

1. **How can we use regression analysis to identify the key factors that contribute to the target variable?**

Ans: Regression analysis helps us to determine factors that are important in predicting. The coefficients show how each component counts. Stepwise regression allows us to quickly identify the most crucial components.

2. **What are the assumptions that linear regression has on data?**

Ans: Linear regression suppose that the independent variables and dependent variables have a linear relationship which means that changes in variables correspond to proportionate changes. It also assumes the independence of individual observations, which means that no data point is influenced by the others. The residuals, or the differences between observed and predicted value, are anticipated to have a constant variance with a normal distribution.

3. **How can regression analysis be used in the feature selection process?**

Ans: Predicting things using data? Regression analysis is useful in selecting the best characteristics. Consider buying a property. You examine the size, location, and number of bedrooms. Regression analysis ranks these factors according to how much they influence the price.

Consider it like selecting players for a team. You test alternative combinations (such as team tryouts) or examine each player's abilities (individual scouting). This allows you to choose the greatest characteristics, such as selecting the top players for your squad. It's data-driven and will assist you realise what's most important.

4. **What is R-squared? What information does it convey? How can it be calculated and what implication does it give on different values?**

Ans: R-squared (R^2) is a number that tells us how well a regression model fits the data. It ranges from 0 to 1. A higher R^2 means the model fits the data better. It's calculated using a formula [$R^2 = 1 - (SS_{yy} / SSE)$] that compares the differences between the actual data points and the predicted ones. If R^2 is close to 1, the model fits well. If it's closer to 0, the model doesn't fit well.