Continuous Distributions

Uniform Distribution: $X \in \mathcal{U}(a,b),\ 0<a<b$, if its pdf is $f(x)=\dfrac{1}{b-a},\ x\in[a,b]$.

Normal Distribution: $X \in N(\mu,\sigma),\ \mu\in\mathbb{R},\ \sigma>0$, if its pdf is $f(x)=\dfrac{1}{\sigma\sqrt{2\pi}}e^{-\dfrac{(x-\mu)^2}{2\sigma^2}},\ x\in\mathbb{R}$.

Standard (Reduced) Normal Distribution: $X\in N(0,1)$, if its pdf is $f(x)=\dfrac{1}{\sqrt{2\pi}}e^{-\dfrac{x^2}{2}},\ x\in\mathbb{R}$.

Gamma Distribution: $X\in Gamma(a,b),\ a,b>0$, if its pdf is $f(x)=\dfrac{1}{\Gamma(a)b^a}x^{a-1}e^{-\dfrac{x}{b}},\ x>0$.

$$\left(\ \Gamma(a)=\int_0^\infty x^{a-1}e^{-x}dx\ ,\ a>0\ \right)$$

Exponential Distribution: $X\in Exp(\lambda)=Gamma(1,1/\lambda),\ \lambda>0$, if its pdf is $f(x)=\lambda e^{-\lambda x}\ ,\ x>0$.

χ^2 Distribution: $X\in\chi^2(n)=Gamma(n/2,2),\ n\in\mathbb{N}$, if its pdf is

$$f(x)=\frac{1}{2^{\frac{n}{2}}\Gamma\left(\frac{n}{2}\right)}x^{\frac{n}{2}-1}e^{-\frac{x}{2}}\ ,\ x>0.$$

Student (T) Distribution: $X\in T(n),\ n\in\mathbb{N}$, if its pdf is $f(x)=\dfrac{\Gamma\left(\frac{n+1}{2}\right)}{\sqrt{n\pi}\ \Gamma\left(\frac{n}{2}\right)}\left(1+\dfrac{x^2}{n}\right)^{-\frac{n+1}{2}},\ x\in\mathbb{R}$.

Beta Distribution: $X\in Beta(a,b),\ a,b>0$, if its pdf is $f(x)=\dfrac{1}{\beta(a,b)}x^{a-1}(1-x)^{b-1}\ ,\ x\in[0,1]$.

$$\left(\ \beta(a,b)=\int_0^1 x^{a-1}(1-x)^{b-1}dx\ ,\ a,b>0\ \right)$$

Cauchy Distribution: $X\in Cauchy(a,b),\ a\in\mathbb{R},\ b>0$, if its pdf is $f(x)=\dfrac{1}{\pi b\left[1+\left(\dfrac{x-a}{b}\right)^2\right]},\ x\in\mathbb{R}$.

Fisher (F) Distribution: $X\in F(m,n),\ m,n\in\mathbb{N}$, if its pdf is

$$f(x)=\frac{1}{\beta\left(\frac{m}{2},\frac{n}{2}\right)}\left(\frac{m}{n}\right)^{\frac{m}{2}}x^{\frac{m}{2}-1}\left(1+\tfrac{m}{n}x\right)^{-\frac{m+n}{2}}\ ,\ x>0.$$