Continuous Distributions

Distribution	pdf	Mean	Variance	`R` function
Beta(α, β)	$\frac{\Gamma(\alpha+\beta)}{\Gamma(\alpha)\Gamma(\beta)} x^{\alpha-1}(1-x)^{\beta-1}; x \in [0,1]; \alpha > 0, \beta > 0$	$\frac{\alpha}{\alpha+\beta}$	$\frac{\alpha\beta}{(\alpha+\beta)^2(\alpha+\beta+1)}$	`rbeta`
Gamma(α, β)	$\frac{\beta^\alpha}{\Gamma(\alpha)} x^{\alpha-1} e^{-\beta x}; x > 0; \alpha > 0; \beta > 0$	$\frac{\alpha}{\beta}$	$\frac{\alpha}{\beta^2}$	`rgamma`
Exponential(λ)	$\lambda e^{-\lambda x}; x \geq 0; \lambda > 0$	$\frac{1}{\lambda}$	$\frac{1}{\lambda^2}$	`rexp`
Normal(μ, σ^2)	$\frac{1}{\sqrt{2\pi\sigma^2}} e^{-\frac{(x-\mu)^2}{2\sigma^2}}; x \in \mathbb{R}; \mu \in \mathbb{R}; \sigma^2 > 0$	μ	σ^2	`rnorm`
Uniform(a, b)	$\frac{1}{b-a}; x \in [a,b]; -\infty < a < b < \infty$	$\frac{1}{2}(a+b)$	$\frac{1}{12}(b-a)^2$	`runif`

Discrete Distributions

Distribution	pmf	Mean	Variance	`R` function
Bernoulli(p)	$p^x(1-p)^{1-x}; x \in \{0,1\}; p \in [0,1]$	p	$p(1-p)$	`rbinom(size = 1)`
Binomial(n, p)	$\binom{n}{x} p^x (1-p)^{n-x}; x \in \{0,1,\ldots,n\}; p \in [0,1]$	np	$np(1-p)$	`rbinom`
Discrete Uniform(N)	$\frac{1}{N}; x \in \{1,\ldots,N\}; N \in \mathbb{N}$	$\frac{N+1}{2}$	$\frac{N^2-1}{12}$	`sample`
Geometric(p)	$(1-p)^{x-1}p; x \in \{1,2,3,\ldots\}; p \in [0,1]$	$\frac{1}{p}$	$\frac{1-p}{p^2}$	`rgeom`
Poisson(λ)	$\frac{\lambda^x e^{-\lambda}}{x!}; x \in \{0,1,2,\ldots\}; \lambda > 0$	λ	λ	`rpois`