Confidence Interval (generic): Estimate ± (Critical_Value)(Standard_Error) OR
Estimate ± (Critical_Value)(Standard_Deviation)

Standardized T/Z-statistic: $t_s = \frac{(Estimate)-E_0}{SE_{Estimate}}$, $z_s = \frac{(Estimate)-E_0}{SD_{Estimate}}$, where E_0 is the value under H_0

$$SE_{\bar{x}_1-\bar{x}_2} = \sqrt{\frac{s_1^2}{n_1}+\frac{s_2^2}{n_2}} \quad or \quad \sqrt{s_p^2\left(\frac{1}{n_1}+\frac{1}{n_2}\right)}, \quad s_p^2 = \frac{(n_1-1)s_1^2+(n_2-1)s_2^2}{n_1+n_2-2}, \quad F_{\max,s} = s_{\max}^2/s_{\min}^2$$

$$\hat{y}_i = \hat{\beta}_0 + \hat{\beta}_1 x_i$$

$$\hat{\beta}_0 = \overline{y} - \hat{\beta}_1\overline{x} \qquad SE_{\hat{\beta}_0} = S_{Y|X}\sqrt{\frac{1}{n}+\frac{\overline{x}^2}{(n-1){S_x}^2}}$$

$$\hat{\beta}_1 = \frac{\sum(x_i-\overline{x})(y_i-\overline{y})}{\sum(x_i-\overline{x})^2} = \frac{SSXY}{SSX} = r\frac{s_y}{s_x} \qquad SE_{\hat{\beta}_1} = \frac{S_{Y|X}}{\sqrt{SSX}} = \frac{S_{Y|X}}{\sqrt{(n-1){S_x}^2}}$$

$$SE_{\hat{\mu}_{Y|X=x_0}} = S_{Y|X}\sqrt{\frac{1}{n}+\frac{(x_0-\overline{x})^2}{(n-1){S_x}^2}}$$

$$SE_{\hat{Y}_{X=x_0}} = S_{Y|X}\sqrt{1+\frac{1}{n}+\frac{(x_0-\overline{x})^2}{(n-1){S_x}^2}} = SE_{pred}$$

$$r = \frac{\sum(x_i-\overline{x})(y_i-\overline{y})}{\sqrt{\sum(x_i-\overline{x})^2\sum(y_i-\overline{y})^2}} = \frac{SSXY}{\sqrt{SSX\ SSY}} = \hat{\beta}_1\frac{s_x}{s_y} \qquad t_s = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}}$$

$$SD\left(\frac{1}{2}\cdot\ln\frac{1+r}{1-r}\right) = \sqrt{\frac{1}{n-3}} \qquad (L_\rho, U_\rho) = \left(\frac{e^{2Lz}-1}{e^{2Lz}+1}, \frac{e^{2Uz}-1}{e^{2Uz}+1}\right)$$

$$\underset{\sim}{Y} = \underset{\sim}{X}\underset{\sim}{\beta}+\underset{\sim}{\epsilon} \qquad \underset{\sim}{\hat{\beta}} = (\underset{\sim}{X}'\underset{\sim}{X})^{-1}\underset{\sim}{X}'\underset{\sim}{Y} \qquad var(\underset{\sim}{\hat{\beta}}) = (\underset{\sim}{X}'\underset{\sim}{X})^{-1}\sigma^2 \qquad var(A+B) = var(A)+var(B)+2cov(A,B)$$

$$SE(\hat{\mu}_{Y|\mathbf{X}=(1,x_{1*},x_{2*},\cdots,x_{k*})}) = \sqrt{s^2_{\hat{Y}|\mathbf{X}=(1,x_{1*},x_{2*},\cdots,x_{k*})}}$$

$$SE(\hat{Y}|\mathbf{X}=(1,x_{1*},x_{2*},\cdots,x_{k*})) = \sqrt{s^2_{Y|\mathbf{X}=(1,x_{1*},x_{2*},\cdots,x_{k*})}+s^2_{\hat{Y}|\mathbf{X}=(1,x_{1*},x_{2*},\cdots,x_{k*})}}$$

$$SS({X_1}^*,\ldots,{X_s}^*|X_1,\ldots,X_q) = SSR(X_1,\ldots,X_q,{X_1}^*,\ldots,{X_s}^*) - SSR(X_1,\ldots,X_q)$$
$$= SSE(X_1,\ldots,X_q) - SSE(X_1,\ldots,X_q,{X_1}^*,\ldots,{X_s}^*)$$

$$F(X_1^*,\cdots,X_s^*|X_1,\cdots,X_q) = \frac{SS(X_1^*,\cdots,X_s^*|X_1,\cdots,X_q)/s}{MSE(X_1^*,\cdots,X_s^*,\ \ X_1,\cdots,X_q)}$$

$$r_{yx_1|z} = \frac{r_{yx_1}-r_{yz}r_{x_1z}}{\sqrt{(1-r_{yz}^2)(1-r_{x_1z}^2)}} \qquad r^2_{yx_1|z} = \frac{SS(X_1|Z)}{SSE(Z)}$$

$$r_i = \frac{e_i}{s_{Y|X}\sqrt{1-h_i}} \qquad h_i = \frac{1}{n}+\frac{(x_i-\overline{x})^2}{(n-1)SSX} \qquad D_i = \frac{r_i^2*h_i}{(k+1)(1-h_i)} \qquad \texttt{vif}_j = \frac{1}{1-R_j^2}$$

$$\hat{L} \pm t_{\texttt{Bonf}}SE(\hat{L}) \qquad \hat{L} \pm q_{\texttt{Tukey}}\frac{1}{\sqrt{2}}SE(\hat{L}) \qquad \hat{L} \pm \sqrt{(k-1)F_{\texttt{Scheffe}}}SE(\hat{L})$$