

EE325 Introductory Econometrics, Semester 1/2019 (Section 046402)

Due Date: Thursday 27th February 2020 by 09.30 via Assignment Submission in Moodle.

Instruction: Do all questions with your own handwriting and your own attempt.

Use 4 decimal places for numerical answers

1. In Table 1. X_i is total econometrics exam point (total points are 100) and Y_i is GPA of each BE student.

Table 1

| Student | Y_i | X_i |
|---------|-------|-------|
| 1 | 2.8 | 63 |
| 2 | 3.4 | 72 |
| 3 | 3.0 | 78 |
| 4 | 3.5 | 81 |
| 5 | 3.6 | 87 |
| 6 | 3.0 | 75 |
| 7 | 2.7 | 75 |
| 8 | 3.7 | 90 |

1.1 Now consider the two-variable model $Y_i = \beta_1 + \beta_2 X_i + u_i$, $u_i \sim NIID(0, \sigma^2)$

Use OLS to find the estimator of β_1 and β_2 . Interpret the regression.

1.2 Find \hat{Y}_i and \hat{u}_i and show that $\sum_{i=1}^n \hat{u}_i \approx 0$

1.3 Find $var(\hat{u}_i)$, $var(\hat{\beta}_1)$, and $var(\hat{\beta}_2)$

2. Data is listed in the table

| X_i | Y_i |
|-------|-------|
| 10 | 0 |
| 12 | 2 |
| 14 | 5 |
| 16 | 6 |
| 18 | 7 |
| 22 | 10 |
| 24 | 10 |
| 26 | 15 |
| 28 | 16 |
| 30 | 20 |

2.1 From the simple regression model $Y_i = \beta_1 + \beta_2 X_i + u_i, u_i \sim NIID(0, \sigma^2)$

Find estimators of β_1 and β_2 from the OLS method and interpret the meaning.

2.2 Find the value of \hat{Y}_i and \hat{u}_i . Show that $\sum \hat{u}_i \approx 0$

2.3 Plot graph and draw regression line. Does the line pass (\bar{X}, \bar{Y}) ?

2.4 If $X_i = 18$, what is the predicted Y?

2.5 Find $var(\hat{u}_i), var(\hat{\beta}_1), var(\hat{\beta}_2)$

3. Consider the below regression function: consider the two-variable model

$$Y_i = \beta_1 + \beta_2 X_i + u_i, u_i \sim NIID(0, \sigma^2)$$

Find an OLS estimator of β_1 . Then, provide a proof that this is an unbiased estimator.

Please state the assumption(s) of CLRM when used (pages 66-75 in Gujarati).

“Practice makes Perfect.”

