Distribuciones Discretas

Distribución	Función masa de probabilidad	Parámetros $p+q=1$	Media μ	Varianza σ^2	Función generadora de momentos $M(t)$
Bernoulli	$f(x) = p^x q^{1-x} \mathbb{1}_{\{0,1\}}(x)$	$0<p<1$	p	pq	$q+pe^t$
Binomial	$f(x) = \binom{n}{x} p^x q^{n-x} \mathbb{1}_{\{0,1,\ldots,n\}}(x)$	$0<p<1$ $n=1,2,\ldots$	np	npq	$(q+pe^t)^n$
Geométrica	$f(x) = pq^x \mathbb{1}_{\{0,1,\ldots\}}(x)$	$0<p<1$	q/p	q/p^2	$p/(1-qe^t)$
Binomial Negativa	$f(x) = \binom{r+x-1}{x} p^r q^x \mathbb{1}_{\{0,1,\ldots\}}(x)$	$0<p<1$ $r=1,2,\ldots$	rq/p	rq/p^2	$\left(\frac{p}{1-qe^t}\right)^r$
Poisson	$f(x) = \frac{\lambda^x}{x!} e^{-\lambda} \mathbb{1}_{\{0,1,\ldots\}}(x)$	$\lambda>0$	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 $M(t)$
Uniforme	$f(x) = \frac{1}{b-a} \mathbb{1}_{[a,b]}(x)$	$a,b\in\mathbb{R}$ $a<b$	$(a+b)/2$	$(b-a)^2/12$	$\frac{e^{bt}-e^{at}}{(b-a)t}$
Normal	$f(x) = \frac{1}{\sqrt{2\pi}\sigma} e^{-\frac{1}{2}\frac{(x-\mu)^2}{\sigma^2}} \mathbb{1}_{\mathbb{R}}(x)$	$\mu\in\mathbb{R}$ $\sigma\in\mathbb{R}^+$	μ	σ^2	$e^{\mu t+\frac{1}{2}\sigma^2 t^2}$
Gamma	$f(x) = \frac{x^{\alpha-1} e^{-x/\beta}}{\beta^\alpha \Gamma(\alpha)} \mathbb{1}_{\mathbb{R}^+}(x)$	$\alpha\in\mathbb{R}^+$ $\beta\in\mathbb{R}^+$	$\alpha\beta$	$\alpha\beta^2$	$(1-\beta t)^{-\alpha}$ $t<1/\beta$
t-Student	$f(x) = \frac{\Gamma[(n+1)/2]}{\sqrt{n\pi}\,\Gamma(n/2)} \left(1+x^2/n\right)^{-\frac{n+1}{2}} \mathbb{1}_{\mathbb{R}}(x)$	$n\in\mathbb{N}$	0	$n/(n-2)$ $n>2$	no existe
F	$f(x) = \frac{\Gamma[(m+n)/2]}{\Gamma(m/2)\Gamma(n/2)} \left(\frac{m}{n}\right)^{m/2} \frac{x^{(m-2)/2}}{[1+(m/n)x]^{(m+n)/2}} \mathbb{1}_{\mathbb{R}^+}(x)$	$m,n\in\mathbb{N}$	$n/(n-2)$ $n>2$	$\frac{2n^2(m+n-2)}{m(n-2)^2(n-4)}$ $n>4$	no existe
Beta	$f(x) = \frac{\Gamma(\alpha+\beta)}{\Gamma(\alpha)\Gamma(\beta)} x^{\alpha-1}(1-x)^{\beta-1}$	$\alpha>0$ $\beta>0$	$\alpha/(\alpha+\beta)$	$\frac{\alpha\beta}{(\alpha+\beta+1)(\alpha+\beta)^2}$	no es útil
Weibull	$f(x) = \alpha\beta x^{\beta-1} e^{-\alpha x^\beta} \mathbb{1}_{\mathbb{R}^+}(x)$	$\alpha>0$ $\beta>0$	$\alpha^{-1/\beta}\Gamma(1+1/\beta)$	$\alpha^{-2/\beta}\Gamma(1+2/\beta)$ $-\Gamma^2(1+1/\beta)$	$\mathbb{E}[X^r] = \alpha^{-r/\beta}\cdot\Gamma(1+r/\beta)$
Pareto	$f(x) = \frac{\theta\alpha^\theta}{x^{\theta+1}} \mathbb{1}_{[\alpha,\infty)}(x)$	$\alpha>0$ $\theta>0$	$\frac{\alpha\cdot\theta}{\theta-1}$ $\theta>1$	$\frac{\alpha^2\theta}{(\theta-1)^2(\theta-2)}$ $\theta>2$	no existe