Sales Performance Analysis Report

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Introduction

Objective: - To conduct a comprehensive sales performance analysis across all branches of the supermarket to identify trends, patterns, and actionable insights that can drive strategic business decisions, enhance customer satisfaction, and optimize operational efficiency.

Scope:

The analysis will cover the following key areas:

Weekly Sales Performance:

Examine total sales across 13 weeks for each branch (A, B, and C).

Identify peak and low sales periods.

Daily Sales Performance:

Analyze total sales by day of the week for each branch.

Determine the best and worst performing days.

Hourly Sales Performance:

Assess total sales by hour of operation (10 AM to 9 PM) for each branch.

Identify peak hours of operation.

Product Line Performance:

Evaluate total sales for each product line (Electronic Accessories, Fashion Accessories, Food and Beverages, Health and Beauty, Home and Lifestyle, Sports and Travel) by branch, week, month, and customer type (Member vs. Normal, Male vs. Female).

Customer Segmentation:

Analyze sales distribution between different customer types (Member vs. Normal) and genders (Male vs. Female).

Assess average sales per transaction for different customer segments.

Data Description

The dataset is one of the historical sales of supermarket company which was recorded in 3 different branches for 3 months. This dataset is stored in Kaggle and made available to us by **AUNG PYAE**

Attribute information

Invoice id: Computer generated sales slip invoice identification number

Branch: Branch of supercenter (3 branches are available identified by A, B and C).

City: Location of supercenters

Customer type: Type of customers, recorded by Members for customers using member card and Normal for without member card.

Gender: Gender type of customer

Product line: General item categorization groups - Electronic accessories, Fashion accessories, Food and beverages, Health and beauty, Home and lifestyle, Sports and travel

Unit price: Price of each product in $

Quantity: Number of products purchased by customer

Tax: 5% tax fee for customer buying

Total: Total price including tax

Date: Date of purchase (Record available from January 2019 to March 2019)

Time: Purchase time (10am to 9pm)

Payment: Payment used by customer for purchase (3 methods are available – Cash, Credit card and E-wallet)

COGS: Cost of goods sold

Gross margin percentage: Gross margin percentage

Gross income: Gross income

**Rating:** Customer stratification rating on their overall shopping experience (On a scale of 1 to 10)

Data Cleaning and Preprocessing

- Removed the duplicate Invoice-id using the remove duplicate options.
- Checked for the missing values using conditional formatting to highlight blank cells and then filtering the highlighted cells using filter by colour option.
- Ensured that each column has correct datatypes.
- Removed leading and trailing spaces using Trim function.

Analyzing the Cleaned Data using Pivot Tables

Total Sales by Week: -

Row Labels	Sum of Total
1	17543.3895
2	24461.199
3	28693.3605
4	29286.8835
5	28360.4475
6	27101.8335
7	25563.594
8	17328.6645
9	29219.715
10	28418.838
11	23990.2215
12	25120.599
13	17878.0035
Grand Total	**322966.749**

TOTAL SALES ACROSS WEEKS
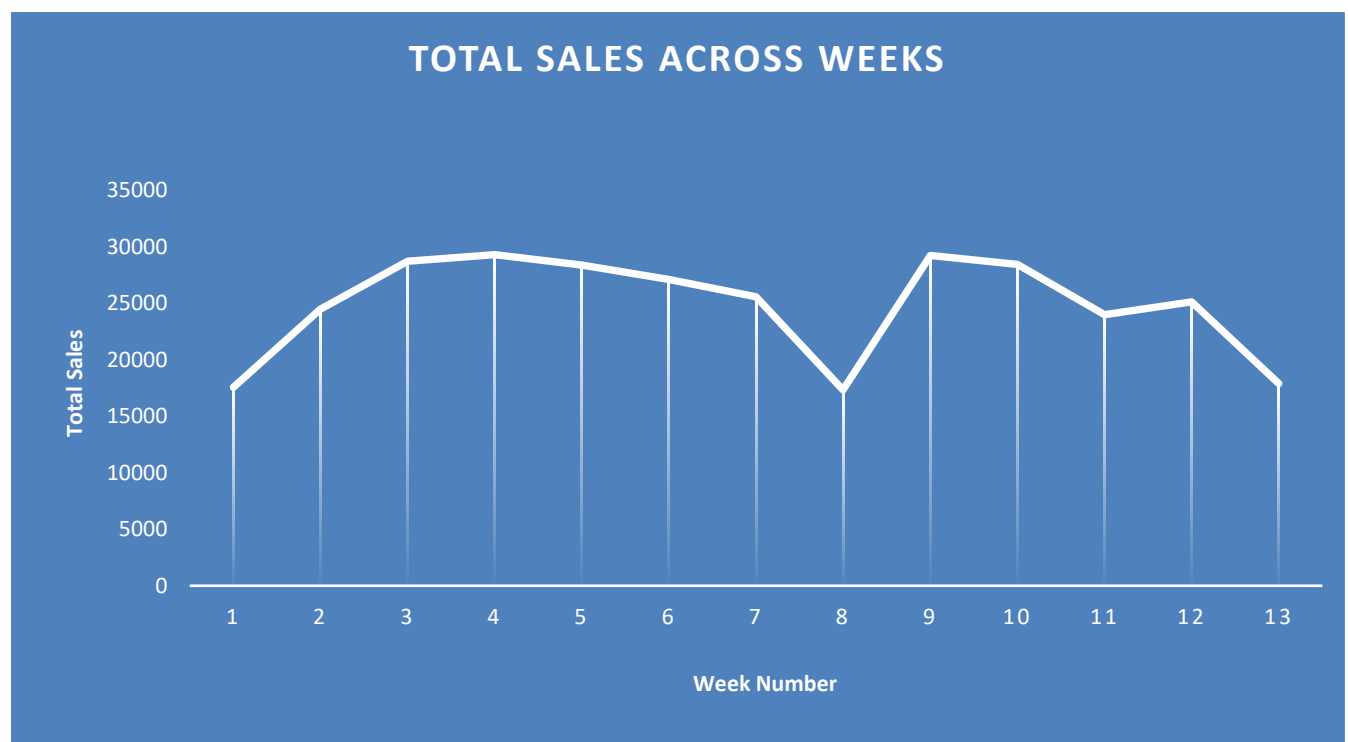
Pattern Interpretation: -

1. Gradual Increase (Weeks 1-3): - This could indicate an initial growth phase, possibly due to effective marketing campaigns, promotions, or seasonal factors (such as the beginning of a new quarter or post-holiday shopping).

2. Decrease (Weeks 4-7): - This period of decline could indicate the end of a promotional period, market saturation, or a natural post-peak decline. Week 7, in particular, shows a significant drop,

which might point to specific events like economic downturns, increased competition, or changes in consumer behavior.

3. Spike in Week 8: - The sudden increase in Week 8 suggests a specific event or factor causing a surge in sales. This could be due to a new product launch, a major promotion, a holiday season, or a one-time event.

4. Gradual Decrease (Weeks 9-13): - Following the spike, the gradual decrease could reflect the end of the promotional or seasonal effect seen in Week 8. This decline suggests a return to a lower baseline of sales, possibly indicating a need for sustained marketing efforts or new strategies to maintain sales levels.

Total Sales by Operation Hours: -

Row Labels	Sum of Total
10 AM	31421.481
11 AM	30377.3295
12 PM	26065.8825
1 PM	34723.227
2 PM	30828.399
3 PM	31179.5085
4 PM	25226.3235
5 PM	24445.218
6 PM	26030.34
7 PM	39699.513
8 PM	22969.527
Grand Total	322966.749

Total Sales for every Hour
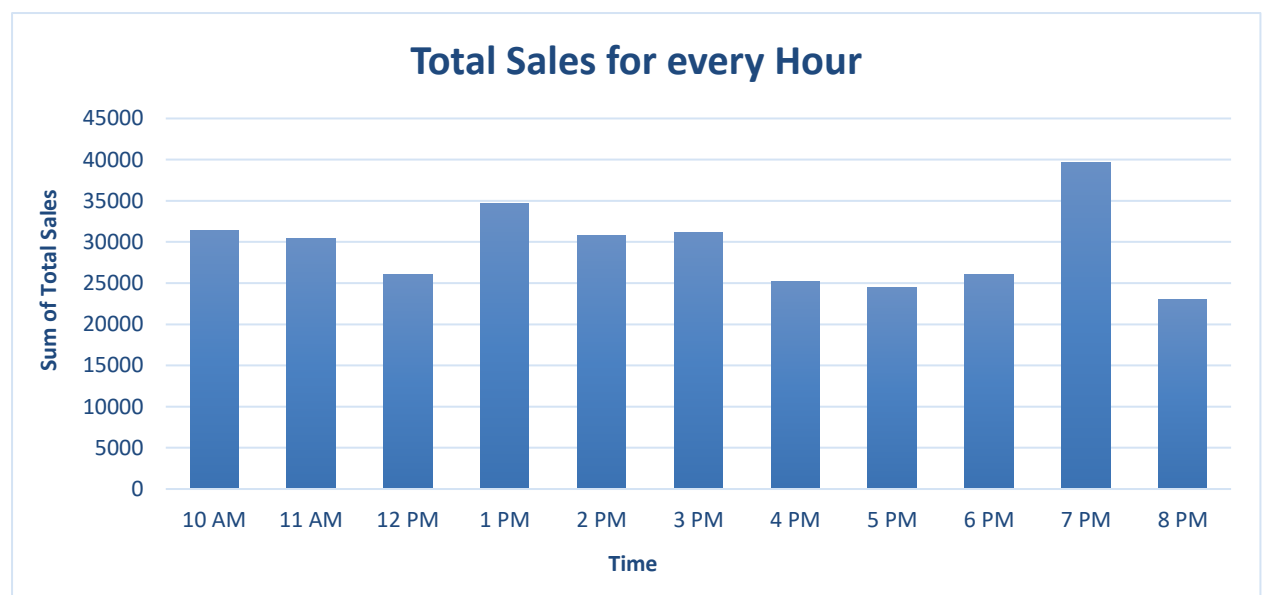
Pattern Interpretation: -

1. Higher Sales Periods: - 10 AM to 12 PM: This suggests that a significant number of customers prefer shopping in the morning, likely including early shoppers, retirees, or individuals shopping before work or other daily activities.

1 PM to 4 PM (especially 1 PM to 2 PM): The post-lunch period shows a spike, indicating customers who prefer afternoon shopping, perhaps those who are free after lunch or have flexible schedules.

7 PM to 8 PM: The highest sales during this period suggest that many customers shop after work or daily activities, making this a peak time.

2. Lower Sales Periods: - 12 PM to 1 PM: The lunch hour sees a significant drop, as many customers are likely taking their lunch break.

4 PM to 7 PM: This extended low period might be due to customers preparing for dinner, commuting from work, or engaging in other activities before settling down for the evening.

8 PM to 9 PM: The lowest sales during the last hour of operation likely indicate that fewer customers shop late in the evening, as they may prefer to wind down or prepare for the next day.

Total Sales by Product-Line: -

Row Labels	Sum of Total
Electronic accessories	54337.5315
Fashion accessories	54305.895
Food and beverages	56144.844
Health and beauty	49193.739
Home and lifestyle	53861.913
Sports and travel	55122.8265
Grand Total	**322966.749**

Total Sales for every Product-Line

Pattern Interpretation: -

1. Highest Sales: - Food and Beverages: This product line having the highest sales indicates a strong and consistent demand, likely driven by frequent consumption and necessity.

Sports and Travel: The second highest sales suggest a significant interest, possibly due to seasonal trends, health awareness, or leisure activities.

2. Moderate Sales: - Electronic Accessories and Fashion Accessories: Both product lines show moderate sales, indicating steady demand, possibly influenced by technological trends and fashion cycles.

3. Lower Sales: - Home and Lifestyle: Lower sales in this category may indicate it is less frequently purchased or less prioritized by customers.

Health and Beauty: The significantly lowest sales suggest that either there is less interest in these products or potential issues like limited product variety or higher prices.

Total Sales by Months: -

Row Labels	Sum of Total
January	116291.868
February	97219.374
March	109455.507
Grand Total	**322966.749**

Total Sales in different Months

34%   36%   30%

- January
- February
- March
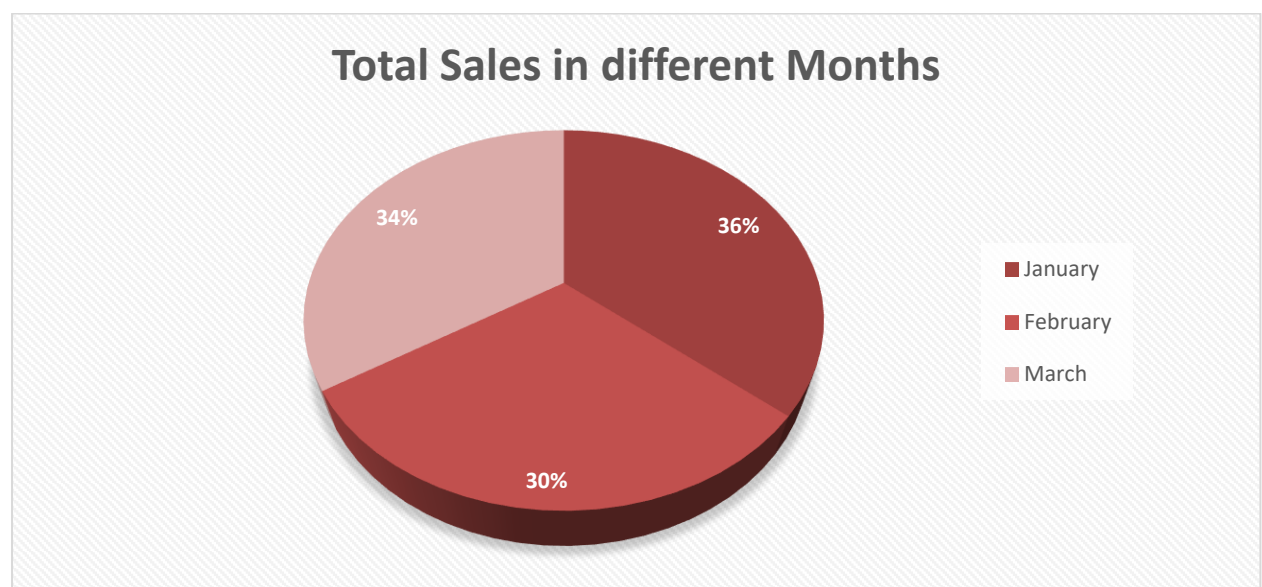
Pattern Interpretation: -

1. High Sales in January: - January typically benefits from post-holiday shopping, New Year's resolutions, and clearance sales. Customers may also have received gift cards or money as gifts, leading to higher spending.

2. Drop in February: - February often sees a natural decline in retail sales as the post-holiday shopping season ends. Customers may be tightening their budgets after the holiday season, or there might be fewer significant shopping events.

3. Recovery in March: - The slight recovery in March could be due to early spring shopping, preparation for upcoming holidays (such as Easter), or end-of-quarter promotions.

Total Sales by Branch: -

| Row Labels	Sum of Total
A	106200.3705
B	106197.672
C	110568.7065
Grand Total	**322966.749**

Total Sales for each Branch
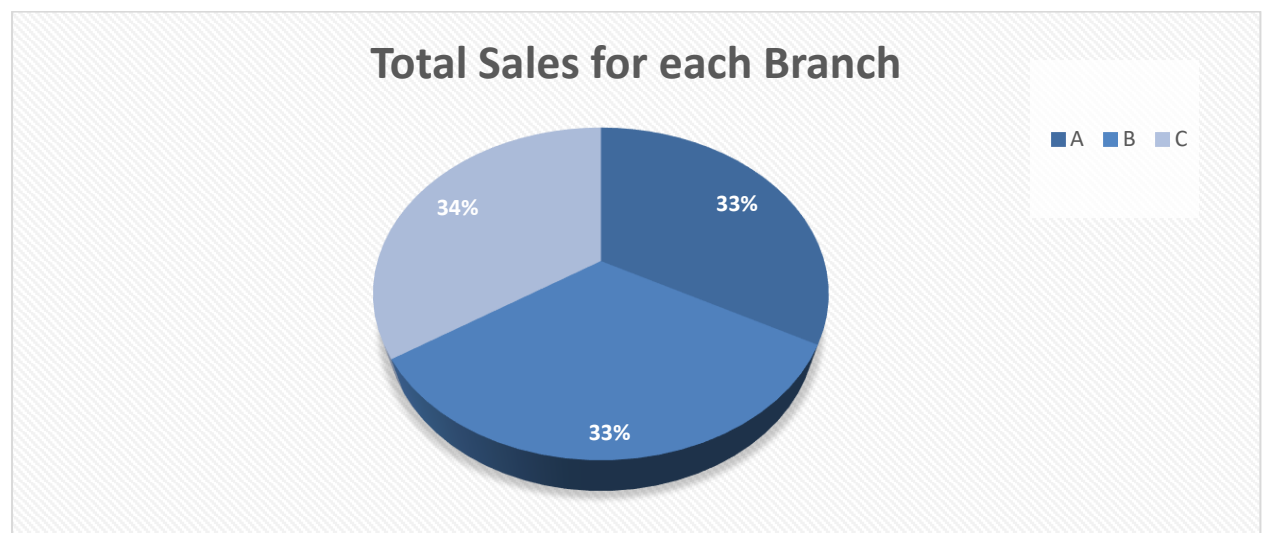
Pattern Interpretation: -

The approximate equal sales distribution across all three branches, with branch C slightly higher, suggests that the company's branches are performing consistently well. However, the slight edge of branch C indicates there may be some best practices or conditions in branch C that could be leveraged to boost the performance of branches A and B.

Total Sales by Payment-Method: -

Row Labels	Sum of Total
Cash	112206.57
Credit card	100767.072
Ewallet	109993.107
Grand Total	**322966.749**

## Total Sales by Payment Method
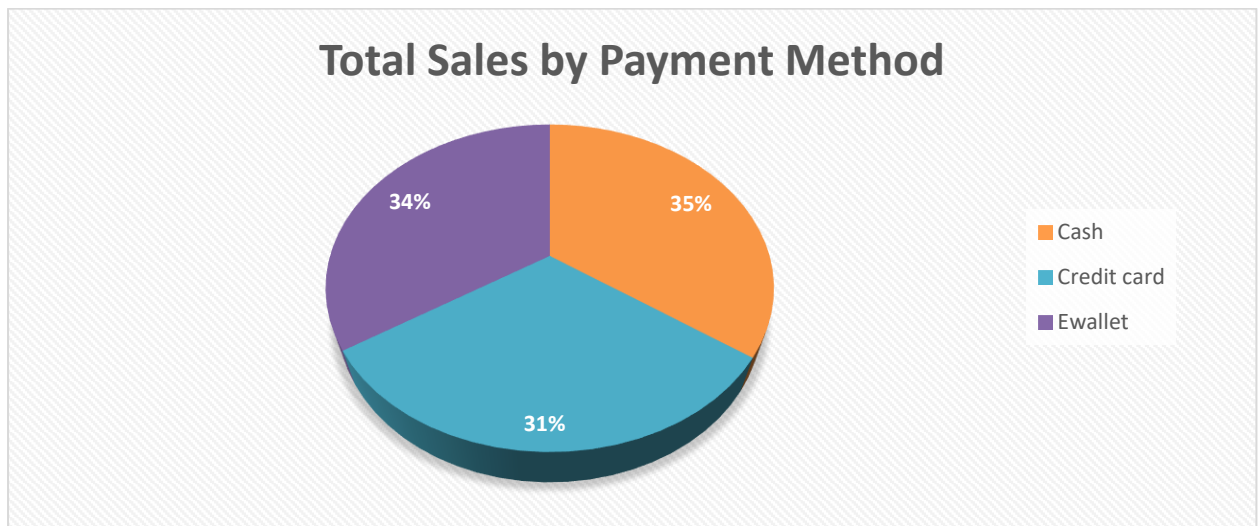
Pattern Interpretation: -

The analysis of total sales by method of transaction reveals a fairly balanced distribution among credit cards (31%), e-wallets (34%), and cash (35%). This indicates that customers use a variety of payment methods, with no single method overwhelmingly dominating.

1. Balanced Payment Preferences: - The relatively even distribution suggests that customers appreciate having multiple payment options and use them almost equally.

2. Diverse Customer Preferences: - Different customer segments may prefer different payment methods based on convenience, habit, or specific benefits associated with each method.

Total Sales by Customer Type: -

| Row Labels	Sum of Total
Member	164223.444
Normal	158743.305
Grand Total	**322966.749**

Total Sales by Customer Type
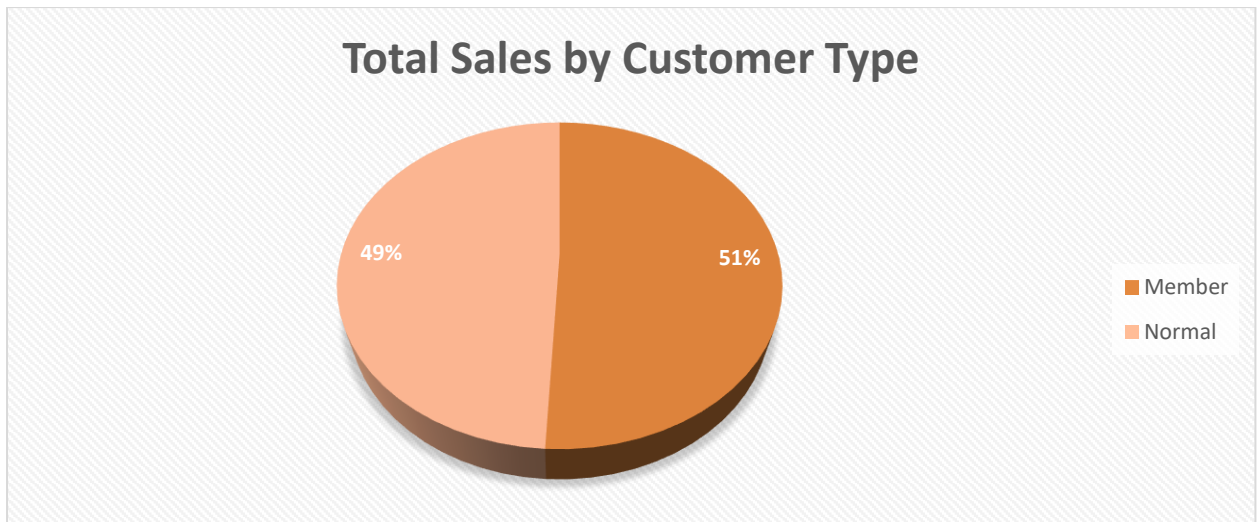
Pattern Interpretation: -

The pie chart showing that total sales are divided almost equally between members (51%) and normal customers (49%) indicates a healthy balance between loyal customers who are part of a membership program and casual shoppers. This balance presents opportunities to enhance customer retention and acquisition strategies.

Total Sales by Gender: -

| Row Labels	Sum of Total
Female	167882.925
Male	155083.824
Grand Total	**322966.749**

Total Sales by Gender
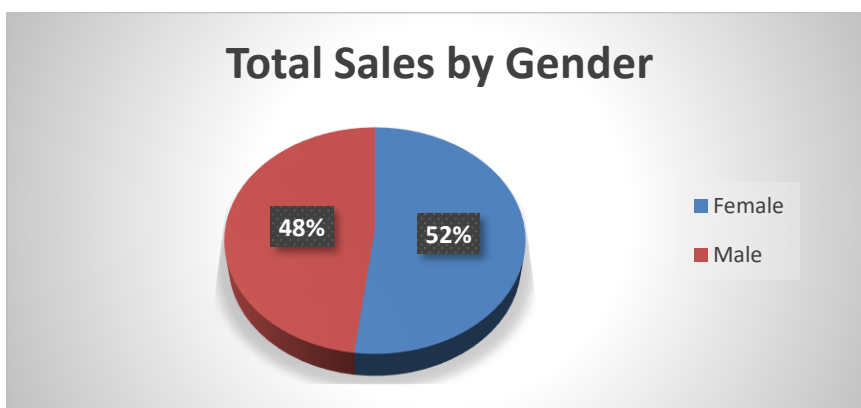
Pattern Interpretation: -

The division of total sales between male and female customers in a ratio of 48:52 respectively suggests a relatively balanced distribution of purchasing power between the two genders.

Total Sales by Branch and Customer Type: -

Sum of Total	Column Labels		
Row Labels	Member	Normal	Grand Total
A	53637.4755	52563	106200.371
B	53704.686	52493	106197.672
C	56881.2825	53687	110568.707
Grand Total	164223.444	158743	322966.749

Total Sales at each Branch by Customer Type
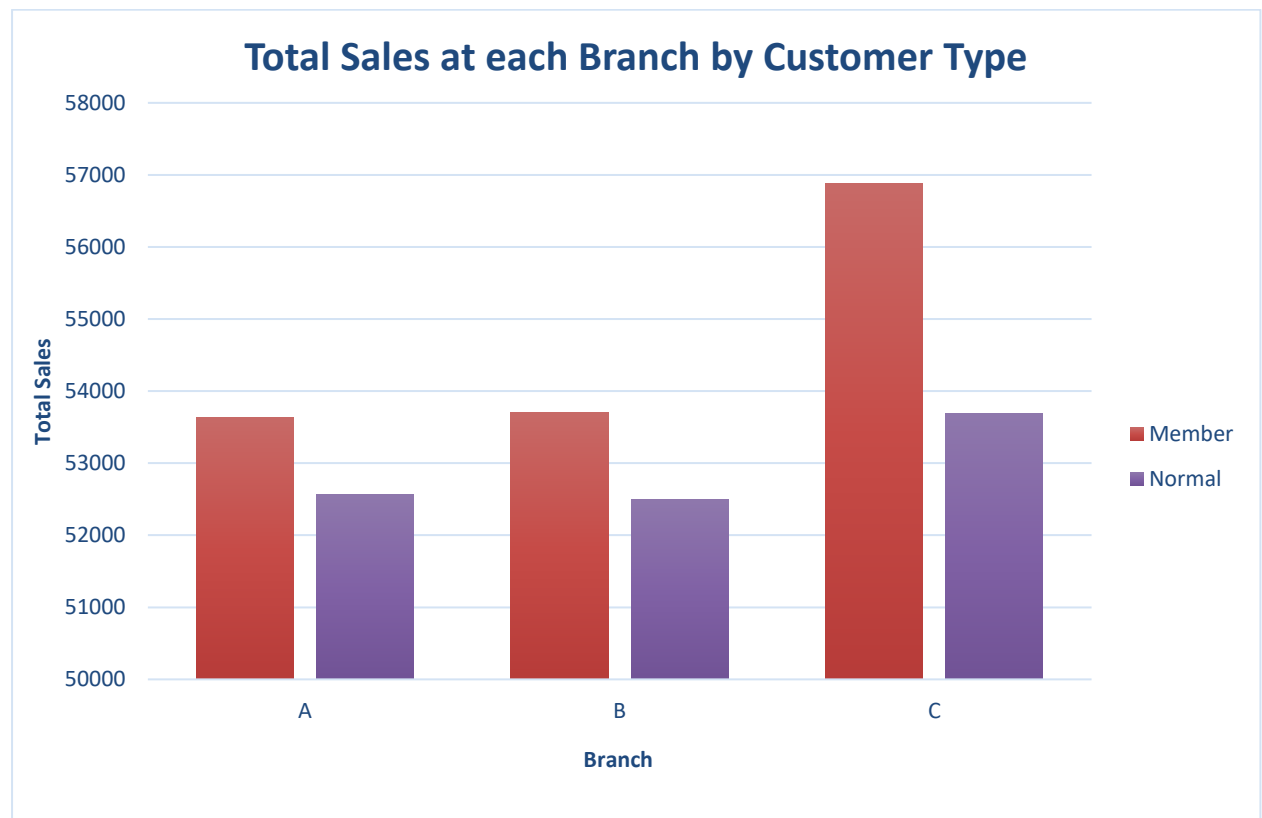
Pattern Interpretation: -

The analysis showing that total sales for members are higher than for normal customers at each branch, with a significant difference at branch C, indicates a few important points about customer behavior and the effectiveness of the membership program.

1. Membership Program Effectiveness: - The membership program is generally effective across all branches, as members contribute more to total sales than normal customers.

Branch C's Outstanding Performance: The significantly higher sales from members at branch C suggest that the membership program is particularly successful at this branch. This could be due to better promotion, more active engagement, or higher perceived value of the membership benefits in branch C.

2. Customer Loyalty and Engagement: - Members tend to be more loyal and engaged, contributing more to sales. This is especially true for branch C, where members seem to be more active and possibly more satisfied with the offerings and service.

3. Potential Best Practices at Branch C: - Branch C might be employing specific strategies or providing experiences that greatly enhance member engagement and spending, which can be explored and replicated in other branches.

Average Sales per Transaction by Branch and Customer Type: -

branch	avg_sale_per_tran	
	member	normal
A	321.1825	303.831763
B	325.4829	314.329257
C	336.5756	337.656755

Average Sales per Transaction at each Branch by Customer Type

Legend: avg_sale_per_tran member, avg_sale_per_tran normal
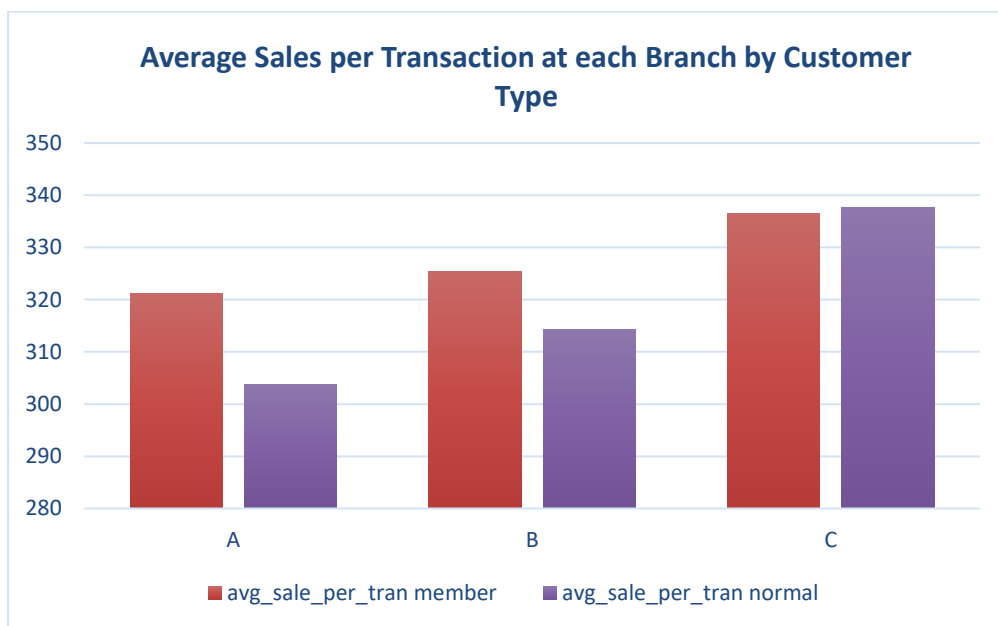
Pattern Interpretation: -

The analysis revealing that average sales per transaction are higher for members than for normal customers at branches A and B, but slightly lower for members than for normal customers at branch C, with overall higher averages at branch C compared to the other branches, provides several insights.

1. Member Spending Patterns: - Branches A and B: The higher average sales per transaction for members suggest that members are more engaged and spend more per visit compared to normal customers, possibly due to member-specific benefits and incentives.

Branch C: Although members at branch C spend slightly less per transaction compared to normal customers, the average transaction value for both groups is significantly higher than in branches A

and B. This could indicate a highly effective overall sales strategy at branch C that boosts spending across all customer types.

2. High Overall Spending at Branch C: - The higher overall average sales per transaction at branch C suggest that this branch has effectively maximized sales through better customer engagement, product offerings, or pricing strategies.

Total Sales by Branch and Gender: -

Sum of Total	Column Labels		
Row Labels	Female	Male	Grand Total
A	53269.167	52931	106200.371
B	52928.295	53269	106197.672
C	61685.463	48883	110568.707
Grand Total	**167882.925**	**155084**	**322966.749**
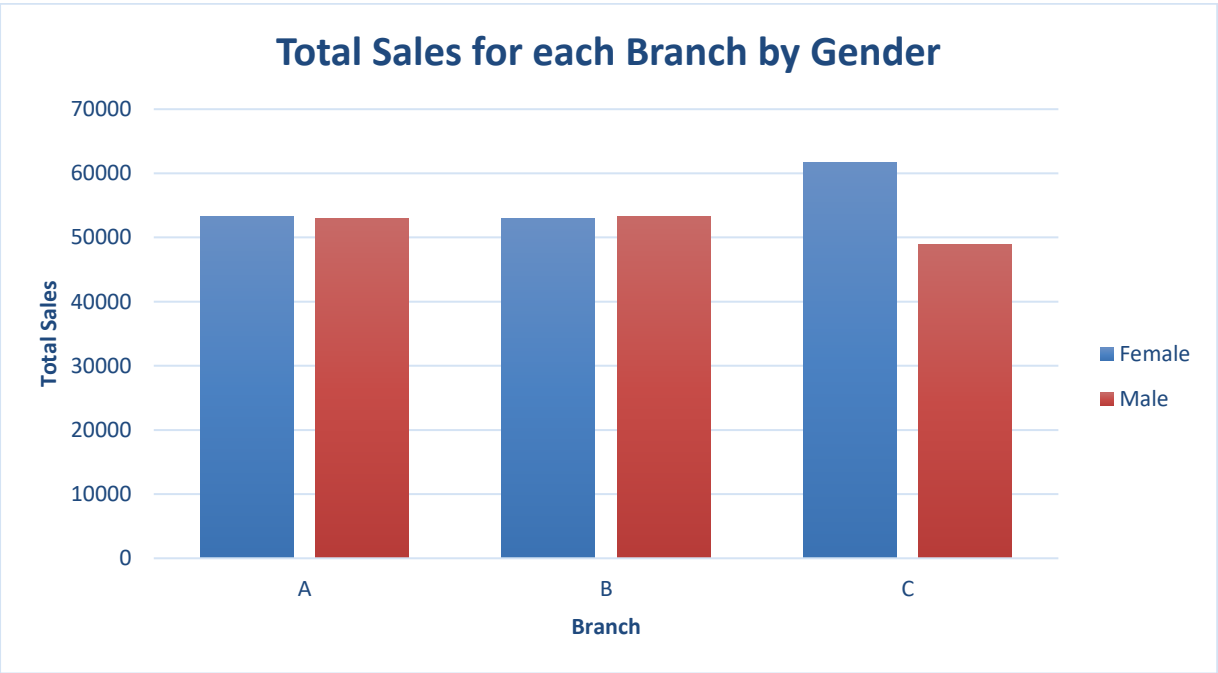
Pattern Interpretation: -

The analysis showing that total sales by gender are approximately equal at branches A and B, but higher for female customers at branch C, indicates differences in customer behavior and potentially in branch strategies or demographics.

1. Gender-Based Sales Patterns: - Branches A and B: The equal sales distribution between male and female customers suggests balanced engagement and appeal to both genders.

Branch C: Higher sales from female customers indicate a stronger appeal or more effective engagement strategies towards women at this branch. This could be due to product offerings, marketing strategies, store environment, or other factors that resonate more with female customers.

2. Branch-Specific Strategies: - The unique success in attracting higher sales from female customers at branch C might point to specific strategies or conditions that could be analyzed and potentially applied to other branches.

Average Sales per Transaction by Branch and Gender: -

branch	avg_sale_per_tran	
	female	male
A	330.8644	295.705047
B	326.7179	313.349276
C	346.5475	325.88829

Average Sales per Transaction at each Branch by Gender
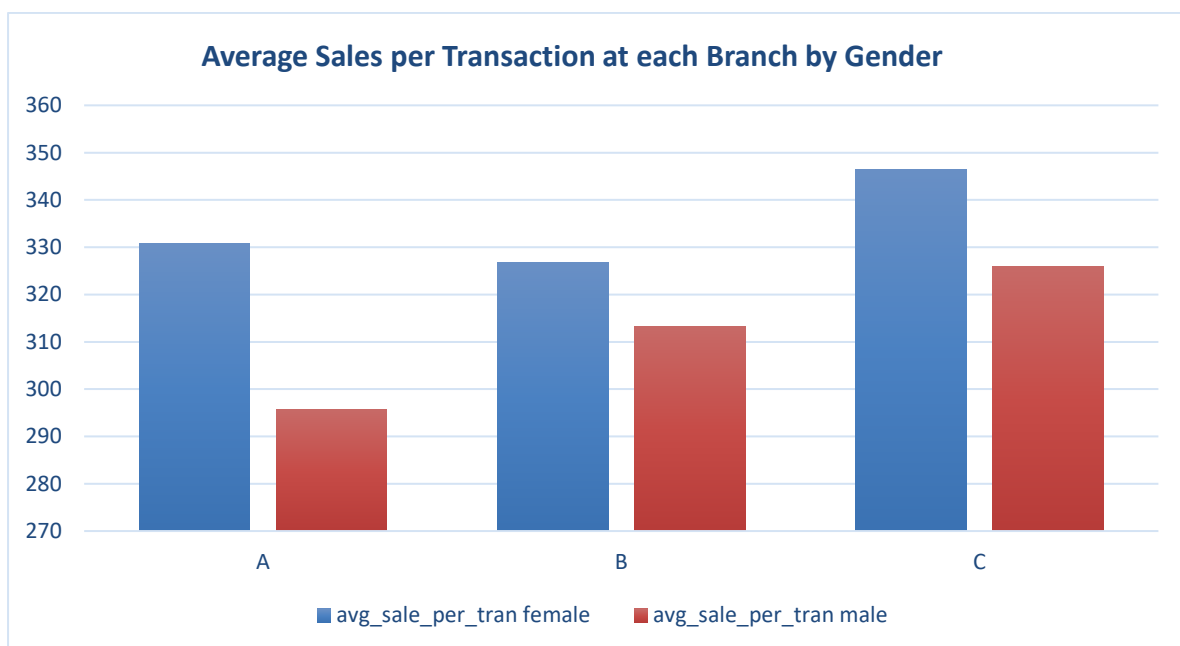
Pattern Interpretation: -

Female customers are a valuable customer segment: Since their average spending is higher, they contribute significantly to the revenue.

Potential for targeted marketing: There might be opportunities to increase sales further by understanding and catering to the preferences and needs of female customers.

Average Ratings by Branch: -

Row Labels	Average of Rating
A	7.027058824
B	6.818072289
C	7.072865854
Grand Total	**6.9727**
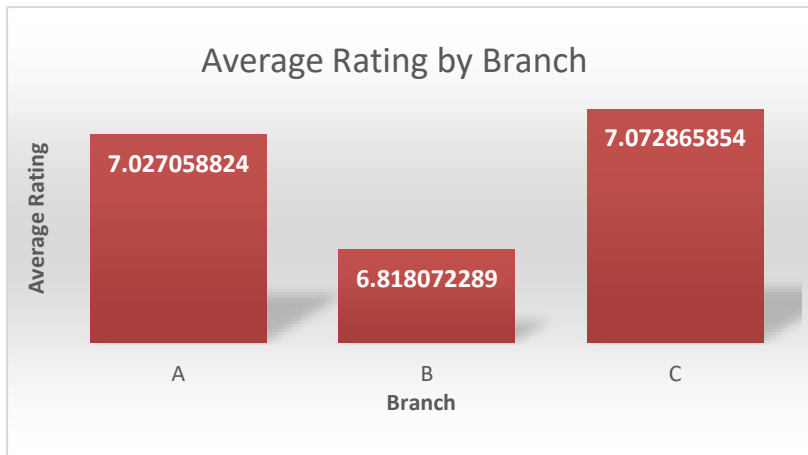
Pattern Interpretation: -

The analysis showing that the average rating for branches A and C is around 7, while branch B has a slightly lower average rating of 6.8, suggests some differences in customer satisfaction across the branches. Although the difference is not large, it is significant enough to warrant attention to improve branch B's performance.

1. Customer Satisfaction: - Branches A and C: The similar and slightly higher average ratings for branches A and C indicate a generally satisfactory customer experience.

Branch B: The slightly lower average rating for branch B suggests there may be specificissues or areas for improvement that are affecting customer satisfaction.

2. Minor Discrepancy: - While the difference in ratings is not drastic, even small differences in customer satisfaction can have an impact on customer loyalty and sales. Addressing these discrepancies can help ensure consistent customer experiences across all branches.

Average Rating by Product-Line: -

Row Labels	Average of Rating
Electronic accessories	6.924705882
Fashion accessories	7.029213483
Food and beverages	7.113218391
Health and beauty	7.003289474
Home and lifestyle	6.8375
Sports and travel	6.91626506
Grand Total	**6.9727**

Average Rating by Product-Line
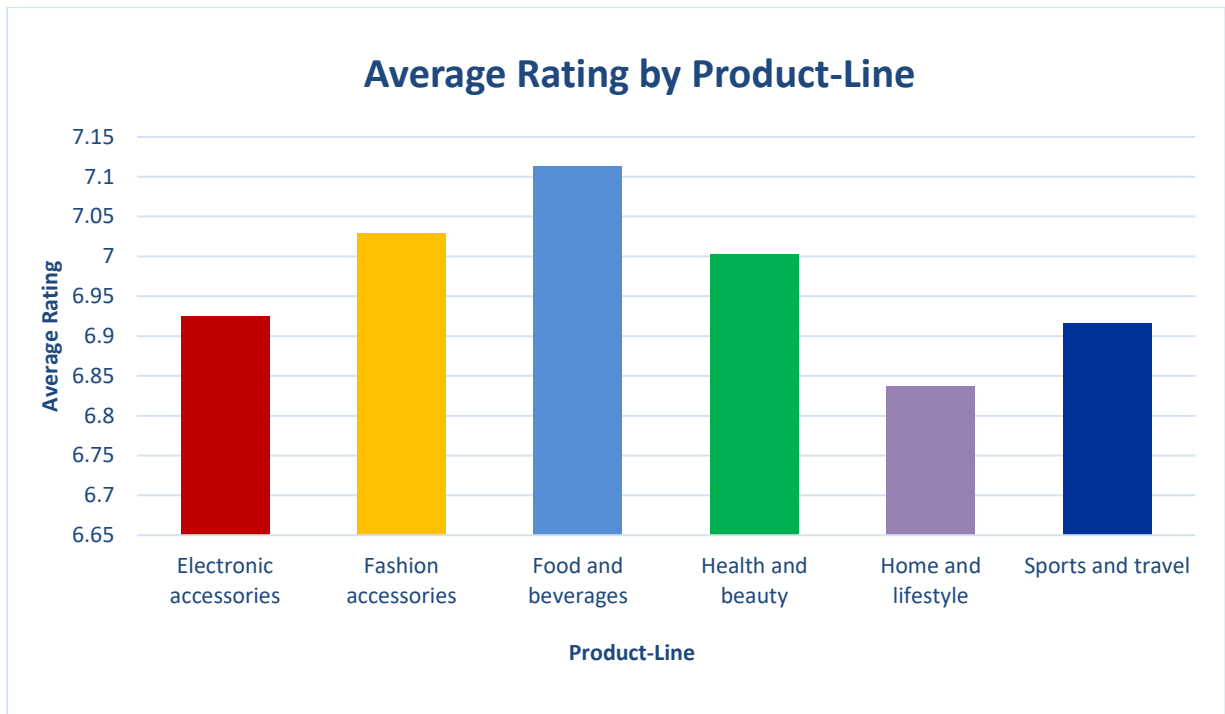
Pattern Interpretation: -

The analysis showing that the average rating varies across different product lines, with Food & Beverages having the highest average rating and Home & Lifestyle the lowest, provides insights into customer satisfaction and product performance.

1. High-Rated Product Lines: - Food & Beverages: The highest average rating suggests that customers are particularly satisfied with the products in this category. This could be due to the quality, variety, freshness, or value for money.

Fashion Accessories and Health & Beauty: These categories also have high ratings, indicating good customer satisfaction.

2. Moderately-Rated Product Lines: - Electronic Accessories and Sports & Travel: These categories have moderate ratings, suggesting that while customers are generally satisfied, there may be specific issues or areas for improvement.

3. Low-Rated Product Line: - Home & Lifestyle: The lowest average rating indicates potential issues with product quality, selection, pricing, or other factors affecting customer satisfaction.

Total Sales by Product-Line and Branch: -

Sum of Total Row Labels	Column Labels A	B	C	Grand Total
Electronic accessories	18317.1135	17051.4435	18968.9745	54337.5315
Fashion accessories	16332.5085	16413.3165	21560.07	54305.895

Food and beverages	17163.1005	15214.8885	23766.855	56144.844
Health and beauty	12597.753	19980.66	16615.326	49193.739
Home and lifestyle	22417.1955	17549.1645	13895.553	53861.913
Sports and travel	19372.6995	19988.199	15761.928	55122.8265
Grand Total	**106200.3705**	**106197.672**	**110568.707**	**322966.749**
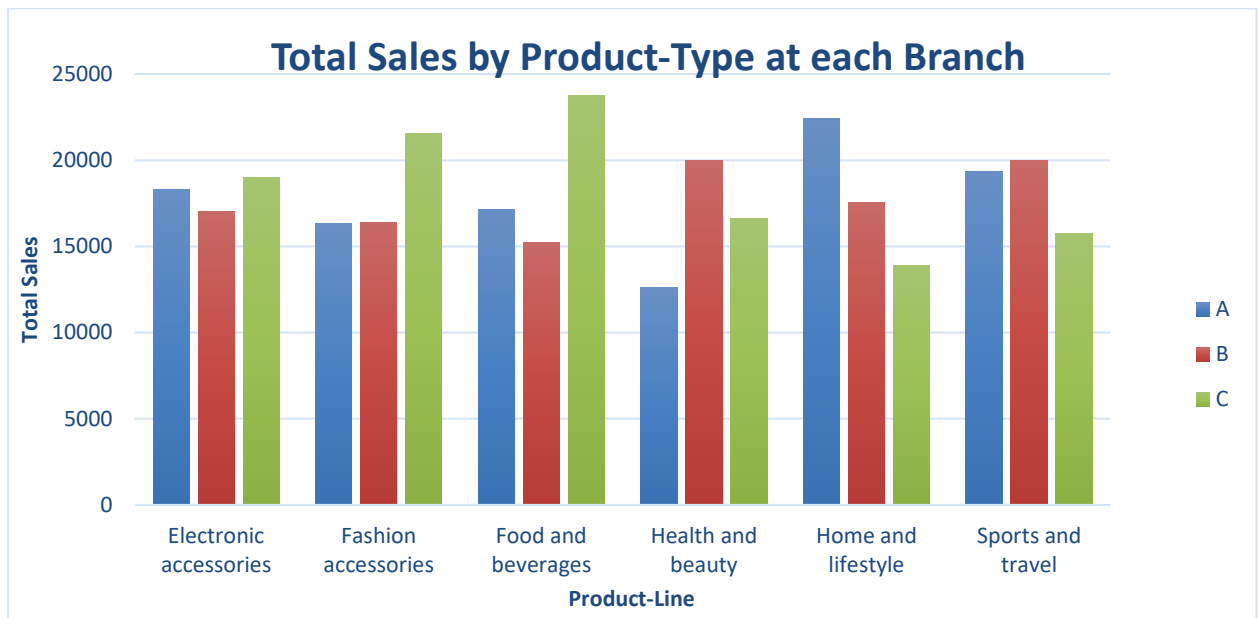
Pattern Interpretation: -

1. Branch Performance by Product Line: - Electronic Accessories: Branch C has the highest sales, followed by Branch A, with Branch B having the lowest.

Fashion Accessories: Branch C again has the highest sales, with Branches A and B having similar sales figures.

Food and Beverages: Branch C significantly leads in sales, followed by Branch A, and then Branch B.

Health and Beauty: Branch B leads in sales, followed by Branch C, and Branch A has the lowest sales.

Home and Lifestyle: Branch A leads in sales, followed by Branch B, and Branch C has the lowest sales.

Sports and Travel: Branches B and A have similar sales, with Branch C slightly lower but not significantly behind.

2. Overall Product Line Performance: - Highest Sales: Food and Beverages is the highest-grossing category overall.

Lowest Sales: Health and Beauty is the lowest-grossing category overall, followed closely by Home and Lifestyle.

Total Sales by Product-Line across Months: -

Sum of Total	Column Labels			
Row Labels	January	February	March	Grand Total
Electronic accessories	18831.288	17362.905	18143.3385	54337.5315
Fashion accessories	19345.116	19009.8615	15950.9175	54305.895
Food and beverages	19570.53	20000.358	16573.956	56144.844
Health and beauty	16383.171	14602.2555	18208.3125	49193.739
Home and lifestyle	20494.74	12434.3835	20932.7895	53861.913
Sports and travel	21667.023	13809.6105	19646.193	55122.8265
Grand Total	**116291.868**	**97219.374**	**109455.507**	**322966.749**
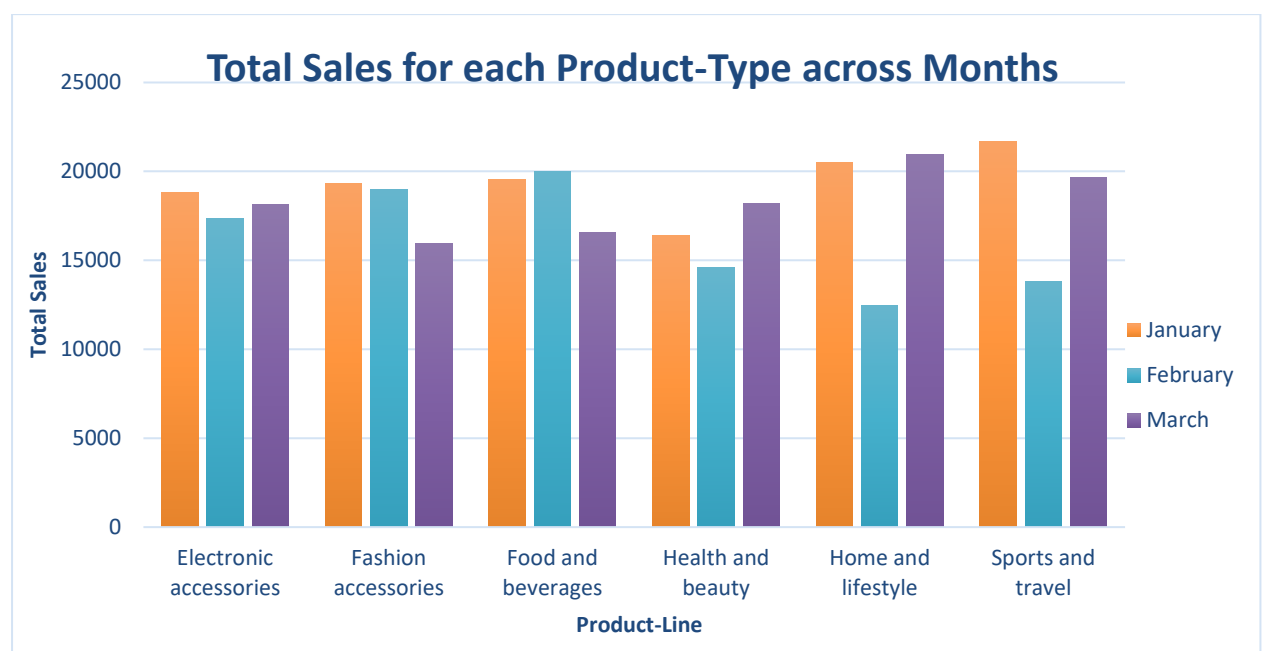
Pattern Interpretation: -

1. Overall Trends: - January: Highest total sales for Fashion Accessories, Home and Lifestyle, and Sports and Travel.

February: Highest total sales for Food and Beverages.

March: Highest total sales for Health and Beauty and Electronic Accessories.

2. Product Line Trends: - Electronic Accessories: Fairly stable with slight dips in February.

Fashion Accessories: Highest in January, slight decline in February, and a significant drop in March.

Food and Beverages: Strongest in February, with January also high, and a drop in March.

Health and Beauty: Inconsistent with a low in February, higher in January and March.

Home and Lifestyle: Peaks in January and March, with a significant dip in February.

Sports and Travel: Highest in January, significant drop in February, and rebound in March.

Total Sales by Product-Line and Customer-Type: -

Sum of Total Row Labels	Column Labels Member	Normal	Grand Total
Electronic accessories	24498.495	29839.0365	54337.5315
Fashion accessories	26323.962	27981.933	54305.895
Food and beverages	31357.62	24787.224	56144.844
Health and beauty	25831.0395	23362.6995	49193.739
Home and lifestyle	27978.027	25883.886	53861.913
Sports and travel	28234.3005	26888.526	55122.8265
Grand Total	**164223.444**	**158743.305**	**322966.749**
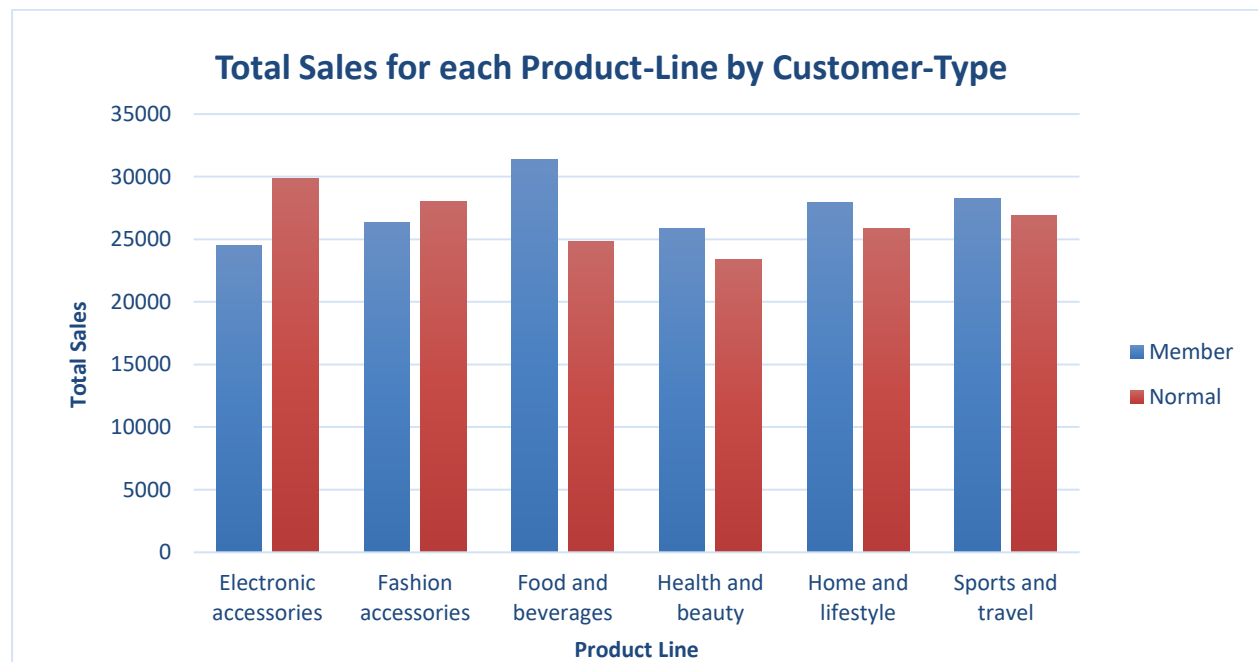
Pattern Interpretation: -

1. Overall Trends: - Members generally contribute more to total sales in several product lines compared to normal customers. The only product line where normal customers significantly outspend members is Electronic Accessories.

2. Product Line Insights: - Electronic Accessories: Normal customers ($29,839.04) outspend members ($24,498.50).

Fashion Accessories: Normal customers ($27,981.93) and members ($26,323.96) have nearly equal spending.

Food and Beverages: Members ($31,357.62) significantly outspend normal customers ($24,787.22).

Health and Beauty: Members ($25,831.04) outspend normal customers ($23,362.70).

Home and Lifestyle: Members ($27,978.03) outspend normal customers ($25,883.89).

Sports and Travel: Members ($28,234.30) outspend normal customers ($26,888.53).

Average Sales per Transaction by Product-Line and Customer-Type: -

product_line	avg_sale_per_tran	
	member	**normal**
Electronic accessories	314.0832692	324.3373533
Fashion accessories	306.0925814	304.1514457
Food and beverages	333.5917021	309.8403
Health and beauty	353.8498562	295.7303734
Home and lifestyle	337.0846627	336.1543636
Sports and travel	324.5321897	340.3610886

Average Sales per Transaction by Product Line for each Customer Type

■ avg_sale_per_tran member   ■ avg_sale_per_tran normal
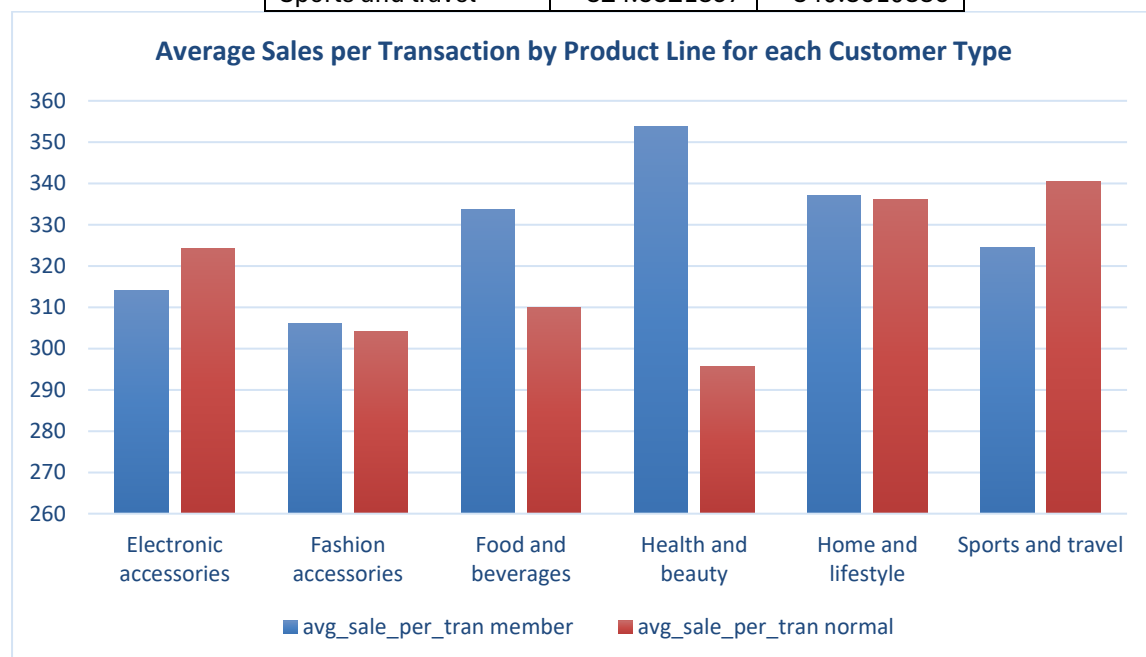
Pattern Interpretation: -

1. Overall Comparison: - Members generally have higher average sales per transaction in most product lines compared to normal customers, except for Home and Lifestyle and Sports and Travel.

2. Product Line Insights: - Electronic Accessories: Members spend slightly less ($314.08) than normal customers ($324.34).

Fashion Accessories: Both members ($306.09) and normal customers ($304.15) have almost identical average sales per transaction.

Food and Beverages: Members ($333.59) spend significantly more than normal customers ($309.84).

Health and Beauty: Members ($353.85) spend significantly more than normal customers ($295.73).

Home and Lifestyle: Members ($337.08) and normal customers ($336.15) have almost identical average sales per transaction.

Sports and Travel: Members ($324.53) spend less than normal customers ($340.36).

Total Sales by Product-Line and Gender: -

Sum of Total Row Labels	Column Labels Female	Male	Grand Total
Electronic accessories	27102.0225	27235.509	54337.5315
Fashion accessories	30437.4	23868.495	54305.895
Food and beverages	33170.9175	22973.9265	56144.844
Health and beauty	18560.9865	30632.7525	49193.739
Home and lifestyle	30036.8775	23825.0355	53861.913
Sports and travel	28574.721	26548.1055	55122.8265
Grand Total	**167882.925**	**155083.824**	**322966.749**

Total Sales by Product Type by each Gender
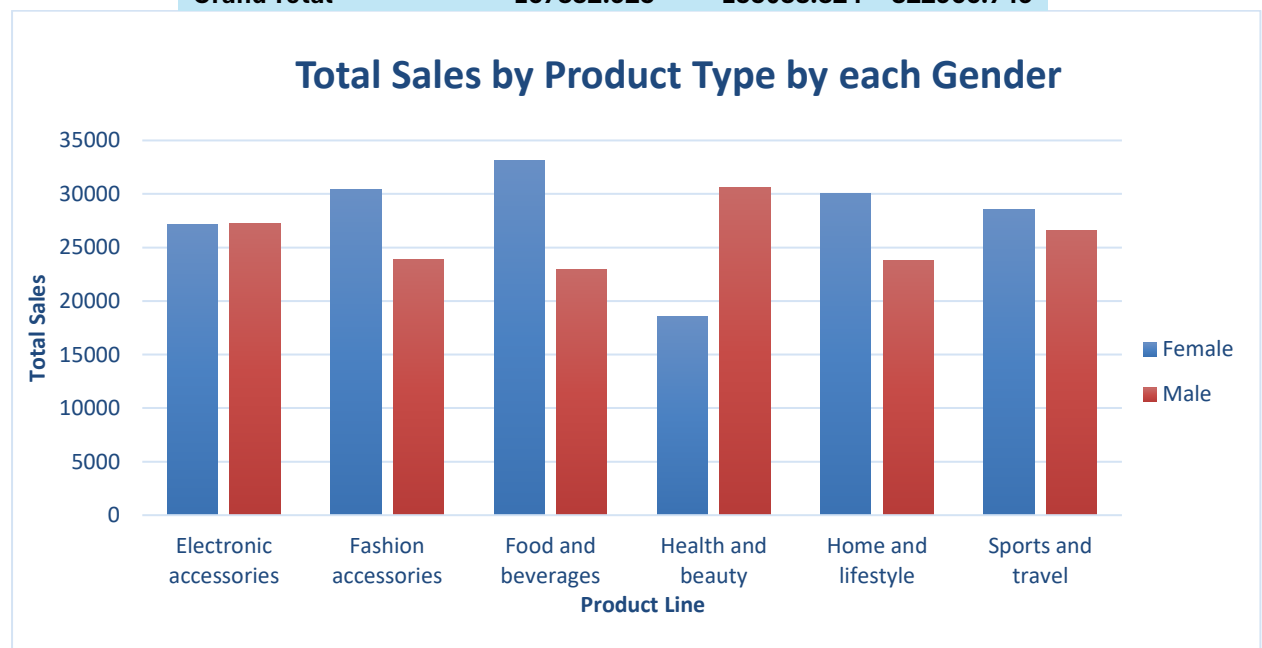
Pattern Interpretation: -

1. Overall Trends: - Sales are relatively balanced between male and female customers in Electronic Accessories and Sports and Travel.

Female customers outspend male customers in Fashion Accessories, Food andBeverages, and Home and Lifestyle.

Male customers outspend female customers significantly in Health and Beauty.

2. Product Line Insights: - Electronic Accessories: Sales are almost equal between female ($27,102.02) and male ($27,235.51) customers.

Fashion Accessories: Female customers ($30,437.40) outspend male customers ($23,868.50).

Food and Beverages: Female customers ($33,170.92) significantly outspend male customers ($22,973.93).

Health and Beauty: Male customers ($30,632.75) significantly outspend female customers ($18,560.99).

Home and Lifestyle: Female customers ($30,036.88) outspend male customers ($23,825.04).

Sports and Travel: Sales are relatively balanced with female customers ($28,574.72) slightly outspending male customers ($26,548.11).

Average Sales per Transaction by Product-Line and Gender: -

product_line	avg_sale_per_tran	
	female	male
Electronic accessories	322.643125	316.6919651
Fashion accessories	317.05625	291.0792073
Food and beverages	368.56575	273.499125
Health and beauty	290.0154141	348.0994602
Home and lifestyle	380.2136392	294.1362407
Sports and travel	324.7127386	340.3603269

Average Sales per Transaction by Product Type for each Gender
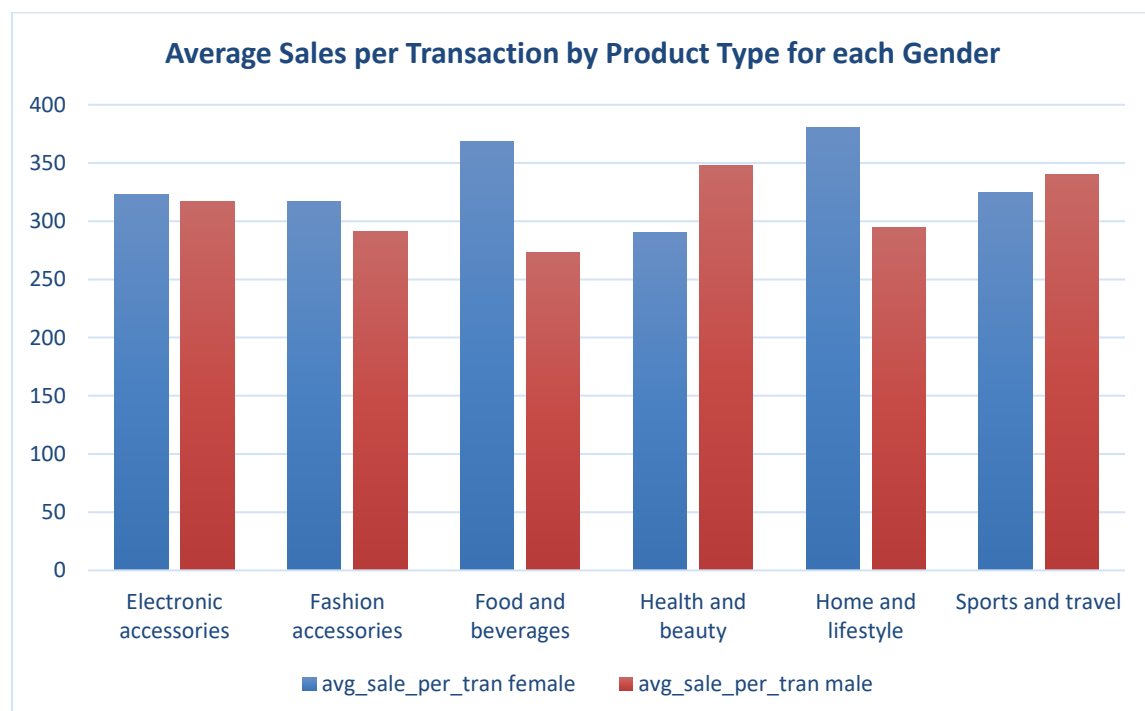
Pattern Interpretation: -

1. Overall Trends: - Higher Average Sales for Females: In several categories, female customers have higher average sales per transaction compared to male customers.

Higher Average Sales for Males: Male customers have higher average sales per transaction in Health and Beauty and Sports and Travel.

2. Product Line Insights: - Electronic Accessories: Female ($322.64) vs. Male ($316.69) - Female customers have slightly higher average sales.

Fashion Accessories: Female ($317.06) vs. Male ($291.08) - Female customers have higher average sales.

Food and Beverages: Female ($368.57) vs. Male ($273.50) - Female customers have significantly higher average sales.

Health and Beauty: Female ($290.02) vs. Male ($348.10) - Male customers have significantly higher average sales.

Home and Lifestyle: Female ($380.21) vs. Male ($294.14) - Female customers have significantly higher average sales.

Sports and Travel: Female ($324.71) vs. Male ($340.36) - Male customers have higher average sales.

Average Sales per Transaction by Product-Line: -

product_type	avg_transaction_per_sales_by_product
Electronic accessories	319.63
Fashion accessories	305.09
Food and beverages	322.67
Health and beauty	323.64
Home and lifestyle	336.64
Sports and travel	332.07

Average Transaction per Sales by Product-Type

Electronic accessories: 319.63
Fashion accessories: 305.09
Food and beverages: 322.67
Health and beauty: 323.64
Home and lifestyle: 336.64
Sports and travel: 332.07
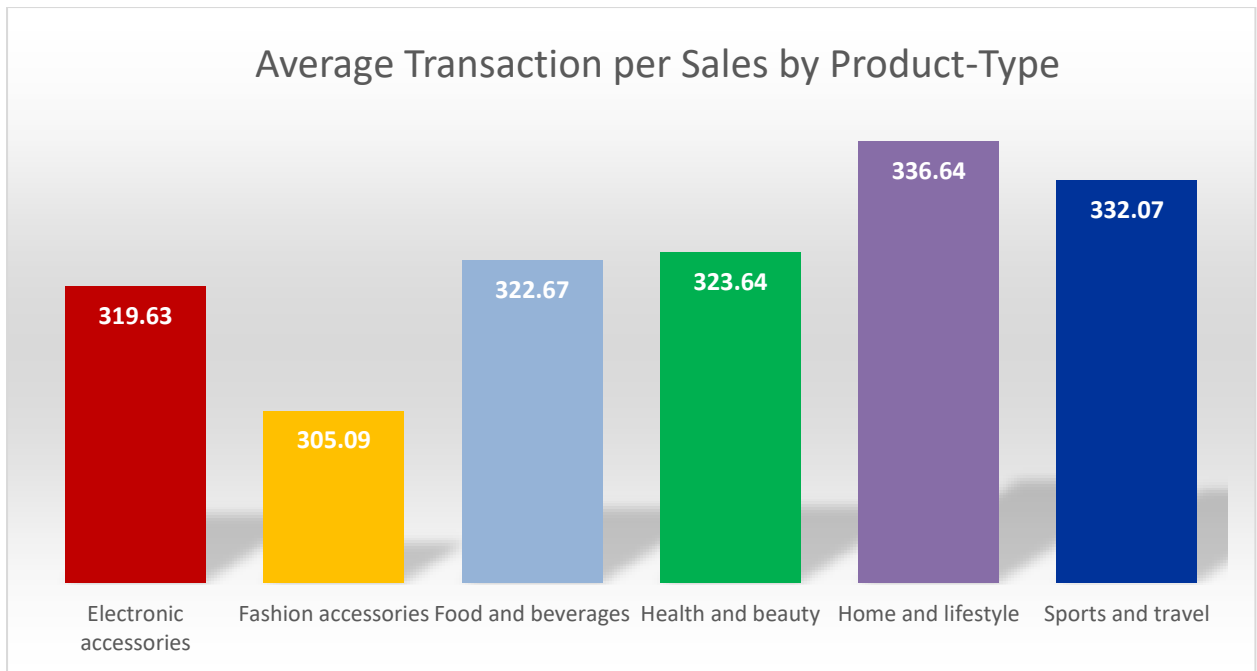
Pattern Interpretation: -

Home and Lifestyle has the highest average sales per transaction ($336.64).

Sports and Travel follows closely with an average transaction sale of ($332.07).

Health and Beauty has an average sales per transaction of ($323.64).

Food and Beverages is next with an average transaction sale of ($322.67).

Electronic Accessories has an average sales per transaction of ($319.63).

Fashion Accessories has the lowest average sales per transaction ($305.09).

Total Sales by Operation Hour and Branch: -

Sum of Total	Column Labels			
Row Labels	A	B	C	Grand Total
10 AM	11208.41	8865.84	11347.22	31421.48
11 AM	11349.89	10481.81	8545.62	30377.33
12 PM	9485.07	8475.41	8105.40	26065.88
1 PM	10443.75	11272.41	13007.06	34723.23
2 PM	8852.41	11694.56	10281.42	30828.40
3 PM	11273.70	10241.16	9664.64	31179.51
4 PM	10869.74	4123.56	10233.03	25226.32
5 PM	9043.73	7841.05	7560.43	24445.22
6 PM	7447.02	9555.28	9028.04	26030.34
7 PM	10330.26	16262.45	13106.80	39699.51
8 PM	5896.38	7384.11	9689.03	22969.53

Grand Total	106200.37	106197.67	110568.71	322966.75

Total Sales for every Hour at each Branch
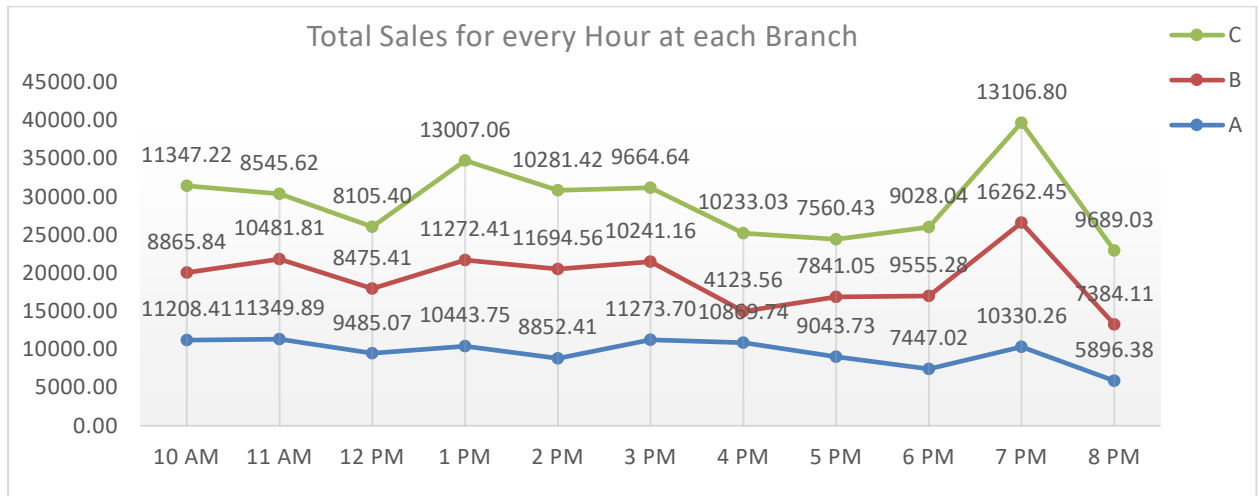
Pattern Interpretation: -

1. Peak Hours: - The highest sales across all branches occur at 1 PM and 7 PM. The total sales are the highest at 1 PM ($34,723.227) and 7 PM ($39,699.513).

2. Low Sales Hours: - Sales are significantly lower during the late afternoon and early evening hours, particularly from 4 PM to 6 PM. The lowest sales occur at 8 PM ($22,969.527) and 6 PM ($26,030.34).

3. Branch-Specific Insights: - Branch A has consistent sales throughout the day, with a noticeable peak at 11 AM. Branch B has the highest sales at 7 PM, showing a significant increase compared to other hours. Branch C sees the highest sales at 1 PM, similar to Branch A, and also a peak at 7 PM.

Total Sales by Operation Hour and Product-Line: -

Sum of Total	Column Labels						
Row Labels	Electronic accessories	Fashion accessories	Food and beverages	Health and beauty	Home and lifestyle	Sports and travel	Grand Total
10 AM	4217.77	6102.64	4843.84	5018.07	6084.73	5154.44	31421.48
11 AM	5950.18	4368.50	6416.71	3305.61	6303.33	4033.00	30377.33
12 PM	3443.04	4950.98	4310.90	4355.31	3641.70	5363.95	26065.88
1 PM	3877.13	8109.39	3747.85	5868.67	6221.99	6898.21	34723.23
2 PM	5693.57	4745.17	4263.26	7431.80	2843.70	5850.89	30828.40
3 PM	5756.60	3456.66	7418.20	3443.27	6199.21	4905.57	31179.51

4 PM	3466.27	5545.40	4562.59	2824.85	3671.44	5155.78	25226.32
5 PM	4111.92	4118.32	1421.34	3872.36	7073.71	3847.57	24445.22
6 PM	6447.18	4461.99	4198.54	3909.85	3384.18	3628.60	26030.34
7 PM	5777.15	6137.16	7981.48	5365.42	5520.06	8918.25	39699.51
8 PM	5596.72	2309.69	6980.14	3798.55	2917.86	1366.58	22969.53
Grand Total	**54337.53**	**54305.90**	**56144.84**	**49193.74**	**53861.91**	**55122.83**	**322966.75**

Total Sales for every Hour by Product Type
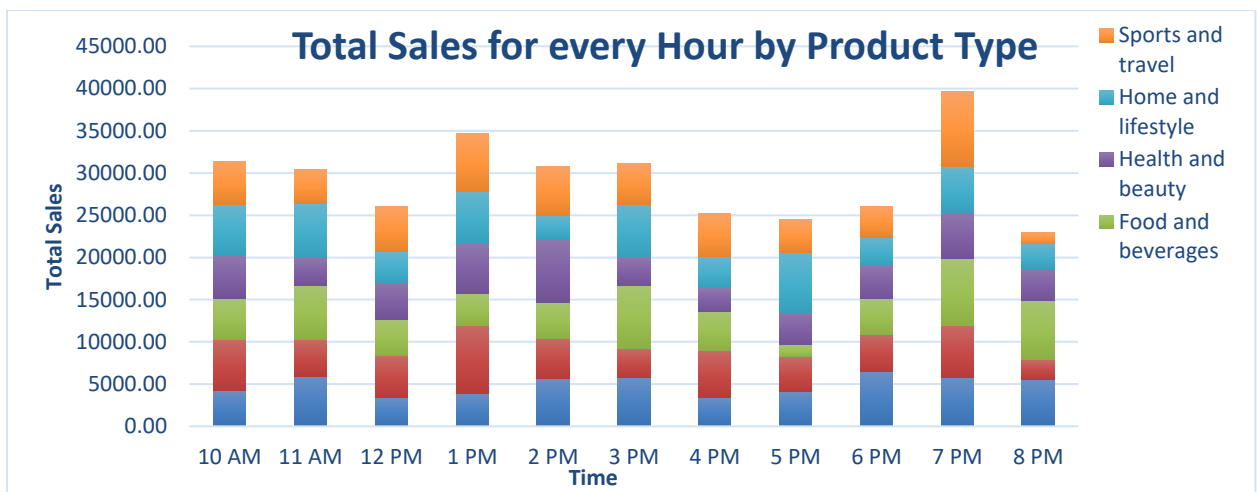
Pattern Interpretation: -

1. Peak Sales Hours: - The highest sales across all product types occur at 1 PM and 7 PM.

1 PM: High sales for Fashion Accessories and Sports and Travel.

7 PM: High sales for Food and Beverages and Sports and Travel.

2. Low Sales Hours: - The lowest sales occur at 12 PM and 8 PM.

12 PM: Low sales for Electronic Accessories and Health and Beauty.

**8 PM:** Low sales for Fashion Accessories and Sports and Travel.

3. Product Type Performance: - Food and Beverages consistently shows strong sales across most hours, peaking at 7 PM.

Fashion Accessories has a significant peak at 1 PM.

Sports and Travel has strong performance at 1 PM and 7 PM.

Total Sales by Operation Hour and Customer-Type: -

Sum of Total	Column Labels		
Row Labels	Member	Normal	Grand Total
10 AM	12266.98	19154.50	31421.48
11 AM	15227.55	15149.78	30377.33
12 PM	13729.57	12336.31	26065.88
1 PM	16006.75	18716.48	34723.23
2 PM	19047.57	11780.83	30828.40
3 PM	18939.28	12240.23	31179.51
4 PM	10601.16	14625.17	25226.32
5 PM	12775.01	11670.20	24445.22
6 PM	11659.01	14371.33	26030.34
7 PM	21057.60	18641.91	39699.51
8 PM	12912.96	10056.56	22969.53
Grand Total	164223.44	158743.31	322966.75
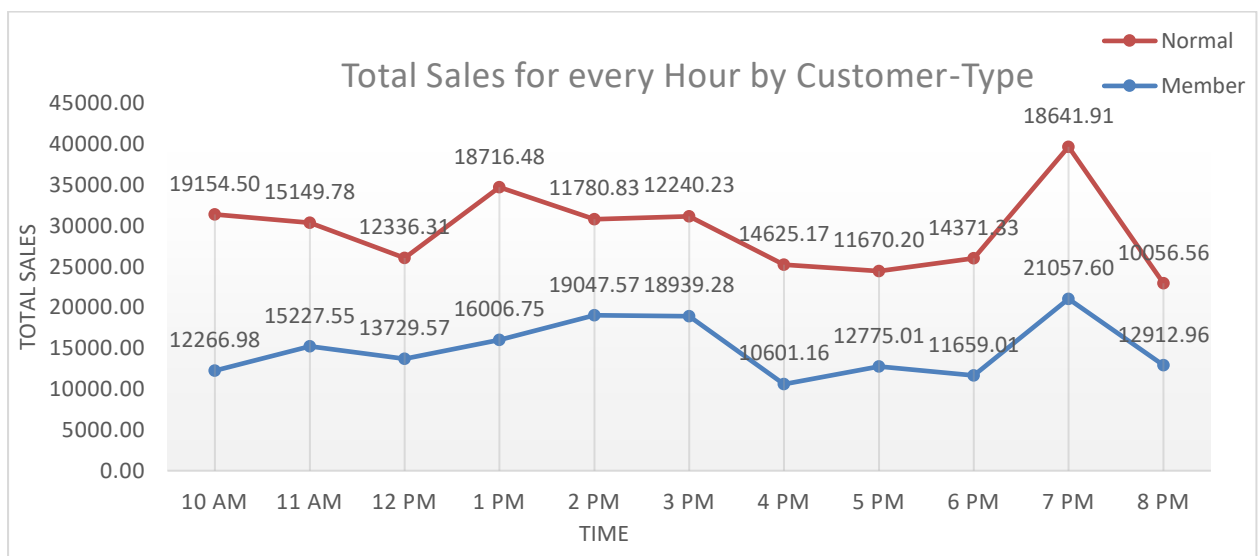
Total Sales for every Hour by Customer-Type

Pattern Interpretation: -

1. Peak Sales Hours: - 7 PM: Highest sales ($39,699.51) with significant contributions from both members and normal customers.

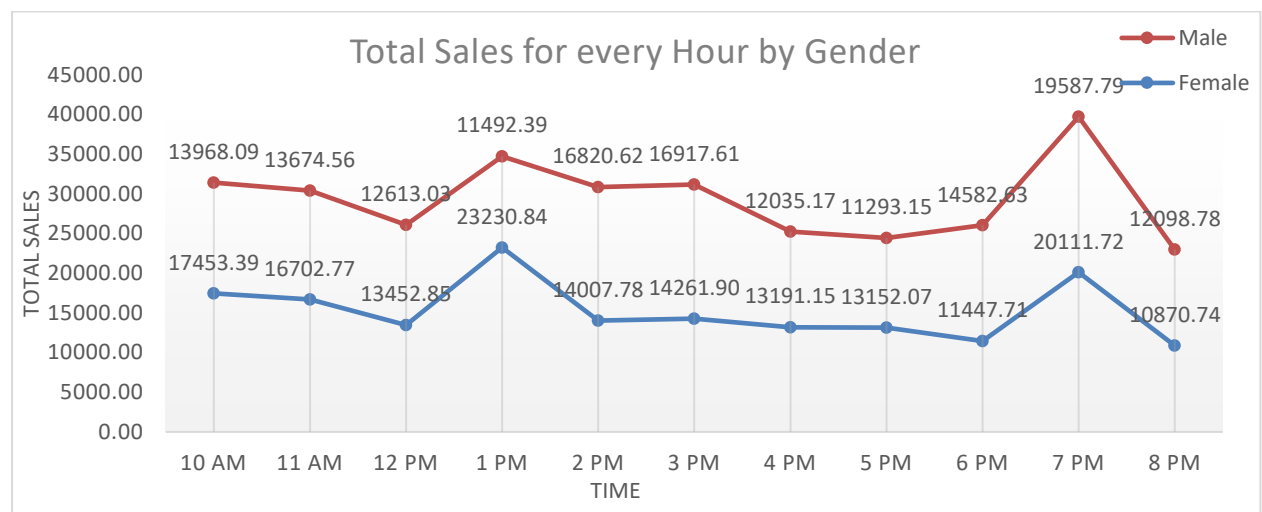**1 PM:** Second highest sales ($34,723.23), driven largely by normal customers.

2. Low Sales Hours: - 4 PM and 5 PM: Lower sales compared to other times, particularly at 4 PM ($25,226.32).

3. Customer Type Patterns: - Members: Higher sales than normal customers in the late afternoon and evening (2 PM, 3 PM, 7 PM).

Normal Customers: Higher sales than members in the morning (10 AM) and at 1 PM.

Total Sales by Operation Hour and Gender: -

Sum of Total	Column Labels		
Row Labels	Female	Male	Grand Total
10 AM	17453.39	13968.09	31421.48
11 AM	16702.77	13674.56	30377.33
12 PM	13452.85	12613.03	26065.88
1 PM	23230.84	11492.39	34723.23
2 PM	14007.78	16820.62	30828.40
3 PM	14261.90	16917.61	31179.51
4 PM	13191.15	12035.17	25226.32
5 PM	13152.07	11293.15	24445.22
6 PM	11447.71	14582.63	26030.34
7 PM	20111.72	19587.79	39699.51
8 PM	10870.74	12098.78	22969.53
Grand Total	167882.93	155083.82	322966.75

Pattern Interpretation: -

1. Peak Sales Hours: - 7 PM: Highest sales ($39,699.51) with significant contributions from both female ($20,111.72) and male customers ($19,587.79).

1 PM: High sales ($34,723.23), driven predominantly by female customers ($23,230.84).

2. Low Sales Hours: - 4 PM and 5 PM: Lower sales compared to other times, particularly at 4 PM ($25,226.32).

3. Gender-Based Patterns: - Female Customers: Higher sales than male customers in the morning (10 AM, 11 AM) and at 1 PM.

Male Customers: Higher sales than female customers in the afternoon (2 PM, 3 PM, 6 PM).

Total Sales by Day of Week and Product-Line: -

Sum of Total	Column Labels						
Row Labels	Electronic accessories	Fashion accessories	Food and beverages	Health and beauty	Home and lifestyle	Sports and travel	Grand Total
Sunday	6411.8775	5583.7425	7763.4165	4973.3355	12072.291	7653.2295	44457.8925
Monday	5922.126	6419.5215	6612.228	8448.237	6095.3445	4401.621	37899.078
Tuesday	10110.9225	7423.2795	9848.2965	8559.5895	7708.7325	7831.425	51482.2455
Wednesday	4864.9125	6819.7815	11188.485	5888.7465	6474.8145	8494.395	43731.135
Thursday	12435.1605	7725.8895	6798.5925	5582.472	5427.303	7379.8305	45349.248
Friday	4848.1545	9554.7585	4558.428	8331.015	6875.421	9758.5635	43926.3405
Saturday	9744.378	10778.922	9375.3975	7410.3435	9208.0065	9603.762	56120.8095
Grand Total	**54337.5315**	**54305.895**	**56144.844**	**49193.739**	**53861.913**	**55122.8265**	**322296.749**

Total Sales by Day of the Week for each Product Type
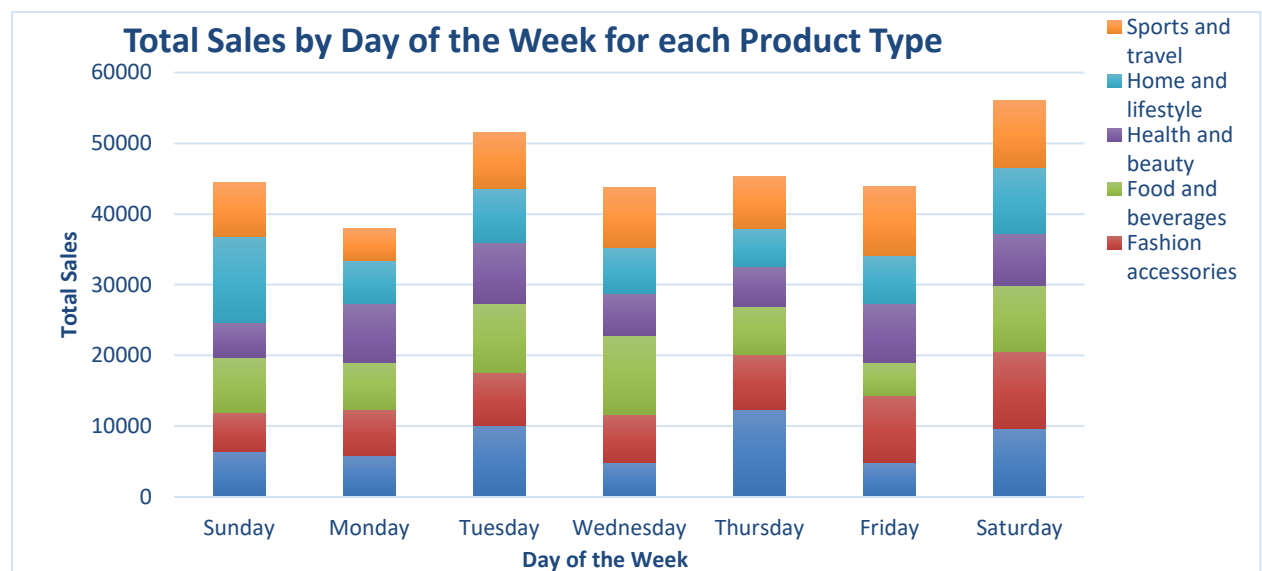
Pattern Interpretation: -

1. Highest Sales Day by Product Type: - Electronic Accessories: Thursday ($12,435.16)

Fashion Accessories: Saturday ($10,778.92)

Food & Beverages: Wednesday ($11,188.49)

Health & Beauty: Monday ($8,448.24)

Home & Lifestyle: Sunday ($12,072.29)

Sports & Travel: Friday ($9,758.56)

2. Lowest Sales Day by Product Type: - Electronic Accessories: Friday ($4,848.15)

Fashion Accessories: Sunday ($5,583.74)

Food & Beverages: Friday ($4,558.43)

Health & Beauty: Sunday ($4,973.34)

**Home & Lifestyle:** Thursday ($5,427.30)

Sports & Travel: Monday ($4,401.62)

3. Overall Highest Sales Day: - Saturday: $56,120.81 Driven by strong sales in Fashion Accessories ($10,778.92), Food & Beverages ($9,375.40), and Sports & Travel ($9,603.76).

4. Overall Lowest Sales Day: - Monday: $37,899.08 Characterized by relatively lower sales across most product categories.

Total Sales by Day of Week and Branch: -

Sum of Total	Column Labels			
Row Labels	A	B	C	Grand Total
Sunday	17006.8185	10415.328	17035.746	44457.8925
Monday	14239.0605	12734.7045	10925.313	37899.078
Tuesday	14955.213	18859.239	17667.7935	51482.2455
Wednesday	13267.7265	12707.5935	17755.815	43731.135
Thursday	15422.274	15778.623	14148.351	45349.248
Friday	14543.865	14417.76	14964.7155	43926.3405
Saturday	16765.413	21284.424	18070.9725	56120.8095
Grand Total	106200.3705	106197.672	110568.7065	322966.749

Total Sales by Day of the Week for each Branch
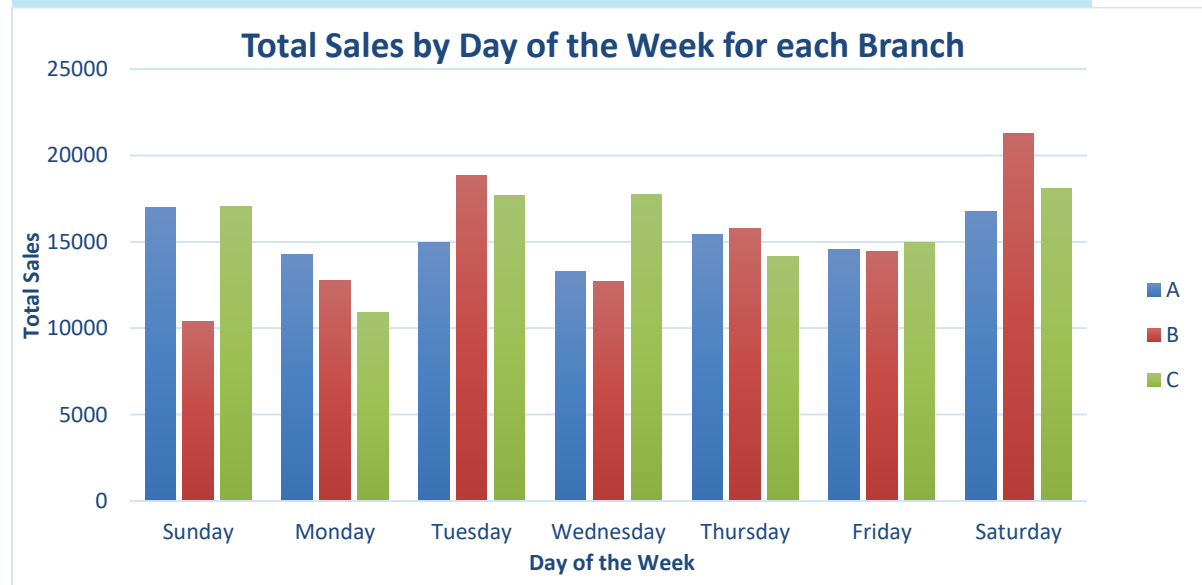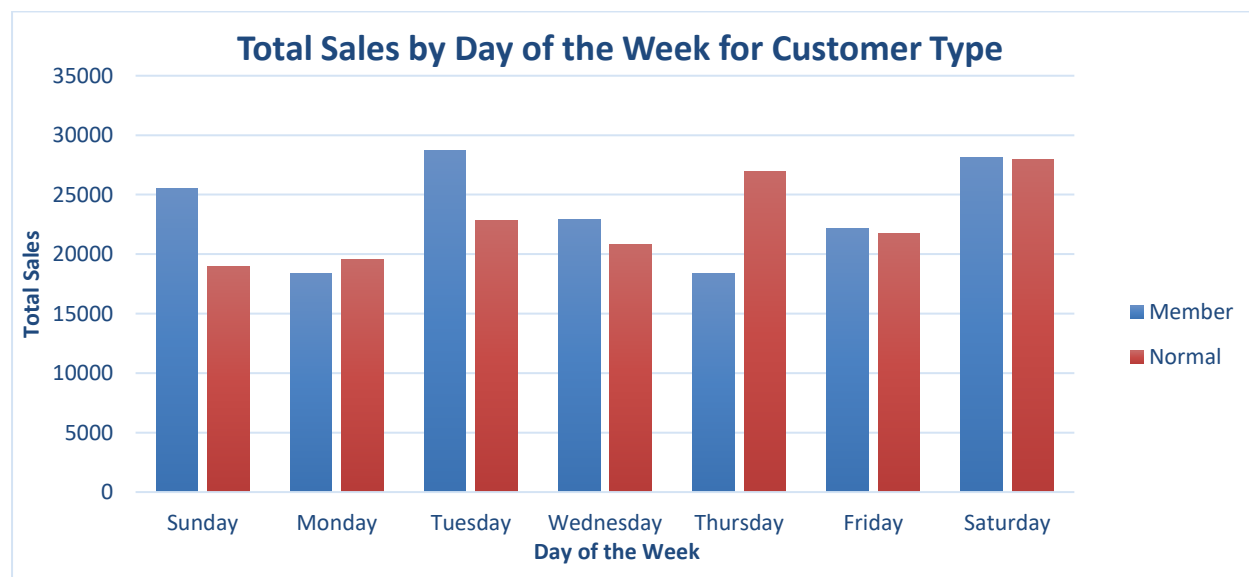
Pattern Interpretation: -

1. Peak Sales Days: - Saturday has the highest sales across all branches, making it the busiest day of the week. Branch B shows particularly high sales on Saturdays. Tuesday also shows strong sales, especially at Branch B.

2. Low Sales Days: - Monday has the lowest total sales, indicating it is the least busy day across branches.

3. Branch Performance: - Branch B sees significant spikes on Saturdays and Tuesdays, suggesting specific trends or events that might be driving these sales. Branch A and Branch C also perform well on Sundays and Saturdays, showing a weekend trend in customer purchases.

Total Sales by Day of Week and Customer-Type: -

Sum of Total	Column Labels		
Row Labels	**Member**	**Normal**	**Grand Total**
Sunday	25533.5535	18924.339	44457.8925
Monday	18355.071	19544.007	37899.078
Tuesday	28689.465	22792.7805	51482.2455
Wednesday	22944.915	20786.22	43731.135
Thursday	18393.6375	26955.6105	45349.248
Friday	22183.8435	21742.497	43926.3405
Saturday	28122.9585	27997.851	56120.8095
Grand Total	**164223.444**	**158743.305**	**322966.749**

Pattern Interpretation: -

1. Highest Sales Days: - Saturday: Highest sales day with a total of $56,120.81, contributed almost equally by members ($28,122.96) and normal customers ($27,997.85).

Tuesday: High sales day with a total of $51,482.25, primarily driven by members ($28,689.47).

2. Lowest Sales Day: - Monday: Lowest sales day with a total of $37,899.08, with normal customers contributing slightly more ($19,544.01) than members ($18,355.07).

3. Member vs. Normal Customer Sales: - Members: Contribute more significantly on Sundays, Tuesdays, and Saturdays.

Normal Customers: Show higher sales on Thursdays and Mondays.

Total Sales by Day of Week and Gender: -

Sum of Total Row Labels	Column Labels Female	Male	Grand Total
Sunday	23100.7665	21357.126	44457.8925
Monday	20412.0105	17487.0675	37899.078
Tuesday	30431.9715	21050.274	51482.2455
Wednesday	19936.6335	23794.5015	43731.135
Thursday	20523.51	24825.738	45349.248
Friday	24147.8055	19778.535	43926.3405
Saturday	29330.2275	26790.582	56120.8095
Grand Total	**167882.925**	**155083.824**	**322966.749**
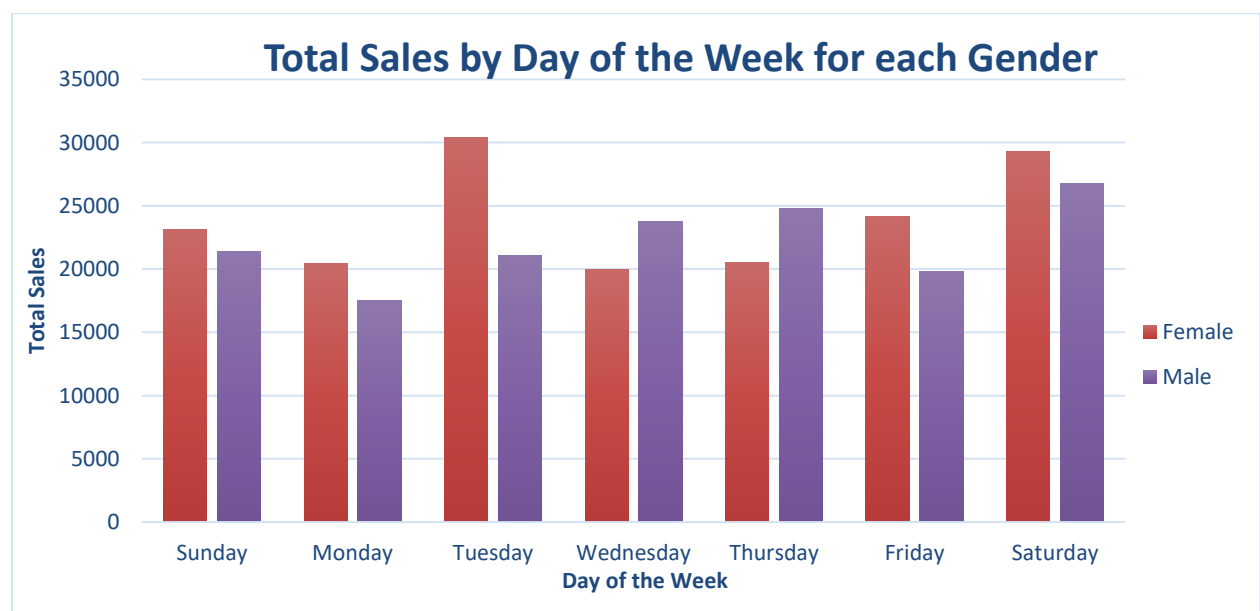
Total Sales by Day of the Week for each Gender

Pattern Interpretation: -

1. Highest Sales Days: - Saturday: Highest sales day with a total of $56,120.81, with female sales at $29,330.23 and male sales at $26,790.58.

Tuesday: Significant sales with a total of $51,482.25, driven primarily by female customers ($30,431.97).

2. Lowest Sales Day: - Monday: Lowest sales day with a total of $37,899.08, with female sales at $20,412.01 and male sales at $17,487.07.

3. Gender-Based Sales Insights: - Female Customers: Contribute more significantly to sales on Sundays, Tuesdays, Fridays, and Saturdays.

Male Customers: Show higher sales than females on Wednesdays and Thursdays.

Total Sales by Branch across Weeks: -

Sum of Total	Column Labels			
Row Labels	A	B	C	Grand Total
1	7433.52	5735.17	4374.70	17543.39
2	6926.35	8115.23	9419.62	24461.20
3	11407.32	7072.70	10213.35	28693.36
4	10217.61	8938.09	10131.18	29286.88
5	7345.59	9961.64	11053.21	28360.45
6	7612.72	9337.10	10152.01	27101.83
7	6972.88	9710.88	8879.83	25563.59
8	5536.82	5812.84	5979.00	17328.66
9	7188.64	13235.99	8795.09	29219.72
10	10524.15	9480.45	8414.24	28418.84
11	7994.54	7354.68	8641.00	23990.22
12	10263.99	5944.65	8911.96	25120.60
13	6776.25	5498.24	5603.51	17878.00
Grand Total	**106200.37**	**106197.67**	**110568.71**	**322966.75**

Total Sales for each Branch across Weeks
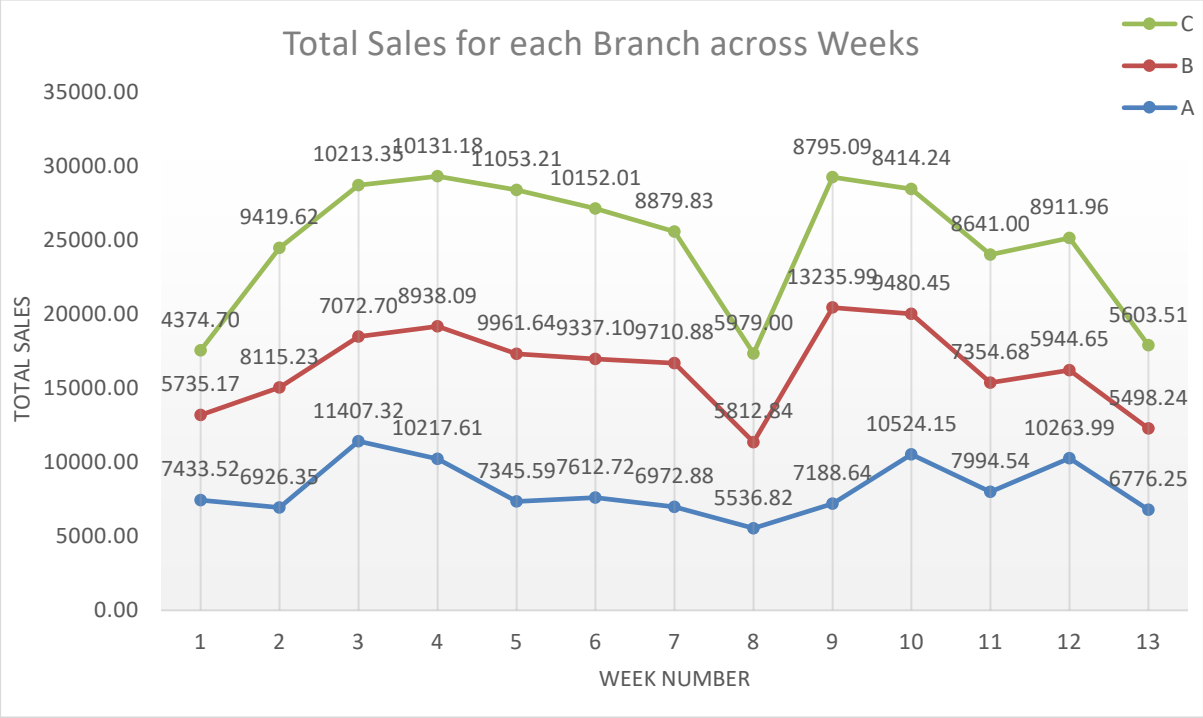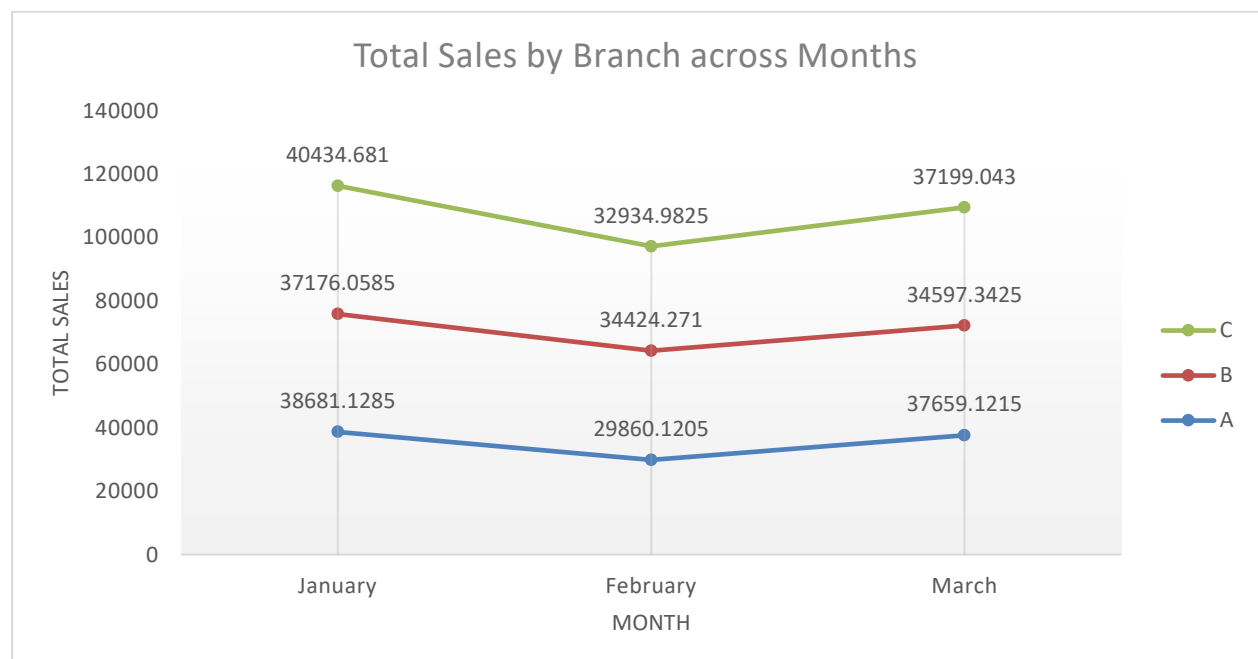
Pattern Interpretation: -

1. Peak Sales Weeks: - Weeks 3, 4, and 9 show the highest sales overall, with Week 4 being the peak for Branch A and Week 9 for Branch B. Branch C also shows high sales in Weeks 3 and 5, indicating a consistent performance during these periods.

2. Low Sales Weeks: - Week 1 and Week 8 have the lowest sales across all branches, particularly in Branch A and Branch C, indicating possible external factors affecting customer turnout.

3. Branch Performance: - Branch A has peak sales in Weeks 3 and 10, indicating successful promotions or events during these weeks. Branch B shows significant spikes in sales in Weeks 4 and 9, suggesting effective marketing strategies or increased footfall during these periods. Branch C has relatively consistent sales but peaks in Week 5, indicating strong performance during specific weeks.

Total Sales by Branch across Months: -

Sum of Total	Column Labels			
Row Labels	A	B	C	Grand Total
January	38681.1285	37176.0585	40434.681	116291.868
February	29860.1205	34424.271	32934.9825	97219.374
March	37659.1215	34597.3425	37199.043	109455.507
Grand Total	**106200.3705**	**106197.672**	**110568.7065**	**322966.749**

Total Sales by Branch across Months

Pattern Interpretation: -

January: Highest total sales across all branches.

February: Lowest total sales across all branches.

March: Sales improved but still lower than January.

Actionable Recommendations

Transaction Methods

- **Credit Cards (31%)**: Enhance security and convenience features.

- **E-wallets (34%)**: Promote e-wallet partnerships and rewards.

- **Cash (35%)**: Implement faster checkout processes and cash handling efficiency.

Customer Type

- **Members (51%) vs. Normal Customers (49%)**:

  - **Loyalty Programs**: Enhance benefits for members.

  - **Conversion**: Encourage normal customers to become members through targeted promotions.

Gender

- **Female (52%) vs. Male (48%)**:

  - **Targeted Marketing**: Develop marketing campaigns aimed at female customers.

  - **Product Stocking**: Stock more products that appeal to female customers.

Branch Performance

- **Equal Sales Across Branches**:

  - **Branch C Optimization**: Investigate and replicate successful strategies from Branch C in A and B.

Customer Type by Branch

- **Higher Member Sales in Branch C**:

  - **Membership Drive**: Increase membership efforts in Branches A and B.

Average Sales per Transaction by Customer Type and Branch

- **Higher Average for Members in A and B, Normal in C**:

  - **Pricing Strategies**: Evaluate and adjust pricing strategies in Branch C.

Gender Sales by Branch

- **Higher Female Sales in Branch C**:

  - **Female-Centric Marketing**: Implement more female-focused promotions in Branch C.

Product Line Ratings

- **High Ratings for Food & Beverages, Low for Home & Lifestyle**:

  - **Product Improvement**: Focus on improving Home & Lifestyle products.

Sales by Time of Day

- **Peak Sales at 7 PM**:

  - **Promotions**: Implement promotions during peak hours to maximize sales.

Sales by Day of Week

- **High Sales on Saturdays**:

  - **Weekend Promotions**: Focus promotional efforts on weekends.

Sales by Product Line and Customer Type

- **Higher Spending by Members**:

  - **Member Promotions**: Enhance exclusive offers for members.

Sales by Product Line and Gender

- **Higher Spending by Females**:

  - **Gender-Specific Campaigns**: Develop marketing campaigns targeting female customers.

Average Sales per Transaction by Product Type and Gender

- **Higher Female Average Spending**:

  - **Female-Focused Product Lines**: Stock and promote products that appeal to female customers.

Key Actionable Steps:

1. **Targeted Marketing Campaigns**: Develop and implement marketing campaigns focused on key customer segments (members, female customers).

2. **Loyalty Programs**: Enhance and promote loyalty programs to increase member engagement.

3. **Product Stocking and Bundling**: Adjust inventory and create product bundles that align with customer preferences.

4. **Branch-Specific Strategies**: Tailor strategies based on the performance and customer demographics of each branch.

5. **Promotional Timing**: Align promotions with peak sales times and days.

These recommendations aim to optimize sales performance, enhance customer experience, and drive revenue growth.