

Math 10 Homework Chapter 2

1. The February 10, 2017 Nielsen ratings of 20 TV programs shown on commercial television, all starting between 8 PM and 10 PM, are given below:

| | | | | | | | | | |
|-----|-----|-----|------|------|------|------|------|------|------|
| 2.1 | 2.3 | 2.5 | 2.8 | 2.8 | 3.6 | 4.4 | 4.5 | 5.7 | 7.6 |
| 7.6 | 8.1 | 8.7 | 10.0 | 10.2 | 10.7 | 11.8 | 13.0 | 13.6 | 17.3 |

- Graph a stem and leaf plot with the tens and ones units making up the stem and the tenths unit being the leaf. (for example, 2.1 would have a stem of 2 and a leaf of 1)
- Group the data into intervals of width 2, starting with the 1st interval at 2, and obtain the frequency of each of the intervals.
- Graphically depict the grouped frequency distribution in part b by a histogram.
- Obtain the relative frequency, cumulative frequency and cumulative relative frequency for the intervals in part b.
- Construct an ogive of the data. Estimate the median and quartiles.
- Obtain the sample mean and median. Do you believe that the data is symmetric, right-skewed or left skewed?
- Determine the sample variance and standard deviation.
- Assuming the data are bell shaped, between which two numbers would you expect to find 68% of the data?

2. The following data represents recovery time for 16 patients (arranged in a table to help you out)

| count | Days (X) | $X - \bar{X}$ | $(X - \bar{X})^2$ | Z Score |
|--------|----------|---------------|-------------------|---------|
| #1 | 2 | | | |
| #2 | 3 | | | |
| #3 | 4 | | | |
| #4 | 4 | | | |
| #5 | 5 | | | |
| #6 | 5 | | | |
| #7 | 5 | | | |
| #8 | 5 | | | |
| #9 | 5 | | | |
| #10 | 6 | | | |
| #11 | 6 | | | |
| #12 | 7 | | | |
| #13 | 7 | | | |
| #14 | 8 | | | |
| #15 | 8 | | | |
| #16 | 16 | | | |
| Totals | | | | |

- a. Calculate the sample mean and median
- b. Complete the 3rd and 4th column of the table and then calculate the variance and standard deviation.
- c. Use the range of the data to see if the standard deviation makes sense. (Range should be between 3 and 6 standard deviations)
- d. Using the empirical rule between what two numbers should you expect to see 68% of the data? 95% of the data? 99.7% of the data?
- e. In the last column of the table, calculate the Z-score for each observation. Do you think any of these data are outliers?

3. The following average daily commute time (minutes) for residents of two cities.

| | | | | | | | | | | | | | | | | | |
|---------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-------------------------------|
| City A | 2 | 4 | 4 | 4 | 4 | 5 | 7 | 9 | 13 | 14 | 16 | 16 | 16 | 18 | 19 | 19 | Sample mean = 29.06 |
| | 21 | 21 | 21 | 27 | 30 | 35 | 37 | 38 | 47 | 48 | 50 | 59 | 70 | 72 | 87 | 97 | Sample Std Dev = 25.35 |
| City B | 29 | 38 | 38 | 40 | 40 | 48 | 48 | 50 | 52 | 52 | 54 | 55 | 56 | 57 | 57 | 58 | Sample mean = 57.00 |
| | 58 | 58 | 59 | 59 | 59 | 62 | 62 | 63 | 66 | 66 | 67 | 69 | 69 | 71 | 75 | 89 | Sample Std Dev = 12.12 |

- Construct a back-to-back stem and leaf diagram and interpret the results.
- Find the quartiles and interquartile range for each group.
- Calculate the 80th percentile for each group.
- Construct side-by-side box plots and compare the two groups.
- For each city, determine the z-score for a commute of 75 minutes. For which group would a 75 minute commute be more unusual.

4. The following data represents the heights (in feet) of 20 almond trees in an orchard.

| | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|
| 14 | 14 | 14 | 14 | 15 | 18 | 18 | 20 | 21 | 21 |
| 22 | 24 | 25 | 25 | 25 | 27 | 27 | 29 | 31 | 45 |

- Construct a box plot of the data.
- Do you think the tree with height of 45 feet is an outlier? Use the box plot method to justify your answer.

5. Rank the following correlation coefficients from weakest to strongest.

.343, -.318, .214, -.765, 0, .998, -.932, .445