File: Ch02, Chapter 2, The Simple Linear Regression Model

Multiple Choice

1. In an economic model that uses income to predict monthly expenditures on entertainment, what is the dependent variable?
a.) income
b.) monthly expenditures on entertainment
c.) income elasticity
d.) demand for entertainment

Ans: b

2. In an economic model that uses income to predict monthly expenditures on entertainment, what is the independent or explanatory variable?
a.) income
b.) monthly expenditures on entertainment
c.) income elasticity
d.) demand for entertainment

Ans: a

3. Which of the following is NOT an assumption of the Simple Linear Regression Model?
a.) The value of y, for each value of x, is
$y = \beta_1 + \beta_2 x + e$
b.)The variance of the random error e is
$\text{var}(e) = \sigma^2$
c.) The covariance between any pair of random errors e_i and e_j is zero
d.) The parameter estimate of β_1 is unbiased.

Ans: d

4. The OLS estimators for β_1 and β_2 are formulas derived by minimizing _____.
a.) the sum of the error terms or residuals
b.) the sum of the squared residuals
c.) the slope of the regression line
d.) the fit of the regression line to the observed data.

Ans: b

5. Applying the OLS model to our data give us the following regression equation:

$\hat{y} = 3.41 + 12.89\ x.$

What would the forecast value be when the independent variable is 15.0?

a.) 196.76
b.) 16.30
c.) 244.50
d.) 32.19

Ans: a

6. In the OLS model, what happens to var(b_1) as the sample size (N) increases?

a.) it also increases
b.) it decreases
c.) it does not change
d.) cannot be determined without more information

Ans: b

7. If b_1 is an estimator for β_1 such that $E(b_1) = \beta_1$, then it must be the case that

a.) b_1 is an efficient estimator
b.) b_1 is an unbiased estimator
c.) b_1 is a linear estimator
d.) b_1 is a preferred estimator

Ans: b

8. What mathematical theorem allows for normally distributed least squares estimators when assumptions SR1 – SR5 hold but the error term is NOT normally distributed?

a.) Central Limit Theorem
b.) Gauss-Markov Theorem
c.) Law of Large Numbers
d.) the Least Squares Principle

Ans: a

9. If we use $\frac{\sum \hat{e}_i^2}{N}$ as an estimator of σ^2 it is _____, but it can be corrected by _____.

a.) biased, changing the numerator to $\sum e_i^2$

b.) non-linear, changing the denominator to N – 2
c.) biased, changing the denominator to N-2
d.) non-linear, taking the log of each term.

Ans: c