$$Z_{stat} = \frac{(\bar{x}-\mu_0)\sqrt{n}}{\sigma} \;\; or \;\; T_{stat} = \frac{(\bar{x}-\mu_0)\sqrt{n}}{s}$$

$Z_{stat} = \frac{\hat{p}-\pi_0}{\sqrt{\frac{\pi_0(1-\pi_0)}{n}}}$ *where* $\hat{p} = \frac{x}{n}$ $\chi^2_{stat} = \frac{(n-1)s^2}{\sigma_0^2}$

And $F_{stat} = \frac{s_i^2}{s_j^2}$ *where* $\begin{matrix} fd_1 = n_i - 1 \\ fd_2 = n_j - 1 \end{matrix}$

The $d_i = x_{1i} - x_{2i}$ with $T_{stat} = \frac{(\bar{d}-\mu_0)\sqrt{n}}{s_d}$

Where $\bar{d} = \frac{\sum d}{n}$ & $s_d = \sqrt{\frac{\sum d^2 - n\bar{d}^2}{n-1}}$.

$Z_{stat} = \frac{(\bar{x}_1-\bar{x}_2)-(\mu_1-\mu_2)}{\sqrt{\frac{\sigma_1^2}{n_1}+\frac{\sigma_2^2}{n_2}}}$ or $Z_{stat} = \frac{(\bar{x}_1-\bar{x}_2)-(\mu_1-\mu_2)}{\sqrt{\frac{s_1^2}{n_1}+\frac{s_2^2}{n_2}}}$

$T_{stat} = \frac{(\bar{x}_1-\bar{x}_2)-(\mu_1-\mu_2)}{s_p\sqrt{\frac{1}{n_1}+\frac{1}{n_2}}}$ *where* $s_p = \sqrt{\frac{(n_1-1)s_1^2+(n_2-1)s_2^2}{n_1+n_2-2}}$

$T_{stat} = \frac{(\bar{x}_1-\bar{x}_2)-(\mu_1-\mu_2)}{\sqrt{\frac{s_1^2}{n_1}+\frac{s_1^2}{n_2}}}$ *where* $df = \frac{\left(\frac{s_1^2}{n_1}+\frac{s_2^2}{n_2}\right)^2}{\frac{\left(\frac{s_1^2}{n_1}\right)^2}{n_1-1}+\frac{\left(\frac{s_2^2}{n_2}\right)^2}{n_2-1}}$

$$Z_{stat} = \frac{(\hat{p}_1-\hat{p}_2)-\pi_0}{\sqrt{\hat{p}(1-\hat{p})\left(\frac{1}{n_1}+\frac{1}{n_2}\right)}}$$

where $\hat{p} = \frac{x_1+x_2}{n_1+n_2}$ & $\hat{p}_1 = \frac{x_1}{n_1}$ $\hat{p}_2 = \frac{x_2}{n_2}$

$$\chi^2_{stat} = \sum \frac{(f_o-f_e)^2}{f_e}, \quad df = (c-1)(r-1)$$

$$|p_i - p_j| > \sqrt{\chi^2_\alpha}\sqrt{\frac{p_i(1-p_i)}{n_i}+\frac{p_j(1-p_j)}{n_j}}$$

$r = \frac{S_{xy}}{\sqrt{S_{xx}\cdot S_{yy}}}$ where $S_{xx} = \sum(x-\bar{x})^2$

$S_{yy} = \sum(y-\bar{y})^2$ and $S_{xy} = \sum(x-\bar{x})(y-\bar{y})$

$T_{stat} = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}}$ & $df = n-2$

$\hat{y} = b_0 + b_1 x$ where $b_1 = \frac{Sxy}{Sxy}$ & $b_0 = \bar{y} - b_1\bar{x}$

$SST = S_{yy} = \sum y^2 - n\bar{y}^2$,

$SSR = b_1 S_{xy} = \frac{S_{xy}^2}{S_{xx}}$ & $SSE = SST - SSR$

$R^2 = \frac{SSR}{SST}$ and $R^2_{adj} = 1-(1-R^2)\left(\frac{n-1}{n-k-1}\right)$

And $S_\epsilon = S_{y.x} = \sqrt{\frac{SSE}{n-k-1}}$ with $S_{b_1} = \frac{S_\epsilon}{\sqrt{S_{xx}}}$

$T_{stat} = \frac{b_1-\beta_{1_0}}{S_{b_1}}$ and $b_1 \pm t_{\frac{\alpha}{2},df}\, S_{b_1}$ where df= n-k-1

$\hat{y} \pm t_{\frac{\alpha}{2},df}\, S_\epsilon\sqrt{\frac{1}{n}+\frac{(x_p-\bar{x})^2}{Sxx}}$ & $\hat{y} \pm t_{\frac{\alpha}{2},df}\, S_\epsilon\sqrt{1+\frac{1}{n}+\frac{(x_p-\bar{x})^2}{Sxx}}$

$F_{stat} = \frac{MSR}{MSE}$ *where* $\begin{matrix} df_1 = k \\ df_2 = n-k-1 \end{matrix}$

$$SSR(X_j|all\ other\ X's) = SSR_{Full} - SSR_{(X_j)}$$

$$r^2_{Y2.1} = \frac{SSR(X_j|all\ other\ X's)}{SST_{Full}-SSR_{Full}+SSR(X_j|all\ other\ X's)}$$

$F_{stat} = \frac{SSR(X_j|all\ other\ X's)}{MSE_{Full}}$ & $\begin{matrix} df_1 = 1 \\ df_2 = n-k_{full}-1 \end{matrix}$

$F_{stat} = \frac{\frac{MSR_{Full}-MSR_{Reduced}}{m}}{MSE_{Full}}$, $\begin{matrix} df_1 = m = k_{Full}-k_{Reduced} \\ df_2 = n_{Full}-k_{full}-1 \end{matrix}$

V $VIF_j = \frac{1}{1-R_j^2}$ & $C_p = \frac{(1-R_k^2)(n-T)}{1-R_T^2} - (n-2k-2)$

$I_t = \frac{y_t}{y_0}$, $I_t = \frac{\sum p_t}{\sum p_0}(100)$ & $E_{t+1} = wy_t + (1-w)E_t$

$IP_t = \frac{\sum p_t\, q_t}{\sum p_0\, q_t}(100)$ $IL_t = \frac{\sum p_t\, q_0}{\sum p_0\, q_0}(100)$

$y_t = \beta_0\beta_1^{x_t}\varepsilon_t$ then

$\log(y_t) = \log(\beta_0) + x_t\log(\beta_1) + \log(\varepsilon_t)$

$y_t = \beta_0\beta_1^{x_t}\beta_2^{Q_1}\beta_3^{Q_2}\beta_4^{Q_3}\varepsilon_t$

$y_t = A_0 + A_1 y_{t-1} + A_2 y_{t-2} + \cdots + A_p y_{t-p} + \varepsilon$