1. Sales (in thousands) of the new Thorton Model 506 convection oven over the eight-week period since its introduction have been as follows:

|  |  |
| --- | --- |
| Week | Sales |
| 1 | 18.6 |
| 2 | 21.4 |
| 3 | 25.2 |
| 4 | 22.4 |
| 5 | 24.6 |
| 6 | 19.2 |
| 7 | 21.7 |
| 8 | 23.8 |

1. Use Naïve forecast, compute the accuracy measures and what is the forecast for week 9?
2. Use average of past values forecast, compute the accuracy measures and what is the forecast for week 9?
3. Use three week moving average, compute the accuracy measures and what is the forecast for week 9?
4. Use three week weighted moving average with weights of 0.2, 0.3 and 0.5, compute the accuracy measures and what is the forecast for week 9?
5. Compare the forecast methods used in a though d, which method should be used?
6. Which exponential smoothing model provides better forecasts, one using  = .6 or  = .2? Compare them using mean squared error. What are the forecasts for week 9?
7. A 24-hour coffee/donut shop makes donuts every eight hours. The manager must forecast donut demand so that the bakers have the fresh ingredients they need. Listed below is the actual number of glazed donuts (in dozens) sold in each of the preceding 13 eight-hour shifts.

|  |  |  |
| --- | --- | --- |
| Date | Shift | Demand(dozens) |
| June 3 | Day | 59 |
|  | Evening | 47 |
|  | Night | 40 |
| June 4 | Day | 64 |
|  | Evening | 43 |
|  | Night | 39 |
| June 5 | Day | 62 |
|  | Evening | 46 |
|  | Night | 42 |
| June 6 | Day | 60 |
|  | Evening | 45 |
|  | Night | 40 |
| June 7 | Day | 58 |

1. Produce a line chart
2. Develop the optimization model that finds the estimated regression equation that minimize the sum of squared error.
3. Solve for the estimated regression equation.
4. Forecast the demand for glazed donuts for the Day, Evening, and Night shifts of June 8.
5. Design a scenario that requires to conduct a multiple regression analysis. You need to find data, construct the linear model, run analysis, evaluate your model, and interpret the results.