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Distribuições de Probabilidade – Informações Básicas

Distribuição	Função	Valor Esperado	Variância
Binomial	$P(X=k)=\binom{n}{k}p^k(1-p)^{n-k}, \quad k=0,1,\ldots,n$	$E(X)=np$	$V(X)=np\,(1-p)$
Poisson	$P(X=k)=\dfrac{e^{-\alpha}\alpha^k}{k!}, \quad k=0,1,\ldots,n,\ldots$	$E(X)=\alpha$	$V(X)=\alpha$
Geométrica	$P(X=k)=q^{k-1}p, \quad k=1,2,\ldots$	$E(X)=\dfrac{1}{p}$	$V(X)=\dfrac{q}{p^2}$
Pascal	$P(X=k)=\binom{k-1}{r-1}p^r q^{k-r}, \quad k=r,r+1,\ldots$	$E(X)=\dfrac{r}{p}$	$V(X)=\dfrac{rq}{p^2}$
Hipergeométrica	$P(X=k)=\dfrac{\binom{r}{k}\binom{N-r}{n-k}}{\binom{N}{n}}, \quad k=0,1,2,\ldots$	$E(X)=np$ $\left(p=\dfrac{r}{N}\right)$	$V(X)=npq\left(\dfrac{N-n}{N-1}\right)$ $(q=1-p)$
Uniforme	$f(x)=\begin{cases}\dfrac{1}{b-a} & \text{se } a\le x\le b,\\ 0 & \text{para quaisquer outros valores,}\end{cases}$	$E(X)=\dfrac{a+b}{2}$	$V(X)=\dfrac{(b-a)^2}{12}$
Normal	$f(x)=\dfrac{1}{\sqrt{2\pi}\,\sigma}\exp\left(-\dfrac{1}{2}\left[\dfrac{x-\mu}{\sigma}\right]^2\right), \quad -\infty<x<\infty$	$E(X)=\mu$	$V(X)=\sigma^2$
Exponencial	$f(x)=\begin{cases}\alpha e^{-\alpha x}, & x\ge 0,\\ 0, & x<0.\end{cases}$	$E(X)=\dfrac{1}{\alpha}$	$V(X)=\dfrac{1}{\alpha^2}$
Gama	$f(x)=\begin{cases}\dfrac{\alpha}{\Gamma(r)}(\alpha x)^{r-1}e^{-\alpha x}, & x>0,\\ 0, & x\le 0.\end{cases}$	$E(X)=\dfrac{r}{\alpha}$	$V(X)=\dfrac{r}{\alpha^2}$
Qui-Quadrado	$f(x)=\dfrac{1}{2^{n/2}\Gamma(n/2)}x^{n/2-1}e^{-x/2}, \quad x>0.$	$E(X)=n$	$V(X)=2n$