Quick reference for standard distributions

Name:	Discrete Uniform
Parameters:	integer $n \geq 1$
Notation:	$\text{Unif}\{1,\dots,n\}$
Support:	$\{1,\dots,n\}$
pmf:	$p(x) = 1/n$
Mean:	$(n+1)/2$
Variance:	$(n^2-1)/12$
Name:	Binomial
Parameters:	integer $n \geq 1$, real $p \in [0,1]$
Notation:	$\text{Bin}(n,p)$
Support:	$\{0,\dots,n\}$
pmf:	$p(x) = \binom{n}{x}p^x(1-p)^{n-x}$
Mean:	np
Variance:	$np(1-p)$
Name:	Negative Binomial
Parameters:	integer $r \geq 1$, real $p \in [0,1]$
Notation:	$\text{NB}(r,p)$
Support:	$\{r+1, r+2, r+3, \dots\}$
pmf:	$p(x) = \binom{x-1}{r-1}p^r(1-p)^{x-r}$
Mean:	r/p
Variance:	$r(1-p)/p^2$
Name:	Hypergeometric
Parameters:	$n, D, N \in \mathbb{Z}$ with $1 \leq n \leq N$, $1 \leq D \leq N$
Notation:	$\text{Hypergeo}(n,D,N)$
Support:	integers x with $x \leq \min(n,D)$, $\max(0, N-D-n) \leq x$
pmf:	$p(x) = \binom{D}{x}\binom{N-D}{n-x}/\binom{N}{n}$
Mean:	nD/N
Variance:	$nD(N-D)(N-n)/(N^2(N-1))$
Name:	Poisson
Parameters:	real $\lambda > 0$
Notation:	$\text{Poi}(\lambda)$
Support:	$\{0,1,2,\dots\}$
pmf:	$p(x) = e^{-\lambda}\lambda^x/x!$
Mean:	λ
Variance:	λ

Name:	Continuous Uniform
Parameters:	reals $a < b$
Notation:	$\text{U}[a,b]$
Support:	$[a,b]$
pdf:	$f(x) = 1/(b-a)$
Mean:	$(a+b)/2$
Variance:	$(b-a)^2/12$
Name:	Gamma
Parameters:	positive reals α, λ
Notation:	$\text{G}(\alpha,\lambda)$
Support:	$(0,\infty)$
pdf:	$f(x) = e^{-x/\lambda}x^{\alpha-1}/(\lambda^\alpha\Gamma(\alpha))$
Mean:	$\alpha\lambda$
Variance:	$\alpha\lambda^2$
Name:	Beta
Parameters:	positive reals α, β
Notation:	$\text{Be}(\alpha,\beta)$
Support:	$(0,1)$
pdf:	$f(x) = x^{\alpha-1}(1-x)^{\beta-1}/B(\alpha,\beta)$
Mean:	$\alpha/(\alpha+\beta)$
Variance:	$\alpha\beta/((\alpha+\beta)^2(\alpha+\beta+1))$
Name:	Pareto
Parameters:	positive reals α, θ
Notation:	$\text{Pa}(\alpha,\theta)$
Support:	$[\theta,\infty)$
pdf:	$f(x) = \alpha\theta^\alpha/x^{\alpha+1}$
Mean:	$\alpha\theta/(\alpha-1)$ if $\alpha > 1$
Variance:	$\alpha\theta^2/((\alpha-1)^2(\alpha-2))$ if $\alpha > 2$
Name:	Normal
Parameters:	reals μ, σ with $\sigma > 0$
Notation:	$\text{N}(\mu,\sigma^2)$
Support:	$\mathbb{R}$
pdf:	$f(x) = \frac{\exp(-(x-\mu)^2/(2\sigma^2))}{\sigma\sqrt{2\pi}}$
Mean:	μ
Variance:	σ^2

Notes: The Geometric Distribution $\text{Geo}(p)$ is $\text{NB}(1,p)$. The Exponential Distribution $\text{Exp}(\lambda)$ is $\text{G}(1,\lambda)$. The Gamma function is $\Gamma(\alpha) = \int_0^\infty e^{-x}x^{\alpha-1}dx$, and $\Gamma(n) = (n-1)!$ for positive integers n. The Beta function is $B(\alpha,\beta) = \int_0^1 x^{\alpha-1}(1-x)^{\beta-1}dx = \Gamma(\alpha)\Gamma(\beta)/\Gamma(\alpha+\beta)$.

Normal Table

$\Phi(x)$	0	1	2	3	4	5	6	7	8	9
0.	0.50	0.54	0.58	0.62	0.66	0.69	0.73	0.76	0.79	0.82
1.	0.84	0.86	0.88	0.90	0.92	0.93	0.95	0.96	0.96	0.97
2.	0.98	0.98	0.99	0.99	0.99	0.99	1.00	1.00	1.00	1.00

Here $\Phi(x)$ is the standard normal CDF, $\Phi(x) = \int_{-\infty}^{x} \frac{\exp(-t^2/2)}{\sqrt{2\pi}}dt$.