

These are often referred to as measures of central tendency – a more accurate phrase.

Mode

Mode refers to most. Which one occurs most often? We can get this by first converting the data to a frequency distribution, and then identifying which values occurs most often.

It is possible that there is more than one value with the highest frequency. If there are two values, then the data set is called bi-modal.

Median

Median refers to the value in the middle of the data set. Arrange the data points in order. If there is an odd number, then there is a single middle value. If there is an even number, then find the average of the two in the middle.

Midrange

Midrange refers to the midpoint value between the highest and lowest.

Mean

Mean refers to average. In every day life, it's what most people call the average. Add up all the data points, and then divide by the number of data points.

Let's introduce some notation and formulas.

	Sample	Population
Data Point	x	x
Size	n	N
Mean	\bar{x} (x-bar)	μ (mu)
Formula	$\bar{x} = \frac{\sum x}{n}$	$\mu = \frac{\sum x}{N}$

Sometimes it is useful to calculate a trimmed mean. This is done by ordering the data points and trimming the top 5% and bottom 5% off the set. This is often done when there are outliers – values that are extremely low or extremely high.

From this point on, we will be using distinct variables and formulas to distinguish between sample and population.

Mean from a Frequency Distribution

With grouped data, we have a frequency distribution and class intervals.

We have to add a few columns to our calculation table:

Class	Freq	Midpt	
	f	x	xf
	$\sum f$		$\sum xf$

$\sum f$ represents n , the number of data points.

$\sum xf$ represents the sum of all the data points.

Therefore, the mean is now calculated by $\frac{\sum xf}{\sum f}$.

Weighted Mean

There are times when a particular value carries more weight than another. We modify the formula for the mean by replacing frequency with weight:

$$\frac{\sum xw}{\sum w}$$

An example is when you are asked to rate a topic using a scale, such as 1 for excellent and 5 for poor.

Skewness

Ideally, the mean, median and mode will all be equal. This is not always the case. A histogram of the data will show a definite shift to one side of the mean.