Distribution	Parameters	PMF/PDF	Support	Expected Value	Variance	MGF
Bernoulli Bern(p)	$0 < p < 1$ $q = 1 - p$	$P(X = k) = p^k q^{1-k}$	$k \in \{0, 1\}$	p	pq	$q + pe^t$
Binomial Bin(n, p)	$0 < p < 1$ $n \in 1, 2 \dots$	$P(X = k) = \binom{n}{k} p^k q^{n-k}$	$k \in \{0, 1, \dots n\}$	np	npq	$(q + pe^t)^n$
Geometric Geom(p)	$0 < p < 1$ $q = 1 - p$	$P(X = k) = q^k p$	$k \in \{0, 1, \dots\}$	q/p	q/p^2	$\frac{p}{1-qe^t}$, $qe^t < 1$
First Success FS(p)	$0 < p < 1$ $q = 1 - p$	$P(X = k) = q^{k-1} p$	$k \in \{1, 2, \dots\}$	$1/p$	q/p^2	$\frac{pe^t}{1-qe^t}$, $qe^t < 1$
Neg. Binomial NBin(r, p)	$r > 0$ $0 < p < 1$	$P(X = k) = \binom{k + r - 1}{r - 1} p^r q^k$	$k \in \{0, 1, \dots\}$	rq/p	rq/p^2	$(\frac{p}{1-qe^t})^r$, $qe^t < 1$
Hypergeometric HGeom(w, b, n)	$w, b \in \{1, 2, \dots\}$ $n \in \{1, 2, \dots\}$	$P(X = k) = \binom{w}{k}\binom{b}{n-k}/\binom{w+b}{n}$	$k \in \{0, 1, \dots, n\}$	$\mu = \frac{nw}{b+w}$	$\left(\frac{w+b-n}{w+b-1}\right) n\frac{\mu}{n}(1 - \frac{\mu}{n})$	messy
Poisson Pois(λ)	$\lambda > 0$	$P(X = k) = \frac{e^{-\lambda}\lambda^k}{k!}$	$k \in \{0, 1, \dots\}$	λ	λ	$e^{\lambda(e^t - 1)}$
Uniform Unif(a, b)	$a < b$	$f(x) = \frac{1}{b - a}$	$x \in (a, b)$	$\frac{a+b}{2}$	$\frac{(b-a)^2}{12}$	$\frac{e^{tb} - e^{ta}}{t(b-a)}$
Normal $\mathcal{N}(\mu, \sigma^2)$	$\mu \in \mathbb{R}$ $\sigma^2 > 0$	$f(x) = \frac{1}{\sigma\sqrt{2\pi}} e^{-(x-\mu)^2/(2\sigma^2)}$	$x \in (-\infty, \infty)$	μ	σ^2	$e^{t\mu + \frac{\sigma^2 t^2}{2}}$
Exponential Expo(λ)	$\lambda > 0$	$f(x) = \lambda e^{-\lambda x}$ $F(x) = 1 - e^{-\lambda x}$	$x \in (0, \infty)$	$\frac{1}{\lambda}$	$\frac{1}{\lambda^2}$	$\frac{\lambda}{\lambda - t}$, $t < \lambda$
Gamma Gamma(a, λ)	$a > 0$ $\lambda > 0$	$f(x) = \frac{\lambda^a}{\Gamma(a)} x^{a-1} e^{-\lambda x}$	$x \in (0, \infty)$	$\frac{a}{\lambda}$	$\frac{a}{\lambda^2}$	$\left(\frac{\lambda}{\lambda - t}\right)^a$, $t < \lambda$
Beta Beta(a, b)	$a > 0$ $b > 0$	$f(x) = \frac{\Gamma(a+b)}{\Gamma(a)\Gamma(b)} x^{a-1}(1-x)^{b-1}$	$x \in (0, 1)$	$\mu = \frac{a}{a+b}$	$\frac{\mu(1-\mu)}{(a+b+1)}$	messy
Log-Normal $\mathcal{LN}(\mu, \sigma^2)$	$\mu \in \mathbb{R}$ $\sigma^2 > 0$	$f(x) = \frac{1}{x\sigma\sqrt{2\pi}} e^{-(\log x - \mu)^2/(2\sigma^2)}$	$x \in (0, \infty)$	$\theta = e^{\mu + \sigma^2/2}$	$\theta^2(e^{\sigma^2} - 1)$	doesn't exist