List of distributions

Name	Notation	Parameters	Support	Density	Mean	Variance
Beta	$\text{Beta}(\alpha, \beta)$	$\alpha > 0$: shape $\beta > 0$: rate	$y \in (0,1)$	$\frac{\Gamma(\alpha+\beta)}{\Gamma(\alpha)\Gamma(\beta)} y^{\alpha-1}(1-y)^{\beta-1}$	$\frac{\alpha}{\alpha+\beta}$	$\frac{\alpha\beta}{(\alpha+\beta)^2(\alpha+\beta+1)}$
Binomial	$\text{Binomial}(n, \theta)$	$n \in \mathbb{N}_0$: number of trials $\theta \in [0,1]$: success probability	$y \in \{0, \ldots, n\}$	$\binom{n}{y}\theta^y(1-\theta)^{n-y}$	$n\theta$	$n\theta(1-\theta)$
Cauchy	$\text{Cauchy}(\theta, \gamma)$	$\theta \in \mathbb{R}$: location $\gamma > 0$: scale	$y \in (-\infty, +\infty)$	$\frac{1}{\pi\gamma\left[1+\left(\frac{y-\theta}{\gamma}\right)^2\right]}$	undefined	undefined
Exponential	$\text{Exp}(\theta)$	$\theta > 0$: rate	$y \in [0, +\infty)$	$\theta\exp(-\theta y)$	θ^{-1}	θ^{-2}
Gamma	$\Gamma(\alpha, \beta)$	$\alpha > 0$: shape $\beta > 0$: rate	$y \in (0, +\infty)$	$\frac{\beta^\alpha}{\Gamma(\alpha)} y^{\alpha-1}\exp(-\beta y)$	$\frac{\alpha}{\beta}$	$\frac{\alpha}{\beta^2}$
Inverse gamma	$\text{Inv-}\Gamma(\alpha, \beta)$	$\alpha > 0$: shape $\beta > 0$: scale	$y \in (0, +\infty)$	$\frac{\beta^\alpha}{\Gamma(\alpha)} y^{-\alpha-1}\exp(-\beta/y)$	$\frac{\beta}{\alpha-1}$	$\frac{\beta^2}{(\alpha-1)^2(\alpha-2)}$
Uniform	$\mathcal{U}([a,b])$	$-\infty < a < b < +\infty$	$y \in [a,b]$	$\frac{1}{b-a}\mathbb{1}\{y \in [a,b]\}$	$\frac{1}{2}(a+b)$	$\frac{1}{12}(b-a)^2$