

## ADM 3301N

### ASSIGNMENT # 1 FORECASTING

ADM 3301 students are reminded that submitted assignments must be neat, readable, and well-organized. Assignment marks will be adjusted for sloppiness, poor grammar and spelling, as well as for technical errors. Plagiarism on assignments will not be accepted, *each student must sign the statement of integrity*. **E-mail questions related to the assignment s should be sent to the Teaching Assistant.**

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#### **Problem # 1 (30 marks)**

National Mixer, Inc. Sells Can Openers. The monthly sales for the last seven months are shown below :

<b>Months</b>	<b>Sales (units)</b>
February	21500
March	20500
April	17800
May	22400
June	20100
Jully	24200
August	22600

- a) Draw the graphical curve for the monthly data. **(5 marks)**
- b) Calculate the forecasting of the sales volume for the month of September using the following methods : **(20 marks)**
  1. Lineaire equation. (using regression analysis)
  2. Five-month moving Average.
  3. Exponential Smoothing with the alpha constante of 0.20 and an initial forecast of 21300.
  4. Naïve method.
  5. Weighted Moving Average using weights of 0.6 for August, 0.3 for Jully, and 0.10 for June.
- c) Which is the most appropriate method? Why? **(5 marks)**

**Problem # 2 (20 marks)**

A publishing Company has collected the following annual sales for the last nine years :

Year	1	2	3	4	5	6	7	8	9
Sales	402000	445000	480000	523000	558000	571000	624000	690000	737000

- a) Use the appropriate model to forecast sales for the next five years. **(10 marks)**
- b) Suppose that the actual sales for the next five years are : **(10 marks)**

Année	10	11	12	13	14
Ventes	772000	821000	878000	906000	989000

Is the forecasting appropriate ? (in other words, does the forecast work correctly? Explain !

**Problem # 3 (20 marks)**

Two forecasting techniques (F1 and F2) have been used to predict demand for water bottles. The actual demand and the two sets of forecasting are shown in the following table :

Period	Demand	Forecast Demand	
		F1	F2
1	680	660	660
2	750	680	680
3	700	720	700
4	740	710	720
5	690	720	740
6	720	700	760
7	800	710	780
8	780	740	800

- a) Calculate the Mean Absolute Deviation (MAD) for each forecasting set.  
Based on your results, which forecasting set looks appropriate? Explain ! **(8 marks)**
- b) Calculate the Mean Square Error (MSE) for each forecasting set. pour chaque ensemble  
Based on your results, which forecasting set looks appropriate? Explain ! **(8 marks)**
- c) In practice, either MAD or MSE can be used to calculate the forecasting error. Which factor can guide the management to choose one compared to the other one ? **(4 marks)**

**Problem # 4 (30 marks)**

The following data represent sales of toys for ABC Company in Ottawa. Every period corresponds to 4 weeks.

Period	2004	2005	2006
1	155	576	1106
2	339	1064	2061
3	143	390	705
4	95	261	412
5	93	277	404
6	170	346	624
7	216	460	704
8	298	638	980
9	339	710	1233
10	213	505	684
11	234	458	671
12	302	679	
13	431	646	

- Draw the monthly sales data in a graph and explain which forecasting method do you recommend. **(5 marks)**
- Use the decomposition multiplicative classical model and calculate the seasonal factors as well as the regression equation -trend. **(15 marks)**
- Use the answer of part (b) to predict sales for the years 2006 and 2007 (Forecast for the next 15 periods). Show your work ! **(10 marks)**