

Types of Questions that can be answered by Multivariate analysis



1. Finance:

- **Predicting Stock Price based on Multiple Economic Indicators:** How do inflation rate, interest rates, GDP growth, and unemployment rate (all numerical) collectively influence a company's stock price (numerical)?
- **Modeling Credit Risk using Financial Ratios:** Can we predict the probability of loan default (numerical, e.g., a score or probability) based on a borrower's debt-to-income ratio, credit score, loan amount, and repayment history (all numerical)?
- **Analyzing Factors Affecting Portfolio Return:** How do the allocation percentages across different asset classes (e.g., stocks, bonds, real estate - all numerical), along with market volatility (numerical), influence the overall return of an investment portfolio (numerical)?
- **Understanding Drivers of Company Valuation:** What is the combined impact of a company's revenue growth rate, profit margin, debt-to-

equity ratio, and market capitalization (all numerical) on its overall valuation (numerical)?

- **Forecasting Sales Revenue based on Economic and Internal Factors:** How do advertising spend, consumer confidence index, seasonality index, and previous year's sales (all numerical) together predict future sales revenue (numerical)?

2. Marketing:

- **Optimizing Marketing Spend for Customer Lifetime Value:** How do spending on social media ads, email marketing frequency, content marketing efforts (measured numerically), and website engagement metrics (numerical) collectively influence customer lifetime value (numerical)?
- **Segmenting Customers based on Behavioral and Demographic Data:** Can we identify distinct customer segments based on their purchase frequency, average order value, website visit duration, and age (all numerical)?
- **Predicting Customer Churn using Engagement and Satisfaction Metrics:** How do website activity (numerical), customer support interactions (numerical), product usage frequency (numerical), and customer satisfaction scores (numerical) together predict the likelihood of a customer churning (numerical, e.g., a probability)?
- **Analyzing the Impact of Multi-Channel Marketing on Sales:** What is the combined effect of spending on online ads, offline advertising, email campaigns, and social media marketing (all numerical) on total sales revenue (numerical)?
- **Understanding Factors Driving Lead Conversion Rates:** How do lead score, number of website visits, time spent on landing pages, and number of marketing emails opened (all numerical) collectively influence the lead conversion rate (numerical)?

3. Sales:

- **Predicting Sales Performance based on Sales Activities and Experience:** How do the number of sales calls made, number of demos given, years of experience, and training hours (all numerical) collectively predict a salesperson's total sales revenue (numerical)?

- **Analyzing Factors Affecting Deal Size:** What is the combined impact of customer size (numerical, e.g., number of employees), number of products purchased, discount percentage offered, and sales cycle length (numerical) on the final deal size (numerical)?
- **Modeling Customer Acquisition Cost based on Marketing and Sales Efforts:** How do spending on different marketing channels (numerical), number of sales reps, and average lead response time (numerical) together influence the cost of acquiring a new customer (numerical)?
- **Understanding Drivers of Customer Retention:** What is the combined effect of customer satisfaction scores, frequency of product usage, number of support interactions, and average purchase value (all numerical) on customer retention rate (numerical)?
- **Forecasting Future Sales based on Historical Data and Market Trends:** How do past sales figures, website traffic, lead generation rate, and market growth rate (all numerical) together predict future sales revenue (numerical)?

4. HR (Human Resources):

- **Predicting Employee Performance based on Multiple Factors:** How do years of experience, training hours, engagement scores, and performance on aptitude tests (all numerical) collectively influence an employee's overall performance rating (numerical)?
- **Analyzing Factors Affecting Employee Turnover:** What is the combined impact of salary, job satisfaction scores, work-life balance rating, and promotion frequency (numerical) on the likelihood of an employee leaving the company (numerical, e.g., a probability)?
- **Modeling Time to Hire based on Recruitment Strategies:** How do the number of job postings, recruitment budget, number of interview stages, and applicant pool size (all numerical) together influence the average time it takes to fill a position (numerical)?
- **Understanding Drivers of Employee Absenteeism:** What is the combined effect of employee stress levels (numerical), commute time (numerical), job role complexity (numerical), and number of sick days taken previously (numerical) on the number of days an employee is absent (numerical)?

- **Forecasting Salary Growth based on Performance and Tenure:** How do past performance ratings, years of tenure, level of education, and industry salary benchmarks (all numerical) together predict an employee's future salary growth (numerical)?

5. Ecommerce:

- **Predicting Customer Purchase Probability based on Website Behavior:** How do website visit duration, number of pages viewed, cart abandonment rate, and past purchase frequency (all numerical) collectively influence the probability of a customer making a purchase (numerical)?
- **Analyzing Factors Affecting Average Order Value:** What is the combined impact of the number of items in the cart, product category of items, discount percentage applied, and shipping cost (all numerical) on the total value of an order (numerical)?
- **Modeling Customer Lifetime Value based on Engagement and Spending:** How do purchase frequency, average order value, website visit frequency, and customer support interactions (numerical) together predict a customer's lifetime value (numerical)?
- **Understanding Drivers of Product Recommendation Click-Through Rates:** What is the combined effect of the number of recommendations shown, the position of the recommendation, the similarity score of the recommended item, and past click history (all numerical) on the click-through rate of product recommendations (numerical)?
- **Forecasting Sales Volume based on Marketing and Website Activity:** How do advertising spend across different channels (numerical), website traffic, conversion rate, and seasonality index (numerical) together predict the total sales volume (numerical)?