**Theorem** The log logistic($\lambda, \kappa$) distribution is a special case of the Lomax($\lambda, \kappa$) distribution when $\kappa = 1$.

**Proof** Let the random variable $X$ have the Lomax($\lambda, \kappa$) distribution with probability density function

$$f_X(x) = \frac{\lambda \kappa}{(1 + \lambda x)^{\kappa+1}} \quad x > 0.$$  

When $\kappa = 1$, this becomes

$$f(x) = \frac{\lambda}{[1 + \lambda x]^2} \quad x > 0,$$

which is the probability density function of the log logistic($\lambda, \kappa$) distribution when $\kappa = 1$.

**APPL verification:** The APPL statements

```apl
kappa := 1;
X := LomaxRV(kappa, lambda);
Y := LogLogisticRV(lambda, kappa);
```

yield identical the functional forms

$$f(x) = \frac{\lambda}{[1 + (\lambda x)]^2} \quad x > 0$$

for the random variables $X$ and $Y$, which verifies that the log logistic($\lambda, \kappa$) distribution is a special case of the Lomax($\lambda, \kappa$) distribution when $\kappa = 1$. 
