Making Nice Slides using Beamer and Sweave

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Syntax in Beamer

\documentclass{beamer}
\usepackage{beamerthemeshadow}
\title{Mytitle}

\begin{document}
\begin{frame}
\titlepage
\end{frame}

\begin{frame}
Content for Slide 1
\end{frame}

\end{document}
lists with pause

- Introduction to \LaTeX
lists with pause

- Introduction to \LaTeX
- Course 2
lists with pause

- Introduction to \LaTeX
- Course 2
- Termpapers and presentations with \LaTeX
lists with pause

- Introduction to \LaTeX
- Course 2
- Termpapers and presentations with \LaTeX
- Beamer class
### Tables

<table>
<thead>
<tr>
<th>Date</th>
<th>Instructor</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>WS 04/05</td>
<td>John Mich</td>
<td>First steps with ( \LaTeX )</td>
</tr>
<tr>
<td>SS 05</td>
<td>Yen-Yi Ho</td>
<td>( \LaTeX ) Course serial</td>
</tr>
</tbody>
</table>
splitting screen

- Beamer
- Beamer Class
- Beamer Class Latex

<table>
<thead>
<tr>
<th>Instructor</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>John</td>
<td>\LaTeX\ Course 1</td>
</tr>
<tr>
<td>Anding</td>
<td>Course serial</td>
</tr>
</tbody>
</table>
Animation

- subject 1
Animation

- subject 1
Animation

- subject 1
- subject 2
subject 1
subject 2
If I speak in the tongues of men or of angels, but do not have love, I am only a resounding gong or a clanging cymbal. If I have the gift of prophecy and can fathom all mysteries and all knowledge, and if I have a faith that can move mountains, but do not have love, I am nothing. If I give all I possess to the poor and give over my body to hardship that I may boast, but do not have love, I gain nothing. Love is patient, love is kind. It does not envy, it does not boast, it is not proud. It does not dishonor others, it is not self-seeking, it is not easily angered, it keeps no record of wrongs. Love does not delight in evil but rejoices with the truth. It always protects, always trusts, always hopes, always perseveres.
Literate programming means that text, data, and computer code are interwoven in a single self-contained document.
This is not literate programming

A research document involving multiple files with figures and tables cut and paste from various places. For instance,

- a stata do-file
- an excel spreadsheet with results
- an excel spreadsheet with data
- a directory with filenames like “old.doc” and “new.doc”
- a word document with tables and figures cut and paste from various places

*Changes to the stata do-file are not automatically propagated to the excel spread-sheet or to the Word document.*
Why you should use literate programming

- Reproducible research
- Dynamic reports
- R Package vignettes: R vignettes are usually developed using Sweave
If you have beamer and tex installed, try reproducing this talk:

```r
> Sweave("HoExample4.Rnw")
> Sys.setenv(PATH=paste(Sys.getenv("PATH"),"/usr/texbin",sep=":"))
> texi2pdf("HoExample4", quiet=F)
```
Literate programming in R using Sweave

Essentially requires a single source document – a '.Rnw' file.

\[ \cdot.Rnw \xrightarrow{\text{Sweave}} \cdot.tex \xrightarrow{\text{latex}} \cdot.dvi \xrightarrow{\text{xdvi}} \text{view of document} \]

see [http://www.bias-project.org.uk/Rpackages_course/intro_Sweave.pdf](http://www.bias-project.org.uk/Rpackages_course/intro_Sweave.pdf)
Syntax using Beamer and Sweave

\documentclass{beamer}
\usepackage{beamerthemeshadow}
\usepackage{Sweave}
\begin{document}
\begin{frame}
\begin{frame}
\begin{frame}
  Content for Slide 1
\end{frame}
\end{frame}
\end{frame}
\begin{frame}
  Content for Slide 2
\end{frame}
\end{frame}
\end{document}
Code chunk options

- `eval(TRUE, or FALSE)`
  Whether the R chunk is run

- `echo(TRUE, FALSE)`
  Whether the R chunk is shown in the \LaTeX\ file

- `results(verbatim, hide, tex)`
  Type of output used to show the printed results produced by the R code.

- `fig(TRUE, FALSE)`
  Whether the output is a figure. By default, PDF files are produced.

- `figname, fig=TRUE, include=FALSE`  

See the HoExample4.Rnw for examples.
Extracting code chunks

To extract code chunks from a .Rnw file:

\texttt{\textgreater{} Stangle("HoExample4.Rnw")}

This command generates the file \texttt{HoExample4.R} containing the code chunks used in this presentation.
Dynamic reports

```r
> require(geneplotter) || {
+    message("package not available. downloading from Bioconductor")
+    source("http://www.bioconductor.org/biocLite.R")
+    biocLite("geneplotter", type="source")
+ }
> x1 <- matrix(rnorm(1e4), ncol=2)
> x2 <- matrix(rnorm(1e4, mean=3, sd=1.5), ncol=2)
> x <- rbind(x1,x2)

> ##I use include=FALSE and then use latex to put the figure exactly where I want
> par(mfrow=c(2,2), las=1)
> par(mar=c(2,2,2,1))
> smoothScatter(x, nrpoints=0)
> smoothScatter(x)
> smoothScatter(x,nrpoints=Inf,colramp=colorRampPalette(RColorBrewer:::brewer.pal(9, "YlOrRd")),bandwidth=1)
> colors <- densCols(x)
> plot(x, col=colors, pch=20)
```
Any changes to the preceding code will be propagated to this figure automatically.
Many public resources

Key words for google: reproducible research, Sweave