Lesson 03 - Getting Started with R

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Introduction

- In this lesson you will learn the basics of how R works as a programming language.

Student Learning Objectives

After completing this lesson students will be able to:

- assign values as objects.
- perform simple mathematical operations in R.
- Identify and provide an example of the three primary object types.
- Identify and provide an example of the two primary data structures.
- Create and manipulate vectors

Interacting with R

The basis of programming is that we write down instructions for the computer to follow, and then we tell the computer to follow those instructions. We write, or *code*, instructions in R because it is a common language that both the computer and we can understand. We call the instructions *commands* and we tell the computer to follow the instructions by *executing* (also called *running*) those commands.

There are two main ways of interacting with R: by using the console or by using script files (plain text files that contain your code).

> When you start R Studio for the very first time, the console will take up the entire left hand side of the window. Go to File –> New File –> R Script to open a new R script window.

The console pane (in RStudio, the bottom left panel) is the place where commands written in the R language can be typed and executed immediately by the computer. It is also where the results will be shown for commands that have been executed. You can type commands directly into the console and press `Enter` to execute those commands, but they will be forgotten when you close the session.

You try it

In the console type the following code, and hit `Enter`.

```
2+2
```

You can do basic aritmetic this way. R is basically an overgrown calculator. Try a more complicated equation next.

You try it

Don't copy paste, type this code directly into the console.

```
2 + 5*(8^3)- 3*log10)
```

Uh oh, we got an

Error

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Because we want our code and workflow to be reproducible, and often your code may span several lines at a time, it is better to type the commands we want in the script editor, and save the script. This way, there is a complete record of what we did, and anyone (including our future selves!) can easily replicate the results on their computer. Let's try that equation again.

You try it

Again, don't copy paste, type this code directly into the console.

```
2 + 5*(8^3)- 3*log(10
```

Notice the console shows a `+` prompt. This means that you haven't finished entering a complete command. This is because you have not 'closed' a parenthesis or quotation, i.e. you don't have the same number of left-parentheses as right-parentheses, or the same number of opening and closing quotation marks. When this happens, and you thought you finished typing your command, click inside the console window and press `Esc`; this will cancel the incomplete command and return you to the `>` prompt.

You try it

One more time, with corrected code, but type this into your script editor (top left window) and then hit `Ctrl` + `Enter`

```
2 + 5*(8^3)- 3*log(10)
```
