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ISDS 415

# Forecasting Homework

1. Compute four-week and five-week moving averages for the time series.

    a. See Excel Worksheet for moving average forecasts.

    b. The best number of weeks of past data appears to be the five-week moving average as the mean squared error is smaller than the other computations.

2. Show the exponential smoothing forecasts using $\alpha = 0.1$.

    See Excel Worksheet for exponential smoothing forecasts.

    a. I would prefer a smoothing constant of $\alpha = 0.2$ as the error is smaller than the constant of $\alpha = 0.1$.

    b. The results are the same if MAE is used. The smoothing constant of 0.2 still has a smaller error than the smoothing constant of 0.1.

    c. If MAPE is used, the smoothing constant of 0.1 has a percentage error of 6.73% while the forecast with a smoothing constant of 0.2 has a percentage error of 5.54%

3. Use exponential smoothing with a $\alpha = 0.4$ to develop a forecast of demand for week 13. What is the resulting MSE?

$$F_t = \alpha A_{t-1} + (1 - \alpha) F_{t-1}$$

$$F_{13} = (0.4)(3150) + (0.6)(3095.013)$$

$$F_{13} = 3117.01$$

Plugging this value into a new table for exponential smoothing with a constant of $\alpha = 0.4$, the resulting MSE is 40748.89992.