DISTRIBUCIONES DE PROBABILIDAD USADAS HABITUALMENTE EN HIDROLOGÍA

Distribución de variable aleatoria x	Función de densidad de probabilidad y densidad acumulada	Rango	Media	Varianza
Binomial	$P(x)=\frac{n!}{x!(n-x)!}p^x(1-p)^{n-x}$	$0\le x<n$	np	$np(1-p)$
Poisson	$P(x)=\frac{\lambda^x e^{-x}}{x!}$	$0\le x\le\ldots$	λ	λ
Uniforme	$f(x)=\frac{1}{b-a}$	$a\le x\le b$	$\frac{b+a}{2}$	$\frac{(b-a)^2}{12}$
Exponencial	$f(x)=\frac{1}{a}e^{-\frac{x}{a}}$	$0\le x\le\infty$	a	a^2
Normal	$f(x)=\frac{1}{\sigma\sqrt{2\pi}}e^{-\frac{(x-\mu)^2}{2\sigma^2}}$	$-\infty\le x\le\infty$	μ	σ^2
Log-Normal $y=\ln x$	$f(y)=\frac{1}{x\,\sigma_y\sqrt{2\pi}}e^{-\frac{(y-\mu)^2}{2\sigma_y^2}}$	$0\le x\le\infty$ $-\infty\le y\le\infty$	μ_y	σ_y^2
Gamma	$f(x)=\frac{x^a e^{-\frac{x}{\beta}}}{\beta^{\alpha+1}\Gamma(a+1)}$	$0\le x\le\infty$	$\beta(\alpha+1)$	$\beta^2(\alpha+1)$
Gumbel	$f(x)=\frac{1}{\alpha}\exp\left[-\frac{x-\xi}{\alpha}-\exp\left(-\frac{x-\xi}{\alpha}\right)\right]$ $F(x)=\exp\left[-\exp\left(-\frac{x-\xi}{\alpha}\right)\right]$ $x=\xi-\alpha\ln(-\ln F)$	$-\infty\le x\le\infty$	$\mu=\xi+0.5772\alpha$	$\sigma^2=\frac{\pi^2\alpha^2}{6}\approx 1.645\,\alpha^2$
Weibull	$f(x)=\left(\frac{k}{\alpha}\right)\left(\frac{x}{\alpha}\right)^{k-1}e^{\left(-\frac{x}{\alpha}\right)^k}$ $F(x)=1-e^{\left(\frac{x}{\alpha}\right)^k}$	$0\le x$ $0\le a,k$	$\mu=\alpha\Gamma\left(1+\frac{1}{k}\right)$	$\sigma=\alpha^2\left\{\Gamma\left(1+\frac{2}{k}\right)-\left[\Gamma\left(1+\frac{1}{k}\right)\right]^2\right\}$
Valor Extremo	$f(x)=\alpha\exp[-\alpha(x-u)-e^{-\alpha(x-u)}]$	$-\infty\le x\le\infty$	$u+\frac{0.5772}{\alpha}$	$\frac{\pi^2}{6\,\alpha^2}$
Log-Pearson III $y=\ln x$	$f(x)=\frac{(y-\gamma)^\alpha}{\beta^2 x\,\Gamma(\alpha+1)}e^{-\frac{(y-\gamma)}{\beta}}$	$0\le x\le\infty$ $-\infty\le y\le\infty$	$\mu_y+\beta(\alpha+1)$	$\sigma_y^2=\beta^2(\alpha+1)$

Fuente: Viessman, Warren, and Gary Lewis. 2003. Introduction to hydrology. Upper Saddle River, New Jersey: Prentice-Hall, Inc.