Theorem The exponential distribution is a special case of the Weibull (α, β) distribution when $\beta = 1$.

Proof Let the random variable X have the Weibull distribution with probability density function

$$f(x) = \frac{\beta}{\alpha} x^{\beta-1} e^{-x^{\beta}/\alpha} \qquad x > 0.$$

When $\beta = 1$, this reduces to

$$f(x) = \frac{1}{\alpha} e^{-x/\alpha} \qquad x > 0.$$

which is the probability density function of the exponential distribution.

APPL verification: The APPL statements

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WeibullRV(1 / alpha, 1);
ExponentialRV(1 / alpha);
```

yield identical probability density functions

$$f(x) = \frac{1}{\alpha} e^{-x/\alpha} \qquad x > 0.$$