Stat 142 (Time Series Analysis)

Laboratory Exercise No. 3

INSTRUCTIONS: Answer the following as indicated. Prepare your answer sheet in R Markdown and submit in PDF format.

1. Perform the following using the CO_2 data set.

    a. Apply classical decomposition and save the trend estimates and the seasonal indices.

    b. Detrend and deseasonalize the data. Apply simple exponential smoothing to the detrended and deaseasonalized data. Generate forecasts for the last 3 months of 1987. Print the forecasts with their 95% forecasts intervals. Recalibrate the forecasts by returning back the trend estimates and the seasonal indices.

    c. Apply Holt's linear trend to the deseasonalized data. Generate forecasts for the last 3 months of 1987. Print the forecasts with their 95% forecasts intervals. Recalibrate the forecasts by returning back the seasonal indices.

    d. Apply the Holt-Winters method to the original and generate forecasts for the last 3 months of 1987. Print the forecasts with their 95% forecasts intervals.

    e. Compare the final forecasts (and confidence intervals) from the three exponential smoothing methods.

2. Repeat (a) through (e) in Number 1 using the Quarterly HH consumption expenditure data set. Generate forecasts for all quarters of 2022.