1. To calculate the mean sales for each region, you need to sum up the sales data for each region and divide it by the number of data points.

For Region A:
Sales data: [10, 15, 12, 8, 14]
Mean sales for Region A = (10 + 15 + 12 + 8 + 14) / 5 = 59 / 5 = 11.8

For Region B:
Sales data: [18, 20, 16, 22, 25]
Mean sales for Region B = (18 + 20 + 16 + 22 + 25) / 5 = 101 / 5 = 20.2

Therefore, the mean sales for Region A is 11.8, and the mean sales for Region B is 20.2.

2. To calculate the mode of the survey responses, you need to determine the value(s) that occur most frequently in the data.

Survey responses: [4, 5, 2, 3, 5, 4, 3, 2, 4, 5]
Mode of the survey responses: 4

Therefore, the mode of the survey responses is 4.

3. To calculate the median salary for each department, you need to arrange the salary data in ascending order and find the middle value. If there is an even number of data points, the median is the average of the two middle values.

For Department A:
Salary data: [5000, 6000, 5500, 7000]
Arranged in ascending order: [5000, 5500, 6000, 7000]
Median salary for Department A = (5500 + 6000) / 2 = 11500 / 2 = 5750

For Department B:
Salary data: [4500, 5500, 5800, 6000, 5200]
Arranged in ascending order: [4500, 5200, 5500, 5800, 6000]
Median salary for Department B = 5500

Therefore, the median salary for Department A is 5750, and the median salary for Department B is 5500.

4. To calculate the range of the stock prices, you need to find the difference between the maximum and minimum values.

Stock prices: [25.5, 24.8, 26.1, 25.3, 24.9]
Range of the stock prices = Maximum stock price - Minimum stock price
Range = 26.1 - 24.8 = 1.3

Therefore, the range of the stock prices is 1.3.

5. To perform a t-test to determine if there is a significant difference in the mean scores between the two groups, you can use a two-sample t-test. This test assesses whether the means of two groups are significantly different from each other.

Group A test scores: [85, 90, 92, 88, 91]
Group B test scores: [82, 88, 90, 86, 87]

Performing the t-test will require more information, such as the significance level or p-value threshold. Additionally, assuming the groups are independent and have equal variances, you can use the Student's t-test for independent samples.

6. To calculate the correlation coefficient between advertising expenditure and sales, you can use the Pearson correlation coefficient. This coefficient measures the strength and direction of the linear relationship between two variables.

Advertising expenditure (in thousands): [10, 15, 12, 8, 14]
Sales (in thousands): [25, 30, 28, 20, 26]

You can use statistical software or a calculator to calculate the correlation coefficient. The correlation coefficient ranges from -1 to 1, where -1 indicates a perfect negative correlation, 1 indicates a perfect positive correlation, and 0 indicates no correlation.

7. To calculate the standard deviation of the heights, you can use the following steps:
- Calculate the mean (average) of the heights.
- Subtract the mean from each height and square the result.
- Calculate the mean of the squared differences.
- Take the square root of the mean squared difference.

Heights: [160, 170, 165, 155, 175, 180, 170]

Step 1: Calculate the mean
Mean height = (160 + 170 + 165 + 155 + 175 + 180 + 170) / 7 = 1175 / 7 = 167.86 (rounded to two decimal places)

Step 2: Calculate the squared differences from the mean
Squared differences: [(160 - 167.86)^2, (170 - 167.86)^2, (165 - 167.86)^2, (155 - 167.86)^2, (175 - 167.86)^2, (180 - 167.86)^2, (170 - 167.86)^2]

Step 3: Calculate the mean of the squared differences
Mean squared difference = (squared difference sum) / (number of data points)

Step 4: Calculate the square root of the mean squared difference
Standard deviation = sqrt(mean squared difference)

8. To perform a linear regression analysis to predict job satisfaction based on employee tenure, you can use the employee tenure as the independent variable (X) and job satisfaction as the dependent variable (Y).

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]

By fitting a linear regression model to the data, you can estimate the relationship between the variables and make predictions. The model will provide the equation of the line (Y = a + bX), where 'a' is the intercept and 'b' is the slope.

9. To perform an analysis of variance (ANOVA) to determine if there is a significant difference in the mean recovery times between the two medications, you can compare the means using a one-way ANOVA test.

Medication A recovery times: [10, 12, 14, 11, 13]
Medication B recovery times: [15, 17, 16, 14, 18]

ANOVA assesses whether there are significant differences among the means of three or more groups. In this case, you have two groups (Medication A and Medication B). The test will provide an F-statistic and a p-value to determine if there is a significant difference between the groups.

10. To calculate the 75th percentile of the feedback ratings, you need to arrange the ratings in ascending order and find the value that is greater than or equal to 75% of the data.

Feedback ratings: [8, 9, 7, 6, 8, 10, 9, 8, 7, 8]
Arranged in ascending order: [6, 7, 7, 8, 8, 8, 8, 9, 9, 10]

The 75th percentile falls between the 8th and 9th values. To calculate the exact value, you can use linear

interpolation.

11. To perform a hypothesis test to determine if the mean weight significantly differs from 10 grams, you can use a one-sample t-test.

Sample weights: [10.2, 9.8, 10.0, 10.5, 10.3, 10.1]

The null hypothesis (H0) assumes that the mean weight is equal to 10 grams. The alternative hypothesis (Ha) assumes that the mean weight is different from 10 grams. By calculating the

test statistic and comparing it to a critical value or p-value threshold, you can determine if there is a significant difference.

12. To perform a chi-square test to determine if there is a significant difference in the click-through rates between Design A and Design B, you can create a contingency table with the observed frequencies for each design.

Design A click-throughs: [100, 120, 110, 90, 95]
Design B click-throughs: [80, 85, 90, 95, 100]

The chi-square test assesses whether there is a significant association between two categorical variables. In this case, the variables are "Design" and "Click-throughs." The test will provide a chi-square statistic and a p-value to determine if there is a significant difference.

13. To calculate the 95% confidence interval for the population mean satisfaction score, you can use the sample data and the formula for confidence intervals.

Sample satisfaction scores: [7, 9, 6, 8, 10, 7, 8, 9, 7, 8]

The confidence interval provides a range within which the population mean satisfaction score is likely to fall. The formula for a confidence interval depends on the sample mean, sample standard deviation, sample size, and the desired level of confidence (in this case, 95%).

14. To perform a simple linear regression to predict performance based on temperature, you can use temperature as the independent variable (X) and performance as the dependent variable (Y).

Temperature (in degrees Celsius): [20, 22, 23, 19, 21]
Performance (on a scale of 1 to 10): [8, 7, 9, 6, 8]

By fitting a linear regression model to the data, you can estimate the relationship between the variables and make predictions. The model will provide the equation of the line ($Y = a + bX$), where 'a' is the intercept and 'b' is the slope.

15. To perform a Mann-Whitney U test to determine if there is a significant difference in the median preferences between Group A and Group B, you can compare the medians using a nonparametric test.

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

The Mann-Whitney U test assesses whether there is a significant difference between two independent groups. The test will provide a U-statistic and a p-value to determine if there is a significant difference.

16. To calculate the interquartile range (IQR) of the ages, you need to arrange the ages in ascending order and find the difference between the upper quartile (Q3) and the lower quartile (Q1).

Ages: [25, 30, 35, 40, 45, 50, 55, 60, 65, 70]
Arranged in ascending order: [25, 30, 35, 40, 45, 50, 55, 60, 65, 70]

The IQR is the range between the 25th and 75th percentiles. You can calculate the values of Q1 and Q3 and then find their difference.

17. To perform a Kruskal-Wallis test to determine if there is a significant difference in the median accuracy scores between Algorithm A, Algorithm B, and Algorithm C, you can use a nonparametric test for independent samples.

Accuracy scores for Algorithm A: [0.85, 0.80, 0.82, 0.87, 0.83]
Accuracy scores for Algorithm B: [0.78, 0.82, 0.84, 0.80, 0.79]
Accuracy scores for Algorithm C: [0.90, 0.88, 0.89, 0.86, 0.87]

The Kruskal-Wallis test assesses whether there is a significant difference among the medians of three or more groups. The test will provide a chi-square statistic and a p-value to determine if there is a significant difference.

18. To perform a simple linear regression to predict sales based on price, you can use price as the independent variable (X) and sales as the dependent variable (Y).

Price (in dollars): [10, 15, 12, 8, 14]
Sales: [100, 80, 90, 110, 95]

By fitting a linear regression model to the data, you can estimate the relationship between the variables and make predictions. The model will provide the equation of the line (Y = a + bX), where 'a' is the intercept and 'b' is the slope.

19. To calculate the standard error of the mean satisfaction score, you can use the sample data and the formula for the standard error.

Sample satisfaction scores: [7, 8, 9, 6, 8, 7, 9, 7, 8, 7]

The standard error of the mean estimates the variability of the sample mean. The formula for the standard error depends on the sample standard deviation and the sample size.

20. To perform a multiple regression analysis to predict sales based on advertising expenditure, you can use advertising expenditure as the independent variable (X) and sales as the dependent variable (Y).

Advertising expenditure (in thousands): [10, 15, 12, 8, 14]
Sales (in thousands): [25, 30, 28, 20, 26]

By fitting a multiple regression model to the data, you can estimate the relationship between the variables and make predictions. The model will provide the equation of the line (Y = a + b1X1 + b2X2 + ...), where 'a' is the intercept and 'b1', 'b2', etc., are the coefficients for the independent variables.