AP STATISTICS
Descriptive Statistics Worksheet (HW #11)

Work these problems out on **separate paper**. Show all work, and make sure any written explanations are in context!

1. An exam is given to students in an introductory statistics course. What is likely to be true of the shape of the histogram of scores if

   a) the exam is quite easy?
   b) the exam is quite difficult?
   c) half the students in the class have had calculus, the other half have had no prior college math courses, and the exam emphasizes mathematical manipulation?

2. Suppose a sample mean for $n = 13$ observations was $\bar{x} = 199.8$ (actually 199.7692), and the 14th observation, somewhat of an outlier, was 159. What is the value of $\bar{x}$ for the new sample?

3. The weights of 30 male college students is displayed in the stemplot to the right.

   a) Find the 5-number summary for this group of males' weights.
   b) Determine if there are any outliers in this distribution of weights.
   c) Construct a boxplot for this data.
   d) Do you expect the mean to be greater or less than the median? Explain.
   e) By how much could the largest weight be increased without affecting the value of the sample median?
   f) By how much could the largest weight be decreased without affecting the value of the sample median?

9	7
10	25
11	47
12	258
13	025789
14	14788
15	479
16	26
17	13
18	9
19	15
20	
21	
22	5

key: 14 | 7 = 147 pounds

4. Consider the following statement: More than 65% of the residents of Los Angeles earn less than the average wage for that city. Could this statement be correct? If so, how? If not, why not?

5. Suppose ten patients with meningitis received treatment with large doses of penicillin. Three days later, temperatures were recorded, and the treatment was considered successful if there had been a reduction in a patient's temperature. Denoting success by S and failure by F, the ten observations are

   S S F S S S F F S S

   a) What is the value of the sample proportion of successes?
   b) Replace each S with 1 and each F with 0. Then calculate $\bar{x}$ for this numerically coded sample. How does $\bar{x}$ compare to the sample proportion, $\hat{p}$?
   c) Suppose it is decided to include 15 more patients in the study.
      How many of these would have to be S's to give $\hat{p} = 0.80$ for the entire sample of 25 patients?

6. A sample distribution with $\bar{x} = 20$ and $s = 3$ is to be transformed by the linear function $y = 2x + 7$. What will be the mean and standard deviation of the transformed data?

7. Two friends, Andy and Bob, participate in a game of bowling every week. From past experiences, it is known that Andy has a mean score of 150 with a standard deviation of 30, and Bob has a mean score of 165 with a standard deviation of 15. We will assume that their scores in any given game are independent of one another's.

   a) Calculate the mean and standard deviation of their combined scores.
   b) If Andy and Bob were to compete against one another, calculate the mean and standard deviation for the number of points that Andy would win by.

Complete pg 91 # 10 (a only), and pg 131 #11, 12, 21