Distribución	Parámetros	Función de Probabilidad	Dominio	Media	Varianza	Función Generatriz de Momentos
Bernoulli	$x \sim bernoulli(p)$	$f(x) = p^x(1-p)^{1-x}$	$x = 0, 1$	p	$p(1-p)$	$(1-p) + e^t p$
Binomial	$x \sim bin(n, p)$	$f(x) = \binom{n}{x} p^x (1-p)^{n-x}$	$x = 1, 2, \dots, \mathbb{Z}^+$	np	$np(1-p)$	$[(1-p) + e^t p]^n$
Binomial Negativa	$x \sim NB(r, p)$	$f(x) = \binom{x-1}{r-1} p^r (1-p)^{x-r}$	$x = r, r+1, \dots, \mathbb{Z}^+$	$\frac{r}{p}$	$\frac{r(1-p)}{p^2}$	$\left[\frac{pe^t}{1-e^t(1-p)}\right]^r$
Geométrica	$x \sim geo(p)$	$f(x) = p(1-p)^{x-1}$	$x = 1, 2, \dots, \mathbb{Z}^+$	$\frac{1}{p}$	$\frac{(1-p)}{p^2}$	$\frac{pe^t}{1-e^t(1-p)}$
Poisson	$x \sim POI(\lambda)$	$f(x) = \frac{e^{-\lambda}\lambda^x}{x!}$	$x = 0, 1, 2, \dots, \mathbb{Z}^+$	λ	λ	$e^{\lambda(e^t - 1)}$
Hipergeométrica	$x \sim hyp(N, M, K)$	$f(x) = \frac{\binom{M}{x}\binom{N-M}{K-x}}{\binom{N}{K}}$	$x = 0, 1, 2, \dots, \mathbb{Z}^+$	$\frac{KM}{N}$	$\frac{KM}{N}\left[\frac{(N-M)(N-K)}{N(N-1)}\right]$	–
Uniforme Discreta Escalonada	$x \sim DU(x_1, \dots, x_k)$	$f(x) = \frac{1}{k}$	$x = x_1, x_2, \dots, x_k$	$\bar{x}$	$\sum_{i=1}^{k} \frac{(x_i - \bar{x})^2}{k}$	–
Uniforme Discreta Seguida	$x \sim DU(1, k)$	$f(x) = \frac{1}{k}$	$x = 1, 2, \dots, k$	$\frac{k+1}{2}$	$\frac{k^2 - 1}{12}$	$\frac{1}{k}\left[\frac{e^t(1-e^{tk})}{1-e^t}\right]$

Distribución	Parámetros	Función de Probabilidad	Dominio	Media	Varianza
Uniforme Continua	$x \sim unif(a,b)$	$f(x) = \frac{1}{b-a}$	$a < x < b$	$\frac{b+a}{2}$	$\frac{(b-a)^2}{12}$
Gamma	$x \sim gam(\alpha,\beta)$	$f(x) = \frac{1}{\Gamma(\alpha)\beta^{\alpha}} x^{\alpha-1} e^{-\frac{x}{\beta}}$	$x > 0$	$\alpha\beta$	$\alpha\beta^2$
Exponencial	$x \sim \exp(\theta)$	$f(x) = \frac{1}{\theta} e^{-\frac{x}{\theta}}$	$x > 0$	θ	θ^2
χ^2	$x \sim \chi^2_{v}$	$f(x) = \frac{1}{\Gamma\left(\frac{v}{2}\right) 2^{v/2}} x^{v/2-1} e^{-\frac{x}{2}}$	$x > 0$	v	$2v$
T	$x \sim T_v$	$f(x) = \frac{\Gamma\left(\frac{v+1}{2}\right)}{\Gamma\left(\frac{v}{2}\right)} \frac{1}{\sqrt{v\pi}} \left(1 + \frac{x^2}{v}\right)^{-\left(\frac{v+1}{2}\right)}$	$x \epsilon \mathbb{R}$	0	$\frac{v}{v+2}; v > 2$
F	$x \sim F_{v_1,v_2}$	$f(x) = \frac{\Gamma\left(\frac{v_1+v_2}{2}\right)}{\Gamma\left(\frac{v_1}{2}\right)\Gamma\left(\frac{v_2}{2}\right)} \left(\frac{v_1}{v_2}\right)^{\frac{v_1}{2}} x^{\frac{v_1}{2}-1} \left(1 + \frac{v_1}{v_2} x\right)^{-\left(\frac{v_1+v_2}{2}\right)}$	$x > 0$	$\frac{v_2}{v_2-2}$	$\frac{2{v_2}^2}{v_1}\left[\frac{v_1+v_2-2}{(v_2-2)^2(v_2-4)}\right]$
Normal	$x \sim N(\mu,\sigma^2)$	$f(x) = \frac{1}{\sqrt{2\pi}\sigma} e^{-\frac{1}{2\sigma^2}(x-\mu)^2}$	$x \epsilon \mathbb{R}$	μ	σ^2
Lognormal	$x \sim LOGN(\mu,\sigma^2)$	$f(x) = \frac{1}{\sqrt{2\pi}x\sigma} e^{-\frac{1}{2\sigma^2}(\ln x-\mu)^2}$	$x > 0$	$e^{\mu+\frac{\sigma^2}{2}}$	$\left(e^{\sigma^2} - 1\right) e^{2\mu+\sigma^2}$

Distribución	Parámetros	Función de Probabilidad	Dominio	Media	Varianza
Beta	$x \sim beta(\alpha, \beta)$	$f(x) = \frac{\Gamma(\alpha+\beta)}{\Gamma(\alpha)\Gamma(\beta)} x^{\alpha-1}(1-x)^{\beta-1}$	$0 < x < 1$	$\frac{\alpha}{\alpha+\beta}$	$\frac{\alpha\beta}{(\alpha+\beta)^2(\alpha+\beta+1)}$
Pareto	$x \sim pareto(\theta, k)$	$f(x) = \frac{k}{\theta}\left(1+\frac{x}{\theta}\right)^{-(k+1)}$	$x > 0$	$\frac{\theta}{k-1}$	$\frac{\theta^2 k}{(k-2)(k-1)^2}$
Weibull	$x \sim weibull(\theta, \beta)$	$f(x) = \frac{\beta}{\theta^\beta} x^{\beta-1} e^{-\left(\frac{x}{\theta}\right)^\beta}$	$x > 0$	$\theta\Gamma\left(1+\frac{1}{\beta}\right)$	$\theta^2\left\{\Gamma\left(1+\frac{2}{\beta}\right) - \left[\Gamma\left(1+\frac{1}{\beta}\right)\right]^2\right\}$
Exponencial de Dos Parámetros	$x \sim exp(\theta, \eta)$	$f(x) = \frac{1}{\theta} e^{-\left(\frac{x-\eta}{\theta}\right)}$	$x > \eta$	$\theta + \eta$	θ^2
Doble Exponencial	$x \sim DE(\theta, \eta)$	$f(x) = \frac{1}{2\theta} e^{-\frac{\lvert X-\eta \rvert}{\theta}}$	$x \epsilon \mathbb{R}$	η	$2\theta^2$
Cauchy	$x \sim CAU(\theta, \eta)$	$f(x) = \frac{1}{\theta\pi\left\{1+\left(\frac{x-\eta}{\theta}\right)^2\right\}}$	$x \epsilon \mathbb{R}$	$-$	$-$
Valores Extremos (Gumbel)	$x \sim gumbel(\theta, \eta)$	$f(x) = \frac{1}{\theta} e^{-\left(\frac{x-\eta}{\theta}\right)} e^{-e^{-\left(\frac{x-\eta}{\theta}\right)}}$	$x \epsilon \mathbb{R}$	$\eta - \gamma\theta$ $\gamma = 0.5772$	$\frac{\pi^2\theta^2}{6}$
Logística	$x \sim LOG(\mu, \theta)$	$f(x) = \frac{1}{4\theta} sech^2\left(\frac{x-\mu}{2\theta}\right)$	$x \epsilon \mathbb{R}$	μ	$\frac{\pi^2}{3}\theta^2$

Distribución	Parámetros	Función Generatriz de Momentos	Función Acumulada
Uniforme Continua	$x \sim unif(a,b)$	$\frac{e^{bt}-e^{at}}{t(b-a)}$	$F(x)=\frac{x-a}{b-a}$
Gamma	$x \sim gam(\alpha,\beta)$	$\frac{1}{(1-\beta t)^{\alpha}}$	–
Exponencial	$x \sim \exp(\theta)$	$\frac{1}{1-\theta t}$	$F(x)=1-e^{-\frac{x}{\theta}}$
χ^2	$x \sim \chi_v^2$	$\frac{1}{(1-2t)^{\frac{v}{2}}}$	–
Normal	$x \sim \mathrm{N}(\mu,\sigma^2)$	$e^{\mu t+\frac{\sigma^2 t^2}{2}}$	–
Beta	$x \sim \mathrm{beta}(\alpha,\beta)$	$1+\sum_{k=1}^{\infty}\left(\prod_{r=0}^{k-1}\frac{\alpha+r}{\alpha+\beta+r}\right)\frac{t^k}{k!}$	–
Weibull	$x \sim \mathrm{weibull}(\theta,\beta)$	$\sum_{n=0}^{\infty}\frac{t^n\theta^n}{n!}\Gamma\left(1+\frac{n}{\beta}\right)$	$F(x)=1-e^{-\left(\frac{x}{\theta}\right)^{\beta}}$

Distribución	Parámetros	Función Generatriz de Momentos	Función Acumulada
Cauchy	$x \sim \mathrm{CAU}(\theta,\eta)$	$-$	$F(x)=\frac{1}{\pi}\tan^{-1}\left(\frac{x-\eta}{\theta}\right)+\frac{1}{2}$
Exponencial de Dos Parámetros	$x \sim \exp(\theta,\eta)$	$\frac{e^{\eta t}}{1-\theta t}$	$F(x)=1-e^{-\frac{(x-\mu)}{\theta}}$
Doble Exponencial	$x \sim \mathrm{DE}(\theta,\eta)$	$\frac{e^{\eta t}}{1-\theta^2 t^2}$	$-$
Valores Extremos (Gumbel)	$x \sim \mathrm{EV}(\theta,\eta)$	$e^{\eta t}\Gamma(1-\theta t)$	$F(x)=e^{-e^{-\left(\frac{x-\eta}{\theta}\right)}}$
Logística	$x \sim \mathrm{LOG}(\mu,\theta)$	$e^{\mu t}\beta(1-\theta t, 1+\theta t)$	$F(x)=\frac{1}{2}+\frac{1}{2}\tanh\left(\frac{x-\mu}{2\theta}\right)$
Geométrica	$x \sim \mathrm{geo}(p)$	$\frac{pe^t}{1-e^t(1-p)}$	$F(x)=1-(1-p)^x$
Pareto	$x \sim \mathrm{pareto}(\theta,k)$	$-$	$F(x)=1-\left(1+\frac{x}{\theta}\right)^{-k}$

Distribución	Dominio	Función de Probabilidad	Teoremas
Normal Bivariada	$x\epsilon\mathcal{R}$ $y\epsilon\mathbb{R}$ $\sigma_x > 0$ $\sigma_y > 0$ $-1 \leq \ \rho \leq 1$	$f(x,y) = \dfrac{1}{2\pi\sigma_x\sigma_y\sqrt{1-\rho^2}}e^{-\frac{1}{2(1-\rho^2)}\left[\left(\frac{x-\mu_x}{\sigma_x}\right)^2-2\rho\left(\frac{x-\mu_x}{\sigma_x}\right)\left(\frac{y-\mu_y}{\sigma_y}\right)+\left(\frac{y-\mu_y}{\sigma_y}\right)^2\right]}$	$x\sim N(\mu_x,{\sigma_x}^2)$ $y\sim N(\mu_y,{\sigma_y}^2)$ $corr_{x,y} = \rho$ $corr(x^2,y^2) = \rho^2$ $x\|y\sim N\left[\mu_x + \rho\dfrac{\sigma_x}{\sigma_y}(y-\mu_y),{\sigma_x}^2(1-\rho^2)\right]$
Multinomial	$\sum_{i=1}^{k} x_i = n$ $\sum_{i=1}^{k} p_i = 1$ $x = 0,1,\ldots,\mathbb{Z}^+$	$f(x_1,x_2,\ldots,x_k;n;{p_1}^{x_1},{p_2}^{x_2},\ldots,{p_k}^{x_k}) = \dfrac{n!}{x_1!\,x_2!\ldots x_k!}{p_1}^{x_1}{p_2}^{x_2}\ldots{p_k}^{x_k}$	$x_j\sim bin(m,p_j)$, $m = n$ $cov(x_i,x_j) = -mp_ip_j$ $x_i\|x_j\sim bin\left(m-x_j,\dfrac{p_i}{1-p_j}\right)$
Hipergeométrica Multivariada	$\sum_{i=1}^{k} x_i = n$ $\sum_{i=1}^{k} M_i = N$ $x = 0,1,\ldots,\mathbb{Z}^+$	$f(x_1,x_2,\ldots,x_k;N;M_1,M_2,\ldots,M_K) = \dfrac{\binom{M_1}{x_1}\binom{M_2}{x_2}\binom{M_3}{x_3}\ldots\binom{M_k}{x_k}}{\binom{N}{n}}$	–
Dirichlet Bivariada	$0 < x < 1$ $0 < y < 1$ $0 < y < 1-x < 1$ $\alpha > 0$ $\beta > 0$ $c > 0$	$f(x,y;\alpha,\beta,c) = \dfrac{\Gamma(\alpha+\beta+c)}{\Gamma(\alpha)\Gamma(\beta)\Gamma(c)}x^{\alpha-1}y^{\beta-1}(1-x-y)^{c-1}$	$x\sim beta(\alpha,\beta+c)$ $y\sim beta(\beta,\alpha+c)$ $Y\|X\sim beta(\beta,c)$ $1-x\sim beta(\beta+c,\alpha)$