

Statistics - Homework 1 (Due Sep. 27, 2017)

Note: All analyses and calculations should be completed using R.

1. The EXCEL file “2017_STAT_HW1DATA.csv” contains the final grades of students in a class over a 9-year period. Conduct the following works using R.
 - (1) Read the data into R by using the “*read.csv*” command and assign the data to an object named *x*.
 - (2) Check the mode, class, and length of *x*.
 - (3) Use the “*names*” command to find the names of individual components in *x*.
 - (4) Calculate the mean grade of students of Year 3 by using the function “*mean*” in R.
 - (5) Calculate the mean grade of all students in Year 1 and Year2.
 - (6) In the same plot, show box plots of final grades of individual years.
2. Use the same data in Problem 1.
 - (1) Use the loop function “*for*” (do NOT use the function “*mean*”) to calculate the mean grade of students of individual years.
 - (2) For each individual year, calculate the number of students whose final grades are higher than or equal to 60.
 - (3) Use the function *ts.plot* in R to create a time series plot of the mean grade. [Hint: *ts.plot(x)* where *x* is the mean grade vector.]
 - (4) For *Year i*, save the grades of individual students and the mean grade to a file named “*Year-i.txt*” on your own PC. Note: Use function “*paste*” to generate an object with filenames.
3. Three objects are defined by the following R commands:

```
x1=c("A","B","C","D","E")  
x2=seq(20,200,20)  
x3=matrix(seq(2,200,2),ncol=20)
```

 - (1) Define a list named *X* with components *x1*, *x2*, and *x3*.
 - (2) Use the function “*names*” to name the components *x1*, *x2*, and *x3* as “*Character*”, “*Sequence*”, and “*Matrix*”, respectively.
 - (3) Check the modes of *X\$Character* and *X\$Matrix*.
 - (4) Check the modes of *X[1]* and *X[3]*.
 - (5) From the list *X*, assign all elements of the third row in matrix *x3* to an object named *y*.