

MTH208a: Worksheet 1

Introduction to R

R is a statistical coding language made for and by statisticians. We will be using R predominantly in this course as well as throughout your degree. It is thus absolutely crucial that you invest in getting familiar with the language.

To setup, you need the following:

- R downloaded from <https://cran.r-project.org/> compatible with your system
- Rstudio is **highly** recommended. RStudio is an Integrated Development Environment (IDE) for R. That means that Rstudio allows you to integrate the various features of R into one visual GUI environment.
- Latex installed on your system in order to use R Markdown (or now Quarto!). Quarto allows us to write pdf documents integrating mathematical equations, automatic code evaluations, plots!

Some Coding Practices

As we progress in this course, we want to make sure we develop good coding habits that will help us in the future

- Don't be lazy!
 - Coding languages are like any language. Every object, operation, etc is a word and you must use "space" to make it easier to read.
 - Comment your code! See `starter.R` file for how I use comments in my code. That will help the reader understand you better.
- Be organized
 - Don't save files randomly on your desktop. Make a folder for the course, and within that folder, make subfolders as appropriate.
 - Pretty soon you'll be writing long complicated codes. Think about which codes should be in which files.
 - Name files appropriately
 - Remember to push changes to GitHub when your work session is done.
- Naming objects

- Don't use `a`, `b`, `c`, etc only. Use variable names based on their utility.
- Assume that the next time you run your code, you have no idea what the code is supposed to do.
- Script vs Console
 - R has both an active console and a script.
 - The script is basically a text file that allows you to keep organize your working code. Make sure any script you write, can run in a different person's computer with a fresh R session.
 - The console is a place for you to run R code. Additionally, during the process of writing code, you can view your results as it comes along, debug your code, and keep a track of results.

Worksheet Problems

1. Write a function in R to find $n!$. Verify your answer with `factorial()` function.
2. Euler's number, e , is accessed through `exp(1)` in R. Similarly e^3 is `exp(3)`. It is well known that

$$e = \lim_{n \rightarrow \infty} \left(1 + \frac{1}{n}\right)^n$$

Write a function in R that calculates the right hand side limit for a user-given value of n .

3. Load the seating dataset:

```
seat <- read.csv("https://dvats.github.io/assets/course/mth208/seating.csv")
```

Write R code to find your assigned seat.

4. Go to the url of the `seating.csv` file and download the csv file on your computer. Using `read.csv()` function, load the locally downloaded `seating.csv` into your R session.