Stat642 Distributions

Arthur Lui

23 September 2014

$$\text{Gamma(n,2)} = \chi^2_{2n}$$

$$U \sim \text{Unif(0,1)} \Rightarrow -log(U) \sim \text{Exp(1)}$$

$$\frac{\chi^2_p/p}{\chi^2_q/q} \sim F_{n,m}$$

$$\frac{\text{N(0,1)}}{\sqrt{\chi^2_p/p}} = t_p$$

$$(t_p)^2 = F_{1,p}$$

$$\text{N(0,1)}^2 = \chi^2_1$$

$$\sum_{i=1}^n \text{N(0,1)}^2 = \chi^2_n$$

$$\frac{(n-1)S^2}{\sigma^2} = \chi^2_{n-1}, \text{ where } S^2 = \frac{\sum_{i=1}^n x_i - \bar{x}}{n-1}$$

$$X \sim \text{Gamma}(\alpha, \beta) \Rightarrow \frac{1}{X} \sim \text{InvGamma}(\alpha, \beta^{-1})$$

$$\text{F(x)} \sim \text{Unif(0,1)}$$

$$\text{1-F(x)} \sim \text{Unif(0,1)}$$

$$\text{X} \sim F_{p,q} \iff \frac{\frac{p}{q}X}{1+\frac{p}{q}X} \sim \text{Beta(p/2, q/2)}$$

$$\begin{cases} X \sim & \text{Bin(n,p)} \\ Y \sim & \text{Beta(x, n-x+1)} \end{cases} \Rightarrow \text{P(X}\geq\text{x) = P(Y}\leq \theta)$$

$$\sum_{i=1}^n (x_i - \mu)^2 = \sum_{i=1}^n (x_i - \bar{x})^2 + n(\bar{x} - \mu)^2$$

Refer to parameterization in Casella & Berger.