

Production Planning & Control BMM4823

Assignment 3

1. Always One Sdn. Bhd. is a manufacturer of car's battery would like to expand their production line for the production of June. However, the expansion is subjected to the demand capacity whether it will be increased or decreased in June. **Table Q1** shows the previous demand for last 5 months. As an expert in this field, you were asked to help Always One to solve few question as highlighted below;

Table Q1 Sales for Jan - May

Month	Sales (1000 units)
Jan	120
Feb	140
Mar	160
Apr	190
May	200
June	?

- a) Determine the forecasting sales for the month of June by using exponential smoothing with an $\sigma = 0.3$ and initial forecast for Jan is 110000 units.
 - b) Determine the forecasting sales for the month of April to June by using 3 month moving average.
 - c) Compare and give comments on forecasting errors by using Mean Squared Error (MSE).
 - d) Do you think the company should expand the plant for the production of future month? Your answer should be justified.
 - e) Suggest which forecasting method is suitable for determination of forecasting model in **Table Q1**.
2. The demand for prawn crackers is fluctuating from month of January to October. The company wants to monitor the demand for this product closely as it nears the end of life cycle. The following table shows the actual sales history for January to October. Generate forecasts for November and December using trend projection by least square method.

Month	Sales	Month	Sales
January	890000	July	710000
February	800000	August	730000
March	825000	September	680000
April	840000	October	670000
May	730000	November	?
June	780000	December	?

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3. The manager of YTL power in Terengganu wants to develop quarterly forecast power loads for the next year. The power loads are seasonal and the data on the quarterly loads in Megawatts (MW) for the last 4 years are as follows;

Quarter	2013	2014	2015	2016	2017
1	103.5	94.7	118.6	109.3	
2	126.1	116.0	141.2	131.6	
3	144.5	137.1	159.0	149.5	
4	166.1	152.5	178.2	169.0	

The manager estimates the total demand for 2017 at 450 MW. Determine the forecast power will be consumed for each quarter.

4. At an ammonia processing factory, process control involves periodic analysis of samples for quality parameter. The standard procedure currently used is costly and time consuming. An alternatives procedure which is less costly has been proposed. However, the numbers for the quality parameter given by the alternative procedure are somewhat different from those given by the current procedure, switching to the new procedure would be reasonable and cost effective. The following data were obtained for the quality parameter by analysing samples using both procedures.

Current	Proposed	Current	Proposed
3.0	3.1	3.1	3.1
3.1	3.9	2.7	2.9
3.0	3.4	3.3	3.6
3.6	4.0	3.2	4.1
3.8	3.6		

- a) Use linear regression to find a relation to forecast Y which is the quality parameter from the current procedure, using the values from the proposed procedure X.
- b) Is there a strong relationship between Y and X? Justify your answer.
5. Always One Sdn. Bhd. manufacturer apply exponential smoothing to forecast the demand for electricity control equipment. The demand shows an increasing trend from month to month. Use the provided data to forecast for October 2015. The company decided smoothing constant for $\alpha = 0.2$ and $\beta = 0.5$. Assume the initial forecast for month April (F_{April}) was 11 units and the trend over that period (T_{April}) was 2 units.

Month	Demand
April	12
May	17
June	20
July	19
August	24
September	21
October	?