

# Instructions for rmd2pdf-slides-sweave

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# Outline

- 1 Launch with stationery
- 2 Our Design Plan
- 3 R Code chunks
  - Displaying R code and output
  - More Frame Options

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# Create a Skeleton

Create a skeleton (template) document by opening R and running

```
1 library(stationery)
2 initWriteup("rnw2pdf-slides-sweave")
```

That will create a folder “writeup/rnw2pdf-slides-sweave” (unless you request otherwise by setting the `dir` argument).

# Edit our skeleton

- Copy skeleton.lyx (or skeleton.Rnw, your choice) to a new file name, one which you will edit.
- Make small changes, try to compile.

# About the theme folder

- Theme files are copied into the theme directory when this document is compiled the first time.
- After that, the author can revise those theme files to suit her taste.
- The document will not erase those files and re-insert our defaults.
- We DO expect everybody will supply their own “logo.pdf” and “logomini.pdf” files, for example.

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# Elegant yet helpful; artistic yet austere; delicious yet light

- The theme settings are in the preamble. No external dependency on a theme file needed.
- Once we saw how simple a Beamer theme is—just a designation theme types for the outer edges and inner content—we knew what to do:

## **CUSTOMIZE!**

- Our preferred theme uses the *right* shades of blue along with:

## Key elements in our theme

```
1 \useoutertheme{infolines}
2 \useinnertheme{rounded}
3 \setbeamertemplate{blocks}[default]
```

- The outer theme is a conservative use of screen real estate (narrow top boxes)
- The inner theme gives the jazzy 3-D bullets



# Elegant yet helpful; artistic yet austere; delicious yet light

...

- We don't want the rounded alert boxes, however, so we have blocks set to the default box style.
- As the Beamer documentation makes clear, there are just a few of these outer and inner themes that can be “mixed-and-matched” to suit the author's taste.

# This is a default style we selected

- This document is formatted to create 16:9 resolution slides.
- To alter that, change document setting options.
- Citations use natbib with apacite. To check, we'll cite R (R Core Team, 2017) and the single most influential book in modern applied statistics (McCullagh & Nelder, 1989)

# About frame options

In the frames used in these reports, the environment is initiated in one of 3 ways:

- 1 No options:

```
1 \begin{frame}
```

- 2 Allow for long output to spill onto successive slides:

```
1 \begin{frame}[allowframebreaks]
```

In case you want to force a break in a long slide, use LaTeX `\framebreak`.

- 3 Allow for inclusion of R output or other LaTeX listings objects

```
1 \begin{frame}[allowframebreaks, containsverbatim]
```

# About frame options ...

## `containsverbatim` is necessary

Any time your slide includes R output, any verbatim markup, or a listings box, the compile will fail if you do not declare the frame with “containsverbatim”.

# Slide with "allowframebreaks" can spill onto several slides

Some filler that causes the spill onto another slide. Note confusing equation labels

- onefile

$$1 \times 1 \quad (1)$$

- two

$$2 \times 1$$

- three

$$3 \times 1 \quad (2)$$

- four

$$4 \times 1$$

# Slide with "allowframebreaks" can spill onto several slides ...

- five

$$5 \times 1$$

- six

$$6 \times 1$$

- seven

$$7 \times 1$$

# Using "allowframebreaks" and "containsverbatim"

- I usually use both "allowframebreaks" and "containsverbatim" on most slides.
- "allowframebreaks" is now harmless. It has no effect in current configuration unless there are actually 2 or more slides worth of material
- However, containsverbatim is not harmless. It will break use of beamer overlay features, or one-at-a-time revelation of enumerated lists.

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# Listings class is used to display code chunks

- R code chunks are displayed with LaTeX listings, a highly customizable class for code displays.
- We use 2 types of listings:
  - **Rinput**: for all listings boxes and for R code
  - **Routput**: output listings use smaller font
- Because slides are often “guides”, the listings style is the same as a CRMDA guide document.
- The author can adjust these by editing the file “`theme/guidePreambleSweavel.tex`”, or
- replacing the theme file with our alternative “`theme/reportPreambleSweavel.tex`”.
- by adjusting the properties of the individual listings items. In the previous slide, we adjusted the listings options for a smaller font in the third item, or
- I (often) fiddle the line-numbering settings in that tex file to suit my taste.

# line numbers on code chunks

- Sometimes it appears that there are line numbers with code chunks.
- Sometimes they are invisible because they are outside the left margin
- The margins are adjustable when this happens, see preamble for example. Don't use LyX menus, use the preamble to edit.

# Code chunks suggestions for authors

- Please name all chunks.
  - This makes bug-shooting much easier
  - Here is a chunk named `dat10`. The default settings of the options `include` and `echo` are `TRUE`, so we set them as `FALSE` for variety.

```
1 < <data10, include=FALSE, echo=FALSE>>=  
2 x <- rnorm(100)  
3 mean(x)
```

# Styling of non-chunk code commentary

- The listings environment can be used in “containsverbatim” chunks. The styling will, by default, be same as R input.
- If instead author desires style of Routput, the listings argument “style=Routput” can be specified.
- Inline comments will declared with the code environment will have a gray box similar to the Rinput box for chunks.
  - Examples, should have same appearance in PDF:
    - LyX text menu `lm(y ~ x, data = dat)` .
    - Raw Latex `lm(y ~ x, data = dat`

# Both "allowframebreaks" and "containsverbatim" accomodate large R output

```
1 example(lm)
```

```
1 lm require(graphics)
2
3 lm ## Annette Dobson (1990) "An Introduction to Generalized Linear
4     Models".
5 lm ## Page 9: Plant Weight Data.
6 lm ctl <- c(4.17,5.58,5.18,6.11,4.50,4.61,5.17,4.53,5.33,5.14)
7
8 lm trt <- c(4.81,4.17,4.41,3.59,5.87,3.83,6.03,4.89,4.32,4.69)
9
10 lm group <- gl(2, 10, 20, labels = c("Ctl","Trt"))
11
12 lm weight <- c(ctl, trt)
13
14 lm lm.D9 <- lm(weight ~ group)
15
16 lm lm.D90 <- lm(weight ~ group - 1) # omitting intercept
17
18 lm ## No test:
19 lm ##D anova(lm.D9)
20 lm ##D summary(lm.D90)
```

# Both "allowframebreaks" and "containsverbatim" accomodate large R output ...

```
20 lm ## End(No test)
21 lm opar <- par(mfrow = c(2,2), oma = c(0, 0, 1.1, 0))
22
23 lm plot(lm.D9, las = 1)          # Residuals, Fitted, ...
24
25 lm par(opar)
26
27 lm ## Don't show:
28 lm ## model frame :
29 lm stopifnot(identical(lm(weight ~ group, method = "model.frame"),
30 lm                               model.frame(lm.D9)))
31
32 lm ## End(Don't show)
33 lm ### less simple examples in "See Also" above
34 lm
35 lm
36 lm
```

## 2 Columns

- Total width of page is 12cm
- Author can set each column at 6cm

### A Block Can be Nested

This is inside the content area of the block

- In LyX, I find it tricky to use the GUI tool for slides (in general)
- Columns often seem difficult, but I still use GUI because I don't want to write out lots of code
- But I do manually write Frames in LyX because I don't enjoy the GUI style these days.

# References

- McCullagh, P. & Nelder, J. A. (1989). *Generalized Linear Models, Second Edition*. Boca Raton: Chapman and Hall/CRC, 2 edition edition.
- R Core Team (2017). *R: A Language and Environment for Statistical Computing*. R Foundation for Statistical Computing, Vienna, Austria.



# Session

```
1 sessionInfo()
```

```
1 R version 3.4.3 (2017-11-30)
2 Platform: x86_64-pc-linux-gnu (64-bit)
3 Running under: Ubuntu 17.10
4
5 Matrix products: default
6 BLAS: /usr/lib/x86_64-linux-gnu/blas/libblas.so.3.7.1
7 LAPACK: /usr/lib/x86_64-linux-gnu/lapack/liblapack.so.3.7.1
8
9 locale:
10  [1] LC_CTYPE=en_US.UTF-8          LC_NUMERIC=C
11  [3] LC_TIME=en_US.UTF-8          LC_COLLATE=en_US.UTF-8
12  [5] LC_MONETARY=en_US.UTF-8      LC_MESSAGES=en_US.UTF-8
13  [7] LC_PAPER=en_US.UTF-8         LC_NAME=C
14  [9] LC_ADDRESS=C                 LC_TELEPHONE=C
15  [11] LC_MEASUREMENT=en_US.UTF-8   LC_IDENTIFICATION=C
16
17 attached base packages:
18 [1] stats      graphics  grDevices  utils      datasets   base
19
20 other attached packages:
21 [1] stationery_0.73
22
```

# Session ...

```
loaded via a namespace (and not attached):
[1] Rcpp_0.12.15      quadprog_1.5-5    rprojroot_1.3-2
[4] digest_0.6.15     plyr_1.8.4        backports_1.1.2
[7] xtable_1.8-2      magrittr_1.5      stats4_3.4.3
[10] evaluate_0.10.1   stringi_1.1.6     pbivnorm_0.6.0
[13] openxlsx_4.0.17   rmarkdown_1.8     tools_3.4.3
[16] stringr_1.2.0     foreign_0.8-69    kutils_1.34
[19] compiler_3.4.3    mnormt_1.5-5      htmltools_0.3.6
[22] knitr_1.19        lavaan_0.5-23.1097 methods_3.4.3
```