$$b_1 = \frac{\sum(x-\bar{x})(y-\bar{y})}{\sum(x-\bar{x})^2} = \frac{n\sum(xy) - \sum x \sum y}{n\sum x^2 - (\sum x)^2}$$

$$b_0 = \bar{y} - b_1\bar{x}$$

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

$$SS_{res} = \sum_{i=1}^{n}(y_i - (b_0 + b_1 x_i))^2$$

$$s_{y|x} = \sqrt{MS_{res}} \qquad (n-1)s_x^2 = \sum_{i=1}^{n}(x_i - \bar{x})^2$$

$$s_{b_1} = \sqrt{\frac{s_{y|x}^2}{(n-1)s_x^2}} \quad \text{use with } t_{(df=n-2)}$$

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

$$s_{Y_{new}} = s_{y|x}\sqrt{1 + \frac{1}{n} + \frac{(x-\bar{x})^2}{(n-1)s_x^2}} \quad \text{use with } t_{(df=n-2)}$$

$$r = \frac{\sum(x-\bar{x})(y-\bar{y})}{\sqrt{\sum(x-\bar{x})^2\sum(y-\bar{y})^2}} = b_1\frac{s_x}{s_y}$$

$$r^2 = \frac{SS_{reg}}{SS_{tot}}$$

$$r_{-i} \quad > 2 > 3$$

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

$$D_i \quad > 1 > 4$$

$$VIF \quad > 4 > 10$$

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