TABLA DE DISTRIBUCIONES

Distribuciones Discretas

1. **Bernoulli** $X \sim \mathcal{B}(p)$ si
$$P(X=1)=p;\ P(X=0)=1-p$$
$E[X]=p$ y $V[X]=p(1-p)$.

2. **Binomial** $X \sim \mathcal{BI}(n,p)$ si
$$P(X=k)=\binom{n}{k}p^k(1-p)^{n-k} \quad k=0,1,\ldots,n.$$
$E[X]=np$ y $V[X]=np(1-p)$.

3. **Geométrica** $X \sim \mathcal{G}(p)$ si
$$P(X=k)=(1-p)^{k-1}\,p \quad k=1,2,\ldots$$
$E[X]=\frac{1}{p}$ y $V[X]=\frac{1-p}{p^2}$.

4. **Poisson** $X \sim \mathcal{P}(\lambda)$ si
$$P(X=k)=\frac{\lambda^k e^{-\lambda}}{k!} \quad k=0,1,2,\ldots$$
$E[X]=\lambda=V[X]$.

Distribuciones Continuas

1. **Exponencial** $X \sim \mathcal{E}xp(\lambda)$ si
$$f(x)=\lambda e^{-\lambda x} \quad x>0.$$
$E[X]=\frac{1}{\lambda}$ y $V[X]=\frac{1}{\lambda^2}$.

2. **Normal** $X \sim \mathcal{N}(\mu,\sigma^2)$ si
$$f(x)=\frac{1}{\sigma\sqrt{2\pi}}e^{-\frac{1}{2\sigma^2}(x-\mu)^2} \quad \forall x.$$
$E[X]=\mu$ y $V[X]=\sigma^2$.

3. **Normal multivariante** $\mathbf{X}=(X_1,\ldots,X_k)^T \sim \mathcal{N}(\boldsymbol{\mu},\boldsymbol{\Sigma})$ si
$$f(\mathbf{x})=\frac{1}{(2\pi)^{k/2}|\boldsymbol{\Sigma}|}\exp\left\{-\frac{1}{2}(\mathbf{x}-\boldsymbol{\mu})^T\boldsymbol{\Sigma}^{-1}(\mathbf{x}-\boldsymbol{\mu})\right\} \quad \forall \mathbf{x}.$$
$E[\mathbf{X}]=\boldsymbol{\mu}$ y $V[\mathbf{X}]=\Sigma$.

4. **Uniforme** $X \sim \mathcal{U}(a,b)$ si
$$f(x)=\frac{1}{b-a} \quad a<x<b.$$
$E[X]=\frac{a+b}{2}$ y $V[X]=\frac{(b-a)^2}{12}$.