Learning *R*

Carl James Schwarz

StatMathComp Consulting by Schwarz
cschwarz.stat.sfu.ca @ gmail.com

Getting Output from *R*

How to save output and write reports.

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How do you get output from *R* into other documents?

- Introductory
  - Separate files for text fragments and graphs
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- Advanced
  - Markdown documents that get 90% of the way there
  - Sweave using LaTeX that give final product with no intervention

Extracting output from *R* - Graphical output

ggsave(plot=..., file=..., h=xx, y=xx, units="in", dpi=300)

```
1 myplot <- ggplot(data=cereal, aes(x=fat, y=calories))+
2     geom_point()
3 ggsave(myplot, file='myggplot.png',
4      h=4, w=6, units="in", dpi=300))
```

- Able to save graphics in a variety of ways (look at suffix, e.g. *.png format).
- Script runs and generates the plot with no user intervention.

Extracting output from *R* - Graphical output - multipages

Many graphical formats (e.g. *png*) do not allow multi-page outputs. Need to use device driver.

```
1  xtabs(~mfr, data=cereal, exclude=NULL, na.action=na.pass)
2  npages=ceiling(length(unique(cereal$mfr))/4)
3
4  pdf(file.path('..','..','MyStuff','Images','sample-ggplot-my
5  plyr::l_ply(1:npages, function (page){
6     myplot <- ggplot(data=cereal, aes(x=fat, y=calories))+
7       ggtitle("Calories vs grams of fat")+
8       geom_point()+
9       facet_wrap_paginate(~mfr, nrow=2, ncol=2, page=page)
10    plot(myplot)
11 })
12 dev.off()
```

- Must use *plot()* within a "loop" to get the output displayed on the device.
- Don't forget the *dev.off()* - also used to reset the graphics window.

Extracting output from *R* - Text output

sink('filename.txt', split=TRUE) ... R code ... sink()

```
1 sink('Images/sample-textoutput.txt', split=TRUE)
2    fit <- lm(Calories ~ Fat, data=cereal)
3    anova(fit)
4    summary(fit)
5    confint(fit)
6 sink()
```

- Simple text output in raw ascii text.
- Script runs and generates the file with no user intervention.
- You need to do extensive formatting of textual output after the fact (groan).
- Creating an HTML notebook does not send info to file (groan).
- **Careful of mismatched sinks (groan).**. Use repeated *sink()* to reset.

Extracting output from *R* - Data output as *.csv file

write.csv(dataframe, "filename.csv", ...)
write.xls(dataframe, "filename.xls", ...)

```
1 write.csv(cereal, 'new file name.csv')
```

- Useful for data tables.

Extracting output from *R* - Table output as *.csv file

write.csv(table, "table.csv", ...)

```
1  report <- plyr::ddply(cereal, "mfr", plyr::summarize,
2                        n.cereals=length(mfr),
3                        calories.mean = mean(calories, na.rm=T
4  report
5
6  temp <- report
7  temp[,3] <- round(temp[,3],1)
8  temp
9  write.csv(temp,
10           file=file.path(.....), row.names=FALSE)
```

- Simple tables that can be then formatted using Excel (e.g. decimal points) etc.
- Try and get the table into as best format possible

Extracting output from *R* - Saving objects/environments

Most *R* code can run in real time. But in some cases (e.g. MCMC output) best to save output and process later to save time.

```
saveRDS("cereal", file='xxx.Rdata'))
new.cereal <- readRDS(file="xxx.Rdata"))

save.image(file='allenv.Rdata')
```

- You can also compress (e.g. zip) the saved object.

Extracting output from *R* - Notebooks

Rstudio allows you to create notebooks in a variety of formats that combine textual and graphical output. Try it on a simple script.

- Scripts must be perfect with NO errors.
- Scripts must load all libraries
- You may need LaTeX to generate PDF.

Try it with *SampleScript.r* in SampleData/Notebooks directory.