

## Correlation and Regression Quiz Answer Key PDF

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**Which type of correlation coefficient is used for ordinal data?**

- A. Pearson's
- B. Spearman's ✓**
- C. Kendall's
- D. None of the above

**Explain the difference between correlation and causation.**

**Correlation is a statistical measure that describes the extent to which two variables change together, whereas causation indicates that one variable is responsible for causing a change in another.**

**Which of the following are assumptions of linear regression? (Select all that apply)**

- A. Linearity ✓**
- B. Independence ✓**
- C. Homoscedasticity ✓**
- D. Non-linearity

**What does a correlation coefficient of 0 indicate?**

- A. Strong positive relationship
- B. No relationship ✓**
- C. Strong negative relationship
- D. Perfect relationship

**Which of the following can be used to evaluate a regression model? (Select all that apply)**

- A. Coefficient of Determination ( $R^2$ ) ✓**
- B. Residual Analysis ✓**

**C. Significance Testing ✓**

D. Mode

**What are characteristics of Spearman's Rank Correlation? (Select all that apply)****A. It is a non-parametric measure ✓**

B. It requires interval data

**C. It is used for ordinal data ✓**

D. It assumes a linear relationship

**Which of the following are types of regression? (Select all that apply)****A. Simple Linear Regression ✓****B. Multiple Regression ✓****C. Non-linear Regression ✓**

D. Exponential Regression

**What are potential applications of regression analysis? (Select all that apply)****A. Forecast ✓****B. Risk management ✓**

C. Data encryption

**D. Determining relationships between variables ✓****Describe a scenario where multiple regression would be more appropriate than simple linear regression.****A scenario where multiple regression would be more appropriate is predicting house prices based on multiple factors such as size, location, number of bedrooms, and age of the property.****What are the potential consequences of violating the assumptions of linear regression?****The potential consequences of violating the assumptions of linear regression include biased parameter estimates, inflated standard errors, unreliable hypothesis tests, and poor predictive performance.**

**In a simple linear regression equation  $Y = a + bX$ , what does ' b ' represent?**

- A. Y-intercept
- B. Slope of the line ✓**
- C. Dependent variable
- D. Independent variable

**Why is it important to perform residual analysis in regression?**

**It is important to perform residual analysis in regression to check for homoscedasticity, normality of errors, and independence of residuals, ensuring that the model is appropriate and reliable.**

**How can outliers affect the results of a correlation analysis?**

**Outliers can distort the correlation coefficient, making it appear stronger or weaker than it actually is, and can also affect the overall regression line.**

**What is the range of the Pearson correlation coefficient?**

- A. 0 to 1
- B. -1 to 1 ✓**
- C. -2 to 2
- D. 0 to 100

**Which measure is used to determine the strength and direction of a linear relationship between two variables?**

- A. Mean
- B. Median
- C. Correlation coefficient ✓**
- D. Mode

**Which assumption is NOT required for linear regression?**

- A. Linearity
- B. Independence
- C. Homoscedasticity

#### D. Causality ✓

Which of the following is a limitation of using correlation?

- A. It can only measure linear relationships ✓
- B. It implies causation ✓
- C. It is sensitive to outliers ✓
- D. All of the above ✓

What does an  $R^2$  value of 0.85 indicate in a regression model?

- A. 85% of the variance in the dependent variable is explained by the model ✓
- B. 15% of the variance in the dependent variable is explained by the model
- C. The model is not significant
- D. The model is overfitted

Discuss the implications of a negative correlation coefficient in a real-world context.

For example, in economics, a negative correlation between unemployment rates and consumer spending suggests that as unemployment rises, consumer spending tends to fall, impacting overall economic growth.

Which statements about correlation are true? (Select all that apply)

- A. Correlation implies causation
- B. Correlation can be positive or negative ✓
- C. Correlation measures the strength of a linear relationship ✓
- D. A correlation of 0 means no linear relationship ✓