Discrete random variables

Distribution	Parameter	Frequency function	$E(X)$	$Var(X)$	mgf
Bernoulli	p	$p^x(1-p)^{1-x}$ $x = 0, 1,\ 0 < p < 1$	p	$p(1-p)$	$pe^t + 1 - p$ $-\infty < t < \infty$
Binomial	n, p	$\binom{n}{x}p^x(1-p)^{n-x}$ $x = 0, 1, \ldots, n$	np	$np(1-p)$	$(pe^t + 1 - p)^n$ $-\infty < t < \infty$
Geometric	p	$(1-p)^{x-1}p$ $x = 1, 2, \ldots$	$\frac{1}{p}$	$\frac{(1-p)}{p^2}$	$\frac{pe^t}{1-(1-p)e^t}$ $t < -\log(1-p)$
Negative Binomial	r, p	$\binom{x-1}{r-1}p^r(1-p)^{x-r}$ $x = r, r+1, \ldots$	$\frac{r}{p}$	$\frac{r(1-p)}{p^2}$	$\left(\frac{pe^t}{1-(1-p)e^t}\right)^r$ $t < -\log(1-p)$
Hyper-geometric	m, r, n	$\binom{r}{x}\binom{n-r}{m-x}/\binom{n}{m}$	$\frac{mr}{n}$	$\frac{n-m}{n-1}\frac{mr}{n}\left(1-\frac{r}{n}\right)$	
Poisson	λ	$\frac{e^{-\lambda}\lambda^x}{x!}$ $\lambda > 0,\ x = 0, 1, \ldots$	λ	λ	$e^{\lambda(e^t-1)}$ $-\infty < t < \infty$

Continuous random variables

Distribution	Parameter	Density function	$E(X)$	$Var(X)$	mgf
$U[0, 1]$		$1,\ 0 \le x \le 1$	$1/2$	$1/12$	$\frac{e^t-1}{t}$, $t \neq 0$
Exponential	λ	$\lambda e^{-\lambda x}$ $x \ge 0, \lambda > 0$	$\frac{1}{\lambda}$	$\frac{1}{\lambda^2}$	$\frac{1}{1-t/\lambda}$ $t < \lambda$
Gamma	α, λ	$\frac{\lambda^\alpha}{\Gamma(\alpha)}x^{\alpha-1}e^{-\lambda x}$ $x \ge 0, \alpha, \lambda > 0$	$\frac{\alpha}{\lambda}$	$\frac{\alpha}{\lambda^2}$	$\left(\frac{1}{1-t/\lambda}\right)^\alpha$ $t < \lambda$
Normal	μ, σ	$\frac{1}{\sigma\sqrt{2\pi}}e^{-(x-\mu)^2/2\sigma^2}$ $-\infty < x < \infty$ $-\infty < \mu < \infty, \sigma > 0$	μ	σ^2	$e^{\mu t+\sigma^2 t^2/2}$ $-\infty < t < \infty$