$$\hat{\beta}_1 = \frac{\sum_{i=1}^{n}(x-\bar{x})(y-\bar{y})}{\sum_{i=1}^{n}(x-\bar{x})^2} = \frac{S_{xy}}{S_{xx}}$$

$$\hat{\beta}_0 = \bar{y} - \hat{\beta}_1\bar{x}$$

$$TSS = \sum_{i=1}^{n}(y_i-\bar{y})^2$$

$$SSE = \sum_{i=1}^{n}(y_i-(\hat{\beta}_0+\hat{\beta}_1 x_i))^2$$

$$s_{\hat{\beta}_1} = \sqrt{\frac{MSE}{S_{xx}}} \quad \text{use with } t_{(df=n-2)}$$

$$s_{\hat{\mu}_{y|x}} = \sqrt{MSE}\sqrt{\frac{1}{n}+\frac{(x^*-\bar{x})^2}{S_{xx}}} \quad \text{use with } t_{(df=n-2)}$$

$$s_{\hat{y}_{y|x}} = \sqrt{MSE}\sqrt{1+\frac{1}{n}+\frac{(x^*-\bar{x})^2}{S_{xx}}} \quad \text{use with } t_{(df=n-2)}$$

$$r = \frac{\sum_{i=1}^{n}(x-\bar{x})(y-\bar{y})}{\sqrt{\sum_{i=1}^{n}(x-\bar{x})^2\sum_{i=1}^{n}(y-\bar{y})^2}} = \hat{\beta}_1\frac{s_x}{s_y}$$

$$r^2 = \frac{SSR}{TSS}$$

$$F = \frac{(n-2)r^2}{(1-r^2)}$$

$$VIF \quad > 10$$

$$C_p \quad \approx p+1 \quad \text{(or less)}$$

$$h_{ii} \quad > \frac{2(m+1)}{n}$$

$$t_i \quad > 2 > 3$$

$$DFFITS_i \quad > 2\sqrt{\frac{m+1}{n}}$$