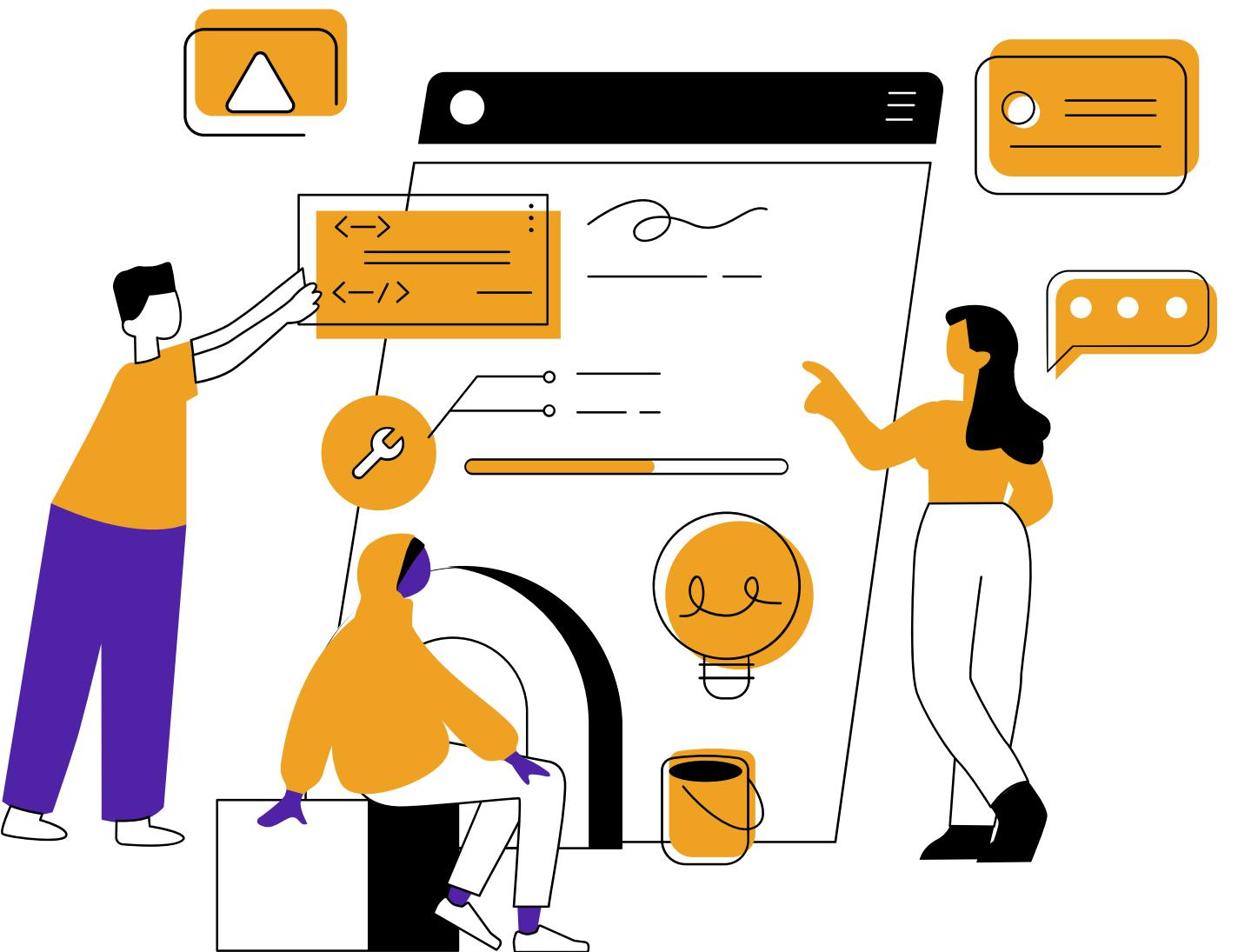




SALES DATA ANALYSIS





SALES DATA ANALYSIS

SALES DATA ANALYSIS INVOLVES EXAMINING AND INTERPRETING SALES DATA TO IDENTIFY TRENDS, OPTIMIZE STRATEGIES, AND IMPROVE BUSINESS DECISIONS, ULTIMATELY ENHANCING PROFITABILITY AND COMPETITIVENESS.



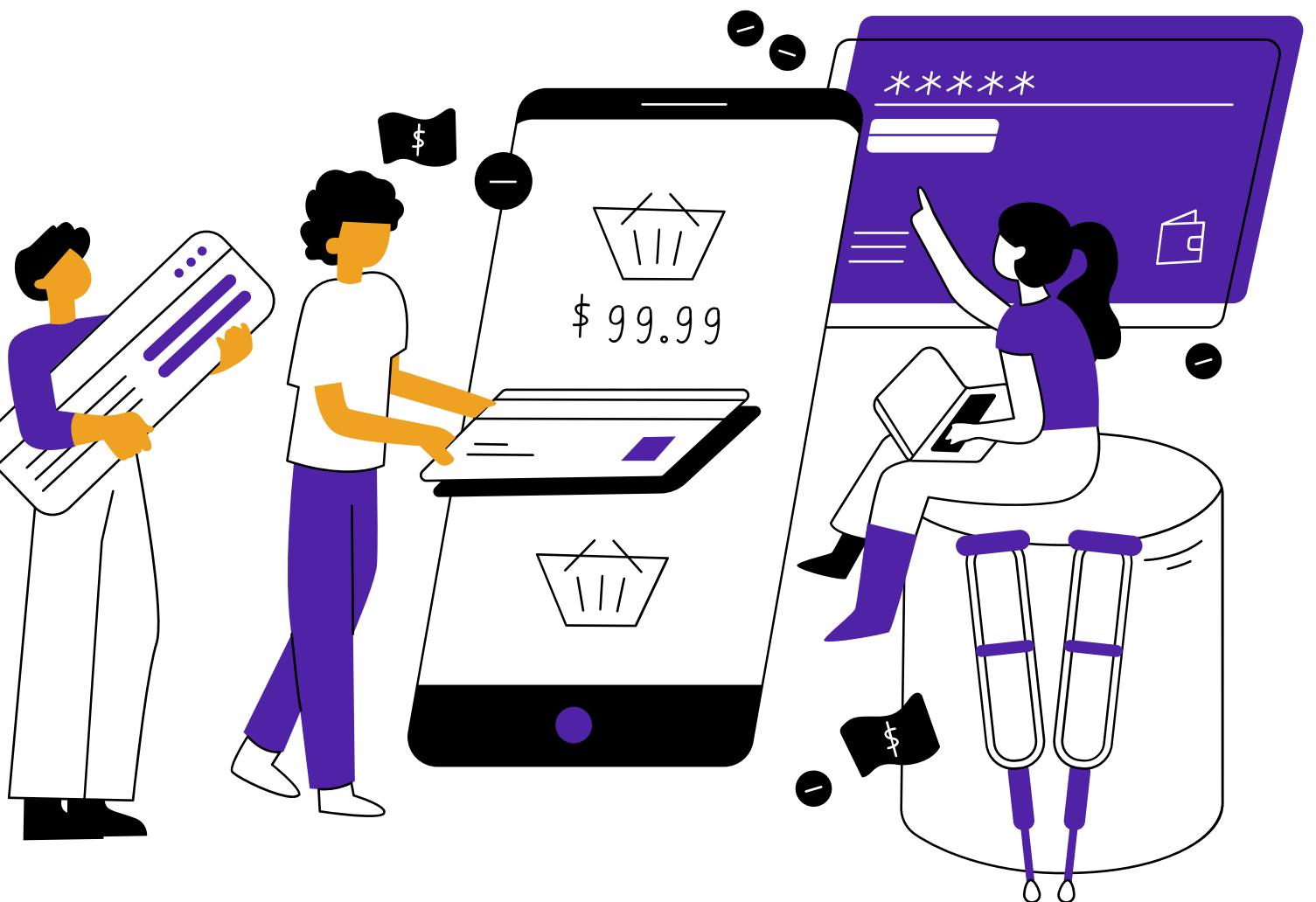
AIM OF THE PROJECT

The aim of a sales data analysis project is to understand sales trends and customer behavior, evaluate product performance, and forecast future sales to optimize marketing strategies and resource allocation. This helps in identifying key drivers of revenue and improving overall business performance.



DATA COLLECTION

Data collection involves gathering detailed sales transactions and customer demographics, along with relevant external data like market trends and economic indicators. This comprehensive data provides the foundation for insightful sales analysis.



DATA COLLECTION



SALES DATA ANALYSIS

This data is collected for our project purpose so all are requested to fill the form.

akashayushsamanta@gmail.com [Switch account](#)

Not shared

* Indicates required question

Customer Name *
Your answer

Customer Type *
 Consumer

City (If your city is not mentioned here then * you can select any one of it. It is for a project purpose.)

Krishnagar 1
 Krishnagar 2
 Badkulla
 Tehatta
 Mayapur
 Nabadwip
 Dhubulia
 Swarupganj
 Chapra
 Karimpur
 Aamghata
 Bahadurpur
 Kalna
 Others

Sate *
 West Bengal

Country *
 India

Gender *
 M
 F

Age *
 0 - 10
 11 - 18
 19 - 30
 31 - 50
 51 - 70

Catagory *

Electronics
 Home & Furniture
 Fashion
 Books & Media
 Groceries
 Health & Personal Care

Sub category(which product you buy) *

Mobile & Tablets
 Computers & Laptops
 Cameras & Photography
 Home Appliances & Kitchenware
 Televisions
 Audio Devices & Wearable Technology
 Gaming
 Furniture & Bedding
 Home Decor
 Clothing
 Footwear
 Accessories
 Jewellery
 Books & Magazines
 Fruits & Vegetables
 Dairy & Eggs
 Beverages
 Snacks & Packaged Foods
 Staples(Rice, Dal, Atta, Cooking oil etc)
 Personal Care & Beauty Products
 Health Supplements & Medical Supplies
 Sportswear
 Sports & Fitness Equipment

Brand Name *
Your answer

Price *
Your answer

Quantity *

1
 2
 3
 4
 5
 6
 7
 8
 9
 10

Submit **Clear form**

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Google Forms



DATA CLEANING

Data cleaning involves removing duplicates, correcting errors, handling missing values, and standardizing formats to ensure accuracy and consistency. This process is often performed using tools like Excel to enhance the quality and reliability of the dataset for analysis.



DATA CLEANING



Copy of store

File Edit View Insert Format Data Tools Extensions Help

F34 India

B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
Order ID	Order Date	Customer Name	Customer Type	Country	City	State	Postal Code	Gender	Age	PRODUCT ID	CATEGORY	SUB CATEGORY	BRAND IDENTIFICATION	PRICE	Quantity	Total Sales
WB-2024-1224	01/02/2024	Tarak Biswas	Consumer	India	Chapra	West Bengal	741123	Male	11-18	MK_172000	Health & Personal Care	Makeup	Revlon	799	2	1598
WB-2024-1225	01/02/2024	Moumita Hazra	Consumer	India	Aamghata	West Bengal	741137	Female	11-18	AC_332000	Appliances	Air Conditioners	Samsung AC	42,990	2	85980
WB-2024-1226	01/02/2024	Junaid Mondal	Corporate	India	Karimpur	West Bengal	741152	Male	11-18	RF_872000	Appliances	Refrigerators	Haier Refrigerators	27,790	1	27790
WB-2024-1227	01/02/2024	Sankalita Ghosh	Consumer	India	Aamghata	West Bengal	741137	Female	11-18	FL_998000	Groceries	Flours	Aashirvaad	399	7	2793
WB-2024-1228	01/02/2024	Debjit Nag	Consumer	India	Karimpur	West Bengal	741152	Male	11-18	SB_572000	Books & Media	Self-Help Books	HarperCollins India	559	2	1118
WB-2024-1229	01/02/2024	Dev Dutta	Consumer	India	Swarupganj	West Bengal	741315	Male	11-18	HL_337000	Automotive	Helmets	SMK Helmets	879	2	1758
WB-2024-1230	01/02/2024	Tonmoy Dutta	Consumer	India	Karimpur	West Bengal	741152	Male	11-18	CBB_7789000	Groceries	Cakes and Biscuits	McVitie's	169	9	1521
WB-2024-1231	01/02/2024	Marufa Mumtaza	Consumer	India	Aamghata	West Bengal	741137	Female	11-18	LP_556000	Electronics	Laptop	Lenovo LAPTOP	47,990	1	47990
WB-2024-1232	01/02/2024	Roktim Dutta	Consumer	India	Krishnanagar 2	West Bengal	741102	Male	11-18	KC_375000	Fashion	Kids' Clothing	LittleLooms	150	6	900
WB-2024-1233	01/02/2024	Dhiman Nag	Consumer	India	Nabadwip	West Bengal	741301	Male	11-18	FAC_187000	Sports	Fitness Accessories	Cosco	810	4	3240
WB-2024-1234	01/02/2024	Tarak Biswas	Consumer	India	Nabadwip	West Bengal	741301	Male	11-18	JW_655000	Fashion	Jewelry	Malabar Gold and Diamonds	56,479	2	112958
WB-2024-1235	01/02/2024	Khaled Nashif	Consumer	India	Krishnanagar 1	West Bengal	741101	Male	11-18	WD_712000	Home & Furniture	Wardrobe	SKRILL	2,499	4	9996
WB-2024-1236	01/02/2024	Boishali Halder	Consumer	India	Bahadurpur	West Bengal	741124	Female	11-18	WD_712000	Home & Furniture	Wardrobe	Nilkamal	4,499	5	22495
WB-2024-1237	01/02/2024	Khaleed Nashif	Consumer	India	Krishnanagar 1	West Bengal	741101	Male	11-18	HT_656000	Appliances	Heaters	Maharaja Whiteline HEATER	2,345	2	4690
WB-2024-1238	01/02/2024	Bijoyta Saha	Home Office	India	Krishnanagar 2	West Bengal	741102	Female	11-18	BF_774000	Baby Products	Baby Food	Nestle Cerelac	329	6	1974
WB-2024-1239	01/02/2024	Boishali Halder	Home Office	India	Bahadurpur	West Bengal	741124	Female	11-18	HC_569000	Health & Personal Care	Haircare	Sunsilk	154	2	308
WB-2024-1240	01/02/2024	Tanish Biswas	Consumer	India	Dhubulia	West Bengal	741139	Male	11-18	CM_512000	Electronics	Camera	Canon	87,990	1	87990
WB-2024-1241	01/02/2024	Dhiman Nag	Consumer	India	Karimpur	West Bengal	741152	Male	11-18	HP_633000	Electronics	Headphone	JBL	1,749	2	3498
WB-2024-1242	01/02/2024	Akash Rahut	Consumer	India	Mayapur	West Bengal	741313	Male	11-18	FW_117000	Sports	Footwear	Paragon	989	2	1978
WB-2024-1243	01/02/2024	Moumita Hazra	Consumer	India	Krishnanagar 2	West Bengal	741102	Female	11-18	MC_152000	Fashion	Men's Clothing	Turtle	2,899	3	8697
WB-2024-1244	01/02/2024	Oindrilla Ghosh	Consumer	India	Bahadurpur	West Bengal	741124	Female	11-18	DK_272000	Electronics	Desktops	Asus DESKTOP	69,999	1	69999
WB-2024-1245	01/02/2024	Henry Mondal	Corporate	India	Krishnanagar 2	West Bengal	741102	Male	11-18	DK_272000	Electronics	Desktops	Acar DESKTOP	53,869	2	107738
WB-2024-1246	01/02/2024	Paloma Ghosh	Corporate	India	Karimpur	West Bengal	741152	Female	11-18	JW_655000	Fashion	Jewelry	Kalyan Jewellers	55,899	2	111798
WB-2024-1247	01/02/2024	Helena Dutta	Consumer	India	Mayapur	West Bengal	741313	Female	11-18	TB_221000	Electronics	Tablets	Huawei TAB	45,699	1	45699
WB-2024-1248	01/02/2024	Debasish Mondal	Consumer	India	Krishnanagar 2	West Bengal	741102	Male	11-18	MK_172000	Health & Personal Care	Makeup	Maybelline New York	1,899	1	1899
WB-2024-1249	01/02/2024	Krishna Mallick	Consumer	India	Bahadurpur	West Bengal	741124	Male	11-18	WM_973000	Appliances	Washing Machine	Whirlpool WASHING MACHINE	16,490	1	16490
WB-2024-1250	01/02/2024	Tamaghna Das	Consumer	India	Krishnanagar 2	West Bengal	741102	Female	11-18	BF_774000	Baby Products	Baby Food	Nutricia	360	6	2160
WB-2024-1251	01/02/2024	Suresh Biswas	Consumer	India	Krishnanagar 2	West Bengal	741102	Male	11-18	MB_595000	Electronics	Mobile	Apple	134,990	2	26980
WB-2024-1252	01/02/2024	Gaurav Basak	Consumer	India	Krishnanagar 2	West Bengal	741102	Male	11-18	CM_512000	Electronics	Camera	Nikon	38,900	1	38900
WB-2024-1253	01/02/2024	Jamal Sheik	Consumer	India	Bahadurpur	West Bengal	741124	Male	11-18	WC_566000	Fashion	Women's Clothing	Libas	759	4	3036
WB-2024-1254	01/02/2024	Helena Dutta	Consumer	India	Chapra	West Bengal	741123	Female	11-18	AC_332000	Appliances	Air Conditioners	Voltas AC	34,490	1	34490
WB-2024-1255	01/02/2024	Bodhisattva Sikdar	Consumer	India	Krishnanagar 1	West Bengal	741101	Male	11-18	SU_521000	Travel	Suitcases	Aristocrat	1,599	2	3198
WB-2024-1256	01/02/2024	Tarak Biswas	Consumer	India	Karimpur	West Bengal	741152	Male	11-18	HD_225000	Home & Furniture	Home Decor	Forzza	599	4	2396
WB-2024-1257	01/02/2024	Krishna Mallick	Consumer	India	Krishnanagar 1	West Bengal	741101	Male	11-18	CM_512000	Electronics	Camera	Panasonic CAMERA	38,900	1	38900

ANALYSIS

Data analysis involves using statistical and computational techniques to identify patterns, trends, and insights within the dataset. This process often utilizes tools like Pandas for data manipulation and Y Data Profiling for comprehensive data profiling and summary reports, aiding in informed business decisions.





PANDAS

Pandas is a powerful data manipulation and analysis library in Python. In this code, it is used to:

1. Read CSV File:

```
df = pd.read_csv(r'C:\Users\AKASH RAHUT\Desktop\data analysys>New folder\store_with_profit.csv')
```

Pandas reads the CSV file into a DataFrame, which is a tabular data structure.

2. Create Age Groups:

```
bins = [0, 18, 25, 35, 45, 55, 65, 100]  
labels = ['0-18', '19-25', '26-35', '36-45', '46-55', '56-65', '65+']  
df['Age Group'] = pd.cut(df['Age'], bins=bins, labels=labels, right=False)
```

This categorizes the 'Age' column into defined age groups.

3. Group and Aggregate Data:

Total sales by city and product

```
product_sales_city = df.groupby(['City', 'Product ID'], observed=True)['Total Sales'].sum().reset_index()
```

Customer count by city:

```
customer_base_city=df.groupby('City',observed=True)[['Customer Name']].nunique().reset_index().rename(columns={'Customer Name': 'Customer Count'})
```

Similar groupings and aggregations are done for other analyses, like profit by category, subcategory, and brand.

PLOTLY

Plotly is a graphing library that makes interactive, publication-quality graphs. In this Plotly is a graphing library that makes interactive, publication-quality graphs. In this code, it is used to:

1. Create Bar Charts:

```
fig1 = px.bar(product_sales_city, x='City', y='Total Sales', color='Product ID', title='Sales of Each Product in Each City')
fig2 = px.bar(max_product_sales_city, x='City', y='Total Sales', color='Product ID', title='Product with the Biggest Sale in Each City')
fig3 = px.bar(age_product_city, x='City', y='Total Sales', color='Product ID', facet_col='Age Group', title='Age Group Buying Which Product in Which City')
fig4 = px.bar(max_brand_sales_city, x='City', y='Total Sales', color='BRAND IDENTIFICATION', title='Brand with the Biggest Sales in Each City')
fig5 = px.bar(customer_base_city, x='City', y='Customer Count', title='City with the Largest Customer Base')
fig6 = px.bar(max_customer_base_age_city, x='City', y='Customer Count', color='Age Group', title='Age Group with the Largest Customer Base in Each City')
fig7 = px.bar(max_profit_category_city, x='City', y='Profit', color='CATEGORY', title='Category with Most Profit in Each City')
fig8 = px.bar(max_profit_subcategory_city, x='City', y='Profit', color='SUB CATEGORY', title='Subcategory with Most Profit in Each City')
fig9 = px.bar(max_profit_brand_city, x='City', y='Profit', color='BRAND IDENTIFICATION', title='Brand with Most Profit in Each City')
```

Each px.bar call generates a bar chart for the specified data and configuration.

2. Convert Figures to HTML:

```
html_content = pio.to_html(fig1, full_html=False) + pio.to_html(fig2, full_html=False) + pio.to_html(fig3, full_html=False) + \
    pio.to_html(fig4, full_html=False) + pio.to_html(fig5, full_html=False) + pio.to_html(fig6, full_html=False) + \
    pio.to_html(fig7, full_html=False) + pio.to_html(fig8, full_html=False) + pio.to_html(fig9, full_html=False)
```

The pio.to_html function converts each Plotly figure into HTML format.

3. Save HTML Report:

```
with open('sales_analysis_report.html', 'w', encoding='utf-8') as f:
    f.write(html_content)
```

The HTML content is saved into an HTML file, creating an interactive sales analysis report.





YDATA_PROFILING (FORMERLY PANDAS_PROFILING)

ydata_profiling is a library used for generating profile reports from a pandas DataFrame. It provides an extensive analysis of the data with minimal code. In this code, it is used to:

1. Generate Profile Report: The ProfileReport class is used to create a profile report of the DataFrame df. This report includes various statistics and visualizations that help in understanding the data quality and distribution.

```
report = ProfileReport(df, title="Quality_Test", explorative=True)  
report = ProfileReport(df, title="Quality_Test", explorative=True)
```

2. Save Report to File: The to_file method is used to save the generated report as an HTML file. This file can be opened in a web browser to view the detailed analysis of the data.

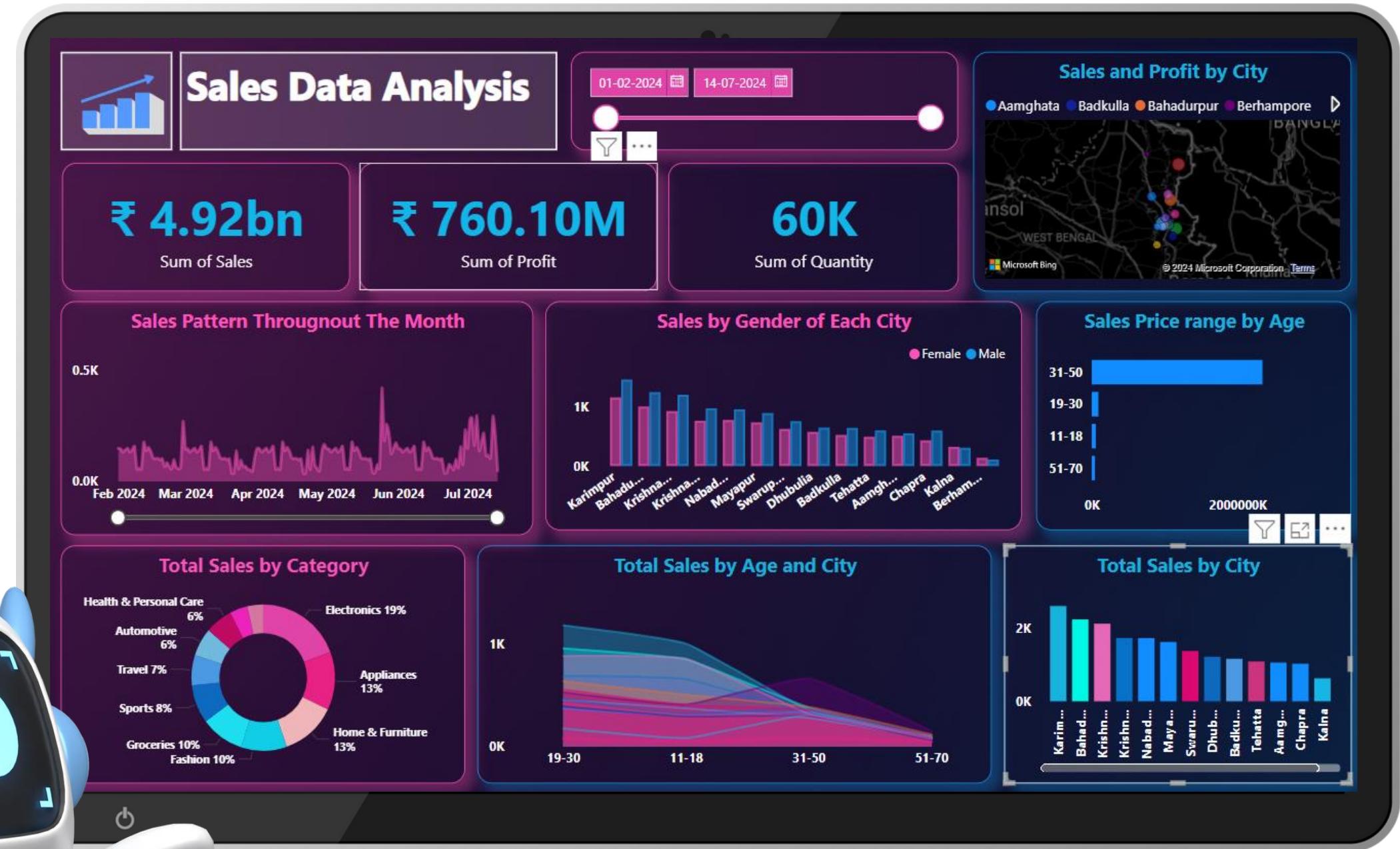
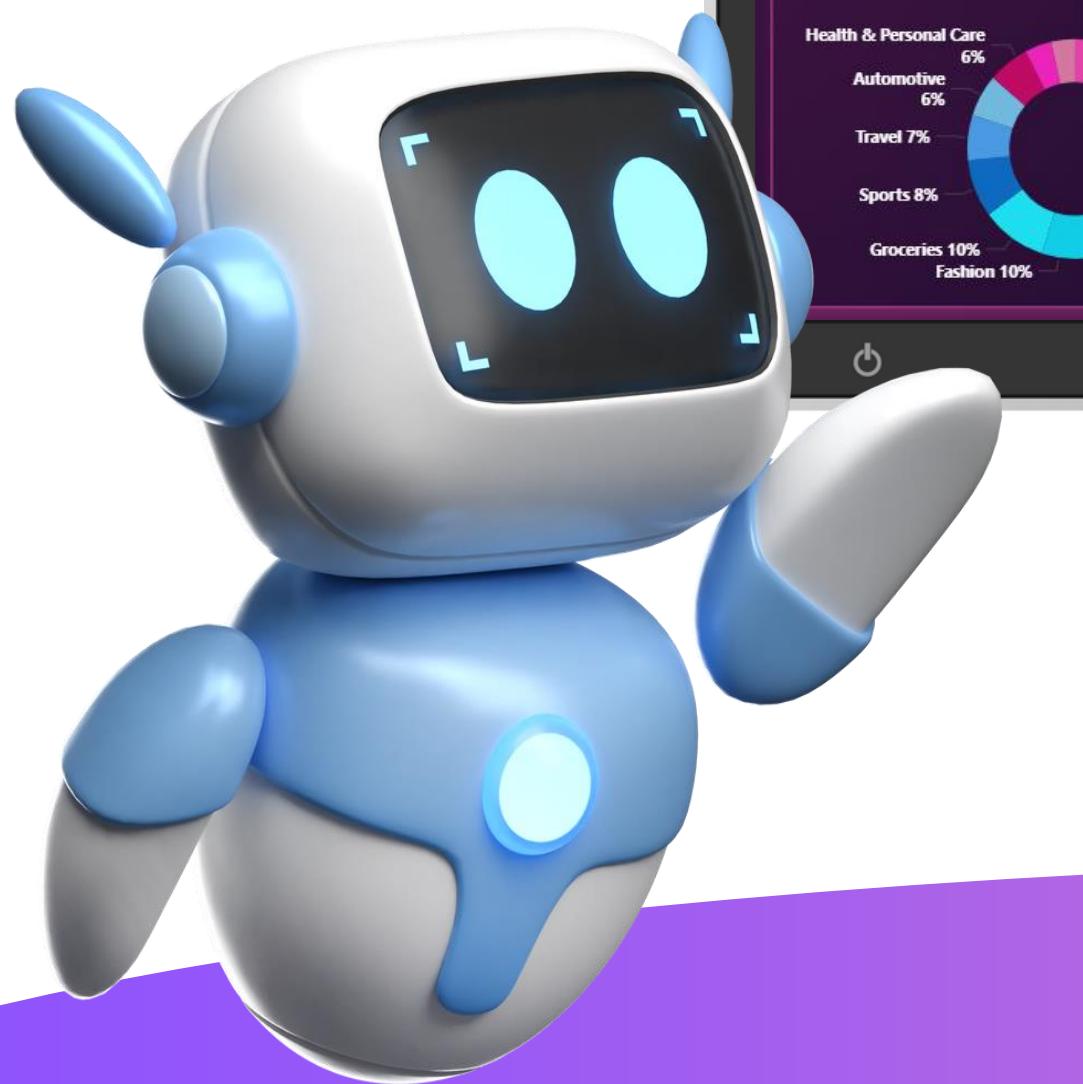
```
report.to_file(r"C:\Users\AKASH RAHUT\Desktop\data analysys\Data_results.html")
```



DATA VISUALIZATION

1. TOTAL SALES BY CATEGORY
2. SALES AND PROFIT BY CITY
3. TOTAL SALES BY AGE & CITY
4. SALES DATA ANALYSIS BY SALES, PROFIT, QUANTITY
5. COUNT OF TOTAL SALES BY CITY
6. SALES PRICE RANGE BY AGE
7. SALES BY GENDER OF EACH CITY
8. SALES PATTERN THROUGHOUT THE MONTH





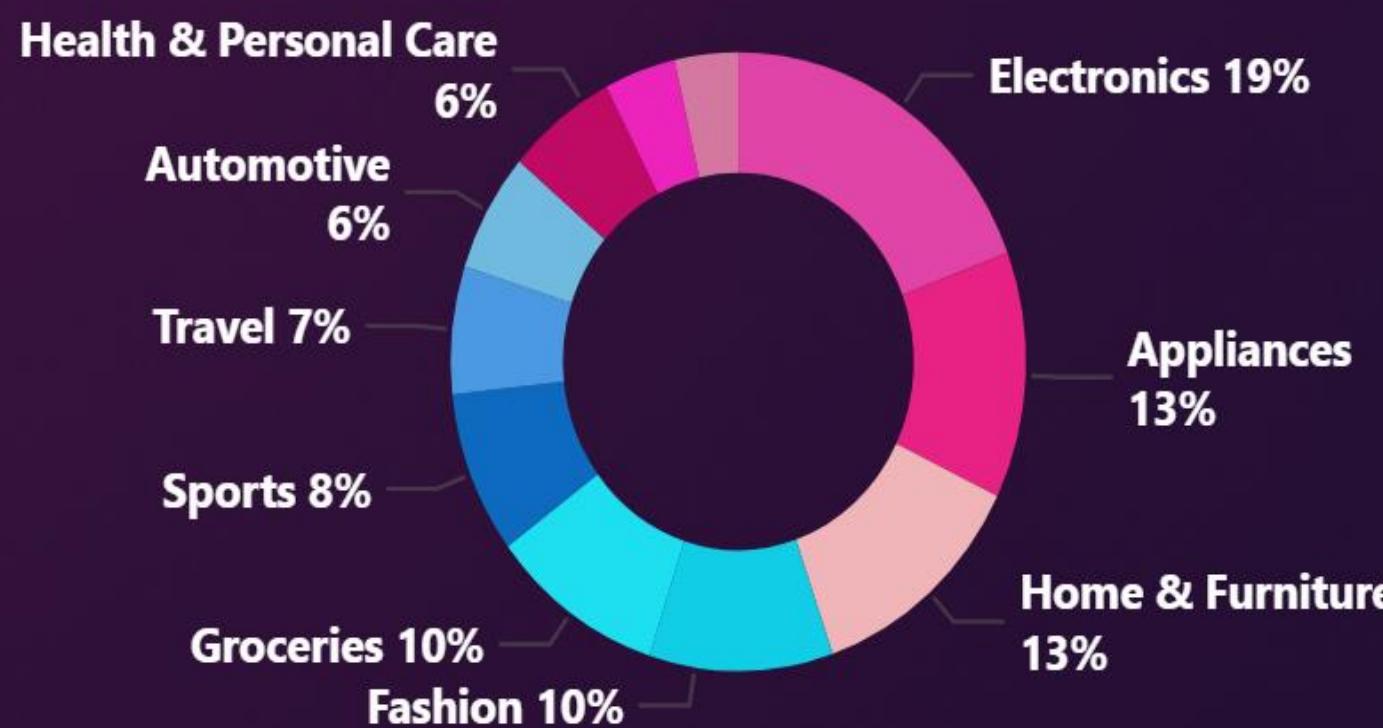
DASHBOARD





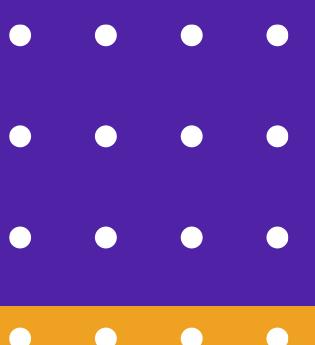
TOTAL SALES BY CATEGORY

Total Sales by Category



The donut chart shows the total sales distribution by category: Electronics lead with 19%, followed by Appliances and Home & Furniture at 13% each. Fashion and Groceries each account for 10%, while Sports hold 8%, Travel 7%, both Automotive and Health at 6% , Baby Product at 4.01% And Book & Media at 3.57%.

In summary, electronics lead in total sales, followed by appliances and home & furniture. Fashion and groceries have equal shares, with sports, travel, automotive, health-related products ,Baby Products And Books making up the rest of the sales distribution.



SALES AND PROFIT BY CITY

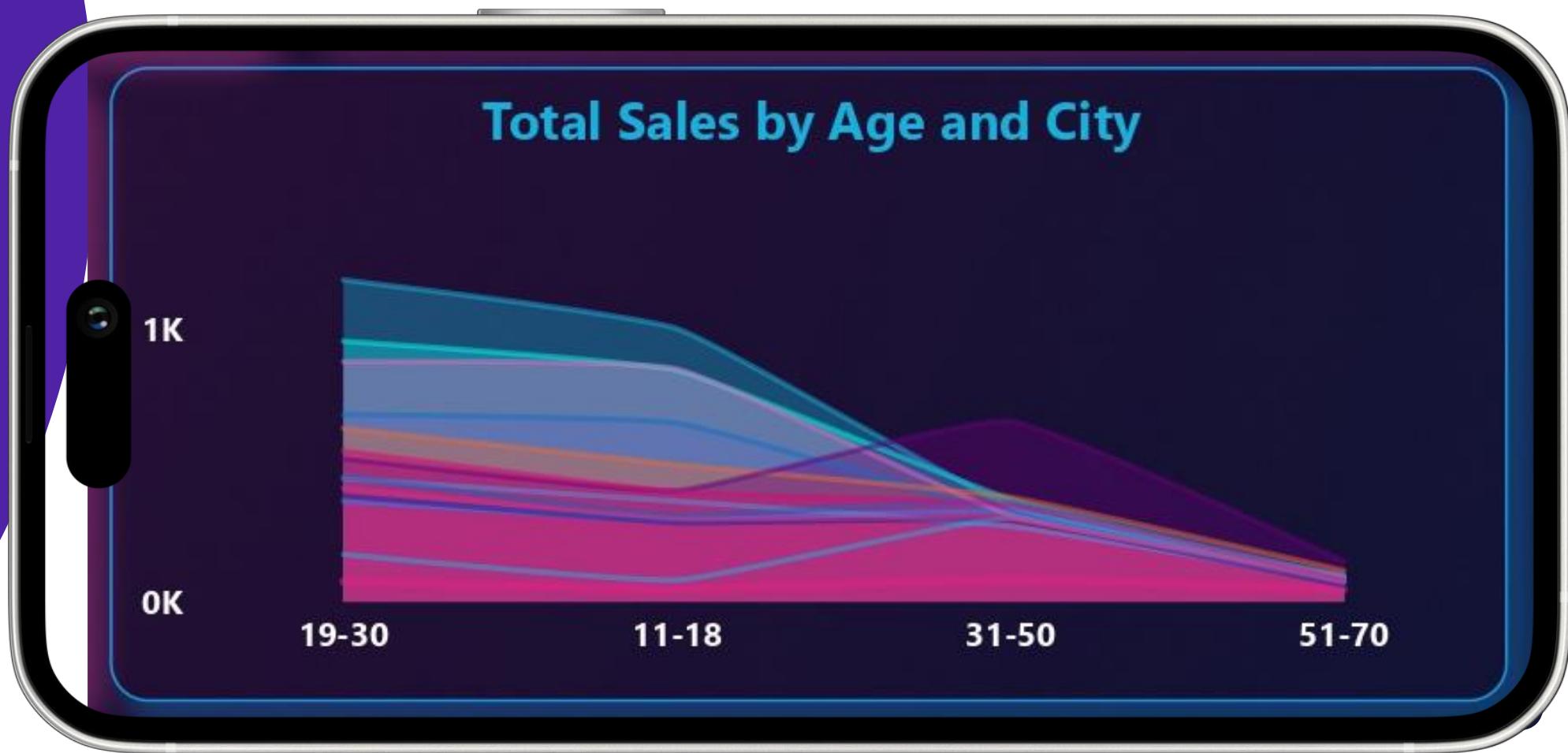
The data shows that Karimpur and Bahadurpur have the highest sales, with female sales slightly surpassing male sales. In cities like Krishnagar-2 and Krishnagar-1, sales are equal for both genders. Generally, there is a gradual decrease in sales from Nabadwip to Beherampur, with male sales slightly higher or equal to female sales in most cases.

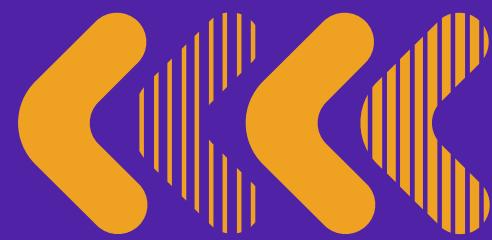


TOTAL SALES BY AGE & CITY

The chart displays total sales distribution by age and city:

1. The highest sales occur in the 19-30 age group, with a noticeable decline in sales as age increases.
2. Sales for the 11-18 age group are moderate but higher than those for the 31-50 and 51-70 groups.
3. The 31-50 age group shows a steady decline in sales compared to younger groups.
4. Sales are the lowest in the 51-70 age group across all cities.





SALES DATA ANALYSIS BY SALES, PROFIT, QUANTITY

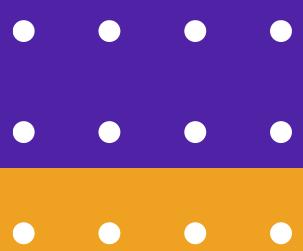
The sales data analysis dashboard provides the following key metrics for the period from February 1, 2024, to July 14, 2024:

1. Sum of Sales: ₹4.92 billion
2. Sum of Profit: ₹760.10 million
3. Sum of Quantity: 60,000 units

Summary

- The total revenue generated is ₹4.92 billion.
- The profit from these sales amounts to ₹760.10 million.
- A total of 60,000 units were sold during this period.

These figures suggest a strong sales performance with significant profitability over the analyzed period.



COUNT OF TOTAL SALES BY CITY

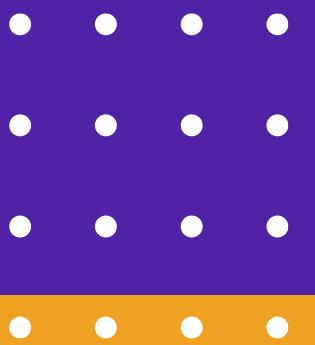
- **Karimpur:** Leads with the highest sales at 2,625 units.
- **Bahadurpur:** Follows with 2,257 units.
- **Krishnanagar 2:** Records 2,154 units.
- **Krishnanagar 1:** Achieves 1,783 units.
- **Nabadwip:** Slightly lower with 1,742 units.
- **Mayapur:** Close behind at 1,665 units.
- **Swarupganj:** Registers 1,387 units.
- **Dhubulia:** Comes in next with 1,231 units.
- **Badkulla:** Records 1,178 units.
- **Tehatta:** Slightly lower at 1,098 units.
- **Aamghata:** Logs 1,067 units.
- **Chapra:** Slightly behind with 1,036 units.
- **Kalna:** Shows 634 units.
- **Berhampore:** Has the lowest sales with 248 units.





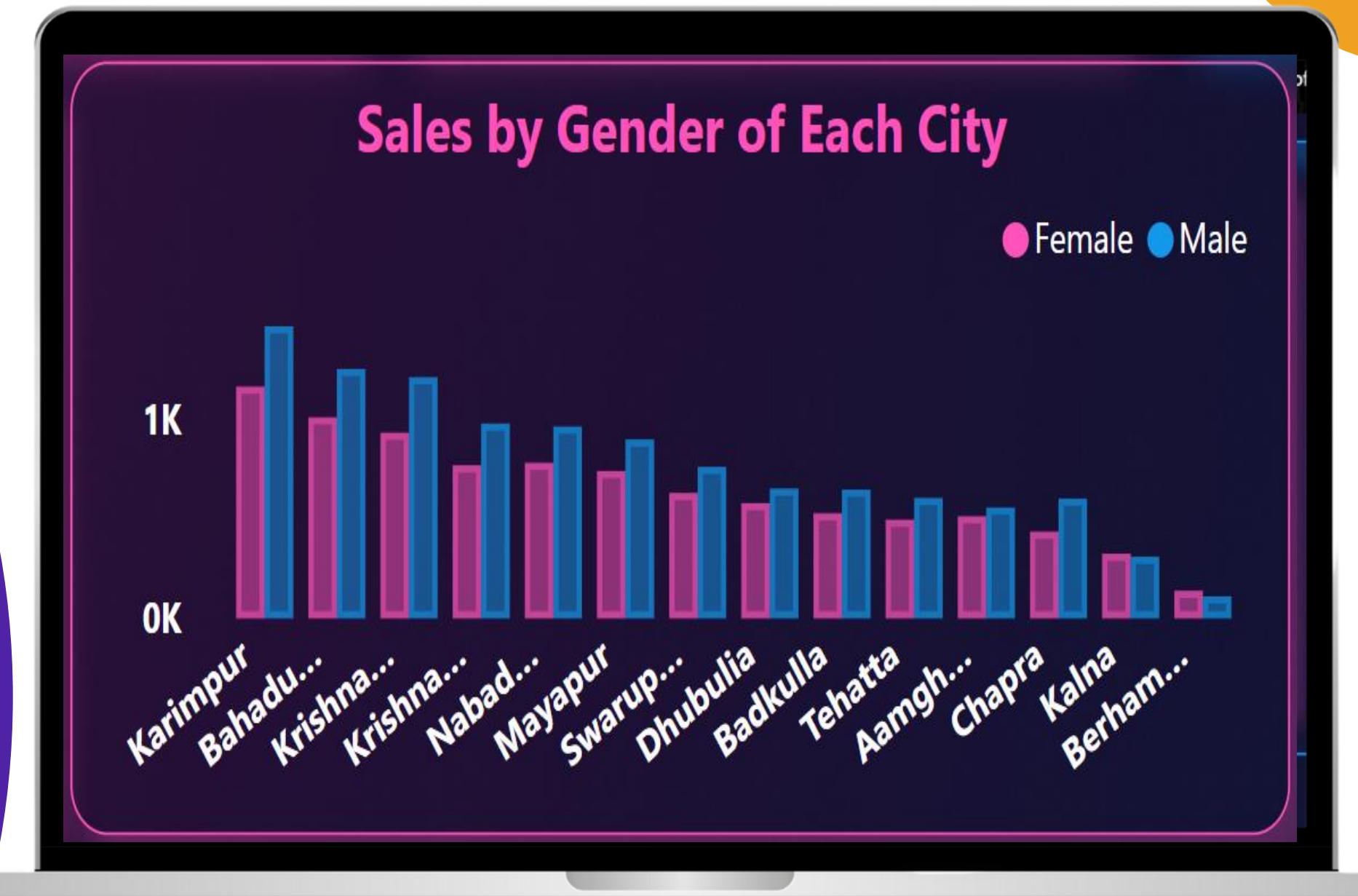
SALES PRICE RANGE BY AGE

- **Dominance of Age Group 31-50:** The age group 31-50 shows a significantly higher sales price range compared to the other age groups. This group dominates the chart, indicating that individuals in this age bracket are associated with the highest sales prices, nearing the 2000M mark.
- **Minimal Sales in Other Age Groups:** The age groups 11-18, 19-30, and 51-70 exhibit minimal sales price ranges. Each of these groups has a very small bar, suggesting that their contribution to the overall sales prices is substantially lower than the 31-50 age group.



SALES BY GENDER OF EACH CITY

The data shows that Karimpur and Bahadurpur have the highest sales, with female sales slightly surpassing male sales. In cities like Krishnagar-2 and Krishnagar-1, sales are equal for both genders. Generally, there is a gradual decrease in sales from Nabadwip to Beherampur, with male sales slightly higher or equal to female sales in most cases.





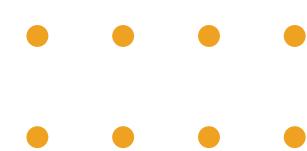
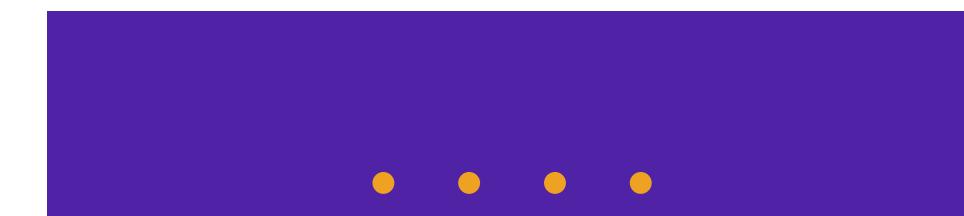
SALES PATTERN THROUGHOUT THE MONTH





CONCLUSION OF PROJECT

The sales data analysis from February 1, 2024, to July 14, 2024, shows a total revenue of ₹4.92 billion and a profit of ₹760.10 million from 60,000 units sold. Sales were stable early in the year, with significant increases observed in June and July, likely due to seasonal or promotional factors. Gender-wise, Karimpur and Bahadurpur had the highest sales, with females slightly outperforming males. The findings highlight the need for targeted marketing strategies to capitalize on peak periods and maintain steady growth throughout the year.





Thank
You

