Theorem The standard uniform distribution is a special case of the beta distribution when $\beta = \gamma = 1$.

Proof Let the random variable $X \sim \text{beta}(\beta, \gamma)$. The probability density function of X is

$$f_X(x) = \frac{\Gamma(\beta+\gamma)x^{\beta-1}(1-x)^{\gamma-1}}{\Gamma(\beta)\Gamma(\gamma)} \qquad\qquad 0 < x < 1.$$

Substituting $\beta = \gamma = 1$ yields

$$f_X(x) = \frac{\Gamma(1+1)x^{1-1}(1-x)^{1-1}}{\Gamma(1)\Gamma(1)} = 1 \qquad\qquad 0 < x < 1,$$

which is the probability density function of a standard uniform random variable.

APPL verification: The APPL statements

```
alpha := 1;
beta := 1;
X := BetaRV(alpha, beta);
Y := UniformRV(0, 1);
```

confirm the result.