Chapter 4: Linear Regression with One Regressor

Multiple Choice for the Web

1) Binary variables
   a. are generally used to control for outliers in your sample.
   b. can take on more than two values.
   c. exclude certain individuals from your sample.
   d. can take on only two values.

2) In the simple linear regression model, the regression slope
   a. indicates by how many percent \( Y \) increases, given a one percent increase in \( X \).
   b. when multiplied with the explanatory variable will give you the predicted \( Y \).
   c. indicates by how many units \( Y \) increases, given a one unit increase in \( X \).
   d. represents the elasticity of \( Y \) on \( X \).

3) The regression \( R^2 \) is a measure of
   a. whether or not \( X \) causes \( Y \).
   b. the goodness of fit of your regression line.
   c. whether or not \( ESS > TSS \).
   d. the square of the determinant of \( R \).

4) In the simple linear regression model \( Y_i = \beta_0 + \beta_1 X_i + u_i \),
   a. the intercept is typically small and unimportant.
   b. \( \beta_0 + \beta_1 X_i \) represents the population regression function.
   c. the absolute value of the slope is typically between 0 and 1.
   d. \( \beta_0 + \beta_1 X_i \) represents the sample regression function.

5) \( E(u_i \mid X_i) = 0 \) says that
   a. dividing the error by the explanatory variable results in a zero (on average).
   b. the sample regression function residuals are unrelated to the explanatory variable.
   c. the sample mean of the Xs is much larger than the sample mean of the errors.
   d. the conditional distribution of the error given the explanatory variable has a zero mean.
6) Assume that you have collected a sample of observations from over 100 households and their consumption and income patterns. Using these observations, you estimate the following regression \( C_i = \beta_0 + \beta_1 Y_i + u_i \), where \( C \) is consumption and \( Y \) is disposable income. The estimate of \( \beta_1 \) will tell you

a. \( \frac{\Delta \text{Income}}{\Delta \text{Consumption}} \)
b. The amount you need to consume to survive

c. \( \frac{\text{Income}}{\text{Consumption}} \)
d. \( \frac{\Delta \text{Consumption}}{\Delta \text{Income}} \)

7) In which of the following relationships does the intercept have a real-world interpretation?

a. the relationship between the change in the unemployment rate and the growth rate of real GDP (“Okun’s Law”)
b. the demand for coffee and its price
c. test scores and class-size
d. weight and height of individuals

8) The OLS residuals, \( \hat{u}_i \), are sample counterparts of the population

a. regression function slope
b. errors
c. regression function’s predicted values
d. regression function intercept

9) Changing the units of measurement, e.g. measuring test scores in 100s, will do all of the following EXCEPT for changing the

a. residuals
b. numerical value of the slope estimate
c. interpretation of the effect that a change in \( X \) has on the change in \( Y \)
d. numerical value of the intercept
10) To decide whether the slope coefficient indicates a “large” effect of \( X \) on \( Y \), you look at the

a. size of the slope coefficient
b. regression \( R^2 \)
c. economic importance implied by the slope coefficient
d. value of the intercept