Unit 5: Assignment

This Assignment requires you to use Excel.

Make sure to use the *Unit 5 Assignment template* located in Doc Sharing when you turn in your answers.

Question 1

Determine the error for each of the following forecasts. Then, calculate MAD and MSE.

Period	Value	Forecast	Error
1	202	—	—
2	191	202	
3	173	192	
4	169	181	
5	171	174	
6	175	172	
7	182	174	
8	196	179	
9	204	189	
10	219	198	
11	227	211	

Question 2

The U.S. Census Bureau publishes data on factory orders for all manufacturing, durable goods, and nondurable goods industries. Shown here are factory orders in the United States over a 13-year period ($ billion).

First, use the data to develop forecasts for years 6 through 13 using a 5-year moving average.

Then, use the data to develop forecasts for years 6 through 13 using a 5-year weighted moving average. Weight the most recent year by 6, the previous year by 4, the year before that by 2, and the other years by 1.

Answer the following questions:

a) What is the forecast for year 13 based on the 5-year moving average?
b) What is the forecast for year 13 based on the 5-year weighted moving average?
c) What is the MAD for the moving average forecast?
d) What is the MAD for the weighted moving average forecast?
e) Which forecasting model is better?

Year	Factory orders
1	2,512.70
2	2,739.20
3	2,874.90
4	2,934.10
5	2,865.70
6	2,978.50
7	3,092.40
8	3,052.60
9	3,145.20
10	3,114.10
11	3,257.40
12	3,654.00
13	

Question 3

The “Economic Report to the President of the United States” included data on the amounts of manufacturers’ new and unfilled orders in millions of dollars. Shown here are the figures for new orders over a 21-year period.

Use the charting tool in Excel to develop a regression model to fit the trend effects for the data. Use a linear model and then try a polynomial (order 2) model. Make sure the charts show the line formula and the r-squared value. Include both charts in your report. Then, answer the following question:

- How well does either model fit the data? Which model should be used for forecasting? Explain using the relevant metrics.

Year	Total Number of New Orders
1	55,022
2	55,921
3	64,182
4	76,003
5	87,327
6	85,139
7	99,513
8	115,109
9	116,251
10	121,547
11	123,321
12	141,200
13	162,140
14	168,420
15	171,250
16	176,355
17	195,204
18	209,389
19	237,025
20	272,544
21	293,475

Directions for submitting your Assignment

Make sure to use the Unit 5 Assignment template from Doc Sharing when you turn in your answers. Submit your Assignment to the Unit 5 Dropbox.

Grading Rubric

Your Assignment will be graded based on the following breakdown.

Unit 5 Assignment		
Content	**Points Possible**	**Points Earned**
Question 1 Provided the MAD.	5	
Question 1 Provided the MSE.	5	
Question 2a Correct forecast for year 13 using a 5-year moving average.	5	
Question 2b Correct forecast for year 13 using a 5-year weighted moving average.	5	
Question 2c Correct MAD for moving average forecast.	5	
Question 2d Correct MAD for weighted moving average forecast.	5	
Question 2e Recommended the better model with justification.	5	
Question 3 Used Excel charting to fit a linear trendline, including	5	

the formula and r-squared.		
Question 3 Used Excel charting to fit a polynomial trendline, including the formula and r-squared.	5	
Question 3 Recommended the better model with justification.	5	
Total	**50**	