Escuela Superior de Física y Matemáticas

Instituto Politécnico Nacional

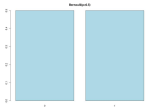
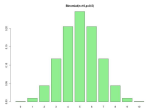
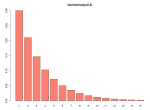
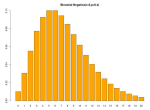
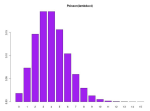
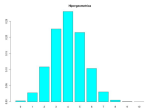
Tabla de Distribuciones de Probabilidad

Modelos Estocásticos

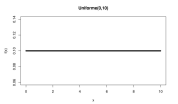
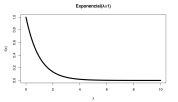
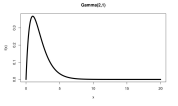
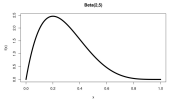
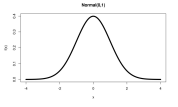
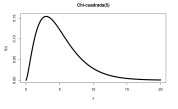
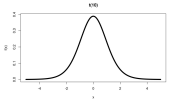
Andrés Mauricio Sandoval Valdivieso

25 de febrero de 2026

Distribuciones Discretas

Nombre	Notación	$f(x)$	$F(x)$	$\mathbb{E}(X)$	$\text{Var}(X)$	σ	FGM	Imagen
Bernoulli	$Bern(p)$	$p^x(1-p)^{1-x}$	$\begin{cases} 0 & x<0 \\ 1-p & 0\leq x<1 \\ 1 & x\geq 1 \end{cases}$	p	$p(1-p)$	$\sqrt{p(1-p)}$	$1-p+pe^t$	
Binomial	$Bin(n,p)$	$\binom{n}{x}p^x(1-p)^{n-x}$	$\sum_{k=0}^{x}\binom{n}{k}p^k(1-p)^{n-k}$	np	$np(1-p)$	$\sqrt{np(1-p)}$	$(1-p+pe^t)^n$	
Geométrica	$Geom(p)$	$p(1-p)^{x-1}$	$1-(1-p)^x$	$\frac{1}{p}$	$\frac{1-p}{p^2}$	$\frac{\sqrt{1-p}}{p}$	$\frac{pe^t}{1-(1-p)e^t}$	
Binomial Negativa	$NB(r,p)$	$\binom{x-1}{r-1}p^r(1-p)^{x-r}$	$\sum_{k=r}^{x}\binom{k-1}{r-1}p^r(1-p)^{k-r}$	$\frac{r}{p}$	$\frac{r(1-p)}{p^2}$	$\frac{\sqrt{r(1-p)}}{p}$	$\left(\frac{pe^t}{1-(1-p)e^t}\right)^r$	
Poisson	$Pois(\lambda)$	$\frac{e^{-\lambda}\lambda^x}{x!}$	$\sum_{k=0}^{x}\frac{e^{-\lambda}\lambda^k}{k!}$	λ	λ	$\sqrt{\lambda}$	$e^{\lambda(e^t-1)}$	
Hipergeométrica	$H(N,K,n)$	$\frac{\binom{K}{x}\binom{N-K}{n-x}}{\binom{N}{n}}$	$\sum_{k=0}^{x}\frac{\binom{K}{k}\binom{N-K}{n-k}}{\binom{N}{n}}$	$n\frac{K}{N}$	$n\frac{K}{N}\left(1-\frac{K}{N}\right)\frac{N-n}{N-1}$	$\sqrt{n\frac{K}{N}\left(1-\frac{K}{N}\right)\frac{N-n}{N-1}}$	No cerrada	

Distribuciones Continuas

Nombre	Notación	$f(x)$	$F(x)$	$\mathbb{E}(X)$	$\text{Var}(X)$	σ	FGM	Imagen
Uniforme	$U(a,b)$	$\frac{1}{b-a}$	$\frac{x-a}{b-a}$	$\frac{a+b}{2}$	$\frac{(b-a)^2}{12}$	$\frac{b-a}{\sqrt{12}}$	$\frac{e^{tb}-e^{ta}}{t(b-a)}$	
Exponencial	$Exp(\lambda)$	$\lambda e^{-\lambda x}$	$1-e^{-\lambda x}$	$\frac{1}{\lambda}$	$\frac{1}{\lambda^2}$	$\frac{1}{\lambda}$	$\frac{\lambda}{\lambda-t}$	
Gamma	$\Gamma(\alpha,\beta)$	$\frac{\beta^\alpha x^{\alpha-1}e^{-\beta x}}{\Gamma(\alpha)}$	$\frac{\gamma(\alpha,\beta x)}{\Gamma(\alpha)}$	$\frac{\alpha}{\beta}$	$\frac{\alpha}{\beta^2}$	$\frac{\sqrt{\alpha}}{\beta}$	$\left(\frac{\beta}{\beta-t}\right)^\alpha$	
Beta	$Beta(\alpha,\beta)$	$\frac{x^{\alpha-1}(1-x)^{\beta-1}}{B(\alpha,\beta)}$	$\frac{B(x;\alpha,\beta)}{B(\alpha,\beta)}$	$\frac{\alpha}{\alpha+\beta}$	$\frac{\alpha\beta}{(\alpha+\beta)^2(\alpha+\beta+1)}$	$\sqrt{\frac{\alpha\beta}{(\alpha+\beta)^2(\alpha+\beta+1)}}$	No cerrada	
Normal	$N(\mu,\sigma^2)$	$\frac{1}{\sqrt{2\pi\sigma^2}}e^{-\frac{(x-\mu)^2}{2\sigma^2}}$	$\Phi\left(\frac{x-\mu}{\sigma}\right)$	μ	σ^2	σ	$e^{\mu t+\frac{\sigma^2 t^2}{2}}$	
Chi-cuadrada	$\chi^2(k)$	$\frac{1}{2^{k/2}\Gamma(k/2)}x^{k/2-1}e^{-x/2}$	$\frac{\gamma(k/2,x/2)}{\Gamma(k/2)}$	k	$2k$	$\sqrt{2k}$	$(1-2t)^{-k/2}$	
t-Student	$t(\nu)$	$\frac{\Gamma((\nu+1)/2)}{\sqrt{\nu\pi}\Gamma(\nu/2)}\left(1+\frac{x^2}{\nu}\right)^{-(\nu+1)/2}$	$F(x)$	0	$\frac{\nu}{\nu-2}$	$\sqrt{\frac{\nu}{\nu-2}}$	No cerrada	
F	$F(d_1,d_2)$	$f(x)$	$F(x)$	$\frac{d_2}{d_2-2}$	$\frac{2d_2^2(d_1+d_2-2)}{d_1(d_2-2)^2(d_2-4)}$	$\sqrt{\text{Var}}$	No cerrada