Project Title: SuperStore Sales Analysis Dashboard

Introduction

The SuperStore Dataset is a comprehensive dataset that contains transactional records of a retail business over a four-year period, from 2014 to early 2018.

It captures key aspects of sales, shipping, customer segmentation, and product details, making it a valuable resource for sales analysis, customer behavior insights, and logistics optimization.

Project Scope

In this project, I conducted a comprehensive analysis of SuperStore retail data using Power BI, covering a period from 2014 to early 2018.

The focus of the analysis included several key areas:

- Evaluating sales and profit performance across different geographic regions.
- Analyzing customer behavior based on segment types (Corporate, Consumer, Home Office).
- Categorizing and assessing product performance by category and sub-category.
- Examining the impact of shipping modes on sales and profitability.
- Investigating returned orders to identify patterns and high-return categories.
- Tracking key performance indicators (KPIs), such as:
    - Total Sales
    - Total Profit
    - Number of Orders
    - Number of Returned Orders
    - Average Shipping Time

Data Sources

The data used in this Power BI project was sourced from a **Microsoft Excel file** containing structured transactional and reference data. The dataset includes **9,994 recorded transactions**, providing a strong base for analytical insights and interactive visualizations related to:

- Profitability
- Sales performance and trends
- Customer segmentation
- Supply chain and logistics optimization

Data Structure

The Excel file comprises multiple tables, each serving a specific purpose:

Table Name	Number of Columns	Description
Orders	21	The main table containing complete order details including customers, products, profit, and dates.
Return	2	Contains records of returned orders (Order ID and Return status).
People	2	Links salespeople to their regions (Person and Region).
Shipping Cost	2	Contains shipping cost information per state (State and Shipping Cost Per Unit).

These tables were imported into Power BI via the Import mode. Initial cleaning and preparation were done using Power Query to ensure data quality and establish relationships based on keys such as Order ID and Region.

Data Cleaning & Transformation Steps

1. Promoted Headers: The first row of the dataset was promoted to serve as column headers.

2. Changed Data Types: Data types were standardized (e.g., Date, Text, Whole Number) to ensure consistency and enable proper analysis.

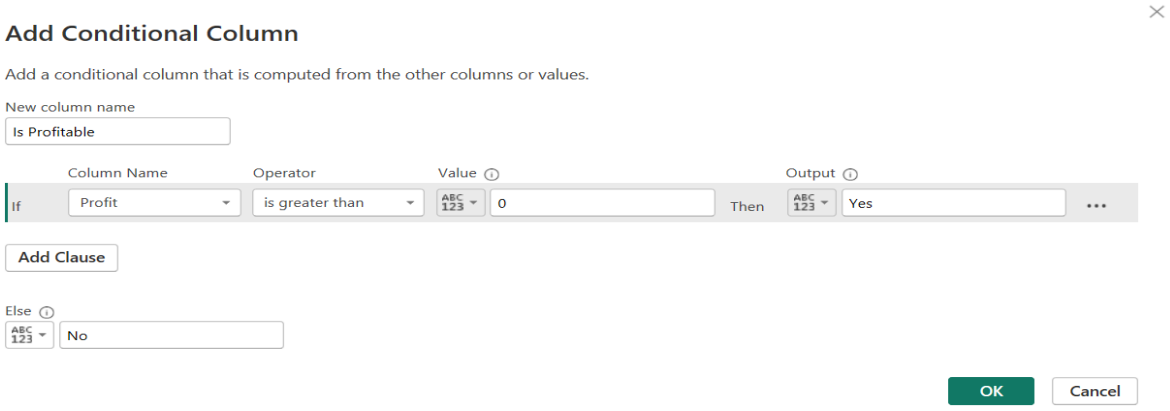
3. Removed Unnecessary Columns: to streamline the data model.

4. Added Conditional Column:

Objective:

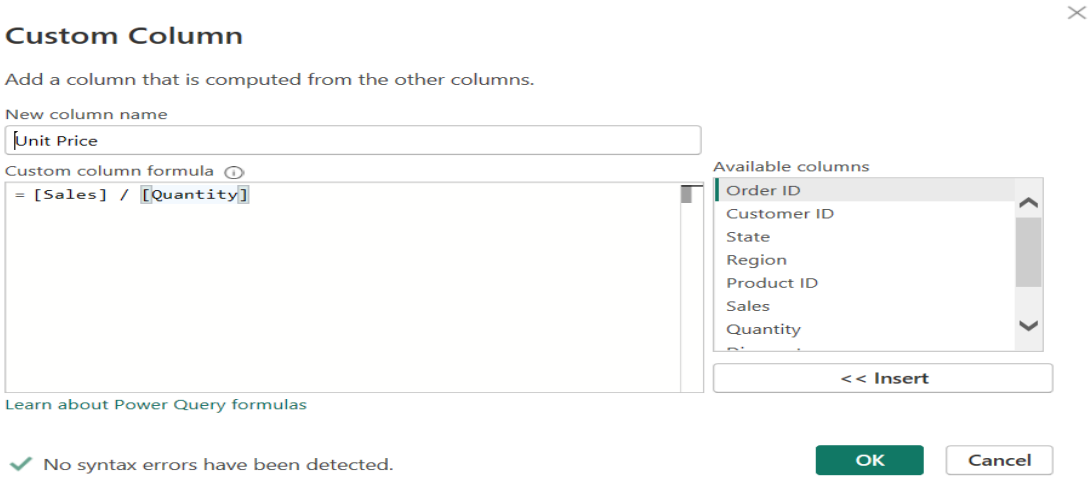
To classify each order as **Profitable** or **Not Profitable** based on the value in the Profit column.

If Profit **is greater than 0** → Output = **"Yes"**, Else → Output = **"No".**

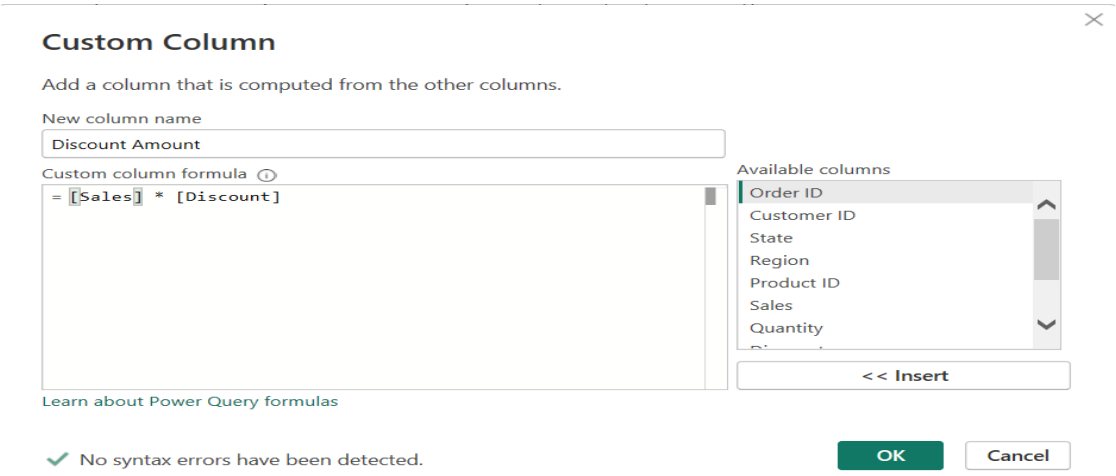


5. Created Custom Columns:

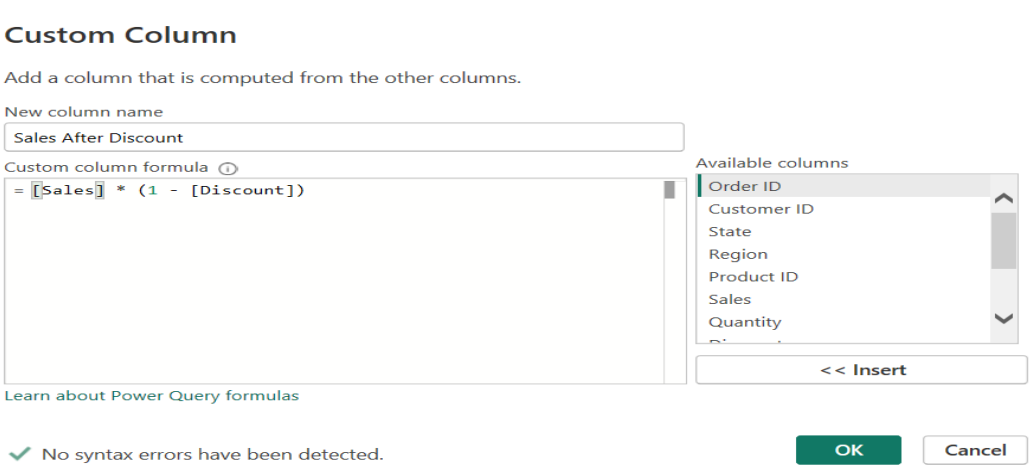
1- Unit Price



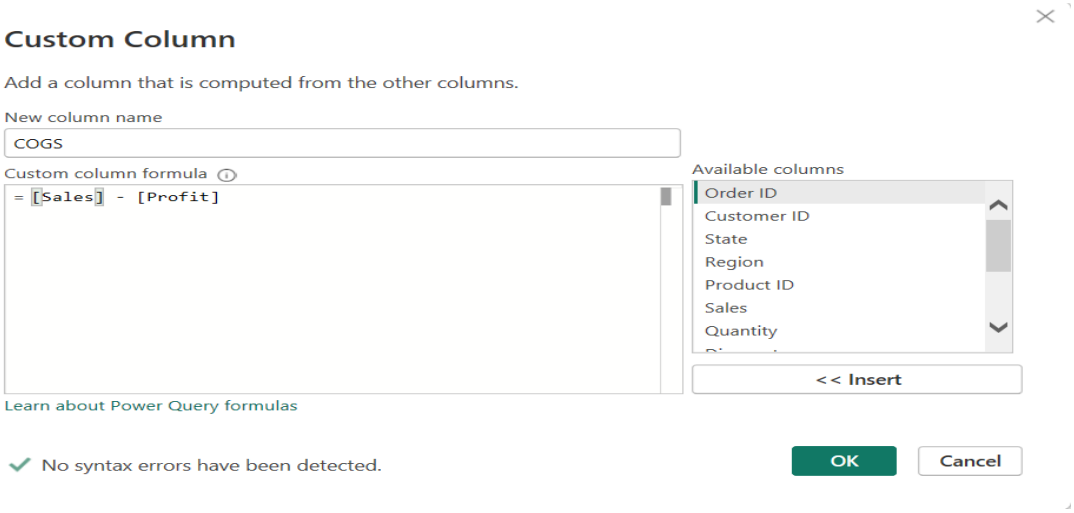
2- Discount Amount



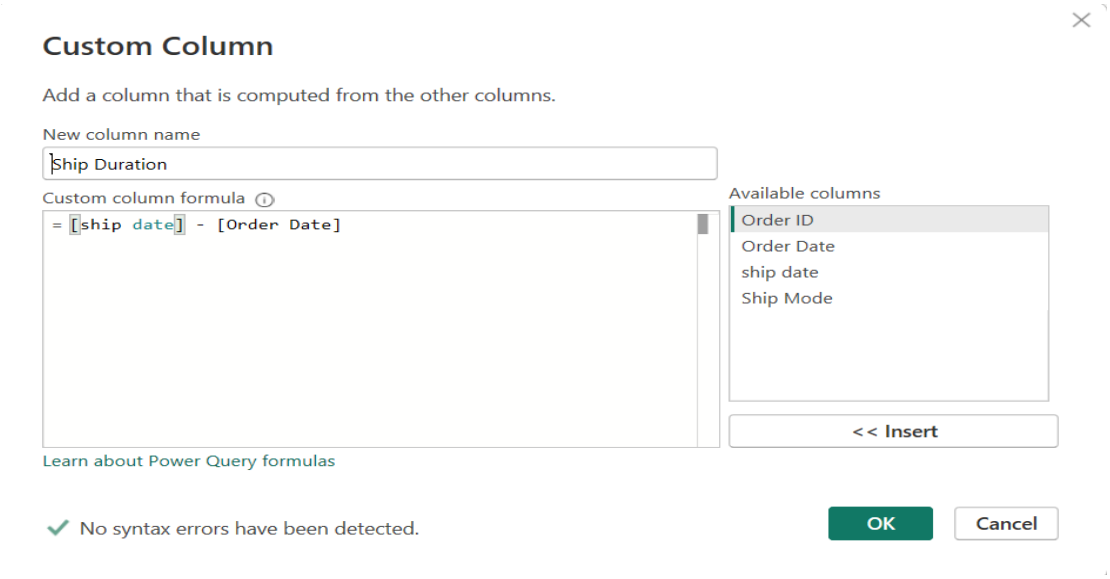
3- Sales After Discount



4- COGS

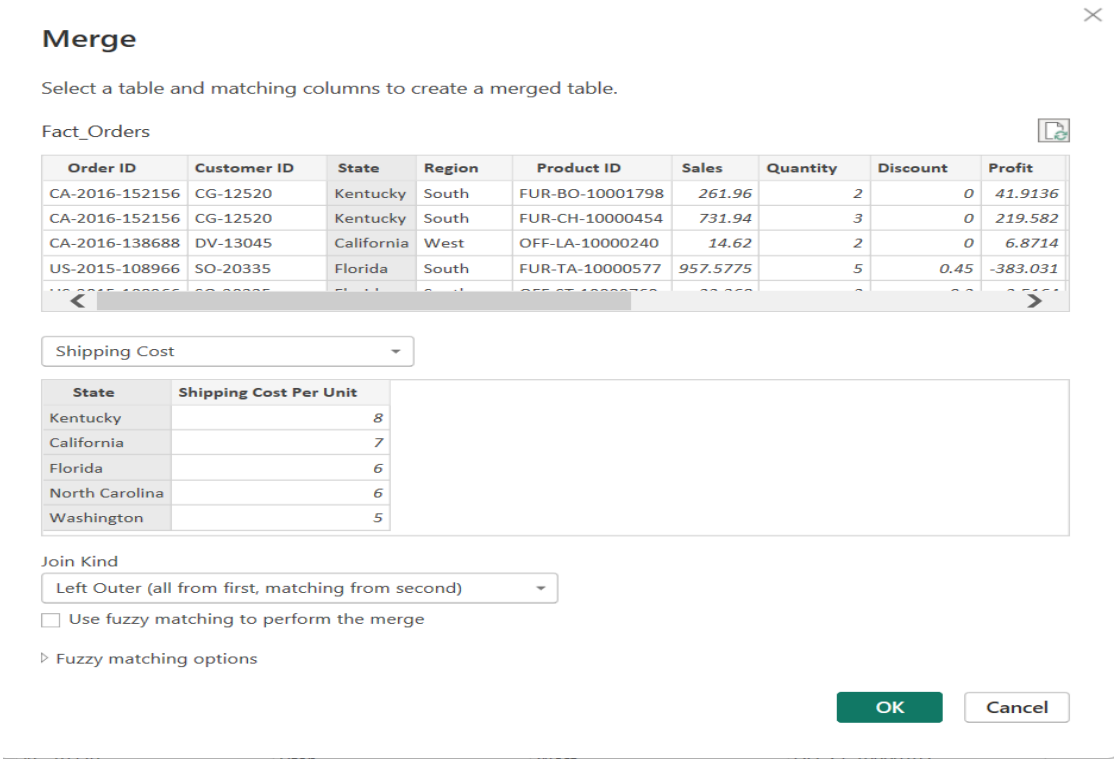


5- Ship Duration

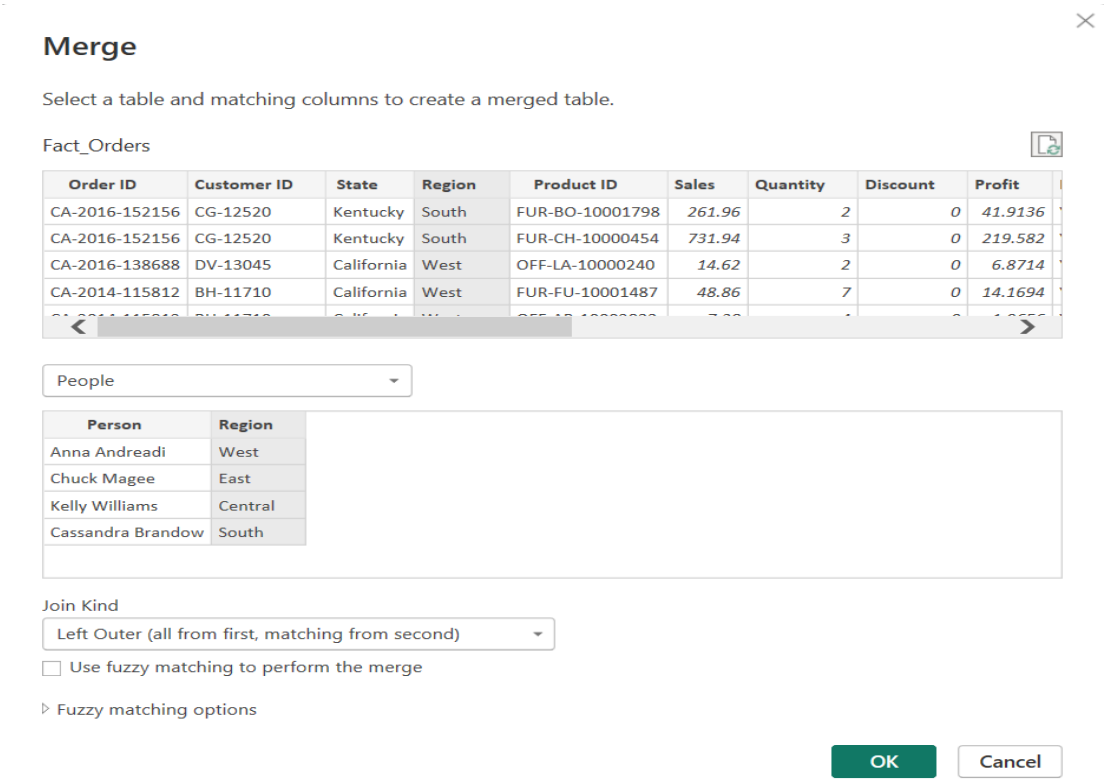


6. <u>Merged Queries</u>**:** The Fact Orders table was enriched by merging with other dimension tables like:

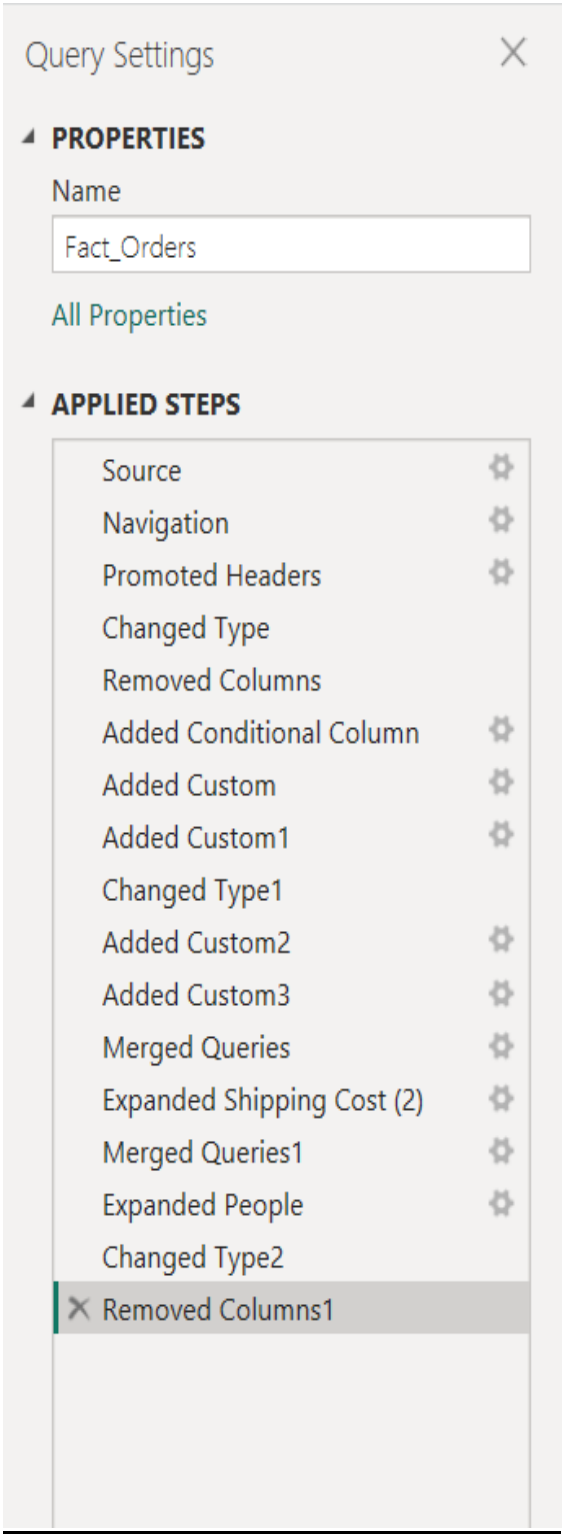
1- Shipping Cost (based on State)

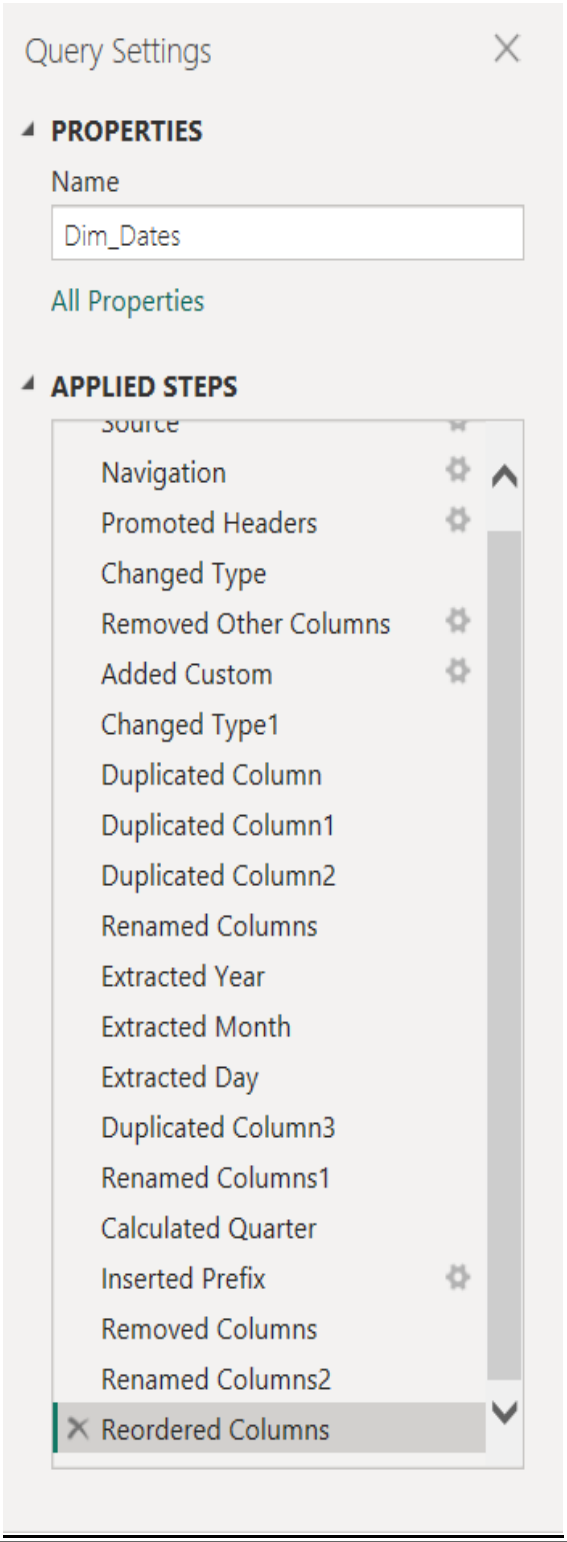


2- People (based on Region or Salesperson)



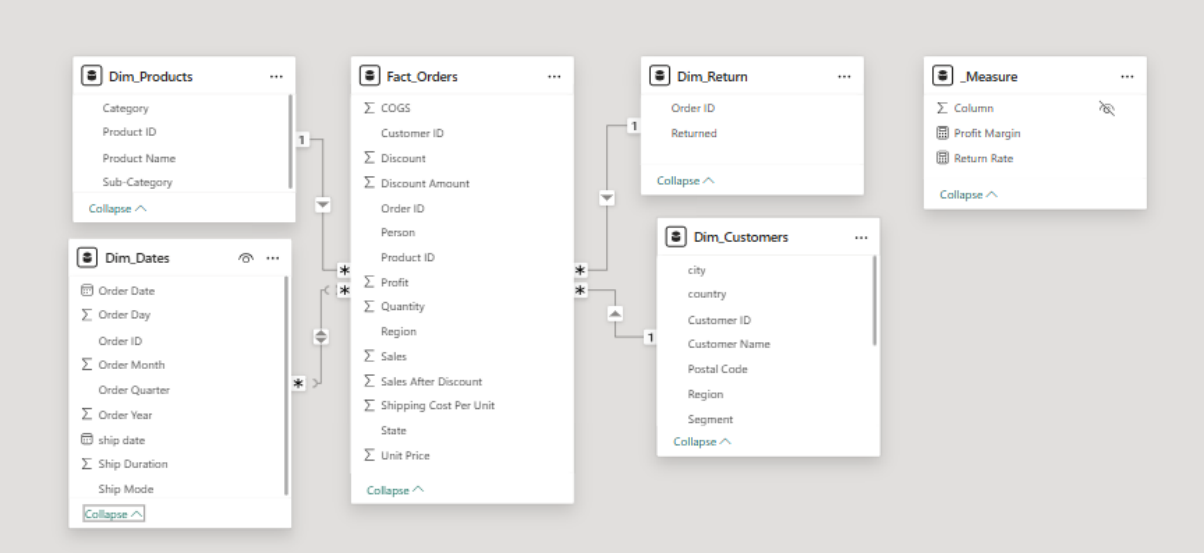
The following images from Power Query Editor illustrate all the steps performed





Data Modeling

The central Fact_Orders table is connected to dimension tables (Customers, Products, Dates, Returns). Additionally, a separate Measures table is used to store KPIs such as Profit Margin and Return Rate.



DAX Measures and Calculated KPIs

Return Rate

This measure calculates the percentage of returned orders out of the total unique orders. It helps assess customer satisfaction and product quality

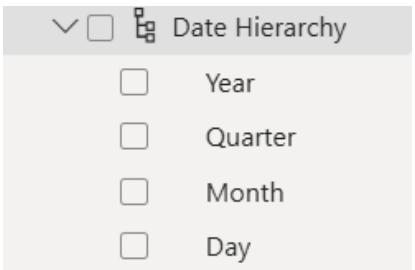
```
1  Return Rate = DIVIDE(COUNTROWS('Dim_Return'), DISTINCTCOUNT(Fact_Orders[Order ID]))
```

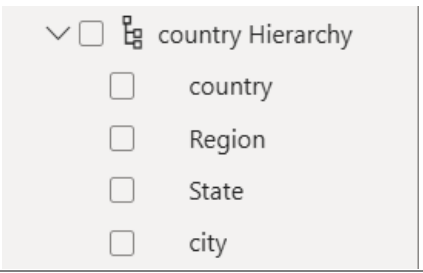
Profit Margin

This measure shows the ratio of total profit to total sales, indicating the overall profitability of the business operations.

```
1  Profit Margin = DIVIDE(SUM(Fact_Orders[Profit]), SUM(Fact_Orders[Sales]))
```

To illustrate the distribution of the metric across countries and time periods, the following histogram has been created:





Questions Analysis

KPIs

- The total number of orders is 5,009.
- The total sales amount to $2.30 million.
- The total profit achieved is $286.40K.
- The profit margin is calculated at 12%.
- The return rate stands at 16%.
- The total number of unique customers is 793.

Orders	Sales	Profit	Profit Margin	Return Rate	Customer
5009	2.30M	286.40K	12%	5.91%	793

Visuals

1. Distribution of orders per region?

West >> **1611**

East >> **1401**

Central >> **1175**

South >> **822**

2. Monthly and annual sales performance?

2014 >> **49,543**

2015 >> **61,618**

2016 >> **81,795**

2017 >> **93,439**

3. Return Rate by each category?

Furniture >> **9.7%**

Technology >> **10.1%**

Office Supplies >> **12.6%**

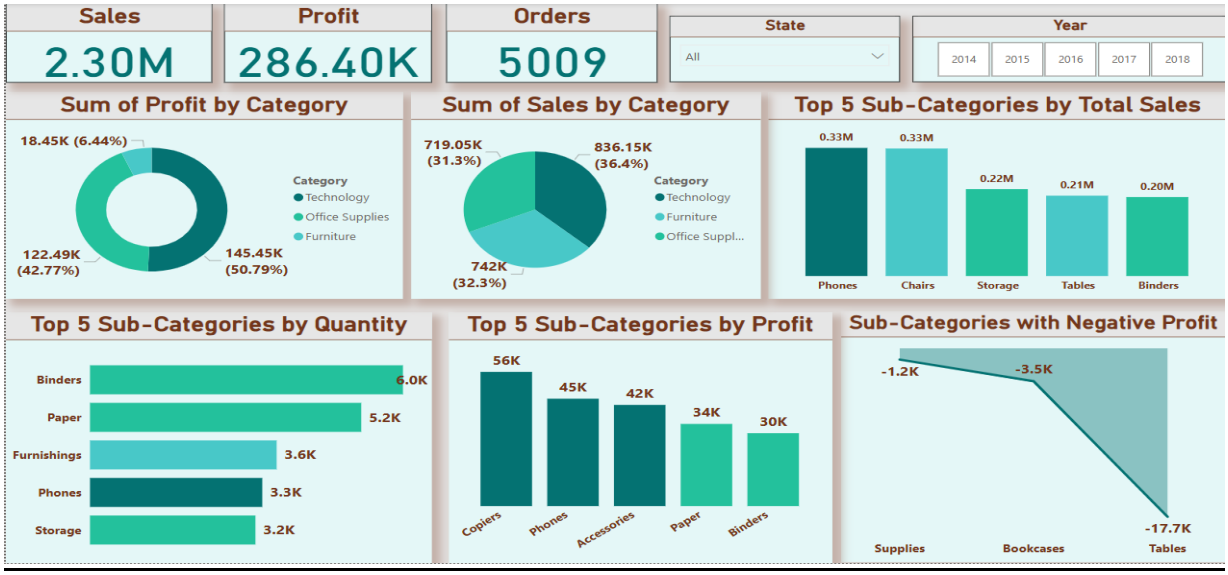
Product analysis page:

1. Which product categories are generating the highest sales compared to profitability? And does the quantity sold have an impact?
   Technology is the most profitable category: Although it accounts for **36.4%** of total sales value and only **20.95%** of the total quantity sold, it generates **50.79%** of total profit.
   Office Supplies: It represents **31.3%** of sales value, but has the highest quantity sold at **60.48%**, generating **42.77%** of total profit.
   Furniture is underperforming: It contributes **32.3%** of sales and **18.57%** of quantity sold but delivers only **6.44%** of total profit.

2. What is the relationship between discounts and profitability in each category?
   Technology: Achieves the highest profit, with the lowest average discount (**13%**).
   Office Supplies: Has medium discounts (**16%**) and medium profitability.
   Furniture: Records the highest average discount (**17%**) but achieves the lowest profit.

3. Which furniture products generate the most sales and profit?
   Chairs: account for approximately **44.27%** of total Furniture sales and contribute to **144.11%** of the category's profit.
   Tables: make up **27.89%** of sales but result in a **-96.07%** loss of the category's total profit.
   Bookcases: represent **15.48%** of sales and cause a **-18.82%** profit loss.
   Furnishings: account for **12.63%** of sales and contribute to around **70.78%** of the profit → average performance, potential for improvement.

4. Do discounts affect profitability in Furniture products?
   Tables have the highest average discount at **26%.**
   Bookcases with a **21%** discount.
   Chairs with a lower discount of **17%.**
   Furnishings receive a **14%** discount.

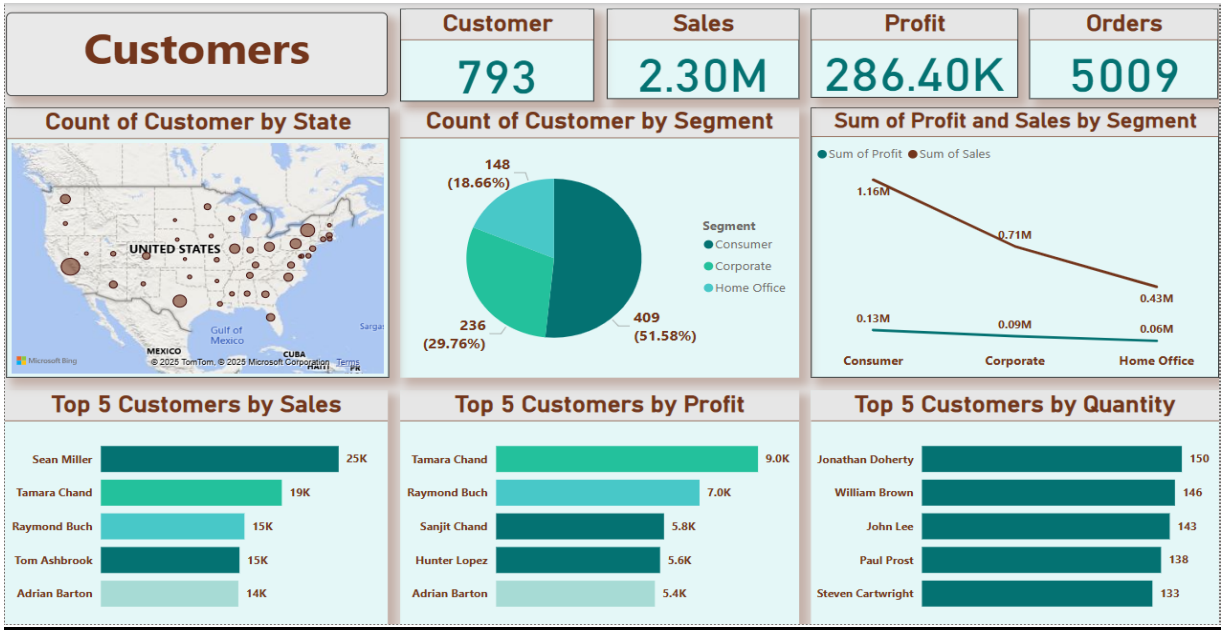


Customer performance analysis:

1. Who are our Top Customers according to number of orders?
   Emily Phan is the customer with the highest number of orders with **17** orders with **144.96$ profits** and **sales of 5,478$**
   We have 2 customers with the second highest number of orders with **13 orders**:
   Chloris Kasten Smidt with **profit 141.28$** and **sales 3,154$.**
   Zu schuss Carrol with **profit -1,032.15$** and **sales 8,025$.**

2. Who are the Top 3 customers according to contributing to Sales?
   Sean Miller has the highest sales with **25,043**, **profit -1,980**, **5 order**
   Tamara Chand ranked second with **19,052**, **First in profit 8,981**, **5 order**
   Raymond Buch is the third one with **15,117**, **Second in profit 6,976**, **6 order**

3. Which segment of customers is the highest in terms of profit?
   Consumer is the highest segment with **409** customers with **Profit 134,119**.
   Corporate the second one with **236** customers with **Profit 91,979.**
   Home offices are the lowest among them with **148** customers with **Profit 60,298.**



Geographical analysis Page:

1. What is the geographic distribution of the customers?
   West has the highest number of **255** customers with **32.16%** of the total
   East the second one with **220** customers contributing with **27.74%**
   Central region has **184** customers with **23.2%**
   South is the least one of **134** customers with only **16.9%**

2. What are the top five states with total profit?

   California has the highest number of 59,398$
   New York the second one with 58,178$
   Washington has 24,406$

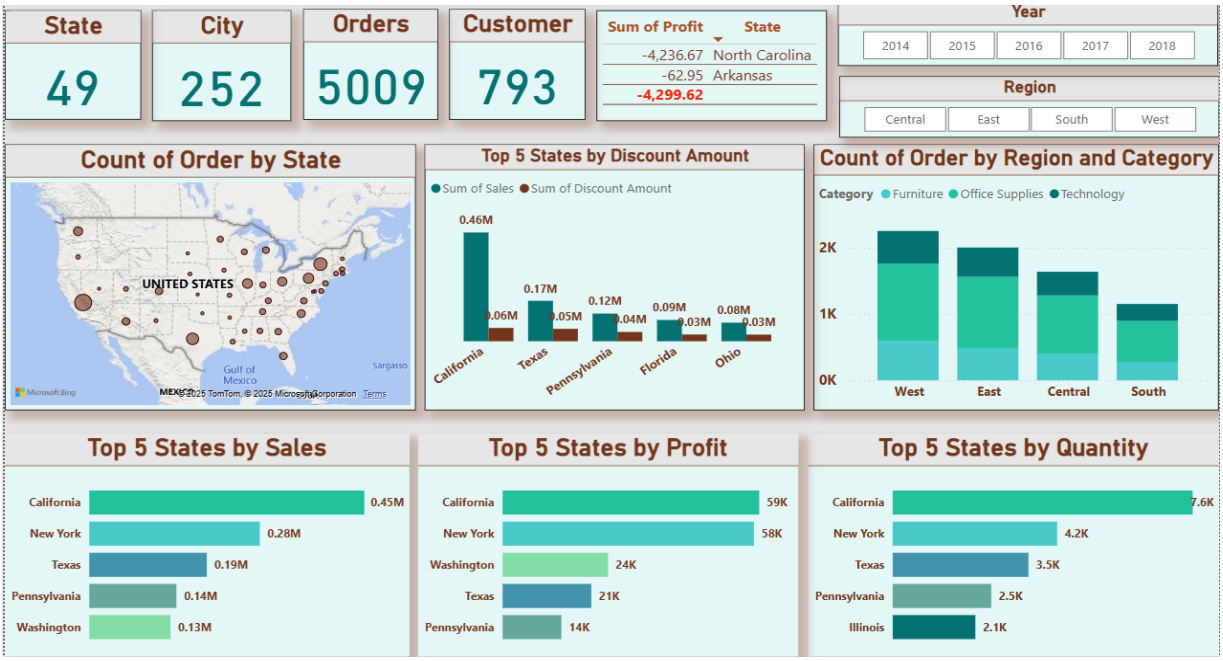
   Texas has 20,529$
   Pennsylvania is the least one of 13,605$

3. Sales Vs. Discount Amount of each region?

   East has total sales of **678,781$** and discount amount **94,608$**
   West has total sales of **725,457$** and discount amount **93,406$**
   Central has total sales of **501,239$** and discount amount **77,787$**
   South has total sales of **391,721$** and discount amount **56,779$**

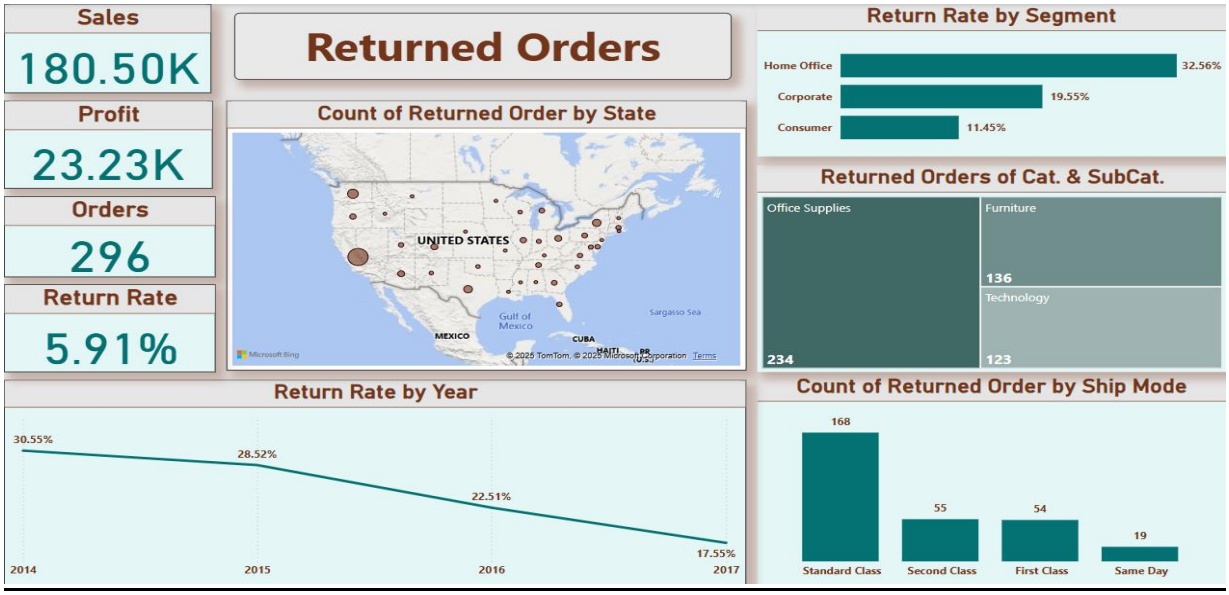
4. States with negative total profit?

   North Carolina has **- 4237$**
   Arkansas has **- 63$**



Returned Orders Analysis Page

1. **How has the return rate changed over the years?**
   The return rate shows a consistent decline over the years:
   - **2014**: 30.55%
   - **2015**: 28.52%
   - **2016**: 22.51%
   - **2017**: 17.55%
2. **Which customer segment has the highest return rate?**
   - **Home Office** has the highest return rate at **32.56%**.
   - Followed by **Corporate** at **19.55%**, and **Consumer** at **11.45%**.
3. **Which product category has the highest number of returned orders?**
   - **Office Supplies** has the most with **234 returned orders**.
   - **Furniture** follows with **136**, and **Technology** has **123**.
4. **How are returned orders distributed by shipping mode?**
   - **Standard Class** has the highest with **168 returned orders**.
   - **Second Class**: 55
   - **First Class**: 54
   - **Same Day**: 19
5. **What is the geographical distribution of returned orders?**
   The map indicates that returned orders are widely spread across the U.S., with higher concentrations in major states such as **California**, **New York**, and **Texas**.



Key Insights and Recommendations

Product performance

Insights:

- Technology is the most profitable category: Although it accounts for 36.4% of total sales value and only 20.95% of the total quantity sold, it generates 50.79% of total profit.
- Office Supplies: It represents 31.3% of sales value, but has the highest quantity sold at 60.48%, generating 42.77% of total profit.
- Furniture is underperforming: It contributes 32.3% of sales and 18.57% of quantity sold but delivers only 6.44% of total profit.
- Furniture: Highest negative profit in some sub-categories
- *Sub-Category*
  Bookcases, Tables, Supplies had negative profits, notably:
  Bookcases: –$17.7K
  Tables: –$3.5K

Recommendations:

- Shift marketing and bundling strategies toward Technology items.
- Consider phasing out or re-pricing loss-making sub-categories (Bookcases, Tables).
- Review the Office Supplies category to uncover potential profit loss due to low margins or excessive discounting.

Customer performance:

Insights:

- Consumer is the highest segment with 409 customers with Profit 134,119.
- Corporate the second one with 236 customers with Profit 91,979.
- Home offices are the lowest among them with 148 customers with Profit 60,298.
- Top Customers (Sales vs Profit)
  Tamara Chand and Raymond Buch appear in both top sales and profit lists — good for loyalty focus.
  Jonathan Doherty leads in quantity ordered—potential bulk buyer or reseller?
- Customer Segmentation
  Consumer: 51.58% of customers (highest profit contributor)
  Corporate: 29.76%
  Home Office: 18.66%

Recommendations:

- Review customers who buy large quantities but bring in low profit to find chances to offer more products or adjust pricing.
- Boost sales in the Home Office segment by offering custom bundles and better pricing deals.

Regional & State-Level Analysis

Insights:

- Top Performers
  California dominates in sales ($450K) and profit ($59K).
  New York, Texas, Washington are also strong.
- Underperformers
  North Carolina and Arkansas show negative profits.
  States with high discount amounts (e.g., California, Texas, PA) may be cannibalizing margins.

Recommendations:

- Focus promotions on the top-performing states to get better returns.
- Check states with high discounts to see if marketing is working or if the right customers are being targeted.
- In states with losses, think about removing low-profit products or changing delivery methods.

Return Analysis

Insights:

- Return rate is volatile, suggesting inconsistent product or delivery quality.
- Office Supplies have the highest return rate, particularly Supplies and Bookcases—which aligns with their negative profit.
- Top sub-categories returned: Supplies, Bookcases, Envelopes, Machines
- Office Supplies account for 59.13% of returns.

Recommendations:

- Review supplier and quality control processes for top-return items.
- Consider changing logistics providers or packaging to reduce damage-related returns.
- Introduce better pre-sale information (e.g., dimensions, use cases) to set customer expectations.