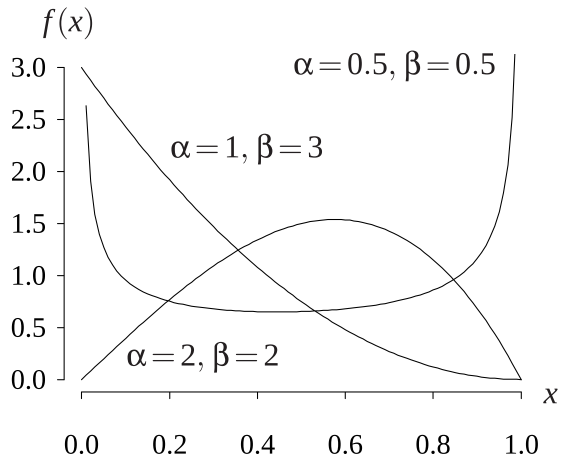
Minimax distribution (from http://www.math.wm.edu/~leemis/chart/UDR/UDR.html)
The shorthand $X \sim \text{minimax}(\beta, \gamma)$ is used to indicate that the random variable X has the minimax distribution with positive shape parameters β and γ. A minimax random variable X with parameters β and γ has probability density function

$$f(x) = \beta\gamma x^{\beta-1}\left(1 - x^{\beta}\right)^{\gamma-1} \qquad 0 < x < 1.$$

The probability density function with three different parameter settings is illustrated below.



The cumulative distribution on the support of X is

$$F(x) = P(X \le x) = 1 - \left(1 - x^{\beta}\right)^{\gamma} \qquad 0 < x < 1.$$

The survivor functionx on the support of X is

$$S(x) = P(X \ge x) = \left(1 - x^{\beta}\right)^{\gamma} \qquad 0 < x < 1.$$

The hazard function on the support of X is

$$h(x) = \frac{f(x)}{S(x)} = \frac{\beta\gamma x^{\beta-1}}{1 - x^{\beta}} \qquad 0 < x < 1.$$

The inverse distribution function of X is

$$F^{-1}(u) = \left(1 - (1-u)^{1/\gamma}\right)^{1/\beta} \qquad 0 < u < 1.$$

The cumulative hazard, moment generating, and characteristic functions on the support of X are mathematically intractable.

The population mean of X is

$$E[X] = \frac{\Gamma(\gamma+1)\,\Gamma((\beta+1)/\beta)}{\Gamma((\beta\gamma+\beta+1)/\beta)} \qquad .$$