Brady Buttrey

1. Looking at the line chart, we can see that every year the sales peak in January and then decline until September aside from a couple spikes in March, May, and August. It doesn’t appear to be increasing too much but it is increasing every year.

2.

The MSE for the moving average for 2 months is 1670.48

The MSE for the moving average for 3 months is 2356.07

The MSE for the moving average for 6 months is 3553.147

3.

Trend only: This models significance F stat suggests the model is not significant, that is because the p value for trend is .98 which is greater than .05. the R-square is 6.84E-06. The average MSE for the model is 2162.494.

Seasonality with trend: This model is statistically significant at a .05 significance level due to all p values being far lower than .05. The r-square is .9911 or 99.11% which is a great explanation of the variability in sales. The average MSE for this model is 12.60069.

Seasonality without trend: Though the significance F stat suggests that this model is significant, it is not. This is because the p values for February and March are greater than .05. The r-squared for this model is .9482 or 95%, which is a good explanation of variability in the sales data. The average MSE for this model is 111.963.

4. Because this MSE for the regression model for Seasonality with trend is the lowest of the 3 models and the 3 moving averages, we have to say this is the best model. Even further, the model has very good goodness of fit.

sales= 200.2674 + (1.017361\*36) + (49.85764\*1) + (29.17361\*0) + (33.48958\*0) + (-23.5278\*0) + (-20.8785 \*0) + (-67.8958\*0) + (-62.5799\*0) + (-57.2639\*0) + (-101.281\*0) + (-85.6319 \* 0) + (-58.6493 \* 0)

5.

January Year 4 = 200.2674 + (1.017361\*36) + (49.85764\*1) + (29.17361\*0) + (33.48958\*0) + (-23.5278\*0) + (-20.8785 \*0) + (-67.8958\*0) + (-62.5799\*0) + (-57.2639\*0) + (-101.281\*0) + (-85.6319 \* 0) + (-58.6493 \* 0)

January year 4 = 286.75004

This sales number does in fact follow the pattern seen in the chart, it shows the peak and increase in January in comparison to previous years.