



# RETAIL SHOP ANALYSIS

MS-Excel, PostgreSQL & Power BI



# DISCRIPTION

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## Project Overview

The Retail Shop Sales Analysis project is a comprehensive data analysis project that utilizes PostgreSQL and Power Excel to provide insights into the sales performance of a retail shop. The project aims to analyze sales data to identify trends, patterns, and correlations, enabling informed business decisions to drive growth and profitability.

## Project Objectives

The primary objectives of this project are:

- To design and implement a database using PostgreSQL to store and manage sales data
- To develop a data analysis framework using Power Excel to extract, transform, and load (ETL) data from the database
- To perform descriptive analytics on sales data to identify key trends and patterns
- To develop visualizations and reports to communicate insights to stakeholders

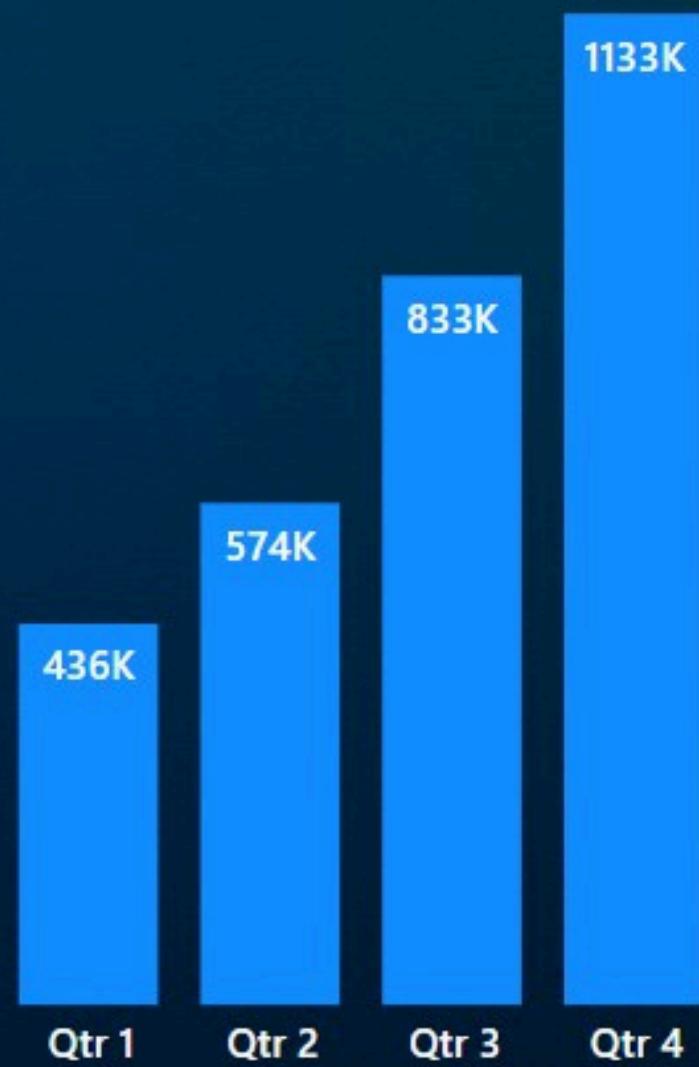
## Sales Analysis

- Performed descriptive analytics on sales data to identify key trends and patterns, including:
  - Sales by product category and subcategory
  - Sales by store location and region
  - Sales by customer demographics and behavior
  - Sales by time of day, day of week, and seasonality
- Developed visualizations and reports to communicate insights to stakeholders, including:
  - Bar charts and histograms to display sales distributions
  - Line charts and area charts to display sales trends
  - Scatter plots and heatmaps to display correlations and relationships

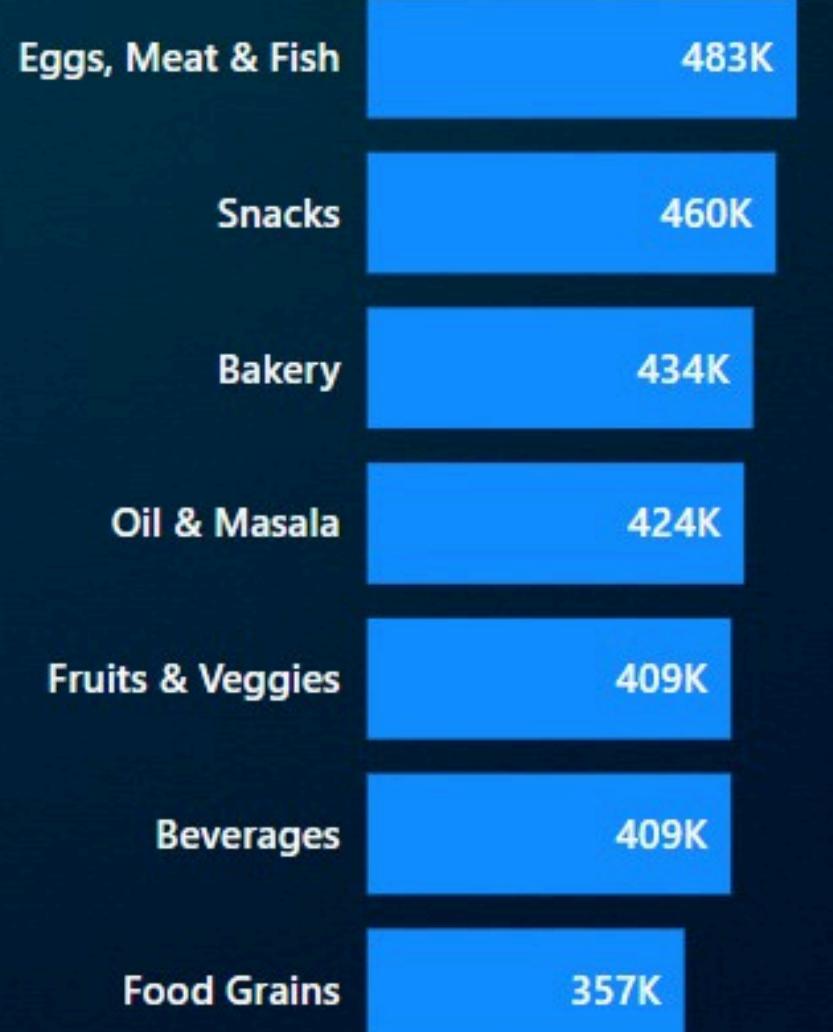
## Conclusion

The Retail Shop Sales Analysis project is a comprehensive data analysis project that leverages the power of PostgreSQL and Power Excel to provide actionable insights into sales performance. By analyzing sales data and identifying key trends and patterns, the project enables informed business decisions to drive growth and profitability.

## Total sales by Quarter



## Total sales by Category



## Total sales by Month



## 1993

TOTAL VISITS



## 2976K

TOTAL SALES



## 2,223K

TOTAL COST



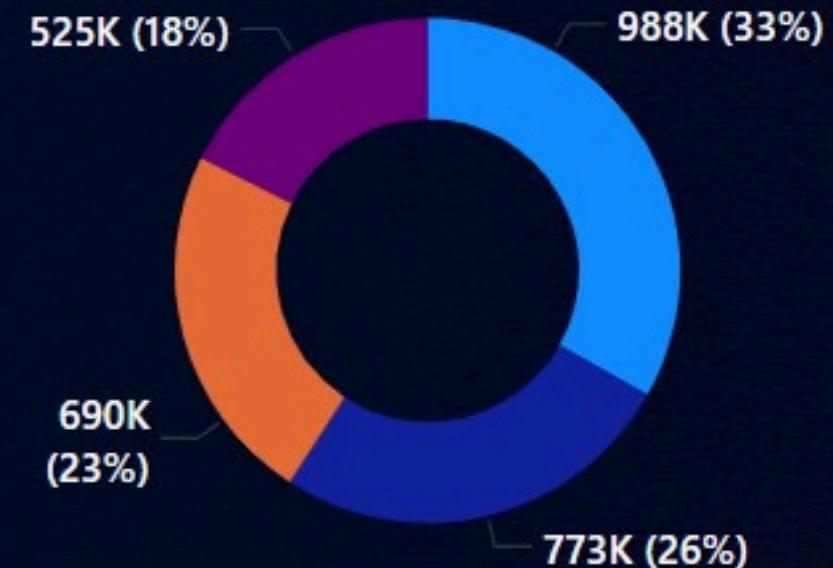
## 753K

TOTAL PROFIT



## Total sales by Region

West East Central South

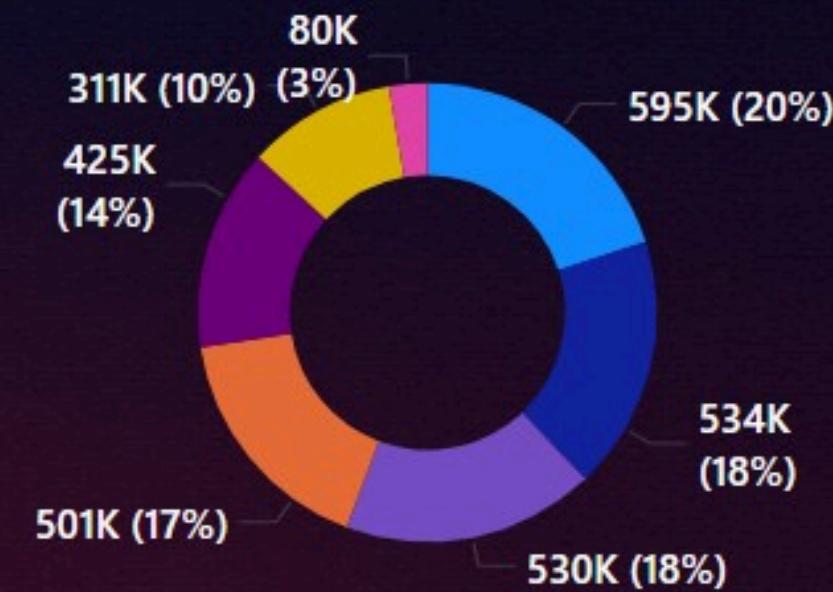


## Total sales by City

Vellore	159K
Salem	149K
Pudukkottai	146K
Bodi	142K
Ooty	141K
Perambalur	137K
Theni	137K
Chennai	137K
Tenkasi	133K
Tirunelveli	129K
Virudhunagar	126K
Karur	125K
Kanyakumari	121K
Nagercoil	120K
Namakkal	116K
Dindigul	114K
Cumbum	112K
Coimbatore	107K
Dharmapuri	107K

## Total Profit by Days

Tuesday Saturday Wednesday Sunday

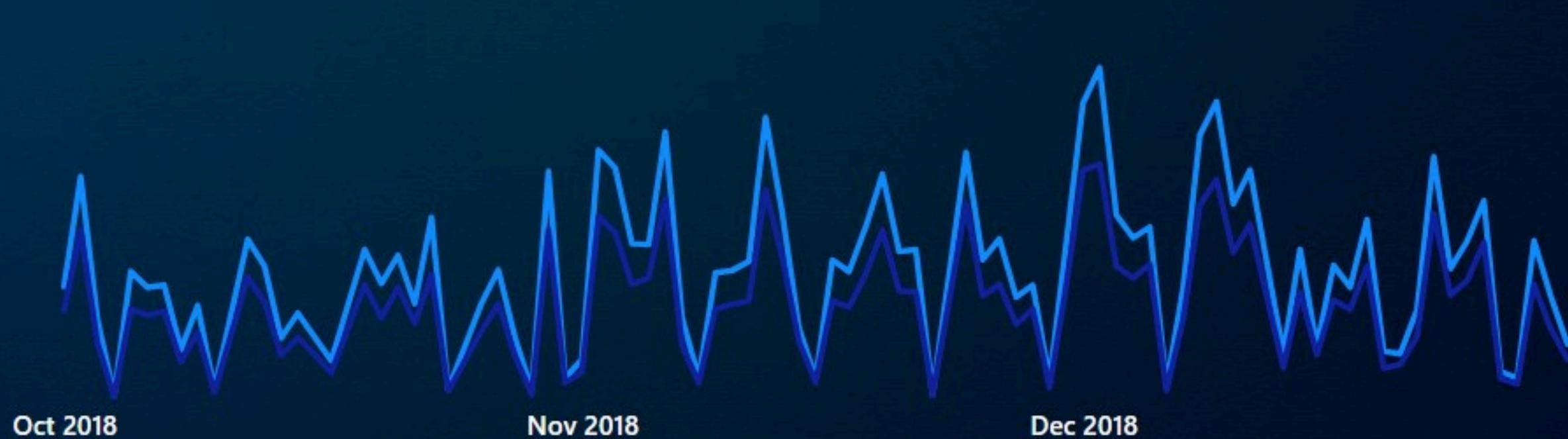


10/1/2018



### Sales vs Profit

Sales Cost



Bakery Bevera... Eggs, ... Food G... Fruits ...



West Central East



### Sales vs Profit

Sales Profit

Virudhunagar	3355
	615
Dharmapuri	2325
	558
Salem	2246
	270
Coimbatore	1963
	530
Trichy	1879
	564
Theni	1668
	284
Bodi	1231
	111
Viluppuram	1080
	108
Karur	1069
	224
Nagercoil	913
	374
Tirunelveli	727
	247

## Customer Demographics

TOTAL VISITS

186

MAXIMUM PURCHASE

2496

AVERAGE PURCHASE

1.53K

TOTAL SALES

283735

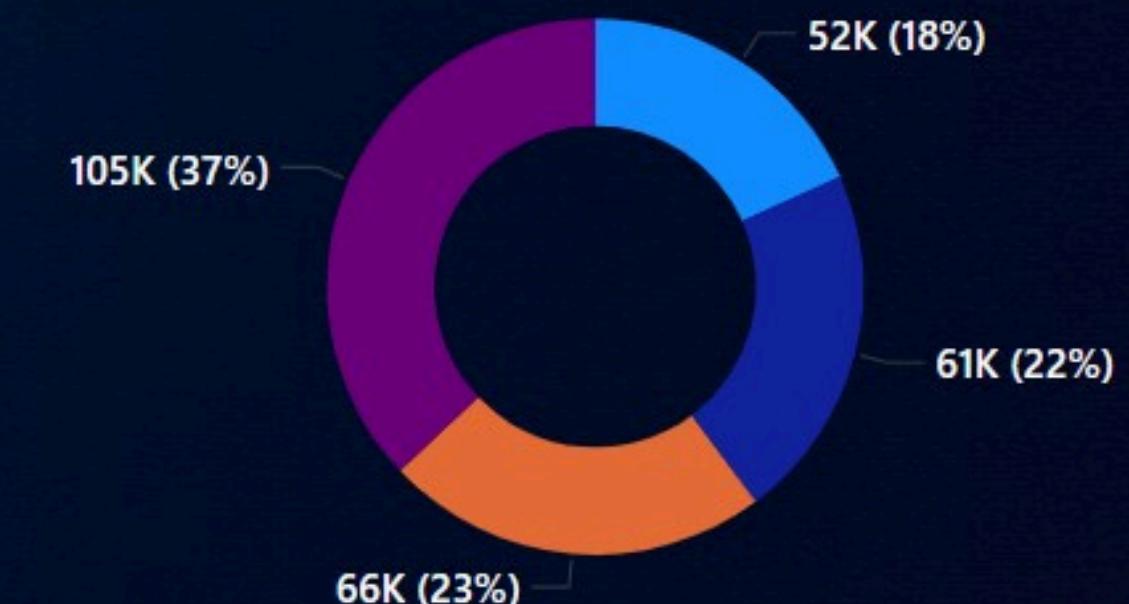
## Select Customer

- Adavan
- Aditi
- Akash
- Alan
- Amrish
- Amy
- Anu
- Arutra
- Arvind
- Esther
- Ganesh
- Hafiz
- Harish
- Haseena
- Hussain
- Jackson
- James

Customer Name	City	Sub Category	Sales
Anu	Bodi	Chicken	1381
Anu	Bodi	Edible Oil & Ghee	888
Anu	Bodi	Edible Oil & Ghee	997
Anu	Bodi	Eggs	1311
Anu	Bodi	Fish	791
Anu	Bodi	Health Drinks	1508
Anu	Bodi	Mutton	2496
Anu	Chennai	Chocolates	1018
Anu	Chennai	Cookies	2458
Anu	Chennai	Dals & Pulses	1650
Anu	Chennai	Fish	609
Anu	Chennai	Fish	2198
Anu	Chennai	Health Drinks	1405
Anu	Chennai	Health Drinks	2028
Anu	Chennai	Health Drinks	2418
Anu	Chennai	Organic Fruits	839
Anu	Chennai	Organic Vegetables	651
Anu	Chennai	Organic Vegetables	2152
Anu	Chennai	Organic Vegetables	2274
Anu	Chennai	Spices	2451
Anu	Coimbatore	Breads & Buns	1258
Anu	Coimbatore	Breads & Buns	1485
Anu	Coimbatore	Breads & Buns	1787

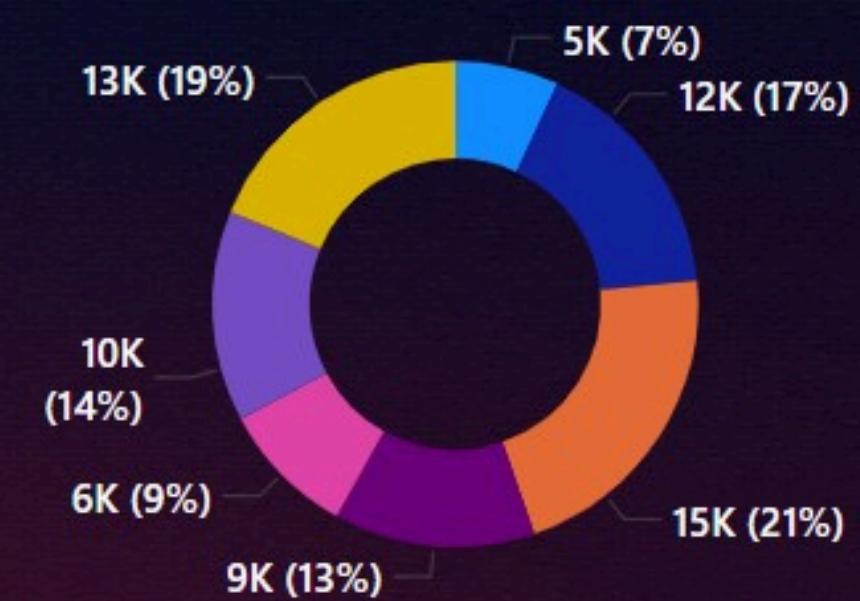
## Total of Sales by Year

- 2015
- 2016
- 2017
- 2018



## Total Profit by Category

- Bakery
- Beverages
- Eggs, Meat & Fish
- Food Grains
- Fruits & Veggies
- Oil & Masala
- Snacks



Query History

```
1 --Display distinct Category and Sub_Category from the grocery_sales table.
2 select distinct category from grocery_sales;
3 select distinct sub_category from grocery_sales;
4
5 --List all sales records made in the year 2018.
6 select * from grocery_sales
7 where order_date > '2017-12-31';
8
9 --Retrieve the total number of orders placed in each City.
10 select city, count(order_id) as total_ordrs
11 from grocery_sales
12 group by city
13 order by total_ordrs desc;
14
15 --Find the total sales amount from the grocery_sales table.
16 select sum(sales)
17 from grocery_sales;
18
19 --Retrieve the total profit made in each Region.
20 select region, sum(profit) Total_profit
21 from grocery_sales
22 group by region
23 order by Total_profit desc;
24
25 --List the top 5 customers who made the highest purchases in terms of Sales.
26 select customer_name, sum(sales) Total_sales
27 from grocery_sales
28 group by customer_name
29 order by Total_sales
30 limit 5;
31
32 --Show records for orders that were placed in December of any year.
33 select * from grocery_sales
34 where extract(month from order_date) = 12;
35
36 --Count the number of orders placed in each Statee.
37 select statee, count(order_id) Total_orders
38 from grocery_sales
39 group by statee
40 order by Total_orders desc;
41
42
43
44
45
46
47
```

Total rows: 1 of 1    Query complete 00:00:00.248    Ln 10, Col 43

Query History

```
13 order by total_ordrs desc;
14
15 --Find the total sales amount from the grocery_sales table.
16 select sum(sales)
17 from grocery_sales;
18
19 --Retrieve the total profit made in each Region.
20 select region, sum(profit) Total_profit
21 from grocery_sales
22 group by region
23 order by Total_profit desc;
24
25 --List the top 5 customers who made the highest purchases in terms of Sales.
26 select customer_name, sum(sales) Total_sales
27 from grocery_sales
28 group by customer_name
29 order by Total_sales
30 limit 5;
31
32 --Show records for orders that were placed in December of any year.
33 select * from grocery_sales
34 where extract(month from order_date) = 12;
35
36 --Count the number of orders placed in each Statee.
37 select statee, count(order_id) Total_orders
38 from grocery_sales
39 group by statee
40 order by Total_orders desc;
41
42
43
44
45
46
47
```

Total rows: 1 of 1    Query complete 00:00:00.248    Ln 10, Col 43

Query History

```

1 --Identify orders where the profit margin (Profit/Sales) is less than 5%.
2 select order_id, round(profit/sales,3)
3   from grocery_sales
4 where round(profit/sales,3) < 0.05;
5
6 --Calculate the average discount given per region.
7 select region, round(avg(discount),2) as avg_discount
8   from grocery_sales
9 group by region
10 order by avg_discount desc;
11
12 --Find the month with the highest sales for each year.
13 with xx as
14 (with x as
15 (select extract(year from order_date) as Year,
16 extract(month from order_date) as Month, sum(sales) as Total_sales
17   from grocery_sales
18 group by year,month
19 order by year,month asc)
20 select x.*,
21 row_number() over (partition by year order by x.Total_sales desc) as rn
22 from x)
23 select xx.year as Sales_Year, xx.month as Sales_Month, xx.Total_sales as Total_Sales
24   from xx
25 where xx.rn = 1
26
27 --List the top 10 products (Sub_Category) that generated the highest profit.
28 select Sub_category, sum(profit) as Total_Profit
29   from grocery_sales
30 group by Sub_category
31 order by Total_Profit desc
32 limit 10;
33
34
35

```

Total rows: 10 of 10    Query complete 00:00:00.170    Ln 25, Col 16

Dashboard X Processes X  Grocery/postgres@PostgreSQL 13\*

Query History

```

1 --Calculate the total sales, profit, and discount by Category and Sub_Category.
2 select category, sum(sales), sum(profit), sum(discount)
3   from grocery_sales
4 group by category;
5
6 select sub_category, sum(sales), sum(profit), sum(discount)
7   from grocery_sales
8 group by sub_category;
9
10 --Find the top 3 cities with the highest total sales.
11 select city, sum(sales) Total_sales
12   from grocery_sales
13 group by city
14 order by Total_sales desc
15 limit 3;
16
17 --List customers who have made more than 200 purchase.
18 select customer_name, count(order_id) as Total_purchase
19   from grocery_sales
20 group by customer_name
21 having count(order_id) > 200;
22
23 --Retrieve the total sales and profit for each year (2015-2018).
24
25 select tb1.Sales_2015, tb1.profit_2015, tb2.Sales_2018, tb2.profit_2018
26   from
27 (select sum(sales) as Sales_2015, sum(profit) as profit_2015, 1 as x
28   from grocery_sales
29 where extract(year from order_date) = 2015) as tb1
30 join
31 (select sum(sales) as Sales_2018, sum(profit) as profit_2018, 1 as x
32   from grocery_sales
33 where extract(year from order_date) = 2018) as tb2
34 on tb1.x=tb2.x;
35

```

Total rows: 1 of 1    Query complete 00:00:00.254    Ln 35, Col 1

```
1 --Compare total sales and profit year over year (YoY) for each region.
2 select s1.Year, s1.Region, s1.Total_sales, s1.Prev_y_Sales,
3 round((s1.Total_sales - s1.Prev_y_Sales)/s1.Prev_y_Sales)*100,2) as Sales_YoY_Growth,
4 s1.Total_Profit, s1.Prev_y_Profit,
5 round((s1.Total_Profit - s1.Prev_y_Profit)/s1.Prev_y_Profit)*100,2) as Profit_YoY_Growth
6 from
7 (with x As (select extract(year from order_date) as Year,
8 region, sum(sales) Total_sales, sum(profit) as total_profit
9 from grocery_sales
10 group by year, region
11 order by region, year asc)
12 select x.*,
13 lag(x.Total_sales) over (partition by region) as Prev_Y_sales,
14 lag(x.Total_Profit) over (partition by region) as Prev_Y_Profit
15 from x) as s1;
16
```

```
1 ---Create a report showing the percentage contribution of each region to total sales.
2 with x as
3 (select region,sum(sales) sales_by_region,
4 (select sum(sales) from grocery_sales) as Total_sales
5 from grocery_sales
6 group by region
7 order by Total_sales desc)
8 select x.region,
9 round((x.sales_by_region/x.Total_sales)*100,2)|| '%' as Sales_contribution
10 from x
11 order by Sales_contribution desc;
12
13
14 --Identify the sub-categories where discounts are most frequently applied
15 --and analyze their impact on profit.
16 select sub_category, count(discount), sum(discount)
17 from grocery_sales
18 where discount > 0
19 group by sub_category;
20
21
22
```

```
1 --Write a query to find the top 5 order with the maximum profit margin (Profit/Sales).
2 select order_id, (sales - cost_price) as margin
3 from grocery_sales
4 order by margin desc
5 limit 5;
6
7 --Identify regions where total sales have increased every year from 2015 to 2018.
8 select s1.region
9 from
10 (with x As
11 (select extract(year from order_date) as Year,
12 region, sum(sales) Total_sales
13 from grocery_sales
14 group by year, region
15 order by region, year asc)
16 select x.*,
17 lag(Total_sales) over (partition by region ) as Prev_Y_sales,
18 case when x.Total_sales > lag(Total_sales) over (partition by region )
19 or lag(Total_sales) over (partition by region ) is null then 1
20 else 2 end as Year_sales_status
21 from x ) as s1
22 group by s1.region
23 having sum(s1.Year_sales_status) = 4;
```

# REPORT

## Sales and Profit Analysis

This report analyzes sales and profit data across various dimensions, providing insights to drive business strategies.

Key Performance Indicators (KPIs):

- Total Sales: The overall revenue generated during the analyzed period is 14.95M.
- Total Profit: The net income earned after deducting all expenses is 3.75M
- Total Visits: The number of time customer visits to the business is 9,994
- Average Sales: The average sales value per customer visit is 1,494
- Average Profit: The average profit generated per customer visit is 374.9

## Recommendations

### 1. Focus on the West and East Regions

- West region has the highest sales (4799K) and is performing well. You should focus on maintaining or increasing sales here by introducing promotional campaigns or loyalty programs to further strengthen the relationship with existing customers.
- East region has a strong sales figure (3468K), so more targeted efforts like expanding product lines or improving supply chain efficiency could increase sales further in this region.

### 2. Expand in the Central Region

- The Central region has relatively low sales (2440K), indicating room for growth. Conduct market research to identify consumer needs, increase product variety, and optimize pricing strategies to boost sales.
- Increase promotional activities, or introduce online and mobile shopping options to capture more market share in this underperforming region.
- North region has a negligible contribution (1K), suggesting it may not be a profitable area to invest in for now. Consider scaling back or reevaluating strategies in this region unless further market analysis indicates untapped potential.

### 4. Inventory Management Based on Category Performance

- Eggs, Meat & Fish and Snacks are the top-performing categories, contributing 2267K and 2238K in sales, respectively. Maintain high inventory levels for these products, especially during peak months like November.
- Focus on ensuring that your supply chain can handle sudden spikes in demand for these categories, as they are clearly consumer favorites.
- Reduce or optimize inventory for underperforming product categories to avoid overstock and reduce holding costs.

## 5. Maximize Sales in Kanyakumari and Stable Cities

- Kanyakumari, as the best-performing city (707K sales), should have a more diverse product portfolio and special offers to maintain its leading position.
- Leverage the stable sales performance in Perambalur (660K) and Tirunelveli (660K) by improving customer loyalty programs or exploring cross-selling strategies to drive further growth.

## 6. Promote Sales during Q4 and November

- With the highest sales peak in Q4 (5525K), especially in November (2194K), optimize marketing strategies around these periods. Offer discounts, promotions, and product bundles to capitalize on the natural surge in demand.
- Prepare inventory ahead of Q4 to avoid stockouts and ensure smooth operations during the high-demand period.

## 8. Analyze and Improve Viluppuram's Performance

- Viluppuram has the lowest sales (581K), so it's critical to analyze the market there. Determine if the low performance is due to limited product availability, competition, or consumer preferences. Reassess marketing strategies or shift resources to better-performing areas if necessary.

## 9. Tailor Marketing Campaigns for Each Region

- Invest in region-specific marketing campaigns based on sales data. For example, focus on promoting high-demand items like Eggs, Meat & Fish and Snacks in the West and East regions, while offering localized promotions in underperforming regions like Central and North to attract more customers.

THANK YOU