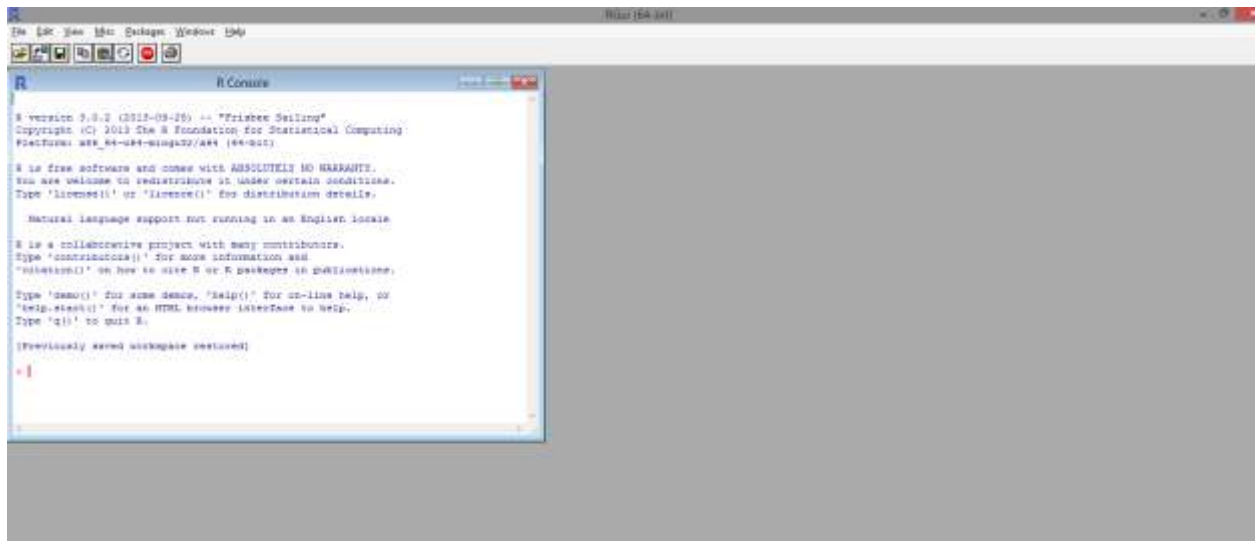


## R Installation and Setup Guide.

In order to complete most of the labs in COMM 550 you will need to have the R statistical language installed. R is an open source program available for Windows, Mac and Linux. It is fairly lightweight and will run on most computers, but if you cannot get it to work please email me (joshuaac@usc.edu) or use one of the computers in the PhD office. In order to install R please follow these step by step instructions. Any code snippets and examples will be in the Courier New font, like so.

1. Head to the local download host for R (in this case the UCLA Statistics Dept.) by clicking [here](http://cran.stat.ucla.edu/) or copy and pasting the following link into your browser.  
<http://cran.stat.ucla.edu/>
2. Select the version of R appropriate for your operating system.
  - a. For WINDOWS users select "base" and then Download R 3.0.2 for Windows.
  - b. For MAC users select R-3.0.2.pkg.
  - c. For LINUX users select the appropriate distro and download the required files.
3. Install the downloaded files
  - a. Windows users, if your computer has more than 4gb of RAM then you only really need the 64 bit version of R.
4. Fire up R from your Program Files/Dock you should see something similar to this

A screenshot of the R console window. The window title is "R Console". The text inside the console is as follows:

```
R version 3.0.2 (2015-09-29) -- "Frisbee Sealing"
Copyright (c) 2015 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.

Natural language support but running in an English locale

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.

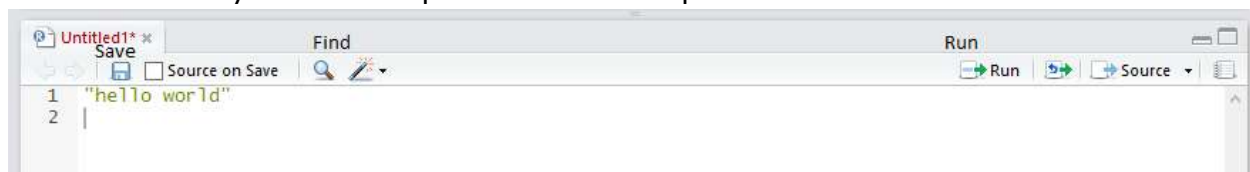
[Previously saved workspace restored]

> |
```

5. In keeping with a long tradition of programming, test R by typing "hello world" into the white text box (the console) and hitting enter, you should see this. Afterwards try some basic addition, subtraction and multiplication.

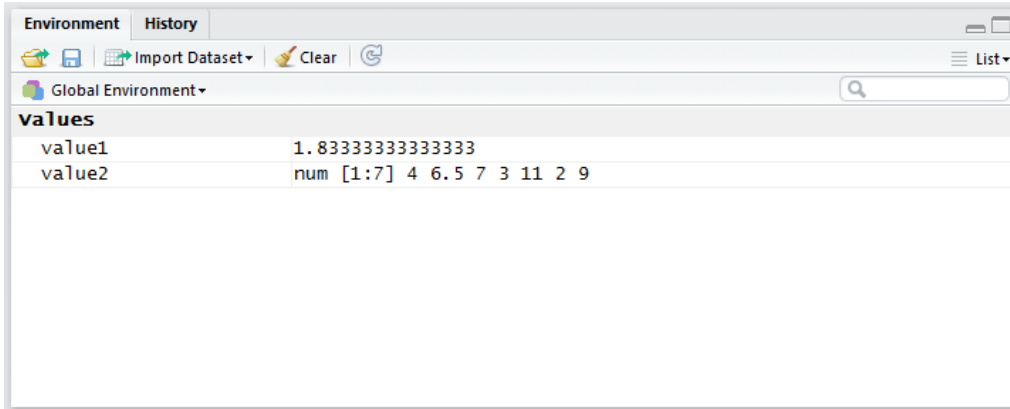
```
> "hello world"
[1] "hello world"
> |
```

6. As you've probably noticed R is not the prettiest piece of software. Lets download an IDE (Integrated Development Environment) which sits on top of the program and makes writing code easier. For this class I will be using Rstudio which is a popular IDE, you can chose your own version if you'd like but some of the screenshots and instuctions in later labs might not make sense.
7. Head to <http://www.rstudio.com/> hit "download now "and then select the desktop version. Use the link provided under the **Recommended For Your System** header
8. Install Rstudio and open it up. You should see four windows.
  - a. Top left is the scripting window. Here you can type lines of code and run entire programs at one time. Rstudio will close brackets, highlight key words and perform other helpful features.



- i. Let's try the "hello world" program again. Type it in the scripting window and -hit the green "run" arrow or select the code and hit ctrl-enter (command-enter on a mac).
    - ii. Now hit the blue disk button and save your code as HelloWorld.R
    - iii. Finally hit the magnifying glass and type *hello* into the find box to highlight the text below.
9. When you ran your program you should have seen "hello world" pop up in the window immediately below the scripting window. This is the console. Any results and code from the scripting window will be run here. Additionally you can type code directly into the console, although the syntax editors is preferable due to the extra features described above. However, the console can be useful for doing one time calculations which don't need to be in your final code. Try typing  $(4+7)/6$  into the console and hit enter .
10. At the right hand top Rstudio is the Enviornment and History window. Enviornment shows all the assigned names for datasets or formulas which you have saved or created in your code. History has a running log of the various commands entered into the console.
  - a. Lets assign a name to a number and put it in the enviornment. This is done with the name<-content command chain. If we wanted to assign the name value1 to the earlier math we did in the console then enter  $value1<-(4+7)/6$

- b. To see the contents of the variable simply type value1 and run it.
- c. Multiple numbers can be assigned to a variable let's create a row of numbers and assign it to the name value2 with the following code:  
`value2<-c(4,6.5,7,3,11,2,9)`



- d. Typing value2 will display the contents, try some other commands such as:
    - i. `summary(value2)`
    - ii. `max(value2)`
    - iii. `mean(value2)`
    - iv. `value2/5`
  - e. You can store a wide variety of things in the environment such as formulas, tables, numbers, graphs and more.
  - f. Click the history tab and look at the log of your actions, double click an entry to transfer the code to the console.
11. Finally, the bottom righthand window is a multipurpose display area. You can see generated plots and graphs here, open up files from your harddrive, search the help files and manage packages (extensions of R's capabilities). Spend a few minutes clicking around to familiarize yourself.

Congratulations, you've set up R and run a basic script. Take some time and look through the help features and try different commands. R is very forgiving so don't worry about errors or mistyped commands. Under the Tools->Options menu at the top of the window there are numerous commands for customizing and changing how Rstudio appears and runs, so experiment and set up your environment in a way which is comfortable for you. Additionally bookmark these resources as they may come in handy over the course of the semester.

UCLA Stats Help- <http://www.ats.ucla.edu/stat/r/>

R- Bloggers- <http://www.r-bloggers.com/>

Comprehensive R Archive Network- <http://cran.r-project.org/>