

1. Scenario: A company wants to analyze the sales performance of its products in different regions. They have collected the following data:  
Region A: [10, 15, 12, 8, 14]  
Region B: [18, 20, 16, 22, 25]  
Calculate the mean sales for each region.
2. Scenario: A survey is conducted to measure customer satisfaction on a scale of 1 to 5. The data collected is as follows:  
[4, 5, 2, 3, 5, 4, 3, 2, 4, 5]  
Calculate the mode of the survey responses.
3. Scenario: A company wants to compare the salaries of two departments. The salary data for Department A and Department B are as follows:  
Department A: [5000, 6000, 5500, 7000]  
Department B: [4500, 5500, 5800, 6000, 5200]  
Calculate the median salary for each department.
4. Scenario: A data analyst wants to determine the variability in the daily stock prices of a company. The data collected is as follows:  
[25.5, 24.8, 26.1, 25.3, 24.9]  
Calculate the range of the stock prices.
5. Scenario: A study is conducted to compare the performance of two different teaching methods. The test scores of the students in each group are as follows:  
Group A: [85, 90, 92, 88, 91]  
Group B: [82, 88, 90, 86, 87]  
Perform a t-test to determine if there is a significant difference in the mean scores between the two groups.
6. Scenario: A company wants to analyze the relationship between advertising expenditure and sales. The data collected is as follows:  
Advertising Expenditure (in thousands): [10, 15, 12, 8, 14]  
Sales (in thousands): [25, 30, 28, 20, 26]  
Calculate the correlation coefficient between advertising expenditure and sales.
7. Scenario: A survey is conducted to measure the heights of a group of people. The data collected is as follows:  
[160, 170, 165, 155, 175, 180, 170]  
Calculate the standard deviation of the heights.
8. Scenario: A company wants to analyze the relationship between employee tenure and job satisfaction. The data collected is as follows:

Employee Tenure (in years): [2, 3, 5, 4, 6, 2, 4]

Job Satisfaction (on a scale of 1 to 10): [7, 8, 6, 9, 5, 7, 6]

Perform a linear regression analysis to predict job satisfaction based on employee tenure.

9. Scenario: A study is conducted to compare the effectiveness of two different medications.

The recovery times of the patients in each group are as follows:

Medication A: [10, 12, 14, 11, 13]

Medication B: [15, 17, 16, 14, 18]

Perform an analysis of variance (ANOVA) to determine if there is a significant difference in the mean recovery times between the two medications.

10. Scenario: A company wants to analyze customer feedback ratings on a scale of 1 to 10. The data collected is

as follows:

[8, 9, 7, 6, 8, 10, 9, 8, 7, 8]

Calculate the 75th percentile of the feedback ratings.

11. Scenario: A quality control department wants to test the weight consistency of a product.

The weights of a sample of products are as follows:

[10.2, 9.8, 10.0, 10.5, 10.3, 10.1]

Perform a hypothesis test to determine if the mean weight differs significantly from 10 grams.

12. Scenario: A company wants to analyze the click-through rates of two different website designs. The number of clicks for each design is as follows:

Design A: [100, 120, 110, 90, 95]

Design B: [80, 85, 90, 95, 100]

Perform a chi-square test to determine if there is a significant difference in the click-through rates between the two designs.

13. Scenario: A survey is conducted to measure customer satisfaction with a product on a scale of 1 to 10. The data collected is as follows:

[7, 9, 6, 8, 10, 7, 8, 9, 7, 8]

Calculate the 95% confidence interval for the population mean satisfaction score.

14. Scenario: A company wants to analyze the effect of temperature on product performance.

The data collected is as follows:

Temperature (in degrees Celsius): [20, 22, 23, 19, 21]

Performance (on a scale of 1 to 10): [8, 7, 9, 6, 8]

Perform a simple linear regression to predict performance based on temperature.

15. Scenario: A study is conducted to compare the preferences of two groups of participants.

The preferences are measured on a Likert scale from 1 to 5. The data collected is as follows:

Group A: [4, 3, 5, 2, 4]

Group B: [3, 2, 4, 3, 3]

Perform a Mann-Whitney U test to determine if there is a significant difference in the median preferences between the two groups.

16. Scenario: A company wants to analyze the distribution of customer ages. The data collected is as follows:

[25, 30, 35, 40, 45, 50, 55, 60, 65, 70]

Calculate the interquartile range (IQR) of the ages.

17. Scenario: A study is conducted to compare the performance of three different machine learning algorithms. The accuracy scores for each algorithm are as follows:

Algorithm A: [0.85, 0.80, 0.82, 0.87, 0.83]

Algorithm B: [0.78, 0.82, 0.84, 0.80, 0.79]

Algorithm C: [0.90, 0.88, 0.89, 0.86, 0.87]

Perform a Kruskal-Wallis test to determine if there is a significant difference in the median accuracy scores between the algorithms.

18. Scenario: A company wants to analyze the effect of price on sales. The data collected is as follows:

Price (in dollars): [10, 15, 12, 8, 14]

Sales: [100, 80, 90, 110, 95]

Perform a simple linear regression to predict

sales based on price.

19. Scenario: A survey is conducted to measure the satisfaction levels of customers with a new product. The data collected is as follows:

[7, 8, 9, 6, 8, 7, 9, 7, 8, 7]

Calculate the standard error of the mean satisfaction score.

20. Scenario: A company wants to analyze the relationship between advertising expenditure and sales. The data collected is as follows:

Advertising Expenditure (in thousands): [10, 15, 12, 8, 14]

Sales (in thousands): [25, 30, 28, 20, 26]

Perform a multiple regression analysis to predict sales based on advertising expenditure.