**Summary (Statistics)**

Data Analysis of a set of given data has been performed. In Descriptive Statistics analysis the datasets containing data = [12, 15, 14, 10, 18, 20, 22, 24, 17, 19], its mean, median, mode was calculated along with that its percentile, Q1, Q2, Q3, IQR (Interquartile range), Min value, Max value, Lower bound (LB), Upper bound (UB) and Its Outliers were Calculated in Using Excel.

The Range, Variance and the Standard Deviation where also calculated for the dataset using Excel. After all this Z-Score standardization was performed to the data values and its results where store in Excel.

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From the two data sets X and Y:

X = = [10, 20, 30, 40, 50]

Y = [5, 10, 15, 20, 25]

* Pearson correlation coefficient was calculated using Excel. Scatter-Plot Visualization for the same was also done using Excel.
* Box-plot Analysis and Histogram Analysis were done for the data set, data = [12, 15, 14, 10, 18, 20, 22, 24, 17, 19]

While coming to Inferential Statistics, the difference between Correlation and Causation was discussed along with an example. The difference between Population and sample were discussed along with the importance of sampling with a real – world Example. Terms like Null Hypothesis, Alternate Hypothesis, Significance Level (α), and P-value were defined along the way.

* Z- test Calculation for the Question:

“” Given a sample mean of 25, population mean of 22, population standard deviation of 3, and sample size of 40, compute the Z-test statistic and interpret the results.”” Was done and the result is recorded in Excel. P- value computation for the Z-test was done and recorded.

* One Sample T- test was done for the given data in Excel, data = [45, 50, 55, 60, 62, 48, 52] and its t- test value was recorded and analysed i.e. if the value is Significant or Not.

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* Independent Sample T-test was performed for the two data sets Group 1: [85, 90, 88, 92, 86] , Group 2: [78, 75, 80, 83, 79] in Python programming Language and its T-test value was recorded along with that its critical T-value was recorded using the t-table.

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* ***Descriptive statistics*** summarize and organize data to make it easier to understand. They focus on presenting data as it is, without drawing conclusions beyond the immediate dataset.

Real World Uses:

* Business
* Sports
* Education
* Visualization
* ***Inferential statistics*** go beyond the data at hand, allowing conclusions, predictions, or decisions about a larger population based on sample data.

Real World Uses:

* Hypothesis testing
* Elections
* Market Research