DATA 505: Lab 1

Getting Started with R, RStudio and Quarto

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1 Setup & Goals

Welcome to Lab 1! In this session you will:

- Learn to navigate RStudio
- Write, save, and run an R script
- See how Quarto works (our tool for mixing text and code)

Reminder: Today is about getting comfortable with the environment. Don't worry if the code examples feel very simple.

If you have not installed R, RStudio, and Quarto already, see the instructions here: Installing required software.

2 Navigating RStudio

When you open RStudio, you'll see **four panes**. The official Getting Started guide describes their purposes:

- 1. The Source pane is where you can edit and save R or Python scripts or author computational documents like Quarto and R Markdown.
- 2. The Console pane is used to write short interactive R commands.
- 3. The Environment pane displays temporary R objects as created during that R session.
- 4. The Output pane displays the plots, tables, or HTML outputs of executed code along with files saved to disk.

2.1 Exercise

- Find the **Console** (bottom-left).
- Type:

```
2 + 2
```

3 Writing scripts and running code

The Console is for quick experiments. For work you want to save and rerun, you should use a script.

3.1 Demo

- 1. Create a new script:
 - File -> New File -> R Script
 - Using the editor window, type the code in @mean-numbers
 - Save the file as data505_lab1.R
 - You have created your first R source file!

```
c(2, 4, 6, 8, 10)
numbers <- 2 * (1:5)
print(numbers)
mean(numbers)
sample_mean <- mean(numbers)</pre>
```

- 2. Now you will practice executing code in RStudio. A useful reference: "Executing Code" in the RStudio User Guide
 - Run the first line of @mean-numbers. What happens in the console?
 - Now run the next three lines one at a time. What variables are now present in the environment?
 - Next restart your R session (Session -> Restart R, or one of these keyboard shortcuts). What happened to the variables in the environment?
 - Now practice running a selection of code (multiple selected lines). Select the lines and then do Ctrl + Enter / Cmd + Enter (or click "Run" from the toolbar).
 - Finally, run the entire file using the "Source" button or Ctrl + Shift + Enter

4 Quarto demo

We will be using Quarto for lab assignments and case studies. Quarto lets us mix text (like these instructions) with code and output within a single script (a .qmd file).

Code is written in **code chunks**, which are executed when the document is **rendered**. The result is a formatted document which includes the code, the output, along with all the surrounding text.

We will get more practice with Quarto next week.

4.1 Exercise

- Download the Quarto script for Lab 1 from here: lab_1_blank.qmd
- Open it in RStudio
- Edit the script to add yourself as author
- Edit the code chunk below to print your name (use print())
- Render the script
- Submit your edited code AND the pdf output to Moodle: Link