

EDA Using Power BI

Project Title: Retail Sales Performance Analysis

Problem Statement

A nationwide retail company operates multiple stores across four regions (North, South, East, West). The business sells electronics and office supplies to different customer segments.

Senior management has noticed that overall revenue is growing, but profit margins are inconsistent across regions and products. Some regions report high sales but low profits, while others perform steadily.

The leadership team wants a single Power BI dashboard that:

- Cleans and validates raw sales data
- Identifies profitable and non-profitable products
- Highlights regional performance gaps
- Supports data-driven decisions for promotions and inventory planning

You are assigned as a Data Analyst to explore the data, build a robust data model, apply DAX calculations, and present actionable insights.

Questions:

- Identify missing values and duplicates in the Sales dataset. What cleaning steps are required?
- Perform univariate analysis on Sales and Profit. What distribution patterns do you observe?
- Which product categories contribute the highest revenue and profit?
- How does sales performance vary across regions?
- Create a star schema using Sales, Customer, and Product tables. Why is this model effective?
- Write a DAX measure to calculate Total Sales and Total Profit.
- Calculate Profit Margin (%) using DAX and identify low-margin products.
- Design a dashboard to show regional and category-wise performance.
- Which products should be discontinued or promoted based on analysis?

Identify missing or Duplicate Sales data.

Screenshot of the Power Query Editor showing the 'Sales' query. The data preview shows a table with columns: OrderID, OrderDate, CustomerID, ProductID, and Region. The 'APPLIED STEPS' pane shows a step named 'Removed Duplicates'.

OrderID	OrderDate	CustomerID	ProductID	Region
1001	01-02-2024	C004	P006	East
1002	28-01-2024	C003	P001	South
1003	15-01-2024	C002	P006	North
1004	04-02-2024	C027	P001	South
1005	10-02-2024	C026	P002	North
1006	01-03-2024	C030	P004	West
1007	24-02-2024	C012	P004	South
1008	20-01-2024	C005	P003	West
1009	17-02-2024	C020	P003	North
1010	04-01-2024	C017	P004	East
1011	07-01-2024	C006	P004	North
1012	01-01-2024	C020	P005	East
1013	14-02-2024	C030	P003	West
1014	13-01-2024	C017	P004	North
1015	21-02-2024	C014	P003	South
1016	18-02-2024	C015	P001	East
1017	16-01-2024	C010	P001	East
1018	13-01-2024	C009	P006	West
1019	18-01-2024	C001	P006	North
1020	22-02-2024	C015	P003	West
1021	21-01-2024	C029	P005	North
1022	28-01-2024	C026	P005	West
1023	20-01-2024	C002	P002	North

Screenshot of the Power Query Editor showing the 'Sales' query. A 'Replace Values' dialog box is open, prompting to replace 'null' with another value. The 'APPLIED STEPS' pane shows a step named 'Removed Duplicates'.

Region	Quantity	UnitPrice	Discount	Profit
1	2	5000	0	76
2	1	8000	0.1	3389
3	2	45000	0.12	7505
4	2	45000	0.24	-283
5	10	5000	0.01	7629
6	5	5000	0.09	4596
7	9	8000	0.22	3634
8	1	300	0.24	7254
9	5	300	0.08	2617
10	6	1200	0.1	2604

Screenshot of the Power BI Query Editor interface showing the 'Sales' query.

File Home Transform Add Column View Tools Help

Query Settings Layout Data Preview Advanced Editor Dependencies

Queries [3]

Customers Products Sales

Table.Distinct(#"Changed Type")

	OrderID	OrderDate	CustomerID	ProductID	Region
1	1001	01-02-2024	C004	P006	East
2	1002	28-01-2024	C003	P001	South
3	1003	15-01-2024	C002	P006	North
4	1004	04-02-2024	C027	P001	South
5	1005	10-02-2024	C026	P002	North
6	1006	01-03-2024	C030	P004	West
7	1007	24-02-2024	C012	P004	South
8	1008	20-01-2024	C005	P003	West
9	1009	17-02-2024	C020	P003	North
10	1010	04-01-2024	C017	P004	East
11	1011	07-01-2024	C006	P004	North
12	1012	01-01-2024	C020	P005	East
13	1013	14-02-2024	C030	P003	West
14	1014	13-01-2024	C017	P004	North
15	1015	21-02-2024	C014	P003	South
16	1016	18-02-2024	C015	P001	East
17	1017	16-01-2024	C010	P001	East
18	1018	13-01-2024	C009	P006	West
19	1019	18-01-2024	C001	P006	North
20	1020	22-02-2024	C015	P003	West

9 COLUMNS, 100 ROWS Column profiling based on top 1000 rows PREVIEW DOWNLOADED AT 16:30

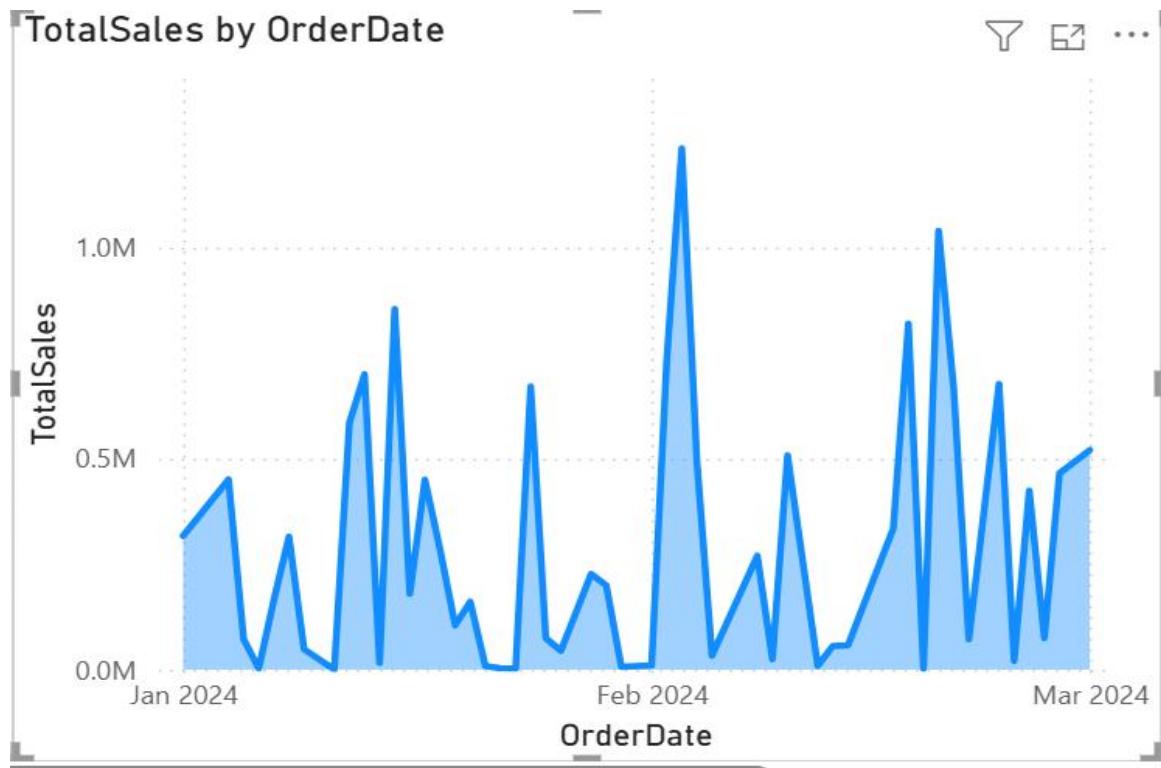
Query Settings

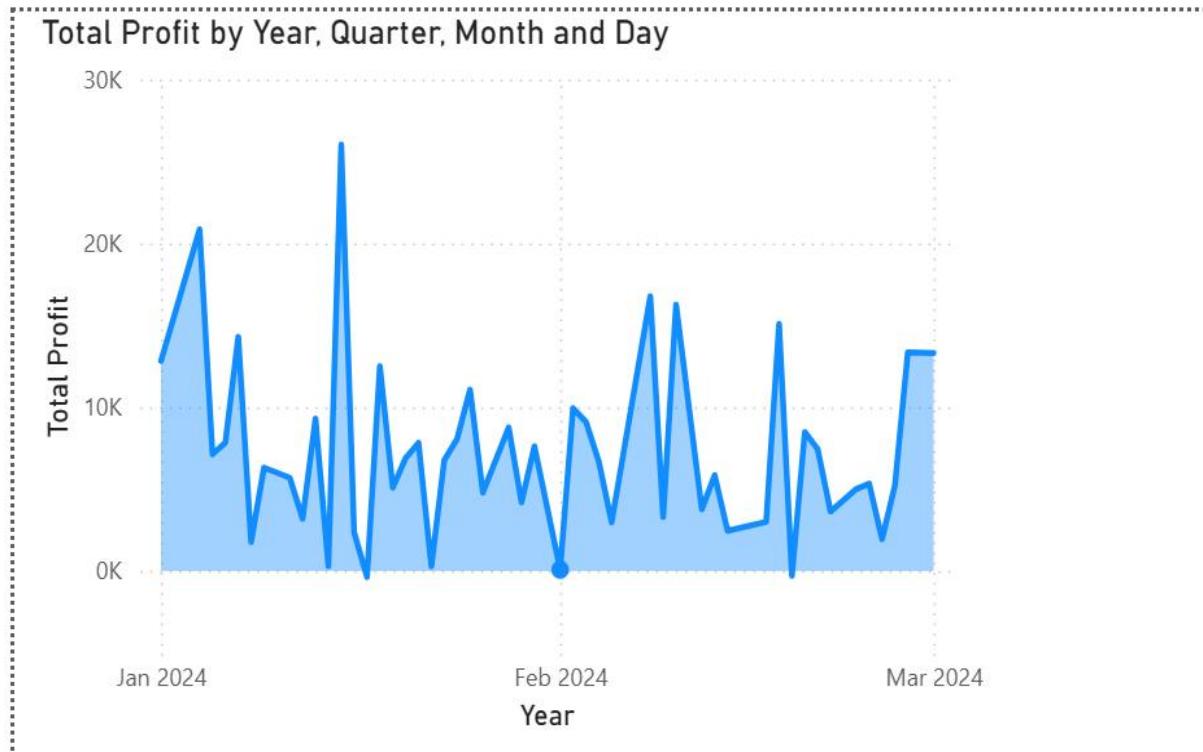
Properties Name: Sales All Properties

Applied Steps Source Navigation Promoted Headers Changed Type Removed Duplicates

- There will be no error, missing or inconsistent marketing data

Univariate Analysis on Sales and Profit





- Profit is not stable.
- Some days profit is very high, some days very low.
- There are sudden spikes and drops in profit.

product categories contribute the highest revenue and profit

Retail Sales Performance • Last saved: Today at 9:17 PM

Table tools

Name: Total Profit | Format: General | Data category: Uncategorized | New measure

Data

OrderID	OrderDate	CustomerID	ProductID	Region	Quantity	UnitPrice	Discount	Profit	Sales
1001	01-02-2024	C004	P006	East	2	5000	0	76	10000
1002	28-01-2024	C003	P001	South	5	45000	0.19	6146	225000
1003	15-01-2024	C002	P006	North	7	5000	0.06	3449	35000
1004	04-02-2024	C027	P001	South	8	45000	0.24	-720	360000
1005	10-02-2024	C026	P002	North	1	1200	0.11	1578	1200
1006	01-03-2024	C030	P004	West	2	65000	0.1	5511	130000
1007	24-02-2024	C012	P004	South	4	65000	0.08	524	260000
1008	20-01-2024	C005	P003	West	7	8000	0.09	-816	56000
1009	17-02-2024	C020	P003	North	9	8000	0.04	1539	72000
1010	04-01-2024	C017	P004	East	6	65000	0.18	7561	390000
1011	07-01-2024	C006	P004	North	2	65000	0.1	7849	130000
1012	01-02-2024	C020	P005	East	2	300	0.13	4921	600
1013	14-02-2024	C030	P003	West	7	8000	0.11	-247	56000
1014	13-01-2024	C017	P004	North	10	65000	0.21	1680	650000
1015	21-02-2024	C014	P003	South	2	8000	0.1	3389	16000
1016	18-02-2024	C015	P001	East	9	45000	0.12	7505	405000
1017	16-01-2024	C010	P001	East	2	45000	0.24	-283	90000
1018	13-01-2024	C009	P006	West	10	5000	0.01	7629	50000
1019	18-01-2024	C009	P006	North	5	5000	0.09	4596	25000
1020	22-02-2024	C015	P003	West	9	8000	0.22	3634	72000
1021	21-01-2024	C029	P005	North	1	300	0.24	7254	300

Table: Sales (100 rows) Column: Total Profit (0 distinct values)

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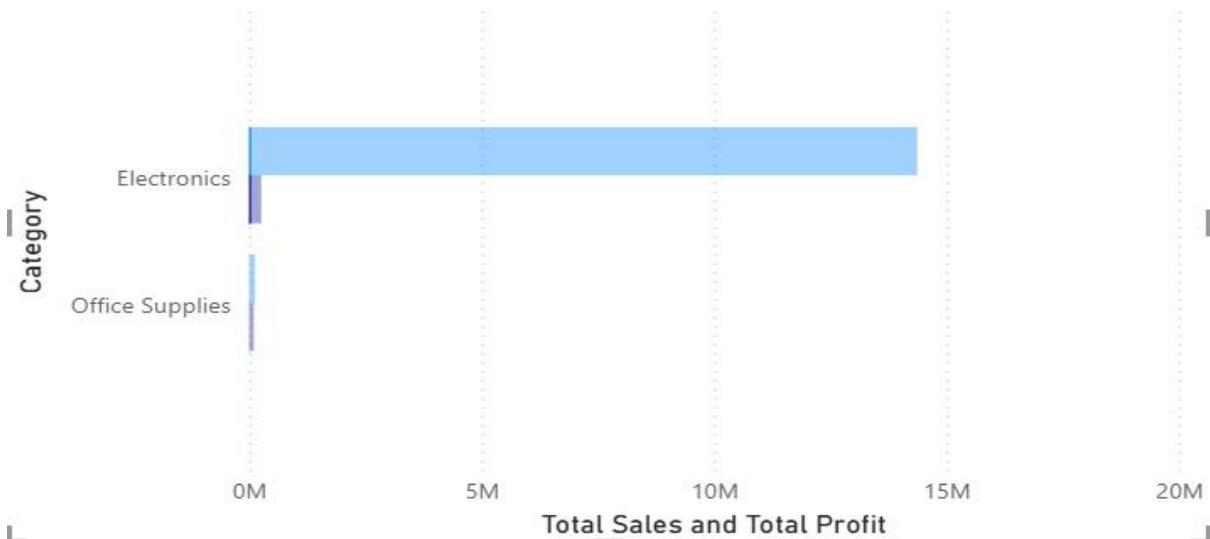
Measure tools

OrderID	OrderDate	CustomerID	ProductID	Region	Quantity	UnitPrice	Discount	Profit	Sales
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Table: Sales (100 rows) Column: Total Sales (0 distinct values)

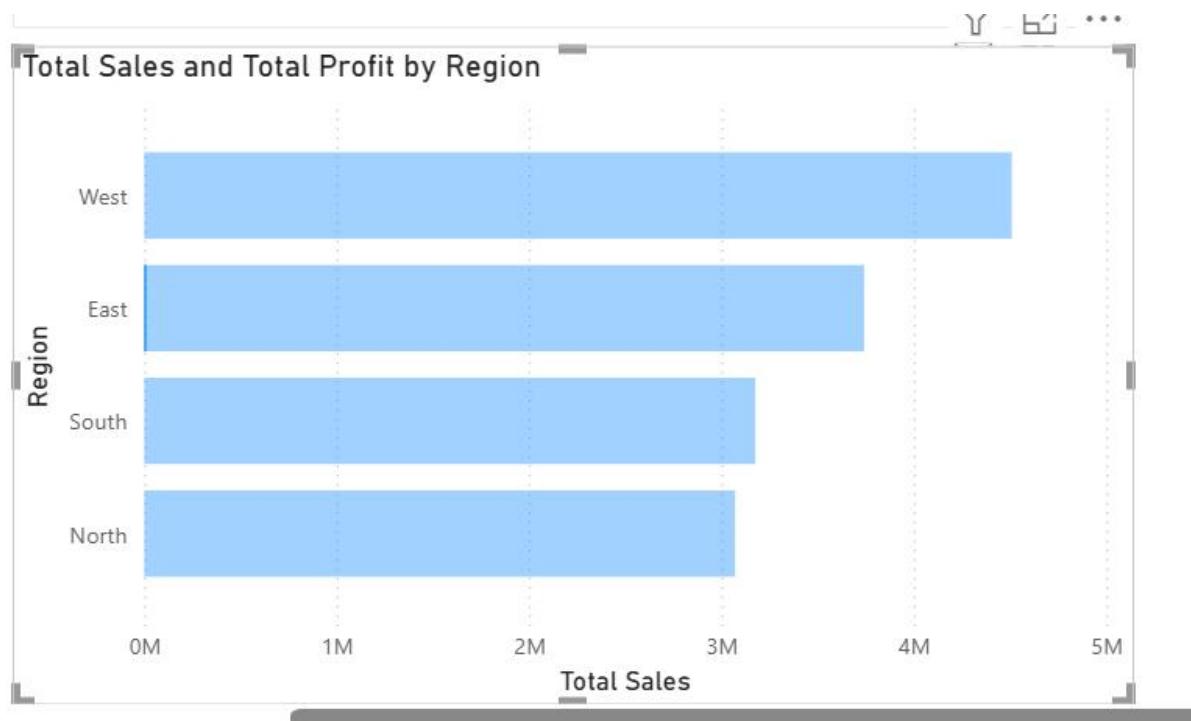
Total Sales and Total Profit by Category

● Total Sales ● Total Profit



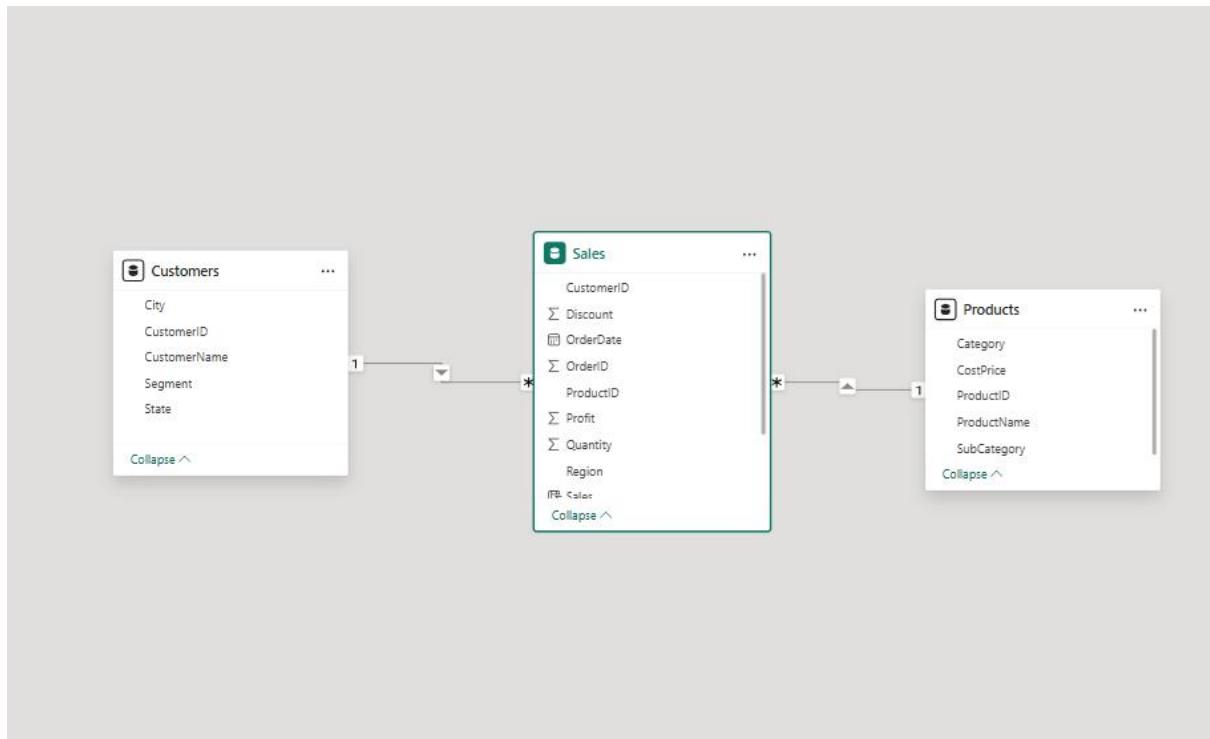
Electronics category contributes the highest revenue and profit in the dataset. Office Supplies category has significantly lower sales and profit, indicating weak performance compared to Electronics.

Sales performance vary across regions



- **West = Best performing region**
- **North = Poor performing region**
-

Star Schema using Sales, Customer, and Product Tables



- **Faster data analysis**
- **Easy to understand structure**
- **Reduces data duplication**
- **Improves Power BI performance**
- **Best for reporting and dashboards**

DAX measure to calculate Total Sales and Total Profit.

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File Home Help Table tools Measure tools

Name: Total Sales Format: General Data category: Uncategorized

Home table: Sales \$ % Auto New Quick measure measure Calculations

Structure Formatting Properties

1 Total Sales = SUMX(Sales, Sales[Quantity] * Sales[UnitPrice])

OrderID	OrderDate	CustomerID	ProductID	Region	Quantity	UnitPrice	Discount	Profit	Sales
1001	01-02-2024	C004	P006	East	2	5000	0	76	10000
1002	28-01-2024	C003	P001	South	5	45000	0.19	6146	225000
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Data

Search

- ProductID
- ProductName
- SubCategory
- Sales
- CustomerID
- Discount
- OrderDate
- OrderID
- ProductID
- Profit
- Profit Margin %
- Quantity
- Region
- Sales
- Total Profit
- Total Sales
- UnitPrice

Table: Sales (100 rows) Column: Total Sales (0 distinct values)

21:24 09-02-2026

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File Home Help Table tools Measure tools

Name: Total Profit Format: General Data category: Uncategorized

Home table: Sales \$ % Auto New Quick measure measure Calculations

Structure Formatting Properties

1 Total Profit = SUM(Sales[Profit])

OrderID	OrderDate	CustomerID	ProductID	Region	Quantity	UnitPrice	Discount	Profit	Sales
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1002	28-01-2024	C003	P001	South	5	45000	0.19	6146	225000
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Data

Search

- ProductID
- ProductName
- SubCategory
- Sales
- CustomerID
- Discount
- OrderDate
- OrderID
- ProductID
- Profit
- Profit Margin %
- Quantity
- Region
- Sales
- Total Profit
- Total Sales
- UnitPrice

Table: Sales (100 rows) Column: Total Profit (0 distinct values)

21:24 09-02-2026

Profit Margin (%) and low-margin products

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File Home Help Table tools Measure tools

Search

Name Profit Margin %

Home table Sales

Format General \$ % Auto

Data category Uncategorized

New Quick measure measure

Structure Formatting Properties Calculations

1 Profit Margin % =
2 DIVIDE(SUM(Sales[Profit]), SUM(Sales[Sales])), 0) * 100

OrderID	OrderDate	CustomerID	ProductID	Region	Quantity	UnitPrice	Discount	Profit	Sales
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1021	21-01-2024	C009	P005	North	1	300	0.24	7254	300

Table: Sales (100 rows) Column: Profit Margin % (0 distinct values)

Search Type here to search

ProductID Profit Margin %

1.00
1.15
7.28
14.34
39.89
288.39
Total 2.48

ProductID	Profit Margin %
P001	1.00
P004	1.15
P003	7.28
P006	14.34
P002	39.89
P005	288.39
Total	2.48

DashBoard

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File Home Insert Modeling View Optimize Help

Cut Copy Paste Format painter

Get data from Excel workbook catalog OneLake SQL Server Enter data Data Datasource Recent sources Transform Refresh data New visual Text box More visuals Insert New visual calculation

Clipboard Total Profit by Year, Quarter, Month and Day

Total Sales and Total Profit by Category

Total Sales and Total Profit by Region

TotalSales by Year, Quarter, Month and Day

Visualizations Build visual

Data Search

Customers

- City
- CustomerID
- CustomerName
- Segment
- State

Products

Sales

Values Add data fields here

Drill through

Cross-report

Keep all filters

Page 1 Page 2 Page 3 +

Type here to search

Search

Nandini G

Share

Prep data for Copilot AI Copilot

30°C 64% ENG 09-02-2026 21:28

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Get data from workbook catalog OneLake SQL Server Data Source Recent sources

Transform Refresh data New visual Text box More visuals

New visual calculation Insert

Clipboard Data Queries Calculations

Clipboard Data Queries Calculations

Prep data for Copilot AI Copilot

DASHBOARD

69.96K Total Profit 3.07M Total Sales 2.28 Profit Margin %

Sales and Profit by Region

Total Sales and Total Profit by Category

Total Sales by Category

Region, Category, OrderDate

ProductID Category Total Sales Total Profit Profit Margin %

ProductID	Category	Total Sales	Total Profit	Profit Margin %
P001	Electronics	8,10,000.00	-1,110.00	-6.14
P002	Electronics	14,00,000.00	-1,400.00	-5.13
P004	Electronics	20,15,000.00	32,764.00	1.63
P006	Electronics	75,00,000.00	15,758.00	21.01
P002	Office Supplies	24,00,000.00	4,917.00	20.49
P005	Office Supplies	2,400.00	9,956.00	414.58
Total		30,70,400.00	69,556.00	2.28

Page 1 Page 2 Page 3 +

Search

Nandini G

Share

Visualizations Data

Build visual

Filters

Customers

- City
- CustomerID
- CustomerName
- Segment
- State

Products

Sales

Values

Add data fields here

Drill through

Cross-report

Keep all filters

64%

Discontinued or Promoted based on analysis

☒ Products to Discontinue:

Products P001, P004, and P006 have very low profit margins, indicating that they contribute less to profitability. These products should be discontinued or their pricing and cost structure should be revised.

☒ Products to Promote:

Products P002 and P005 show high profit margins and good sales performance. These products should be promoted through marketing campaigns and increased inventory to maximize business profit.