

Individual Homework #3

NAME: _____

CLUSTER: _____

Directions:

- Each student must turn in the student's own assignment.
- Assignments are due at the beginning of class. Late assignments are not accepted.
- To receive credit, you must show your work.

Problem 1: Luxury Hotel Quality [10pts]

Luxury Hotel is examining their morning delivery of breakfast trays. Each night, customers fill out a form of their breakfast selection and also select a delivery time. Luxury Hotel notices that the most popular delivery time is 7am and has decided to look more closely at the actual time that breakfast trays are delivered for these customers. The data they collect is in the hw3.xls Excel file. There are 4 samples for delivery times (T1, T2, T3, T4) taken for each group.

1a. Generate the X-bar control chart for the time that breakfast trays are delivered (in number of minutes from midnight). Is the process in control? (Circle one)

In control

Out of control

1b. What are the upper and lower performance limits of the process?

UPL: _____

LPL: _____

1c. Luxury Hotel indicates to its customers that their order will be delivered within plus or minus 5 minutes of their selected delivery time. What is the process capability?

Capability Index C_p = _____

Problem 2: GE Healthcare Inventory Management [10 points]

In this problem, we will use the Newsvendor model to determine the profit-maximizing make-to-stock production decision for GE's MR machines for a particular quarter, using the 6-month demand forecasts.

Assume that all products sold during the selling period of this quarter earn a profit equal to 20% of the base price, and that the company incurs a loss equal to 6.5% of the base price on each leftover unit that is not sold in this quarter. Additionally, assume that the customer demand for MR machines in this quarter is normally distributed with mean equal to the average actual demand in each period, and standard deviation given by the square-root of the mean-squared error of the 6-month demand forecasts. For example, the demand for the Premium-750w is normally distributed with mean 16.79 and standard deviation 5.24. As another example, the demand for the Premium-HDxt is normally distributed with mean 3.89 and standard deviation 2.34.

2a. Provide the order size you recommend for each MR machine, assuming that there are no restrictions in the sizes of the order (you can produce as little or as much as you want of each model). Fill in the table below with your answers. For this problem you need only show your work for one of the production decisions.

Segment	Product	Production Quantity
PREMIUM	750w	
	HDxt	
	450w	
	HDi	
PERFORMANCE	Pioneer	
	Voyager	
VALUE	355 BRIVO/360 Optima	
	Creator - 8 Chnl.	
	Explorer - 16 Chnl.	

2b. Suppose that GE decides to produce 15 units of the Premium-750w MR machine. Given this production decision, calculate the stockout probability for the Premium-750w MR machine (this is the probability more people want to purchase the machine during the selling period).

2c. How many Premium-750w MR machines should GE produce in order to limit its stockout probability to 5%?