

ASSIGNMENT 01 – R, RStudio Installation

2015-01-11

Due before class: 2015-01-18 (one week)

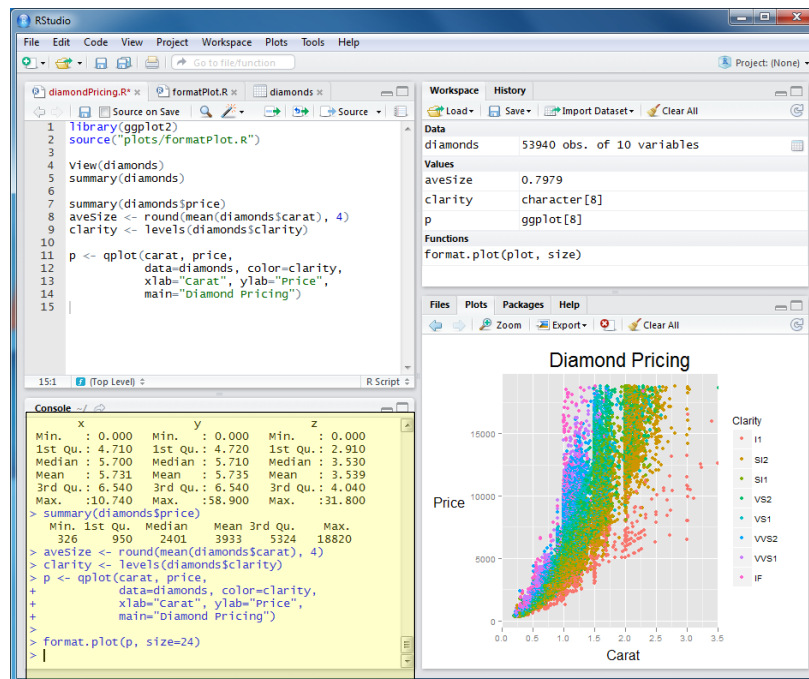
Install R

1. Go to <https://www.r-project.org/>
2. Click on CRAN or download R
3. Select a web location near you (I like UTK)
4. Click on your operating system.
5. Follow instructions for installing R for the first time.

Install RStudio

1. Go to <https://www.rstudio.com/>
2. Click on Download RStudio
3. Click on Desktop
4. Click DOWNLOAD RSTUDIO DESKTOP (Free)
5. Click on the version for your operating system to download the installation file.
6. Run the installation file.
7. Once 1 – 6 are succesful, run RStudio.

Your initial run of RStudio will be more plain, but below is a sample screen shot:



The program area in yellow in the lower left of the screen (you will probably only have a window on the left) is the “console”. It is where you type in R commands and where results (except for plots) are

displayed. Plots appear in the lower right window as shown above.

Make a screen shot of your RStudio window and include it in your report. Details on how to create screen shots can be found at:

Mac OS X: <https://support.apple.com/en-us/HT201361>

Windows: <http://windows.microsoft.com/en-us/windows/take-screen-capture-print-screen#take-screen-capture-print-screen=windows-8>

Try It

Type the following commands in the console window. Include in your report the results.

```
> 1+1  
> 6*3  
> 5/7  
> dir()  
> getwd()
```

Create Working Directories

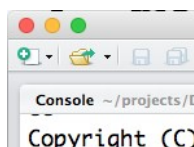
We will talk more about this in class, but you will need a place to put the R programs (called scripts) and results you generate. For now, just do the following:

1. On your desktop create a folder called “ISC4244C”
2. Inside of this folder create another called “Lab_01”
3. Click on the RStudio window and from the menu select the RStudio Preferences (at least that is what it is called on the Mac).
4. Under the general program preferences, use the Browse function to select the “Lab_01” directory as your “Default working directory”. This is where your scripts will be saved and from which they will be run (for now).
5. Close and restart RStudio (this is so the above change will take effect).

Create an R Script I

You can use R interactively as you did in the “Try It” section, but to fully realize its power, you have to use “scripts”. These are lists of R commands that you could have typed in at the console. However, these are saved to a file. This means you can collect, edit, and debug (fix) larger sets of commands than you would want to type in directly, and you can run them over and over. We start with a simple script. Note that all of the above should have been done successfully so the script will be saved and run from the Lab_01 directory.

1. Open a script window either with the File|New File|R Script menu option or the icon in the RStudio window. On the Mac it is the icon with the “+” (the other lets you open an existing script):



2. Type the following into the script window

```
# print some strings
print("Hello, Professor")
print("my name is...")
print(your_name_between_quotation_marks)
```
3. Save the script to a file named "hello.R" in the Lab_01 directory.
4. To execute or run the script, go to the console and type:

```
> source("hello.R")
```

You could also use the "Source" button at the top, right of the edit window.
5. What are the results? Include this in your report.

Create an R Script II

Again,

1. Create a new script containing...

```
# compute the ratio of two numbers
x = 3+5
y = 2*5
z = x/y

# output the results
print("z=x/y=")
print(z)
```
2. Save the script as "ratio.R".
3. Run it.
4. Discuss your results in your report.

Make a Simple Plot

1. Create a third script...

```
# Generate two vectors and plot them
x = c(1,2,3,4,5)
y = c(13,-5,7,2,1)
plot(x,y,type="l")
```
2. Save it as "plot.R" and run it.
3. Export the plot (it should appear in the lower right subwindow) using the "Export" button. Note that you can then include such saved plots in your report.

Write a Report

Your report for this project should include an introduction stating the purpose of the exercise followed by a description of what you did and the results as indicated above. This should include program output (that can be cut-and-pasted from the RStudio console) and any plots. For this assignment, you need not

turn in any scripts.

Reports should be Clear, Correct, and Concise. That is, explain clearly what you did and what results you got, but don't go on and on about it.

You may create your report with whatever software you wish, e.g., Microsoft Office, OpenOffice, LaTeX, etc.). **HOWEVER, YOU MUST SUBMIT REPORTS ONLY AS .PDF FORMAT FILES.** Your program will have an option for saving your report as a .pdf files.

We will discuss later how to package multiple files, including scripts, for submission.

Nota bene (from Latin meaning "to note well"): Documents (presentations, .pdf files, etc.) will occasionally use typographic quotes, "”, because that is simply the default for my word processor. However, R only understands straight quotes, "" . This could be a problem if you try to cut and paste something from a document into R. Otherwise, you can only type straight (ASCII) quotes in R.