Exercise 1: Getting started with R and RStudio

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The *RStudio IDE Cheat Sheet* may be helpful.

Getting started

- Create a new project for use during this course. Create it either in a new directory or in an existing directory.
- Create a new R script file. Write a comment in top of the file stating that this is the first R script for the course. Comments start with `#` in R. Save the file in the project directory. Note the Files pane.
- Find Project Options in the menu. It is recommended to turn of saving and restoring the workspace.
- Open the Preferences. Try to reorganize the pane layout. You can also change the appearance if you like.

Code and variables

- Turn to the console. What is the *working directory*? Change it to the project directory if needed.
- In the console, assign the value 1 to a variable with name `x`. In R, `<-` and well as `=` work as assignment operators. Note the Environment pane.
- Write `x` in the console.
- Remove the variable `x` from the workspace (aka global environment) using the Environment pane. This could also have been done by calling `rm(x)` in the console.
- Turn to your R script (that doesn't contain any code at this point). Insert the following code:

```
x <- 1
x
```

- Then run it. This can be done line-by-line or as a selected region using either the menu, buttons or via keyboard shortcuts. It can also be done by "sourcing" the entire script using the source button. What's the difference?

Triangular numbers

You are 11 persons attending the course. Let's compute how many handshakes you need in total so that everybody says hello to everybody once. Well, the first person says hello to 10 others, the second to 9 others and so on, so the number is

$$T_{11} = 10 + 9 + \ldots + 1$$

- Write R code to compute this number in at least two different ways. One way should use a for-loop. What is T_{111}?
- Insert a breakpoint inside the for-loop (the Debug menu). Source the code and step through the loop using the debugger's navigation tools.
- Remove the breakpoint and insert the code `if(i == 5 && NA) break` into the loop (supposing that the counter index variable is `i`). What happens when you source the code?
- Open the Preferences and deselect the "Use debug only ...". Source the buggy code again.