

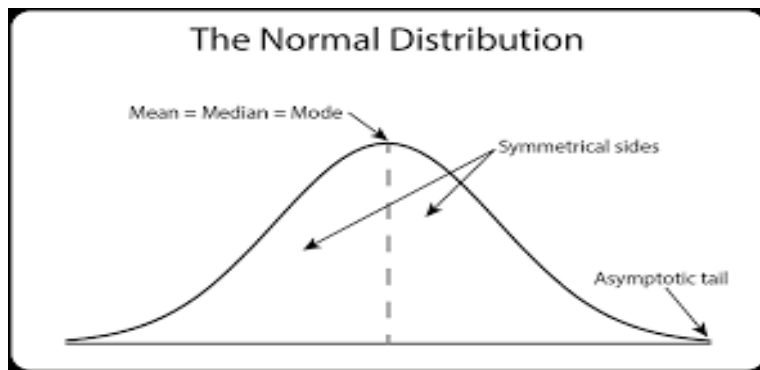
Introduction to the Normal Distribution

The normal distribution is a continuous probability distribution that is symmetrical on both sides of the mean, so the right side of the center is a mirror image of the left side.

The area under the normal distribution curve represents probability and the total area under the curve sums to one.

Most of the continuous data values in a normal distribution tend to cluster around the mean, and the further a value is from the mean, the less likely it is to occur.

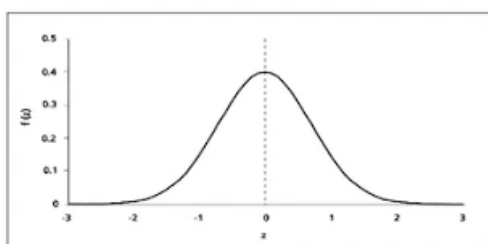
For a perfectly normal distribution the mean, median and mode will be the same value, visually represented by the peak of the curve.



The normal distribution is often called the bell curve because the graph of its probability density looks like a bell. It is also known as called Gaussian distribution, after the German mathematician Carl Gauss who first described it.

What is the difference between a normal distribution and a standard normal distribution?

A normal distribution is determined by two parameters the mean and the variance. A normal distribution with a mean of 0 and a standard deviation of 1 is called a standard normal distribution.



Why is the normal distribution important?

The normal distribution is the most important probability distribution in statistics because many continuous data in nature and psychology displays this bell-shaped curve when compiled and graphed.

For example, if we randomly sampled 100 individuals we would expect to see a normal distribution frequency curve for many continuous variables, such as IQ, height, weight and blood pressure.

What is the empirical rule formula?

The empirical rule in statistics allows researchers to determine the proportion of values that fall within certain distances from the mean. The empirical rule is often referred to as the three-sigma rule or the 68-95-99.7 rule.

This procedure allows researchers to determine the proportion of the values that fall within a specified number of standard deviations from the mean (i.e. calculate the empirical rule).

