Instructions for rmd2pdf-slides-sweave

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Outline

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Outline

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

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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)

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About frame options

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

1. No options:

```
\begin{frame}
```

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

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

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

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

```
\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

$$1 \times 1 \tag{1}$$

- two

$$2 \times 1$$

- three

$$3 \times 1 \tag{2}$$

- 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.

Outline

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.

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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

```
example(lm)
```

```
lm require(graphics)

lm ## Annette Dobson (1990) "An Introduction to Generalized Linear
     Models".
lm ## Page 9: Plant Weight Data.
lm ctl <- c(4.17,5.58,5.18,6.11,4.50,4.61,5.17,4.53,5.33,5.14)

lm trt <- c(4.81,4.17,4.41,3.59,5.87,3.83,6.03,4.89,4.32,4.69)

lm group <- gl(2, 10, 20, labels = c("Ctl","Trt"))

lm weight <- c(ctl, trt)

lm lm.D9 <- lm(weight ~ group)

lm lm.D90 <- lm(weight ~ group - 1) # omitting intercept

lm ## No test:
lm ##D anova(lm.D9)
lm ##D summary(lm.D90)
```

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

```
lm ## End(No test)
lm opar <- par(mfrow = c(2,2), oma = c(0, 0, 1.1, 0))
lm
lm plot(lm.D9, las = 1)      # Residuals, Fitted, ...
lm
lm par(opar)
lm
lm ## Don't show:
lm ## model frame :
lm stopifnot(identical(lm(weight ~ group, method = "model.frame"),
lm                     model.frame(lm.D9)))
lm
lm ## End(Don't show)
lm ### less simple examples in "See Also" above
lm
lm
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.

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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_0.76
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
```