

Big Mart Tableau Based Data Analysis



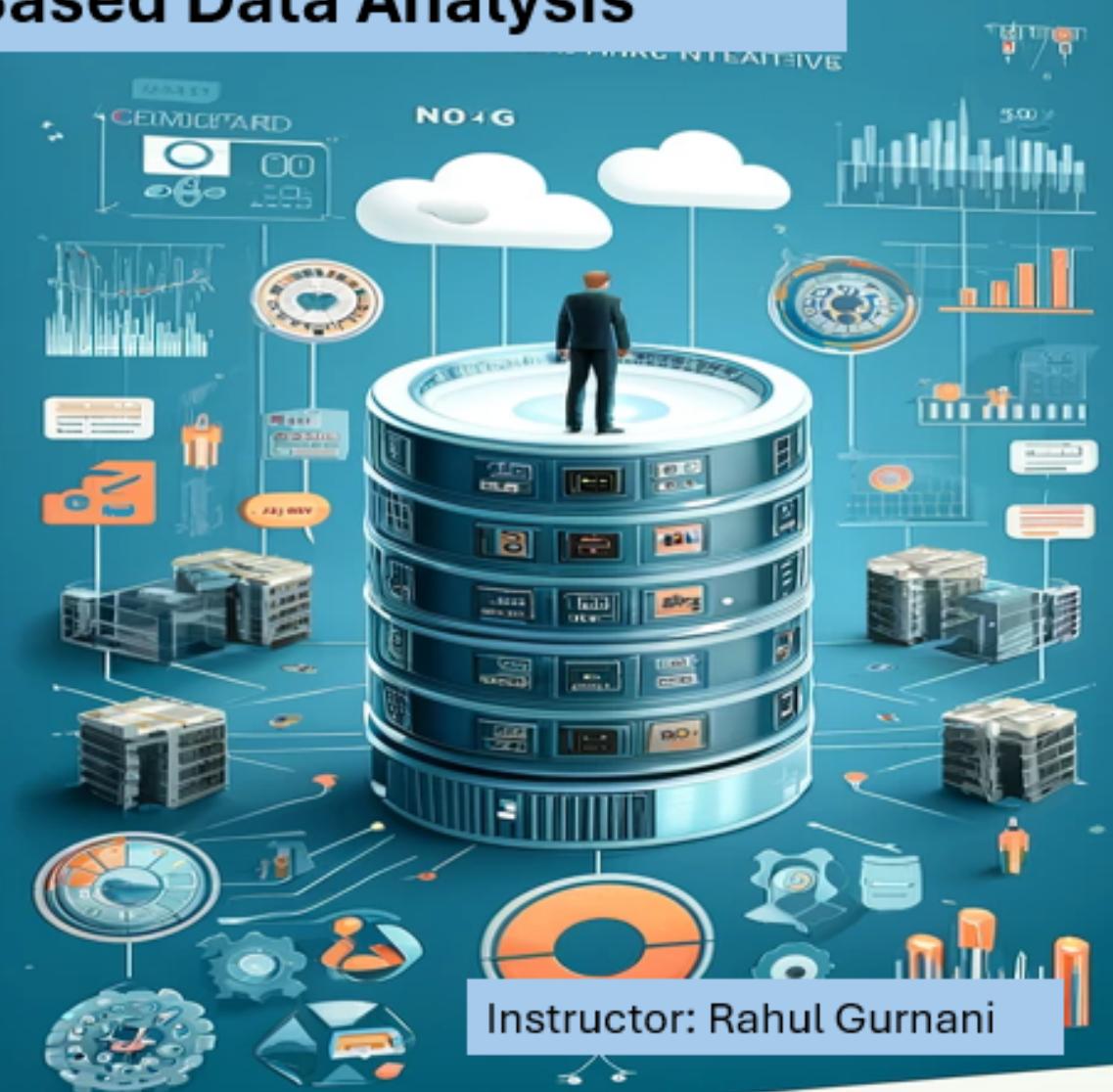
Presenters: Sweta Patel

Muhammad Iqbal

Maya Babu

Bhanu

Date:04/12/2024



Instructor: Rahul Gurnani

Agenda

Business Problem

Case Study (Big Mart)

Recommendation and Conclusion

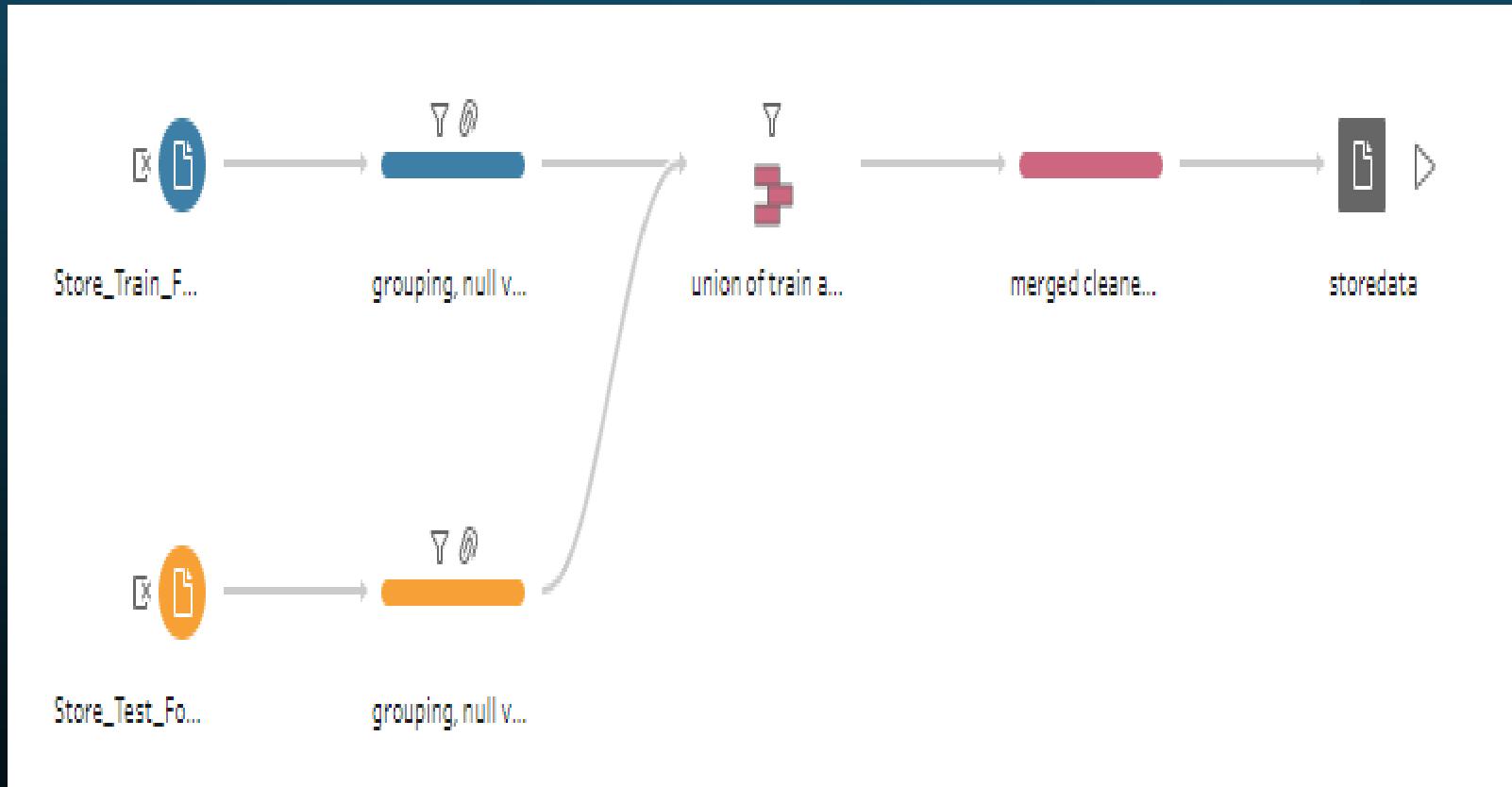
Business Problem:

Big Mart is experiencing uneven sales growth across product categories and outlet sizes. While core products like fruits, vegetables, and low-fat household items perform well, others like seafood, dairy, and regular breakfast items lag behind. Additionally, smaller Tier 2 outlets outperform larger outlets in sales per unit, suggesting potential issues with product assortment, resource allocation, and untapped revenue streams.

Challenges:

- Uneven product performance: Some categories underperform, requiring sales revitalization strategies.
- Discrepancies in outlet performance: Tier 2 outlets show higher efficiency, requiring optimization across the chain.
- Potential for uneven resource allocation: Sales data suggests a need for strategic resource allocation to maximize profitability.

Data Cleaning Process



Changes (5)

Filter: Null Values

Outlet_Size

Keep only: non-null values

Filter: Null Values

Item_Weight

Keep only: non-null values

Group Values

Item_Fat_Content

"low fat" replaced by "Low Fat"

Group Values

Item_Fat_Content

"reg" replaced by "Regular"

Group Values

Item_Fat_Content

"LF" replaced by "Low Fat"



store

Connection
Live ExtractFilters
0 | Add

Connections Add

store
Text file

Files

Use Data Interpreter
Data Interpreter
might be able to
clean your Text file
workbook.

store.csv

New Union

New Table Extension

Item Identifier	Item Weight	Item Fat Content	Item Visibility	Item Type	Item_MRP	Outlet Identifier	Outlet Establishment Year	Outlet Size
FDA15	9.3000	Low Fat	0.0	Dairy	249.8	OUT049	1999	Medium
DRC01	5.9200	Regular	0.0	Soft Drinks	48.3	OUT018	2009	Medium
FDN15	17.5000	Low Fat	0.0	Meat	1416	OUT049	1999	Medium
NCD19	8.9300	Low Fat	0.0	Household	53.9	OUT013	1987	High
FDP36	10.3950	Regular	0.0	Baking Goods	514	OUT018	2009	Medium
FDO10	13.6500	Regular	0.0	Snack Foods	57.7	OUT013	1987	High
FDY07	11.8000	Low Fat	0.0	Fruits and Vegetables	45.5	OUT049	1999	Medium
FDA03	18.5000	Regular	0.0	Dairy	144.1	OUT046	1997	Small
FDX32	15.1000	Regular	0.1	Fruits and Vegetables	145.5	OUT049	1999	Medium
FDS46	17.6000	Regular	0.0	Snack Foods	119.7	OUT046	1997	Small
FDF32	16.3500	Low Fat	0.1	Fruits and Vegetables	196.4	OUT013	1987	High
FDP49	9.0000	Regular	0.1	Breakfast	56.4	OUT046	1997	Small
NCB42	11.8000	Low Fat	0.0	Health and Hygiene	115.3	OUT018	2009	Medium
FDP49	9.0000	Regular	0.1	Breakfast	54.4	OUT049	1999	Medium
FDU02	13.3500	Low Fat	0.1	Dairy	230.5	OUT035	2004	Small
FDN22	18.8500	Regular	0.1	Snack Foods	250.9	OUT013	1987	High
NCB30	14.6000	Low Fat	0.0	Household	196.5	OUT035	2004	Small
FDR28	13.8500	Regular	0.0	Frozen Foods	165.0	OUT046	1997	Small

Dataset statistics

Number of variables	14
Number of observations	4650
Missing cells	0
Missing cells (%)	0.0%
Duplicate rows	0
Duplicate rows (%)	0.0%
Total size in memory	2.9 MiB
Average record size in memory	648.0 B

Variable types

Categorical	9
Numeric	4
Text	1

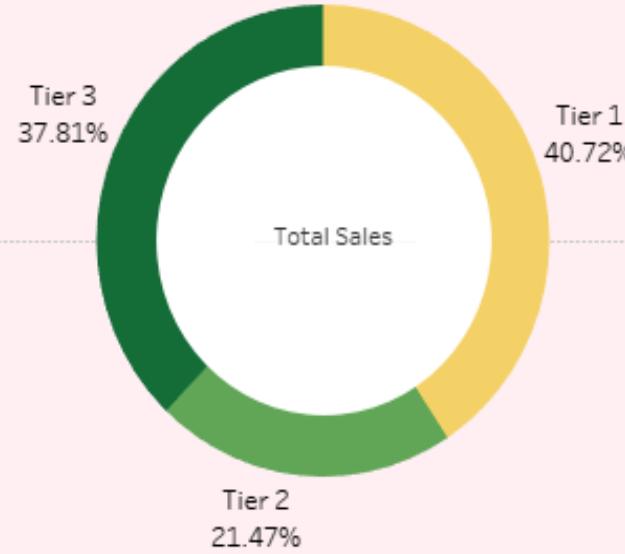
Calculated Fields

avg price per unit	outlet age	profit margin
[Item MRP] / [Item Weight]	YEAR(TODAY()) - [Outlet Establishment Year]	([Item Outlet Sales] - [Item MRP]) / [Item Outlet Sales]

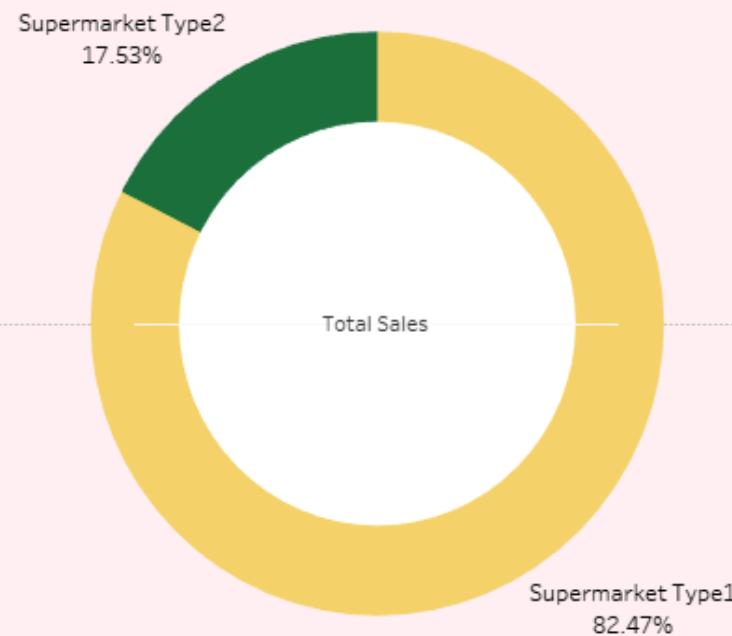
Created 3 calculated fields in tableau desktop namely average price per unit, outlet age, profit margin from the variables given in the dataset to create insights on sales revenue generated by products and overall business. Total we have 17 variables in our dataset after adding 3 calculated variables in Tableau desktop

Sales by Outlet Location Size and Type

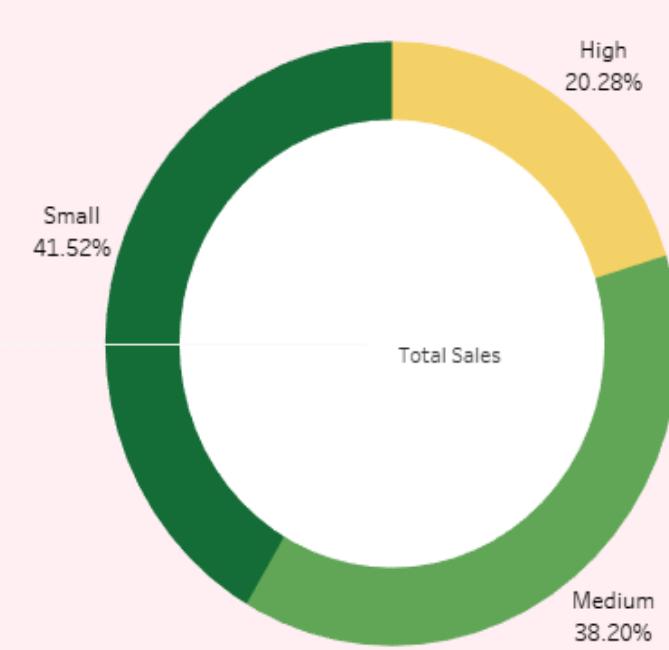
Total outlets are 4650 and Total sales generated by the whole Big mart sales across all units is approx. \$11 million



Illustrates sales distribution across three outlet location types: Tier 1, Tier 2, and Tier 3. Tier 1 contributes the largest share of sales at 40.72%. Tier 3 follows closely with 37.81% of sales. Tier 2 has the smallest share with 21.47% of total sales.



Two outlet types represented: Supermarket Type1 and Type2. Supermarket Type1 accounts for the majority of sales at 82.47%. Supermarket Type2 comprises 17.53% of total sales.



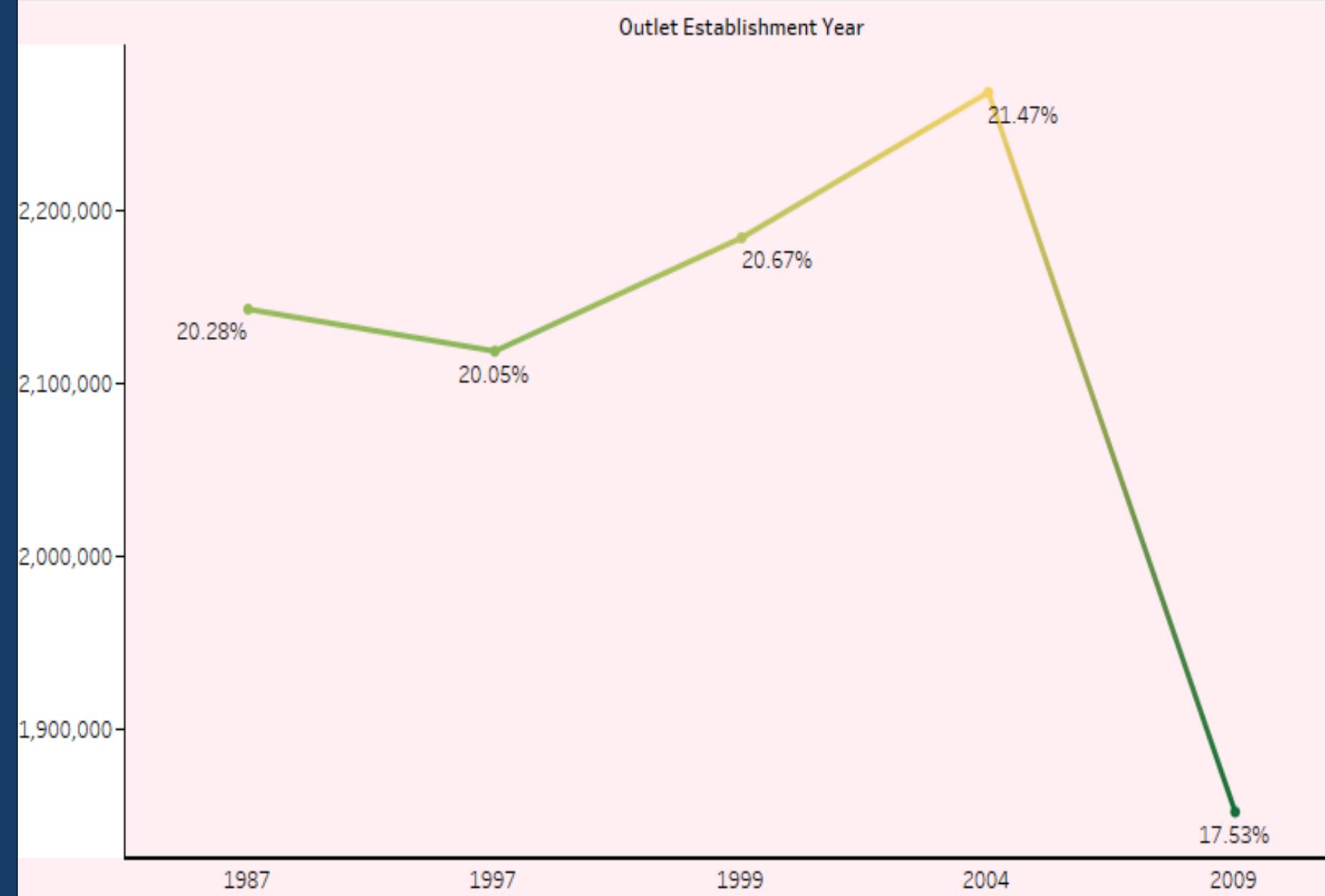
Sales percentages divided into three outlet sizes: High, Medium, Small. Small outlets constitute the largest portion of sales at 41.52%. Medium-sized outlets account for 38.20% of sales. High-sized outlets make up 20.28% of sales.

Sales trend over the years

The sales trends of Big Mart over a period from 1987 to 2009. The trend shows:

- An initial decrease in sales trend from 1987 to 1997 which is - 1.13% decrease in sales giving sales of \$2,118,395
- A continued rise with a sales increase of 3.10% in 1999 and reaching its highest point of 3.85% in 2004 with sales of \$2,183,970
- A sharp decline after 2004, ending in 2009 with sales around \$1.85 million (decline by -18.35% than previous year)

This trend suggests that while Big Mart experienced growth and peak performance in the late 1990s to early 2000s, there was a notable downturn in the latter part of the decade that would warrant further investigation to understand underlying factors.



Item and Outlet Identifier by sales

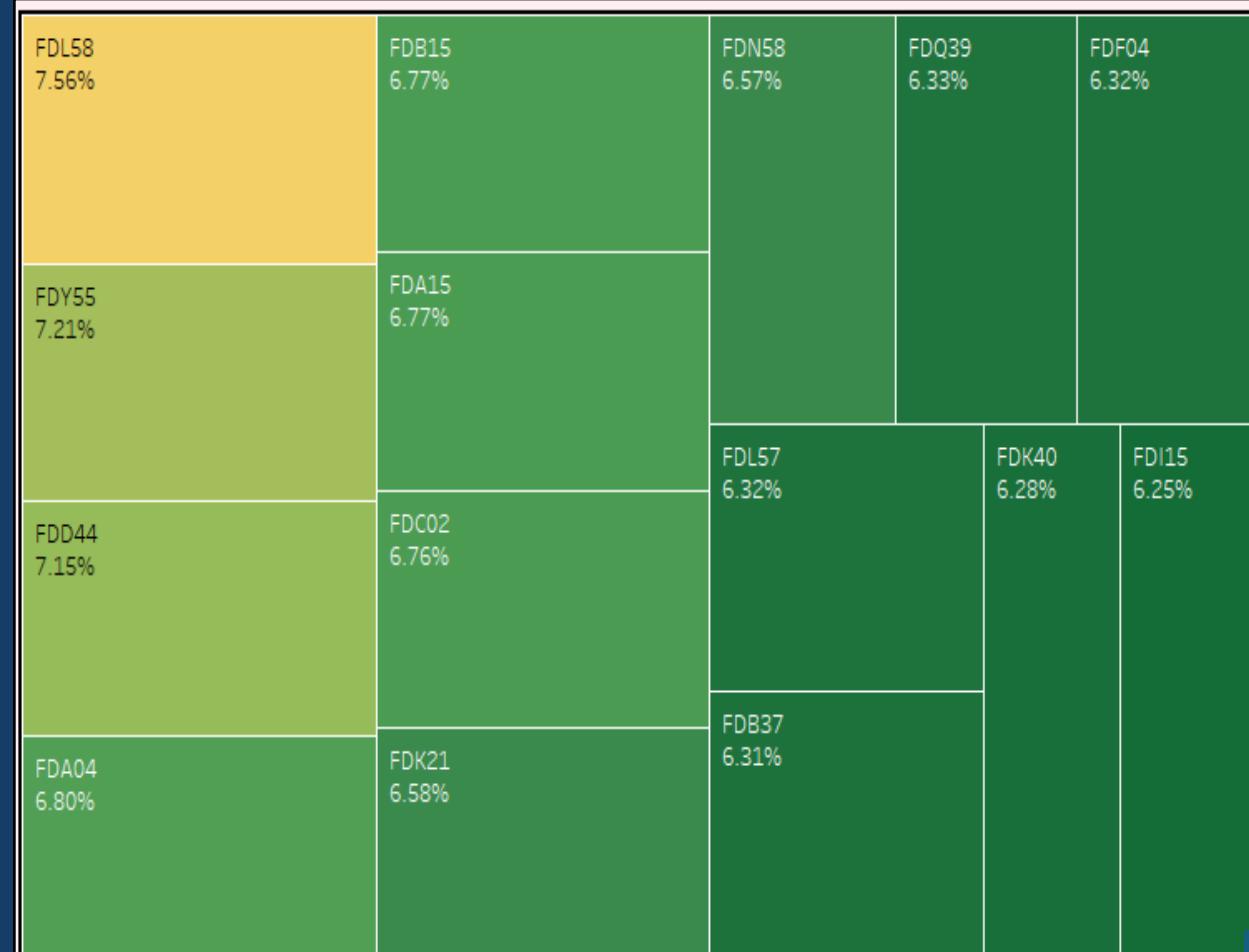
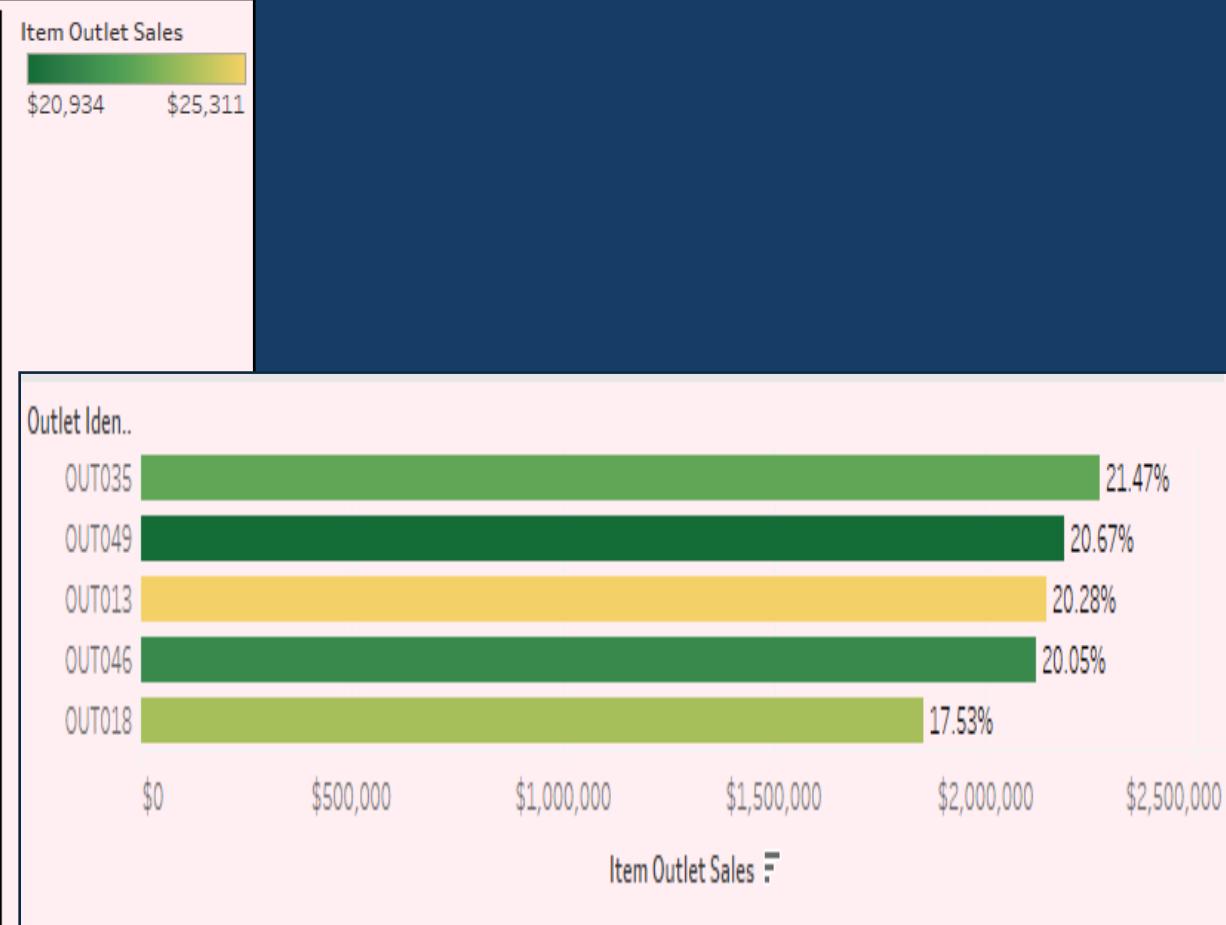


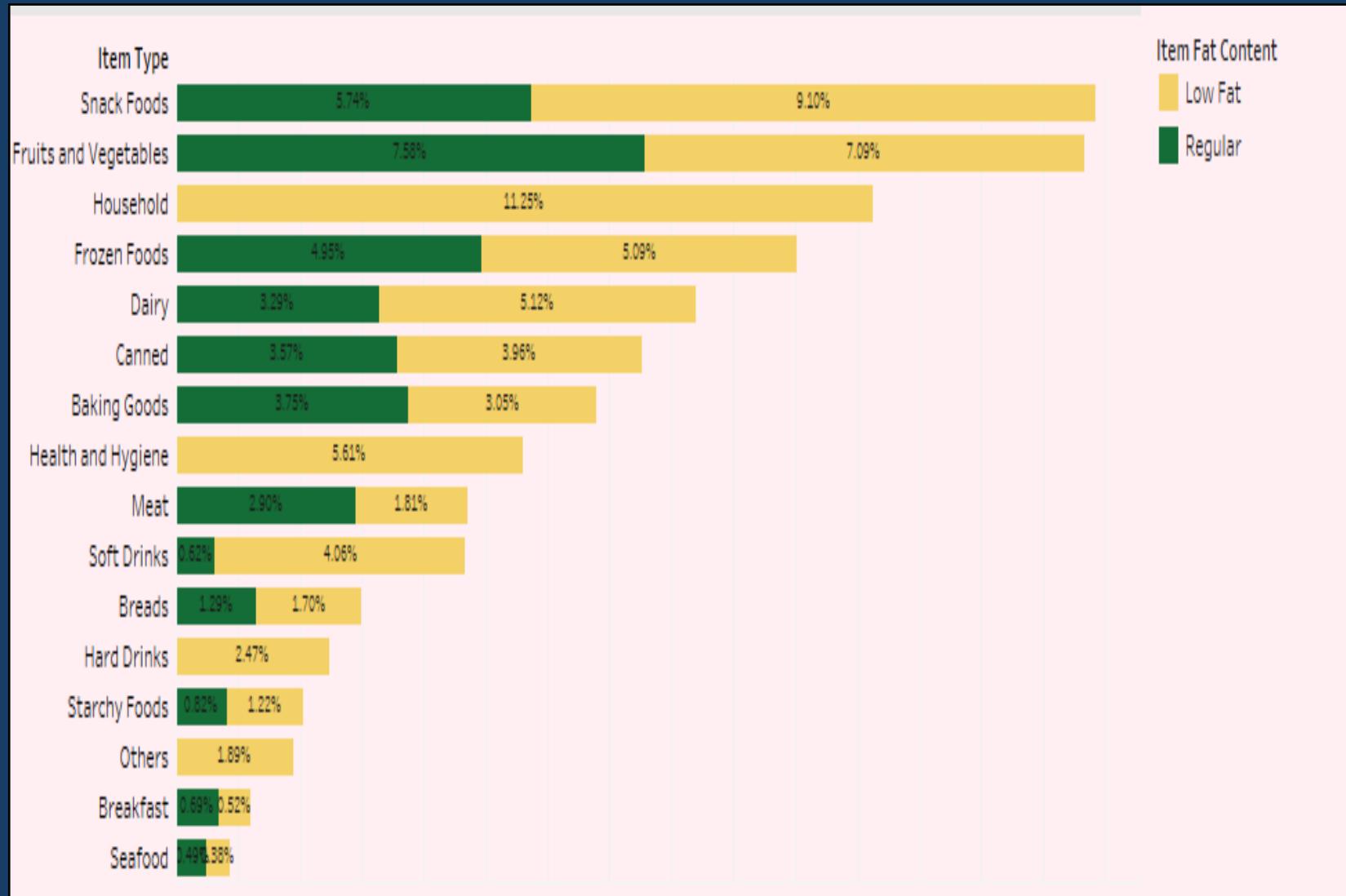
Chart displays sales distribution across multiple item identifier.
Each box represents a different item identification given to items with associated sales percentages.
Largest slices: FDL58 (7.56%), FDY55 (7.21%), FDD44 (7.15%).
Smallest observed slices: FDQ39 (6.33%),



Displays sales values for five different outlets.
Outlet OUT049 has the highest sales of 21.
Outlet OUT013 has the lowest sales at \$1,851,823.
Sales values for other outlets range from \$2,118,395 to \$2,183,970.
The outlets are color-coded for identification: OUT013, OUT018, OUT035, OUT046, OUT049.

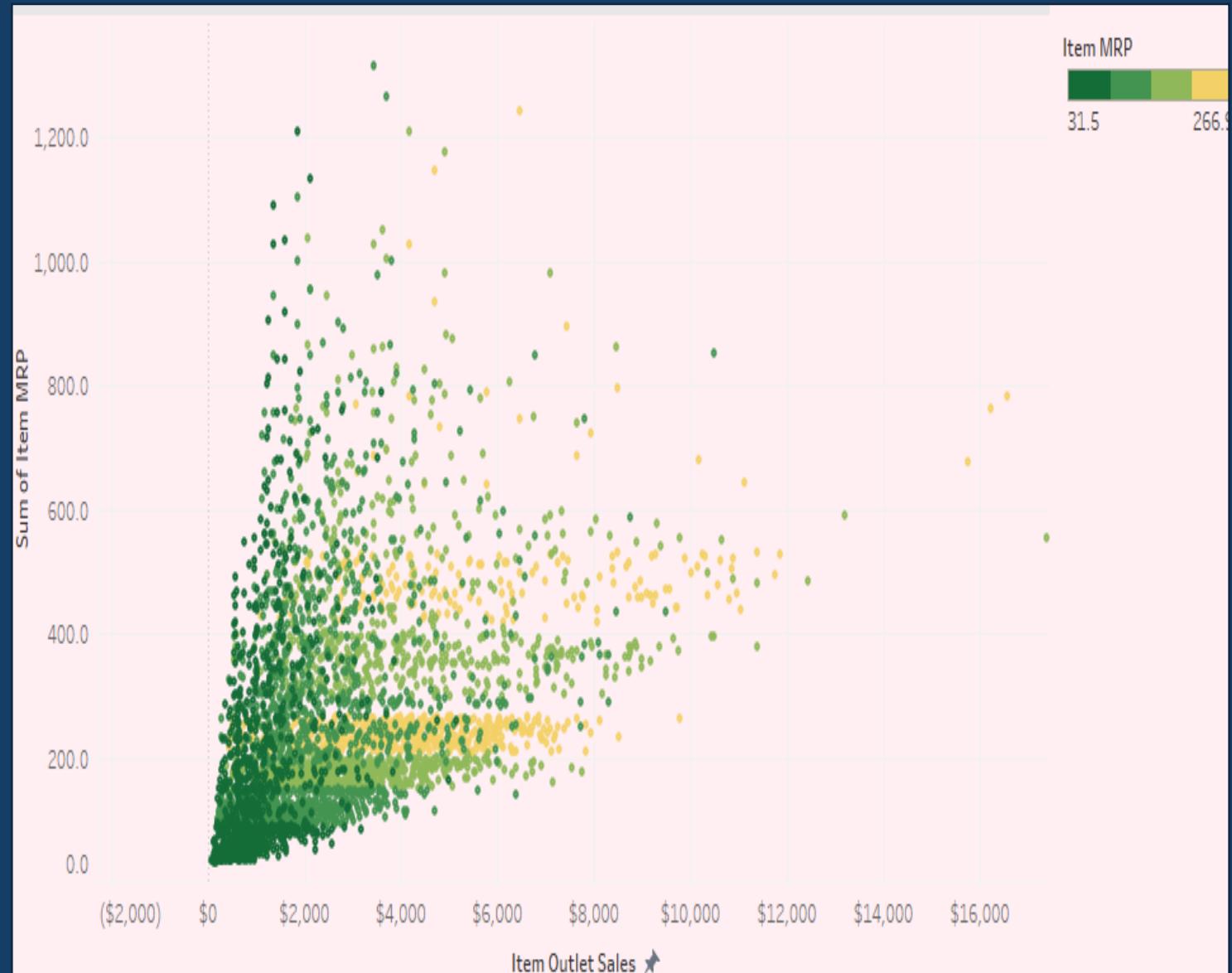
Sales by Item Fat Content

Compares sales across item types with different fat contents. Two fat content categories: Low Fat and Regular. Top three item types by sales volume: Snack Foods, Fruits and Vegetables, and Household items. Snack Foods have the highest sales in both Low Fat and Regular categories. The graph shows a higher proportion of sales for Low Fat items compared to Regular for most item types.



Price and Sales

Scatter plot shows there is a positive linear relationship between sales and price. As the price of the product increases, the sales also tend to increase. However, there are more data points with lower price and sales values, indicating that there are more products sold at lower prices. As prices increase, the data points become more scattered, suggesting that there is more variability in sales for products with higher prices.

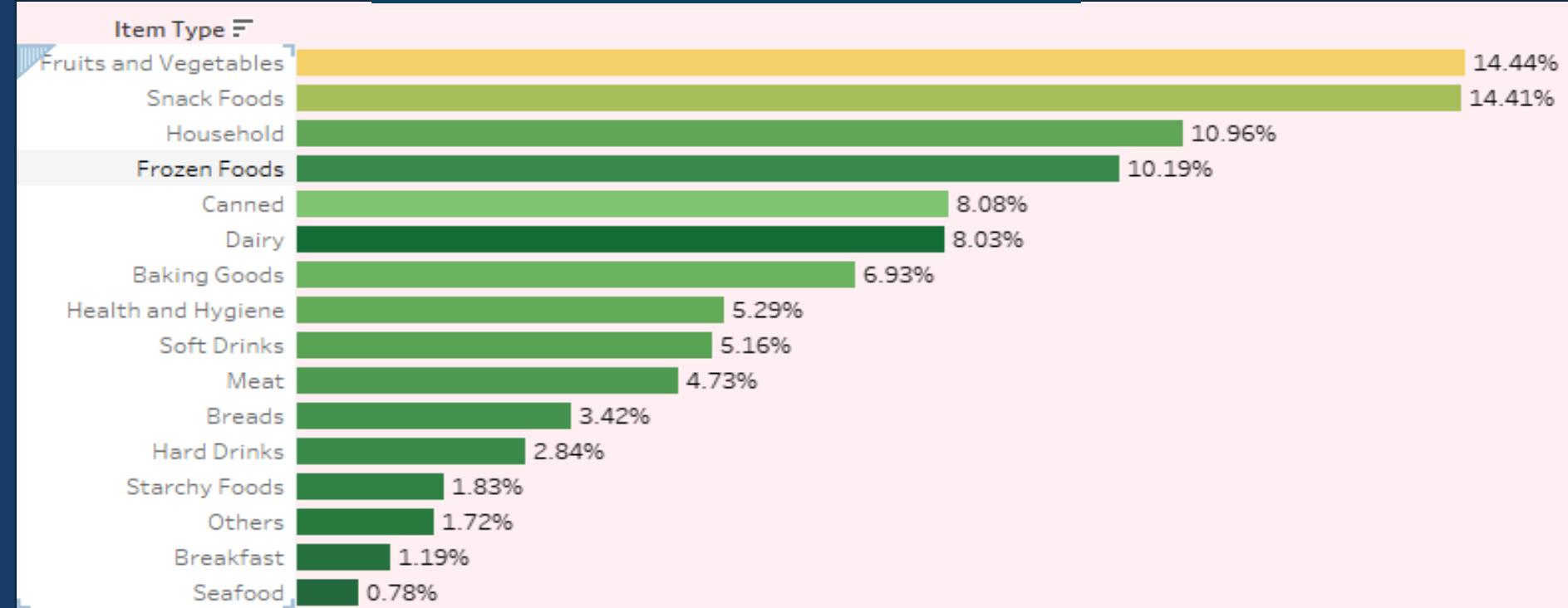


Pricing insights

Price per unit of item type

Top 5 costly items(avg)

Item Type	
Starchy Foods	\$151.26
Household	\$149.88
Dairy	\$149.48
Snack Foods	\$147.57
Seafood	\$146.60



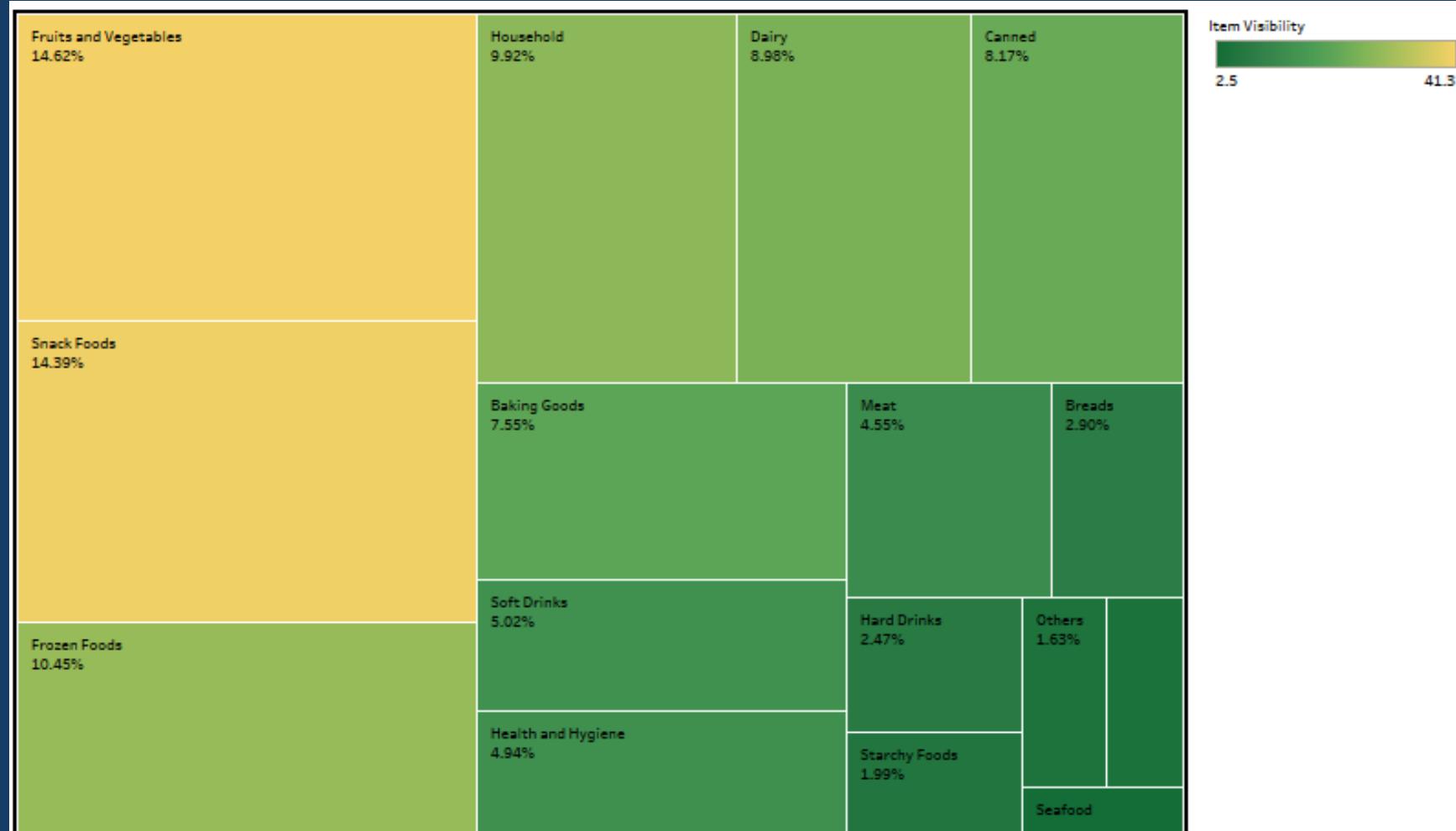
The first table shows the average maximum retail price (MRP) for each item type. Starchy foods have the highest average MRP at \$151.30, followed by dairy at \$149.50. This suggests that starchy foods and dairy products tend to be priced higher compared to other item types in the store.

The second table shows the percentage of total sales and the average price per unit for each item type in a retail store. It is clear from the table that fruits and vegetables and snack foods contribute the most to total sales, each accounting for over 14% of total sales. The average price per unit is also relatively high for these two categories, with fruits and vegetables having the highest average price per unit at \$855,788.50. On the other hand, seafood has the lowest percentage of total sales at 0.78% and the lowest average price per unit at \$46.26. This suggests that seafood is not a significant contributor to total sales in the store.

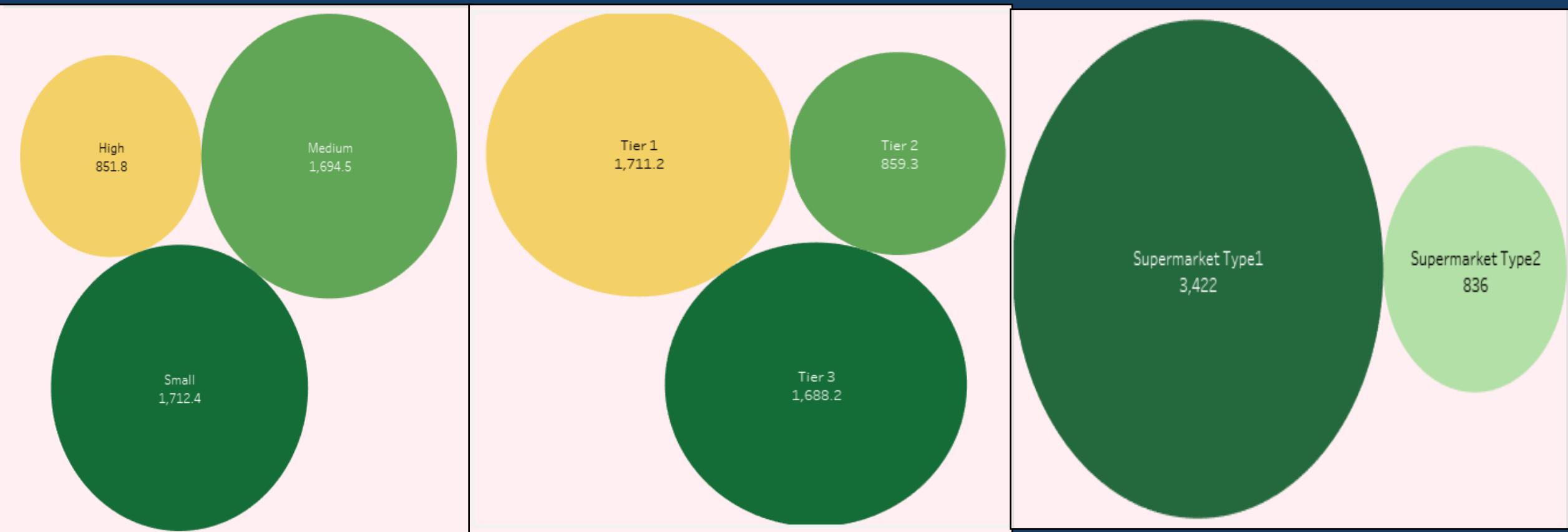
Sales by Item Visibility

The tree map indicates:

- "Fruits and Vegetables" and "Snack Foods" have the highest visibility among all categories, with percentages exceeding 14%.
- "Frozen Foods" and "Dairy" products also have significant visibility, averaging above 8%.
- Categories like "Baking Goods" and "Soft Drinks" have moderate visibility, with "Baking Goods" just above 7.5% and "Soft Drinks" around 5%.
- "Health and Hygiene" and "Meat" products have lower visibility, under 5%.
- The least visible categories include "Breads," "Hard Drinks," and "Starchy Foods," all under 3%, with "Others" and Breakfast having the lowest visibility, around 1.5%.



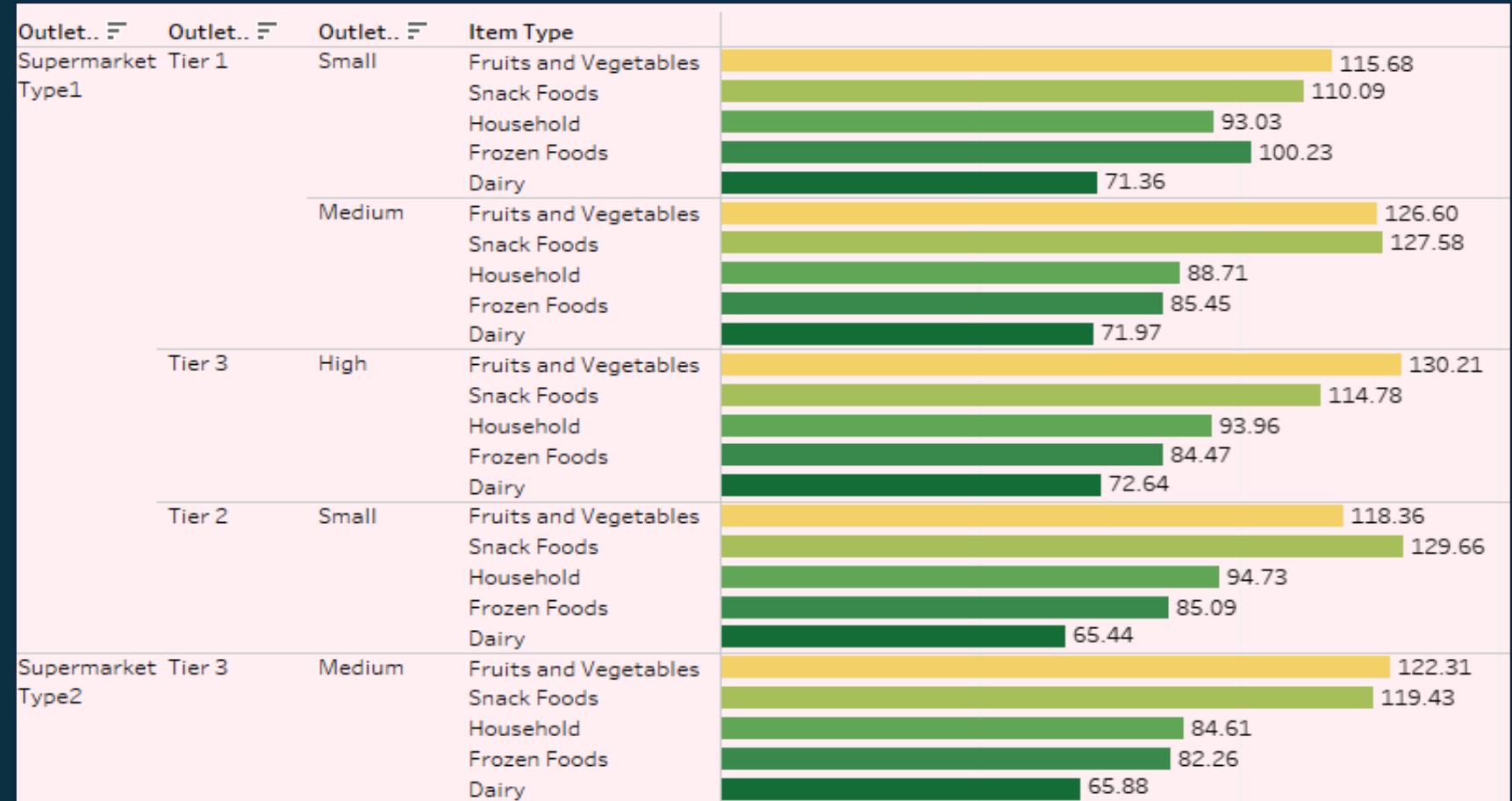
Profit Margin of Outlets by size location and type



The data shows that the majority of profit margin comes from small and medium-sized outlets, with 40.20% and 39.79% respectively. In terms of outlet location type, Tier 1 locations contribute the most to the total profit margin at 40.18%. Lastly, Supermarket Type1 outlets generate the highest profit margin at 80.36% compared to Supermarket Type2 at 19.64%.

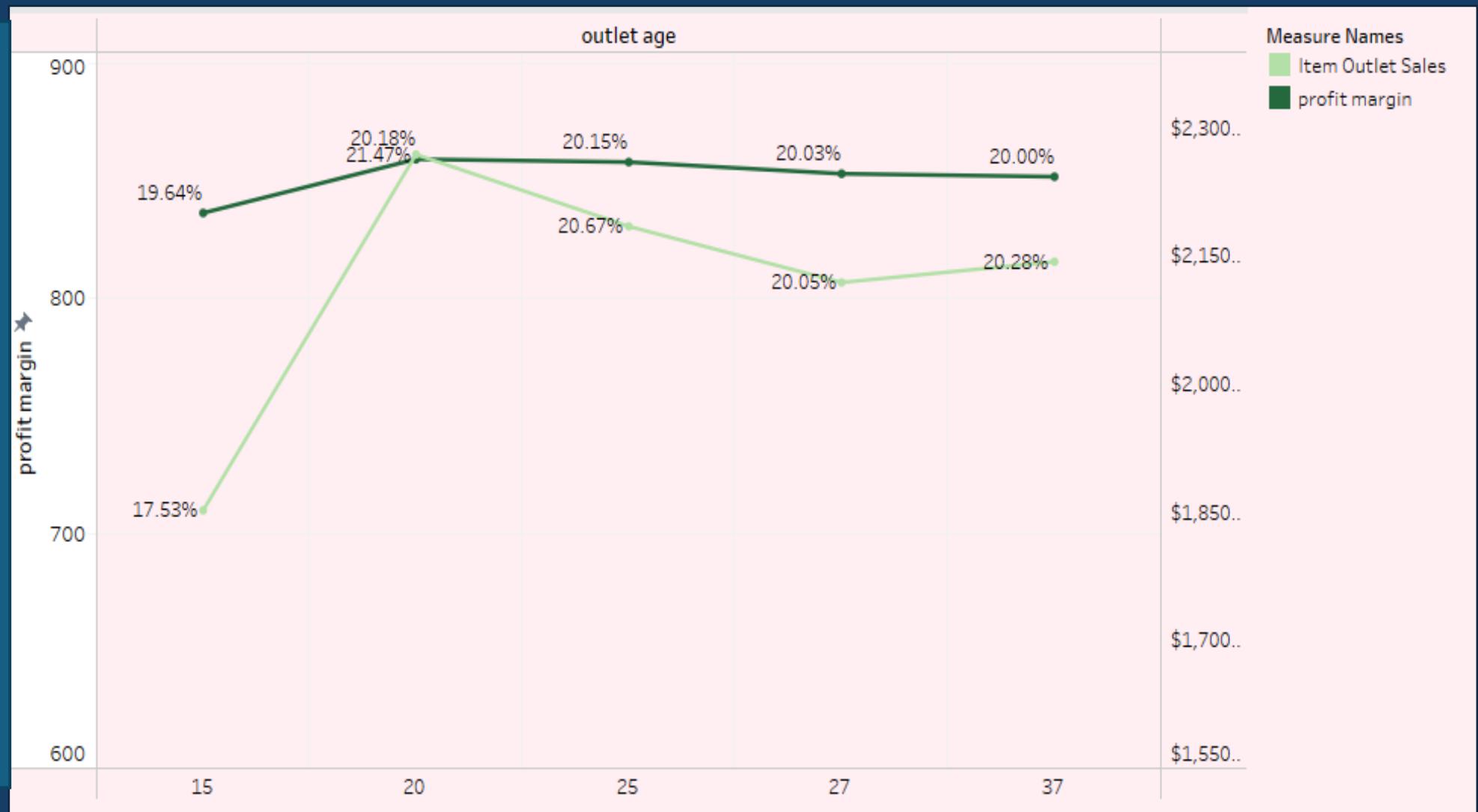
Profit margins of item types across all outlets

The profit margins for Fruits and Vegetables, Snack Foods, Household, Frozen Foods, and Dairy products vary based on the outlet location type, size, and type. Supermarket Type1 outlets in Tier 1 and Tier 3 locations tend to have higher profit margins compared to Supermarket Type2 outlets. Additionally, Medium-sized outlets generally have higher profit margins compared to Small and High-sized outlets. This information can help in making strategic decisions regarding product placement and pricing in different types of outlets.



Sales and profit margin trend over the outlet age

Outlet age 20 also has the highest percentage of total profit margin at 20.18%, while outlet age 37 has the lowest percentage at 20.00%. This suggests that outlet age 20 not only generates the highest sales volume but also has a higher profit margin compared to the other age categories.



Big Mart Sales Performance Analysis

Total Sales

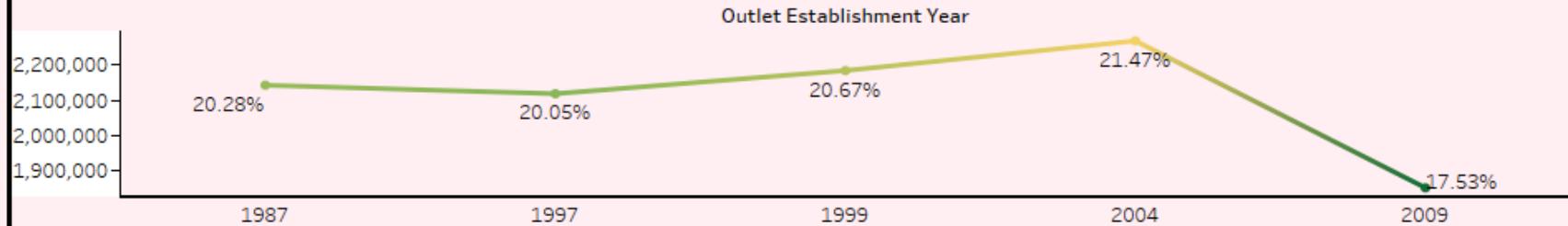
\$10,564,974

Total Outlets

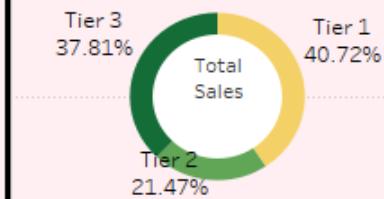
4,650

Sales and Inventories by Outlet and Location

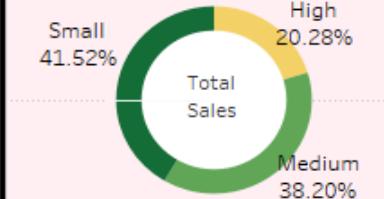
Sale trends over the years



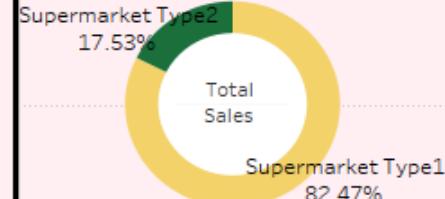
Sales by Location



Sales by Outlet Size

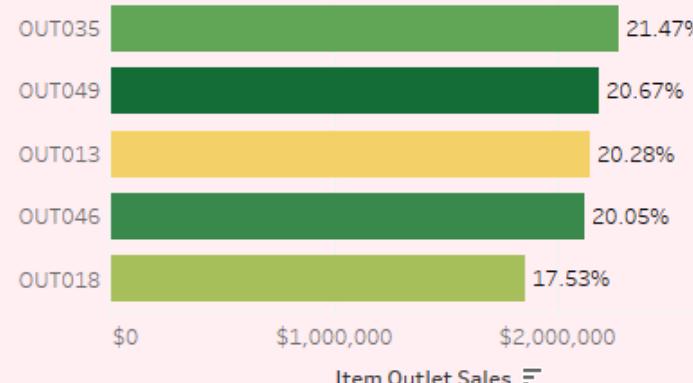


Sales by Outlet Type

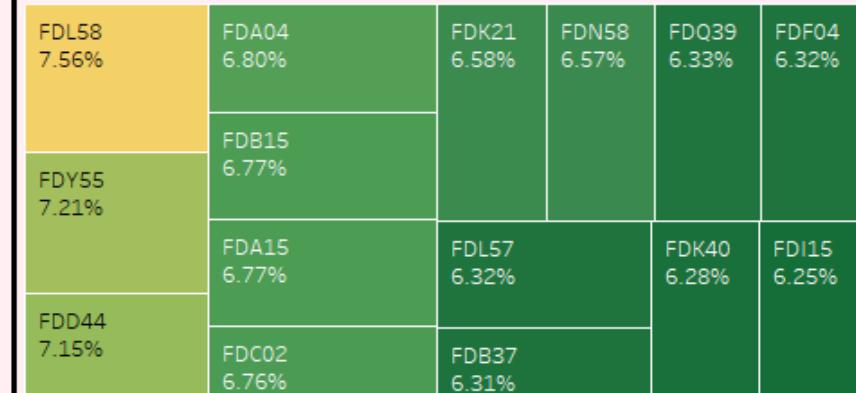


Tracking inventory by Outlet

Outlet Iden..



Tracking inventory by Item Sales



Big Mart Sales Performance Analysis Summary

Total Sales:

- The dashboard reports a substantial total sales figure of \$10,564,974, indicating the overall revenue performance of Big Mart outlets.

Trend Analysis of Yearly Sales:

- A temporal sales trend from 1987 to 2009 is depicted, showing a notable peak in 1997 at \$2,142,167. Following the peak, a decline is observed, culminating in sales of \$1,851,823 in 2009, which suggests potential market saturation, increased competition, or changes in consumer behavior.

Sales Distribution by Geographic Location:

- The sales are stratified by geographic tiers, with Tier 1 leading at 40.72%, closely followed by Tier 3 at 37.81%, and Tier 2 at 21.47%. This stratification may reflect the regional market penetration and consumer purchasing power in each tier.

Sales Comparison by Outlet Size:

- The distribution of sales by outlet size shows that "Small" outlets account for 41.52% of total sales, "Medium" outlets for 38.20%, and "High" outlets for 20.28%. This indicates that smaller outlets contribute a significant portion of sales, which may be due to higher numbers or strategic locations.



Big Mart Sales Performance Analysis Summary

Breakdown of Sales by Outlet Type:

The lion's share of sales is generated by "Supermarket Type1" at 82.47%, with "Supermarket Type2" contributing 17.53%. This stark contrast suggests varying sales dynamics and customer preferences across different supermarket formats.

Tracking inventory by Outlet:

Indicates a close range of item sales percentages among the outlets, with OUT035 leading marginally at 21.47% and OUT018 having the lowest at 17.53%. The percentages suggest a relatively even distribution of item sales across the outlets, with no single outlet dominating sales. They are rated as follows.

- OUT035: 21.47%
- OUT049: 20.67%
- OUT013: 20.28%
- OUT046: 20.05%
- OUT018: 17.53%

Tracking inventory by Item Sales

Highlights the top-selling items, with FDL58, FDY55, and FDD44 as the highest-selling items, indicating a higher customer demand or preference for these products. Notably, the percentages are quite close, pointing to a diverse spread in the popularity of items rather than a steep gradient of demand. Inventory by items sales are as follows.

- FDL58: 7.56%
- FDY55: 7.21%



Big Mart Sales Performance Analysis Summary

- FDD44: 7.15%
 - FDA15: 6.77%
 - FDB15: 6.77%
 - FDC02: 6.76%
 - FDK21: 6.58%
 - FDNS8: 6.57%
 - FDQ39: 6.33%
 - FDG04: 6.32%
 - FDL57: 6.32%
 - FDK40: 6.28%
 - FDJ15: 6.25%



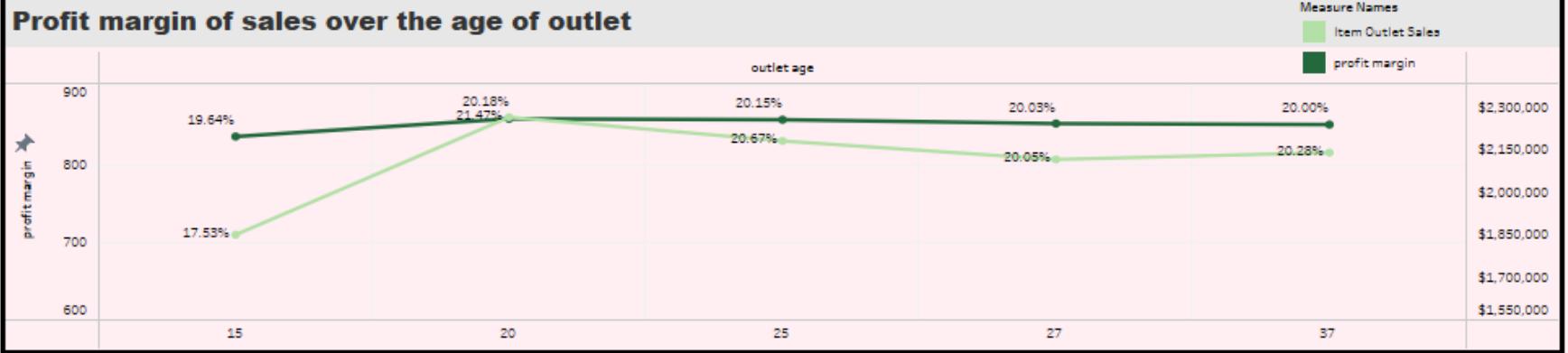
Outlet Profit and Product Price

Top 5 costly items(avg)

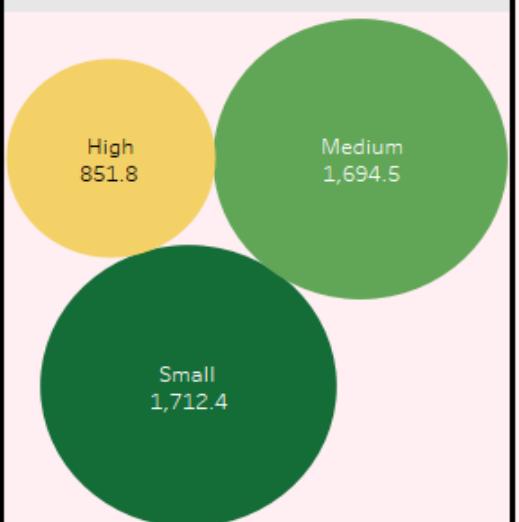
Item Type

Starchy Foods	\$151.26
Household	\$149.88
Dairy	\$149.48
Snack Foods	\$147.57
Seafood	\$146.60

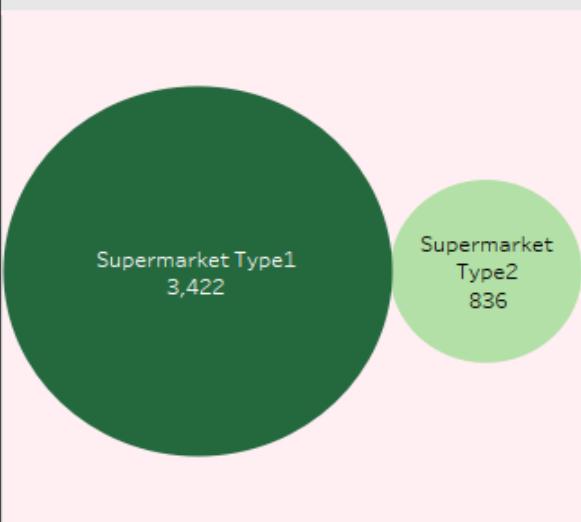
Profit margin of sales over the age of outlet



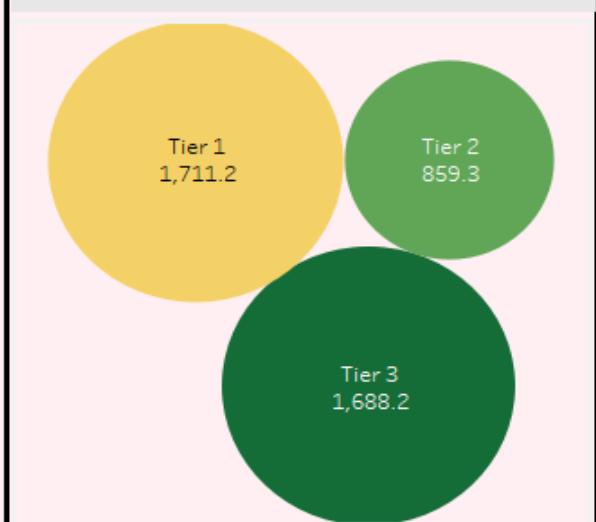
Total profit margin by outlet size



Profit margin by outlet type



Total profit margin by outlet location type



Outlet Profit and Product Price Analysis Summary

Product Pricing:

Top 5 Costly Items (Average Price):

- Our analysis reveals a trend where starchy foods, household items, and dairy products rank as the most expensive categories (Starchy Foods: \$151.26, Household: \$149.88, Dairy: \$149.47).

This suggests a potential price-based categorization within Big Mart's inventory. Analyzing these high-cost items can inform targeted pricing strategies, allowing for adjustments based on product cost and customer demand. The top 5 items are listed as follows.

- Starchy Foods: \$151.26
- Household: \$149.88
- Dairy: \$149.47
- Snack Foods: \$147.85
- Seafood: \$146.60

Outlet Age and Profitability:

Profit Margin of Sales Over the Age of Outlet:

The line graph depicts a noteworthy trend. There's a positive correlation between outlet age and profitability. Outlets operating for 27 years or more exhibit a higher profit margin exceeding 20%, while younger outlets (around 15 years) have a lower margin (approximately 17.35%). This trend suggests potential benefits associated with outlet maturity, such as increased efficiency, stronger customer loyalty, or a combination of factors. Further investigation is recommended to understand the specific reasons behind this correlation.



Outlet Profit and Product Price Analysis Summary

Optimizing Profitability Based on Outlet Size:

Total Profit Margin by Outlet Size:

The bubble chart visually represents the profit margin distribution across different outlet sizes. Medium outlets generate the highest overall profit margin (1,694.5), followed by small (1,712.4) and high outlets (851.8). This data can inform strategic decisions regarding expansion and resource allocation, suggesting a focus on replicating the success factors of medium-sized outlets while considering the specific needs of each size category.

- High: 851.8 (profit margin)
- Medium: 1,694.5 (profit margin)
- Small: 1,712.4 (profit margin)

Profitability Disparity Between Outlet Types:

Profit Margin by Outlet Type:

The bubble chart highlights a significant disparity in profitability between Supermarket Type 1 and Type 2. Supermarket Type 1 boasts a considerably higher profit margin (3,422) compared to Type 2 (836). Further research is necessary to understand the underlying reasons behind this difference. Factors such as location demographics, product mix, or operational efficiency could all play a role.

A bubble chart with the following values:

- Supermarket Type 1: 3,422 (profit margin)
- Supermarket Type 2: 836 (profit margin)



Outlet Profit and Product Price Analysis Summary

Location and Profitability: Unveiling Geographical Trends:

Total Profit Margin by Outlet Location Type:

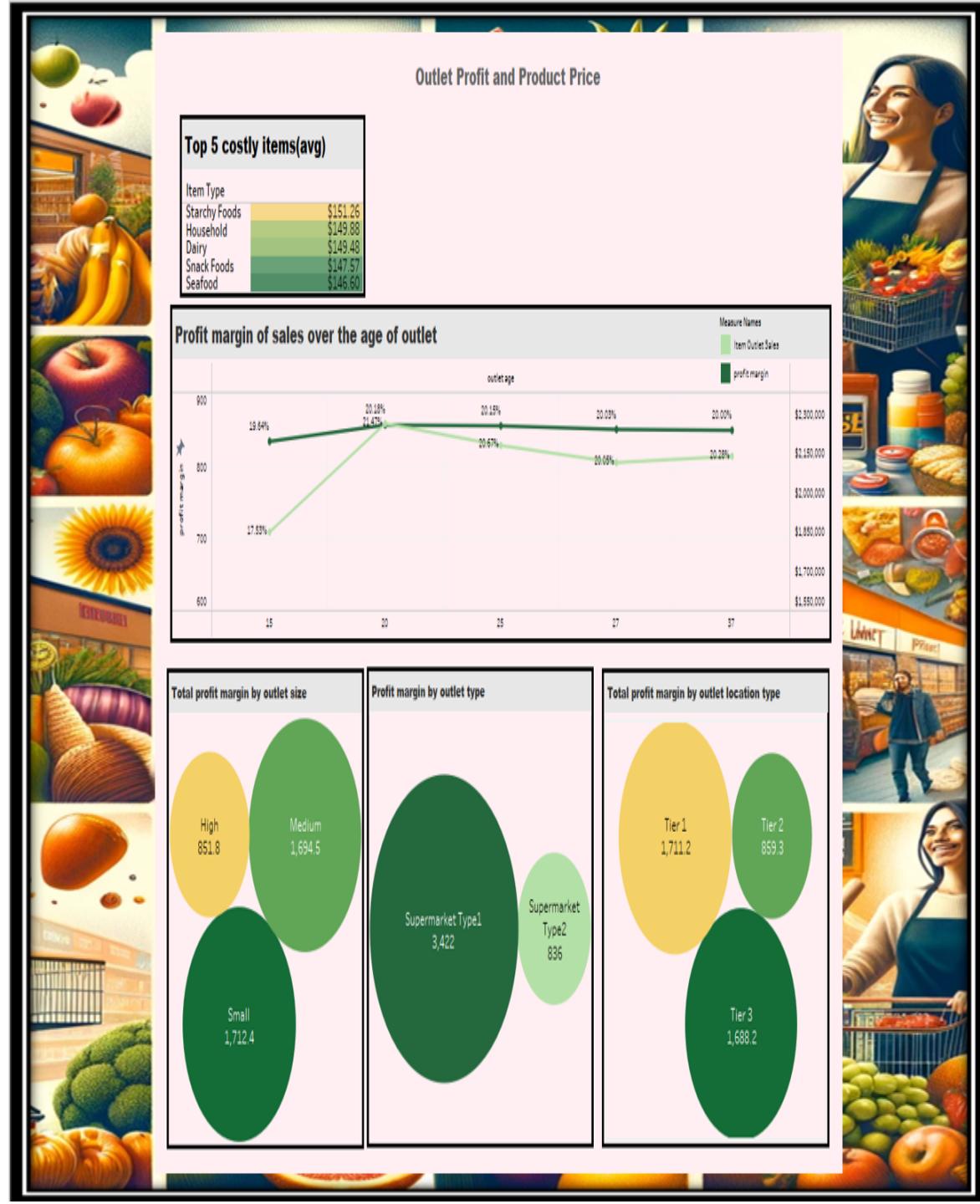
The final chart reveals a pattern in profitability across geographical tiers. Tier 1 and Tier 3 locations demonstrate a higher profit margin (1,711.2 and 1,688.2, respectively) compared to Tier 2 (859.3). Analyzing factors such as demographics, customer preferences, and competitor landscape within each tier can provide valuable insights for optimizing profitability across geographical locations.

A bubble chart with the following values:

- Tier 1: 1,711.2 (profit margin)
- Tier 2: 859.3 (profit margin)
- Tier 3: 1,688.2 (profit margin)

Conclusion:

By employing a multifaceted approach to data analysis, Big Mart can gain a deeper understanding of the factors influencing profitability across the company. The insights gleaned from product pricing, outlet age, size, type, and location can be utilized to develop targeted strategies for optimizing sales, maximizing profit margins, and achieving sustainable growth. This data-driven approach positions Big Mart to make informed decisions for long-term success.



Recommendations (Business Growth Strategies):

Product Performance:

- Focus on high-selling categories (Fruits & Vegetables, Snack Foods, Low Fat Household Items).
- Develop strategies to boost sales in underperforming categories (Seafood, Dairy, Regular Breakfast Items).

Outlet Performance:

- Maximize revenue growth in high-performing Tier 2 outlets through targeted marketing and inventory management.
- Improve performance in Tier 3 outlets (high & medium size) with product assortment

Pricing and Product Mix:

- Use MRP analysis to make strategic pricing decisions for maximum profitability.
- Optimize product mix in each outlet based on customer preferences and sales trends.

Outlet Identifier Analysis:

- Promote outlets with high sales contributions and develop strategies to increase sales in lower-performing outlets.
- Analyze sales data by outlet identifier to identify growth opportunities and implement targeted initiatives.

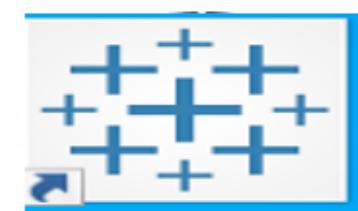


Conclusion:

- **Data-driven decisions:** Leverage insights from data analysis to optimize sales, profitability, and growth.
- **Product focus:** Prioritize high-selling categories and develop strategies for underperforming ones.
- **Outlet optimization:** Maximize revenue in Tier 2 outlets and improve Tier 3 performance through targeted strategies.
- **Pricing and product mix:** Utilize MRP analysis for strategic pricing and optimize product mix based on customer preferences.
- **Outlet analysis:** Promote high-performing outlets, develop strategies for lower performers, and leverage data to identify growth opportunities.
- **Strategic resource allocation:** Implement targeted initiatives based on data analysis to maximize revenue and achieve success.



THANK YOU



Tableau



Tableau Prep Builder