

Supermart Grocery Sales Analysis



Introduction

This project focuses on the analysis of Supermart grocery sales data using **SQL** and **Power BI**. The goal of this project is to extract meaningful insights from a dataset containing customer orders, product categories, sales, discounts, profits, and regional information. By leveraging SQL for data analysis and Power BI for visualization, I aim to provide a comprehensive understanding of the business's performance and help optimize decision-making processes.

Key objectives of this project:

- SQL Data Analysis:

- Perform detailed analysis of sales and profit trends across different product categories and regions.
- Identify the top-performing customers, cities, and sub-categories.
- Calculate total sales, profit, and profit margins to uncover key business drivers.
- Evaluate the relationship between product categories and profitability to provide actionable insights.

- Power BI Dashboard:

- Develop an interactive dashboard to visualize the key insights derived from the data.
- Track overall sales and profit performance, highlighting top categories and regions.
- Visualize the impact of discounts on sales and profit through charts.
- Display monthly sales trends and geographical performance across different cities and regions.
- Provide stakeholders with easy-to-interpret visuals to support data-driven business decisions.

This project highlights the combination of SQL for in-depth data querying and Power BI for dynamic reporting, offering a full-scale approach to analyzing and visualizing the grocery sales data effectively.

Problem Statements

- What is the total sales and profit for all orders in the dataset?
- Which categories (e.g., Food Grains, Bakery) generate the most sales?
- Which cities have the highest sales?
- Which product categories generate the most profit?
- What is the sales and profit distribution by region (North, South, West)?
- What is the average discount given across all orders?
- Who are the top 5 customers based on total sales?
- What are the sales trends by order date? (Analyze sales by month or year.)
- Which city has the highest profit margins?
- What are the top-performing sub-categories in terms of sales and profit?

Data cleaning in SQL

```
ALTER TABLE db.supermart
CHANGE COLUMN `Order ID` `order_id` VARCHAR(10);

ALTER TABLE db.supermart
CHANGE COLUMN `Customer Name` `customer_name` VARCHAR(100);

ALTER TABLE db.supermart
CHANGE COLUMN `Sub Category` `sub_category` VARCHAR(100);

UPDATE db.supermart
SET `Order Date` = STR_TO_DATE(`Order Date`, "%d-%m-%Y");

ALTER TABLE db.supermart
CHANGE COLUMN `Order Date` `order_date` DATE;
```

what is the total sales and profit for
all orders in the dataset?

```
1 • SELECT sum(Sales) AS Total_Sales, ROUND(sum(Profit)) AS Total_Profit  
2 FROM db.supermart;
```

	Total_Sales	Total_Profit
▶	14956982	3747121

which categories (e.g., Food Grains, Bakery) generate the most sales?

```
SELECT Category, sum(Sales) AS Total_Sales  
FROM db.supermart  
GROUP BY Category  
ORDER BY SUM(Sales) DESC  
LIMIT 4;
```

	Category	Total_Sales
▶	Eggs, Meat & Fish	2267401
	Snacks	2237546
	Food Grains	2115272
	Bakery	2112281



which cities have the highest sales?



```
SELECT city, SUM(Sales) AS Total_Sales  
FROM db.supermart  
GROUP BY city  
ORDER BY SUM(Sales) DESC  
LIMIT 5;
```

Result Grid | Filter Row

	city	Total_Sales
▶	Kanyakumari	706764
	Vellore	676550
	Bodi	667177
	Tirunelveli	659812
	Perambalur	659738

which product categories generate the most profit?

```
SELECT Category, ROUND(SUM(Profit),2) AS Total_Profit  
FROM db.supermart  
GROUP BY Category  
ORDER BY SUM(Profit) DESC  
LIMIT 3;
```

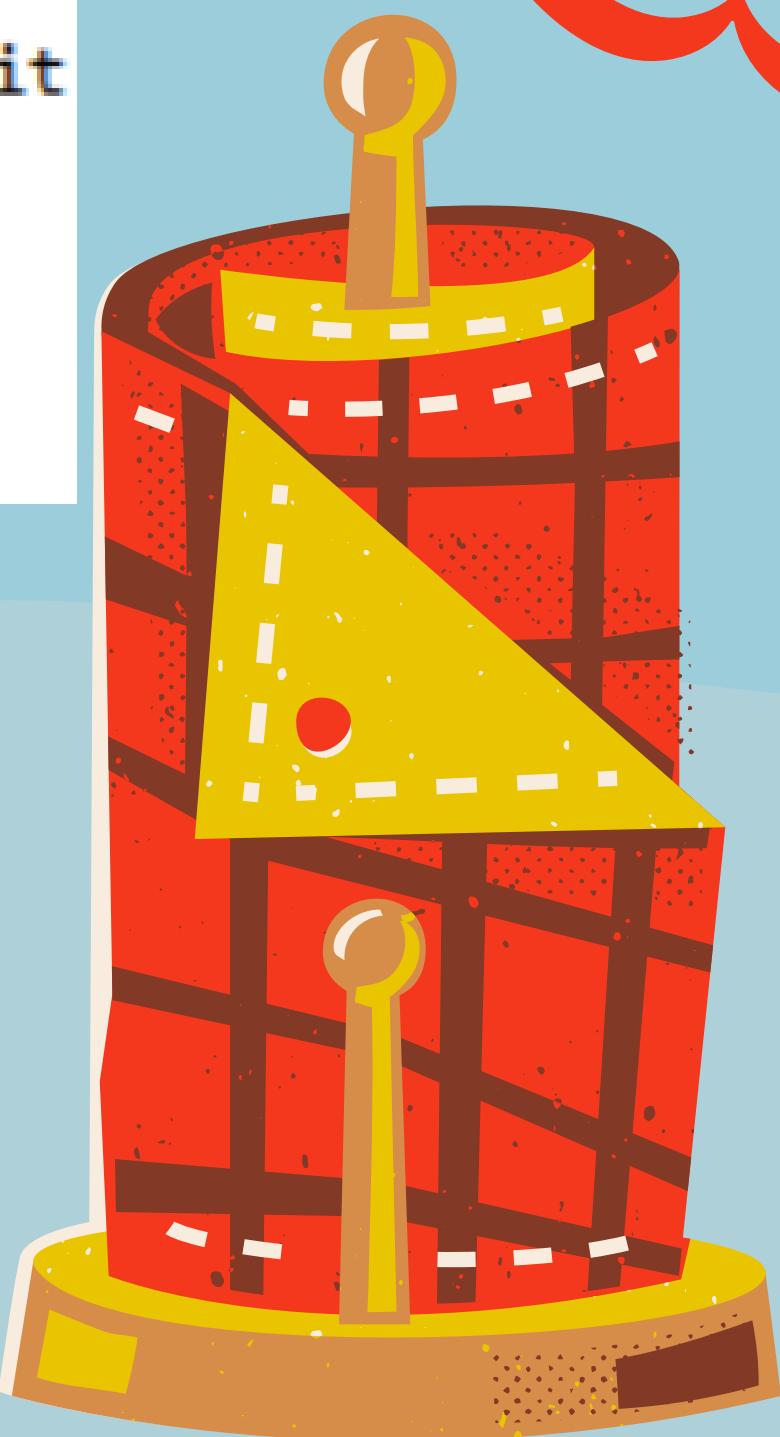
Result Grid | Filter Rows:

	Category	Total_Profit
▶	Snacks	568178.85
	Eggs, Meat & Fish	567357.22
	Fruits & Veggies	530400.38

What is the sales and profit distribution by region (North, South, West)?

```
SELECT Region, SUM(Sales) AS Total_Sales, ROUND(SUM(Profit),2) AS Total_Profit  
FROM db.supermart  
GROUP BY Region  
ORDER BY SUM(Sales) DESC, SUM(Profit) DESC;
```

	Region	Total_Sales	Total_Profit
▶	West	4798743	1192004.61
	East	4248368	1074345.58
	Central	3468156	856806.84
	South	2440461	623562.89
	North	1254	401.28



what is the average discount given across all orders?

```
SELECT AVG(Discount) AS average_discount  
FROM db.supermart;
```

Result Grid	
average_discount	0.2268170902541504



who are the top 5 customers based on total sales?



```
SELECT customer_name, SUM(Sales) AS total_sales  
FROM db.supermart  
GROUP BY customer_name  
ORDER BY total_sales DESC  
LIMIT 5;
```

Result Grid | Filter Rows

	customer_name	total_sales
▶	Krithika	334361
	Amrish	333351
	Verma	331665
	Arutra	325720
	Vidya	321798



Sales Trends Over Time

What are the sales trends by order date? (Analyze sales by month.)

```
SELECT SUM(Sales) AS Total_Sales, MONTH(order_date) AS Month  
FROM db.supermart  
GROUP BY MONTH(order_date)  
ORDER BY SUM(Sales) DESC  
LIMIT 5;
```

Total_Sales	Month
2193924	11
2088076	12
2064266	9
1243289	10
1089385	7

What are the sales trends by order date? (Analyze sales by year.)

```
SELECT SUM(Sales) AS Total_Sales, YEAR(order_date) AS Year  
FROM db.supermart  
GROUP BY YEAR(order_date)  
ORDER BY SUM(Sales) DESC;
```

Total_Sales	Year
4977512	2018
3871912	2017
3131959	2016
2975599	2015

which city has the highest profit margins?

```
SELECT City, ROUND((SUM(Profit) / SUM(Sales)) * 100,2) AS Profit_Margin  
FROM db.supermart  
GROUP BY City  
ORDER BY profit_margin DESC  
LIMIT 3;
```

Result Grid | Filter Row

	City	Profit_Margin
▶	Karur	26.36
	Bodi	26.03
	Perambalur	25.94

what are the top-performing sub-categories in terms of sales and profit

```
SELECT sub_category, SUM(Sales) AS Total_Sales, ROUND(SUM(Profit),2) AS Total_Profit  
FROM db.supermart  
GROUP BY sub_category  
ORDER BY Total_Sales DESC, Total_Profit DESC  
LIMIT 5;
```



Result Grid | Filter Rows:

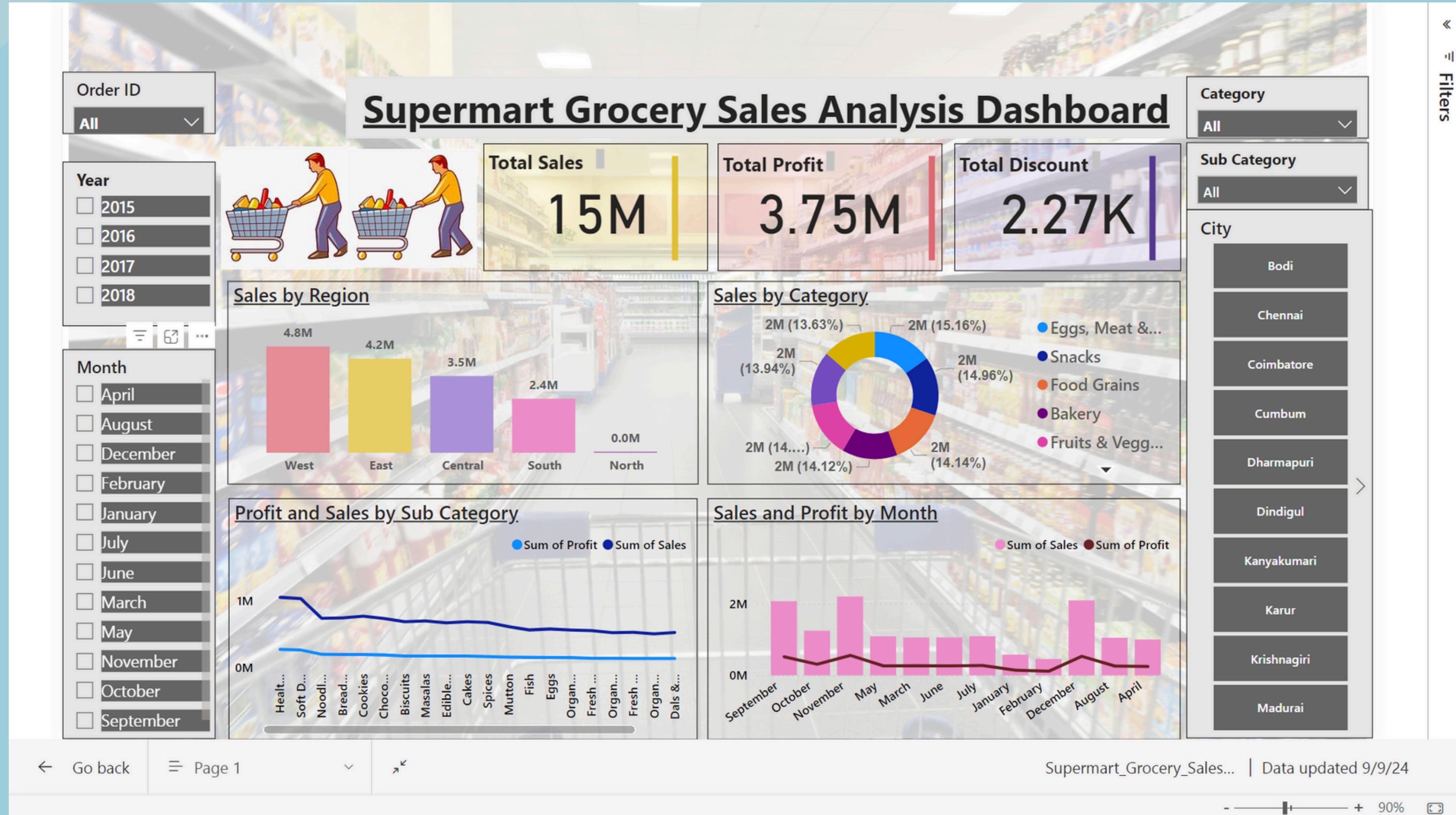
	sub_category	Total_Sales	Total_Profit
▶	Health Drinks	1051439	267469.79
	Soft Drinks	1033874	258135.97
	Cookies	768213	190643.7
	Breads & Buns	742586	190764.98
	Noodles	735435	193685.81



Supermart Sales Analysis Dashboard

Dashboard Link:-

<https://app.powerbi.com/groups/me/reports/b5f91bd9-3226-425f-b75d-9b9a6c35d533/c48bdead164851cc168b?experience=power-bi>



Key Insights

- **Top-Performing Categories:** ‘Eggs, Meat & Fish’, ‘Snacks’ and ‘Food Grains’ emerged as the **top-selling** categories while ‘Snacks’, ‘Eggs, Meat & Fish’ and ‘Fruits & Veggies’ emerged as the **most profitable** categories.
- **High-Contributing Customers:** Krithika, Amrish and Verma were among the **top customers**, generating the **highest sales volumes**.
- **City-Based Performance:** Kanyakumari, Vellore and Bodi were the **top cities in terms of sales** while Karur, Bodi and Perambalur were the **top cities in terms of profit**.
- **Profitability by Region:** The **West** and **East** regions outperformed in sales, indicating stronger demand and better market penetration in these areas.
- **Sales Trends:** The months from **September to December** saw a significant **rise in sales**, aligning with **festive seasons and promotional periods**. And **year 2017** showed the **highest overall sales**, indicating growth in the customer base and product demand.

Suggestions for Improvement

1. Leverage Top-Performing Categories:

Continue to focus on high-selling categories like Eggs, Meat & Fish, Snacks, and Food Grains by ensuring their availability, especially during high-demand periods.

Given the profitability of Snacks, Eggs, Meat & Fish, and Fruits & Veggies, increase promotional efforts for these categories to further maximize profits.

2. Engage High-Contributing Customers:

Implement loyalty or rewards programs targeting top customers like Krithika, Amrish, and Verma, offering personalized discounts or exclusive offers to maintain their loyalty and increase their purchase frequency.

Encourage these customers to explore other profitable product categories with cross-category promotions.

3. Expand Presence in High-Performing Cities:

Focus on enhancing marketing and distribution in cities like Kanyakumari, Vellore, and Bodi, where sales performance is strong.

Invest in strategies to boost sales in Karur, Bodi, and Perambalur, which have shown high profit margins, suggesting a favorable market for premium or high-margin products.

4.Target Regional Growth:

Strengthen your market penetration in the West and East regions by expanding distribution channels, increasing advertising efforts, and offering region-specific promotions to further boost sales.

Consider introducing regionally tailored product lines to cater to localized preferences, helping you tap into untapped demand in these areas.

5.Optimize Sales During Peak Seasons:

Plan for increased inventory and marketing efforts from September to December, coinciding with the festive season, to capture the peak in demand and maximize revenue.

Leverage the high sales in 2017 to identify growth strategies that can be applied to future years, such as recurring seasonal promotions or expanding your product assortment during high-demand months.

6.Discount and Pricing Strategy:

Offer moderate discounts on top-selling and high-profit categories to maintain profitability while driving sales.

Use data-driven pricing strategies to optimize margins, especially for the highly profitable categories such as Snacks and Fruits & Veggies, without compromising on sales volume.