

Pledge:

2/8/2008  
Dr. Lunsford

MATH 171  
In-Class Quiz 1

Name: \_\_\_\_\_  
100 Points Possible

**Problem I.** How much does a person with just a bachelor's degree (but no higher degree) earn? Here are the incomes of 22 such people, chosen at random by the Census Bureau in March 2002 and asked how much they earned in 2001. Most people reported their incomes to the nearest thousand dollars, so we have rounded their responses to thousands of dollars. For your convenience the data have been sorted from smallest to largest. (58 points total)

15    20    25    25    28    28    30    30    33    33    34  
35    37    40    43    44    49    50    55    60    70    74

(a) To your right is a frequency table for the data using 8 classes. I have given you the class boundaries using the convention we discussed in class. Note that the variable  $X$  is the amount earned in 2001 in thousands of dollars. Please use the data above to complete the table. (16 points)

Class Limits For $X$	Number of People	Percent of People
$0 \leq X < 10$		
$10 \leq X < 20$		
$20 \leq X < 30$		
$30 \leq X < 40$		
$40 \leq X < 50$		
$50 \leq X < 60$		
$60 \leq X < 70$		
$70 \leq X < 80$		

(b) Use the frequency table to graph a *percent* frequency histogram (i.e. graph the percent of people on the vertical axis) on the axes provided below. Be sure to label your axes! (10 points)

(c) What percent of these college graduates earned less than 30 thousand dollars in 2001? Shade the area on the histogram that corresponds to this percent. Clearly your answer below and clearly indicate the area on the histogram. (7 points)

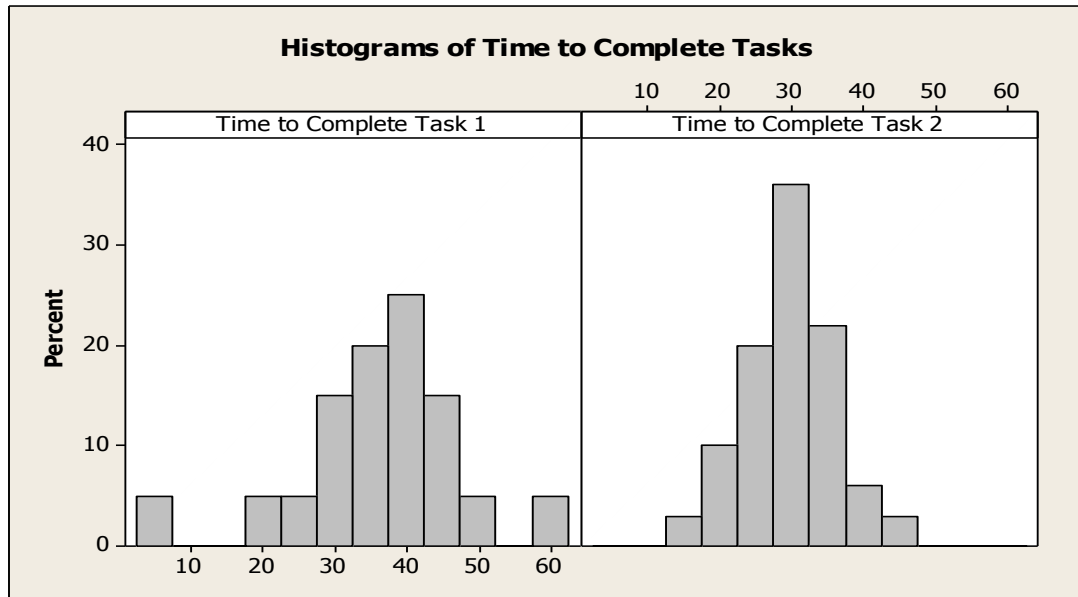
(d) Find the five number summary for this data. Clearly indicate your answers. (10 points)

(e) Draw a boxplot for the salaries of these college graduates. Clearly label your axes. (10 points)

(f) Based on your histogram and boxplot, circle all words below that best describe the shape of the distribution of salaries: (5 points)

symmetric                      slightly right skewed                      slightly left skewed                      normal  
uniform                      unimodal                      multimodal

**Problem 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: (6 points each, 12 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)?
- (b) Which task has the smaller standard deviation? Why?

**Problem III.** In a certain marathon, the average time to complete the race was approximately normally distributed with mean of 4.15 hours and a standard deviation 0.84 hours. Please answer the following being sure to show all calculator input. (30 points)

- (a) Draw a graph of the distribution. Be sure to draw the distribution with proper shape, label your axis, and show variable values at  $\pm 1$ ,  $\pm 2$ , and  $\pm 3$  standard deviations from the mean. (12 points)
- (b) What time would correspond to a z-score of  $-2.34$ ? (8 points)
- (c) If a runner finished among the **slowest** 4% of runners, what could be their **fastest** possible time? Note: Fast times are smaller than slow times! (10 points)