1. Using a graph to illustrate slope and intercept, define basic linear regression.

>>>Basic linear regression is a statistical technique used to model the relationship between two variables by fitting a linear equation to observed data.

2. In a graph, explain the terms rise, run, and slope.

>>>The slope of a line represents the rate of change between two variables. It's calculated as the "rise" (vertical change) divided by the "run" (horizontal change) between two points on the line.

3. Use a graph to demonstrate slope, linear positive slope, and linear negative slope, as well as the different conditions that contribute to the slope.

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4. Use a graph to demonstrate curve linear negative slope and curve linear positive slope.

5. Use a graph to show the maximum and low points of curves.

6. Use the formulas for a and b to explain ordinary least squares.

7. Provide a step-by-step explanation of the OLS algorithm.

>>>In linear regression, OLS minimizes the sum of squared differences between the actual and predicted values. The formulas for calculating the slope b and the y-intercept a are derived from this optimization process.

8. What is the regression's standard error? To represent the same, make a graph.

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Assumptions include linearity, independence of errors, constant variance (homoscedasticity), and normality of errors. The BLUE (Best Linear Unbiased Estimators) principle states that among the unbiased linear estimators, OLS estimators are the best in terms of minimum variance.

Major Issues with Regression Analysis:

Two issues are multicollinearity (high correlation between independent variables) and heteroscedasticity (unequal variance of errors).

Improving Linear Regression Model Accuracy:

Improve data quality, address outliers, consider transformations, select relevant features, and choose appropriate models.

Polynomial Regression:

Polynomial regression models relationships that aren't linear. It involves fitting a polynomial equation to the data. Example: Fitting a quadratic curve to data points.

Logistic Regression:

Logistic regression is used for binary classification problems. It models the probability of a binary outcome as a function of independent variables.

Logistic Regression Assumptions:

Some assumptions include independence of observations, linearity of independent variables and log-odds, absence of multicollinearity, and an adequate sample size.

Maximum Likelihood Estimation (MLE) - Details:

MLE is a method for estimating the parameters of a statistical model that maximizes the likelihood function. It's commonly used in logistic regression to find the parameters that maximize the likelihood of observing the given data under the model. It involves finding the parameter values that make the observed outcomes most probable.