Intro to R

Intro & Foundations

Websites
NEOF: https://neof.org.uk/
NERC: https://nerc.ukri.org/
CGR:
https://www.liverpool.ac.uk/genomic-research/

Twitter
NEOF: @NERC_EOF
NERC: @NERCscience
CGR: @CGR_UoL

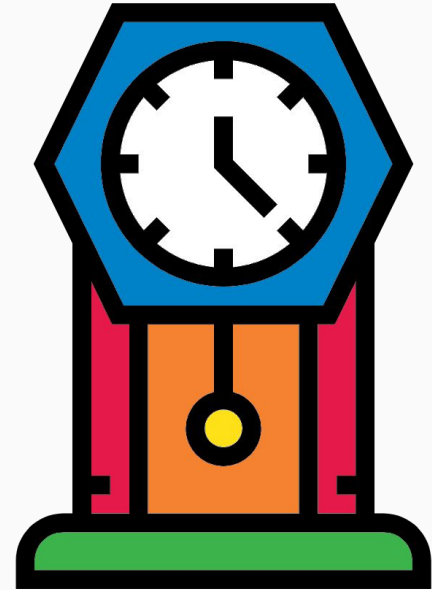# Upcoming workshops

https://neof.org.uk/training/

- Introduction to sequencing data and quality control
  - Tue 30 Nov & Thu 2 Dec 2021
- Population genomics
  - Tuesday 25 & Thursday 27 January 2022
- Bacterial 16S metabarcoding
  - mid February 2022
- Metabarcoding for diet analysis and environmental DNA
  - mid March 2022
- Microbial shotgun metagenomics
  - early April 2022

Format & Schedule

This intro
Bookdown
Theory
Practice
Exercises
Optional materials

Work at your own pace on your own time

Map

Plans and goals

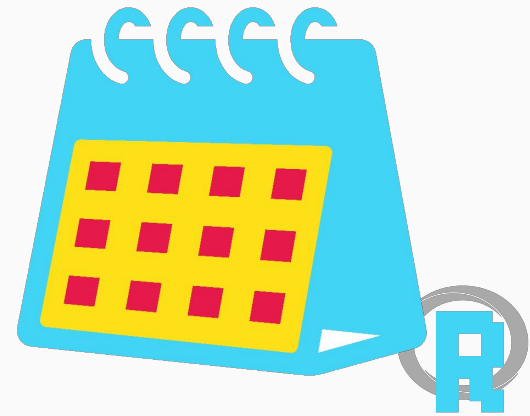What is R and RStudio

RStudio layout

R foundations

Calendar

Morning 1: Foundations of R & RStudio

Afternoon 1: R objects (Classes and Data Structures)

Morning 2: Files and subsetting data

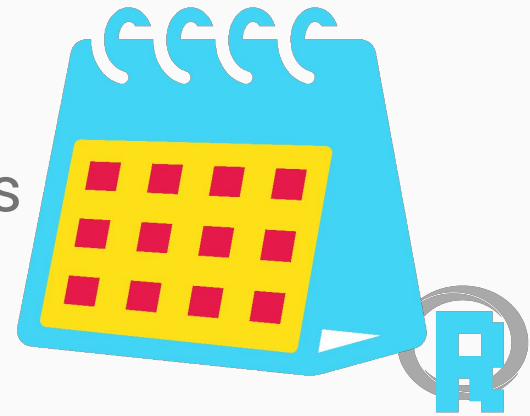Afternoon 2: Handy R tips and tricks

Calendar pt2

Morning 3: Visualisation (Line graphs & histograms)

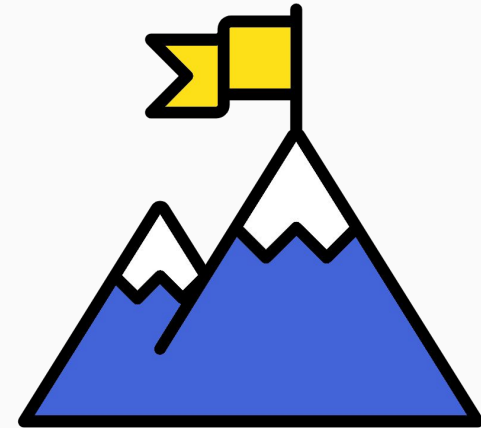Afternoon 3: Visualisation (Scatter plots and boxplots)

Morning 4: Basic statistics

Afternoon 4: Loops, ifs, and custom functions

Goals

- Fluency in R
  - Be able to learn more R with the R you learnt here
- Use RStudio
- Read in and write out files with R
- Manipulate data in R
- Create plots in R
- Carry out statistics in R

R

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

Language & Environment

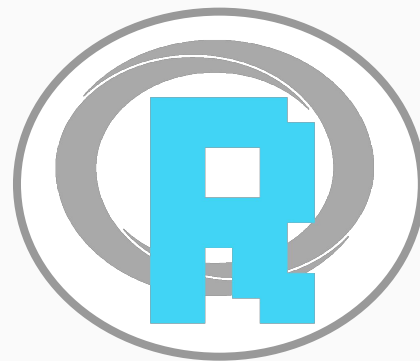Data manipulation

Graphics

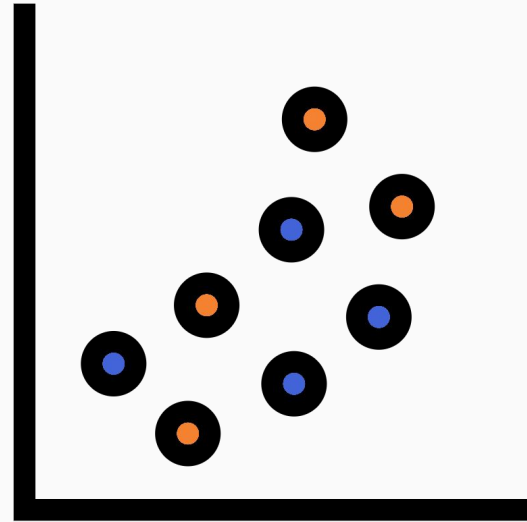Statistics

August 1993; 28 years ago

Highly used

Well maintained

Lots of resources

Why use R?

- Powerful
- Flexible
- Statistics
- Visualisation
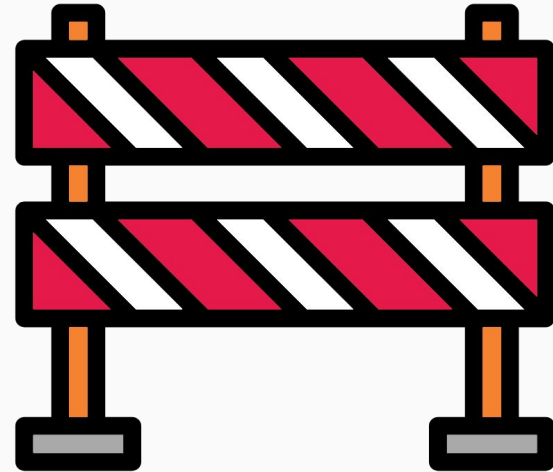- Widely used
- Many Packages

Barriers to entry

Difficult

Poor documentation

Excel

Requires coding

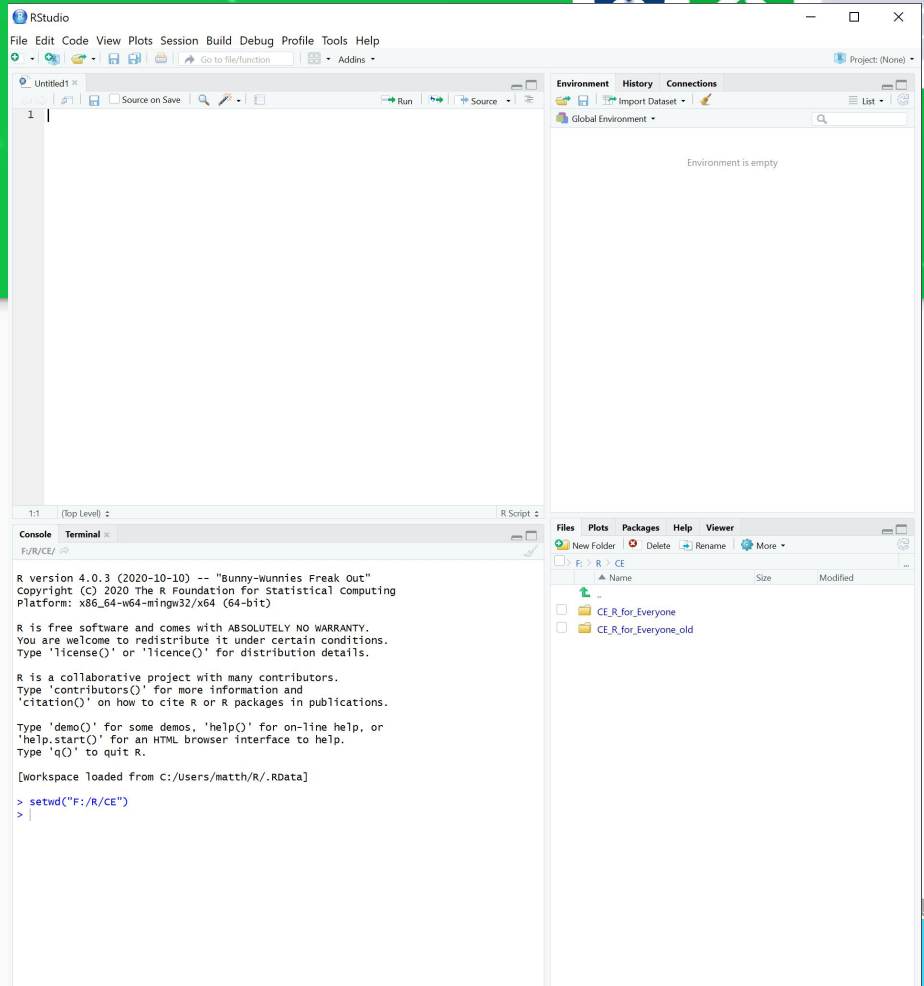# Foundations of R & RStudio

RStudio
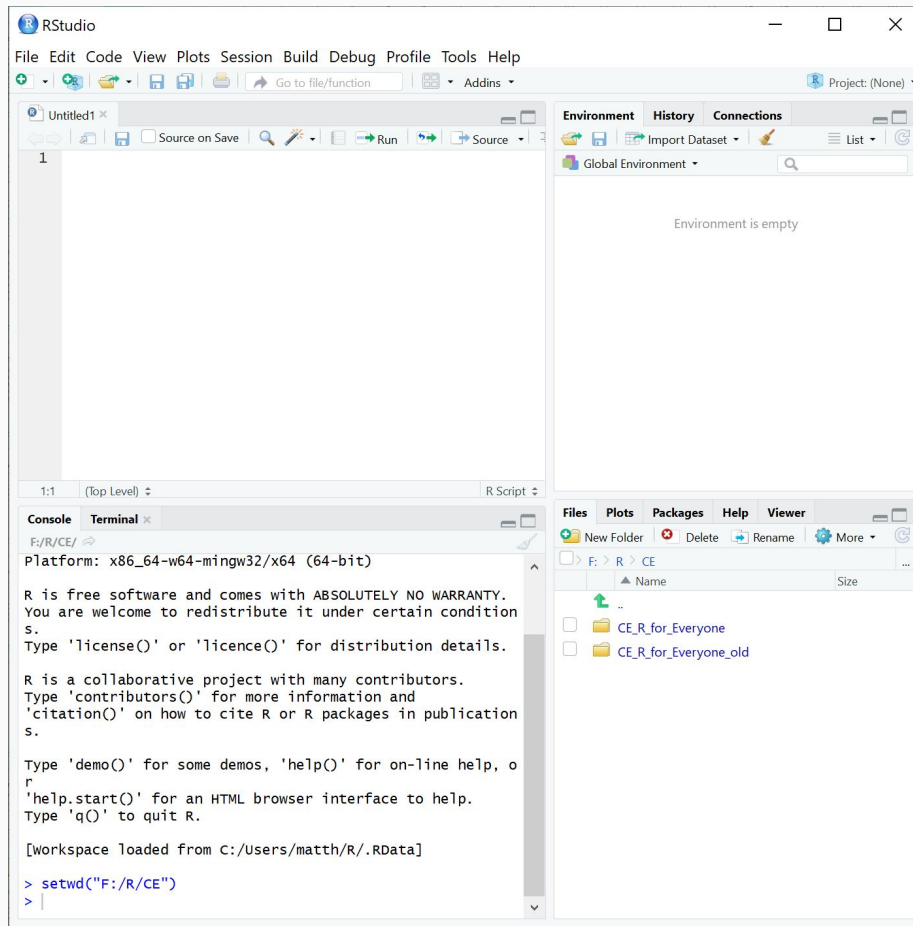

https://rstudio.com/

Integrated Development Environment (IDE)

Nice interface for R

Free

2: Script editor (source) window

3: Environment and history window
Environment and History panes

1: Console window
Command line

4: Misc window
Files, Plots, Packages, Help and Viewer panes

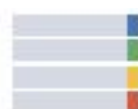RStudio Layout: Windows and Panes

Using Rstudio

First install R

https://www.stats.bris.ac.uk/R/

Install Rstudio Desktop

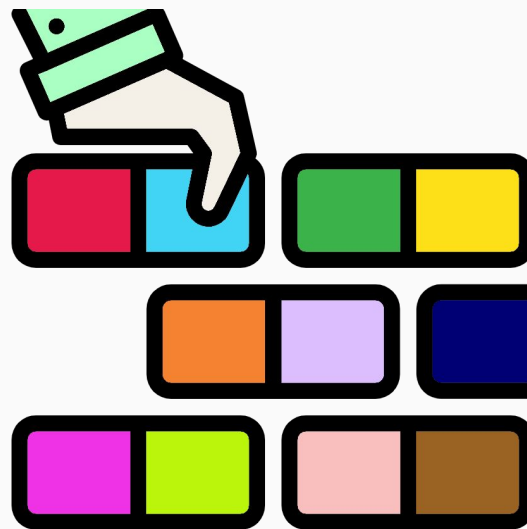https://rstudio.com/products/rstudio/download/

R Foundations

- Operators
- Variables
- Functions
- Directories
- Script editor
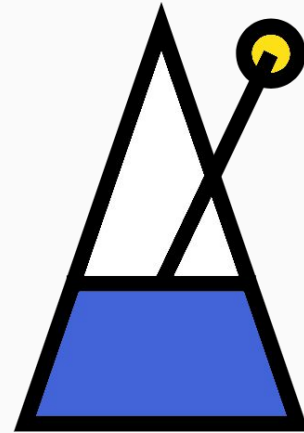- Annotations

Course info

Pace

Work at your own pace through the book

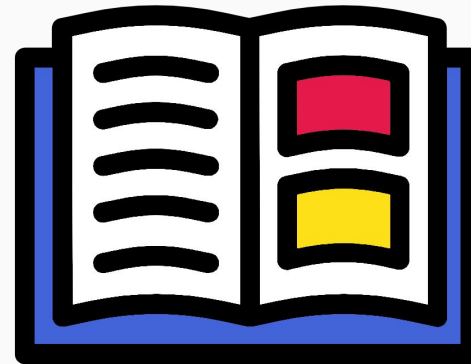If you get stuck:

    1st check for typos

    2nd ask for help

No such thing as a dumb question, just dumb answers by me

HTML book

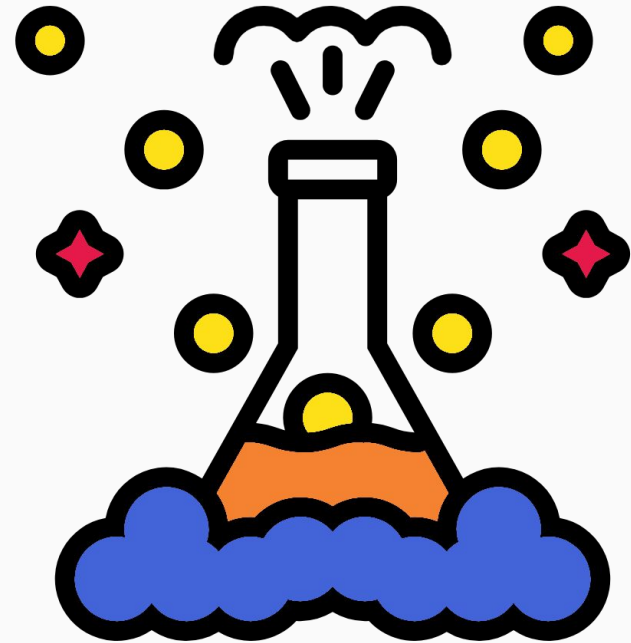Theory, practice, exercise and solutions

Experiment

Experiment

Different commands

Combining functions

You will not break anything

Ask questions!

Here to help!

Don't understand a concept?

Don't understand the objective of an exercise?
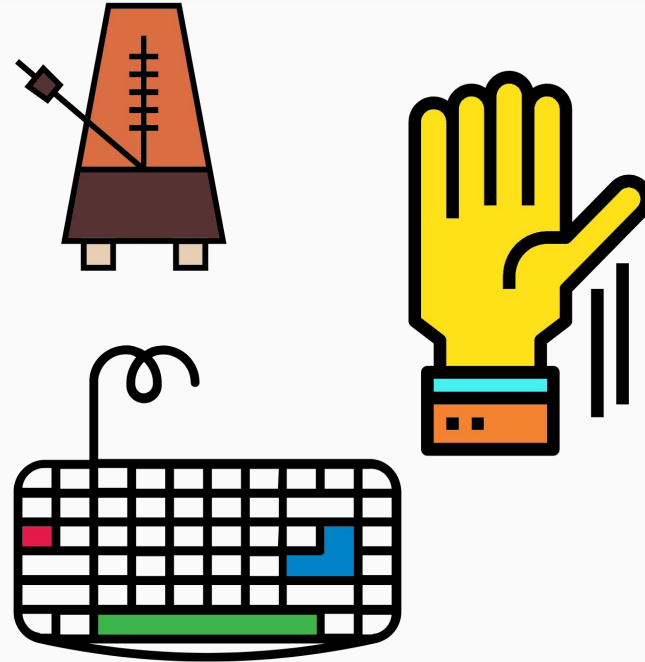
Reminders and Tips

Work at your own pace

Typos

Ask questions

Breaks are important

Answers in bookdown

Workshop sessions

Zoom - Ask via microphone if no question currently being asked/answered
Slack - Ask questions via the channel or ask to go into a zoom breakout room with one of us
WebVNC - We can connect to your webVNC to see and help with issues.
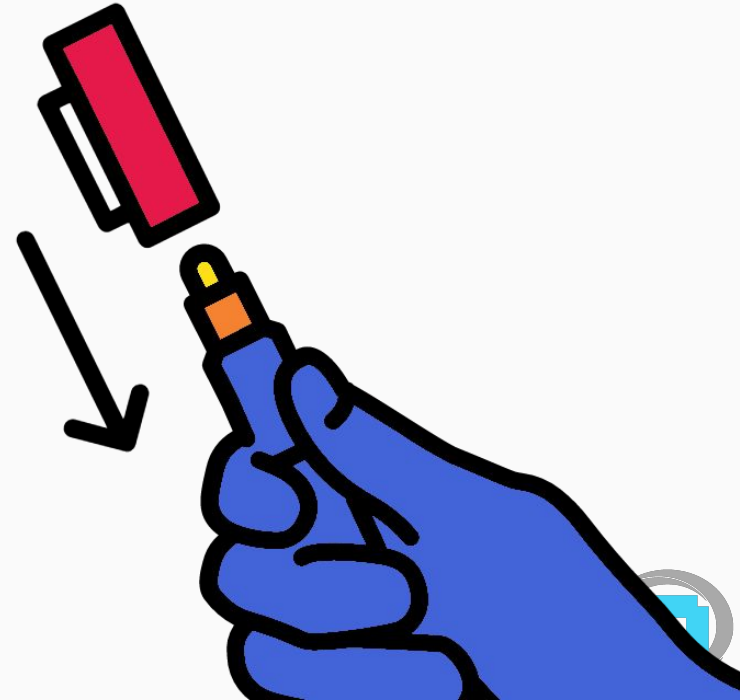Breakout rooms upon request

Recap

Plans and goals

What is R and RStudio

RStudio layout

R foundations

Thank you!

Questions?