

Distribuciones Discretas

Distribución	Función masa de probabilidad	Parámetros $p + q = 1$	Media μ	Varianza σ^2	Función generadora de momentos $M(t)$
<i>Bernoulli</i>	$f(x) = p^x q^{1-x} I_{\{0,1\}}(x)$	$0 < p < 1$	p	pq	$q + pe^t$
<i>Binomial</i>	$f(x) = \binom{n}{x} p^x q^{n-x} I_{\{0,1,\dots,n\}}(x)$	$0 < p < 1$	np	npq	$(q + pe^t)^n$
<i>Geométrica</i>	$f(x) = pq^x I_{\{0,1,\dots\}}(x)$	$0 < p < 1$	q/p	q/p^2	$p/(1 - qe^t)$
<i>Binomial Negativa</i>	$f(x) = \binom{r+x-1}{x} p^r q^x I_{\{0,1,\dots\}}(x)$	$0 < p < 1$ $r > 0$	rq/p	rq/p^2	$\left(\frac{p}{1-qe^t}\right)^r$
<i>Poisson</i>	$f(x) = \frac{\lambda^x}{x!} e^{-\lambda} I_{\{0,1,\dots\}}(x)$	$\lambda > 0$	λ	λ	$e^{\lambda(e^t-1)}$

Distribuciones Continuas

Distribución	Función de densidad de probabilidad	Parámetros	Media μ	Varianza σ^2	Función generadora de momentos $M(t)$
<i>Uniforme</i>	$f(x) = \frac{1}{b-a} I_{[a,b]}(x)$	$a, b \in \mathbb{R}$ $a < b$	$(a + b)/2$	$(b - a)^2/12$	$\frac{e^{bt} - e^{at}}{(b-a)t}$
<i>Normal o Gaussiana</i>	$f(x) = \frac{1}{\sqrt{2\pi}\sigma} e^{-\frac{1}{2}\frac{(x-\mu)^2}{\sigma^2}} I_{\mathbb{R}}(x)$	$\mu \in \mathbb{R}$ $\sigma \in \mathbb{R}^+$	μ	σ^2	$e^{\mu t + \frac{1}{2}\sigma^2 t^2}$
<i>Gamma</i>	$f(x) = \frac{x^{\alpha-1} e^{-x/\beta}}{\beta^\alpha \Gamma(\alpha)} I_{\mathbb{R}^+}(x)$	$\alpha \in \mathbb{R}^+$ $\beta \in \mathbb{R}^+$	$\alpha\beta$	$\alpha\beta^2$	$(1 - \beta t)^{-\alpha}$ $t < 1/\beta$
<i>Ji-Cuadrada</i> χ_n^2	$f(x) = \frac{x^{\frac{n}{2}-1} e^{-x/2}}{2^{n/2} \Gamma(n/2)} I_{\mathbb{R}^+}(x)$	$n \in \mathbb{N}$	n	$2n$	$(1 - 2t)^{-n/2}$ $t < 1/2$
<i>t-Student</i>	$f(x) = \frac{\Gamma[(n+1)/2]}{\sqrt{n\pi} \Gamma(n/2)} (1 + x^2/n)^{-\frac{n+1}{2}} I_{\mathbb{R}}(x)$	$n \in \mathbb{N}$	0	$n/(n-2)$ $n > 2$	no existe
<i>F</i>	$f(x) = \frac{\Gamma[(m+n)/2]}{\Gamma(m/2)\Gamma(n/2)} \left(\frac{m}{n}\right)^{m/2} \frac{x^{(m-2)/2}}{[1+(m/n)x]^{(m+n)/2}} I_{\mathbb{R}^+}(x)$	$m, n \in \mathbb{N}$	$n/(n-2)$ $n > 2$	$\frac{2n^2(m+n-2)}{m(n-2)^2(n-4)}$ $n > 4$	no existe
<i>Weibull</i>	$f(x) = \alpha\beta x^{\beta-1} e^{-\alpha x^\beta} I_{\mathbb{R}^+}(x)$	$\alpha > 0$ $\beta > 0$	$\alpha^{-1/\beta} \Gamma(1 + 1/\beta)$	$\alpha^{-2/\beta} \Gamma(1 + 2/\beta) - \Gamma^2(1 + 1/\beta)$	$\mathbb{E}[X^r] = \alpha^{r/\beta} \cdot \Gamma(1 + r/\beta)$
<i>Pareto</i>	$f(x) = \frac{\theta \alpha^\theta}{x^{\theta+1}} I_{[\alpha, \infty)}(x)$	$\alpha > 0$ $\theta > 0$	$\frac{\alpha \cdot \theta}{\theta - 1}$ $\theta > 1$	$\frac{\alpha^2 \theta}{(\theta - 1)^2 (\theta - 2)}$ $\theta > 2$	no existe