Assignment 1

1. Introduction - R is a programming language and software environment for statistical analysis, graphics representation and reporting. R was created by Ross Ihaka and Robert Gentleman at the University of Auckland, New Zealand, and is currently developed by the R Development Core Team. The core of R is an interpreted computer language which allows branching and looping as well as modular programming using functions. R is a well-developed, simple and effective programming language which includes conditionals, loops, user defined recursive functions and input and output facilities.
   - R has an effective data handling and storage facility,
   - R provides a suite of operators for calculations on arrays, lists, vectors and matrices.
   - R provides a large, coherent and integrated collection of tools for data analysis.
   - R provides graphical facilities for data analysis and display either directly at the computer or printing at the papers.

2. **Objective** - In this assignment we want to show how to install R and R studio. Which file we should download according to the OS ? What are the essential packages we need to run R studio ?

3. **Prerequisites** - R 3.3.3 binary for Mac OS X 10.9 (Mavericks) and higher, signed package. Contains R 3.3.3 framework, R.app GUI 1.69 in 64-bit for Intel Macs, Tcl/Tk 8.6.0 X11 libraries and Texinfo 5.2. The latter two components are optional and can be omitted when choosing "custom install", It is only needed if you want to use the tcltk R package or build package documentation from sources.

4. **Associated Data Files** - For R its it's R-3.3.3.pkg and for R studio it is RStudio version for Mac OS X. It'll say something like RStudio 1.0.136 - Mac OS X 10.6+ (64-bit).

5. **Problem Statement** - We need to make sure we download suitable file according to the operating system and bit size of the machine. And after installation we need to make sure we have all the necessary packages installed in R studio.

6. **Expected Output** - R prompt should open smoothly. We can try couple of commands to find out that.

7. **Approximate Time to Complete Task** - Not more than 30 minutes to download and install R/ Rstudio.

Installation Process

Get R

- Go to https://cran.rstudio.com/bin/macosx/
- If you're on a recent version of OS X, download the first .pkg link. As of this post, it's R-3.3.3.pkg and the direct URL is https://cran.rstudio.com/bin/macosx/R-3.3.3.pkg. (Image - 1)
- Install the package by double-clicking on it and working through the prompts.

R for Mac OS X

This directory contains binaries for a base distribution and packages to run on Mac OS X (release 10.6 and above). Mac OS 8.6 to 9.2 (and Mac OS X 10.1) are no longer supported but you can find the last supported release of R for these systems (which is R 1.7.1) here. Releases for old Mac OS X systems (through Mac OS X 10.5) and PowerPC Macs can be found in the old directory.

Note: CRAN does not have Mac OS X systems and cannot check these binaries for viruses. Although we take precautions when assembling binaries, please use the normal precautions with downloaded executables.

As of 2016/03/01 package binaries for R versions older than 2.12.0 are only available from the CRAN archive so users of such versions should adjust the CRAN mirror setting accordingly.

R 3.3.3 "Another Canoe" released on 2017/03/07

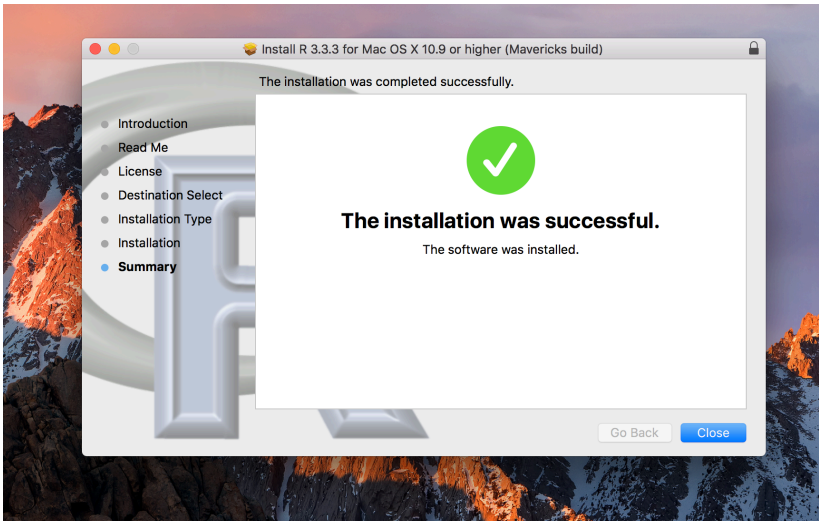
Please check the MD5 checksum of the downloaded image to ensure that it has not been tampered with or corrupted during the mirroring process. For example type
`md5 R-3.3.3.pkg`
in the *Terminal* application to print the MD5 checksum for the R-3.3.3.pkg image. On Mac OS X 10.7 and later you can also validate the signature using
`pkgutil --check-signature R-3.3.3.pkg`

Files:

R-3.3.3.pkg MD5-hash: 893ba010f303e666e19f86e4800f1fbf SHA1-hash: 5ae71b000b15805f95f38c08c45972d51ce3d027 (ca. 71MB)	**R 3.3.3** binary for Mac OS X 10.9 (Mavericks) and higher, signed package. Contains R 3.3.3 framework, R.app GUI 1.69 in 64-bit for Intel Macs, Tcl/Tk 8.6.0 X11 libraries and Texinfo 5.2. The latter two components are optional and can be ommitted when choosing "custom install", it is only needed if you want to use the `tcltk` R package or build package documentation from sources. Note: the use of X11 (including `tcltk`) requires XQuartz to be installed since it is no longer part of OS X. Always re-install XQuartz when upgrading your OS X to a new major version.
R-3.2.1-snowleopard.pkg MD5-hash: 58fe9d01314d9cb75ff80ccfb914fd65 SHA1-hash: be6e91db12bac22a324f0cb51c7efa9063ece0d0 (ca. 68MB)	**R 3.2.1** legacy binary for Mac OS X 10.6 (Snow Leopard) - 10.8 (Mountain Lion), signed package. Contains R 3.2.1 framework, R.app GUI 1.66 in 64-bit for Intel Macs. This package contains the R framework, 64-bit GUI (R.app), Tcl/Tk 8.6.0 X11 libraries and Texinfo 5.2. GNU Fortran is **NOT** included (needed if you want to compile packages from sources that contain FORTRAN code) please see the tools directory. NOTE: the binary support for OS X before Mavericks is being phased out, we do not expect further releases!
Mac-GUI-1.68.tar.gz MD5-hash: f0026d182efc3bfb342a8bb99bb6f9ee	Sources for the R.app GUI 1.68 for Mac OS X. This file is only needed if you want to join the development of the GUI, it is not intended for regular users. Read the INSTALL file for further instructions.
NEWS (for Mac GUI)	News features and changes in the R.app Mac GUI

(image - 1)

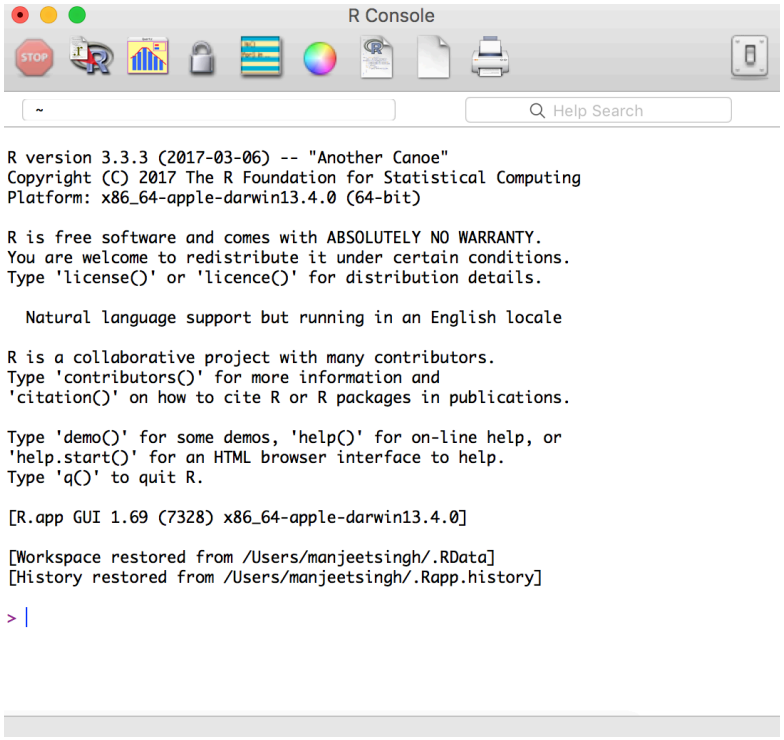
After downloading, Install R by double clicking on the file. Image-2 is showing the successful installation of R.



(Image -2)

Verify R itself is working-

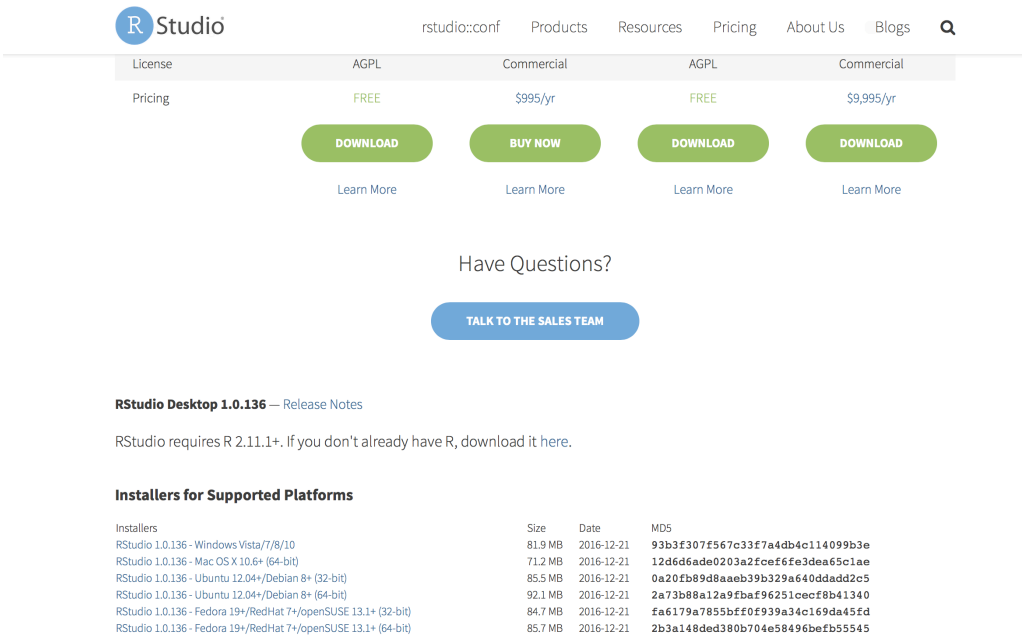
- Look in the Applications folder for the R application.
- Double-click it and you should see an R console window. (Image -3)
- If that did not work, try installing R again
- Once you've verified R is working, quit the app



(image - 3)

Download RStudio - RStudio is an integrated development environment for R that will make your life and coding easier.

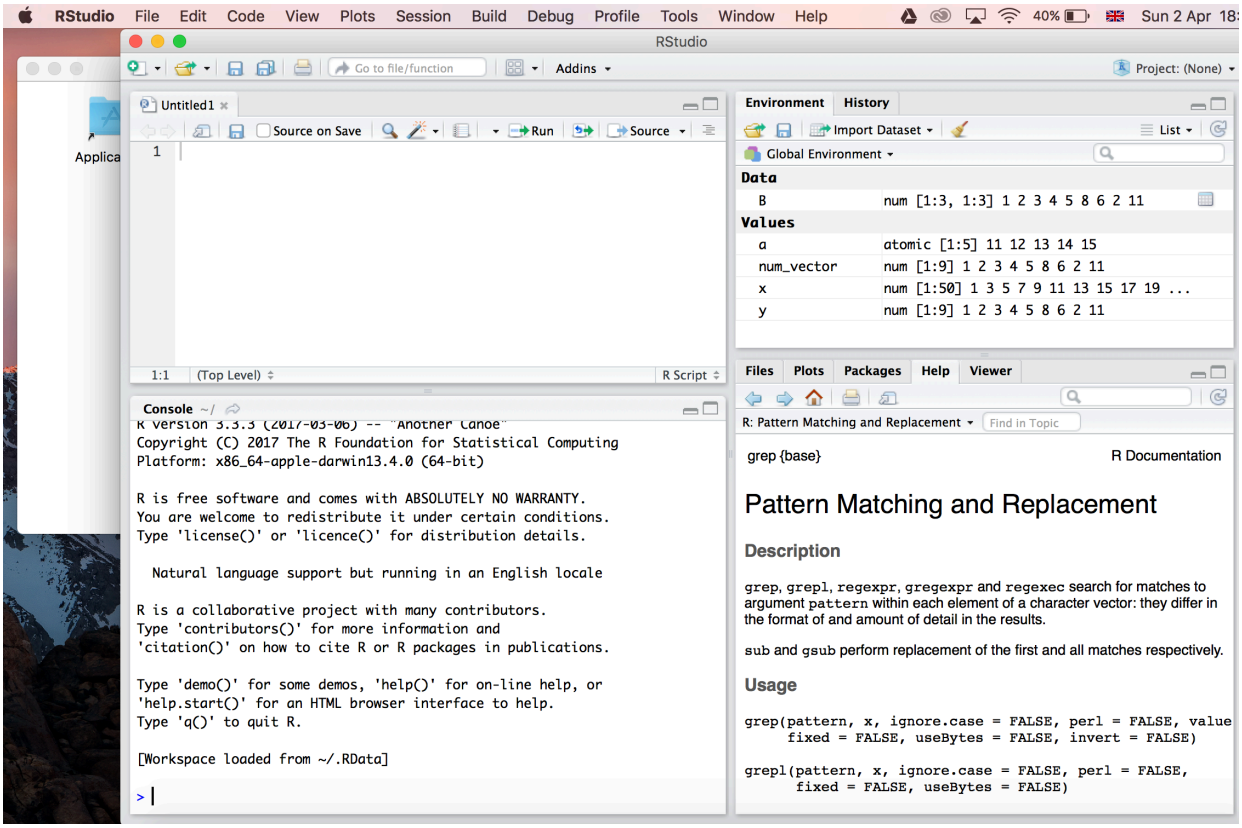
- Go to https://www.rstudio.com/products/rstudio/download/ and download the RStudio version for Mac OS X. It'll say something like RStudio 1.0.136 - Mac OS X 10.6+ (64-bit). (image - 4)
- Double-click that DMG file and Drag the RStudio icon to the Applications folder.



(image - 4)

Verify RStudio & R are working together -

- Look in the Applications folder for the RStudio application.
- Double-click it and you should see an RStudio window with four panes. (image - 5)



(image - 5)

From now on, just start RStudio when you want to work in R.

Set yourself up for easier future compiled package installation
Some R packages need additional libraries to work and most aren't on your system by default. There are a myriad of ways to get these libraries, and the way I obtain them is via the homebrew utility. You can save yourself the trouble of installing homebrew later by doing the following now:

- Find and open the Terminal program in the Utilities folder under the Applications folder
- Paste the following into the Terminal window and hit enter/return:

```
ruby -e "$(curl -fsSL https://raw.githubusercontent.com/Homebrew/install/master/install)"
```

- Read and accept the various prompts until it's installed
- Close the Terminal application

To see which packages are already installed on your system , type : installed.packages()
But, We have to install few packages before we start using R studio.

Important R packages are :-
install.package("Hmisc")

install.packages("party")
install.packages("ggplot2")
install.packages("reshape2")
install.packages("sqldf")
install.packages("forecast")
install.packages("lubridate")

Swirl - This package teaches R programming and Data science interactively , at your own pace and right in console R.

To install this package we will use - install.packages("swirl") (image - 6)

```
> install.packages("swirl")
trying URL 'https://cran.rstudio.com/bin/macosx/mavericks/contrib/3.3/swirl_2.4.3.tgz'
Content type 'application/x-gzip' length 234162 bytes (228 KB)
==================================================
downloaded 228 KB


The downloaded binary packages are in
        /var/folders/pp/6y2_kh0j54sgkn2yn6rg7nmc0000gn/T//RtmpCKMA8B/downloaded_packages
>
```

(image -6)