Algumas distribuições de probabilidade DISCRETAS

Distribuição	f. discreta de probabilidade	Média	Variância	F.G.Momentos
Bernoulli(p) $p \in [0,1]$, $q = 1-p$	$p(x) = p^x q^{1-x} \mathbb{1}_{\{0,1\}}(x)$	p	pq	$q + pe^t$
Binomial(n, p) $p \in [0,1]$, $q = 1-p$	$p(x) = \binom{n}{x} p^x q^{n-x} \mathbb{1}_{\{0,1,\ldots,n\}}(x)$	np	npq	$(q + pe^t)^n$
Hipergeométrica (N, r, n) $r \leq N, n \leq N$	$p(x) = \dfrac{\binom{r}{x}\binom{N-r}{n-x}}{\binom{N}{n}}$ $x = \max\{0, n-N+r\}, \ldots, \min\{r,n\}$	$n\dfrac{r}{N}$	$n\dfrac{r}{N}\dfrac{N-r}{N}\left(\dfrac{N-n}{N-1}\right)$	
Poisson(λ) $\lambda > 0$	$p(x) = \dfrac{e^{-\lambda}\lambda^x}{x!} \mathbb{1}_{\{0,1,\ldots\}}(x)$	λ	λ	$\exp\{\lambda(e^t - 1)\}$
Geométrica(p) *No. de fracassos*	$p(x) = pq^x \mathbb{1}_{\{0,1,\ldots\}}(x)$	q/p	q/p^2	$\dfrac{p}{1-qe^t}$, $t < \ln\frac{1}{q}$
Geométrica(p) *No. de ensaios*	$p(x) = pq^{x-1} \mathbb{1}_{\{1,2\ldots\}}(x)$	$1/p$	q/p^2	$\dfrac{pe^t}{1-qe^t}$, $t < \ln\frac{1}{q}$
Bin. Negativa(r, p) *No. de fracassos*	$p(x) = \binom{r+x-1}{x} p^r q^x \mathbb{1}_{\{0,1,\ldots\}}(x)$	$r.q/p$	$r.q/p^2$	$\left(\dfrac{p}{1-qe^t}\right)^r, t < \ln\frac{1}{q}$
Bin. Negativa(r, p) *No. de ensaios*	$p(x) = \binom{x-1}{r-1} p^r q^{x-r} \mathbb{1}_{\{r,r+1,\ldots\}}(x)$	$r.1/p$	$r.q/p^2$	$\left(\dfrac{pe^t}{1-qe^t}\right)^r, t < \ln\frac{1}{q}$

Algumas distribuições de probabilidade CONTÍNUAS

Distribuição	f. densidade de probabilidade	Média	Variância	F.G.Momentos
Uniforme$[a,b]$ $a<b$, reais	$f(x)=\frac{1}{b-a}\mathbb{1}_{[a,b]}(x)$	$\frac{a+b}{2}$	$\frac{(b-a)^2}{12}$	$\frac{e^{bt}-e^{at}}{(b-a)t}$
Normal(μ,σ^2) $\mu\in\mathcal{R}$, $\sigma^2>0$	$f(x)=\frac{1}{\sigma\sqrt{2\pi}}\exp\left\{-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2\right\}$	μ	σ^2	$\exp\left\{\mu t+\frac{\sigma^2t^2}{2}\right\}$
Exponencial(λ) $\lambda>0$	$f(x)=\lambda e^{-\lambda x}\mathbb{1}_{(0,\infty)}(x)$	$1/\lambda$	$1/\lambda^2$	$\frac{\lambda}{\lambda-t}$, $t<\lambda$
Gama(r,λ) $r,\lambda>0$, reais	$f(x)=\frac{\lambda^r}{\Gamma(r)}e^{-\lambda x}x^{r-1}\mathbb{1}_{(0,\infty)}(x)$	r/λ	r/λ^2	$\left(\frac{\lambda}{\lambda-t}\right)^r$, $t<\lambda$
Beta(a,b) $a,b>0$, reais	$f(x)=\frac{1}{\beta(a,b)}x^{a-1}(1-x)^{b-1}\mathbb{1}_{[0,1]}(x)$	$\frac{a}{a+b}$	$\frac{ab}{(a+b+1)(a+b)^2}$	
Quiquadrado $\chi^2(k), k=1,2,\ldots$	$f(x)=\frac{\left(\frac{1}{2}\right)^{\frac{k}{2}}}{\Gamma\left(\frac{k}{2}\right)}x^{\frac{k}{2}-1}e^{-\left(\frac{1}{2}\right)x}\ \mathbb{1}_{(0,\infty)}(x)$	k	$2k$	$\left(\frac{1}{1-2t}\right)^{\frac{k}{2}}$, $t<\frac{1}{2}$
$t-$Student(k) $k>0$, real	$f(x)=\frac{\Gamma\left(\frac{k+1}{2}\right)}{\Gamma\left(\frac{k}{2}\right)}\frac{1}{\sqrt{k\pi}\left(1+\frac{x^2}{k}\right)^{\frac{k+1}{2}}}$	0 para $k>1$	$\frac{k}{k-2}$ para $k>2$	não existe
Cauchy (α,β) $\alpha\in\mathcal{R},\beta>0$	$f(x)=\frac{1}{\pi\beta\left\{1+\left(\frac{x-\alpha}{\beta}\right)^2\right\}}$	não existe α=mediana	não existe	$\exp\{i\alpha t-\beta\mid t\mid\}$ f. característica
Distribuição F (Fisher-Snedecor) $F(m,n)$ $m,n=1,2,\ldots$	$f(x)=\frac{\Gamma\left(\frac{m+n}{2}\right)}{\Gamma\left(\frac{m}{2}\right)\Gamma\left(\frac{n}{2}\right)}\left(\frac{m}{n}\right)^{\frac{m}{2}}\times$ $\times\frac{x^{(m-2)/2}}{(1+\frac{m}{n}x)^{(m+n)/2}}\mathbb{1}_{(0,\infty)}(x)$	$\frac{n}{n-2}$ se $n>2$	$\frac{2n^2(m+n-2)}{m(n-2)^2(n-4)}$ se $n>4$	não existe
Pareto (θ,b) $b>0$, $\theta>0$	$f(x)=\frac{\theta\ b^\theta}{x^{\theta+1}}\mathbb{1}_{(b,\infty)}(x)$	$\frac{\theta\ b}{\theta-1}$ para $\theta>1$	$\frac{\theta\ b^2}{(\theta-1)^2(\theta-2)}$ para $\theta>2$	não existe