Topic :- ..... Date : __/__/____

DATA DRIVEN & DECISION MAKING

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SECTION = D

Roll No: 25012010115

COURSE = foundation of data-driven making.

Program: BCA (AI & DS)

ASSIGNMENT = 3

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* Task - 1

Using a sample data set (sales, website traffic, or survey data), Compute means, median and standard deviation.

Lets take a sample set of monthly sales (in ₹)

Months	Sales (in ₹)
Jan	12000
feb	15000
Mar	17000
Apr	16000
May	13000
Jun	19000
July	20000
Aug	18000
Sept	22000
Oct	21000

$$\text{Mean (Avg)} = \frac{\text{Sum of all values}}{\text{Number of values}}$$

$$= \frac{12000 + 15000 + 17000 + 16000 + 13000 + 19000 + 20000 + 18000 + 22000 + 21000}{10}$$

$$= \frac{173000}{10} = 17300 \text{ Ans.}$$

→ Median (Middle Value)

→ Ascending order:

12000, 13000, 16000, 17000, 15000, 18000, 19000, 21000, 22000

Median = avg of 5th and 6th term

$$= \frac{17000 + 18000}{2} = 17500$$

* Standard Deviation

$$S.D = \sqrt{\frac{\Sigma (x_i - \bar{x})^2}{n-1}}$$

Sales	(x - Mean)	(x - Mean)^2
12000	-5300	28090000
15000	-2300	5290000
17000	-300	90000
16000	-1300	1690000
13000	-4300	18490000
19000	1700	2890000
20000	2700	7290000
18000	700	490000
22000	4700	22090000
21000	3700	13690000

$$S.D = \sqrt{\frac{100100000}{9}} = \sqrt{11122222.22} \approx 3334$$

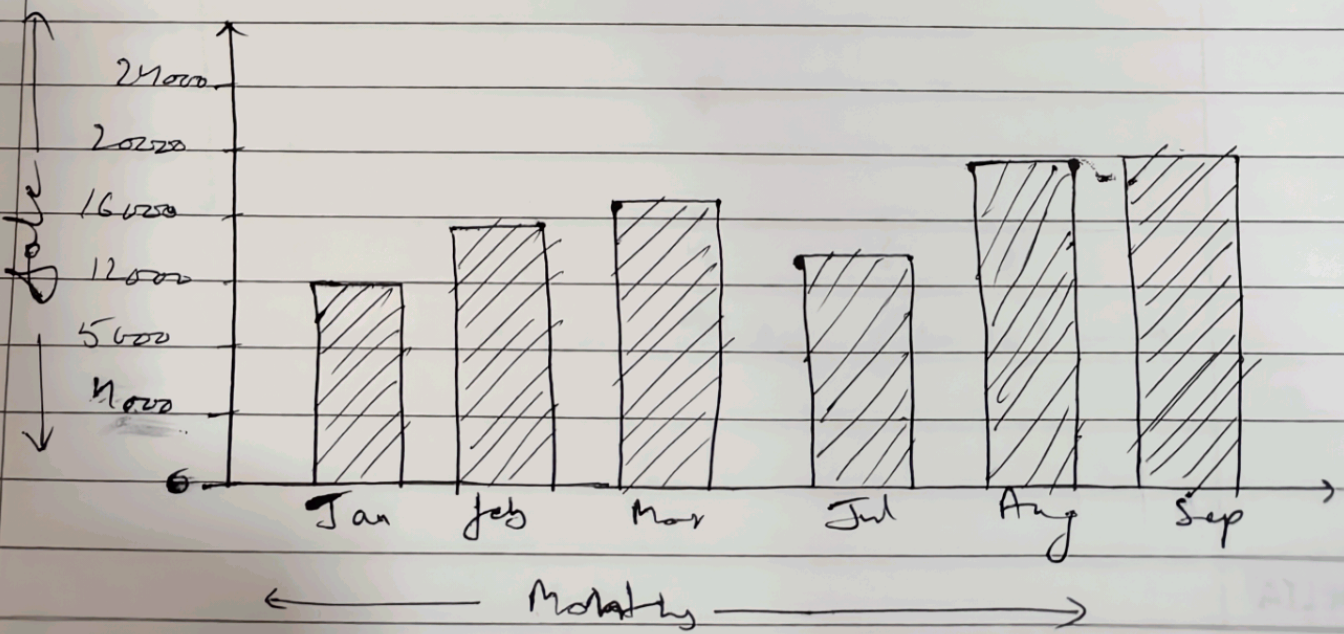
* Task 2:

Create at least 3 different charts (bar, histogram and scatter plot) to visualize data trends.

Lets take a data set of Monthly Sale (in ₹)

Month	Sales (in ₹)
Jan	12000
feb	16000
Mar	17000
Apr	16000
May	12000
Jun	20000
Jul	18000
Aug	22000
Sep	20000
Oct	22000

* Bar Chart



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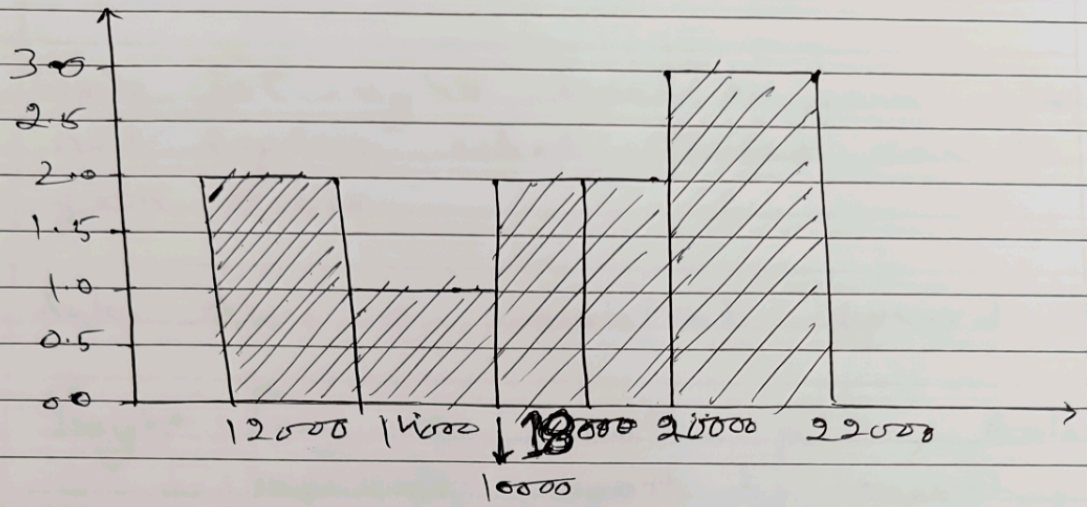
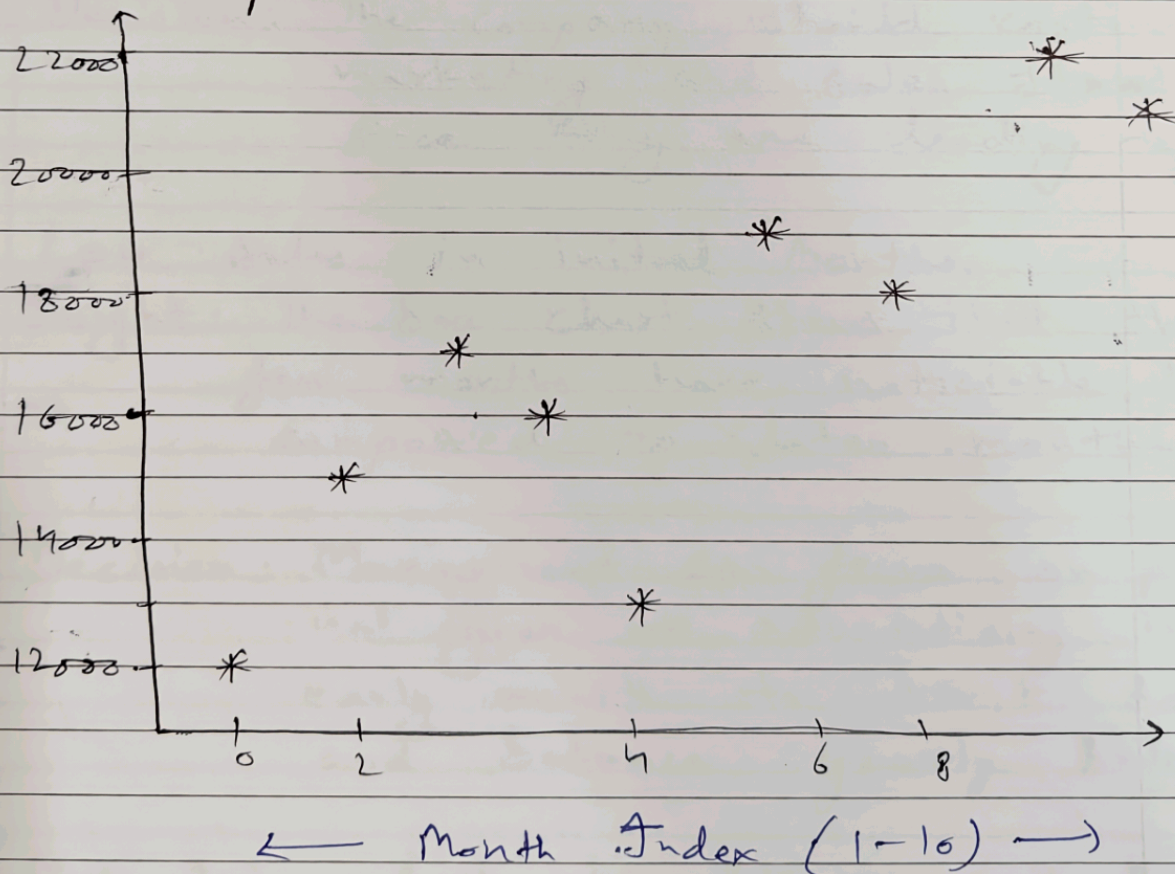
* Histogram



* Scatter plot



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* Task - 3:

Write 3-5 insights based on your visualization and explain what decision can be made from these.

1. Sales show a consistent upword trend:

2. Insight: From the scatter plot, sales gradually increase month by month, peaking around September.

3. Decision: The company should continue marketing and sales strategies since they are leading to growth.

2. Low sales in initial months.

> Insight: The bar chart shows that the first few months have noticiable lower compared to later months.

> Decision: Managment can focus on promotion -nal offer or advertising in the early month to boost demand and balance yearly sales.

3. Most Sales fall b/w ₹.15000 to 20000

> Insight: The histogram indicates that the majority of sales are right in this range, meaning performance and stable.

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> Decision: This can be used to set realstic monthly sales target and essure performance against the usual range.

* Task : 4

Reflect on how visual story telling enhance data interpretation?

Visual storytelling transforms raw data into clear, meaning full insights, when data shows through charts, graph and visuals, it becomes easier for people to see pattern. trends, and relationship that right be hidden in Number alone.

for Example in the sales data set, a bar chart quickly shows which months had heights or lower sales, a histogram to overall distribution or performance, and a scatter plot makes the upward trend instantly visible. These visual tell a story of business growth for more effitively than a table of figures.

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DATA DRIVEN AND DECISION MAKING

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Cource: Foundation of Data - Driven making.

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ASSIGNMENT - 4

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Task1:

Choose a business scenario (marketing, operation, or education) and define 3-4 KPIs to measures success.

A company launches a digital marketing campaign to promote a new product online. The goal is to increase brand awareness attract potential customers, and boost online sales, to evaluate the success of the campaign specific Key performance Indicator are defined.

1. Conversion Rate:

> Definition: The percentage of website visitor who take a desired action (such as making a purchase or signing up).

> formula:

Conversion rate = (Number of Conversions / Total visitor) x 100

2. Click - Through Rate:

> Definition: The percentage of people who clicked on the ad or promotional link after seeing it.

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> formula:

Click Through rate : Clicks / Impressions X 100

3 Customer Acquisition cost (CAC):

> Definition: The total cost spent on acquiring one new customer through the campaign.

> formula:

Customer Acquisition Cost = Total marketing Cost / Number of New customer

4. Return or Marketing Investment (ROMI):

> Definition: Measure the overall profit -ability generated from the marketing campaign

> formula:

Return on marketing Investent = (Revenue from Campaign - Marketing cost) / Marketing cost X 100

Task 2:

Develop a data-driven decision plan using available information and justify your choices:

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Scenario:
A retail store wants to improve its monthly sales and customer satisfaction using data-driven decision making.

∴ Step 1:

Collect Available Data: The store collects data from different sources such as:

- Monthly sales reports
- Customer feedback surveys
- Website traffic and online purchase records.
- Inventory and product return details.

∴ Step 2:
Analyze the data: Using charts and reports the store identifies.

- Which product sell the most
- Which months have low sales
- Common customer complains or preferences.

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∴ Make Data - Driven Decision:

Based on insight, the store decide to:

- Increase stock for high-demand items during peak months.
- offer discount or promotions in low-sales periods.
- Improve customer service in area where feed back is poor.

∴ Measure Result Using KPIs:

The store tracks the success of its plan using key metric like:

- Monthly Sales growth
- Customer Satisfaction Score
- Repeat purchase rate.

Justification:

These decision are based on actual data rather than assumption. This ensure resource are used effectively, helps meet customer needs and improves overall profit. Data-driven planning reduces guesswork and support continuous improvement through measurable outcomes.

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Task 3:

Suggest method to tracks and evalute performance over time using feedback loops.

A good method to track and evalute performance over time is by using feed back loops.

for example:

1. Collect feedback. throught Surveys, performance report or customer reviews.

2. Analyze data: to find trends, Streng-ths., and weaknesses.

3. Implement Changes: based on the feed-back to improve results.

4. Monitor Outcomes. again to see if the changes were effecti

This continuous cycle of feedback and improvement helps maintain consistent performonces, support data driven decision and ensure long-term growth and effetiency.

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Task 4:
Prepare a one-page executive summary highlights your insights and recommendations.

This report analyzes data from a sample business scenario to understand trends, performance, and opportunities for improvement. The study used different visualization such as bar charts, histogram, and scatter plots to highlight key pattern in sales and customer behavior.

1. Continue offering targeted promotion during low-sales months.
2. Monitor customer feedback regular through surveys and reviews.
3. Use performed dashboard to track KPIs like sale growth, customer retention, and satisfaction scores.

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