Regression Analysis TA
Chapter 3 – Diagnostics and Remedial Measures

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1   Problems

3.4

(c) & (d)

$i:$	1	2	...	44	45
$Y_i:$	29.49034	59.56084	...	59.56084	74.59608
$e_i:$	-9.49034	0.43916	...	1.43916	2.40392

(e)

Ascending order:	1	2	...	44	45
Ordered residual:	-22.77232	-19.70183	...	14.40392	15.40392
Expected value:	-19.63272	-16.04643	...	16.04643	19.63272

H_0: Normal, H_a: not normal. $r = 0.9891$. If $r \geq 0.9785$ conclude H_0, otherwise H_a.

Conclude H_0.

(g) $SSR^* = 15,155, SSE = 3416.38, X^2_{BP} = (15,155/2) \div (3416.38/45)^2 = 1.314676, \chi^2(0.95;1)$

$= 3.84$. If $X^2_{BP} \leq 3.84$ conclude error variance constant, otherwise error variance not

constant. Conclude error variance constant.

3.13

(a) $H_0 : E\{Y\} = \beta_0 + \beta_1 X, H_a : E\{Y\} \neq \beta_0 + \beta_1 X$

(b) $SSPE = 2797.66, SSLF = 618.719, F^* = (618.719/8) \div (2797.66/35) = 0.967557,$

$F(0.95; 8, 35) = 2.21668$. If $F^* \leq 2.21668$ conclude H_0, otherwise H_a. Conclude H_0.

3.15

(a) $\hat{Y} = 2.57533 - 0.32400X$

(b) $H_0 : E\{Y\} = \beta_0 + \beta_1 X, H_a : E\{Y\} \neq \beta_0 + \beta_1 X$. $SSPE = 0.1575, SSLF = 2.7675,$

$F^* = (2.7675/3) \div (0.1575/10) = 58.5714, F(0.975; 3, 10) = 4.83.$

If $F^* \leq 4.83$ conclude H_0, otherwise H_a. Conclude H_a.

3.17

(b)

λ:	0.3	0.4	0.5	0.6	0.7
$SSE:$	1099.7	967.9	916.4	942.4	1044.2

(c) $\hat{Y}' = 10.26093 + 1.07629X$

(e)

i:	1	2	3	4	5
e_i :	-0.36	0.28	0.31	-0.15	0.30
$\hat{Y}'$:	10.26	11.34	12.41	13.49	14.57
Expected value:	-0.24	0.14	0.36	-0.14	0.24

i:	6	7	8	9	10
e_i :	-0.41	0.10	-0.47	0.47	-0.07
$\hat{Y}'$:	15.64	16.72	17.79	18.87	19.95
Expected value:	-0.36	0.04	-0.56	0.56	-0.04

(f) $\hat{Y} = (10.26093 + 1.07629X)^2$