L17 Reporting

EPID 799B

Mike Dolan Fliss

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If you're reading this…

(1) Update your Rstudio now
(2) Try to create a new R Markdown file or install.packages("Rmarkdown")
(3) Try to find and install MikTeX (PC) or MacTeX (Mac)

Reporting

- Why?

- Reminders of useful tricks

- R sweave (short)
- R Markdown
  - Intro
  - A note on LaTeX
  - Useful paired packages: printr, knitr,

- Notes for the future:
  - GIS

Reporting: Why?

- Reproducible research! (Yeah yeah…)
- Other use cases
    - Validate chunks
    - Staging into another document
    - Write entire websites…powerpoints…
    - Write books
    - Write entire articles*

Tricks So Far: Better than Nothing!

- Tables
  - Manipulating and outputting data.frames, including of results
  - Linked table in Excel for precise formatting
- Images
  - ggsave()
  - Whatever else. ☺

Reporting Basics: Markup & markdown

- Word
- HTML
- LaTeX →

```
\documentclass{article}
\title{Cartesian closed categories and the price of eggs}
\author{Jane Doe}
\date{September 1994}
\begin{document}
   \maketitle
   Hello world!
\end{document}
```
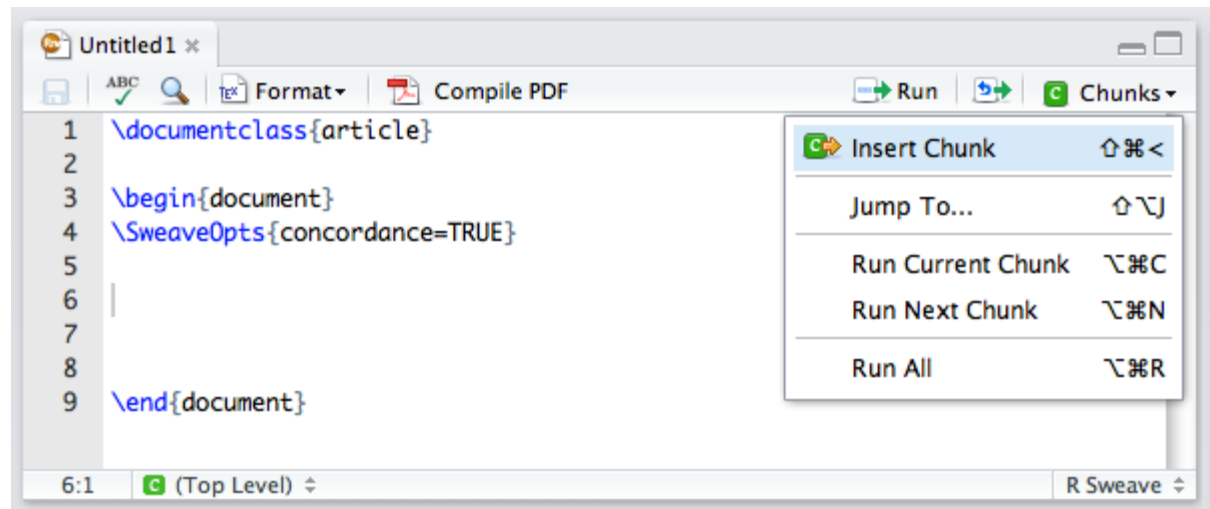
Or, in English:

- This document is an article.
- Its title is Cartesian closed categories and the price of eggs.
- Its author is Jane Doe.
- It was written in September 1994.
- The document consists of a title followed by the text Hello world!

http://www.latex-project.org/about/

R Sweave

- Straight to the LaTeX please!
  - Standard language for layouts
  - Handles equations, etc.

R Markdown

- Yihui Xie

- Another "family" of packages!
  - knitr, pandoc, printr, etc.

- Process is a few years … young.

- New walk through on the process is here:
  - http://rmarkdown.rstudio.com/

- Fancy things happening every day!

Packages w/ R Markdown

- Printr

(head/table/whatever after attaching the library...)

```
head(mtcars)
```

	mpg	cyl	disp	hp	drat	wt	qsec	vs	am	gear	carb
Mazda RX4	21.0	6	160	110	3.90	2.620	16.46	0	1	4	4
Mazda RX4 Wag	21.0	6	160	110	3.90	2.875	17.02	0	1	4	4
Datsun 710	22.8	4	108	93	3.85	2.320	18.61	1	1	4	1
Hornet 4 Drive	21.4	6	258	110	3.08	3.215	19.44	1	0	3	1
Hornet Sportabout	18.7	8	360	175	3.15	3.440	17.02	0	0	3	2
Valiant	18.1	6	225	105	2.76	3.460	20.22	1	0	3	1

http://yihui.name/printr/

Packages w/ R Markdown

- Stargazer
  - Prints tables (in LaTeX)
  - Can be passed multiple model objects

Table 1:

Statistic	N	Mean	St. Dev.	Min	Max
rating	30	64.633	12.173	40	85
complaints	30	66.600	13.315	37	90
privileges	30	53.133	12.235	30	83
learning	30	56.367	11.737	34	75
raises	30	64.633	10.397	43	88
critical	30	74.767	9.895	49	92
advance	30	42.933	10.289	25	72

Table 1: Regression Results

	Dependent variable:		
	rating		high.rating
	OLS		probit
	(1)	(2)	(3)
complaints	0.692*** (0.149)	0.682*** (0.129)	
privileges	−0.104 (0.135)	−0.103 (0.129)	
learning	0.249 (0.160)	0.238* (0.139)	0.164*** (0.053)
raises	−0.033 (0.202)		
critical	0.015 (0.147)		−0.001 (0.044)
advance			−0.062 (0.042)
Constant	11.011 (11.704)	11.258 (7.318)	−7.476** (3.570)
Observations	30	30	30
R^2	0.715	0.715	
Adjusted R^2	0.656	0.682	
Log likelihood			−9.087
Akaike Inf. Crit.			26.175
Residual Std. Error	7.139($df = 24$)	6.863($df = 26$)	
F statistic	12.063***($df = 5; 24$)	21.743***($df = 3; 26$)	

Note: $^*p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$

http://jakeruss.com/cheatsheets/stargazer.html

Other packages for tables

- Kable (w printr), pander, xtable

Table 1: *A table produced by printr.*

A	B	C	D	E	F	G	H
-0.56	1.72	1.22	1.79	-1.07	-1.69	0.43	0.69
-0.23	0.46	0.36	0.50	-0.22	0.84	-0.30	0.55
1.56	-1.27	0.40	-1.97	-1.03	0.15	0.90	-0.06
0.07	-0.69	0.11	0.70	-0.73	-1.14	0.88	-0.31
0.13	-0.45	-0.56	-0.47	-0.63	1.25	0.82	-0.38

- http://kbroman.org/knitr_knutshell/pages/figs_tables.html

Examples!

- My old homework
- A short script from a contract
- A practical project flow using tricks…
- …and using in R Markdown
  - Script in R, create objects, have R Markdown pick up those objects
- Article templates
  - This is the FUTURE. I'm just not there yet. ☺
  - If anyone figures out references from zotero, lemme know…
  - Let's try it anyway!