DIWALI SALES DATA ANALYSIS

- *Arijit Das*

INTRODUCTION

Summary :

• *This project analyzes sales data collected during Diwali festival season. The goal is to understand customer buying behaviour and identify key trends that can help business optimize their marketing and sales strategies for future seasons.*

• *This dataset contains customers demographic details (such as gender, state, age group) along with product categories, purchase amounts. By analysing this data, I aim to answer questions like :*

→ **Which category buys the most product ?**

→ **Which state contribute the most sales ?**

→ **Which product is most popular during Diwali ?**

→ **Which age group buys the most product ?**

→ **What is the average sale of this time of period ?**

→ **What is the maximum sale amount ?**

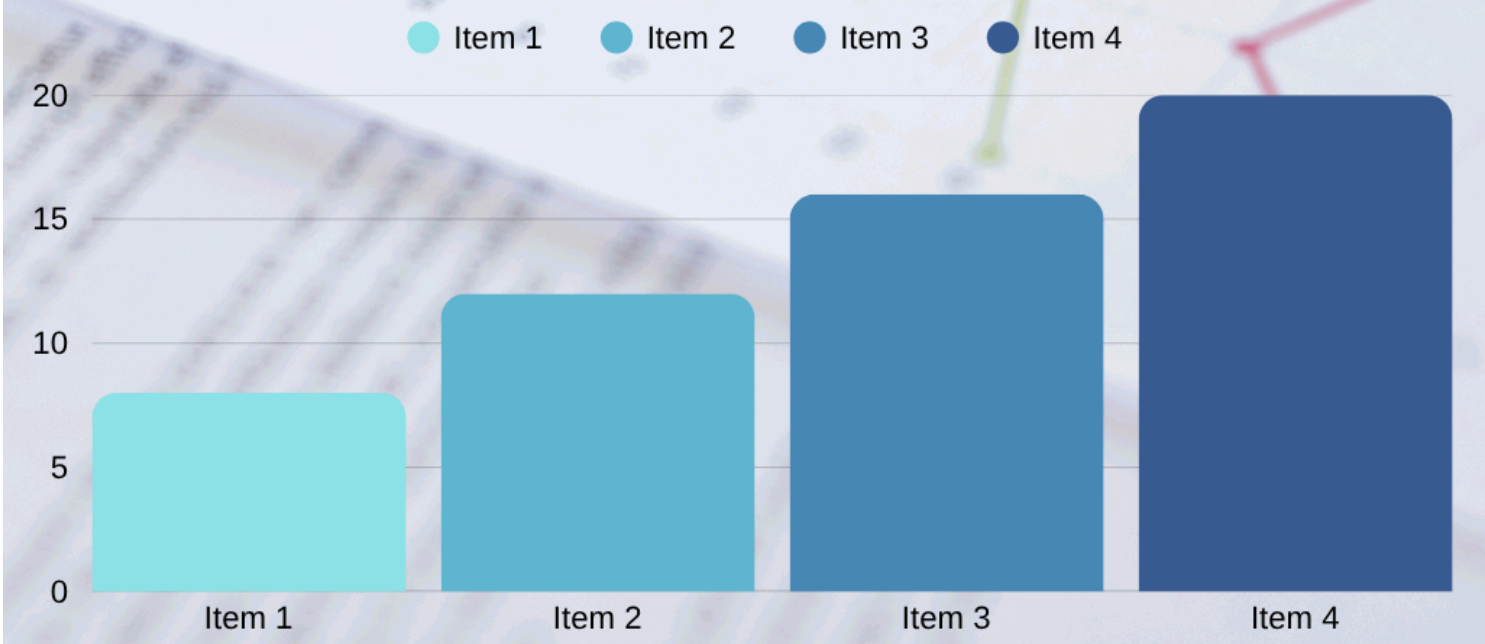
→ **What is the minimum sale amount ?**

→ **Which product sold the most ?**

→ **Which product had limited sales ?**

→ **Who are the target customers that buisness should focuss on ?**

This analysis provides useful insights to customer preference and buying patterns , which can help retailers make data-driven decisions for upcoming festive campaigns.



DATA OVERVIEW

• Data Source :

The dataset used in this project was collected from kaggle. It contains retail sales data from the diwali festival season, including customer demographic, purchase details, and transaction amounts.

• Size Of The Dataset :

→ *Total number of rows = 11,251*
→ *Total number of columns = 14*

• Column Description :

→ User_id
→ Product_id
→ State
→ Zone
→ Amount
→ Product_Category
→ Gender
→ Orders
→ Age
→ Age_Group

• Data preparation :

→ *Handles missing values : Checked the NaN (Null) Values.*
→ *Removed duplicates : Drop duplicates from 'User_ID' column.*
→ *Data type conversion : Convert the object type data into Integer (int64).*
→ *Filtered irrelevant data : Removed irrelevant values from particular columns.*
→ *Standardized data set : Removed unwanted columns/rows.*
→ *Save the clean data for EDA*

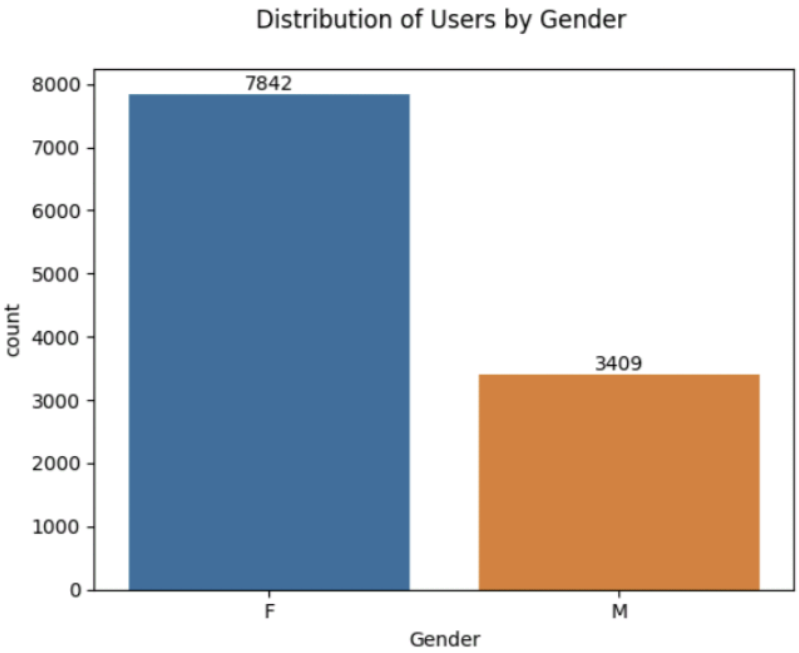
• EDA (Exploratory Data Analysis :

1 > Univariate Analysis :

- *Distribution of genders : Age, Age_Group, Gender, States, Orders, Product Categories*
- *Plots : Bar Charts, Pie Charts, Count plots.*

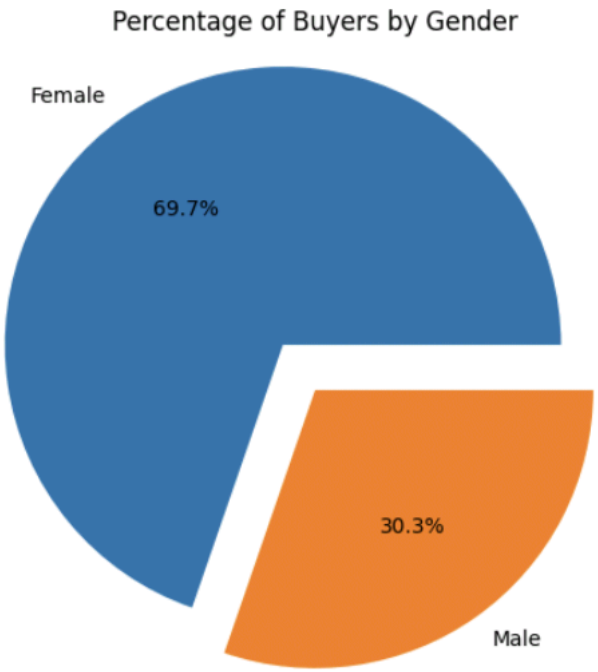
2 > Bivariate Analysis / Multivariate Analysis :

- *Age Group vs Amount*
- *Gender vs Amount*
- *State vs Amount*
- *State vs Orders*
- *Product Categories vs Amount*
- *State vs Product Categories*



[130]:

	Gender	Count
0	F	7842
1	M	3409



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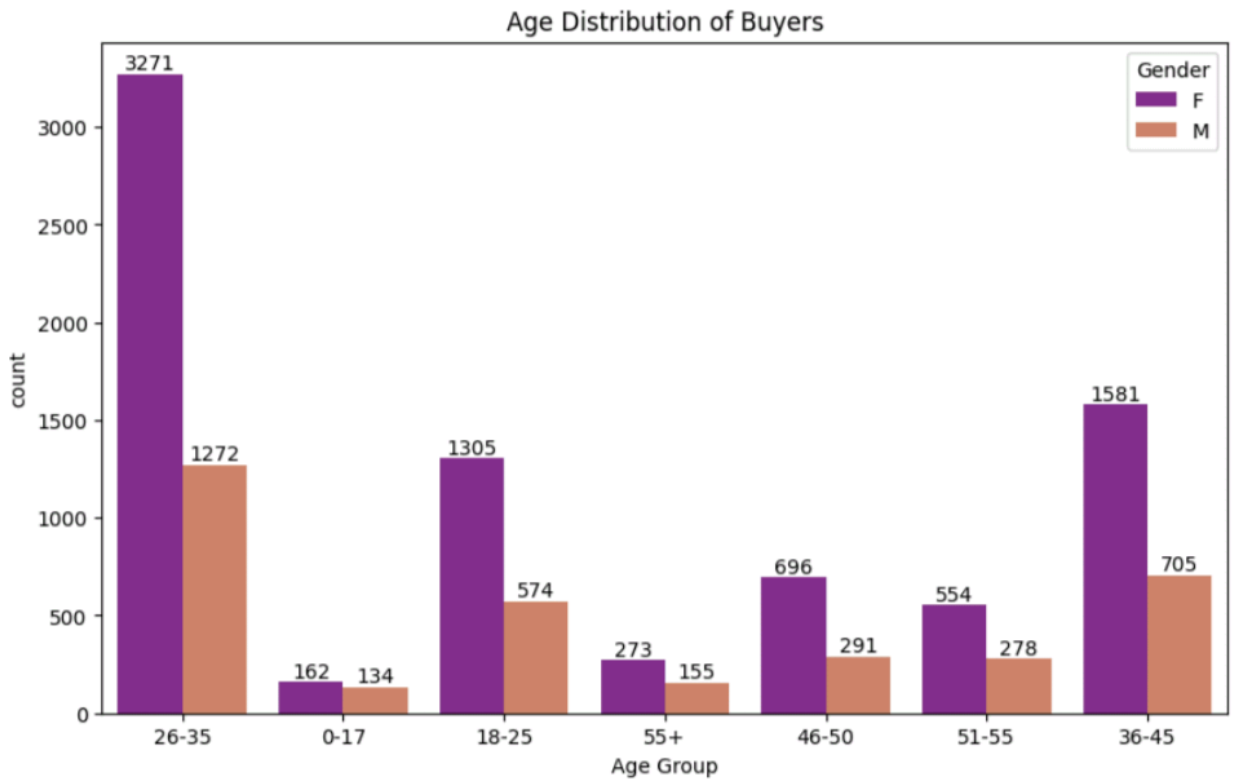
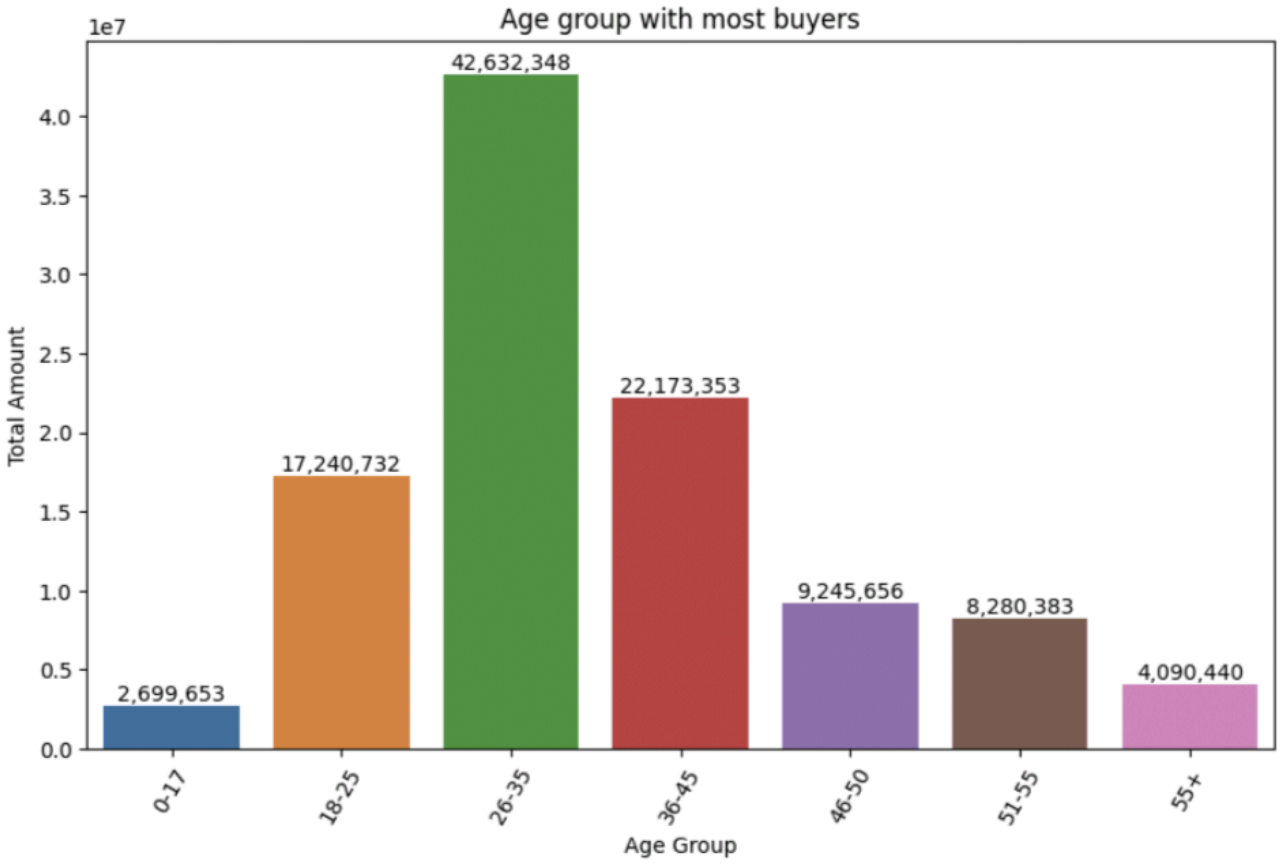
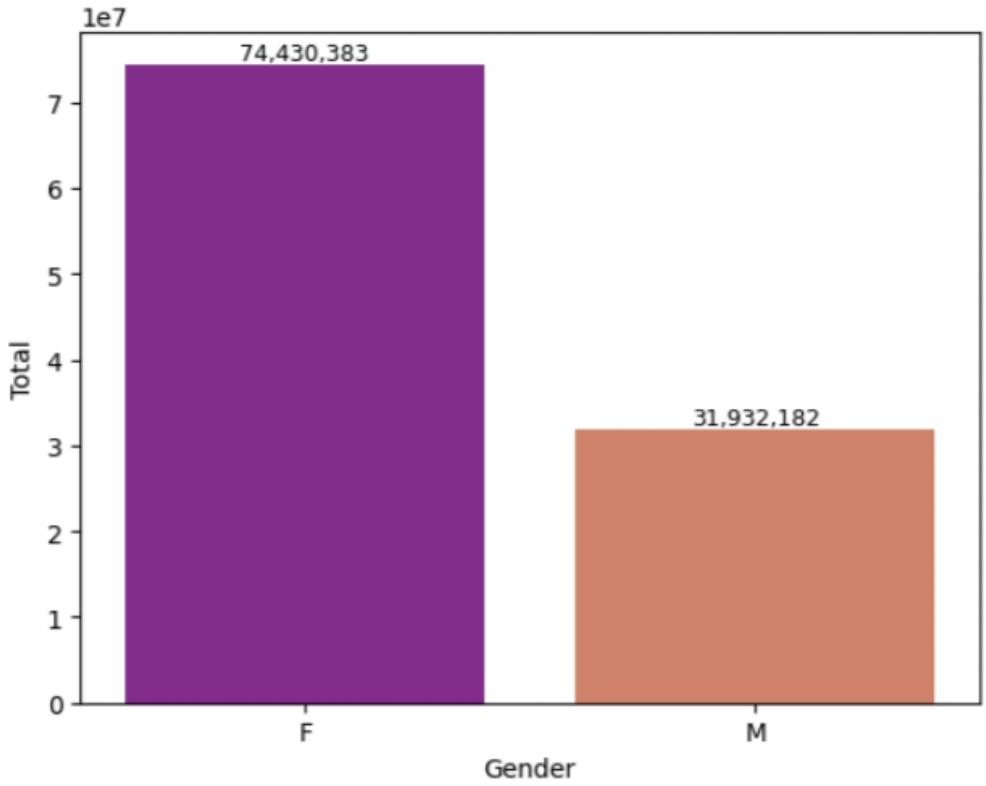
	Gender	Count
0	F	7842
1	M	3409


Age Distribution of Buyers
Gender
F
M
count
Age Group
0
500
1000
1500
2000
2500
3000
3271
1272
162
134
1305
574
273
155
696
291
554
278
1581
705
26-35
0-17
18-25
55+
46-50
51-55
36-45

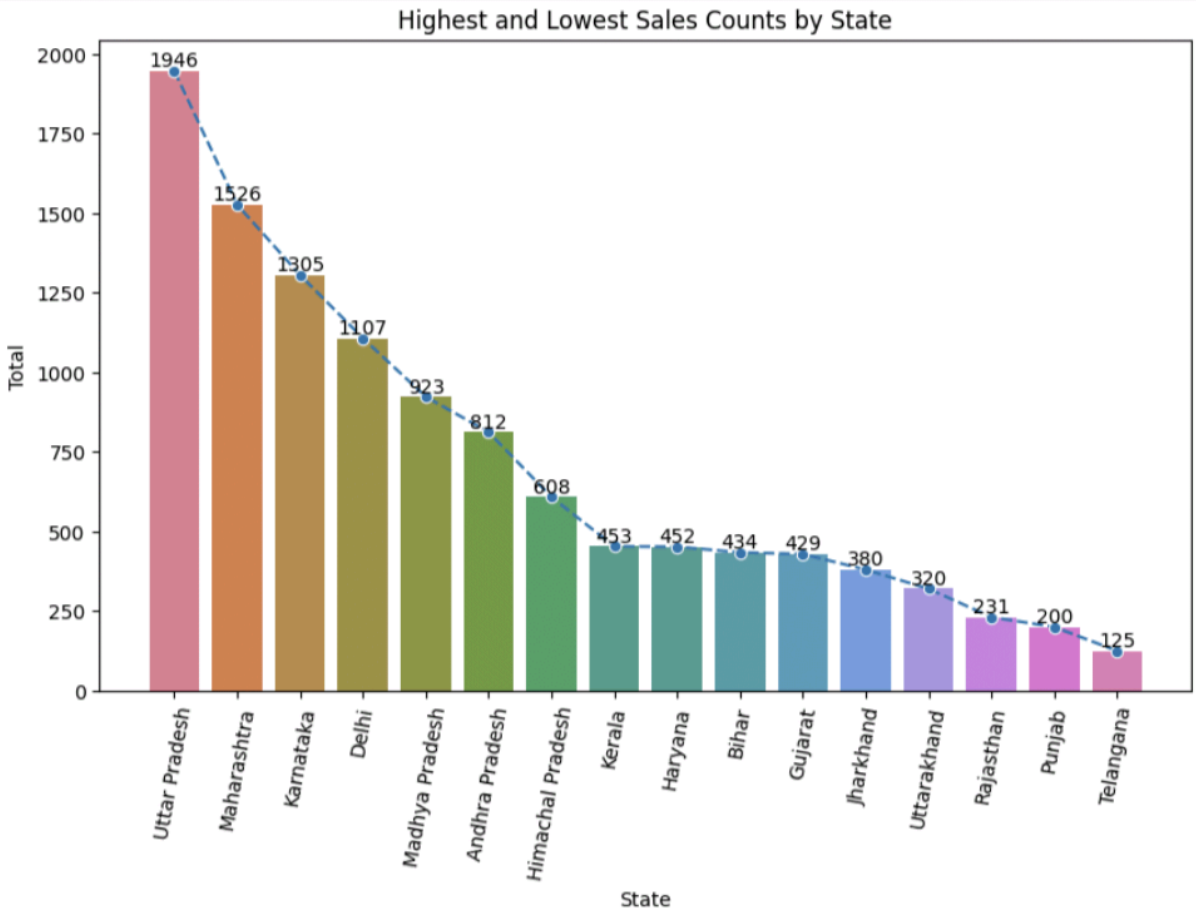

Age group with most buyers
1e7
Total Amount
Age Group
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
2,699,653
17,240,732
42,632,348
22,173,353
9,245,656
8,280,383
4,090,440
0-17
18-25
26-35
36-45
46-50
51-55
55+

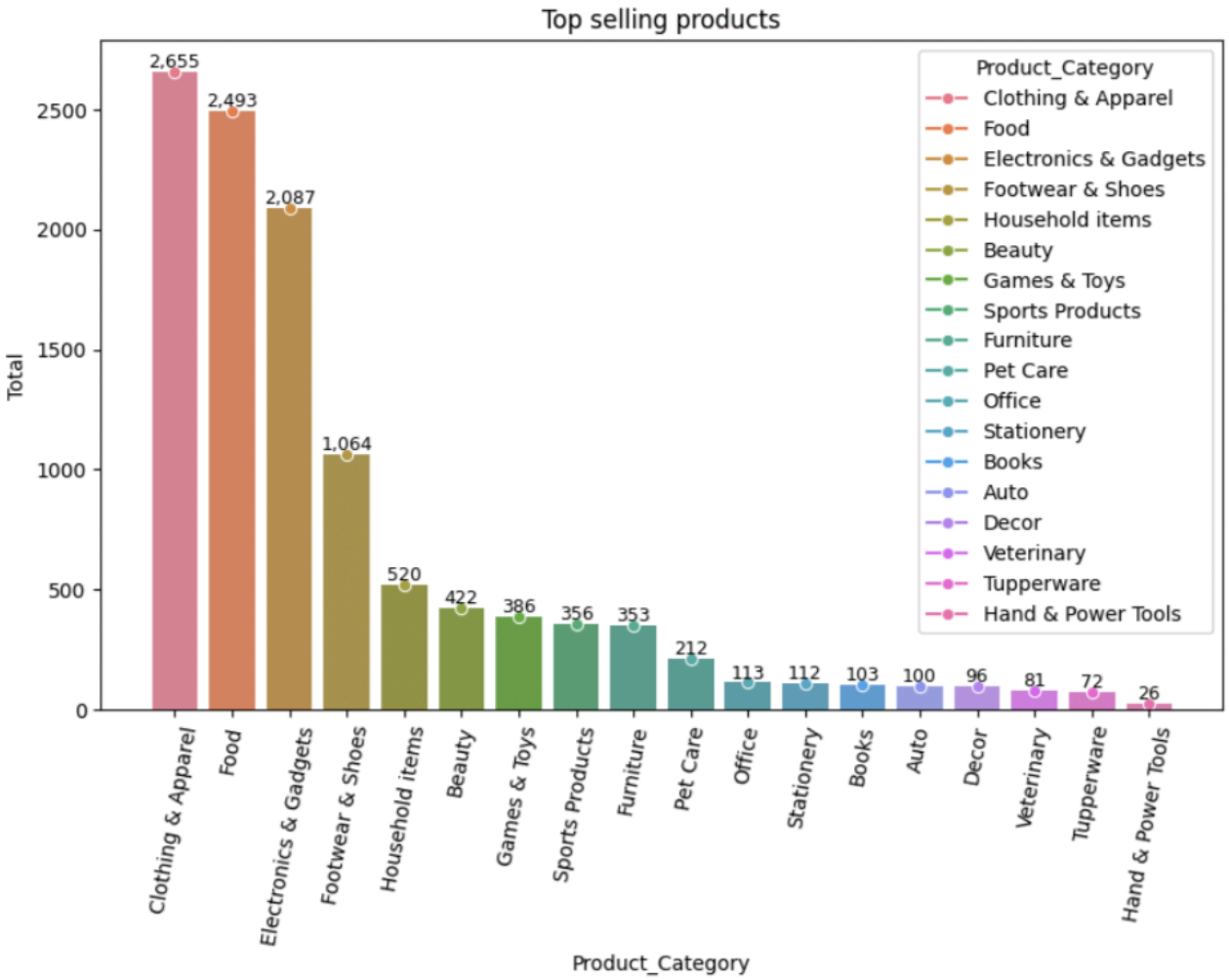
Calculating total amount according to female and male category

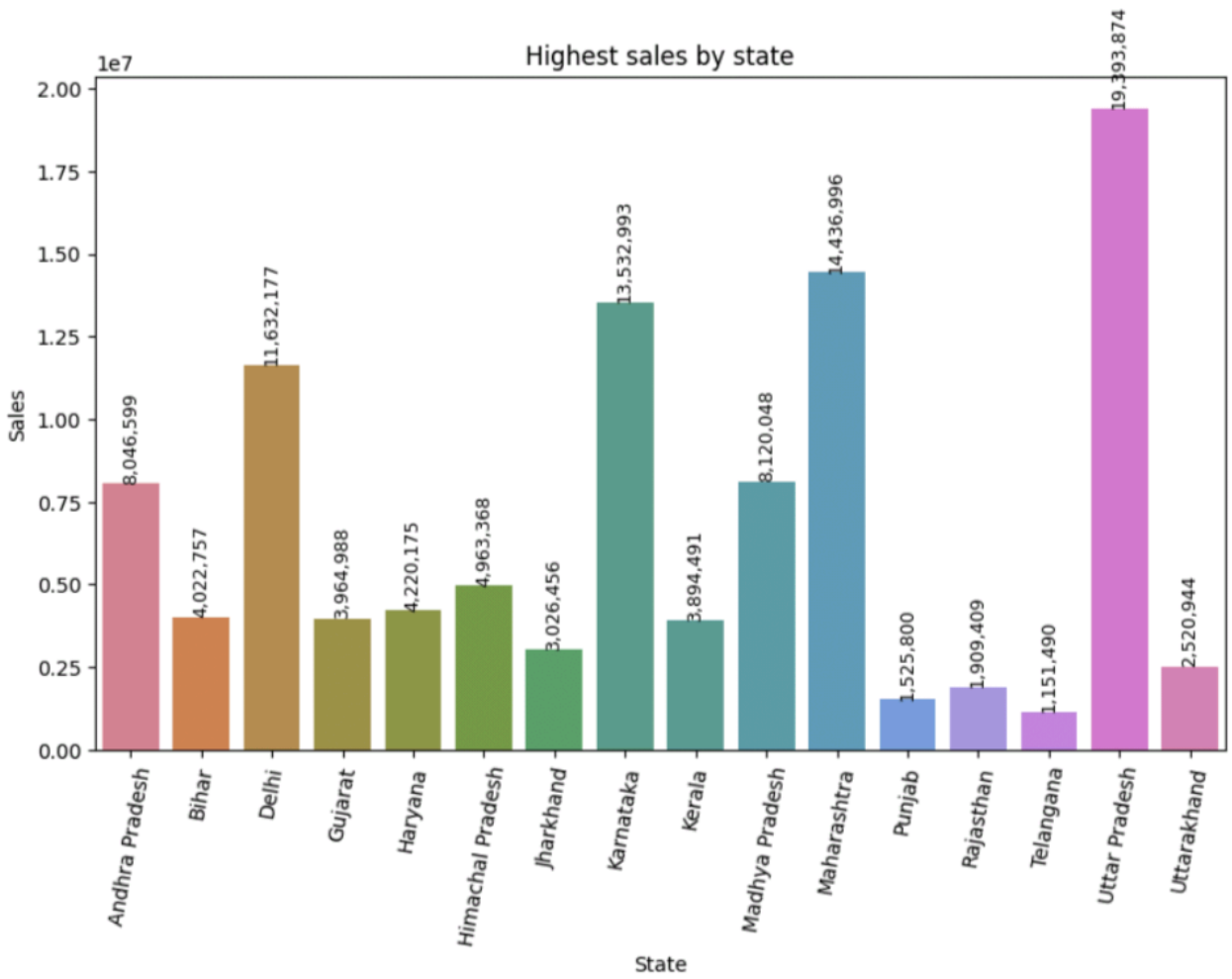


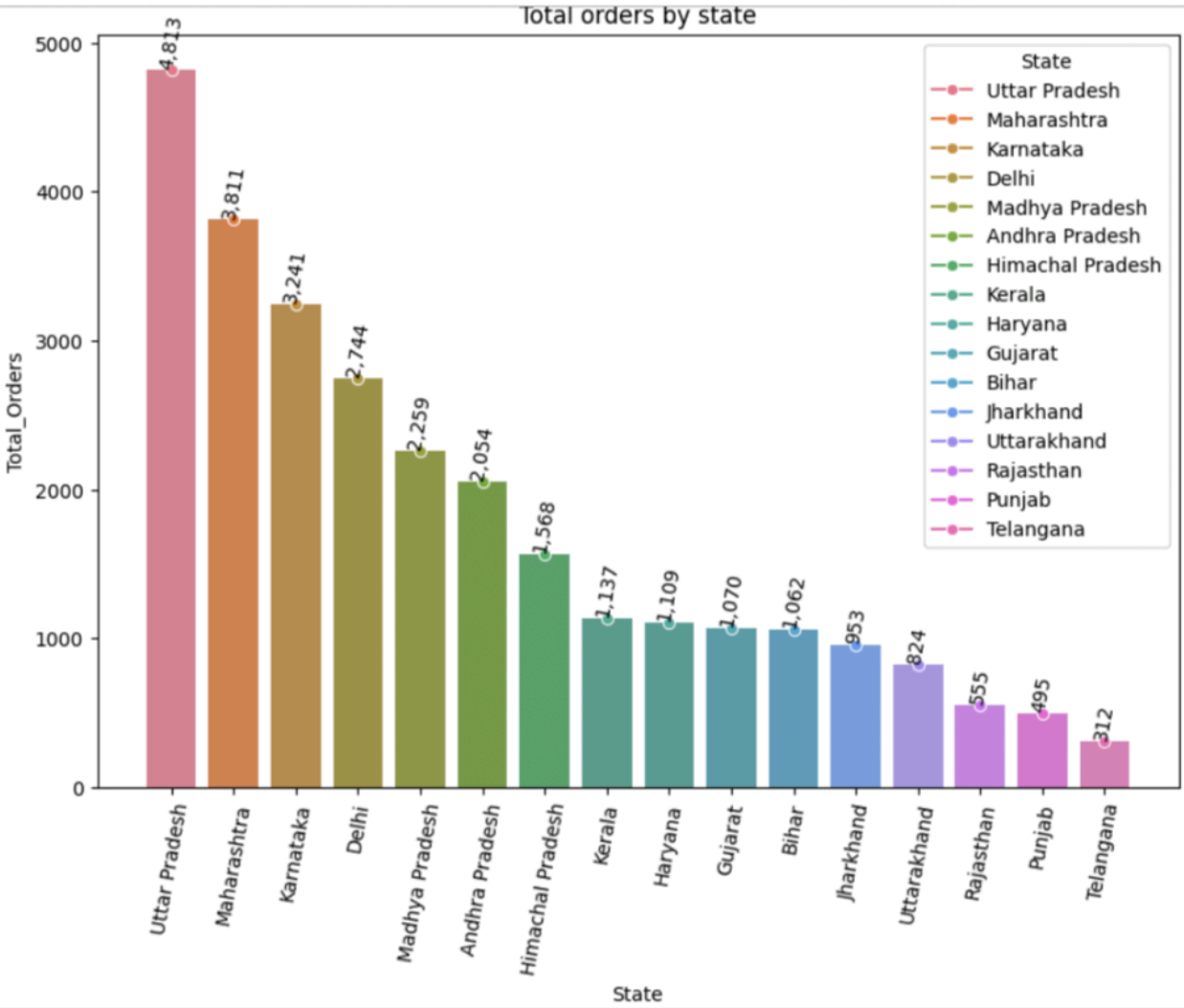
[134]:

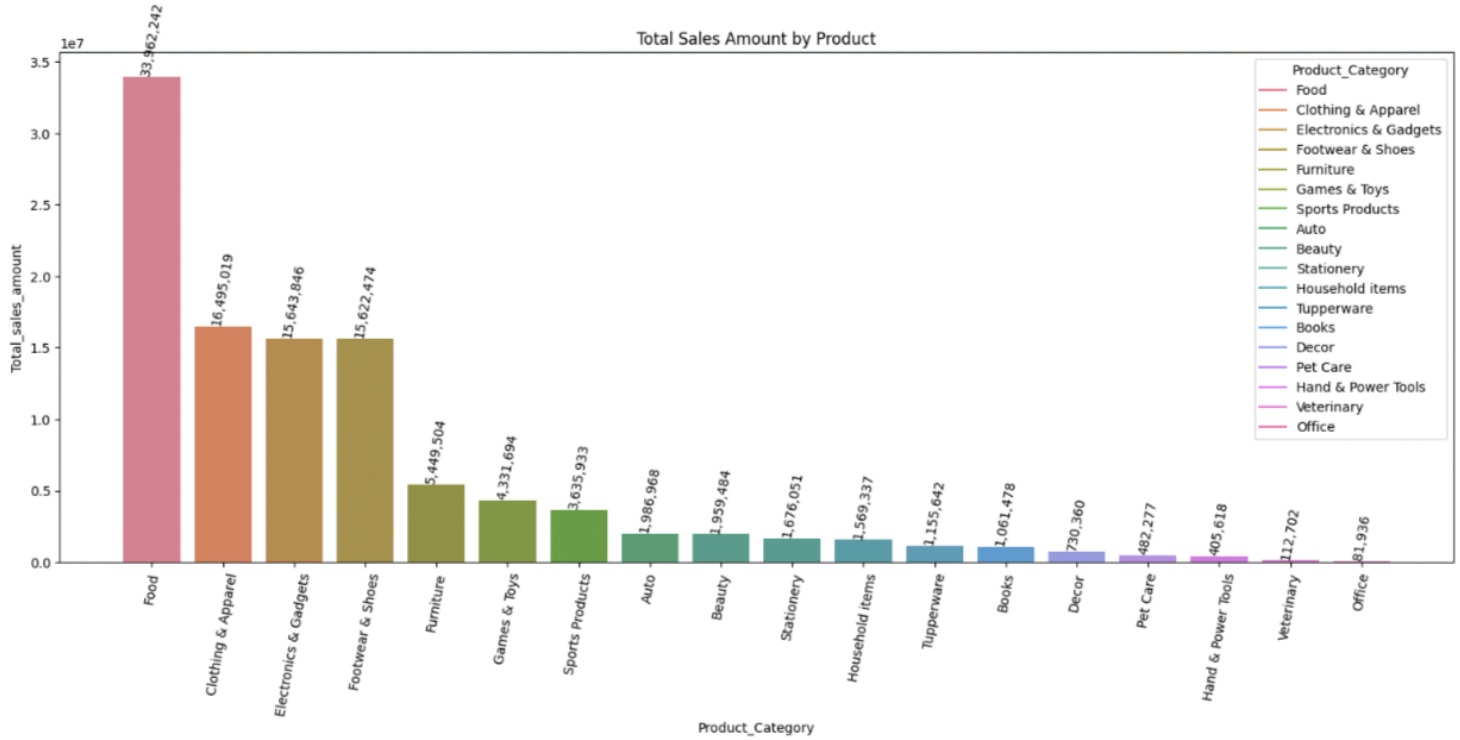
	Gender	Total
0	F	74430383
1	M	31932182

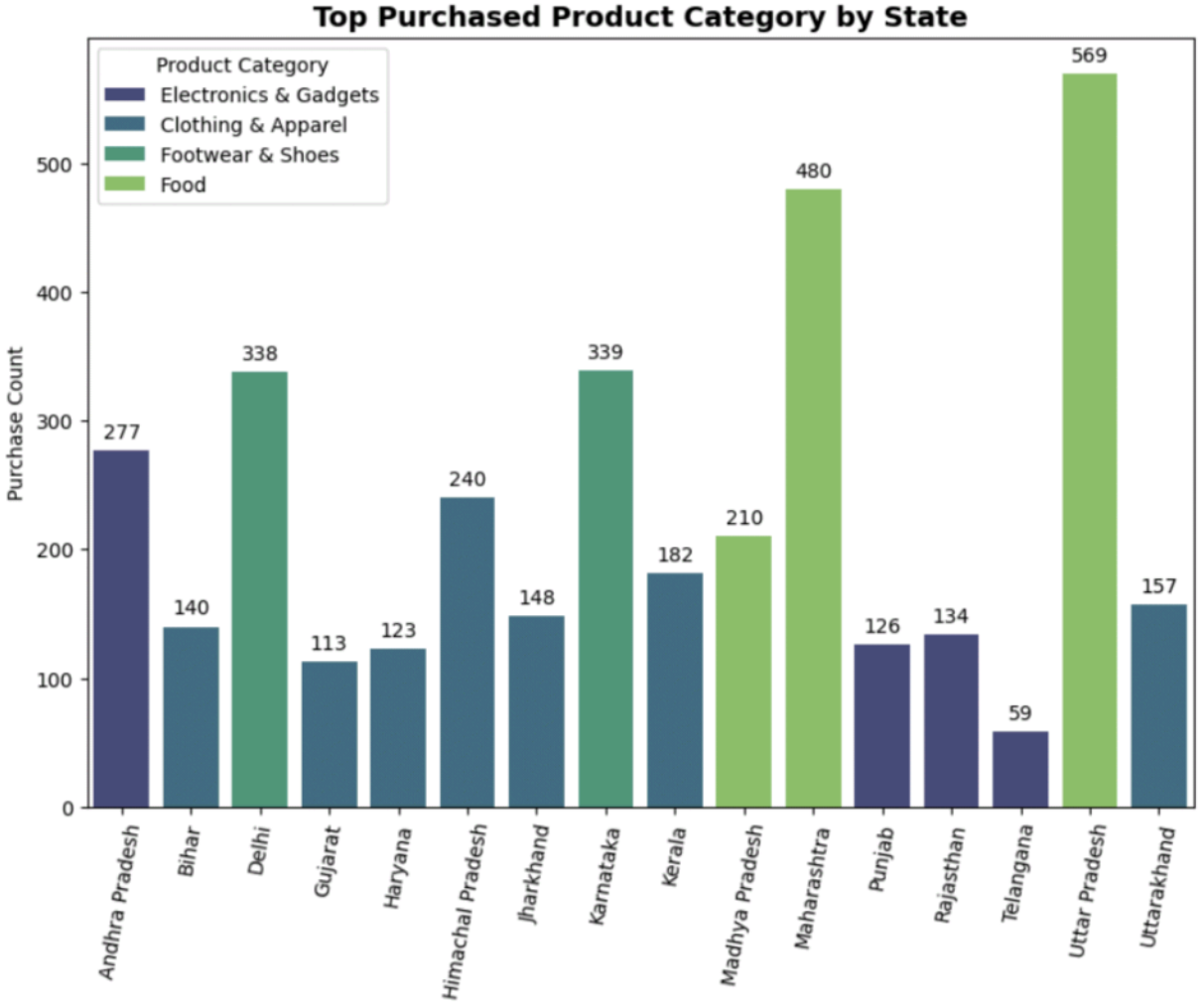

Highest and Lowest Sales Counts by State
Total
State
2000
1750
1500
1250
1000
750
500
250
0
1946
1526
1305
1107
923
812
608
453
452
434
429
380
320
231
200
125
Uttar Pradesh
Maharashtra
Karnataka
Delhi
Madhya Pradesh
Andhra Pradesh
Himachal Pradesh
Kerala
Haryana
Bihar
Gujarat
Jharkhand
Uttarakhand
Rajasthan
Punjab
Telangana

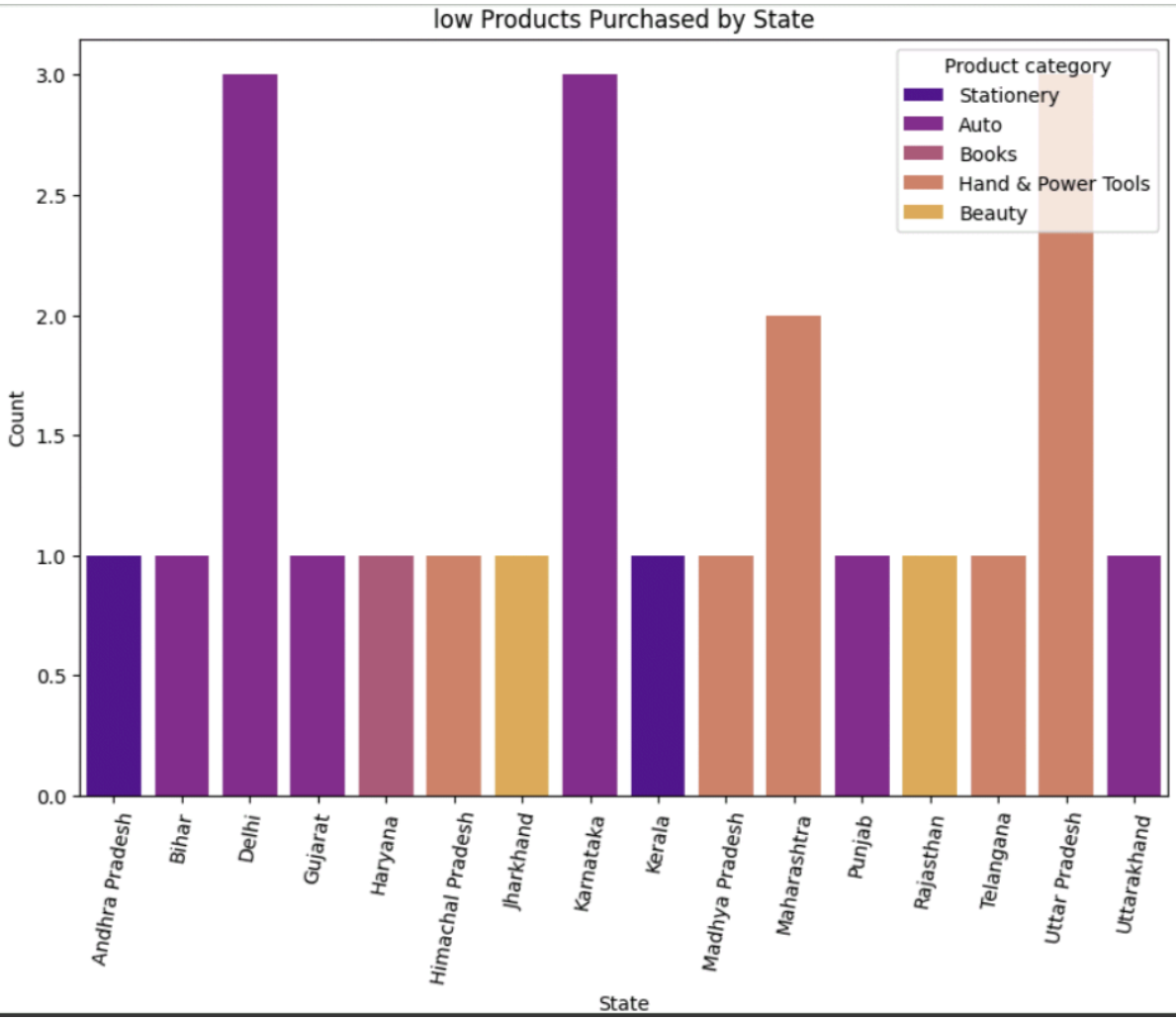

Top selling products
Total
Product_Category
Clothing & Apparel
Food
Electronics & Gadgets
Footwear & Shoes
Household items
Beauty
Games & Toys
Sports Products
Furniture
Pet Care
Office
Stationery
Books
Auto
Decor
Veterinary
Tupperware
Hand & Power Tools
2,655
2,493
2,087
1,064
520
422
386
356
353
212
113
112
103
100
96
81
72
26
0
500
1000
1500
2000
2500


Highest sales by state
1e7
Sales
State
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
8,046,599
4,022,757
11,632,177
3,964,988
4,220,175
4,963,368
3,026,456
13,532,993
3,894,491
8,120,048
14,436,996
1,525,800
1,909,409
1,151,490
19,393,874
2,520,944
Andhra Pradesh
Bihar
Delhi
Gujarat
Haryana
Himachal Pradesh
Jharkhand
Karnataka
Kerala
Madhya Pradesh
Maharashtra
Punjab
Rajasthan
Telangana
Uttar Pradesh
Uttarakhand


Total orders by state
Total_Orders
State
0
1000
2000
3000
4000
5000
4,813
3,811
3,241
2,744
2,259
2,054
1,568
1,137
1,109
1,070
1,062
953
824
555
495
312
Uttar Pradesh
Maharashtra
Karnataka
Delhi
Madhya Pradesh
Andhra Pradesh
Himachal Pradesh
Kerala
Haryana
Gujarat
Bihar
Jharkhand
Uttarakhand
Rajasthan
Punjab
Telangana
State
Uttar Pradesh
Maharashtra
Karnataka
Delhi
Madhya Pradesh
Andhra Pradesh
Himachal Pradesh
Kerala
Haryana
Gujarat
Bihar
Jharkhand
Uttarakhand
Rajasthan
Punjab
Telangana


Total Sales Amount by Product
1e7
Total_sales_amount
Product_Category
Food
Clothing & Apparel
Electronics & Gadgets
Footwear & Shoes
Furniture
Games & Toys
Sports Products
Auto
Beauty
Stationery
Household items
Tupperware
Books
Decor
Pet Care
Hand & Power Tools
Veterinary
Office
33,962,242
16,495,019
15,643,846
15,622,474
5,449,504
4,331,694
3,635,933
1,986,968
1,959,484
1,676,051
1,569,337
1,155,642
1,061,478
730,360
482,277
405,618
112,702
81,936


Top Purchased Product Category by State
Product Category
Electronics & Gadgets
Clothing & Apparel
Footwear & Shoes
Food
Purchase Count
0
100
200
300
400
500
277
140
338
113
123
240
148
339
182
210
480
126
134
59
569
157
Andhra Pradesh
Bihar
Delhi
Gujarat
Haryana
Himachal Pradesh
Jharkhand
Karnataka
Kerala
Madhya Pradesh
Maharashtra
Punjab
Rajasthan
Telangana
Uttar Pradesh
Uttarakhand


low Products Purchased by State
Product category
Stationery
Auto
Books
Hand & Power Tools
Beauty
Count
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Andhra Pradesh
Bihar
Delhi
Gujarat
Haryana
Himachal Pradesh
Jharkhand
Karnataka
Kerala
Madhya Pradesh
Maharashtra
Punjab
Rajasthan
Telangana
Uttar Pradesh
Uttarakhand
State

Key Insights

● Demographic :

- Majority of buyers are female , contributing to higher total sales..
- Age group 26–35 years is the largest consumer segment.
- Age group 0-17 years is the lowest consumer segment.
- In the 26–35 age group, females dominate with 3,271 buyers compared to 1,272 males, making this segment the most active consumer group.
- Within the 26–35 age group, 69.7% of buyers are female while 30.3% are male, highlighting a strong female-driven purchasing trend in this segment..

● Geography :

1. **Highest :**
   - Uttar pradesh, Karnataka, Maharashtra shows the highest sales. .
   - Uttar Pradesh leads with a total sales amount of 19,393,374, followed by Maharashtra with 14,436,996 and Karnataka with 13,532,993, making these the top three revenue-generating states .

2. Lowest :

- Rajasthan, Panjab and Telengana shows the lowest sales. .
- On the lower end, Rajasthan recorded sales of 1,909,409, Punjab 1,525,800, and Telangana 1,151,490, making them the states with the least contribution to overall sales. .

● Product Categories :

1. **Highest :**
   - The highest sales were observed in Food, Clothing & Apparel, Electronics & Gadgets, and Footwear & Shoes, making them the most popular product categories among buyers. .
   - Among product categories, Food accounts for the largest share with 40.9% of sales (33,162,242), followed by Clothing & Apparel at 20.4% (16,495,019), Electronics & Gadgets at 19.3% (15,643,144), and Footwear & Shoes also at 19.3% (15,622,474) .

2.Lowest :

- Categories such as Office Supplies, Veterinary Products, Hand & Power Tools, and Pet Care recorded the lowest sales, contributing minimally to overall revenue. .
- Among the lowest-performing categories, Hand & Power Tools contributed 405,618 sales (67.6%), followed by Veterinary Products with 112,702 (18.8%) and Office Supplies with 81,936 (13.6%). These categories together form only a negligible share of overall sales.

Conclusion & Recommendations

The Diwali Sales Data Analysis provides valuable insights into customer benavaior, regional performance during the festive season. By analyzzing demograprchic trends, salles patterns, and product categorles.

Key Findings: Demographics: Women in the 26–35 age group are the most dominant buyers, contributing significantly more to sales compared to male buyers.

Geography: The top-performing states are Uttar Pradesh, Maharashtra, and Karnataka, generating the highest sales volumes, In contrast, Rajatsthan, Punjab, and Telangana contribute minimally.

Products: The most popular categories include Food, Clothing & Apoarel, Electronics, and Footwear, while categories suchas Office Supplies, Veterinary Products; and Power Tools so' very low sales.

Recommendations Target female customers aged 26–35 with personalized offers and campaigns

- Strengthen inventory management for Food and Apparel during peak festive periods
- Introduce discounts and bundled offers on Electronics and Footwear to maximize revenue
- Reconsider low-performing categories, either by bundling them with popular products or shifting focus away from them

Final Note This analysis demonstrates how businesses can leverage data-driven insights to optimize sales strategies, improve customer targeting, and enhance profitability during festive seasons.

Thank you

~Arijit Das