



commerce  
undergraduate  
society

# COMM 204 FINAL REVIEW SESSION

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# I. Forecasting

1. What is the forecast for May based on a weighted moving average applied to the following past demand data and using the weights: 4, 3, 2 (largest weight is for most recent data)?

November	December	January	February	March	April
37	36	40	42	47	43

2. Daily sales of Frappes at a local Starbucks are in the table below. Using a three period moving average and a four period moving average, compute MAD for each forecast and then forecast day 8 using the more accurate method.

Day	Sales
1	17
2	21
3	27
4	31
5	19
6	17
7	21

3. Management wants to forecast the tonnage unloaded at a shipping company. The forecast tonnage unloaded for Quarter 1 is 175 and the actual tonnage unloaded for each quarter is given below. Using an alpha of 0.10 and 0.50, compute the forecasts for the rest of the 8 quarters. Which is better?

Quarter	Actual Tonnage Unloaded
1	180
2	168
3	159
4	175
5	190
6	205
7	180
8	182



## II. Inventory Management

1. A large consulting firm uses an average of 40 packages of paper a day. Each pack contains 500 pages. The consulting firm operates 246 days a year. Holding cost for the paper is \$1 per pack, and it costs around \$6 to order and receive a shipment of paper.
  - a) What order size would minimize total annual ordering and holding costs?
  - b) Compute the total annual ordering and holding costs using your order size from part a).
  - c) Except for rounding, are annual ordering and holding costs always equal at the EOQ? Why?
  - d) The office manager is currently using an order size of 380 packages. The partners of the firm expect the office to be managed “in a cost-efficient manner”. Would you recommend that the office manager use the optimal order size instead of 380 packages? Justify your answer.
2. A manufacturer uses 800 boxes a month. The boxes can be purchased from either supplier A or supplier B. Holding cost is 25% of unit cost and the ordering cost is \$40. The following quantity discounts are available.

SUPPLIER A	
Quantity	Unit Price
1-199	\$14.00
200-499	\$13.80
500+	\$13.60

SUPPLIER B	
Quantity	Unit Price
1-149	\$14.10
150-349	\$13.90
350+	\$13.70

Which supplier should be used and what is the optimal order quantity if the intent is to minimize total annual costs?



### III. More on Inventory Management

1. Safeway sells almonds by the kilogram. Historically, Safeway noticed that daily demand is normally distributed with a mean of 80 kg and a standard deviation of 10 kg. Lead time is 7 days. What ROP would provide a stock-out risk of 10% during lead time?
  
2. In the summer time, demand for ice cream at a local 7-Eleven can be approximated by a normal distribution with a mean of 14 kg per week and a standard deviation of 2.5 kg per week. The new manager desires a service level policy that has a 95% probability of not stocking out. Lead time from the producer is 2 days. The store is open seven days a week.
  - a) If a fixed-order quantity model is used, what ROP would be consistent with the desired service level?
  
  - b) If a fixed-time period model is used instead, what order size would be needed for the 95% service level with an order interval of 5 days and a supply of 4 kg on hand at the order time?



## IV. Project Management

- The following are the precedence requirements, normal and crash activity times, and normal and crash costs for a construction project on UBC campus:

Activity	Preceding Activities	Required Time (weeks)		Cost (\$)	
		Normal	Crash	Normal	Crash
A	-	4	2	10,000	11,000
B	A	3	2	6,000	9,000
C	A	2	1	4,000	6,000
D	B	5	3	14,000	18,000
E	B,C	1	1	9,000	9,000
F	C	3	2	7,000	8,000
G	E,F	4	2	13,000	25,000
H	D,E	4	1	11,000	18,000
I	H,G	6	5	20,000	29,000

- What is the critical path?
- What is the estimated completion time?
- To shorten the project by three weeks, which tasks would be shortened and what would the final total project cost be?

## V. Newsvendor Problems

- A bakery bakes strawberry tarts overnight. Each tart costs \$3.50 to make and sells at \$5.00. The owner is proud of the freshness of the baked goods. Therefore, unsold tarts are donated to a local food bank for no charge at the end of the day. The daily demand for strawberry tarts is shown below:

No. of Tarts	Probability
3	0.05
4	0.12
5	0.20
6	0.24
7	0.21
8	0.18

Using this data, what is the optimal number of tarts to order?

