

Assignment #6, Stat 5511, Spring, 2009

Due on Wednesday , April 8

(1) Do Problem 3.5 on p.115.

(2) Do problem 3.25 on p.120, using the simple linear regression model:

$$Y_i = \beta_0 + \beta_1 (X_i - \bar{X}) + \varepsilon_i .$$

(3) Consider the multiple linear regression model

$Y_i = \beta_0 + \beta_1 x_{i1} + \beta_2 x_{i2} + \beta_3 x_{i3} + \beta_4 x_{i4} + \varepsilon_i$ where ε_i are independent and Normal with

mean 0 and variance σ^2 . Test

$$H_0 : \beta_1 + \beta_3 = \beta_2 + \beta_4 \quad \text{vs}$$

$$H_1 : \beta_1 + \beta_3 \neq \beta_2 + \beta_4. \quad \text{Use } \alpha = 10\%.$$

(Give test statistics and rejection region)

(4) Do problem 4.2 (a ,b, c, e) on p.153.

(5) Do problem 4.4 (a, b, d) on p153/4

(6) Do problem 4.14 on p. 154.

(7) Consider the “soft drink delivery “ data in the text book, we know data point #9 is an unusual point.

a) Fit a model with all data points (you may use the handout in class).

b) Fit a model with all data points except point #9 and calculate all the residuals (i.e, residuals, standardized residuals, studentized residuals and PRESS residuals).

What is the PRESS.

c) Comment on the data point #9. (you may use the handouts from class).

(8) Optional.

Prove that

$$e_{(i)} = e_i / (1-h_{ii}). \quad (\text{see Appendix C.7})$$

