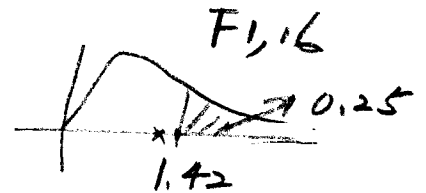


$$H_0: \beta_1 = 0 \quad Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \epsilon \quad P.2$$

$$c. F(X_1 | X_2, X_3) = \frac{[Reg\ SS(X_1, X_2, X_3) - Reg\ SS(X_2, X_3)] / 1}{MSE(X_1, X_2, X_3)}$$

$$= \frac{1507.18 - (1360.14 + 117.23)}{348.03 / 16} = \frac{29.81}{21.75} = 1.37$$

$$P\text{-value} = P(F_{1,16} > 1.37)$$



$$P\text{-value} > 0.25$$

not enough evidence to reject  $H_0$ .

Ans: NO

$$d \quad R^2(X_2, X_3) = 0.796$$

$$R^2(X_1, X_2, X_3) = \frac{1507.18}{1507.18 + 348.03} = \frac{1507.18}{1855.2} = 0.81$$

$$\text{Increase: } 0.81 - 0.796 = 0.016 \text{ very small}$$

$$e. F(X_4 | X_2, X_3) = \frac{0.09 / 1}{23.61} = 0.0038 \quad d.f.: 1, 16$$

$$H_0: \beta_4 = 0$$

$$P\text{-value} > 0.25$$

no evidence to reject  $H_0$ .

Ans: NO

$$f. F(X_3) = \frac{1360.14 / 1}{(117.23 + 0.09 + 377.73) / 18} = \frac{1360.14}{27.50} = 49.46$$

$H_0: \beta_3 = 0$   
 $H_a: \beta_3 \neq 0$   
 $P\text{-value} = P(F > 49.46) < 0.001$  Conclude:  $X_3$  is useful  
 reject  $H_0$ .

g.  $X_3, X_2$  use results from f, a, confirmed by c, d