

What is the average in statistics?

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June 29, 2024

RECOMMENDED CITATION

stats writer (2024). *What is the average in statistics?*. PSYCHOLOGICAL SCALES.
Retrieved from <https://scales.arabpsychology.com/?p=158936>

The average, also known as the mean, is a commonly used measure of central tendency in statistics. It is calculated by adding up all the values in a data set and dividing it by the number of values. The average represents the typical or "average" value in the data set, and is often used to summarize and compare data. It is a useful tool for understanding the overall trend or pattern of a data set, and is often used in conjunction with other statistical measures to gain a better understanding of the data.

Statistics - Average

An average is a measure of where most of the values in the data are located.

The Center of the Data

The center of the data is where most of the values in the data are located. Averages are measures of the **location** of the center.

There are different types of averages. The most commonly used are:

Mean Median Mode

Note: In statistics, averages are often referred to as 'measures of **central tendency**'.

For example, using the values:

40, 21, 55, 21, 48, 13, 72

Mean

The mean is usually referred to as 'the average'.

The mean is the sum of all the values in the data divided by the total number of values in the data:

$$(40 + 21 + 55 + 31 + 48 + 13 + 72)/7 = 38.57$$

Note: There are multiple types of mean values. The most common type of mean is the **arithmetic** mean.

In this tutorial, 'mean' refers to the arithmetic mean.

Median

The **median** is the 'middle value' of the data.

The median is found by **ordering all the values** in the data and picking the middle value:

13, 21, 21, 40, 48, 55, 72

The median is less influenced by **extreme** values in the data than the mean.

Changing the last value to 356 does not change the median:

13, 21, 21, 40, 48, 55, **356**

The median is still 40.

Changing the last value to 356 changes the **mean** a lot:

$$(13 + 21 + 21 + 40 + 48 + 55 + 72)/7 = 38.57$$

$$(13 + 21 + 21 + 40 + 48 + 55 + \mathbf{356})/7 = 79.14$$

Note: Extreme values are values in the data that are much smaller or larger than the average values in the data.

Mode

The **mode** is the value(s) that appears most often in the data:

40, 21, 55, 21, 48, 13, 72

Here, 21 appears two times, and the other values only once. The mode of this data is 21.

The mode is also used for **categorical** data, unlike the median and mean. Categorical data can't be described directly with numbers, like names:

Alice, John, Bob, Maria, John, Julia, Carol

Here, John appears two times, and the other values only once. The mode of this data is John.

Note: There can be more than one mode if multiple values appear the same number of times in the data.

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