Discrete Probability Models

Model	pdf $f(x)$	Support $\mathcal{X}$	Mean μ	Variance σ^2
Equilikely(a, b)	$\dfrac{1}{b-a+1}$	$x = a, a+1, \ldots, b$	$\dfrac{a+b}{2}$	$\dfrac{(b-a+1)^2 - 1}{12}$
Bernoulli(p)	$p^x(1-p)^{1-x}$	$x = 0, 1$	p	$p(1-p)$
Geometric(p)	$p^x(1-p)$	$x = 0, 1, 2, \ldots$	$\dfrac{p}{1-p}$	$\dfrac{p}{(1-p)^2}$
Pascal(n, p)	$\binom{n+x-1}{x} p^x(1-p)^n$	$x = 0, 1, 2, \ldots$	$\dfrac{np}{1-p}$	$\dfrac{np}{(1-p)^2}$
Binomial(n, p)	$\binom{n}{x} p^x(1-p)^{n-x}$	$x = 0, 1, \ldots, n$	np	$np(1-p)$
Poisson(μ)	$\dfrac{e^{-\mu}\mu^x}{x!}$	$x = 0, 1, 2, \ldots$	μ	μ

Continuous Probability Models

Model	pdf $f(x)$	Support $\mathcal{X}$	Mean μ	Variance σ^2
Uniform(a, b)	$\dfrac{1}{b-a}$	$a < x < b$	$\dfrac{a+b}{2}$	$\dfrac{(b-a)^2}{12}$
Exponential(μ)	$\dfrac{1}{\mu} e^{-x/\mu}$	$x > 0$	μ	μ^2
Erlang(n, b)	$\dfrac{1}{b\,(n-1)!} (x/b)^{n-1} e^{-x/b}$	$x > 0$	nb	nb^2
Normal$(0, 1)$	$\dfrac{1}{\sqrt{2\pi}} e^{-x^2/2}$	$-\infty < x < \infty$	0	1
Normal(μ, σ)	$\dfrac{1}{\sigma\sqrt{2\pi}} e^{-(x-\mu)^2/2\sigma^2}$	$-\infty < x < \infty$	μ	σ^2
Lognormal(a, b)	$\dfrac{1}{bx\sqrt{2\pi}} e^{-(\ln(x)-a)^2/2b^2}$	$x > 0$	$e^{a+b^2/2}$	$e^{2a+b^2}(e^{b^2} - 1)$
Chisquare(n)	$\dfrac{1}{2\Gamma(n/2)} (x/2)^{n/2-1} e^{-x/2}$	$x > 0$	n	$2n$
Student(n)	$\dfrac{(1 + x^2/n)^{-(n+1)/2}}{\sqrt{n}\, B(1/2\,,\, n/2)}$	$-\infty < x < \infty$	0	$\dfrac{n}{n-2}$