

## Glossary

### **1. Central moments**

Central moments form one set of values by which the properties of a probability distribution can be usefully characterized. Central moments are used in preference to ordinary moments because then the values' higher-order quantities relate only to the spread and shape of the distribution, rather than to its location.

### **2. Deciles**

In descriptive statistics, any of the nine values that divide the sorted data into ten equal parts, so that each part represents 1/10 of the sample or population.

### **3. Frequency distribution**

Frequency distribution is an arrangement of the values that one or more variables take in a sample. Each entry in the table contains the frequency or count of the occurrences of values within a particular group or interval, and in this way, the table summarizes the distribution of values in the sample.

### **4. Kurtosis**

Kurtosis is any measure of the "peakedness" of the probability distribution of a real-valued random variable. In a similar way to the concept of skewness, kurtosis is a descriptor of the shape of a probability distribution and, just as for skewness; there are different ways of quantifying it for a theoretical distribution and corresponding ways of estimating it from a sample from a population.

### **5. Mean**

The mean of a statistical distribution with a continuous random variable, also called the expected value, is obtained by integrating the product of the variable with its probability as defined by the distribution. The expected value is denoted by the lower case Greek letter mu ( $\mu$ ).

### **6. Median**

The median of a distribution with a continuous random variable is the value  $m$  such that the probability is at least 1/2 (50%) that a randomly chosen point on the function will be less than or equal to  $m$ , and the probability is at least 1/2 that a randomly chosen point on the function will be greater than or equal to  $m$ .

### **7. Modulus**

In mathematics, the absolute value (or modulus)  $|a|$  of a real number 'a' is the numerical value of a without regard to its sign. So, for example, the absolute value of 3 is 3, and the absolute value of -3 is also 3. The absolute value of a number may be thought of as its distance from zero.

## 8. Moments

A moment is, loosely speaking, a quantitative measure of the shape of a set of points. The moments about the arithmetic mean are called central moments. The moments about any other constant are called raw moments.

## 9. Percentiles

A percentile (or centile) is the value of a variable below which a certain percent of observations fall. For example, the 20th percentile is the value (or score) below which 20 percent of the observations may be found. The term percentile and the related term percentile rank are often used in the reporting of scores from norm-referenced tests. For example, if a score is in the 86th percentile, it is higher than 85% of the other scores.

## 10. Probability distribution

Probability distribution is a function that gives the probability of all elements in a given space.

## 11. Quantiles

Quantiles are points taken at regular intervals from the cumulative distribution function (CDF) of a random variable. Dividing ordered data into  $Q$  essentially equal-sized data subsets is the motivation for  $Q$ -quantiles; the quantiles are the data values marking the boundaries between consecutive subsets.

## 12. Quartiles

Quartiles of a set of values are the three points that divide the data set into four equal groups, each representing a fourth of the population being sampled. A quartile is a type of quantile.

## 13. Random variable

In probability and statistics, a random variable or stochastic variable is a variable whose value is subject to variations due to chance (i.e. randomness, in a mathematical sense). As opposed to other mathematical variables, a random variable conceptually does not have a single, fixed value rather; it can take on a set of possible different values, each with an associated probability.

## 14. Raw moments

The  $n$ th moment about zero of a probability density function  $f(x)$  is the expected value of  $X^n$  and is called a raw moment or crude moment.

## 15. Skewness

Skewness is a measure of the asymmetry of the probability distribution of a real-valued random variable. The skewness value can be positive or negative, or even undefined.

