts

To change the fonts used in the presentation use the command,

`\usefonttheme{font theme name}`

in the preamble.

Some common font themes that Beamer recognizes are:

professional *structureitalicserif*

structurebold *structuresmallcapserif*

BEAMER BACKGROUNDS AND THEMES

Up to this point, the presentations we could make would be able to convey information but would not be eye-catching. Beamer has a variety of ways to help make visually appealing presentations.

BACKGROUNDS

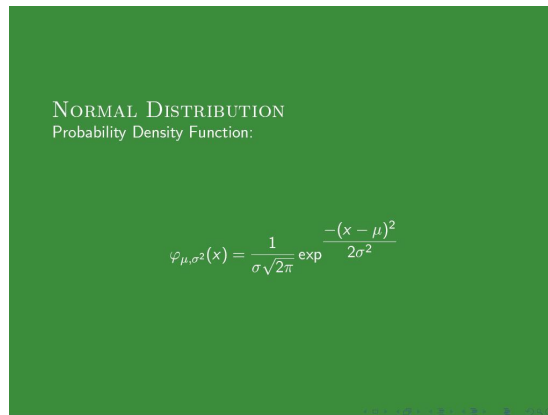
To change the colour of the background, use the command,

```
\setbeamercolor{normal text}{bg=colour}
```

in the preamble. If we define our own colour, the commands will be similar to,

```
\setbeamercolor{normal text}{bg=MyGreen}
```

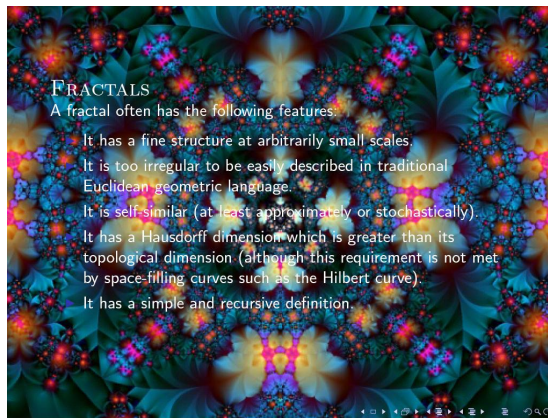
```
\definecolor{MyGreen}{RGB}{60, 140, 60}
```



To use an existing picture as the background for the presentation, use the command,

```
\setbeamertemplate{background canvas}{\includegraphics[width=  
\paperwidth,height=\paperheight]{Filename}}
```

in the preamble.



Using the command,

```
\begin{frame}[plain]
```

will result in the frame having none of the loaded backgrounds or decorations.

THEMES

Beamer allows us to use themes to enhance our presentations. These themes will drastically change the visual presentation.

Use the command,

```
\usetheme{theme name}
```

in the preamble.

Some standard themes that Beamer recognizes are:

<i>Hannover</i>	<i>Boadilla</i>	<i>Madrid</i>
<i>Pittsburgh</i>	<i>Rochester</i>	<i>Copenhagen</i>
<i>Warsaw</i>	<i>Singapore</i>	<i>Malmoe</i>
<i>Goettingen</i>	<i>Berkeley</i>	<i>AnnArbor</i>

COLOUR THEMES

When using a theme the standard colours that appear are blues. We can change the colours of the theme by using the command,

$$\backslash\text{usecolortheme}[\text{named}=\textit{colour name}]\{\text{structure}\}$$

in the preamble, where the colour name is one of the standard colours (or a defined colour, in which case the `\definecolor` command must be placed before the `\usecolortheme` command).

We can also use a colour theme by instead using the command,

$$\backslash\text{usecolortheme}\{\textit{colour theme name}\}$$

in the preamble.

Some standard colour themes that Beamer recognizes are:

<i>albatross</i>	<i>beaver</i>	<i>beetle</i>	<i>crane</i>
<i>dolphin</i>	<i>dove</i>	<i>fly</i>	<i>lily</i>
<i>orchid</i>	<i>seahorse</i>	<i>whale</i>	<i>wolverine</i>

A third way we can change the colour theme of the presentation is to use the command,

$$\backslash\text{usecolortheme}[\text{RGB}=\{\dagger,\dagger,\dagger\}]\{\text{structure}\}$$

in the preamble, where $0 \leq \dagger \leq 255$.

EXAMPLES

Theme: *Warsaw*

Font theme: *structureitalicserif*

Colour Theme: $\text{RGB}=\{100,90,150\}$

<p><i>Pierre de Fermat: Theorems</i></p> <p>Michelle Cylwa</p> <p>Department of Mathematics and Statistics University of Windsor Windsor, Ontario</p> <p>June 16, 2008</p>	<p><i>Pierre de Fermat</i> Fermat's Little Theorem</p> <p>Theorem Let p be a prime which does not divide the integer a, then $ap - 1 \equiv 1 \pmod{p}$.</p> <p>Proof: Start by listing the first $p-1$ positive multiples of a: $a, 2a, 3a, \dots, (p-1)a$ Suppose that ra and sa are the same modulo p, then we have $r \equiv s \pmod{p}$, so the $p-1$ multiples of a above are distinct and nonzero; that is, they must be congruent to $1, 2, 3, \dots, p-1$ in some order.</p> <p>\vdots</p>
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Theme: *Goettingen*

Font theme: *structuresmallcapsserif*

Colour Theme: *seahorse*

<p>PIERRE DE FERMAT: THEOREMS</p> <p>Michelle Cylwa</p> <p>Department of Mathematics and Statistics University of Windsor Windsor, Ontario</p> <p>June 16, 2008</p>	<p>PIERRE DE FERMAT FERMAT'S LITTLE THEOREM</p> <p>THEOREM Let p be a prime which does not divide the integer a, then $ap - 1 \equiv 1 \pmod{p}$.</p> <p>Proof: Start by listing the first $p-1$ positive multiples of a: $a, 2a, 3a, \dots, (p-1)a$ Suppose that ra and sa are the same modulo p, then we have $r \equiv s \pmod{p}$, so the $p-1$ multiples of a above are distinct and nonzero; that is, they must be congruent to $1, 2, 3, \dots, p-1$ in some order.</p> <p>\vdots</p>
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TITLE PAGES, SECTIONS AND SUBSECTIONS

TITLE PAGES

To create a title page, place the following information in the preamble:

```
\title[*]{Title}  
  
\subtitle[*]{Subtitle}  
  
\author[*]{Author's name}  
  
\institute[*]{  
    Department \\  
    University \\  
    City, Province \\[1ex]  
    \texttt{e-mail address}  
}  
  
\date[*]{Date}
```

where the *'s are optional labels. In the document, create the first frame like

so,

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

SECTIONS AND SUBSECTIONS

For some presentations, it may be easier to navigate through the use of sections and subsections. When using sections and subsections, a navigation sidebar is created in Adobe. Depending on the theme used there will be the names of the section and subsection or markers on the slides themselves.

To create a section, simply use the command,

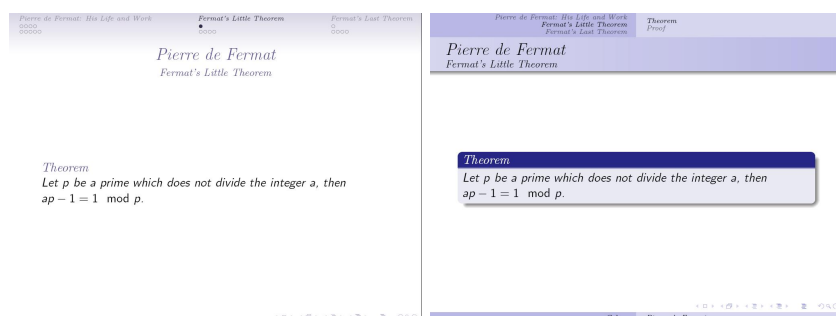
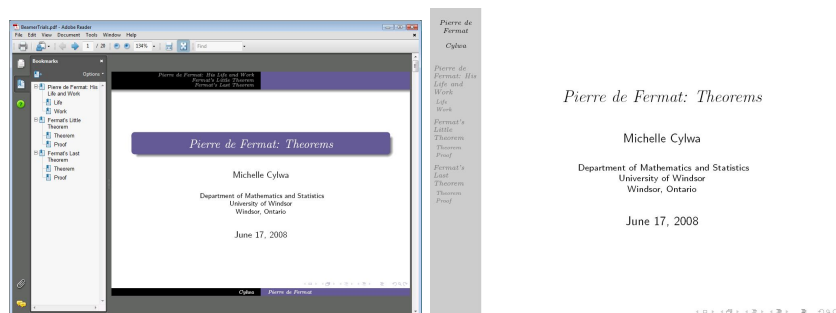
$$\backslash\text{section}\{Section\ name\}$$

before the first frame in that section.

To create a subsection, use the command,

$$\backslash\text{subsection}\{Subsection\ name\}$$

within the section, before the first frame in that subsection.



MISCELLANEOUS TOPICS

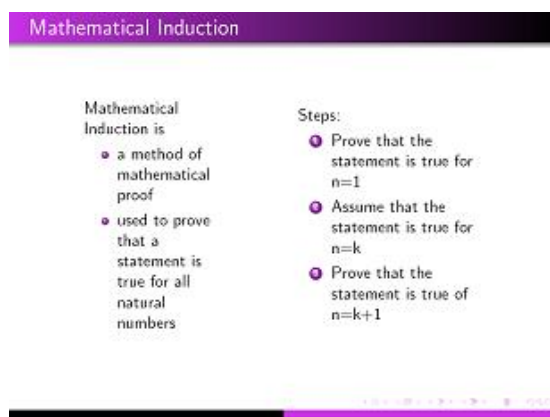
BULLETS

The style of bullets can be changed by using the command,

```
\setbeamertemplate{items}{★}
```

where ★ is one of ball, circle, rectangle or default (triangles).

When using *enumerate* the numbers will appear within the ball or circle.



NAVIGATION SYMBOLS

The navigation symbols that appear along the bottom of the presentation slides

can be removed by using the command,

```
\setbeamertemplate{navigationsymbols}{}
```

in the preamble.