**First R practice**

For the first part, just use the Console to interact with R. A few pointers:

* Whenever you see > you are good to go, when you see + instead, your previous command is not yet complete (for example because you missed a bracket). Either complete it or press Esc to start again.
* To get back to a command you just typed, press the Up arrow. You can also start typing the first few letters of your command and then press Ctrl + Up to get a list of all your previous commands with that start.
* To get the autocomplete menu with all options starting with what you have typed, press Tab.

1. **R as a calculator**

You can type simple calculations into the Console. Just type what you want R to calculate, press Enter, and you will get your result. If you are not sure how to type mathematical operators, have a look at the *Notes on required maths concepts* on learn.gold. You can spend a few minutes trying that out, then answer the following questions using that calculator:

* What is the product of all numbers from 1 to 5? \_\_\_\_\_
* What share of 2019 is over, in %? \_\_\_\_\_

Usually you will want to use more than one number, for example all your measurements on a variable. That is then called a vector, which needs to be constructed with the c() function. Use c(1,2,3,4,5) *inside* the sum() and mean() functions to:

* Calculate the sum of numbers from 1 to 5: \_\_\_\_\_
* Calculate the mean (average) of these numbers: \_\_\_\_\_

1. **Objects in R**

In R (as in most programming languages) objects are the things that you store data in – anything from a scalar to a large dataframe. To assign either a single value or a vector to an object, just type

variable\_name <- variable\_value

* Save the vector of numbers from 1 to 5 into the object x   
  (remember the Up key to save on typing the same thing again).
* Type x into the Console to get the values printed.
* Calculate the sum of x.
* Often, we will need to filter data based on logical comparisons. For that, whole vectors can be compared to a single value with various comparison criteria. Try to understand what the following do:
  + x > 3 and x < 3
  + x == 3 (note the double ==; a single = here   
    would be equivalent to <- and overwrite the variable)
  + 3 %in% x
  + What does an ! around the expression do? E.g., !(x < 3)
* Save your name into an object my\_name. Note that words that are values (i.e. not variable names or function names) need to be written in quotation marks. For example:  
  today <- “Thursday”
* Then get R to say hello, by using the paste() function with my\_name. You can adjust the following example: paste(“Today is “, today)

1. **Working with RMarkdown documents**

Typing directly into the console is great if you have something very simple to do or just want to try out a command. Otherwise, it is better to use a document that you can save and rerun. We will usually use .Rmd files. Download the “Week 1 Class.Rmd” file from learn.gold and open it in RStudio (File -> Open File).

These files contain **blocks of R code** and **blocks of text** that help to describe the analyses. Blocks of code start with ``` {r} and end with ```, and are highlighted in grey, while blocks of text are everything in between. As long as you edit the code, it is not automatically executed. For that you need to click on Run (or press Ctrl + Enter to run the current line or the ones you have selected). The output will then be shown right under the block of code (so it is a good idea to keep each block quite short and focused on one step of your analysis).

In the text outside the code, you can use Markdown formatting instructions so that you can produce a nice report afterwards – for now, only two things are relevant:

**Headings**

# Level 1 (main heading)

## Level 2 (sub-heading) and so on.

*(Note: there needs to be a space between # and your title)*

**Text highlights**

\*This would be italics\* -> use single \* to make a section of text *italicised*

\*\*This would be bold\*\* -> use double \*\* to make a section of text **bolded**

You can check the RMarkdown cheatsheet in the Reference Material section on learn.gold for further options.

Now have a look through the “W1 Class.Rmd” document and continue with the instructions there.