

Chapter 4: Practice Computational Problem Solutions

1. a) $Mean = \bar{X} = \frac{\sum X}{n} \quad n = 10$

Sum all the scores and compute. $Mean = \bar{X} = \frac{\sum X}{n} = \frac{511}{10} = 51.1$

b) First rank the scores from high to low. If n is odd then the median is the middle score. In this case n is even.

If n is even then identify the two middle scores

98
72
64
54
48--middle score
39--middle score
39
38
36
23

The median is the sum of the two middle scores divided by 2

$$Median = \frac{48 + 39}{2} = \frac{87}{2} = 43.5$$

c) To determine the mode, it's best to first rank the scores. The mode is the score that is represented the most times. There are two 39's. Mode = 39

2. a) $Mean = \bar{X} = \frac{\sum X}{n} = \frac{733}{13} = 56.385$

b) Rank order the scores. 49 50 51 52 52 53 55 59 60 60 61 63 68

There are an odd number of scores.

$$Median_{\text{odd number of scores}} = \left[\frac{n+1}{2} \right]^{th} \text{ score} = \frac{13+1}{2} = 7^{th} \text{ score} \quad \text{Median} = 55$$

c) There are two scores tied for most frequent score. The distribution is bimodal with two modes, 52 and 60.

3. a) $Mean = \bar{X} = \frac{\sum X}{n} = \frac{161}{35} = 4.6$

b) $Median_{\text{odd number of scores}} = \left[\frac{n+1}{2} \right]^{th} \text{ score} = \frac{35+1}{2} = 18th \text{ score.}$

Median = 4.

c) The mode is 1.

d) The distribution is skewed because the mean, median, and mode are not the same. The distribution has a positive skew because the mode is lower than the median and the median are lower than the mean. In this case, the median is the best measure of central tendency.

4. a) $Mean = \bar{X} = \frac{\sum X}{n} = \frac{2573}{30} = 85.767$

b) There is an even number of scores in the distribution.

$$Median_{\text{even number of scores}} = \frac{\left[\frac{n+2}{2} \right]^{th} \text{ score} + \left[\frac{n}{2} \right]^{th} \text{ score}}{2} =$$

$$Median_{\text{even number of scores}} = \frac{\left[\frac{30+2}{2} \right]^{th} \text{ score} + \left[\frac{30}{2} \right]^{th} \text{ score}}{2} = \frac{16th + 15th}{2} \text{ score}$$

$$= \frac{88+88}{2} = 88. \text{ The median is 88.}$$

c) The distribution is multimodal. The modes are 98, 88, and 78.

5. a) $Mean = \bar{X} = \frac{\sum X}{n} = \frac{125}{20} = 6.25$

b) There is an even number of scores.

$$Median_{\text{even number of scores}} = \frac{\left[\frac{n+2}{2} \right]^{th} \text{ score} + \left[\frac{n}{2} \right]^{th} \text{ score}}{2} =$$

$$= \frac{\left[\frac{20+2}{2} \right]^{th} \text{ score} + \left[\frac{20}{2} \right]^{th} \text{ score}}{2} = \frac{11th + 10th}{2} \text{ score} = \frac{4+4}{2} = 4 \text{ The median is 4.}$$

c) The mode is 4.

6. The shape of the distribution is skewed. The skew is positive. The tail points in the positive direction. The mode is less than the median and the median is less than the mean.

7. The data are nominal and the mode is Pizza Palace. Note, if you stated 47 was the mode that is not correct because that is the frequency.

8. $m = \frac{\sum X}{N} = \frac{1001}{50} = \20.01 . Note this problem required multiplying the dollars by the frequency (number of people contributing that amount of money). The company was a population also and not a sample. Please note the symbols in the formula.