12.3 Measures of Dispersion

**Measures of dispersion** are used to describe the spread of data within a distribution. Two most common measures of dispersion are the **range** and the **standard deviation** of the data.

# OBJECTIVE 1: Determine the range for a data set

The **range** is the difference between the highest and lowest values in the data set. Recall that the midrange is the mean of these and is a measure of central tendency.

# OBJECTIVE 2: Determine the standard deviation for a data set

The **standard deviation** is a measure of dispersion that considers all of the data items and their difference from the mean. Since the deviations from the mean will always add up to zero, they are squared and added to give the square of the standard deviation.

**CALCULATING THE STANDARD DEVIATION**

1. Find the mean of the data set: 
2. Find the deviation of each data item from the mean: 
3. Square each deviation: 
4. Add the squared deviations: 
5. Divide by (*n* – 1) where *n* is the number of data items: 
6. Take the square root of this value and use the letter *s* to represent the standard deviation of the sample:



A table can help to organize intermediate calculations.

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