Formulae sheet – Second exam

$$S_{xx} = \Sigma(x - \bar{x})^2 \ , \ S_{yy} = \Sigma(y - \bar{y})^2 \ , S_{xy} = \Sigma(x - \bar{x})(y - \bar{y})$$

$$r = \frac{S_{xy}}{\sqrt{S_{xx} \cdot S_{yy}}} \ , \ T_{stat} = r\frac{\sqrt{n-2}}{\sqrt{1-r^2}} \ , \ \hat{y} = b_0 + b_1 x \ , \ b_1 = \frac{S_{xy}}{S_{xx}} \ , \ b_0 = \bar{y} - b_1\bar{x}$$

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

$$R_{adj}^2 = 1 - (1 - R^2)\left(\frac{n-1}{n-k-1}\right) \ , S_\epsilon = S_{Y.X} = \sqrt{\frac{SSE}{n-k-1}} \ , \ S_{b_1} = \frac{S_\epsilon}{\sqrt{S_{xx}}}$$

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

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

$$F_{stat} = \frac{MSR}{MSE} \ , \ df_1 = k \ , \ df_2 = n - k - 1$$

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

$$r_{Yj.others}^2 = \frac{SSR(X_j | all \ other \ X's)}{SSE_{Full} + SSR(X_j | all \ other \ X's)}$$

$$F_{stat} = \frac{SSR(X_j | all \ other \ X's)}{MSE_{Full}} \ , \ df_1 = 1$$

$$F_{stat} = \frac{\frac{SSR_{Full} - SSR_{Others}}{m}}{MSE_{Full}} \ , \ df_1 = m$$

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