Sampling Statistics

1. $Z \sim N(0,1)$, $U \sim \chi_n^2$

    $$\frac{Z}{\sqrt{U/n}} \sim t_n \qquad \text{t distribution with n df}$$

2. $U \sim \chi_m^2$, $V \sim \chi_n^2$ independent

    $$F_{m,n} = \frac{U/m}{V/n} \qquad \text{F distribution}$$

3. $$\frac{(n-1)S^2}{\sigma^2} \sim \chi_{n-1}^2$$

4. $$\frac{\overline{X} - \mu}{S/\sqrt{n}} \sim t_{n-1}$$