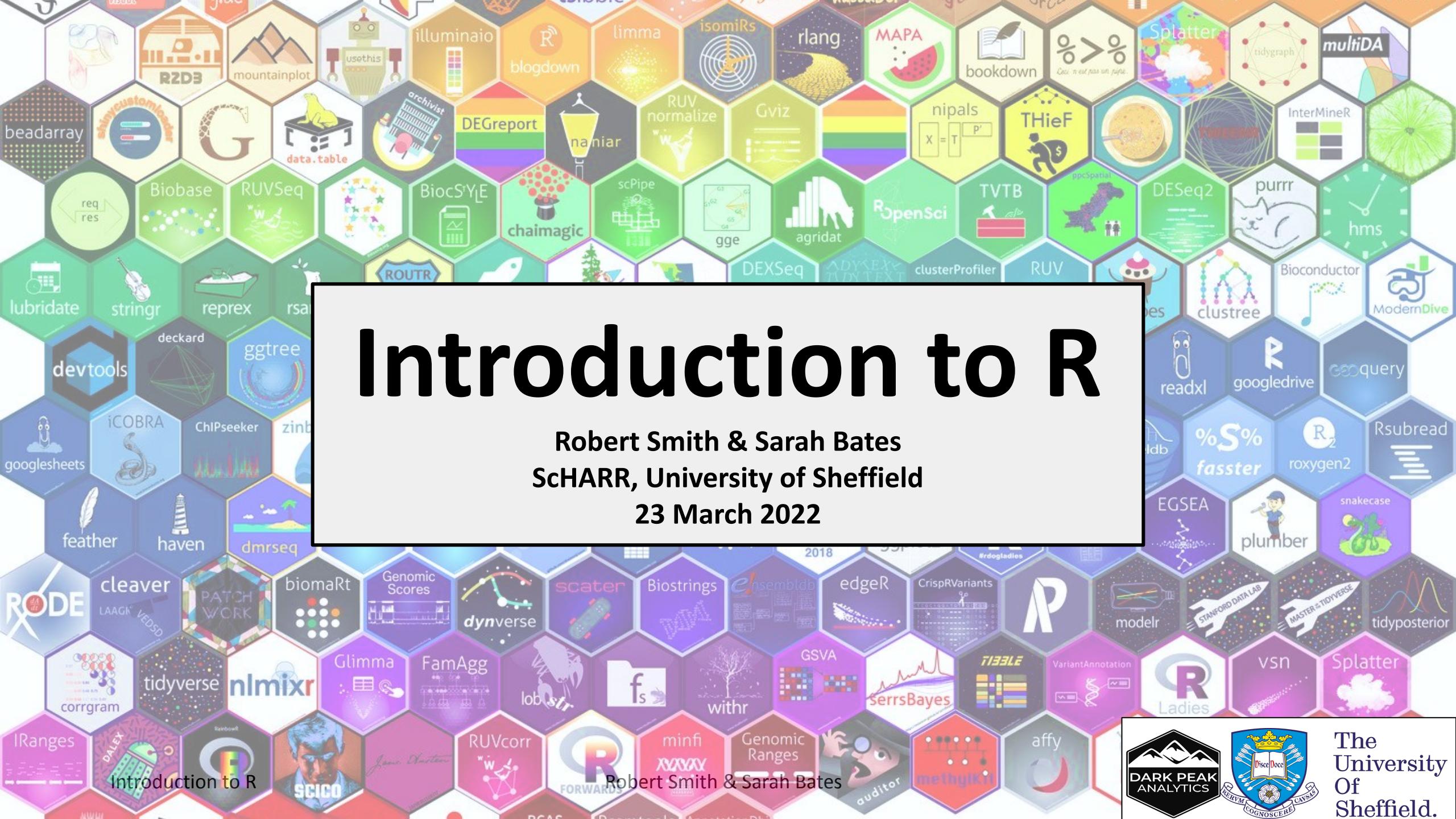


Introduction to R

Robert Smith & Sarah Bates
ScHARR, University of Sheffield

23 March 2022



The University Of Sheffield.

Time	Leader	Files	Section
9:30 – 10:00	Rob		Welcome & Introductions
10:00 – 10:25	Rob		Why R? What is R?, Benefits of R, Benefits of R for decision modelling
10:25 – 11:10	Sarah	Session 1	Syntax and basic operations – 45mins <i>Navigating RStudio, Basic Operations, Objects, Evaluations</i>
11:10 – 11:25			Break – 15mins
11:25 – 12:00	Sarah	Session 2	Objects classes and types – 45mins <i>Object classes, Operations on different data structures, Sub setting data</i>
12:00 – 12:45			Break – 45mins
12:45 – 13:45	Sarah	Session 3	Working with data in R – 45mins <i>Setting working directories, Importing data, Summarizing data</i>
13:45 – 14:00			Break – 15mins
14:00 – 14:45	Rob	Session 4	Data analysis – 45mins <i>Plotting data, Linear regression, Downloading packages</i>
14:45 – 15:00			Break – 15mins
15:00 – 16:00	Rob	Session 5	Learning more about R <i>How to troubleshoot and where to find info, Where to go to learn more, What are the next steps, and what is possible, Observation: Case study analysis. Open discussion & questions.</i>
16:00- 16:30	Rob		Feedback and recap <i>We are happy to remain online to answer specific questions.</i>

Introductions

Sarah Bates



Sarah Bates
SarahEBates

- **Background:**
 - BSc (Hons) Psychology, University of Surrey.
 - MSc Health Psychology, King College London
 - PhD Public Health Economic modelling, ScHARR, Sheffield.
- **Previous Teaching experience:**
 - Medical statistics (Medical school)
 - Valuing the benefits of Healthcare (ScHARR HEDM MSc)
 - Health Technology Assessment (ScHARR open access courses)
 - Advanced Simulation methods
- **Research & Experience**
 - Research Associate at ScHARR
 - Incorporating psychological factors in health economic modelling
 - Modelling of education-based mental health interventions
 - Modelling of obesity and weight management interventions

Robert Smith



- **Background:**
 - Bachelors & Masters in Economics from the University of Nottingham.
 - PhD Candidate, School of Health & Related Research, Sheffield.
- **Teaching:**
 - Advanced Simulation Methods (ScHARR HEDM MSc)
 - Medical Statistics (Sheffield Medical School)
 - Data Science for Health Economic Evaluation (book).
- **Research & Experience**
 - Epidemiologist/Stats programmer at the Joint Biosecurity Centre (now UKHSA).
 - Advisory work with World Health Organisation & parkrunUK.
 - Advocate for the use of R for decision models in public health & medicine.

Robert Smith

RobertASmith

Currently based at the UK Health Security Agency. Previously Public Health, Economics at the University of Sheffield

Participants

- What your background is...
- What experience you have with ...
 - Programming
 - Excel
 - Statistics
- Why you would like to learn R...



Meeting Housekeeping

Please keep your camera off and your mic muted.

Feel free to use the feedback buttons and chat.

If you have a question please raise your hand.

If you want me to speed up/slow down let me know.

Once you have finished the exercises please put DONE in the chat.

Introduction Presentation

Why learn R?

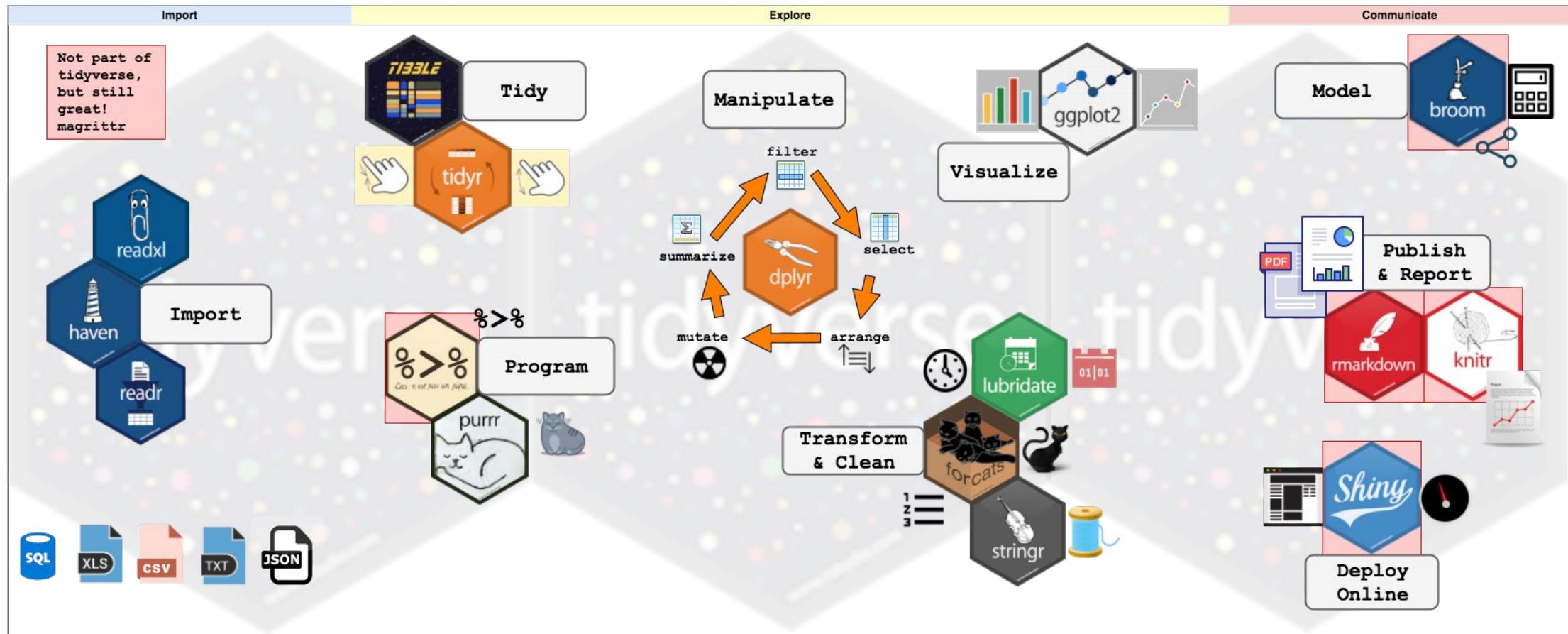
- Programming language & free software environment.
- Mainly used for statistical and graphical techniques.
- Able to produce fantastic publication-quality plots.
- Base-R is good, Base-R + additional packages is awesome.
- It's free



Why learn R? – opportunity cost.



Why learn R? – flexibility



Why learn R? – community.

 **R-bloggers**
R news and tutorials contributed by hundreds of R bloggers

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**The politics of New Mexico:
a brief historical-visual
account**
October 23, 2019
By Jason Timm

New Mexico demographics via tidyCensus 2016 Presidential Election. Presidential elections in New Mexico historically New Mexico as bellwether? Congressional delegation historically New Mexico State Government. Summary In this post, we piece together a brief political history of New Mexico using a host of data sources, including Wikipedia, the US Census, the New Mexico State Legislature (NMSL), VoteView, and the National Conference of State Legislatures. A bit...

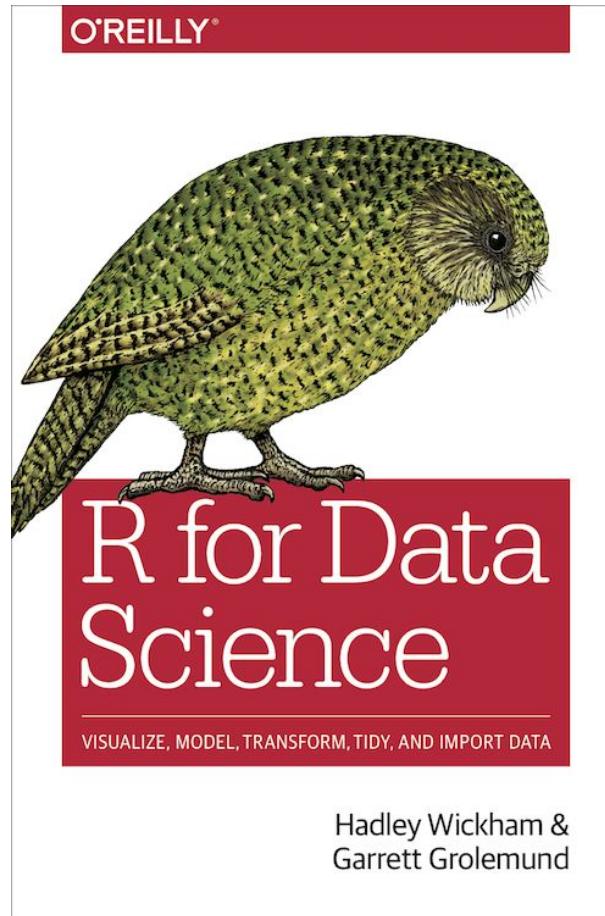
[Read more »](#)

RStudio Professional Drivers 1.6.0
October 23, 2019
By Nathan Stephens



Gold-Mining Week 8 (2019)
October 23, 2019
By Michael Griebe

Week 8 Gold Mining and Fantasy Football Projection Roundup now available -on time and ready to go! The post Gold-Mining Week 8 (2019) appeared first on Fantasy Football Analytics



 stackoverflow Products Customers Use cases

Episode #125 of the Stack Overflow podcast is here. We talk Tide Club and mechanical keyboards. [Listen](#)

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Questions tagged [r]

R is a free, open-source programming language and software environment for statistical computing, and general computing. Please provide minimal and reproducible example(s); `dput()` for data and specify all non-base packages with `library()` calls. Do not embed picture code blocks instead. For statistics related questions, use <https://stats.stackexchange.com>.

[Learn more...](#) [Top users](#) [Synonyms \(2\)](#) [r jobs](#)

312,101 questions [Newest](#) [Active](#) [Bountied \(8\)](#) [Unanswered](#)

2474 votes How to make a great R reproducible example When discussing performance with colleagues, teaching, sending a bug report or mailing lists and here on Stack Overflow, a reproducible example is often asked

23 answers [r](#) [r-faq](#) 274k views

1258 votes How to sort a data frame by multiple column(s) I want to sort a data.frame by multiple columns. For example, with the data.frame column z (descending) then by column b (ascending): dd <- data.frame(b = fact...

19 answers [r](#) [sorting](#) [dataframe](#) [r-faq](#) 1.2m views

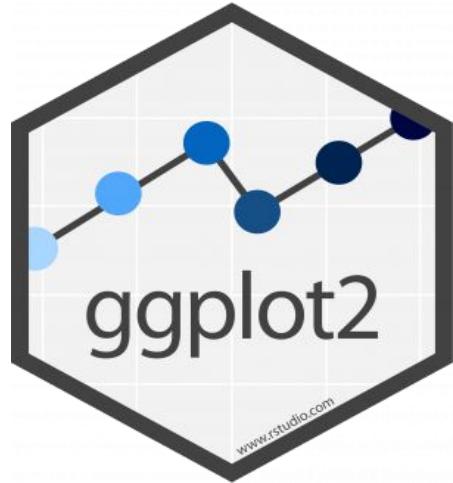
1138 votes How to join (merge) data frames (inner, outer, left, right) Given two data frames: df1 = data.frame(CustomerId = c(1:6), Product = c(rep("A"...

13 answers [r](#) [join](#) [merge](#) [dataframe](#) [r-faq](#) 1.1m views

1005 votes Grouping functions (tapply, by, aggregate) and the *apply family Whenever I want to do something "map"py in R, I usually try to use a function in never quite understood the differences between them -- how (apply, tapply, etc.)

9 answers [r](#) [apply](#) [sapply](#) [tapply](#) [r-faq](#) 384k views

Additional Features



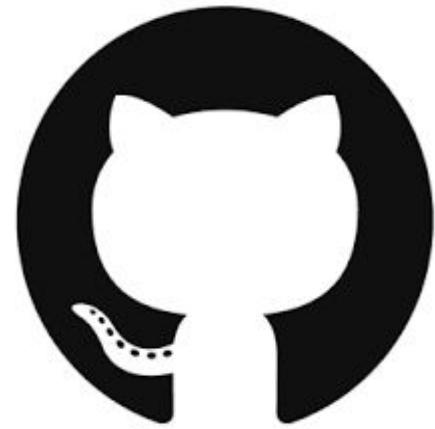
[Link to graph gallery](#)



[Course Document](#)



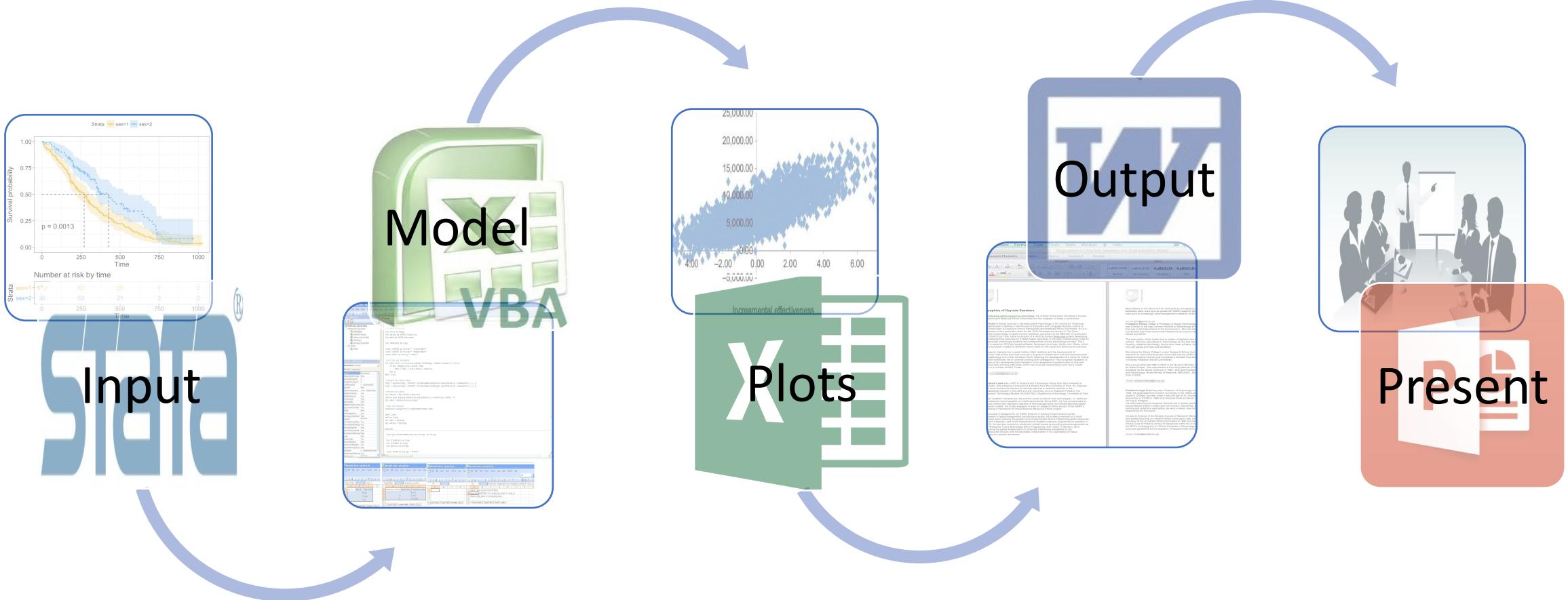
<http://iol-map.shef.ac.uk/>



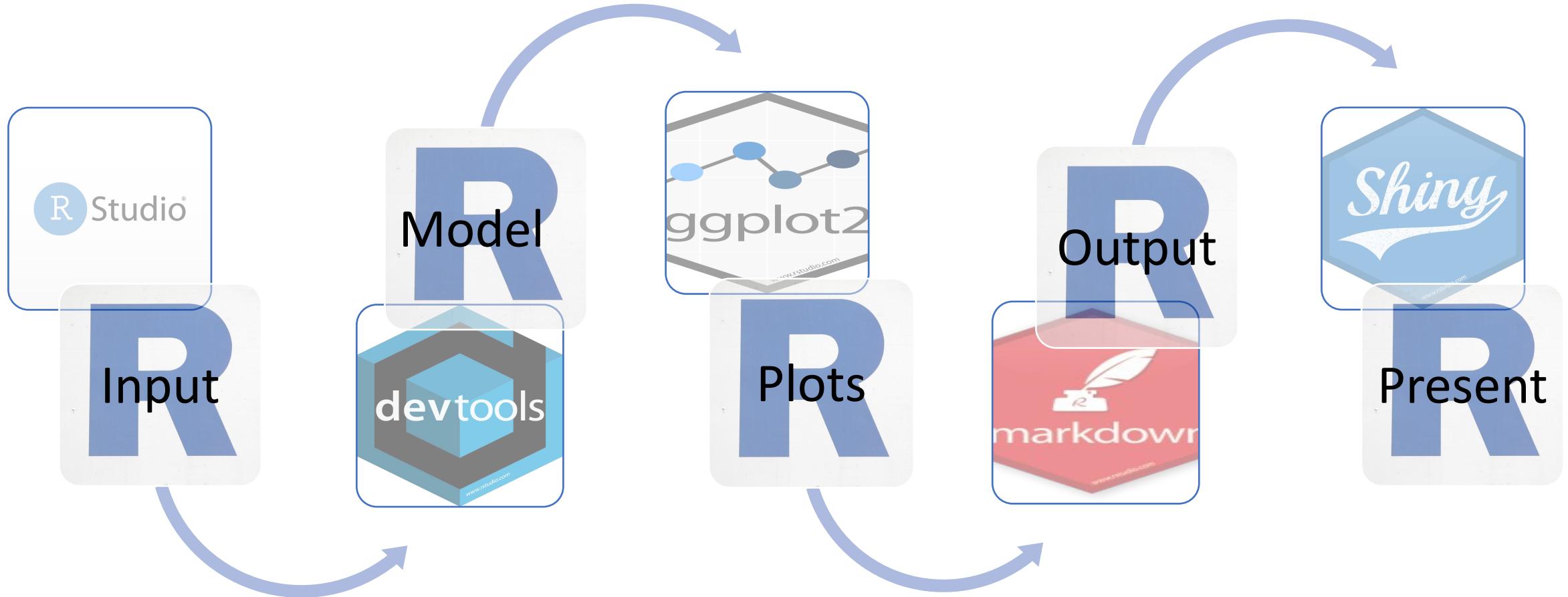
<https://github.com/DARTH-git>

Decision Modelling in R

Why use R for decision modelling?



Why use R for decision modelling?

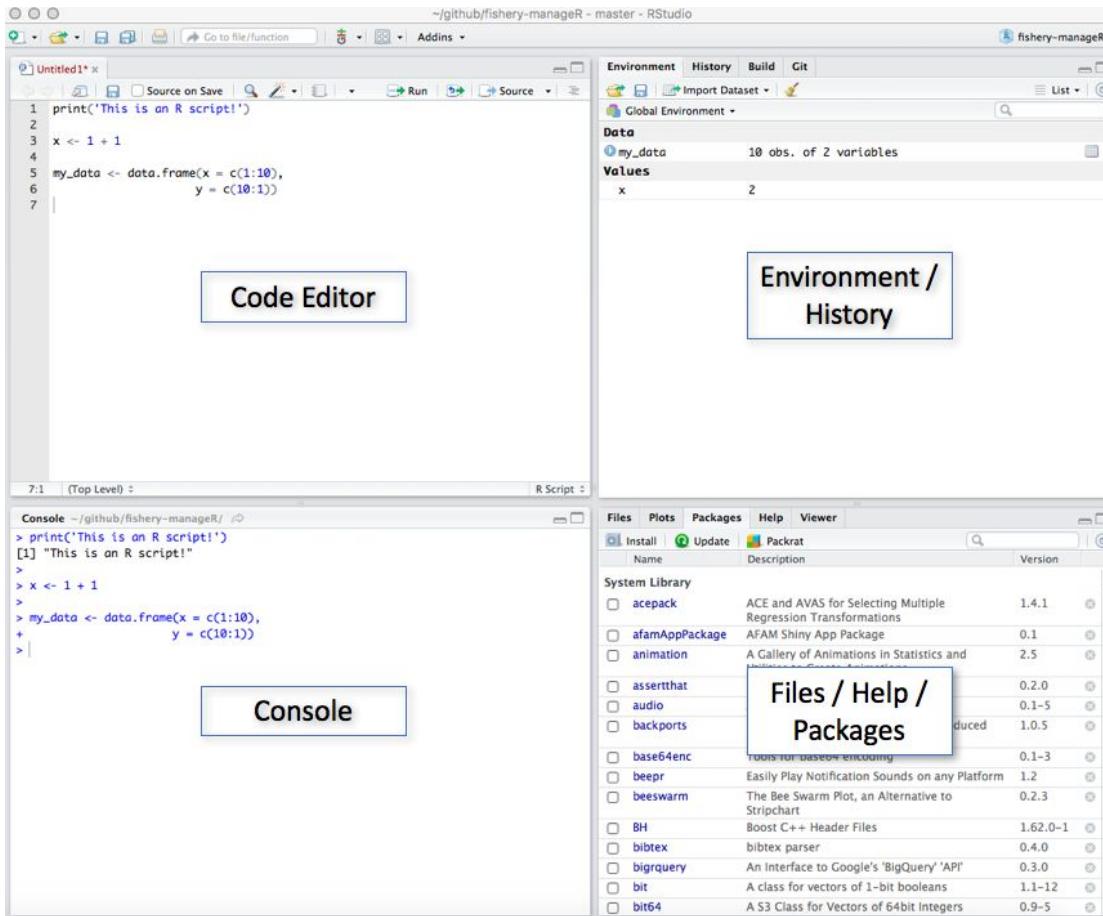


Session 1

Session 1: Objectives

- Learn how to navigate R-Studio.
- Learn how to use R to perform basic calculations
- Learn what objects are and where they are stored.
- Perform basic evaluations.

Session 1: R-Studio Layout



Notes to cover:

Shortcuts at Alt + Shift + K

Show add panes

Show rainbow parenthesis

Show dark mode

Show change layout.



file.edit('scripts/session_1.R')

Session 1: Exercises

<https://r4scharr.shinyapps.io/intro/#section-session1>

file.edit('Exercises/exercise1.R')

BREAK



Session 2

Session 2: Objectives

- Know what classes objects can take.
- Understand the different object types.
- Have the ability to subset objects.
- Understand common errors when working with different object classes and types.



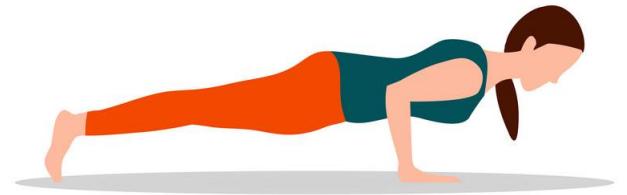
file.edit('scripts/session_2.R')

Session 2: Exercises

<https://r4scharr.shinyapps.io/intro/#section-session2>

file.edit('Exercises/exercise2.R')

BREAK



Session 3

Session 3: Objectives

- Know how to read in data from different file types.
- Understand how to sense-check datasets.
- Summarize data.





file.edit('scripts/session_3.R')

Session 3: Exercises

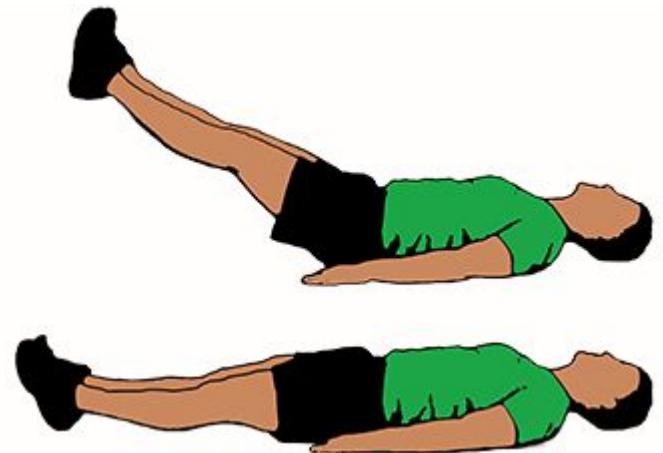
<https://r4scharr.shinyapps.io/intro/#section-session3>

file.edit('Exercises/exercise3.R')

Exercises Finished



BREAK



Session 4

Session 4: Objectives

- Loading data from external sources
- Linear regression
- Plots





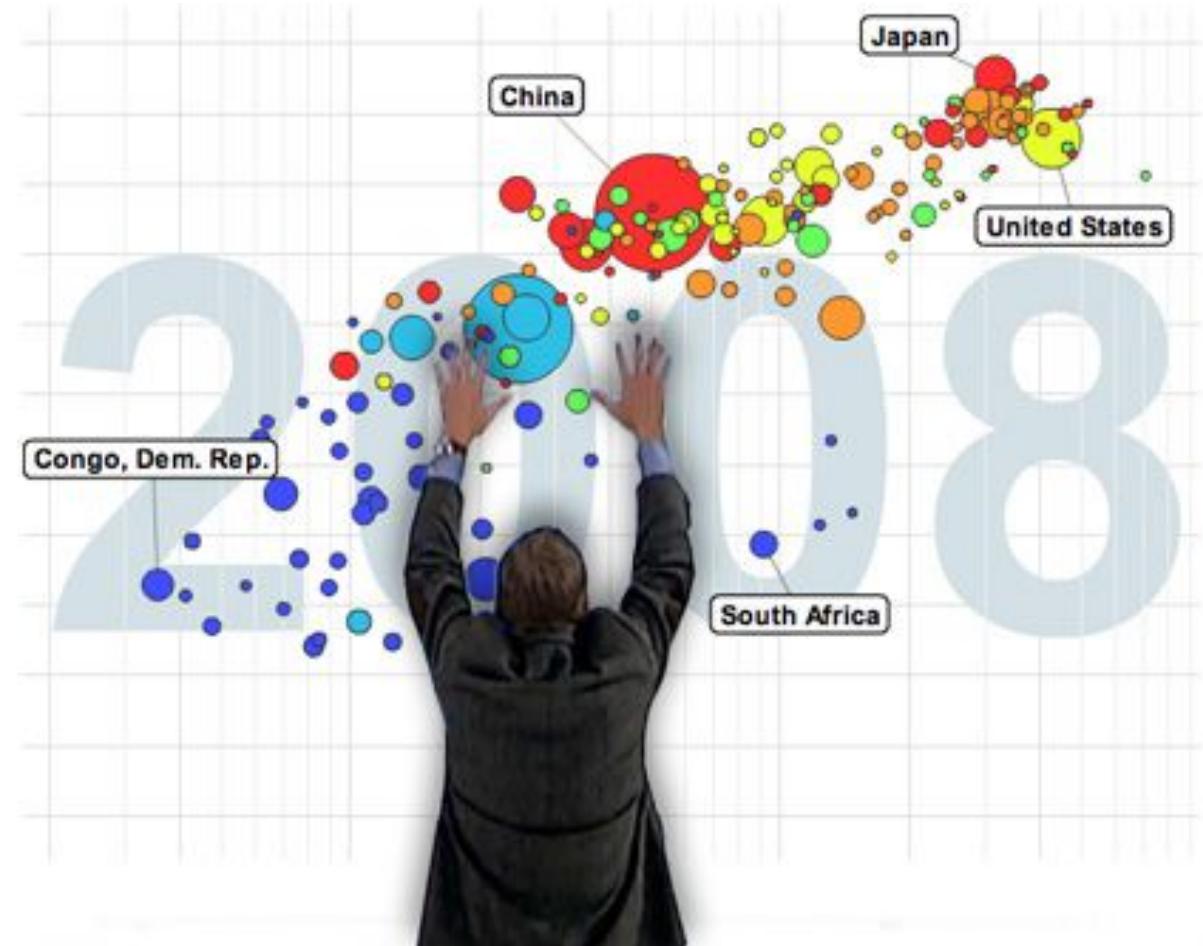
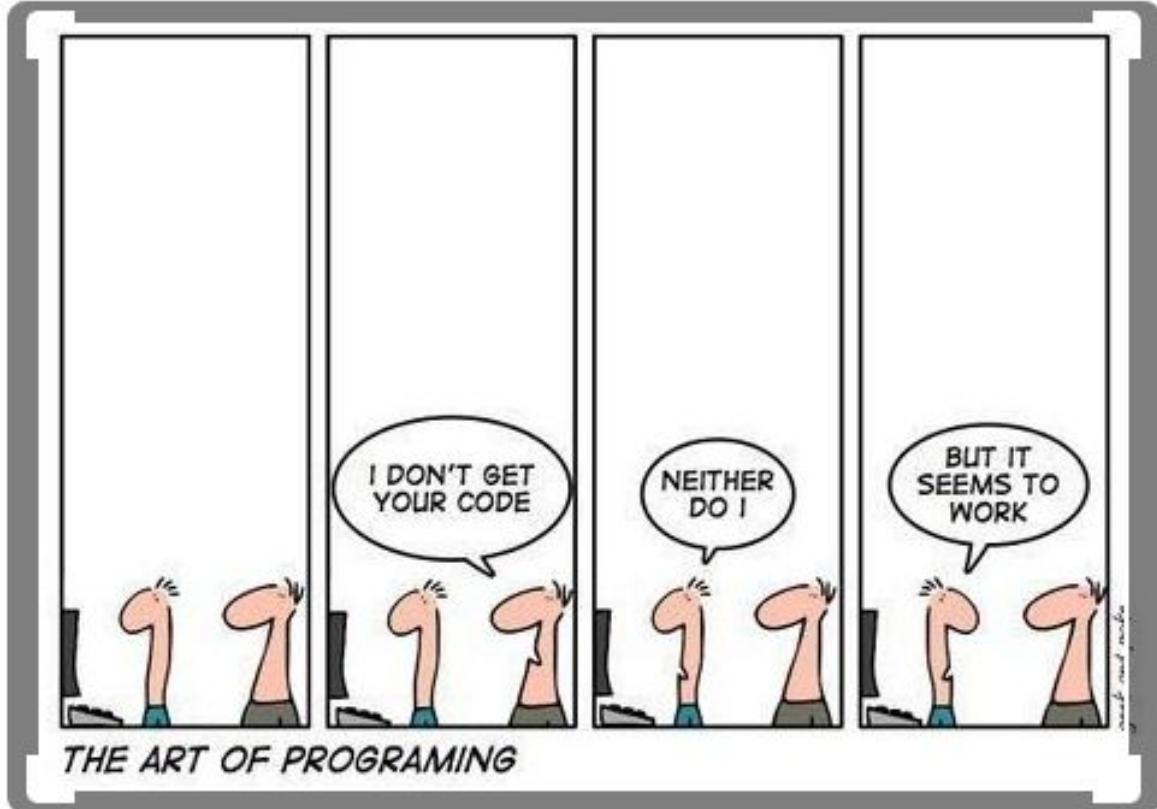
file.edit('scripts/session_4.R')

Session 4: Exercises

```
file.edit('Exercises/recap.R')
```

Conclusion Presentation

Gapminder dataset



Thankyou

Introduction to R

Robert Smith & Sarah Bates



The
University
Of
Derby

Extensions - Open Access Materials

Parkrun paper All code & data for open source paper about parkrun participation can be found here https://github.com/ScHARR-PHEDS/DoPE_Public, can you replicate the analysis?

Parkrun paper 2: Again, all code necessary to replicate the paper can be found here: https://github.com/RobertASmith/parkrun_temporal/blob/master/scripts/DoPE_GLM_by_yr.R

Shiny paper: https://github.com/RobertASmith/paper_makeHEshiny