tabla_densidades

November 25, 2025

Distribución / Notación	Tipo	Parámetros	Soporte de X	PMF $p_X(x)$	$\mathbb{E}[X]$	$\mathrm{Var}(X)$	FGM $M_X(t)$ (si es simple)
Uniforme discreta ($X \sim \mathrm{Unif}\{1,\dots,n\}$)	Discreta	$n \in \mathbb{N},\ n \geq 1$	$\{1,2,\dots,n\}$	$p_X(k) = \dfrac{1}{n},\ k=1,\dots,n$	$\dfrac{n+1}{2}$	$\dfrac{n^2-1}{12}$	$M_X(t) = \dfrac{1}{n}\sum_{k=1}^{n} e^{tk}$
Bernoulli ($X \sim \mathrm{Bern}(p)$)	Discreta	$0 \leq p \leq 1$	$\{0,1\}$	$p_X(1)=p,\ p_X(0)=1-p$	p	$p(1-p)$	$M_X(t) = (1-p) + pe^t$
Binomial ($X \sim \mathrm{Bin}(n,p)$)	Discreta	$n \in \mathbb{N},\ 0 \leq p \leq 1$	$\{0,1,\dots,n\}$	$p_X(k) = \binom{n}{k} p^k (1-p)^{n-k}$	np	$np(1-p)$	$M_X(t) = (1-p+pe^t)^n$
Hipergeométrica ($X \sim \mathrm{Hiper}(N,K,n)$)	Discreta	$N \in \mathbb{N},\ K \in \{0,\dots,N\},\ n \in \{0,\dots,N\}$	k tal que $\max(0,\,n-(N-K)) \leq k \leq \min(n,K)$	$p_X(k) = \dfrac{\binom{K}{k}\binom{N-K}{n-k}}{\binom{N}{n}}$	$n\dfrac{K}{N}$	$n\dfrac{K}{N}\left(1-\dfrac{K}{N}\right)\dfrac{N-n}{N-1}$	No tiene una forma cerrada tan simple
Poisson ($X \sim \mathrm{Pois}(\lambda)$)	Discreta	$\lambda > 0$	$\{0,1,2,\dots\}$	$p_X(k) = \dfrac{\lambda^k e^{-\lambda}}{k!}$	λ	λ	$M_X(t) = \exp(\lambda(e^t-1))$
Binomial negativa ($X \sim \mathrm{NB}(r,p)$)	Discreta	$r > 0$ (habitualmente $r \in \mathbb{N}$), $0 < p < 1$	$\{0,1,2,\dots\}$ (número de fallos antes del r-ésimo éxito)	$p_X(k) = \binom{k+r-1}{k}(1-p)^k p^r$	$\dfrac{r(1-p)}{p}$	$\dfrac{r(1-p)}{p^2}$	$M_X(t) = \left(\dfrac{p}{1-(1-p)e^t}\right)^r,\ t < -\ln(1-p)$ (dominio donde converja)

Distribución / Notación	Tipo	Parámetros	Soporte de X	PDF $f_X(x)$	$\mathbb{E}[X]$	$\mathrm{Var}(X)$	FGM $M_X(t)$ (si es simple)
Uniforme continua ($X \sim \mathrm{Unif}(a,b)$)	Continua	$a < b$	(a,b)	$f_X(x) = \dfrac{1}{b-a}$ para $a < x < b$; 0 en otro caso	$\dfrac{a+b}{2}$	$\dfrac{(b-a)^2}{12}$	$M_X(t) = \dfrac{e^{tb}-e^{ta}}{t(b-a)},\ t \neq 0;\ M_X(0)=1$
Normal ($X \sim \mathcal{N}(\mu,\sigma^2)$)	Continua	$\mu \in \mathbb{R},\ \sigma > 0$	$\mathbb{R}$	$f_X(x) = \dfrac{1}{\sigma\sqrt{2\pi}}\exp\left(-\dfrac{(x-\mu)^2}{2\sigma^2}\right)$	μ	σ^2	$M_X(t) = \exp(\mu t + \tfrac{1}{2}\sigma^2 t^2)$
Gamma ($X \sim \Gamma(k,\theta)$) (shape-scale)	Continua	$k > 0$ (forma), $\theta > 0$ (escala)	$(0,\infty)$	$f_X(x) = \dfrac{1}{\Gamma(k)\theta^k} x^{k-1} e^{-x/\theta},\ x > 0$	$k\theta$	$k\theta^2$	$M_X(t) = (1-\theta t)^{-k}$, para $t < 1/\theta$
Exponencial ($X \sim \mathrm{Exp}(\lambda)$)	Continua	$\lambda > 0$ (tasa)	$[0,\infty)$	$f_X(x) = \lambda e^{-\lambda x},\ x \geq 0$	$\dfrac{1}{\lambda}$	$\dfrac{1}{\lambda^2}$	$M_X(t) = \dfrac{\lambda}{\lambda-t},\ t < \lambda$
Chi-cuadrado ($X \sim \chi^2_\nu$)	Continua	$\nu > 0$ (grados de libertad)	$[0,\infty)$	$f_X(x) = \dfrac{1}{2^{\nu/2}\Gamma(\nu/2)} x^{\nu/2-1} e^{-x/2},\ x > 0$	ν	2ν	$M_X(t) = (1-2t)^{-\nu/2},\ t < \tfrac{1}{2}$
t de Student ($X \sim t_\nu$)	Continua	$\nu > 0$ (grados de libertad)	$\mathbb{R}$	$f_X(x) = \dfrac{\Gamma(\frac{\nu+1}{2})}{\sqrt{\nu\pi}\,\Gamma(\frac{\nu}{2})}\left(1+\dfrac{x^2}{\nu}\right)^{-(\nu+1)/2}$	0 si $\nu > 1$	$\dfrac{\nu}{\nu-2}$ si $\nu > 2$ (infinita si $1 < \nu \leq 2$; no definida si $\nu \leq 1$)	La FGM no existe en un entorno de 0 (no es finita)