

Pledge:

2/1/2007
Dr. Lunsford

MATH 171
Quiz 2

Name: Solution
20 Points Possible

I. Below are the times spent waiting in line (in minutes) for 20 randomly selected customers during the lunch rush hour at a local fast food restaurant. Use these data to answer the questions below. (14 points total)

4.8 0.4 0.0 9.6 4.3 9.9 1.4 6.7 3.3 7.1
12.2 3.2 4.4 1.3 7.8 1.2 4.0 12.4 2.5 1.2

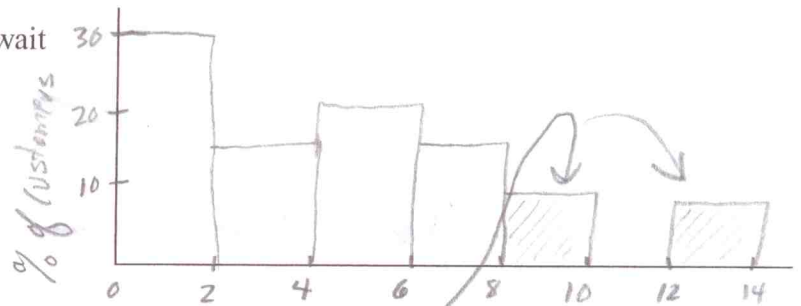
(a) To your right is a frequency table for the data using 7 classes. I have given you the class boundaries using the convention we discussed in class. Note that the variable X is time spent waiting in line. Please use the data above to complete the table. (4 points)

Class Limits For X	Frequency (Count) of Customers	Percent Frequency of Customers
$0 \leq X < 2$	6	30
$2 \leq X < 4$	3	15
$4 \leq X < 6$	4	20
$6 \leq X < 8$	3	15
$8 \leq X < 10$	2	10
$10 \leq X < 12$	0	0
$12 \leq X < 14$	2	10

(b) Use the table in Part (a) to graph a percent frequency histogram (i.e. graph the percent of customers on the vertical axis) on the axes provided below. Be sure to label your axes! (4 points)

(c) What percent of the customers had to wait in line at least 8 minutes? (1 point)

$\frac{4}{20} = .2$ 20%

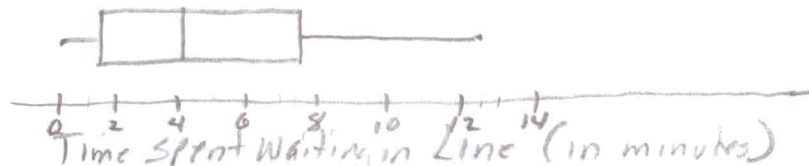


(d) On the histogram you generated above, shade the area that corresponds to the answer in part (c). Clearly indicate this on the histogram. (1 points)

(e) Find the five number summary for this data. Clearly indicate your answers. (2 points)

$\min = 0, Q_1 = 1.35, \text{med} = 4.15, Q_3 = 7.45, \max = 12.4$

(f) Draw a box plot of the waiting time data. Please be sure to label your axis. (3 points)



(g) Circle all words below that describe the distribution of the waiting times. (1 point)

- unimodal
- bimodal
- uniform
- symmetric
- skewed right
- skewed left

Pledge:

II. One hundred subjects were timed (in minutes) as they completed two tasks, Task 1 and Task 2. Below are the histograms of the distributions of the times to complete each task. Notice that the histograms are graphed using the same horizontal and vertical scales. Please answer the following: (~~2~~ points each, ~~4~~ points total)

(a) Which task has a shorter mean completion time? What is that mean time, approximately (i.e. estimate the mean time from the histogram)? (1 point)

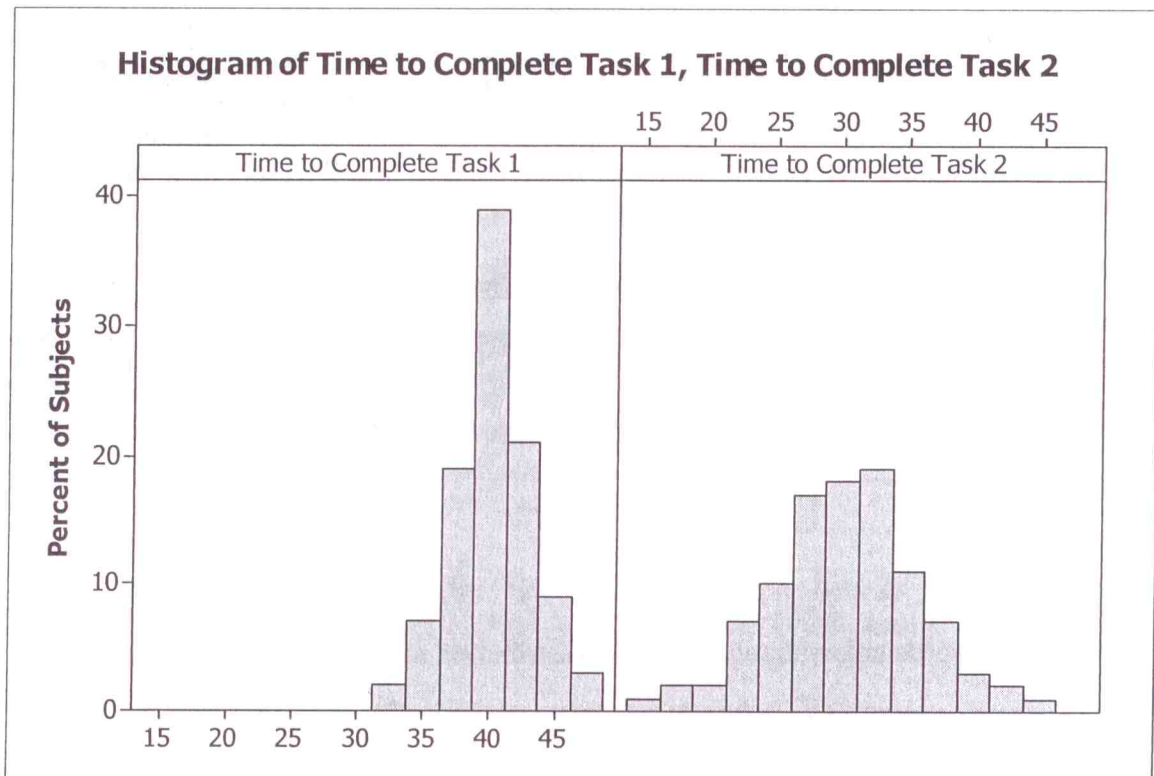
Task 2 has a shorter mean completion time of approximately 30 minutes.

(b) Which task has the smaller standard deviation? Why? (2 points)

Task 1 has a smaller standard deviation. More of its times are closer to the mean time than Task 2.

(c) Which task has a larger range of completion times? What is that range, approximately (i.e. estimate the range from the histogram)? (1 point)

Task 2 has a larger range of completion times. The range is approximately 30 mins. (i.e. from ≈ 15 to ≈ 45 min)



Problem II. Because elderly people may have difficulty standing to have their heights measured, a study looked at predicting overall height from height to the knee. Below are the data (in centimeters) for five elderly men: (10 points each, 30 points total)

Knee Height (x)	57.7	47.4	43.5	44.8	55.2	→ L1
Height (y)	192.1	153.3	146.4	162.7	169.1	→ L2

(a) Find the correlation between knee height and overall height. Please show all calculator commands (with input) that you use. Clearly indicate your answer.

LinReg (a+bx) L1, L2 $r = .87697$

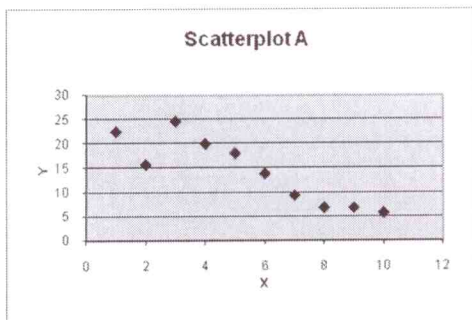
(b) Find the equation of the least-squares regression line for predicting height from knee height. Please show all calculator commands (with input) that you use. Clearly indicate the equation of the line.

Same command $\hat{y} = 44.13 + 2.43x$

(c) Use the line found in part (b) to predict the height of an elderly man whose knee height is 50.2 centimeters. Please explicitly show how you are using the regression line equation.

$\hat{y} = 44.13 + 2.43(50.2) = 166.116 \text{ cm.}$

Problem II. Below you are given three scatterplots and three correlation coefficients. Please write the name of the scatterplot (i.e. either A, B, or C) in the blank next to the correlation coefficient for the scatterplot. (5 points each – 15 points total)



$r = -0.99$ B

$r = -0.81$ C

$r = -0.89$ A

