STAT 513 Test 3 Formula Sheet

$$[\hat{\beta}_0 + \hat{\beta}_1 x^*] \pm t_{\alpha/2, n-2} \sqrt{MSE\left[1 + \frac{1}{n} + \frac{(x^* - \bar{x})^2}{S_{xx}}\right]}$$

$$(\underset{\sim}{X}'\underset{\sim}{X})^{-1}\underset{\sim}{X}'\underset{\sim}{Y}$$

$$t = \frac{\underset{\sim}{a}'\hat{\underset{\sim}{\beta}} - (\underset{\sim}{a}'\underset{\sim}{\beta})_0}{\sqrt{MSE[\underset{\sim}{a}'(\underset{\sim}{X}'\underset{\sim}{X})^{-1}\underset{\sim}{a}]}}$$

$$\underset{\sim}{a}'\hat{\underset{\sim}{\beta}} \pm t_{\alpha/2, n-k-1} \sqrt{MSE[\underset{\sim}{a}'(\underset{\sim}{X}'\underset{\sim}{X})^{-1}\underset{\sim}{a}]}$$

$$\hat{y}^* \pm t_{\alpha/2, n-k-1} \sqrt{MSE[1 + \underset{\sim}{a}'(\underset{\sim}{X}'\underset{\sim}{X})^{-1}\underset{\sim}{a}]}$$

$$F = \frac{(SSE_R - SSE_C)/(k-g)}{SSE_C/(n-k-1)}$$

$$\frac{\sum(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum(x_i - \bar{x})^2 \sum(y_i - \bar{y})^2}} = \frac{S_{xy}}{\sqrt{S_{xx} S_{yy}}} = \hat{\beta}_1 \sqrt{\frac{S_{xx}}{S_{yy}}}$$

$$\frac{r\sqrt{n-2}}{\sqrt{1-r^2}}$$

$$\frac{\frac{1}{2}\ln\left(\frac{1+r}{1-r}\right) - \frac{1}{2}\ln\left(\frac{1+\rho_0}{1-\rho_0}\right)}{1/\sqrt{n-3}}$$

$$\frac{1}{2}\ln\left(\frac{1+r}{1-r}\right) \pm z_{\alpha/2}\left(\frac{1}{\sqrt{n-3}}\right)$$

$$\left[\frac{e^{2L}-1}{e^{2L}+1}, \frac{e^{2U}-1}{e^{2U}+1}\right]$$

$$1 - \frac{SSE}{S_{yy}}$$

$$\sum_{\text{cells}} \frac{(Obs - Exp)^2}{Exp}$$