

Advanced Data Visualization (ADV) Lab

Exp 1

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BE COMPS B

ADV Batch D

Problem Statement: Create basic charts using Tableau / Power BI / R / Python / D3.js to be performed on the dataset of Ecommerce field

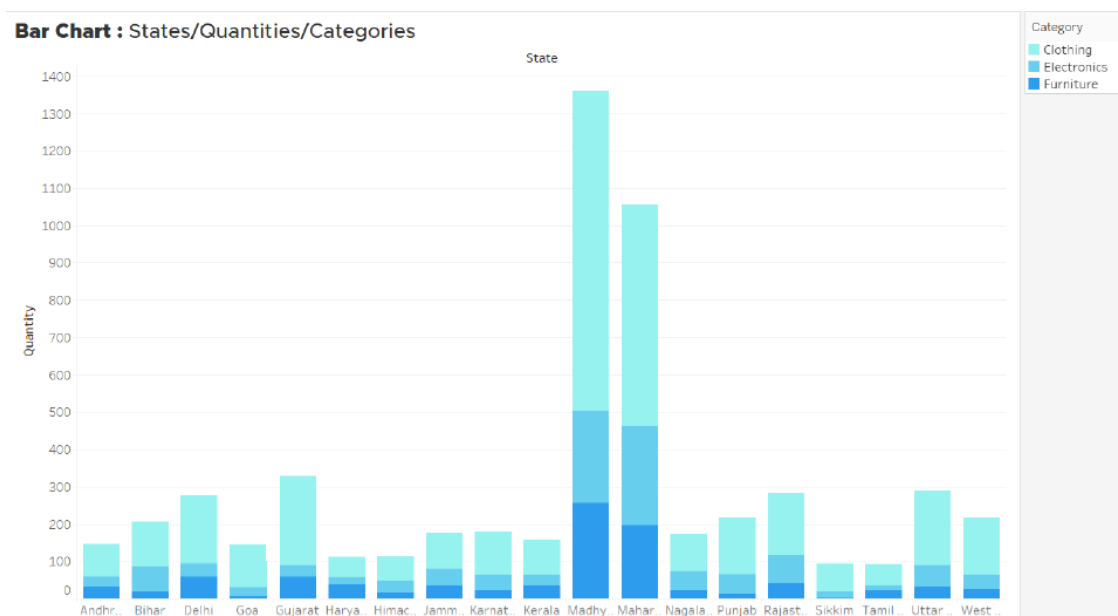
- Complete all plots on practice dataset and reproduce on e-commerce dataset.
- Basic - Bar chart, Pie chart, Histogram, Timeline chart, Scatter plot, Bubble plot
- Calculate Product wise sales, region wise sales
- Write observations from each chart

Software Used: PowerBi (for charts), Pandas (for product and region wise sales)

Dataset Used: <https://www.kaggle.com/datasets/jaynadkarni/e-commerce-sales-data-india>

→ Visualizations with Observations

1. Bar Chart

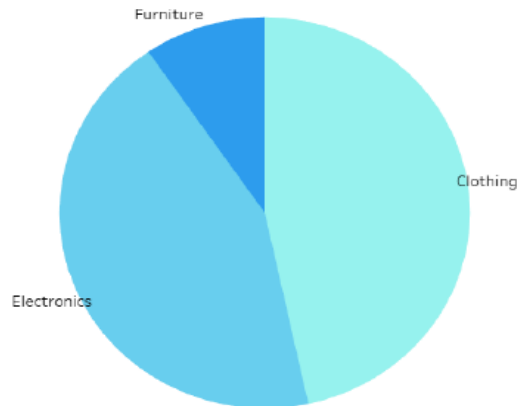


- A clear trend emerges, with Madhya Pradesh and Maharashtra leading the way in terms of quantity ordered, significantly outpacing other states.
- Across all states, clothing is the most sought-after category, followed closely by electronics in most cases.

- However, some exceptions stand out, such as Delhi, Haryana, and Tamil Nadu, where furniture takes the second spot.

2. Pie Chart

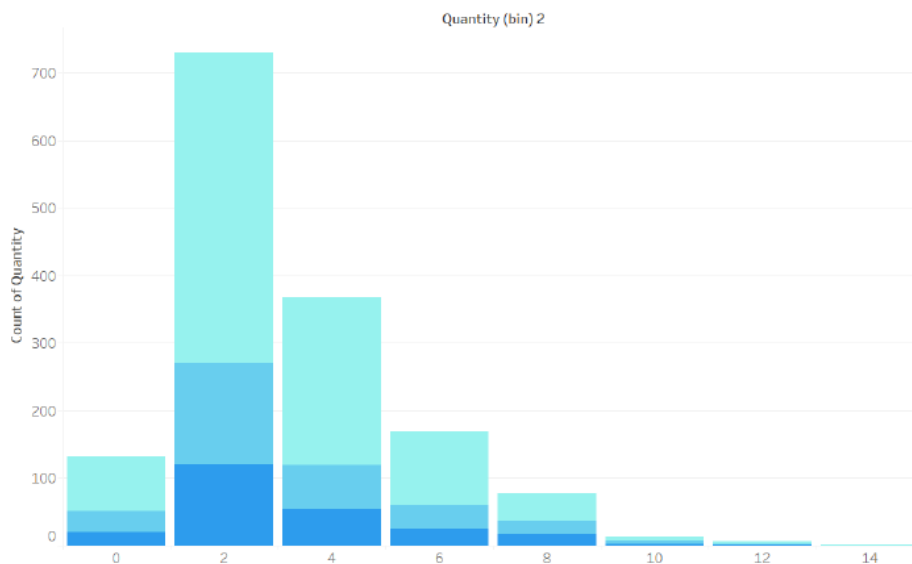
Pie Chart : Categories/Profit



- Clothing and Electronics are equally contributing to profit, indicating a balanced demand for both categories.
- However, profit margins vary across states, with Furniture contributing significantly less to profit in some states, highlighting regional differences in consumer preferences and purchasing habits.

3. Histogram

Histogram: Quantities/Catgeories

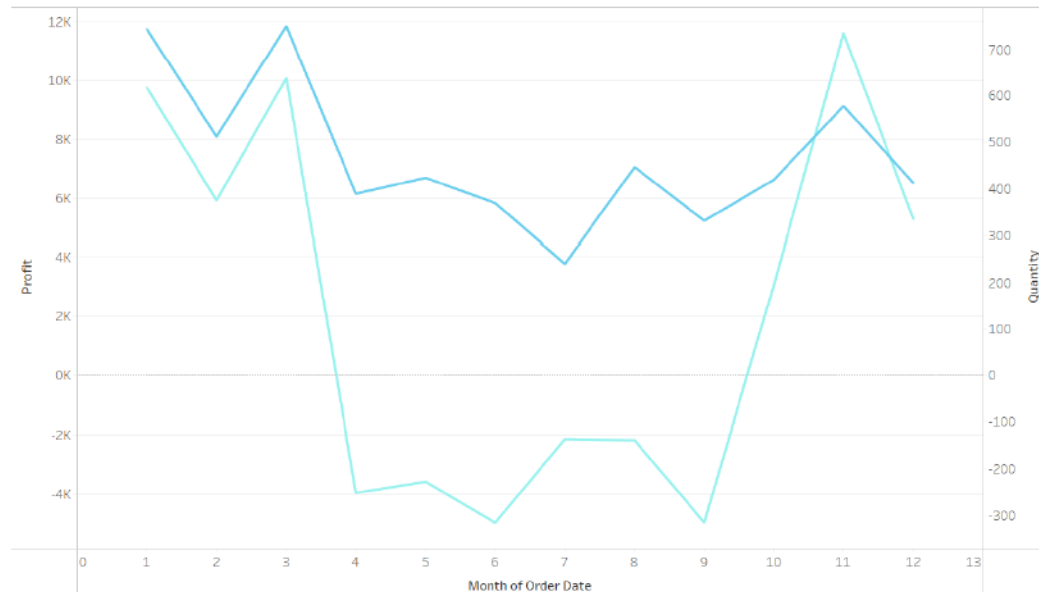


- The data reveals that people typically purchase products in quantities of 2-4 items, followed by 4-6 items, indicating a sweet spot for consumer demand.

- The distribution of purchase quantities follows a normal curve, suggesting a natural and expected pattern of consumer behavior, with most purchases clustering around the average quantity and tapering off at the extremes.

4. Timeline Chart

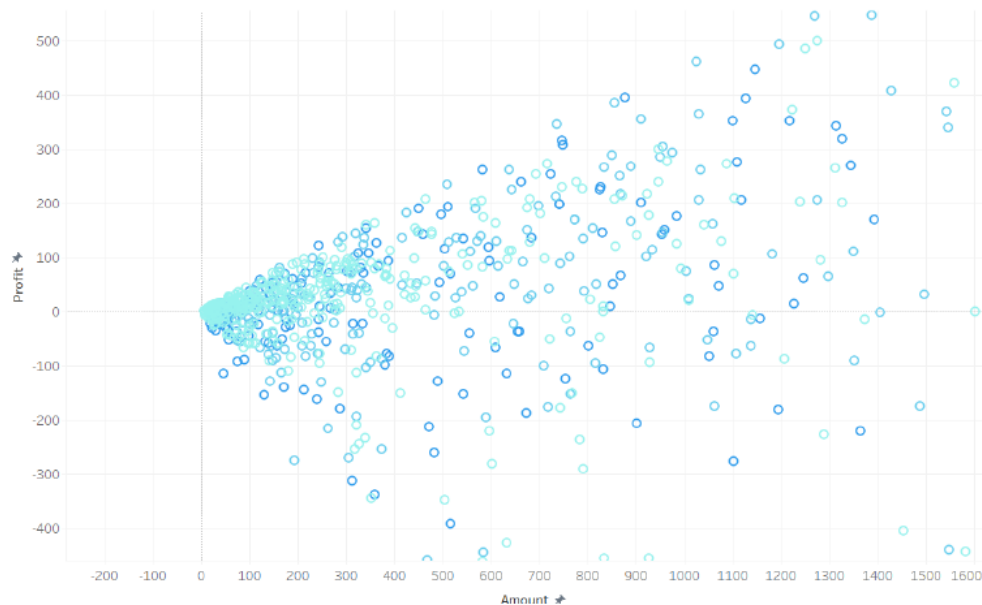
Timeline Chart: Monthly Profit/Quantity



- A significant decline in order quantities occurs during the months of April to September, necessitating a strategic revision to counteract this trend and boost sales.
- Profit closely follows the order quantity trend, with sharp peaks in early March and late October presenting opportunities for growth and increased profitability, while the seasonal slump requires targeted strategies to mitigate its impact

5. Scatter Plot

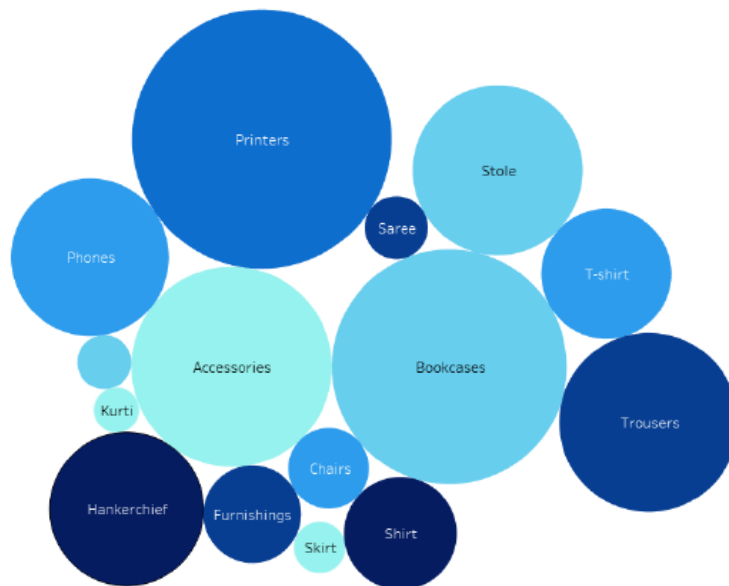
Scatter Plot: Profit/Amount



- A strong linear correlation exists between the amount and profit/loss, with a direct proportional relationship between the two, indicating that as the amount increases or decreases, the profit or loss also follows a similar trajectory.
- However, the clothing category deviates from this trend, showing a relatively lower correlation with profit/loss, suggesting that other factors may influence the profitability of clothing sales, making it a unique case compared to other categories.

6. Bubble Plot

Bubble Plot: Sub-Categories/Profit



- Printers, Bookcases, and Accessories emerge as the most profitable sub-categories, generating the highest profit margins.
- To leverage this potential, sales and marketing efforts should be intensified and optimized for these sub-categories, ensuring they receive the necessary attention and resources to maximize their profitability and drive business growth.

7. Product Wise Sales

```
1st.groupby("Category").sum()
```

	Amount	Profit	Quantity
Category			
Clothing	139054.0	11163.0	3516
Electronics	165267.0	10494.0	1154
Furniture	127181.0	2298.0	945

```
lst.groupby("Sub-Category").sum()
```

	Amount	Profit	Quantity
Sub-Category			
Accessories	21728.0	3559.0	262
Bookcases	56861.0	4888.0	297
Chairs	34222.0	577.0	277
Electronic Games	39168.0	-1236.0	297
Furnishings	13484.0	844.0	310
Hankerchief	14608.0	2098.0	754
Kurti	3361.0	181.0	164
Leggings	2106.0	260.0	186
Phones	46119.0	2207.0	304
Printers	58252.0	5964.0	291
Saree	53511.0	352.0	782
Shirt	7555.0	1131.0	271
Skirt	1946.0	235.0	248
Stole	18546.0	2559.0	671
T-shirt	7382.0	1500.0	305
Tables	22614.0	-4011.0	61
Trousers	30039.0	2847.0	135

- Electronic Games and Tables show losses, while Printers, Bookcases, and Accessories have high profit margins.
- Sarees sell most units but rank 5th in revenue; Phones generate high revenue from fewer units.

12. Region wise sales:

```
lst.groupby("State").sum()
```

	Amount	Profit	Quantity
State			
Andhra Pradesh	13256.0	-496.0	146
Bihar	12943.0	-321.0	206
Delhi	22531.0	2987.0	277
Goa	6705.0	370.0	145
Gujarat	21058.0	465.0	328
Haryana	8863.0	1325.0	111
Himachal Pradesh	8666.0	656.0	113
Jammu and Kashmir	10829.0	8.0	177
Karnataka	15058.0	645.0	180
Kerala	13459.0	1871.0	157
Madhya Pradesh	105140.0	5551.0	1360
Maharashtra	95348.0	6176.0	1056
Nagaland	11903.0	148.0	173
Punjab	16786.0	-609.0	216
Rajasthan	21149.0	1257.0	282
Sikkim	5276.0	401.0	93
Tamil Nadu	6087.0	-2216.0	91
Uttar Pradesh	22359.0	3237.0	288
West Bengal	14086.0	2500.0	216

```
lst.groupby("City").sum()
```

	Amount	Profit	Quantity
City			
Ahmedabad	14230.0	-880.0	235
Allahabad	16857.0	3081.0	138
Amritsar	4507.0	544.0	52
Bangalore	15058.0	645.0	180
Bhopal	23583.0	871.0	247
Chandigarh	21142.0	172.0	275
Chennai	6087.0	-2216.0	91
Delhi	25019.0	3508.0	306
Gangtok	5276.0	401.0	93
Goa	6705.0	370.0	145
Hyderabad	13256.0	-496.0	146
Indore	79069.0	4159.0	1084
Jaipur	10076.0	-753.0	167
Kashmir	10829.0	8.0	177
Kohima	11903.0	148.0	173
Kolkata	14086.0	2500.0	216
Lucknow	5502.0	156.0	150
Mumbai	61867.0	1637.0	727
Patna	12943.0	-321.0	206
Pune	33481.0	4539.0	329
Simla	8666.0	656.0	113
Surat	6828.0	1345.0	93
Thiruvananthapuram	13459.0	1871.0	157
Udaipur	11073.0	2010.0	115

- Madhya Pradesh and Maharashtra have high quantities and profits, but Gujarat has high quantity with low profit.
- Major cities like Delhi and Mumbai show high sales amounts, but some struggle with profitability (e.g., Chennai, Ahmedabad).