12.2 Measures of Central Tendency

**Measures of central tendency** are used to describe the average or typical data within a distribution. Mean, median, and mode are three measures that differ in their calculation methods and in their appropriateness for specific real-world situations.

# OBJECTIVE 1: Determine the mean for a data set

The **mean** is the sum of the data items divided by the number of items.

**CALCULATING THE MEAN**

The Greek letter sigma, , is used for summation. The expression  means the sum of all values of *x*. In this case each *x* is a data item and *n* is the number of data items in the set. The mean of the data set is represented by $.$



If the data has been arranged into a frequency distribution or histogram, the process of calculating the mean can be simplified by multiplying each data value by its frequency, *f*.



# OBJECTIVE 2: Determine the median for a data set

The **median** is the middle item in a data set.

**DETERMINING THE MEDIAN**

1. Arrange the data items in ascending order.
2. If the number of data items is odd, the median is the data item in the middle of the list. If *n* items are arranged in order, the position of the median in the list is $.$
3. If the number of data items is even, the median is the mean of the two middle data items. In this case, the median is not a data item. However, if the two middle items are equal, they will also be equal to the median.

# OBJECTIVE 3: Determine the mode for a data set

The **mode** is the data value that occurs most often in a data set. If more than one data value has the highest frequency, then each of these data values is a mode. If there is no data value that occurs most often, then the data set has no mode.

# OBJECTIVE 4: Determine the midrange for a data set

The **midrange** of a data set is the mean of the highest and lowest data values within the set.