Summing Up

Why use R?

Revolution Analytics introduce R in 93 sec:

`https://youtu.be/TR2bHSJ_eck`

What can R do?

Lots!:

`http://cran.r-project.org/web/views/`

Why use RStudio to use R

Key Features of the RStudio IDE:

`https://vimeo.com/97166163`

R in the news

R consortium announced:

- https://www.r-consortium.org/

Plans to implement R into SQL:

- http://blog.revolutionanalytics.com/2015/05/r-in-sql-server.html

Microsoft buys Revolution Analytics:

- http://www.wired.com/2015/01/microsoft-acquires-open-source-data-science-company-revolution-analytics/

R Academia

Conferences about R:

useR! 2015 Aalborg, Denmark:

- http://user2015.math.aau.dk//

earl2015 London & Boston:

- `http://www.earl-conference.com/`

A journal about R:

- http://journal.r-project.org/

Key Learning Outcomes

Familiarisation with

- Command Line Computing
- RStudio Integrated Development Environment
- Commands & arguments
- Common Object Classes in R
- Assigning values to Objects
- Saving & Loading R Workspaces
- R Base Graphics
- Data Input

Key Learning Outcomes

The key concepts & mechanics of the plotting with the Grammar of Graphics[1] inspired 'ggplot2':

- the mechanics of the

  `ggplot( )`

  command
- the concept of aesthetic mapping
- plotting geometries
- scales
- faceting
- saving plots

Don't forget the best 'ggplot2' manual pages are online:
`http://docs.ggplot2.org/current/`

[1] Leland Wilkinson, *The Grammar of Graphics*, Statistics and Computing. Springer, 2nd edition, 2005.

Key Learning Outcomes

- read data into R from an external file
- fit multiple linear regression models including polynomial & interaction terms
- produce & intepret diagnostic plots for linear models
- plot data along with predictions of model & associated uncertainty
- conduct stepwise variable selection
- produce summary statistics for a fitted model

Key Learning Outcomes

Writing:

- conditional statements
- loops
- functions

Solving problems by writing programs

Key Learning Outcomes

Understand:

- motivations for managaing a coding project via a version control system
- fundamentals of Git & GitHub:
  - local and remote repositories
  - developing multiple versions of the same file
  - combining disparate versions of the same file
  - returning to previous version of a file without loosing the current version
  - collaboratively editing files

The work flow we used to conduct version control via the Git command line application will function equally well using GitHub or BitBucket as a host for remote repositories.

Resources for learning R

Free Courses on R

- http://www.lynda.com/R-tutorials/R-Statistics-Essential-Training/142447-2.html
- https://www.coursera.org/course/rprog
- https://www.coursera.org/course/compdata

Documentation the CRAN Website

Official documentation:

- http://cran.r-project.org/manuals.html

Contributed documentation:

- http://cran.r-project.org/other-docs.html
- Packages may include an vignette (essentially documents presenting a example analyses on data included in the package) e.g.
  - http://cran.r-project.org/web/packages/gstat/index.html

Moving Forward

Ideas for Continuing to Learn R

- one way to begin using R in your work could be to start using R for graphics jobs...
- then perhaps next time you need to fit a model you could do a quick Google to see if there is an R function/package for fitting such models
- A group of you could band together and complete one or more of the Coursera courses - you could collaborate on the coding exercises via GitHub or BitBucket
- if you have fellow students among this cohort with similar research interest you could identify a recent paper from your field which used R and shared the code and data and collaboratively try to replicate (or even extend) the analysis therein