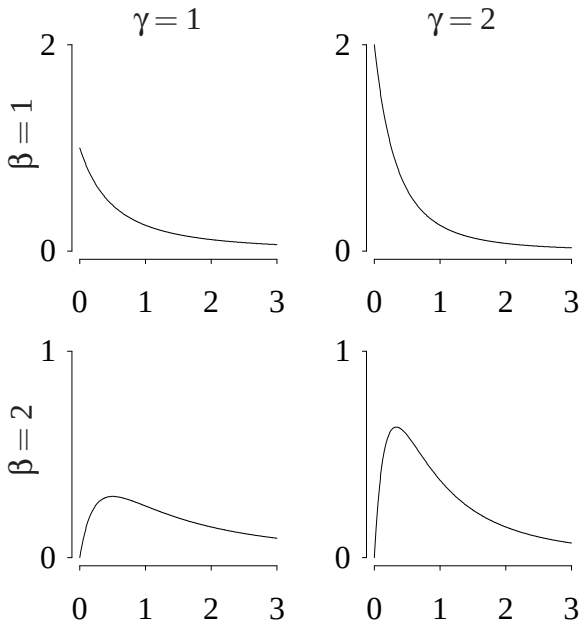
Inverted beta distribution (from http://www.math.wm.edu/~leemis/chart/UDR/UDR.html) The shorthand $X \sim$ inverted beta(β,γ) is used to indicate that the random variable X has the inverted beta distribution with parameters β and γ. A inverted beta random variable X with parameters β and γ has probability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

$$f(x) = \frac{x^{\beta-1}(x+1)^{-\beta-\gamma}}{B(\beta,\gamma)} \qquad x > 0,$$

for $\beta \geq 1$ and $\gamma \geq 1$. The probability density function with four different parameter settings is illustrated below.



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

The population mean of X is

$$E[X] = \frac{\Gamma(-1+\gamma)\Gamma(1+\beta)}{\Gamma(\beta+\gamma)B(\beta,y)}.$$

APPL verification: The APPL statements

```
assume(beta > 1);
assume(y > 1);
X := [[x -> x ^ (beta - 1) * (1 + x) ^ (-beta - y) / Beta(beta, y)],
      [0, infinity],["Continuous", "PDF"]];
Mean(X);
Variance(X);
Skewness(X);
Kurtosis(X);
```

verify the population mean, variance, skewness, and kurtosis.