Unit 02 Practice Problems

2.1
Use this data set to draw a stem-and-leaf plot:

{ 0.9, 5.8, 6.6, 4.3, 8.8, 6.4, 3.2, 6.1, 2.0, 5.3, 7.2, 8.8, 8.6, 8.3, 1.5, 7.7, 4.1, 5.6, 8.1, 5.4, 7.0, 8.2, 7.4, 7.7, 7.0, 8.0, 7.6, 6.9, 3.6, 6.7, 4.6, 8.3, 8.4 }

2.2
Twelve left-handed pitchers were randomly selected and their heights were rounded to the nearest tenth of an inch. Use the data to draw a stem-and-leaf plot:

{ 71.2, 71.7, 72.6, 72.6, 73.0, 73.5, 74.1, 74.9, 75.2, 75.3, 76.4, 76.6 }

2.3
Refer to Practice Problem 2.1. Describe the shape of the stem-and-leaf plot.

2.4
Refer to Practice Problem 2.2. Describe the shape of the stem-and-leaf plot.

2.5
Refer to Practice Problem 1.1. The historian visits the 15 bells he randomly selected and measures their loudness in decibels (dB) when rung. The data is below. Draw a histogram and have the classes be [90,92), [92, 94), [94, 96), … etc. Describe the shape of the histogram.

{ 90.2, 98.7, 92.4, 94.7, 97.6, 98.1, 98.3, 93.8, 99.9, 95.9, 96.2, 94.3, 99.3, 99.5, 97.9 }

2.6
Use this data to draw a histogram and have the classes be [0, 5), [5, 10), [10, 15), … etc. Describe the shape of the histogram.

{ 0.107, 0.741, 0.849, 1.590, 2.686, 3.432, 4.114, 4.253, 5.107, 5.754, 7.423, 9.031, 9.315, 9.413, 10.108, 12.041, 12.394, 13.085, 13.997, 15.108, 19.034, 22.222 }

2.7
Three data sets are described below. Choose exactly one of the following descriptions for each data set:
The mean is less than the median.
The mean is greater than the median.
The mean and median are approximately equal.

a
The owner of a car dealership is looking at a list of the mileages on all the cars available on the lot. Almost all of the cars are brand new, so almost all of the mileages are close to zero. However, just a few are used cars with mileages greater than 80,000 miles.

b
A doctor is looking at a histogram from a data set of blood pressure measurements. The histogram is symmetric and bell-shaped, with most observations (tallest rectangles) in the middle.

c
A professor is looking at a large data set of exam scores. Almost all of the scores are between 70-90 points. However, a small handful of students had extremely low scores in the neighborhood of 10-20 points.

2.8
Refer to Practice Problem 2.2. Find the sample mean and median among the heights.

2.9
Refer to Practice Problem 2.5. Find the sample mean and median among the loudness measurements.

2.10
In a data set with $n = 13{,}642$ values, where would you find the median? What if $n = 173{,}209$?

2.11
Find the sample variance of the data set { 0, 3, 3, 9, 10, 13, 18 } using the both the “regular” formula and “convenient” formula. Make a table and show your work. You should get the same answer with both formulas. Finally, find the standard deviation.

2.12
Find the sample variance of the data set { 5, 8, 9, 10, 17, 21, 24, 30 } using the both the "regular" formula and "convenient" formula. Make a table and show your work. You should get the same answer with both formulas. Finally, find the standard deviation.

2.13
At a large high school exactly 100 juniors and 100 seniors are assembled in the auditorium. If you were to ask the students what grade they are in, the juniors would respond with "11" and the seniors would respond with "12". What is the sample mean of this data set? What is the approximate value of the standard deviation?

2.14
The members of a book club calculate the sample mean and standard deviation among their ages. $\overline{X} = 34.1$ and $s = 7.2$. What will be the sample mean and standard deviation among their ages exactly 5 years from today?

2.15
Each slot machine in a Las Vegas casino contains a certain number of quarters. Suppose the sample mean and standard deviation among the numbers of quarters are $\overline{X} = 512.4$ and $s = 83.5$. What is the sample mean and standard deviation among the dollar amounts of these quarters? (1 quarter = 0.25 dollars)

2.16
Create your own data sets, each with a sample size of $n = 5$, that satisfy the following descriptions. If no such data set could exist, write "impossible".

a
Both the mean and median equal ten, and the standard deviation is positive.

b
The standard deviation is negative.

c
Four of the five values are less than the mean.

d
The mean is negative, but the median is positive.

2.17
Refer to Practice Problem 2.2. Find the five number summary for the heights.

2.18
Refer to Practice Problem 2.5. Find the five number summary for the loudness measurements. Remember to order the data first.

2.19
In a data set with $n = 13{,}642$ values, where would you find the three quartiles? What if $n = 173{,}209$?

2.20
Sixteen cigarette smokers made a New Years resolution to quit smoking. Ten weeks later they were asked how many cigarettes they smoked yesterday. The responses were: { 0, 0, 1, 2, 3, 3, 6, 7, 9, 10, 10, 10, 11, 13, 19, 26 }

Find the five number summary, IQR, the locations of the inner and outer fences, and then use these values to draw a boxplot.

2.21
Examine the following boxplot.
Find the value of the range, IQR, and the location of the fences.