Assignment 8 (Week 8)

Due on 2016-03-24, 19:29 IST

Submitted assignment

1) Least square estimation means- ***1 point***

- minimization of absolute deviation of the observed data points from the regression line
- minimization of deviation of the observed data points from the fitted line
- minimization of squared deviation of the observed data points from the fitted line
- All of these
- None of these

2) In multiple linear regression, the estimated value of β is ***1 point***

- $\widehat{\beta} = (X^T X)^{-1} X^T Y$
- $\widehat{\beta} = (X^T Y)^{-1} XY$
- $\widehat{\beta} = (X^T Y)^{-1} X^T Y$
- $\widehat{\beta} = (X^T Y)^{-1} Y X^{-1}$

3) The coefficient of determination (R^2) is **1 point**

- R^2 = (Explained variance of dependent variable)/ (Unexplained variance of dependent variable)
- R^2 = (Unexplained variance of dependent variable)/ (Total variance of dependent variable)
- R^2 = (Explained variance of dependent variable)/ (Total variance of dependent variable)
- None of these

4) In multiple linear regression, the errors are **1 point**

- normally distributed with mean zero, and standard deviation σ^2
- normally distributed with mean one, and standard deviation σ^2
- normally distributed with mean zero, and standard deviation one
- none of these

5) In a multiple linear regression study with p number of independent variables and n number of observations, the value of R-square for n=p+1 is **1 point**

- 1
- 0
- -0.50
- 0.50

6) Answer the following questions 6 to 9. **3 points**

For a dependence relationship using regression model, the following statistics are obtained from a secondary data source that used 90 direct observations:

$$X^T X = \begin{bmatrix} 90 & 180 & 780 \\ 180 & 420 & 1450 \\ 780 & 1450 & 9600 \end{bmatrix}; \quad X^T y = \begin{bmatrix} 4800 \\ 9600 \\ 3970 \end{bmatrix};$$ SST =7928, and SSE = 6405

Compute the regression coefficients $\left(\widehat{\beta}\right)$

$$\begin{bmatrix} 229.24 \\ -26.14 \\ -14.26 \end{bmatrix}$$

$$\begin{bmatrix} 229.24 \\ -36.14 \\ -14.26 \end{bmatrix}$$

$$\begin{bmatrix} 229.24 \\ -26.14 \\ -25.26 \end{bmatrix}$$

None of these

7) Based on the data given in Q6, obtain the covariance matrix of $\left(\widehat{\beta}\right)$. ***3 points***

$$\begin{bmatrix} 9.97 & 3.08 & -0.344 \\ -3.08 & 1.32 & 0.051 \\ -0.344 & 0.051 & 0.028 \end{bmatrix}$$

$$\begin{bmatrix} 1.00 & 3.08 & -0.344 \\ -3.08 & 1.00 & 0.051 \\ -0.344 & 0.051 & 1.00 \end{bmatrix}$$

$$\begin{bmatrix} 1.00 & 3.08 & 0.344 \\ -3.08 & 1.00 & -0.051 \\ 0.344 & -0.051 & 1.00 \end{bmatrix}$$

None of these.

8) Choose the calculated F-value based on the data given in Q6. ***2 points***

15.21

- 25.38
- 10.34
- None of these

9) Choose the calculated adjusted R-square value based on the data given in Q6. ***2 points***

- 0.29
- 0.42
- 0.17
- None of these.