

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

Date	Instructor	Title
WS 04/05	John Mich	First steps with \LaTeX
SS 05	Yen-Yi Ho	\LaTeX Course serial

splitting screen

- Beamer
- Beamer Class
- Beamer Class Latex

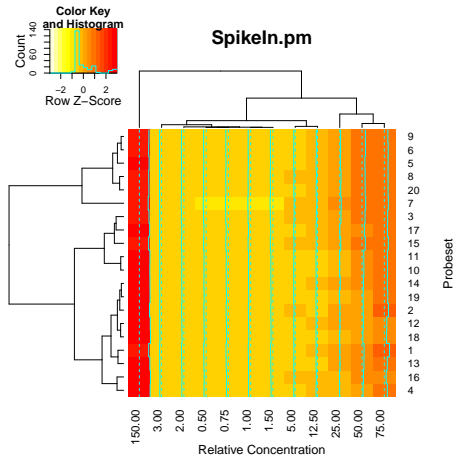
Instructor	Title
John	L ^A T _E X Course 1
Anding	Course serial

Animation

- subject 1

Animation

- subject 1

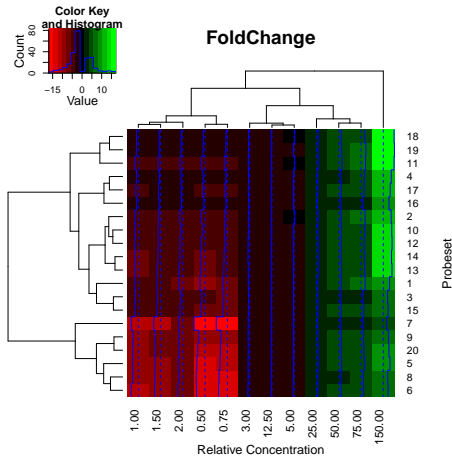


Animation

- subject 1
- subject 2

Animation

- subject 1
- subject 2



Love Letter Too

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 mys-
teries 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 al-
ways 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

This presentation

If you have beamer and tex installed, try reproducing this talk:

```
> 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.

`*.Rnw` $\xrightarrow{\text{Sweave}}$ `*.tex` $\xrightarrow{\text{latex}}$ `*.dvi` $\xrightarrow{\text{xdvi}}$ view of document

see 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}
  Content for Slide 1
\end{frame}
<< >>=
my R code chunk 1
@
\begin{frame}
  Content for Slide 2
<< >>=
my R code chunk 2
@
\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.
- `<<filename, fig=TRUE, include=FALSE>>`

See the `HoExample4.Rnw` for examples.

Extracting code chunks

To extract code chunks from a .Rnw file:

```
> Stangle("HoExample4.Rnw")
```

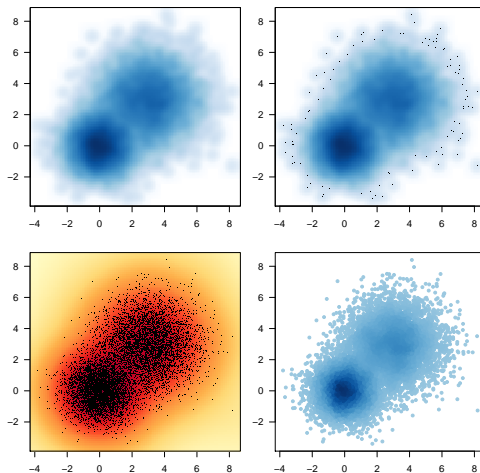
This command generates the file HoExample4.R containing the code chunks used in this presentation.

Dynamic reports

```
> 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  
> colors <- densCols(x)  
> plot(x, col=colors, pch=20)
```

Interweaving text, R code, and figures

Any changes to the preceding code will be propagated to this figure automatically.



Many public resources

Key words for google: reproducible research, Sweave