

Beamer By Example

Darmstadt Theme—Edited from a standard template by dfg

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Beamer

Features

Written by Till Tantau while completing his PhD.

- Process with either `pdflatex` or `latex+dvips`
- Standard \LaTeX commands still work
- `tableofcontents` works
- Overlays & dynamic effects easily created
- Easy navigation through sections & subsections
- Many templates and examples included in package
- `article` style can be used to produce notes

Sample Code

```
\documentclass{beamer}
```

```
\usetheme{Darmstadt}
```

Use `\section{..}` and `\subsection{..}` to create items for the Table of Contents

The code for a frame is ...

```
\subsection{Basics}
```

```
\begin{frame}
```

```
  \frametitle{Sample Code}
```

```
    Frame content
```

```
  .
```

```
\end{frame}
```

Outline–Code

The next lines of code are:

```
\section{Lists}
\subsection{Uncovering Text}
\begin{frame}
  \frametitle{..title..}
  \begin{uncoverenv}<2->
    \alert<2>{Then the next frame ...}
  \end{uncoverenv}
\end{frame}
```

The Table of Contents appears before each new section unless switched off

Colouring Text

This a 2–stage process

- Define the colour

```
\setbeamercolor{blue}{fg=blue!50}
```

- Use the colour

```
{\usebeamercolor[fg]{blue} Some blue text}
```

Some blue text

- or

```
\newcommand{\green}[1]{\usebeamercolor[fg]{green}#1}
```

```
\green{some green text}....some green text
```

`\alert<3>{text}` { puts “text” in red on 3rd overlay}

Uncovering Text

Subtitle: A Short Example

- Use `itemize` a lot--with `\pause`
- Use very short sentences or short phrases.

```
\begin{itemize}
\item
  Use \texttt{itemize} a lot--with \pause
\item
  Use very short sentences or short phrases.
\end{itemize}
```

Uncovering Text

Subtitle: A Longer Example

You can create overlays...

- using the `\pause` command:
 - First item. (`\pause`)
 - Second item.
- using overlay specifications:
 - First item. (`\item<3->`)
 - Second item. (`\item<4>`)
- using the general `\uncover` command:
(`\uncover<5->{\item First item...}`)
 - First item.
 - Second item.

Uncover & alert

- Apple
- Peach
- Plum
- Orange

```
\begin{itemize}[<+- | alert@+>]  
  \item Apple  
  \item Peach  
  \item Plum  
  \item Orange  
\end{itemize}
```

Uncovering Equations

$$\begin{aligned} A &= B \\ &= C \\ &= D \end{aligned}$$

```
\begin{align*}
A &=& \backslashuncover<2->\{B\}\backslash\backslash
& \backslashuncover<2->\{&=C\backslash\backslash}
& \backslashuncover<3->\{&=D\backslash\backslash}
\end{align*}
```

An example of replacement

This uses five overlays, each separate equations. . .

$$\begin{aligned} \frac{d}{dx} \frac{x+3}{(x-1)^2} &= \\ &= \frac{(x-1)^2 - 2(x+3)(x-1)}{(x-1)^4} \\ &= \frac{(x-1)((x-1) - 2(x+3))}{(x-1)^4} \\ &= \frac{((x-1) - 2(x+3))}{(x-1)^3} = -\frac{x+7}{(x-1)^3} \end{aligned}$$

`\alt` is used to replace the first line and then `\visible`, as opposed to `\uncover`. Alignment not ideal.

An example of `align` with replacement

Three overlays, ...

$$\begin{aligned} \textit{left} &= \textit{rhs 1} \\ &= \textit{rhs 3} \end{aligned}$$

```
\begin{align*}
  left&=\alt<1>\{rhs1\}\{\textit{alternate rhs}\}\backslash
  \visible<3->\{\&=rhs3\}
\end{align*}
```

Uses `\alt` and `\visible`, as opposed to `\uncover`. Alignment spoiled because alternative is longer than original.

An example of `align` with replacement

Use of `\phantom` to ensure correct alignment when `\alt` string is longest...

$$\begin{aligned} \text{left} &= \text{rhs 1} \\ &= \text{rhs 3} \end{aligned}$$

```
\begin{align*}
  \text{\text{left}}&=&
  \alt<1>{\text{rhs 1}}{\text{alternate rhs 2}}\backslash\backslash
  \text{\visible<3->}
  \text{\&=\text{rhs 3}\phantom{extra appended}}\backslash\backslash
\end{align*}
```

The align environment with replacement

$$\begin{aligned} \frac{d}{dx} \frac{x+3}{(x-1)^2} &= \\ &= \frac{(x-1)^2 - 2(x+3)(x-1)}{(x-1)^4} \\ &= \frac{(x-1)((x-1) - 2(x+3))}{(x-1)^4} \\ &= \frac{((x-1) - 2(x+3))}{(x-1)^3} = -\frac{x+7}{(x-1)^3} \end{aligned}$$

\alt replaces the first line and then \visible, as opposed to \uncover. Alignment is fixed.

Uncovering Rows

Class	A	B	C	D
X	1	2	3	4
Y	3	4	5	6
Z	5	6	7	8

```
\usepackage{colortbl}
```

```
\rowcolors[]{}{blue!20}{red!10}  
\begin{tabular}{l!{\vrule}cccc}\hline  
Class & A & B & C & D\\\hline  
X & 1 & 2 & 3 & 4 \\\pause  
Y & 3 & 4 & 5 & 6 \\\pause  
Z & 5 & 6 & 7 & 8  
\end{tabular}
```

Uncovering Columns

Class	A	B	C	D
X	1	2	3	4
Y	3	4	5	6
Z	5	6	7	8

```
\begin{tabular}%  
  {l!{\vrule}c<{\onslide<2->}%  
    c<{\onslide<3>}  
    c<{\onslide<4->}c}  
  . . . .  
\end{tabular}
```

Theorem and Proof

Theorem

There is no largest prime number

Proof.

- Suppose p were the largest prime
- Let q be the product of the first p numbers
- Then $q + 1$ is not divisible by any of them
- Thus $q + 1$ is a prime number larger than p .



Theorem and Proof-Code

```
\begin{theorem}
  There is no largest prime number
\end{theorem}

\begin{proof}
\begin{itemize}
\item Suppose  $p$  were the largest prime\pause
\item Let  $q$  be ... first  $p$  numbers\pause
\item Then  $q+1$  is not divisible ... \pause
\item Thus  $q+1$  is a prime ...  $p$ .\pause
\end{itemize}
\end{proof}
```

Main Theorem

Theorem

$\alpha < 2^\alpha$ for all ordinals α .

Proof.

As shown by Cantor...



◀ Return

Printing slides for handouts

With the header

```
\documentclass[t,handout]{beamer}
```

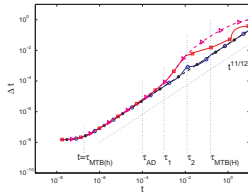
- (i) the `t` option specifies vertically aligned top frames
- (ii) all piecewise defined slides are aggregated into one.
- (iii) `\usepackage{enumerate}`

...

```
\begin{enumerate}[<+>][(i)]  
  \item the \texttt{\blue{t}} option specifies  
  \item all piecewise defined ....  
\end{enumerate}
```

Graphics & Text Side by Side

```
\begin{columns}[b]
\begin{column}{.25\textwidth}
\includegraphics[width=1.3in]{%
{FILE.eps}}
\end{column}
\begin{column}{.75\textwidth}
text column
\end{column}
\end{columns}
```

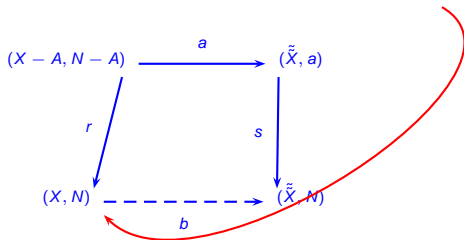


[We actually use semiverbatim & incremental alerts.]

pstricks package

Diagrams

A small diagram with a few lines of \LaTeX . At the 2nd overlay we can add a link from one to another using **PSTRICKS**



```
\blue \rnode{START}{\textsc{PSTricks}}
```

...

```
\visible<2>{\nccurve%  
  [linecolor=red,angleA=330,angleB=315]{START}{c}}
```

Householder formula

The Householder formula below lets one compute $f(\mathbf{x}_*) = 0$ for an arbitrary f .

$$\mathbf{x}_{k+1} \mapsto \Phi_n(\mathbf{x}_k) = \mathbf{x}_k + (n-1) \frac{\left(\frac{1}{f(\mathbf{x}_k)}\right)^{n-2}}{\left(\frac{1}{f(\mathbf{x}_k)}\right)^{n-1}} + f(\mathbf{x}_k)^{n+1} \psi \quad (1)$$

where $n \geq 2$ and ψ is an arbitrary function.

Formula (1) gives an iteration of order n converging towards \mathbf{x}_* such that: $f(\mathbf{x}_*) = 0$.

pstricks package

Some more PSTricks

or this ...



```
\pstextpath{\psccurve[linestyle=none]%  
(.5,0)(3.5,1)(3.5,0)(.5,1)}%  
{\blue ICMS--ICMS--ICMS--ICMS--ICMS--ICMS--%  
ICMS--ICMS--ICMS--ICMS--ICM}
```

Including Movies

```
\movie[width=3in,height=2in,showcontrols,poster]%  
  {}{thank.avi}
```

Even though the movie is “embedded” in the `.tex` file, the `.avi` file must still reside in the same folder as the `pdf` file.

Summary

- The **first main message** of your talk in one or two lines.
 - The **second main message** of your talk in one or two lines.
 - Perhaps a **third message**, but not more than that.
-
- Outlook
 - Something you haven't solved.
 - Something else you haven't solved.

Main Theorem

Theorem

$\alpha < 2^\alpha$ for all ordinals α .

Proof.

As shown by Cantor...



◀ Return

For Further Reading I



A. Author.

Handbook of Everything.

Some Press, 1990.



S. Someone.

On this and that.

Journal of This and That, 2(1):50–100, 2000.



D.F. Griffiths

Beamer By Example

<http://www.maths.dundee.ac.uk/~dfg/talks.shtml>