

# *Abstract*

In probability theory and statistics, the **beta distribution** is a family of continuous probability distributions defined on the interval  $(0, 1)$  parameterized by two positive shape parameters, typically denoted by  $\alpha$  and  $\beta$ . The beta distribution can be suited to the statistical modelling of proportions in applications where values of proportions equal to 0 or 1 do not occur. One theoretical case where the beta distribution arises is as the distribution of the ratio formed by one random variable having a Gamma distribution divided by the sum of it and another independent random variable also having a Gamma distribution with the same scale parameter (but possibly different shape parameter).

The usual formulation of the beta distribution is also known as the beta distribution of the first kind, while beta distribution of the second kind has the alternative name of the beta prime distribution.

