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Normality of Errors and Estimation - Quiz

Bookmark this page

Question 1

1/1 point (graded)

If we assume that the errors are i.i.d. normal, which of the following follow? (Select all that apply.)

- [x] a. $\hat{\beta}_0$ is normally distributed
- [x] b. $\hat{\beta}_1$ is normally distributed
- [ ] c. β_0 is normally distributed
- [ ] d. β_1 is normally distributed

✔

Explanation

Under the stronger assumption that our errors are identically and independently normally distributed, then it follows that our estimators $\hat{\beta}_0$ and $\hat{\beta}_1$ are also normally distributed. However, β_0 and β_1 are true values, so it does not make sense to say that they are normally distributed.

Submit You have used 1 of 2 attempts

✔ Correct (1/1 point)

Question 2

1/1 point (graded)

How do we estimate the error variance (σ^2)?

$\hat{\sigma^2} =$

a. $\frac{1}{n}\sum \hat{\epsilon_i}^2$

b. $\frac{1}{n-1}\sum \hat{\epsilon_i}^2$

c. $\frac{1}{n-2}\sum \hat{\epsilon_i}^2$ ✔

d. $\frac{1}{n}\sum(\hat{\epsilon_i}-1)^2$

Explanation

The Multivariate Linear Model
due Nov 28, 2016 05:00 IST

Module 9: Homework
due Nov 21, 2016 05:00 IST

- Module 10: Practical Issues in Running Regressions, and Omitted Variable Bias
- Exit Survey

We use the estimator with $n-2$ in the denominator because it is unbiased in the linear model when we are estimating two parameters β_0 and β_1. Recall that when we were estimating only one parameter, the estimator with $n-1$ in the denominator would return an unbiased estimator.

Submit You have used 1 of 2 attempts

✔ Correct (1/1 point)

Question 3

1/1 point (graded)

Assuming normality of errors, $\hat{\beta}_0$ and $\hat{\beta}_1$ are normally distributed. If we don't know their variances, we will have to estimate them. If we are interested in the means of the our estimators, what distribution will be relevant?

- a. F-distribution
- b. P-distribution
- c. N-distribution
- d. t-distribution ✔

Explanation

The t-distribution is relevant in situations where the random variable is normally distributed and the variance is unknown. We will discuss “t-tests” as related to the linear model in a later lecture.

Submit You have used 1 of 2 attempts

✔ Correct (1/1 point)

Discussion
Topic: Module 9 / Normality of Errors and Estimation - Quiz

Show Discussion