Week 13 - Quiz

Problem 1.

The correlation coefficient is used to determine:
A. A specific value of the y-variable given a specific value of the x-variable
B. A specific value of the x-variable given a specific value of the y-variable
C. The strength of the linear relationship between the x and y variables
D. The relationship between the x and y variables

Answer – C. It measures the linear relationship.

Problem 2.

If there is a very strong correlation between two variables, then the correlation coefficient must be

A. any value larger than 1
B. much smaller than 0, if the correlation is negative
C. much larger than 0, regardless of whether the correlation is negative or positive
D. either close to 1 or -1.

Answer - D: It is close to 1 if the two variables have a very strong positive correlation; it is close to -1 if the two variables have a very strong negative correlation.

Problem 3.

In regression, the equation that describes how the response variable (y) is related to the explanatory variable (x) is:

A. the correlation model
B. the regression model
C. used to compute the correlation coefficient
D. a two-sample test

Answer - B:

Problem 4.

In regression analysis, the variable that is being predicted is the

A. response, or dependent, variable
B. independent variable
C. intervening variable
D. is usually x

Answer – A.

Problem 5.

The coefficient of correlation
A. is the square of the coefficient of determination
B. is the square root of the coefficient of determination
C. is the same as r-square
D. can never be negative.

Answer- B.

Problem 6.
If the coefficient of determination is a positive value, then the regression equation
A. must have a positive slope
B. must have a negative slope
C. could have either a positive or a negative slope
D. must have a positive y-intercept

Answer-C: because we don't know the sign of the slope.

Problem 7.
If the coefficient of determination is equal to 1, then the correlation coefficient
A. must also be equal to 1
B. can be either -1 or +1
C. can be any value between -1 to +1
D. must be -1

Answer-B. The square of the correlation coefficient is equal to the coefficient of determination.

Problem 8
If the correlation coefficient is 0.8, the percentage of variation in the response variable explained by the variation in the explanatory variable, i.e., the coefficient of determination, is
A. 0.80%
B. 80%
C. 0.64%
D. 64%

Answer- D. The coefficient of determination represents the percentage of variation explained by the explanatory variable.

Problem 9
If the correlation coefficient is a positive value, then the slope of the regression line
A. must also be positive
B. can be either negative or positive
C. can be zero
D. cannot be zero

Answer- A.

Problem 10

If the coefficient of determination is 0.81, the correlation coefficient

A. is 0.6561

B. could be either + 0.9 or - 0.9

C. must be positive

D. must be negative

Answer-B. The square of the correlation coefficient is equal to the coefficient of determination.

Problem 11

A variety of summary statistics were collected for a small sample (10) of bivariate data, where the dependent variable was y and the independent variable was x

$$\Sigma\left(Y-\overline{Y}\right)\left(X-\overline{X}\right)=466$$
$$\Sigma\left(X-\overline{X}\right)^2=234$$
$$\Sigma\left(Y-\overline{Y}\right)^2=1434$$

Using the following coefficient of correlation,

$$r=\frac{\sum_{i=1}^{n}\left(\left(x_i-\bar{x}\right)\left(y_i-\bar{y}\right)\right)}{\sqrt{\sum_{i=1}^{n}\left(x_i-\bar{x}\right)^2\sum_{i=1}^{n}\left(y_i-\bar{y}\right)^2}}$$

we have r =

A. 0.8045

B. -0.8045

C. 0

D. 1

Answer-A.

Problem 12

The data above is from a research study. Ice cream consumption was measured over 30 four-week periods. One purpose of the study was to determine whether ice cream consumption depended on the price of ice cream. The researcher uses least-squares linear regression to determine this prediction equation:

$$y = -2.05x + 0.9230.$$

Which statement best interprets the meaning of the **slope** of the prediction equation?

A. For a $1 increase in the price of a pint of ice cream, we can estimate a per capita ice cream consumption increase of approximately $2.05.
B. For a $1 increase in the price of a pint of ice cream, we can estimate a per capita ice cream consumption decrease of approximately 2.05 pints.
C. For ice cream priced at $1 per pint, we can estimate that the per capita ice cream consumption will decrease by 0.9230 pints.
D. For 1 pint of ice cream consumed per capita, we can estimate its price will be approximately $2.05.

Answer- B.