Homework Assignment 1
Due: 04-Mar-27

PART I:

Look at the material on the web site for week 9 first. Use the Z-table the handout to answer the following questions. Always draw a picture to help you clarify your thinking. Show your work.

1) Suppose the heights of male undergraduate students are normally distributed with a mean of 70 inches and a standard deviation of 2 inches.

   a. What is the probability that a male undergraduate student chosen at random will be over 74 inches tall?

   b. What is the probability that a male undergraduate student chosen at random is less than 68 inches but more than 66 inches tall?

   c. In a group of 1000 male undergraduate students, how many would you expect to find over 73 inches tall?

   d. Suppose that the dorm orders beds for these students. The beds should be of such a size that, on average, only one man in 100 will be too long for his bed. What should the length of the beds be?

2) A recent graduate has two job offers and must decide which to accept. The job in City A pays $27,000. The average cost of living there is $50,000 with a standard deviation of $15,000. The job in City B pays $12,000. The average cost of living there is $14,000 with a standard deviation of $1,000. Assuming that cost of living is normally distributed in both cities, which is the better job offer? Why?

3) A test for selecting intellectually gifted children has a mean of 56 and a standard deviation of 8. Assume that the test scores are normally distributed.

   a. What percent of children are expected to score below 60?

   b. What percent of scores will be above 54?

   c. If a gifted child is defined as being in the top 20%, what is the minimum test score needed to qualify as gifted?
PART II:

Use Spss and the Los Angeles High School dataset to answer the following questions.

The “codebook” for this data set can be found at
http://www.indiana.edu/~educy520/sec6342/week_08/codebook_lahigh.pdf

The dataset is located at
http://www.indiana.edu/~educy520/sec6342/week_08/lahigh7.sav

The Spss commands that will be useful include formats, frequencies, crosstabs, examine, and some version of plot or graph.

1) Construct a frequency table for marks (grades) in Algebra for school Alpha.

2) Construct a joint frequency table (cross-tabulation) for marks in Algebra by school. Include column percentages. Describe the similarities and/or differences in the distribution of Algebra grades for the two schools.

3) Construct a stem-and-leaf plot for the NCE math scores for school Alpha. (Recall that the NCE has a mean = 50 and standard deviation of 21.06).

4) Construct a histogram for the NCE math scores for school Alpha.

5) Briefly describe the shape of the distribution of NCE math scores for school Alpha. If you had to choose one, would you present the stem-and-leaf plot or the histogram as a pictorial representation of the math score distribution?

6) Graph side-by-side box plots for the NCE math scores for the two schools.

7) What are the mean and standard deviation of NCE math scores for each school?

8) What is the “five number summary” (i.e., the maximum, third quartile (75th percentile), median (50th percentile), first quartile (25th percentile), and minimum) of NCE math scores for each school?

9) Describe the similarities and/or differences in the distribution of NCE math scores for the two schools. How does this compare to your answer in (2)?

10) What are the mean and standard deviation of NCE math scores for each school among only those students who failed algebra? What does this suggest about the reasons for the differences in NCE math scores between the two schools?