Question #1 of 13

Question ID: 1572892

The estimated slope coefficient in a simple linear regression is:

A) the predicted value of the dependent variable, given the actual value of the independent variable.

B) the change in the independent variable, given a one-unit change in the dependent variable.

C) the ratio of the covariance of the regression variables to the variance of the independent variable.

Explanation

The estimated slope coefficient in a simple linear regression is $\frac{\mathrm{Cov}_{X,Y}}{\sigma_X^2}$, where Y is the dependent variable and X is the independent variable. The estimated slope coefficient is interpreted as the change in the *dependent* variable, given a one-unit change in the *independent* variable. The predicted value of the dependent variable must consider the estimated intercept term along with the estimated slope coefficient.

(Module 10.1, LOS 10.a)

Question #2 of 13

Question ID: 1572899

Given the relationship: Y = 2.83 + 1.5X

What is the predicted value of the dependent variable when the value of the independent variable equals 2?

A) 2.83.

B) –0.55.

C) 5.83.

Explanation

Y = 2.83 + (1.5)(2) = 2.83 + 3 = 5.83.

(Module 10.3, LOS 10.e)

Question #3 of 13

Question ID: 1572901

When there is a linear relationship between an independent variable and the relative change in the dependent variable, the *most appropriate* model for a simple regression is:

A) the log-log model.

B) the log-lin model.

C) the lin-log model.

Explanation

A regression of the form $\ln Y = b_0 + b_1X$ is appropriate when the relative change in the dependent variable is a linear function of the independent variable.

(Module 10.3, LOS 10.f)

Question #4 of 13

Question ID: 1572898

Consider the following analysis of variance (ANOVA) table:

Source	Sum of squares	Degrees of freedom	Mean sum of squares
Regression	556	1	556
Error	679	50	13.5
Total	1,235	51	

The R^2 for this regression is *closest* to:

A) 0.45.

B) 0.55.

C) 0.82.

Explanation

R^2 = sum of squares regression / sum of squares total = 556 / 1,235 = 0.45.

(Module 10.2, LOS 10.d)

Question #5 of 13

Question ID: 1572895

The coefficient of determination for a linear regression is *best* described as the:

A) percentage of the variation in the dependent variable explained by the variation of the independent variable.

B) percentage of the variation in the independent variable explained by the variation of the dependent variable.

C) covariance of the independent and dependent variables.

Explanation

The coefficient of determination for a linear regression describes the percentage of the variation in the dependent variable explained by the variation of the independent variable.

(Module 10.2, LOS 10.c)

Question #6 of 13

Question ID: 1572894

A simple linear regression is said to exhibit heteroskedasticity if its residual term:

A) does not have a constant variance.

B) is nonnormally distributed.

C) is not independently distributed.

Explanation

Heteroskedasticity is the condition in which the variance of the residual term of a regression is not constant across all observations.

(Module 10.1, LOS 10.b)

Question #7 of 13

Question ID: 1572900

To determine a confidence interval around the predicted value from a simple linear regression, the appropriate degrees of freedom are:

A) n – 1.

B) n.

C) n – 2.

Explanation

The degrees of freedom are n – 2 for a confidence interval around a predicted value.

(Module 10.3, LOS 10.e)

Question #8 of 13

Question ID: 1572893

Which of the following is *least likely* an assumption of linear regression?

A) The variance of the error terms each period remains the same.

B) The error terms from a regression are positively correlated.

C) Values of the independent variable are not correlated with the error term.

Explanation

One assumption of linear regression is that the error terms are independently distributed. In this case, the correlations between error terms are expected to be zero. Constant variance of the error terms and no correlation between the independent variable and the error term are assumptions of linear regression.

(Module 10.1, LOS 10.b)

Question #9 of 13

Question ID: 1572890

A simple linear regression is a model of the relationship between:

A) one dependent variable and one or more independent variables.

B) one dependent variable and one independent variable.

C) one or more dependent variables and one or more independent variables.

Explanation

A simple linear regression is a model of the relationship between one dependent variable and one independent variable. A multiple regression is a model of the relationship between one dependent variable and more than one independent variable.

(Module 10.1, LOS 10.a)

Question #10 of 13

Question ID: 1572897

Consider the following analysis of variance (ANOVA) table:

Source	Sum of squares	Degrees of freedom	Mean sum of squares
Regression	550	1	550.000
Error	750	38	19.737
Total	1,300	39	

The *F*-statistic for the test of the fit of the model is *closest* to:

A) 0.42.

B) 0.97.

C) 27.87.

Explanation

F = sum of squares regression / mean squared error = 550 / 19.737 = 27.867.

(Module 10.2, LOS 10.d)

Question #11 of 13

Question ID: 1572902

To account for logarithmic variables, functional forms of simple linear regressions are available if:

A) the independent variable is logarithmic, but not if the dependent variable is logarithmic.

B) either the dependent or independent variable is logarithmic, but not both.

C) either or both of the dependent and independent variables are logarithmic.

Explanation

A log-lin model is appropriate if the dependent variable is logarithmic, while the independent variable is linear. A lin-log model is appropriate if the independent variable is logarithmic, while the dependent variable is linear. A log-log model is appropriate if both the independent and dependent variables are logarithmic.

(Module 10.3, LOS 10.f)

Question #12 of 13

Question ID: 1572896

A simple linear regression is performed to quantify the relationship between the return on the common stocks of medium-sized companies (mid-caps) and the return on the S&P 500 index, using the monthly return on mid-cap stocks as the dependent variable and the monthly return on the S&P 500 as the independent variable. The results of the regression are shown below:

	Coefficient	Standard Error of Coefficient	*t*-Value
Intercept	1.71	2.950	0.58
S&P 500	1.52	0.130	11.69
Coefficient of determination = 0.599			

The strength of the relationship, as measured by the correlation coefficient, between the return on mid-cap stocks and the return on the S&P 500 for the period under study was:

A) 0.130.

B) 0.774.

C) 0.599.

Explanation

We are given the coefficient of determination of 0.599 (R^2) and are asked to find the correlation coefficient (r), which is the square root of the coefficient of determination for a simple regression:

$$\sqrt{0.599} = 0.774$$

(Module 10.2, LOS 10.c)

Question #13 of 13

Question ID: 1572891

In a simple regression model, the least squares criterion is to minimize the sum of squared differences between:

A) the intercept term and the residual term.

B) the predicted and actual values of the dependent variable.

C) the estimated and actual slope coefficient.

Explanation

The least squares criterion defines the best-fitting linear relationship as the one that minimizes the sum of squared errors, the squared vertical distances between the predicted and actual values of the dependent variable.

(Module 10.1, LOS 10.a)