DS 413/613 HOMEWORK 4

Instructions: Generate and email an Rmarkdown file and a Word file that shows all coding, script and output required for all problems.

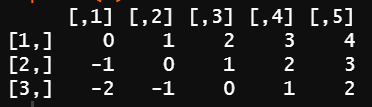
1)

a) Use the R function **nrow** to confirm that the iris data frame has 150 rows. Then use and show R code that features **a map function** to confirm that the iris data frame has 150 rows.

b) Each column of the iris data frame has a unique number of values or objects. For example, the column Sepal.Length has 150 values but 35 of them are unique. Use and show R code that features a map function to find the number of unique values or objects for each column of the iris data frame.

2)

Use and show R code that features a nested loop that will produce the 5 by 3 matrix shown below.



3)

Use and show R code that will produce a tibble that features 10 randomly generated values that are normally distributed, with means of -10, 0, 10 and 100 respectfully. Run your code again, producing a second tibble, that confirms random values, hence the second table will not have the same values.

4)

**X** <- list(12, 14, 15, 18, 19, 22,10,18,18)

**Mean** <- list(16, 16, 16, 16, 16,16,16,16,16)

**sd** <- list(2, 2, 2, 2, 2,2,2,2,2)

a) In statistics, a z score indicates the standard deviation distance between the mean and a specific value of the data set. What formula is used to find a z score? Use and show R coding that features a map function to iteratively find z scores across the lists given above.

b) The test statistic for a population mean is given by the formula ((X - mean)/s/sqrt(n)) Use and show R coding that features a map function to iteratively find test statistics for population means across the lists given above.

5)

V = c(10,15,17,22,32,38,42)

a) Another purr package function is the keep( ) function. Research, explore, and use the keep( ) function to extract all number from the vector V given above that are less than 20

b) Another purr package function is the discard( ) function. Research, explore, and use the **discard( )** function to eliminate all numbers from the vector V given above that are less than 20

6)

Another purr package function is the safely( ) function. Research, explore, and apply the

safely( ) function to the given vector below as illustrated.

U = list(10,15,"mary",22,32,"james",42)

map(U, safely(~ .x + 15))

In four or five sentences, explain the specific output for this problem and how the definition and the application of the safely( ) function is used.