File: Ch03, Chapter 3, Interval Estimation and Hypothesis Testing

Multiple Choice

1. You estimate a simple linear regression model using a sample of 62 observations and obtain the following results (estimated standard errors in parentheses below coefficient estimates):

y = 97.25 + 33.74 *x
(3.86) (9.42)

What are the endpoints of the interval estimator for β_2 with a 95% interval estimate?
a.) (14.90, 52.58)
b.) (24.32, 43.16)
c.) (-3.58, 3.58)
d.) (30.16,37.32)

2. You estimate a simple linear regression model using a sample of 25 observations and obtain the following results (estimated standard errors in parentheses below coefficient estimates):

y = 97.25 + 19.74* x
(3.86) (3.42)

What are the endpoints of the interval estimator for β_2 with a 98% interval estimate?
a.) (-5.77, 25.51)
b.) (16.32 , 23.16)
c.) (11.19, 28.29)
d.) (12.90, 26.58)

3. You estimate a simple linear regression model using a sample of 62 observations and obtain the following results (estimated standard errors in parentheses below coefficient estimates):

y = 97.25 + 33.74* x
(3.86) (9.42)

You want to test the following hypothesis: **H_0: β_2 = 12, H1: $\beta_2 \neq$12.** If you choose to reject the null hypothesis based on these results, what is the probability you have committed a Type I error?
a.) between .05 and .10
b.) between .01 and .025
c.) between .02 and .05
d.) It is impossible to determine without knowing the true value of β_2

4. You estimate a simple linear regression model using a sample of 62 observations and obtain the following results (estimated standard errors in parentheses below coefficient estimates):

y = 97.25 + 33.74* x
(3.86) (9.42)

You want to test the following hypothesis: **H_0: $\beta_2 = 12$, H_1: $\beta_2 \neq 12$.** If you choose to reject the null hypothesis based on these results, what is the probability you have committed a Type II error?
a.) between .05 and .10
b.) between .01 and .025
c.) between .02 and .05
d.) It is impossible to determine without knowing the true value of β_2

5. You estimate a simple linear regression model using a sample of 25 observations and obtain the following results (estimated standard errors in parentheses below coefficient estimates):

$$y = 97.25 + 19.74 * x$$
$$(3.86) \quad (3.42)$$

You want to test the following hypothesis: **H_0: $\beta_2 = 1$, H_1: $\beta_2 > 1$.** If you choose to reject the null hypothesis based on these results, what is the probability you have committed a Type I error?
a.)between .01 and .02
b.)between .02 and .05
c.)less than .005
d.) It is impossible to determine without knowing the true value of β_2

6. Which of the following is not a component of a hypothesis tes?
a.) null hypothesis
b.) goodness-of-fit
c.) test statistic
d.) rejection region

7.) Which of the following cannot be an alternative hypothesis?
a.) $\beta_k = 0$
b.) $\beta_k \neq 0$
c.) $\beta_k > 0$
d.) $\beta_k < 0$

8.) Rejecting a true null hypothesis
a.) is a Type I error.
b.) is a Type II error.
c.) should not happen if a valid statistical test is used.
d.) depends on the size of the estimation sample.

9.) For which alternative hypothesis do you reject H_0 if $t \leq t_{(\alpha, N-2)}$?
a.) $\beta_k = c$
b.) $\beta_k \neq c$

c.) $\beta_k > c$
d.) $\beta_k < c$

10.) For which alternative hypothesis do you reject H_0 if $|t| \geq t_{(1-\alpha/2,N-2)}$?
a.) $\beta_k = c$
b.) $\beta_k \neq c$
c.) $\beta_k > c$
d.) $\beta_k < c$

11.) How do you reduce the probability of committing a Type I error?
a.) reduce α
b.) increase α
c.) use a two-tailed test
d.) increase the rejection region

12.) In which case would testing the null hypothesis involve a two-tailed statistical test?
a.) H_1: Incentive pay for teachers does affect student achievement
b.) H_1: Higher sales tax rates does not reduce state tax revenues
c.) H_1: Extending the duration of unemployment benefits does not increase the length of joblessness
d.) H_1: Smoking does not reduce life expectancy

13.) In testing H_0: $\beta_2 = c$ using a .05 probability of a Type I error, you find a p-value of .38. What should you conclude?
a.) H_0 is true, $\beta_2 = c$.
b.) H_0 should be rejected and is unlikely to be true since the p-value < .50.
c.) It is impossible to know for sure, but there is a .38 probability that $\beta_2 = c$.
d.) There is not sufficient evidence to reject H_0, so we accept the hypothesis by default.

14. What does a p-value NOT tell you?
a.) The size of the largest rejection region that would not contain the observed test statistic
b.) The probability that the null hypothesis is true and you would observe a test statistic more extreme than the one observed
c.) The highest value of α for which you cannot reject the null hypothesis based on the data
d.) The probability that the null hypothesis is true

15. You want to test the hypothesis

H_0: $(c_1 \beta_1 + c_2\beta_2) - c_0 = 0$ and H_1: $(c_1 \beta_1 + c_2\beta_2) - c_0 \neq 0$

What test statistic should you use for the test?

a.) $t = \dfrac{(c_1 b_1 + c_2 b_2) - c_0}{se(c_1 b_1 + c_2 b_2)}$

b.) $t = \dfrac{(c_1 b_1 + c_2 b_2)}{se(c_1 b_1 + c_2 b_2)}$

c.) $t = \dfrac{(b_1 + b_2)}{se(b_1) + se(b_2)}$

d.) $\chi^2 = (\beta_1 - \beta_2)/se(\beta_1 + \beta_2)$

16. You want to test the hypothesis

H_0: $(c_1 \beta_1 + c_2\beta_2) - c_0 = 0$ and H_1: $(c_1 \beta_1 + c_2\beta_2) - c_0 \neq 0$

If the null hypothesis is true, how will the test statistic be distributed?

a.) $t_{(\alpha/2)}$

b.) N(0,1)

c.) $t_{(N-2)}$

d.) $\chi^2_{(3, N-2)}$

17. If you are performing a two-tailed test of significance and you find that the area to the left of |t| is .975, what is the p-value?

a.).025

b.) .050

c.) .975

d.) .950

18. If you are performing a left-tailed significance test and find the area to the left of |t| is .99, what is the p-value?

a.) .01

b.) .99

c.) .02

d.) .05

19. When should a left-tailed significance test be used?

a.) When economic theory suggests the coefficient should be positive

b.) When it allows you to reject the null hypothesis at a lower p-value

c.) When economic theory suggests the coefficient should be negative

d.) When you know the true value of β_2 is positive.