## **Assignment 8 (Week 8)**

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

## **Submitted assignment**

- 1) Least square estimation means
  - 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
  - ninimization 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  $\boldsymbol{\beta}$  is

1 point

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

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

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

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

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3) The coefficient of determination ( $R^2$ ) is

 $R^2$  = (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  $\sigma^2 |$ 

- normally distributed with mean one, and standard deviation  $\sigma^2 |$
- normally distributed with mean zero, and standard deviation one
- one 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:

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

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

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

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

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

None of these

7) Based on the data given in Q6, obtain the covariance matrix of  $(\widehat{\beta})$ 

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

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

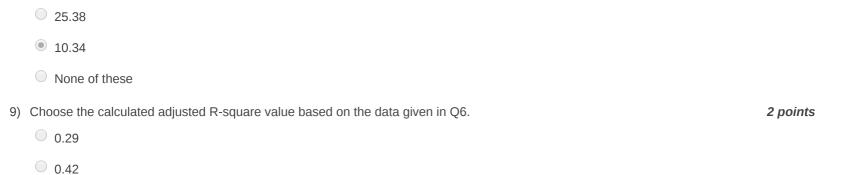
$$\begin{bmatrix} 1.00 & 3.08 & 0.344 \\ -3.08 & 1.00 & -0.051 \\ 0.344 & -0.051 & 1.00 \end{bmatrix}$$

None of these.

- 8) Choose the calculated F-value based on the data given in Q6.
  - 15.21

3 points

2 points



0.17

None of these.