

# Introduction

2020

## Course Info

### Components

- Lectures
- Exercises
- Lab Exercises

### Lab Exercises Program

- Monday
  - 18-20 /Online/
  - 20-22 /Online/
- Saturday
  - 9-11 /FMI 306/
  - 11-13 /FMI 306/
  - 13-15 /FMI 306/

### How to pass

**You have to successfully pass all the 3 components !!!**

For the Lab exercises you will have:

- **Test** in week 8
- **Exam** in the session

### Syllabus

5.Oct	<b>Introduction to R</b>
12.Oct	<b>Univariate data</b>
19.Oct	<b>Bivariate data</b>
26.Oct	<b>Multivariate data</b>
2.Nov	<b>Discrete random data</b>
9.Nov	<b>Continuous random data</b>
16.Nov	<b>Law of large numbers (LLM) and central limit theorem (CLT)</b>
23.Nov	
30.Nov	<b>Confidence interval estimation</b>
7.Dec	<b>Hypothesis testing</b>
14.Dec	<b>Two-sample tests</b>
21.Dec	<b>Chi square tests</b>
04.Jan	<b>Regression analysis</b>
11.Jan	<b>Multiple linear regression</b>
18.Jan	<b>Analysis of variance</b>

## Materials

- **Book:** Verzani, [John Simple R](#)
- **Course Web Site:** [moodle](#)
- **Software:** [R](#)
- **IDE:** [R Studio](#)

## Why we learn statistics with R?

R:

- is free and open-source programming language
- runs on UNIX, Windows and Macintosh
- is widely used in academia
- is interactive /results can be seen one command at a time/
- has an excellent built-in help system
- is powerful and easy to learn
- has many built in statistical functions

## Why is it called R?

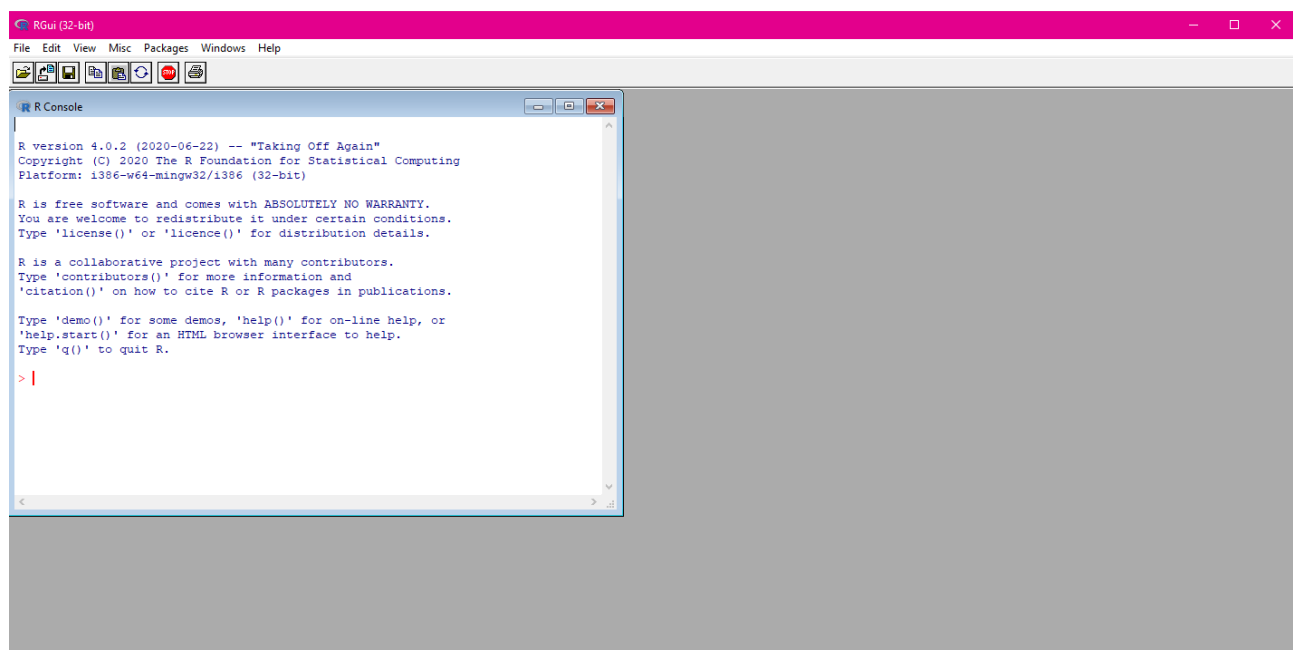
- Created in Aug 1993 by Ross Ihaka and Robert Gentleman at the University of Auckland, New Zealand
- There was a language called S created by John Chambers in 1976, at Bell Labs
- So the name R came from the first letters of the names of the creators of the language and as a play with the name of S

## R Console

You can download and install R from [here](#).

If you have any problem with the installation you can refer to: for the [Windows users](#), for the [Ubuntu users](#), for the [Mac users](#).

After the installation you must see something similar to this:



The screenshot shows the RGui (32-bit) window. The title bar is red. The menu bar includes File, Edit, View, Misc, Packages, Windows, and Help. Below the menu bar is a toolbar with icons for file operations and help. The main window is the R Console, which displays the following text:

```
R version 4.0.2 (2020-06-22) -- "Taking Off Again"
Copyright (C) 2020 The R Foundation for Statistical Computing
Platform: i386-w64-mingw32/i386 (32-bit)

R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.

R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.

> |
```

Commands are written after the prompt ">".

Shortcuts:

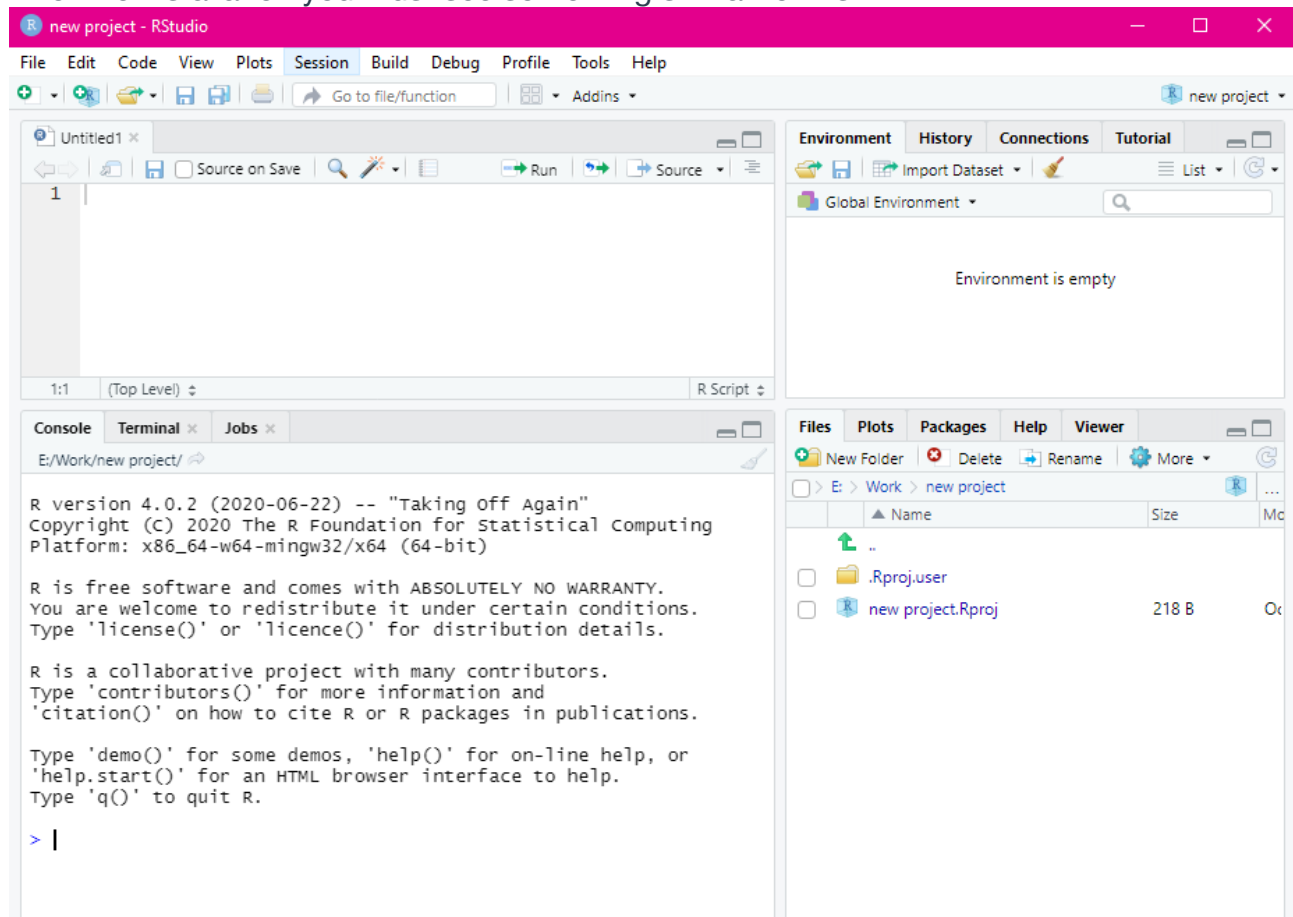
- Enter - run a command
- Up Arrow - give the previous written command
- Esc - interrupt a command

## R Studio

After installing R, you can install the free version of R Studio IDE from [here](#).

If you have any problems with the installation you can refer to : for the [Windows users](#), for the [Ubuntu users](#), for the [Mac users](#).

After the installation you must see something similar to this:



R Studio is customizable, but in the beginning the interface is separated in 4 panels in which we have:

- Upper Left panel
  - **Text editor** - here you write your code
- Lower Left panel
  - **Console** - the commands are executed here and the output is printed
- Upper Right panel
  - **Environment** - contains interactive list of loaded R objects
  - **History** - containing the executed commands
- Lower Right panel
  - **Files** - shows the files in your working directory
  - **Plots** - output location for plots
  - **Packages** - list of installed packages

- **Help** - output location for help commands and help search window

## Shortcuts

- Ctrl + Enter - Run current line
- Ctrl + Shift + S - Run an entire file of code
- Ctrl + Z - Undo
- Ctrl + Shift + Z - Redo
- Ctrl + D - Delete Line
- Ctrl + 1 - Moves the cursor to the text editor area
- Ctrl + 2 - Moves the cursor to the console area
- Alt + Shift + K - Shows keyboard shortcut reference
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