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Sub :- Data Driven
course :- BCA (cyber security)

Assignment-3

Task-1 :-

I select a sample sales dataset for this task.

Sample Dataset (sales in unit) :-

12, 15, 19, 10, 18, 20, 22, 17, 16, 19

1) Mean :-

The mean is calculated by dividing the sum of all values by the total number of values.

Sum of data values = 163

Number of values = 10

$$\text{Mean} = \frac{163}{10} = 16.3$$

2) Median :-

To find the median, the data must be arranged in ascending order :-

10, 12, 19, 15, 16, 17, 18, 19, 20, 22

Since, there are 10 values (even number of observations) the median is the average of the 5th and 6th values.

$$\text{Median} = \frac{16+17}{2} = 16.5$$

3) Standard Deviation :-

Standard deviation shows how much the values vary from the mean.

Steps used :- i) calculate each value's deviation from the mean.

ii) Square the deviations.

iii) Find the average of the squared deviations.

iv) Take the square root

Final Standard Deviation ≈ 3.53

Task-2 :-

1) Bar chart (Sales per observation) :-

A bar chart was created with each bar representing one day's sales.

Purpose :- i) To compare the sales values across the 10 days.

ii) To easily identify high & low sales days.

2) Histogram (sales distribution) :-

A histogram was plotted to show how frequently certain sales ranges appear.

Purpose :- i) To observe the distribution of the values.

ii) To identify whether the data is grouped around a central value or spread out.

3) Scatter Plot (Trend over time) :-

A scatter plot was created with "Day Number" on the x-axis "sales values" on the y-axis.

Purpose :- i) To examine if there is an increasing or decreasing trend in sales.

ii) To identify any patterns or relationships.

Task-3 :-

Based on the three charts, the following insights were observed.

Insight 1 :- The bar chart shows that sales numbers gradually increased over the dataset, indicating on overall upward pattern.

Insight 2 :- The histogram reveals that most sales values fall between 14 and 20 units, suggesting stable & consistent performance.

Insight 3 :- The scatter plot displays a positive upward trend, meaning sales improved over time and did not fluctuate sharply.

Insight 4 :- There are no extreme outliers in the dataset, which indicates that sales are predictable and controlled.

Insight 5 :- Higher sales days often appear close to each other, which may indicate a recurring pattern of effective sales strategy.

Task-1 :-

Visual storytelling plays a crucial role in helping users understand complex data.

When data is presented visually through charts, it becomes easier to identify patterns, interpret trends, and extract insight.

- How visual story-telling helps :-

  i) It simplifies the understanding of large datasets.

  ii) It highlights key patterns and relationships that are not easily visible in raw tables.

  iii) It communicates insights more clearly & quickly than text or numbers alone.

  iv) It supports better decisions-making by providing a visual narrative.

  v) It makes data more engaging and memorable for the audience.

conclusion :-

Visual storytelling enhances data interpretation by transforming numbers into meaningful stories. It helps users to understand what the data is saying and enables more informed, data-driven decisions.