## Introduction to RStudio

#### Day 1 - Introduction to Data Analysis with R

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### Difference between R and RStudio





R is the **programming language** and the **program** that does the actual work

 Can be used with many different programming environments RStudio is the **integrated development environment** (IDE)

- Provides an interface to R
- Specifically built around R code
- Execute code
- Syntax highlighting
- File and project management
- ..

### Difference between R and RStudio









Analogy and image from ModernDive Book



Summary

You can use R without RStudio but RStudio without R would be of little use

## A quick tour around RStudio

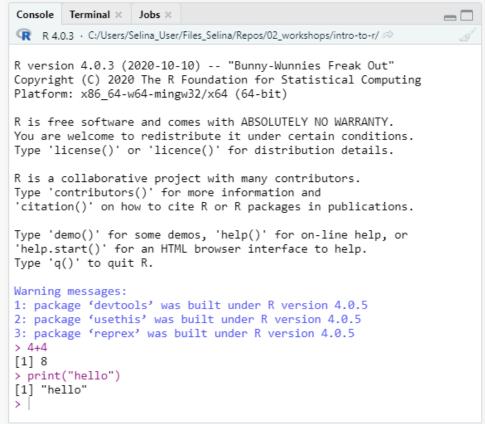
## A quick tour around RStudio



### Console pane

- Execute R code
- Output from R code in scripts is printed there
- Type a command into the console and execute with Enter/Return





### Script pane

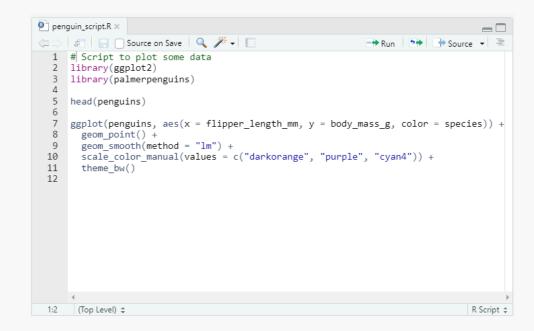
- Write scripts with R code
  - Scripts are text files with R commands (file ending .R)
  - Use scripts to save commands for reuse

```
penguin_scriptR ×

| Source on Save | Source on Save | Run | Source | Run | Run | Source | Run | Run | Source | Run |
```

### Script pane

- Create a new R script:
   File -> New File -> R Script
- Save an R script:File->Save (Ctrl/Cmd + S)
- Run code line by line with Run button (Ctrl+Enter/Cmd+Return)
- You can open multiple scripts

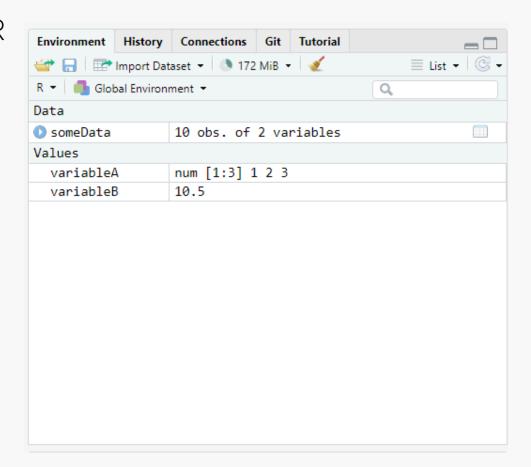


#### (i) Summary

Use **scripts** for all your analysis and for commands that you want to save. Use **console** for temporary commands, e.g. to test something.

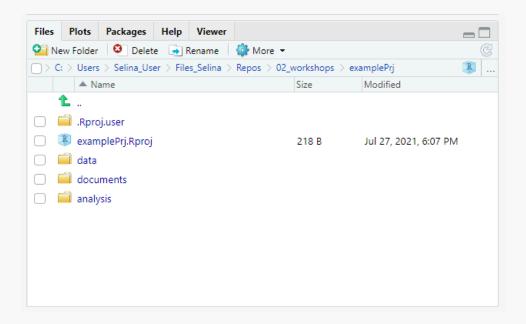
### Environment pane

- Shows objects currently present in the R session
- Is empty if you start R



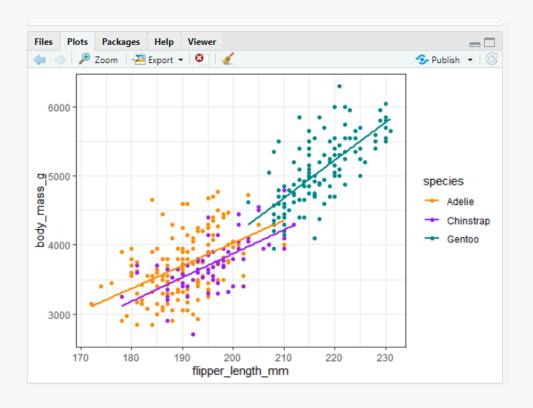
### Files pane

- Similar to Explorer/Finder
- Browse project structure and files
  - Find and open files
  - Create new folders
  - Delete files
  - Rename files
  - •
- Practical if you don't want to switch between File Explorer and RStudio all the time



## Plot pane

 Plots that are created with R will be shown here



How to use RStudio to organize your projects

- One directory with all files relevant for project
  - Scripts, data, plots, documents, ...

```
MyProject
 - data
 - docs
      notes
      reports
  R
     - clean data.R
      statistics.R
```

Example project structure

- One directory with all files relevant for project
  - Scripts, data, plots, documents, ...
- An RStudio project is just a normal directory with an .Rproj file

```
Project
 - data
 - docs
      notes
       reports
  R
     - clean data.R
       statistics.R
 - MyProject.RProj
```

Example RStudio project structure

#### Advantages of using RStudio projects

- Easy to navigate in R Studio (File pane)
- Easy to find and access scripts and data in RStudio
- Project root is working directory
- Open multiple projects simultaneously in separate RStudio instances

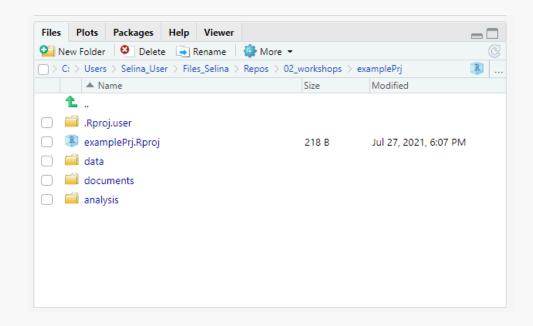
```
Project
 - data
 - docs
      notes
       reports
  R
     - clean data.R
       statistics.R
 - *.RProj
```

Example RStudio project structure

### Create an RStudio project

Create a project from scratch:

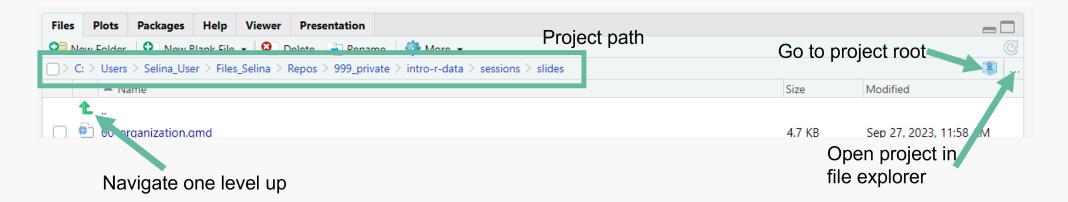
- File -> New Project -> New Directory -> New Project
- 2. Enter a directory name (this will be the name of your project)
- 3. Choose the Directory where the project should be initiated
- 4. Create Project



Example RStudio project structure in the Files pane

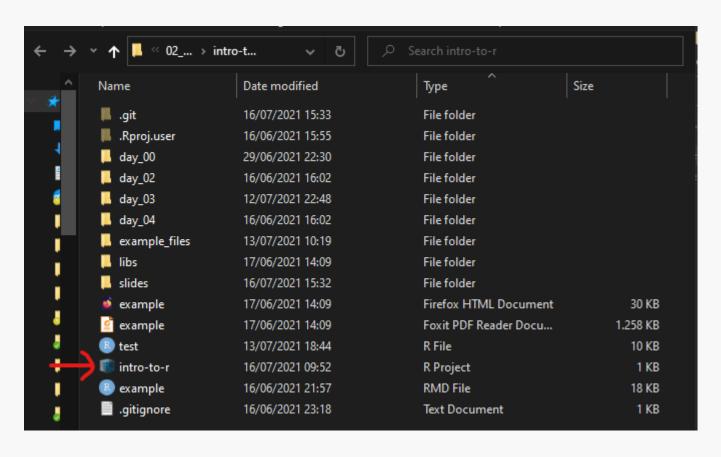
RStudio will now create and open the project for you.

### Navigate an RStudio project



### Open a project from outside RStudio

To open an RStudio project from your file explorer/finder, just double click on the .Rproj file



### Open a project inside RStudio

To open an RStudio project from RStudio, click on the project symbol on the top right of R Studio and select the project from the list.



## A tip before we get started

Learn the most important keyboard shortcuts of R Studio.

Find all shortcuts under Tools -> Keyboard Shortcuts Help

- Save active file: Ctrl/Cmd + S
- Run current line: Ctrl/Cmd + Enter
- Create new R Script: Ctrl/Cmd + N
- Undo: Ctrl/Cmd + Z
- Redo: Ctrl/Cmd + Y
- Copy/Paste: Ctrl/Cmd + C/V

## Now you

Task 1 (25 min)

Set up your own RStudio project for this workshop

Find the task description here