

STAT 513 Test 3 Formula Sheet

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

$$\left(\begin{matrix} \hat{\beta}_0 \\ \hat{\beta}_1 \end{matrix} \right)' \begin{pmatrix} 1 \\ x^* \end{pmatrix} \pm t_{\alpha/2, n-2} \sqrt{\text{MSE} \left[\begin{pmatrix} 1 \\ x^* \end{pmatrix}' \begin{pmatrix} 1 & x^* \end{pmatrix}^{-1} \begin{pmatrix} 1 \\ x^* \end{pmatrix} \right]}$$

$$\begin{pmatrix} \hat{\beta}_0 \\ \hat{\beta}_1 \end{pmatrix}' \begin{pmatrix} 1 \\ x^* \end{pmatrix} \pm t_{\alpha/2, n-k-1} \sqrt{\text{MSE} \left[\begin{pmatrix} 1 \\ x^* \end{pmatrix}' \begin{pmatrix} 1 & x^* \end{pmatrix}^{-1} \begin{pmatrix} 1 \\ x^* \end{pmatrix} \right]}$$

$$\hat{y}^* \pm t_{\alpha/2, n-k-1} \sqrt{\text{MSE} \left[1 + \begin{pmatrix} 1 \\ x^* \end{pmatrix}' \begin{pmatrix} 1 & x^* \end{pmatrix}^{-1} \begin{pmatrix} 1 \\ x^* \end{pmatrix} \right]}$$

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

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

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

$$\frac{\frac{1}{2} \ln \left(\frac{1+r}{1-r} \right) - \frac{1}{2} \left(\frac{1+p_0}{1-p_0} \right)}{1/\sqrt{n-3}}$$

$$\frac{1}{2} \ln \left(\frac{1+r}{1-r} \right) \pm z_{\alpha/2} \left(\frac{1}{\sqrt{n-3}} \right) \left[\frac{e^{2L} - 1}{e^{2L} + 1}, \frac{e^{2U} - 1}{e^{2U} + 1} \right]$$

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

$$g^*(\theta | y_1, \dots, y_n) \propto L(\theta | y_1, \dots, y_n) g(\theta)$$