

Repetition week 6

Confidence interval for the mean in x_0 , Multiple regression

$$\hat{y}_0 \pm t_{\frac{\alpha}{2}, n-k-1} s \sqrt{x_0' (X'X)^{-1} x_0}$$

Prediction interval for a new observation in x_0 , Multiple regression

$$\hat{y}_0 \pm t_{\frac{\alpha}{2}, n-k-1} s \sqrt{1 + x_0' (X'X)^{-1} x_0}$$

Partial F-tests

$H_0 : \beta_{i+1} = \beta_{i+2} = \dots = \beta_k = 0$ H_1 : at least one is different from zero.

$$F = \frac{\frac{SS_R(\beta_1, \dots, \beta_k) - SS_R(\beta_1, \dots, \beta_i)}{k-i}}{\frac{SS_E(\beta_1, \dots, \beta_k)}{n-k-1}} \sim F_{k-i, n-k-1}$$

Forward selection

$$\max F_{in} = \frac{\frac{SS_R(\beta_1, \dots, \beta_{i+1}) - SS_R(\beta_1, \dots, \beta_i)}{1}}{\frac{SS_E(\beta_1, \dots, \beta_{i+1})}{n-(i+2)}} \sim F_{1, n-(i+2)}$$

Backward elimination

$$\min F_{in} = \frac{\frac{SS_R(\beta_1, \dots, \beta_{i+1}) - SS_R(\beta_1, \dots, \beta_i)}{1}}{\frac{SS_E(\beta_1, \dots, \beta_{i+1})}{n - (i + 2)}} \sim F_{1, n - (i + 2)}$$