Assignment 1

Due: Sep 8, 2015 at 9:55 am

Question 1: Familiar with your IDE

- Download and install R and RStudio on your computer. They are both free online, available for Windows, Linux and Mac OS.
- From Canvas, download and read **RStudio101.pdf** to get familiar with this IDE, learn the fundamental things such as how to install an R package.
- In RStudio, go to "Tools→Global Options→Code Editing", change "tab width" from 2 to 4. There may be different entry names for different operating systems.
- Check "Highlight selected line", "Highlight selected word" and "show line numbers".
- Create a new folder for this course, and set it as your working directory.
- Load package 'fBasics', this is one of the default packages in R.
- Install and load package 'quantmod', unlike fBasics, you need to download first.
- Make a screen shot for your installation and loading package 'quantmod', and upload this screenshot with your code together.
- Copy and paste the sample code to your source file, select the first few lines and press "Ctrl + Enter" to draw a histogram, then export it to an isolated PDF file and a JPG file to your working directory (It will be 'Command+Enter' if you are using a Mac).
- In your source type "?basicStats" and learn how to use this function by yourself. Then run this function on the random variable "xx", which you created before in the previous subquestion.
- Try double question mark, "??basicStats" and see what you get.

Question 2: Basic data types

- Three ways to create vector:
  - Of course the first and easiest way is using a colon.
  - With function *seq()*, Create a series named **v1**, from -10 to 10, by = 0.1, then print it out.
  - Create a STRING vector **v2** = {'0', '1', '2', '0', '1', '2', '0', '1', '2'} using *rep()*.
- Expilict coercion
  - Convert **v2** to numeric and assign to a new variable **v2num**
  - Convert **v2** to logical, what is the result? Assign the result to **v2NA**.
  - Convert **v2num** to logical and assign to **v2logical**.
- Matrix and List
  - Create a 3 by 3 matrix based on **v2num**, byrow = T. Name your matrix **m2**.
  - **m2** is a singular matrix, do something to make this matrix solvable, calculate and print the inverse matrix of **m2**.
  - Create a list called **myFirstList**, using **v2**, **v2num**, **v2NA**, **v2logical** and **m2** as the elements.
  - Name these elements as "char", "integer", "NAs", "bool" and "mat".
  - Use two methods to subset the 4th element: by indexing and by element name.

Question 3: Loops

I hope you have all downloaded and read the code from Lecture 1 before doing this homework.
At the end of that source file, there is a *Fibonacci* example. Read this example and understand why the first version is wrong. Now modify the second version with a different loop named *repeat*. We didn't cover this during the lecture, try to figure out how the repeat loop works by yourself.
Read the *Fibonacci* example at the end of There is a special keywords of loop in R: *repeat*. Learn how to use *repeat* and apply it to the fibonacci example in class.

Please upload all code and necessary files showing that you have completed all questions.