**MSBA 444 Homework #1 Due: November 7th, 2022**

Note: This is a group assignment. Please upload your report to Canvas. Your report should include not just the final answer but show the process you went through to derive it. Upload all supporting material (R/EXCEL files) to Canvas.

**General Guidelines for writing report for homework problems**

In preparing report for all homework, ask yourself, as a manager, what kind of report you will expect from a consultant you have hired to do a project for you! You will not hire this consultant again if only thing he or she submits to you is a software output with few numbers circled! In general, you may follow following outline:

1. Brief Problem description
2. Your answers and conclusions (Managerial Summary)
3. Details of the Methodology/Analysis you used to derive your answers and conclusions.
4. Attach printout of your model (R file) and output as an Appendix.

Your report should be complete so that I need to go to your uploaded files only as an exception.

**PROBLEM 1:**

A company offer a maintenance service where for a yearly membership fee; members receive service on call. For each service call, the company incur significant cost. For budgeting purpose therefore, the company would like to predict ‘Number of Service Calls” each month. The company thinks that number of calls (tot\_calls) each month depends on following variables (mostly related to weather):

Tot\_mem = Total number of members with service contract

Month = Month of the year

Avg\_temp = Average temperature during the month

Deg\_heat = heat index

Pr-rain = total rain during the month

Pr\_snow = total amount of snow during the month

Age = Average age of the equipment registered under the contract

Download the EXCEL CSV File from canvas that contains the monthly data for last few years. Exclude any observation, which does not have, complete information.

1. Use stepwise regression in R to build the “best” Linear Regression model you can! Check if your model satisfies all the assumptions used in Linear Regression. Your report should include the steps you took in deriving the eventual model.
2. If your model in part (a) does not satisfy any assumptions of linear regression, take appropriate action to modify your model. Discuss how good you think is your eventual model for prediction.