Chapter 11.1: Find Measures of Central Tendency and Dispersion

Statistics are numerical values used to summarize and compare sets of data.

A measure of central tendency is a number used to represent the center or middle of a set of data values(mean, median,mode).

Mean- The average of the data set

Median- The middle number in the ascending data set. or the mean of the two middle numbers

Mode- The number that occurs the most. does not have to be a mode.

The data sets at the right give the waiting times (in minutes) of several people at two veterinary offices. Find the mean, median, and mode of each data set.
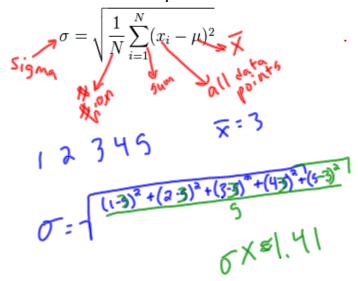
Office A	Office B
14, 17, 18, 19, 20, 24, 24, 30, 32	8, 11, 12, 16, 18, 18, 18, 20, 23

$\overline{X}$ = mean = 22
med = 20
mode = 24

$\overline{X}$ = 16
mode: 18
med: 18

Find the range of the waiting times in each data set in Example 1.

A measure of dispersion is a statistic that tells you how spread out the data values are.

Range- largest minus smallest

Standard Deviation- measures the difference of a data point and the mean.

$$\sigma = \sqrt{\frac{1}{N}\sum_{i=1}^{N}(x_i - \mu)^2}$$

Sigma

of
#'s

sum

all data
points

$\overline{x} = 3$

1 2 3 4 5

$$\sigma = \sqrt{\frac{(1-3)^2 + (2-3)^2 + (3-3)^2 + (4-3)^2 + (5-3)^2}{5}}$$

$\sigma x \approx 1.41$

On Calculator:

Stat edit list

stat calc 1-var stat

What is the standard deviation of the waiting times in each data set in Example 1?

Ⓐ 4.7 and 5.2   Ⓑ 5.7 and 5.2   Ⓒ 4.7 and 4.5   Ⓓ 5.7 and 4.5

You are competing in an air hockey tournament. The winning scores for the first 10 games are given below.

14, 15, 15, 17, 11, 15, 13, 12, 15, 13

a. **Find the mean, median, mode, range, and standard deviation of the data set.**

$\bar{X} = 14$ range: 6
med = 14.5 $\sigma = 1.67$
mode: 15

b. **The winning score in the next game is an outlier, 3. Find the new mean, median, mode, range, and standard deviation.**

$\bar{X} = 13$ range = 14
med = 14 $\sigma = 3.7$
mode = 15

c. **Which measure of central tendency does the outlier affect the most? the least?**

mean

d. **What effect does the outlier have on the range and standard deviation?**

Work: Chapter 11.1 pg.747 #'s 5,13,15,17,21,29