

MgtOp 340—Operations Management (Section 1)
Washington State University
Fall 2019

Problem Set #4—Handwritten Section

Due: October 24, 2019

(The online portion of the assignment is found in MyLab.)

Show your work!

1. (7 points)
Consider the demand for trading cards listed below.

<u>Month</u>	<u>Demand</u>
Jan.	49,000
Feb.	43,000
March	38,000
April	32,000
May	86,000
June	71,000
July	98,000
Aug.	94,000
Sep.	99,000

Use Excel to prepare a forecast for October, November, and December using linear regression. **Print out** the sheet of results, **as well as a sheet containing the formulas that you used** (<CTRL> ` can be used to toggle between displaying values and displaying formulas; or you can click on **Formulas-->Formula Auditing-->Show Formulas.**)

2. (18 points)
(You can round all quantities to the nearest whole unit, and you can round all annual costs to the nearest whole dollar.)

Suppose that your firm manufactures rubber chickens. *Monthly* demand for the chickens is 32,000 units. Setup cost per order is \$85, and the annual holding cost percentage is 17%. The chickens cost \$8 to produce and are sold for \$18.

- a. If you have one warehouse, what is the economic order quantity for the chickens? What is the total of the annual setup and holding costs of this quantity?
- b. Suppose that you have 25 warehouses instead of one, and total demand is equally distributed among the warehouses. If setup and holding costs are the same in the smaller warehouses as they would be for the single large warehouse, what is the EOQ for the chickens at each of the 25 warehouses? What is the total of the annual setup and holding costs at each warehouse? What is the total of the company's annual setup and holding costs?
- c. Using centralized warehousing as in part (a) implies that products must be shipped over longer distances. Suppose that shipping costs \$0.80 per unit when using one warehouse and \$0.64 per unit when using 25 warehouses. Which option should the company choose, considering all relevant costs? Support your answer.
- d. (2 points) Based on your answers to (a) and (b) above, if total company demand is D , what is the general formula for the total company EOQ cost of using N warehouses instead of one (if the demand is spread evenly over those warehouses)?