Distributions	Probability density function	Distribution moments
Pearson type III (PIII)	$f_Y(y \| \theta_1, \theta_2, \theta_3) = \frac{(y-\theta_3)^{1/\theta_2^2 - 1}}{\Gamma(1/\theta_2^2)(\theta_1\theta_2^2)^{1/\theta_2^2}} \exp\left(-\frac{y-\theta_3}{\theta_1\theta_2^2}\right)$ $y > \theta_3, \theta_3 > 0, \theta_1 > 0, \theta_2 > 0$	$E[Y] = \theta_1 + \theta_3$ $\text{Var}[Y] = \theta_1^2\theta_2^2$
Gamma (GA)	$f_Y(y \| \theta_1, \theta_2) = \frac{(y)^{1/\theta_2^2 - 1}}{\Gamma(1/\theta_2^2)(\theta_1\theta_2^2)^{1/\theta_2^2}} \exp\left(-\frac{y}{\theta_1\theta_2^2}\right)$ $y > 0, \theta_1 > 0, \theta_2 > 0$	$E[Y] = \theta_1$ $\text{Var}[Y] = \theta_1^2\theta_2^2$
Weibull (WEI)	$f_Y(y \| \theta_1, \theta_2) = \left(\frac{\theta_2}{\theta_1}\right)\left(\frac{y}{\theta_1}\right)^{\theta_2 - 1} \exp\left(-\left(\frac{y}{\theta_1}\right)^{\theta_2}\right)$ $y > 0, \theta_1 > 0, \theta_2 > 0$	$E[Y] = \theta_1\Gamma(1 + 1/\theta_2)$ $\text{Var}[Y] = \theta_1^2\left[\Gamma\left(1 + \frac{2}{\theta_2}\right) - \Gamma^2\left(1 + \frac{1}{\theta_2}\right)\right]$
Lognormal (LOGNO)	$f_Y(y \| \theta_1, \theta_2) = \frac{1}{y\theta_2\sqrt{2\pi}} \exp\left\{-\frac{[\log(y) - \theta_1]^2}{2\theta_2^2}\right\}$ $y > 0, \theta_2 > 0$	$E[Y] = w^{1/2}e^{\theta_1}$ $\text{Var}[Y] = w(w-1)e^{2\theta_1}$ $w = \exp\left(\theta_2^2\right)$
Generalized extreme value (GEV)	$f_Y(y \| \theta_1, \theta_2, \theta_3) = \frac{1}{\theta_2}\left[1 + \theta_3\left(\frac{y-\theta_1}{\theta_2}\right)\right]^{-1/\theta_3 - 1} \exp\left\{-\left[1 + \theta_3\left(\frac{y-\theta_1}{\theta_2}\right)\right]^{-1/\theta_3}\right\}$ $-\infty < \theta_1 < \infty, \theta_2 > 0, -\infty < \theta_3 < \infty$	$E[Y] = \theta_1 - \frac{\theta_2}{\theta_3} + \frac{\theta_2}{\theta_3}\eta_1$ $\text{Var}[Y] = \theta_2^2\left(\eta_2 - \eta_1^2\right)/\theta_3^2$ $\eta_m = \Gamma(1 - m\theta_3)$