UST 803: COMPUTER LAB#4

COBB-DOUGLAS PRODUCTION FUNCTION

Multiple Regression. Data on Taiwan production Y, labor X2, capital X3. Gujarati, pg 216. The Cobb-Douglas production function is used to fit the data.

$$X := \begin{pmatrix} 275.5 & 17803.7 \\ 274.4 & 18096.8 \\ 269.7 & 18271.8 \\ 267 & 19167.3 \\ 267.8 & 19647.6 \\ 275 & 20803.5 \\ 283 & 22076.6 \\ 300.7 & 23445.2 \\ 307.5 & 24939. \\ 303.7 & 26713.7 \\ 304.7 & 29957.8 \\ 298.6 & 31585.9 \\ 295.5 & 33474.5 \\ 299 & 34821.8 \\ 288.1 & 41794.3 \end{pmatrix} \qquad Y := \begin{pmatrix} 16607.7 \\ 17511.3 \\ 20171.2 \\ 20932.9 \\ 20406. \\ 20831.6 \\ 24806.3 \\ 26465.8 \\ 27403 \\ 28628.7 \\ 29904.5 \\ 27508.2 \\ 29035.5 \\ 29281.5 \\ 31535.8 \end{pmatrix}$$

$i := 0..14 \qquad j := 0..1$

$lnX_{i,j} := \ln(X_{i,j}) \qquad lnY_i := \ln(Y_i)$

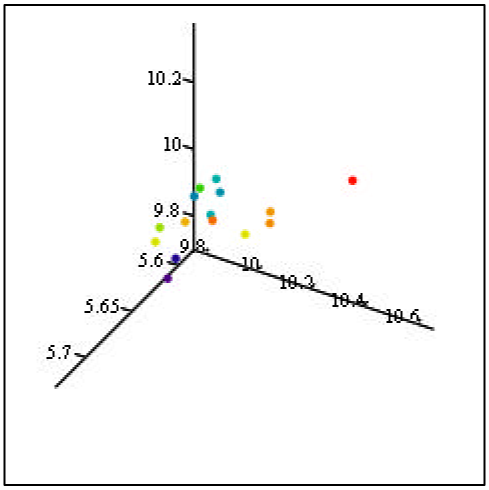
$$\text{regress}(lnX, lnY, 1) = \begin{pmatrix} 3.00000 \\ 3.00000 \\ 1.00000 \\ 1.49877 \\ 0.48986 \\ -3.33846 \end{pmatrix}$$

$\beta_0 := \text{regress}(lnX, lnY, 1)_5 \qquad \beta_1 := \text{regress}(lnX, lnY, 1)_3 \qquad \beta_2 := \text{regress}(lnX, lnY, 1)_4$

$\beta_0 = -3.33846 \qquad \beta_1 = 1.49877 \qquad \beta_2 = 0.48986$

$$Rsquare := 1 - \frac{\sum_{i=0}^{14} \left(lnY_i - \beta_0 - \beta_1 \cdot lnX_{i,0} - \beta_2 \cdot lnX_{i,1}\right)^2}{15 \cdot \text{var}(lnY)}$$

$Rsquare = 0.88903$



$\left(\ln X^{\langle 0\rangle}, \ln X^{\langle 1\rangle}, \ln Y\right)$