Department of Computer Technology and Information Systems

CTIS 365: Applied Data Analysis

Fall 2019-2020

Lab Guide #1 – Week 02

OBJECTIVE: Vectors, Matrices, Data Frames
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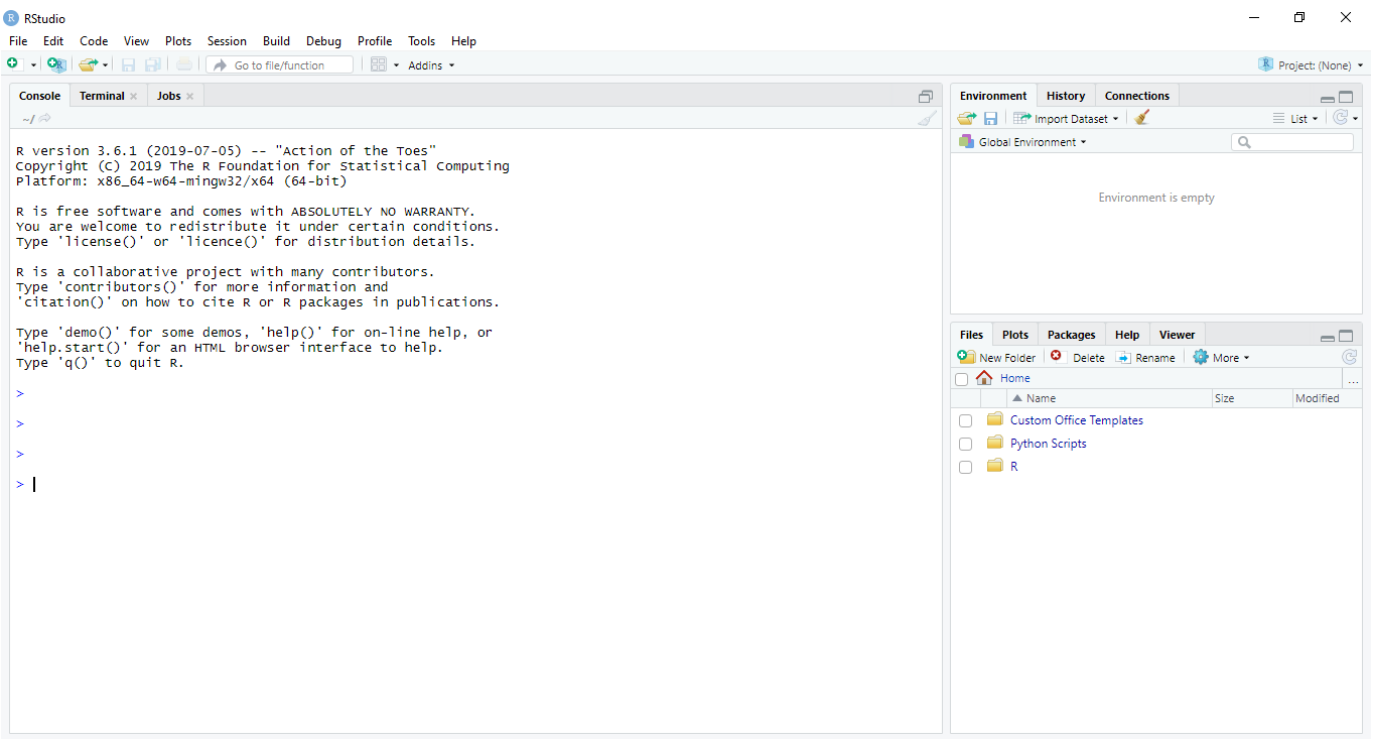
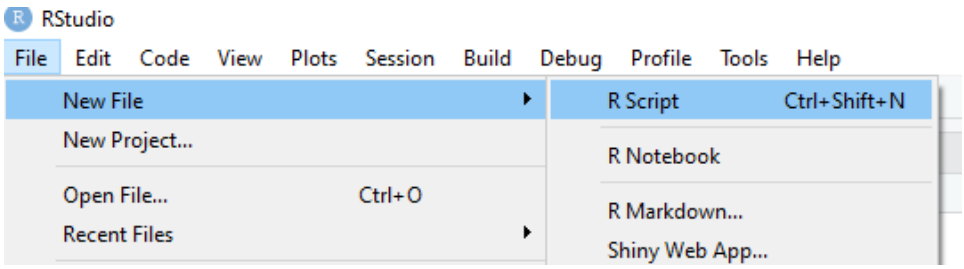
1.

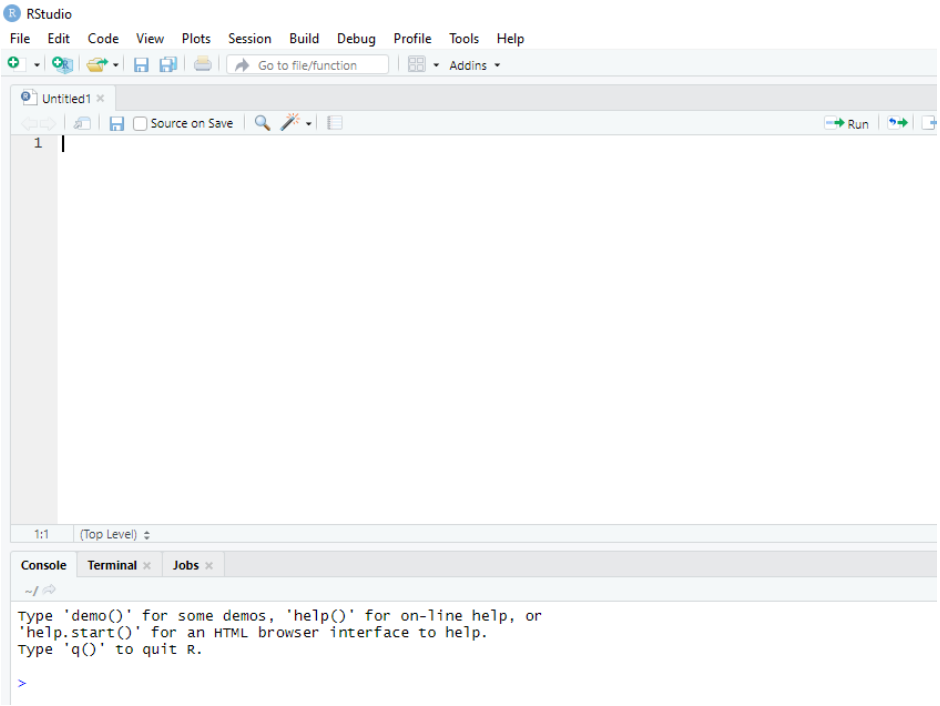


Once you have installed Rstudio and ran it, you will see a page like the one above. Here you required to create a new RScript and to do this, you have 2 options;

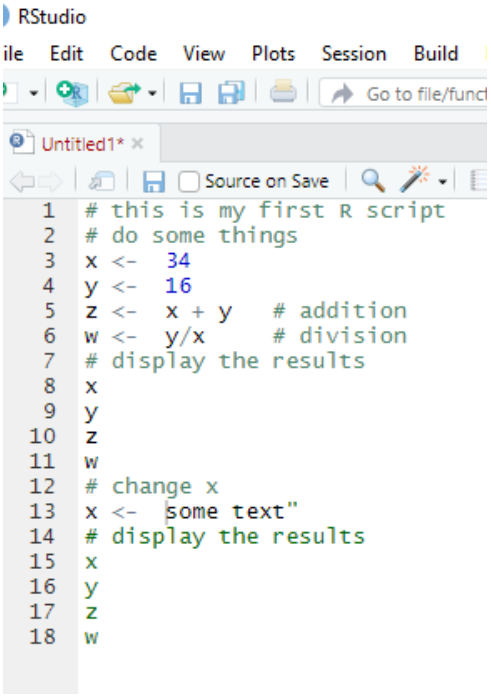
You can open a new empty script by clicking the **New File** icon "  " in the upper left of the main RStudio toolbar. This icon looks like a white square with a white plus sign in a green circle. Clicking the icon opens the **New File Menu**. Click the **R Script** menu option and the script editor will open with an empty script or you can select File > New File > R Script, as shown to the below.



Both methods will bring the same untitled empty R Script as shown below. R Script is a series of commands that you can execute line by line or at one time and you can save lot of time. Script is just a plain text file with R commands in it. If you have a long analysis, and you want to be able to recreate it later, a good idea is to type it into a script.



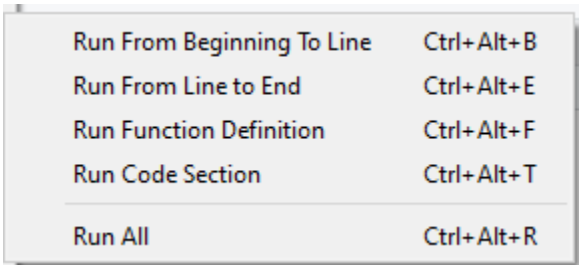
Once you open your R Script, you can start writing your code. Here is a simple example to familiarize you with the Script Editor interface. Type the following code as your new script.



You can run the code in your R script easily. The **Run** button in the Script Editor Panel toolbar will run either the current line of code or any block of selected code.

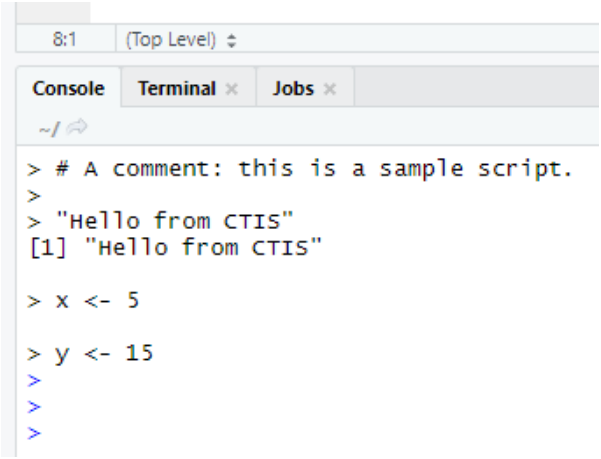
Place the cursor anywhere in line 3 of your script [x <- 34]. Now press the **Run** button in the Script Editor panel toolbar. Three things happen: 1) the code is transferred to the command console, 2) the code is executed, and 3) the cursor moves to the next line in your script. Press the **Run** button three more times. RStudio executes lines 4, 5, and 6 of your script.

Now you will run a set of code commands all at once. Highlight lines 8, 9, 10, and 11 in the script and press the **CTRL + Enter**. Also you can see other shortcuts at below.



When the code is executed the script has created the variables "x" and "y" in your workspace (and has erased any old objects you had by that name). However “Hello from CTIS” is not saved under a variable because we did not assign any variable to it.
You can see them with the ls( ) function.

If your code runs properly you are going to see the results on the console as shown below.



2. Read 2 exam grades from 2 different text files (grd1.txt and grd2.txt) and find their differences. Finally specify the ones that is below zero.

3. By using the grade vectors in the first question, create a matrix and add the difference of the grades as a new column to the matrix.

4. **Scenario:** In a weekly tournament your team and opponents teams scores is given in two text files (myTeam.txt and opponentTeam.txt) Read the scores as vectors and store the point your team gains in a vector form. Considering the following rule:
   If you win, you get 3 point,
   If there is a tie, you get 1 point,
   If you lose, you do not get any points.
   Task: Find the total points of your team.

Package Installation

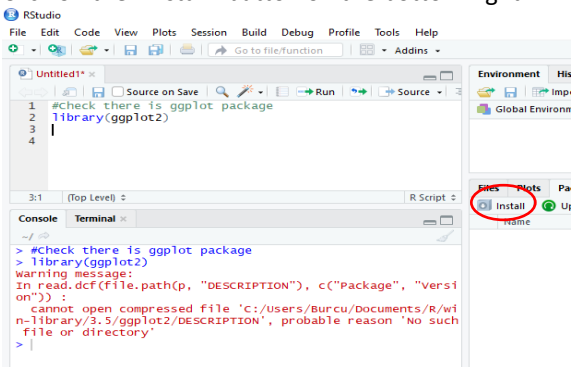
First check whether you have the package or not installed. If you have this package then R will not give any error.

If you do not have this package installed, R will give an error similar to the below given screenshot. (Assume ggplot2 package is required)

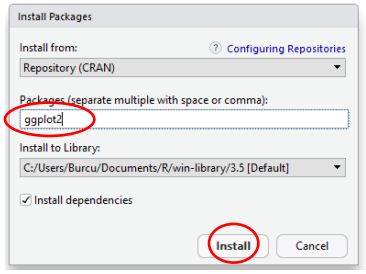
```
> #Check there is ggplot package
> library(ggplot2)
Error in library(ggplot2) : there is no package called 'ggplot2'
```

To download a package there are 2 different methods:

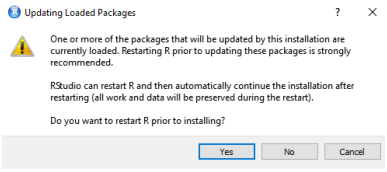
a) • Click on the "Install" button on the bottom right



- Write the package name to the screen that will appear and click the install button.



- Click "Yes"



- And installation will start.

```
> install.packages("ggplot2")
Installing package into 'C:/Users/Burcu/Documents/R/win-library/3.5'
(as 'lib' is unspecified)
trying URL 'https://cran.rstudio.com/bin/windows/contrib/3.5/ggplot2_3.0.0.zip
Content type 'application/zip' length 3579999 bytes (3.4 MB)
downloaded 3.4 MB

package 'ggplot2' successfully unpacked and MD5 sums checked

The downloaded binary packages are in
        C:\Users\Burcu\AppData\Local\Temp\Rtmpwbc9dS\downloaded_packages
```

b) Second approach to download a package:

You can just write install.packages("package name") to the console and when you execute the code, the installation will start. While using the above approach, when you select the package you want to install, RStudio will automatically write install.packages("package name")to the console and will execute it.