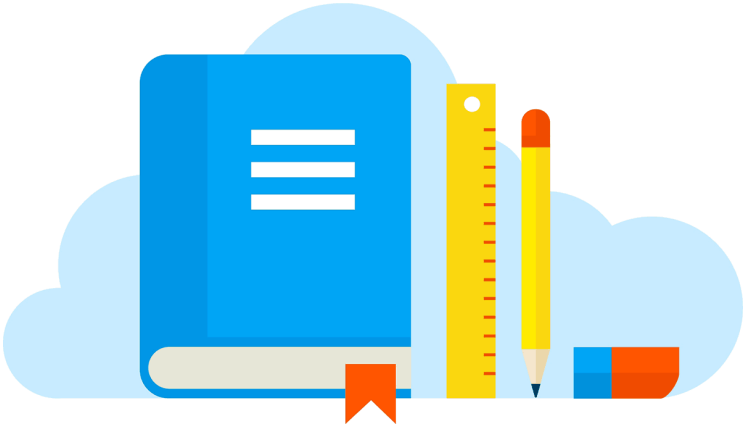

Data Science Notes by Sarowar Ahmed

📊 Chapter: inferential statistics

📊 Topic: Regression Analysis

📢 What is Regression Analysis?

▪ Regression analysis is a statistical method used to model the relationship between one or more independent variables (predictors) and a dependent variable (outcome). It enables us to understand how changes in one variable are associated with changes in another and make predictions based on observed data patterns.

➕ Formula:

The general formula for simple linear regression, which involves one independent variable and one dependent variable, is:

$y=\beta 0+\beta 1x+\varepsilon$

Where:

- y is the dependent variable
- x is the independent variable
- $\beta 0$ is the y-intercept (constant term)
- $\beta 1$ is the slope coefficient (effect of x on y)
- ε is the error term (residuals)

🔰 Example:

- Suppose we want to understand the relationship between hours spent studying (independent variable) and exam scores (dependent variable). We collect data from 50 students and perform a regression analysis. The resulting equation is:

Exam Score=60+5(Hours Studied)+ε

This equation suggests that, on average, each additional hour of studying is associated with a 5-point increase in exam score when all other factors remain constant.

💡 Why is Regression Analysis Useful?

▪ Regression analysis allows us to:
▪ Predict future outcomes: Based on observed patterns, we can forecast future trends or outcomes.
▪ Identify relationships: We can determine how changes in one variable affect another, helping us understand causal relationships.
▪ Make informed decisions: By quantifying relationships, we can make data-driven decisions in various fields, from business to healthcare to social sciences.

🔍 Key Takeaway:

▪ Understanding regression analysis empowers us to extract meaningful insights from data patterns, guiding decision-making and driving innovation across industries.

Got any questions on the Regression Analysis? Feel free to ask me via Linkedin! Let's keep learning together.

My LinkedIn Date: 11/05/2024