COMPUTER LAB 1: USING RSTUDIO AND RMARKDOWN

C91AR: Advanced Statistics using R

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WHAT ARE WE GOING TO COVER IN THIS COMPUTER LAB?

- Setting up an R Project
- Creating related subdirectories
- Create an R Markdown file
- Add some content to our R Markdown file

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USING DIRECTORIES WITH R

- To reference data or media in R you need to set a working directory
- You will also be asked to set a directory for installed packages
- **DO NOT create a folder called 'R'**, as this is the default title R gives to its own namespace, which will lead to conflicts and unusual behaviour
- Good practice is to create R projects in designated project folders, and I will show you how to do this
- Creating an `.RProj` creates a project directory, avoiding any potential confusion R may experience when switching between projects

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SETTING UP R PROJECT AND DIRECTORIES

DEMO: Setting up an R Project and directories - Work in pairs with someone who has done this already at Monday's lecture. - Once we have set the RProject up this will be the **primary launch file for this course**

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WORKING WITH RMARKDOWN

- RMarkdown allow you to combine code chunks and plain text to produce reproducible scientific reports.
- RMarkdown files are edited in the *Workspace Tab* - top left window
- Create script headings using # (called a "comment" or inactive code)
- **To execute code chunks in RMarkdown click the play button**
- This can be done for single lines, or multiple lines by highlighting sections and pressing CTRL(or CMD) + Enter
- The beauty of working in RMarkdown is that you can write text summaries around your code.

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SETTING UP AN RMARKDOWN FILE

- **DEMO**: Setting up an RMarkdown file
- Remember to comment inside chunks and to keep things tidy

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ENTERING CODE INTO CODE CHUNKS

```
 1  # Using operators
 2
 3  3 + 5
 4
 5  12/7
 6
 7  # Assigning variables
 8
 9  x <- 5
10
11  7 -> x
```

ADDING FORMULA

- We wrap mathematical formula in double dollars for format it appropriately
- Wrap the following in double dollars to write the formula for simple regression

```
# Y_i = \beta_0 + \beta_1 X_i + e_i
```

WHAT'S THE DIFFERENCE BETWEEN R MARKDOWN AND R SCRIPTS

R scripts

- Purpose: Primarily used for writing and running R code.
- Format: Plain text files with .R extension.
- Execution: Code is executed line-by-line or in chunks, typically within an R environment like RStudio.
- Output: Produces console output, plots, and other results directly in the R environment.
- Usage: Ideal for scripting, data analysis, and running R code interactively.

R Markdown

- Purpose: Combines R code with narrative text to create dynamic documents.
- Format: Markdown files with .Rmd extension.
- Execution: Code chunks are embedded within markdown text and executed to produce a final document.
- Output: Generates documents in various formats (HTML, PDF, Word) that include both the code and its output (e.g., plots, tables).
- Usage: Perfect for creating reports, presentations, and reproducible research documents.

WHAT DID WE COVER TODAY

- How to create an R Project
- How to create related subdirectories
- Define and create an R Markdown file
- Run R code in our R Markdown file

REMINDER!

- **Always open the .RProj file for this class**
- Do not open any other file as a srarting point

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R MARKDOWN RESOURCES

R Markdown: The Definitive Guide

RStudio basics of R Markdown


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