Introduction to R and data analytics

Session 1

What is data analytics?

Data Analytics

- Examining raw data and data sets
- Looking for trends
- Analysing and drawing conclusions about that information
- Helping to optimise business processes and performance
- Providing insights into more data-driven decisions
- Various approaches to data analytics - **descriptive** (what happened), **diagnostic** (why this happened), **predictive** (what is going to happen)
- Using a lot of automated techniques and processes
- Relies on different software tools (examples?)

What is R?

What is R?

R is a programming language and a free software environment for statistical computing and graphics (r-project.org)

Advantages of R

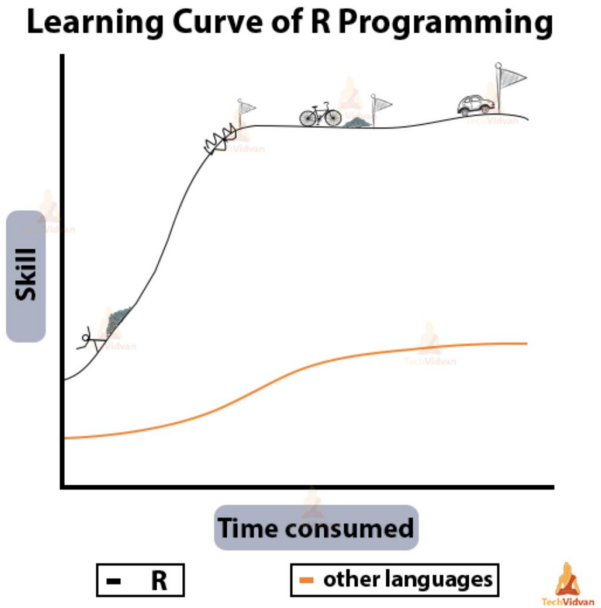
- Open-source software
- Cross platform support
- Excellent for statistical analysis
- A huge amount of resources and materials are available
- Highly active community that contributes to R development
- A large variety of packages and libraries
- Supports various data types and data operations
- Powerful graphics

What is R?

R is a programming language and a free software environment for statistical computing and graphics (r-project.org)

Disadvantages of R

- Steep learning curve
- Can slow down your machine
- Poor memory management
- No dedicated support team
- Flexible syntax
- Some packages may be of poor quality
- Multiple solutions to the same problem (disadvantage?)



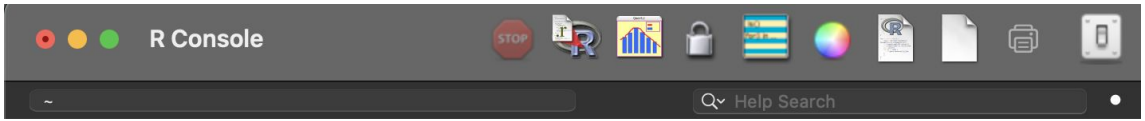
What can R do for you?

- Data entry
- Data pre-processing
- General data handling
- Data visualization
- Statistical analysis
- Modelling
- Machine learning
- Data simulation
- Excellent data report preparation
- Communication of results

R ecosystem

Downloading R:

https://cloud.r-project.org

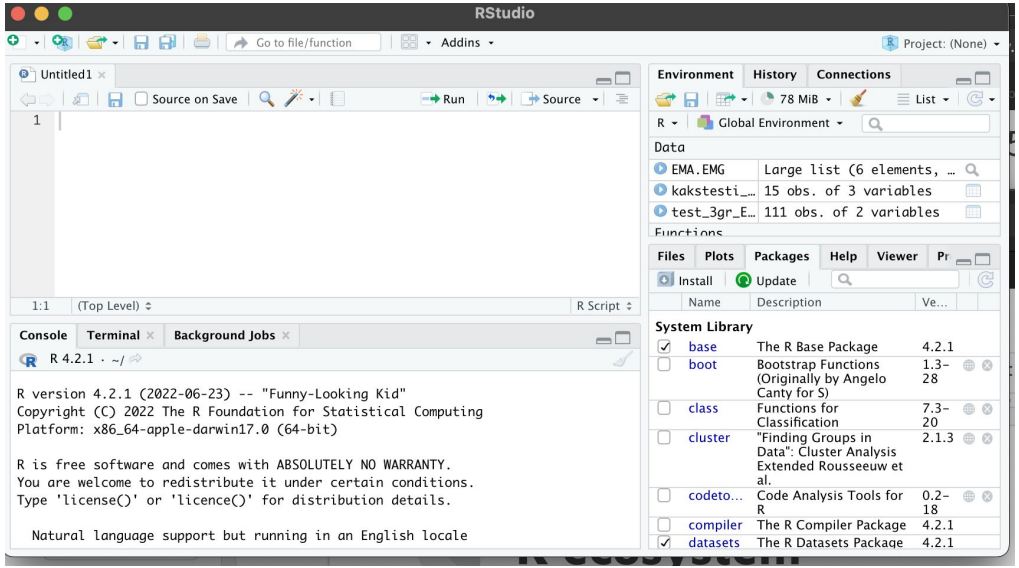



```
R version 4.2.1 (2022-06-23) -- "Funny-Looking Kid"
Copyright (C) 2022 The R Foundation for Statistical Computing
Platform: x86_64-apple-darwin17.0 (64-bit)

R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.

  Natural language support but running in an English locale

R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.
```

R ecosystem

Downloading RStudio, examine the RStudio interface:

https://www.rstudio.com/products/rstudio/download/



R/RStudio

Default panes:

- Your source code (upper left)
- Console (lower left)
- Environment/History (tabbed in upper right)
- Files/Plots/Packages/Help (tabbed in lower right)

Default location of the panes can be changed and customised

➔ Go into the Console, where we interact with the live R process

➔ Make **an assignment** and then inspect the **object** you just created

➔ All R statements where you create objects – “assignments” – have this form:

ObjectName <- value

➔ Inspect RStudio shortcuts

R functions, packages and libraries

R function is an object with a set of statements organised together to perform a specific task. R has a large number of in-build functions that can perform various tasks.

R packages are collections of R functions, data, and compiled code in a well-defined format, created to add specific functionality.

R libraries - when you have the package installed, you can **load the library** into your R session for use. Any of the functions that are specific to that package will be available for you to use by simply calling the function as you would for any of the base functions.

Thank you!

Complete the SetUp tutorial:

https://learnr-examples.shinyapps.io/ex-setup-r/

Did you get all the main concepts for today right?