Distr.	Parameters	Possible description	$E[X]$	$Var(X)$	PDF/PMF	CDF ($F_X(x) = P(X \leq x)$)
Uniform (disc)	$\boldsymbol{Unif(a,b)}$ $for\ a,b \in \mathbb{Z}$ $a \leq b$	Equally likely to be any integer in $[a,b]$	$\frac{a+b}{2}$	$\frac{(b-a)(b-a+2)}{12}$	$\frac{1}{b-a+1}$ $for\ k = a, a+1, \ldots, b$	---
Bernoulli (disc)	$\boldsymbol{Ber(p)}$ $for\ p \in [0,1]$	Takes value 1 with prob p and 0 with prob $1-p$	p	$p(1-p)$	$p^k(1-p)^{1-k}$ $for\ k = 0,1$	---
Binomial (disc)	$\boldsymbol{Bin(n,p)}$ $for\ n \in \mathbb{N}$, $p \in [0,1]$	Sum of n independent Bernoulli trials, each with parameter p	np	$np(1-p)$	$\binom{n}{k} p^k (1-p)^{n-k}$ $for\ k = 0,1,\ldots,n$	---
Poisson (disc)	$\boldsymbol{Poi(\lambda)}$ $for\ \lambda > 0$	# of events that occur in a unit of time independently with rate λ per unit time	λ	λ	$\frac{\lambda^k}{k!} e^{-\lambda}$ $for\ k = 0,1,\ldots$	---
Geometric (disc)	$\boldsymbol{Geo(p)}$ $for\ p \in [0,1]$	# of independent Bernoulli trials with parameter p up to and including first success	$\frac{1}{p}$	$\frac{1-p}{p^2}$	$(1-p)^{k-1}p$ $for\ k = 1,2,\ldots$	$1-(1-p)^x$ $for\ x = 1,2,\ldots$
Hypergeometric (disc)	$\boldsymbol{HypGeo(N,K,n)}$ $for\ n,K \leq N$	# of successes in n draws (w/out replacement) from N items that contain K successes in total	$n\frac{K}{N}$	$n\frac{K(N-K)(N-n)}{N^2(N-1)}$	$\frac{\binom{K}{k}\binom{N-K}{n-k}}{\binom{N}{n}}$ $for\ 0 \leq k \leq K,$ $0 \leq n-k \leq N-K$	---
Negative Binomial (disc)	$\boldsymbol{NegBin(r,p)}$ $for\ r \in \mathbb{N}$, $p \in [0,1]$	# of trials until r^{th} success in Bernoulli process	$\frac{r}{p}$	$\frac{r(1-p)}{p^2}$	$\binom{k-1}{r-1}(1-p)^{k-r}p^r$ $for\ k = r, r+1, \ldots$	---
Uniform (cont)	$\boldsymbol{Unif(a,b)}$ $for\ a < b$	Equally likely to be any real number in $[a,b]$	$\frac{a+b}{2}$	$\frac{(b-a)^2}{12}$	$\frac{1}{b-a}$ $for\ x \in [a,b]$	$0\ if\ x < a$ $\frac{x-a}{b-a}\ if\ a \leq x < b$ $1\ if\ x \geq b$
Exponential (cont)	$\boldsymbol{Exp(\lambda)}$ $for\ \lambda > 0$	Time until next event in Poisson process	$\frac{1}{\lambda}$	$\frac{1}{\lambda^2}$	$\lambda e^{-\lambda x}$ $for\ x \geq 0$	$1 - e^{-\lambda x}$ $for\ x \geq 0$
Normal (cont)	$\boldsymbol{N(\mu,\sigma^2)}$ $for\ \mu \in \mathbb{R},$ $\sigma^2 > 0$	Standard bell curve	μ	σ^2	$\frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{(x-\mu)^2}{2\sigma^2}}$ $for\ x \in \mathbb{R}$	$\Phi\left(\frac{x-\mu}{\sigma}\right)$
Gamma (cont)	$\boldsymbol{Gam(r,\lambda)}$ $for\ r,\lambda > 0$	Conjugate prior for exp, poi. Time to r^{th} event in Poisson process.	$\frac{r}{\lambda}$	$\frac{r}{\lambda^2}$	$\frac{\lambda^r}{\Gamma(r)} x^{r-1} e^{-\lambda x}$ $for\ x > 0$	---
Beta (cont)	$\boldsymbol{Beta(a,b)}$ $for\ a,b > 0$	Conjugate prior for ber, bin, geo, negbin. a,b control shape.	$\frac{a}{a+b}$	$\frac{ab}{(a+b)^2(a+b+1)}$	$\Gamma(a+b)\frac{x^{a-1}(1-x)^{b-1}}{\Gamma(a)\Gamma(b)}$ $for\ x \in [0,1]$	---

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