**MSBA444 Homework #2 Due: Nov. 16th , 2022**

**Upload your report and all supporting material (EXCEL and R files) to the Canvas. Your report should be self-contained so that I need to download your supporting material only as an exception.**

**PROBLEM 1:**

Consider the monthly sales data (in millions of dollars) of a manufacturing company over last eight years (download EXCEL file HW2.xlsx from Canvas).

1. Use first two years of data to estimate initial (time 0) Level (L0), Trend (T0), and the additive seasonal factors for each month of the year.
2. Using smoothing constants α=0.2, β=0.1, and γ=0.1 apply additive trend-seasonal model to your data and compute Mean % Error, Mean Absolute % Error, RMSE (Root Mean Square Error), and other indicators. Discuss what information these indicators provide. Use your model to forecast next 12 months.
3. Repeat part (a) and part (b) for a multiplicative trend-seasonal model. Compare this model to the additive trend-seasonal model obtained in part (b). Use your model to forecast next 12 months.
4. Use R to find the best additive trend-seasonal model as well as best multiplicative trend-seasonal model (restrict all smoothing constants to be between 0.1 and 0.5). Compare accuracy measures (RMSE, etc.) of these models to one obtained in part (b) and part (c). What is your forecast for next 12 months based on this model?