

# Political Analysis Using R

## R Basics

Hilary 2016

Authors: Roosmarijn de Geus, Niels Goet, and Julia de Romémont

## 1. Welcome!

Welcome to the first R lab session! Over the course of four sessions we will move from basic data manipulation to descriptive statistics, to bivariate and multivariate regression analysis. All with the aim to provide you with the skills to conduct your own data analysis! The lab sheets provide you with exercises to complete during the lab session, the homework assignments, but also handy background information such as the most important commands used and links to online tutorials.

### How to log into the lab-computers

Login: q-step-[number of your computer]

Password: q-step-[number of your computer]

You should always use two digits, e.g. for computer number 1, use 01, for computer number 12, 12.

### Some basic information

- A script is a text file in which you write your commands (code)
- Remember to save your script or send it to yourself at the end of the lab session so you can use it at home
- If you put the # character in front of a line of text this line will not be executed; this is useful to add comments to your script
- R is case sensitive
- To send code from the script to the console, select the line of code in your script and click on **Run**, or select the line and hit **ctrl + enter** (**cmd + enter** on Mac)
- Access help files for R functions by preceding the name of the function with ? (e.g., `?table`)
- By pressing the **up** key, you can go back to the commands you have used before
- Press the **tab** key to auto-complete variable names and commands

## 2. Practicing in R

The main aim of this first lab-session is to familiarize yourself with R. Luckily, R has some very useful in-built tutorials that we can use for this. So, let's get started!

- First, open a new “R Script”:

```
File --> NewFile --> RScript
```

We will now install a so-called ‘package’ - a program that fulfills a specific function. For instance, the package “`ggplot`” contains functions to create a variety of graphs and figures, the package “`maps`” contains functions to create maps. We will now install and use the “`swirl`” package, which contains in-built, interactive R

tutorials. In these tutorials, you will be asked questions in the console by the computer (in red). Note that, when doing your own programming in R, it will not tell you what to do and which commands to use. Therefore, we recommend everytime you encounter a new command in the following exercise to write it down in your R-script.

- To run your code, highlight the text you typed in the script and click `run`. Alternatively, place your cursor before the line and press `ctrl` and `enter`
- If you want to install a new package in R you always need to first install the package and then open the package with the `library()` function

```
install.packages("swirl") #installs the swirl package on your computer/laptop  
library(swirl) #loads the package
```

- The next line tells R to download the basic R Programming Course
- The final step `swirl()` prompts the Swirl package into action

```
install_from_swirl("R Programming", mirror = "bitbucket") #installs the specific course  
swirl() #starts up swirl and allows you to select from installed courses
```

- You will now be prompted by the Swirl package in the console to enter your name and select a course. Now use the R Programming lessons to practice using R; we suggest having a go at the following lessons:

```
1. Basic Building Blocks  
4. Vectors  
7. Matrices and Data Frames  
12. Looking at Data  
15. Basic Graphics
```

### 3. Homework

- First, your main homework for this week is to download and install R and RStudio on your home computer or laptop
- Second, we recommend you install Swirl and the R Programming Package (see above) so you can practice some tutorials at home
- Just to check you have the basics down, please submit your R-code for the following exercises to your lab tutor by noon on the Friday of week 3:

```
1. Create a vector called x that contains the numbers 1 to 50  
2. Create a logical vector y that takes the value TRUE if x is smaller than 25  
3. Create a character vector "my_name" - that contains the words:  
My name is [yourname]  
4. How do you display all variable names for the in-built data-set cars?  
5. Create a data frame with a sequence from 1 to 12 of 3 by 4.  
Name the rows as follows: Conservative; Labour; LibDem  
Name columns as follows: Party; Leader Name; Leader Resigned; Voteshare; Number of MPs  
#Hint: create the separate row and column vectors first and then use the  
#data.frame()-command
```

## Main Commands Used in This Lab

```
#The <- sign to assign values to a vector  
#ls()  
#my var <- c(1,2,3,4)  
#dim(), length(), class(), summary()  
#data.frame() or matrix()  
#head(), tail() and str()  
#the $ is used to refer to variables within a dataframe,  
 #(e.g. my data$var1, plants$plantname)
```

### 4. Online material

You can access the powerpoint slides via the Politics Weblearn portal

Additionally, there are a lot of helpful websites that provide assistance with R:

- <https://www.rstudio.com/resources/training/online-learning/#R>
- <https://www.coursera.org/course/rprog>
- <https://www.r-project.org/mail.html>
- <http://www.statmethods.net>
- <http://stackoverflow.com>