

  	Set up R, R Studio and Swirl. Dr. Martín Lozano <martin.lozano@udem.edu> This version: July 20, 2019.
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The interest in the freely available statistical programming language and software environment R is soaring. R dominates other (commercial) software for statistical computing in most fields of research in applied statistics and data science. The benefits of it being freely available, open source and having a large and constantly growing community of users that contribute to CRAN render R more and more appealing for empirical economics, econometrics, finance applications, marketing, data science, machine learning, data mining, artificial intelligence among others fields.

The objective of this document is twofold. First, show the very basic instructions to download and install R and R Studio. Second, show the very basic instructions to install Swirl. The difference between R and R Studio is that R is the main program whereas R Studio represents the open-source integrated development environment to develop code in R. In other words, R Studio is the user interface and the main program is R, so you need to download and install both, but you will only need to open R Studio to work with R. In practical terms, you will spend your time programming directly in R Studio and internally your computer will call R to do all calculations.

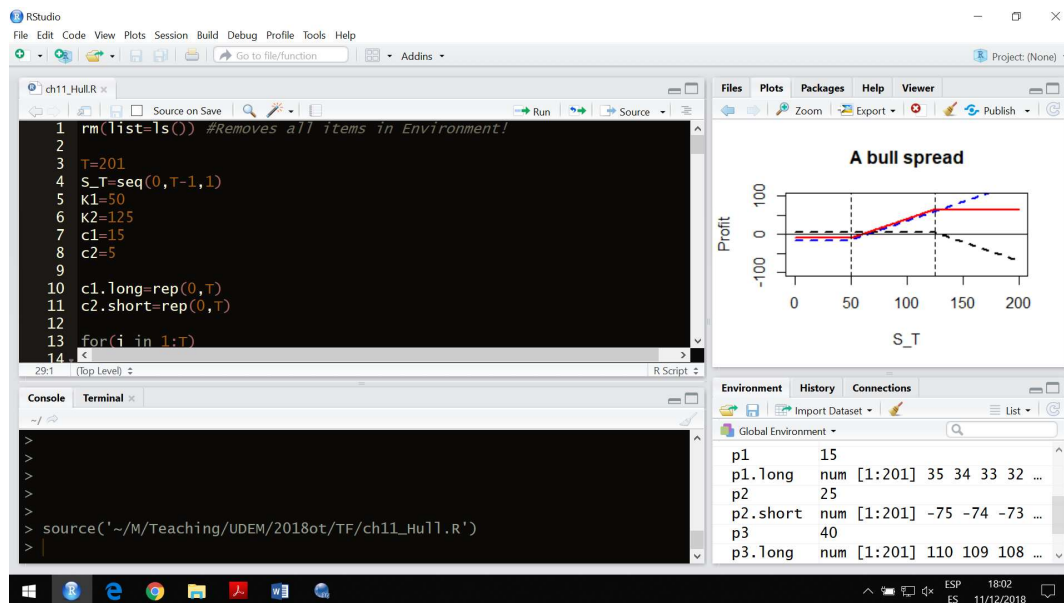
<https://www.r-project.org/>

<https://www.rstudio.com/>

The following YouTube link show how to download and install R and R Studio in a PC: <https://youtu.be/9-RrkJQQYqY> and this link explains how to do the same for MAC: https://youtu.be/GLLZhC_5enQ If you find better videos that explains how to do this please share them with me to include them in future versions of this document.

A striking advantage of using R in econometrics and financial analysis is that it enables students, researchers and practitioners to explicitly document their analysis step-by-step such that it is easy to update and to expand. This allows us to re-use code for similar applications with different data allowing for reproducibility, which is very convenient when conducting research and empirical applications in general as this feature makes it straightforward for others to comprehend and validate results. The course syllabus elaborates more on this discussion.

My R Studio looks like this:



The upper left panel is where you will spend most of your time typing and editing your code or script. The upper left panel shows the first 13 lines of a script named "ch11_Hull.R". Every line you write can be saved, edited, and run it at any time by selecting specific code lines and click "Run" or simply by clicking "Source" at the top of this upper left panel to run the entire script. Then, you can write instructions after instructions (line after line) in the upper left panel and they will not execute until you select the lines and click "Run" or "Source" to run the entire script.

The lower left panel is a console in which you can reproduce instructions immediately as soon as you type enter, just like a calculator. For example, if you type 2+2 and then click enter in this lower left panel you will get immediately a 4. The console also shows the numerical result of running the script located in the upper left panel.

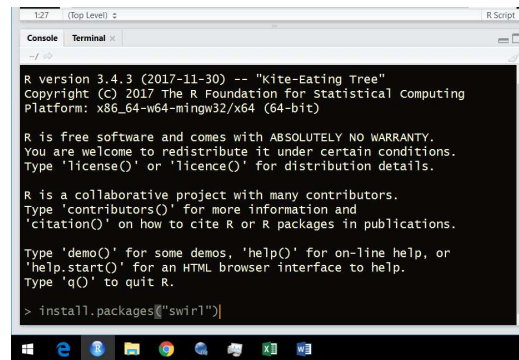
The upper right panel reproduces plots and help you to manage files when necessary. The lower right panel lets you see some variables values and other things. Normally, most of the fun happens in the upper and lower left panels.

You can earn one sticker if you show me and explain to the class the way you can reproduce the plot in the upper right panel. You already have the first 13 lines necessary to complete the plot so your task is to complete the rest of the code to reproduce the exact figure that represents the profits of a bull spread. The plot has to be fully correct and identical to mine. The deadline is the last day of class and this offer is limited to the first 2 students enrolled in this course who manage to do it correctly.

One of the best ways to start learning how to code in R is by using Swirl. Before setting up Swirl, you need to download and install R and R studio in your computer. According to swirl website, swirl teaches you R programming and data science interactively, at your own pace, and right in the R console. This is why I suggest my students to take as many Swirl lessons as they need, depending on your own interests and time availability. If you are concern about not knowing R, if you consider learning R is very difficult, or even if you are interested to learn more about R, then Swirl is a very good starting point and a very good alternative.

Follow these steps to set up Swirl. Please note that you can find further details in the Swirl website <http://swirlstats.com/>

1. Open R studio and make sure you have Internet access.
2. Type `install.packages("swirl")` in the console and hit enter. Now wait for installation. This has to be done only one time.



```
R version 3.4.3 (2017-11-30) -- "Kite-Eating Tree"
Copyright (C) 2017 The R Foundation for Statistical Computing
Platform: x86_64-w64-mingw32/x64 (64-bit)

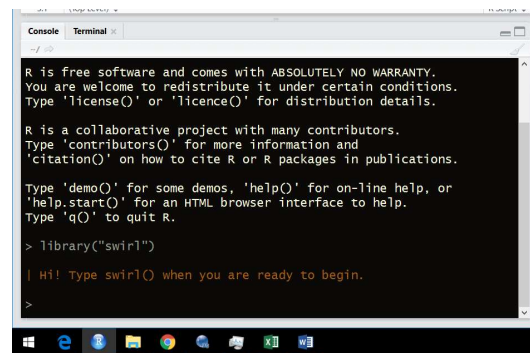
R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.

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.

> install.packages("swirl")
```

3. Once installation is complete, type `library("swirl")` in the console and hit enter.



```
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'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.

> library("swirl")

| Hi! Type swirl() when you are ready to begin.

>
```

4. Type `install_course("R Programming")` in the console and hit enter. This will install the course in your computer and you will have it available to complete it.
5. You can install more courses. For example, type `install_course("Regression Models")` in the console and hit enter.
6. You can install more courses about different topics if you want. For instance, `install_course("Exploratory Data Analysis")`. There are many more courses available, see the swirl webpage for further details. You are free to install and take as many courses as you like or need.
7. Type `swirl()` to start. After asking for your name, you will be asked to choose a course. Probably the most important are "R Programming", and "Regression Models".
8. Remember you are free to take as many courses as you can, you will surely need them for this course.
9. At the end of the course syllabus you can find some useful R references.

Contact me if you have difficulties with this.

Regards.

Martín.