

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?

File

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Combine

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New Query

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Output Data

Query

Manage Columns

Reduce Rows

Transform

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
21	1021	21-01-2024	C029	P005	North
22	1022	28-01-2024	C026	P005	West
23	1023	30-01-2024	C003	P007	West

Query Settings

PROPERTIES

Name

Sales

All Properties

APPLIED STEPS

Source

Navigation

Promoted Headers

Changed Type

Removed Duplicates

9 COLUMNS, 100 ROWS

Column profiling based on top 1000 rows

PREVIEW DOWNLOADED AT 16:30

FileHomeTransformAdd ColumnViewToolsHelp

Query SettingsLayout

Formula Bar

Monospaced

Column distribution

Show whitespace

Column profile

Column quality

Go to Column

Columns

Parameters

Advanced

Query Dependencies

Dependencies

Queries [3]

Customers

Products

Sales

Table.Distinct("#Changed Type")

Region	Quantity	UnitPrice	Discount	Profit	
1	2	5000	0	76	
2	th				
3	th				
4	th				
5	th				
6	st				
7	th				
8	st				
9	th				
10	st				
11	th				
12	st				
13	st				
14	th				
15	th	2	8000	0.1	3389
16	st	9	45000	0.12	7505
17	st	2	45000	0.24	-283
18	st	10	5000	0.01	7629
19	th	5	5000	0.09	4596
20	st	9	8000	0.22	3634
21	th	1	300	0.24	7254
22	st	5	300	0.08	2617
23	st	6	1200	0.1	7604

Replace Values

Replace one value with another in the selected columns.

Value To Find

Replace With

OK

Cancel

Query Settings

PROPERTIES

Name

Sales

All Properties

APPLIED STEPS

Source

Navigation

Promoted Headers

Changed Type

Removed Duplicates

9 COLUMNS, 100 ROWS Column profiling based on top 1000 rows

File Home Transform Add Column View Tools Help

Query Settings: ☒ Formula Bar ☐ Monospaced ☐ Column distribution ☐ Show whitespace ☐ Column profile ☒ Column quality ☐ Always allow

Layout Data Preview Columns Parameters Advanced Dependencies

Queries [3]: Customers Products Sales

Query: = 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

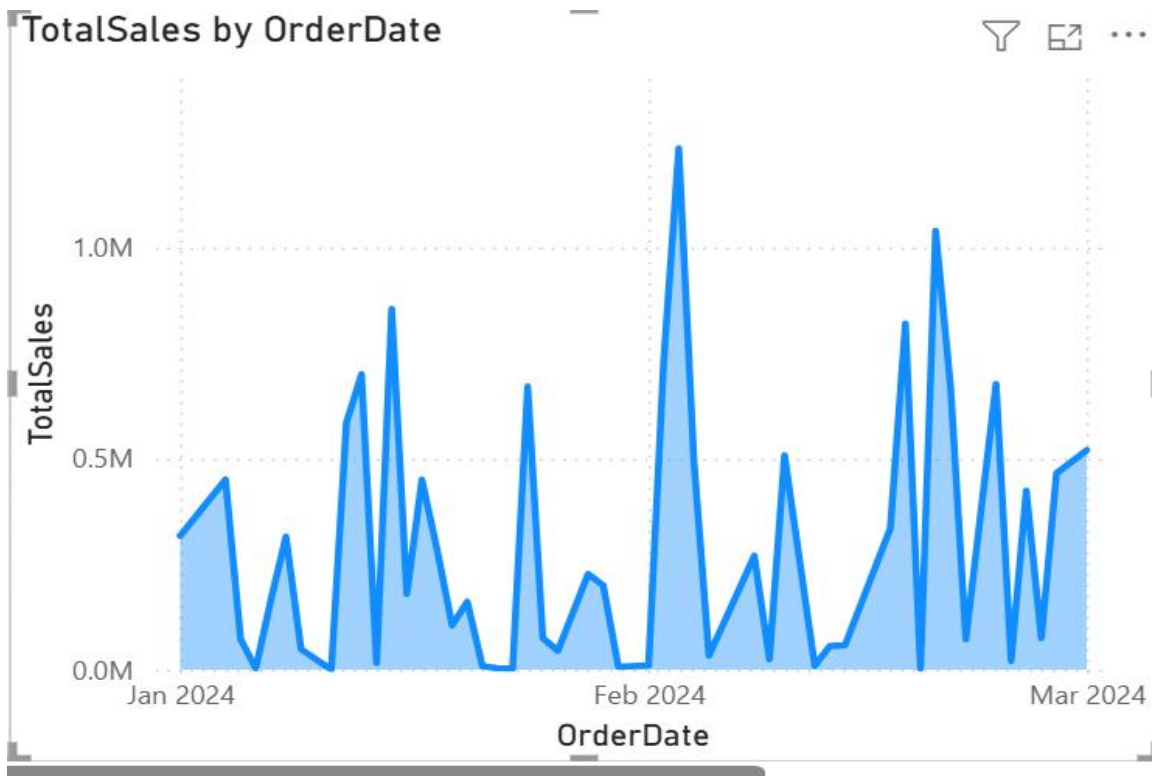
Query Settings: Name: Sales

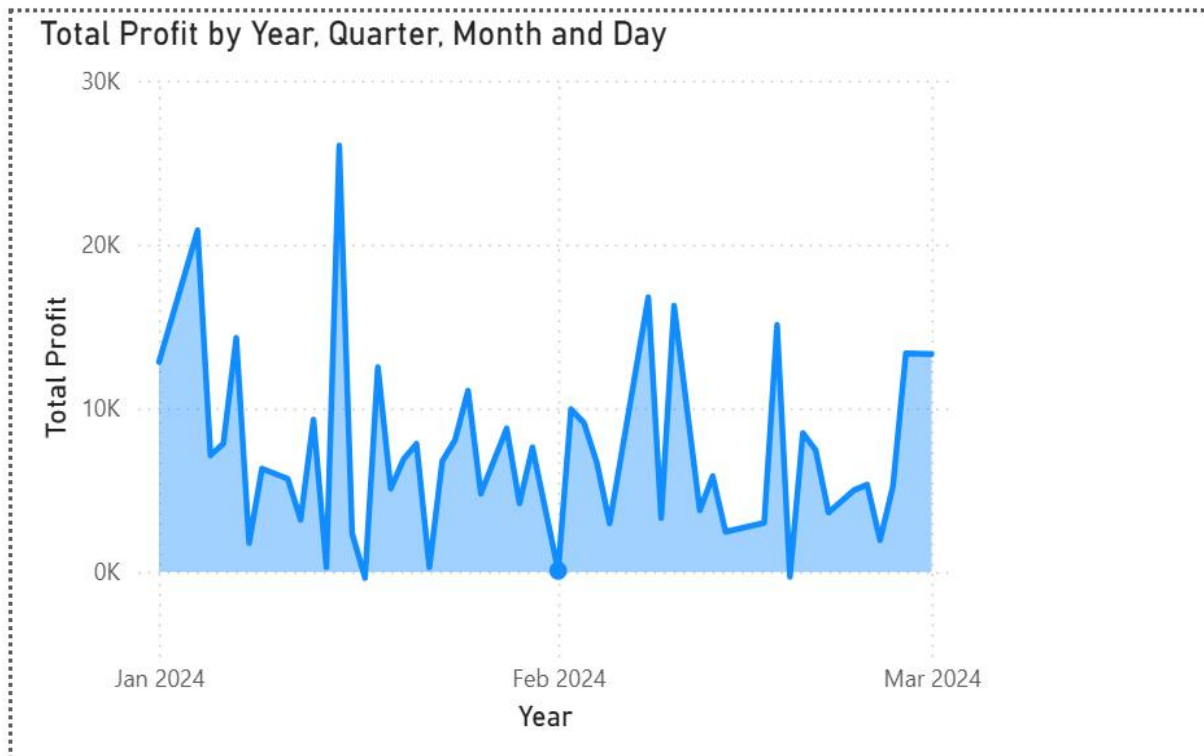
APPLIED STEPS: Source, Navigation, Promoted Headers, Changed Type, X Removed Duplicates

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- 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

Search

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File Home Help Table tools Measure tools

Name: Total Profit Format: General Data category: Uncategorized

Home table: Sales

Structure: 1 Total Profit = SUM(Sales[Profit])

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	01-01-2024	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	C001	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)

ProductID
ProductName
SubCategory

Sales

CustomerID

Discount

OrderDate

OrderID

ProductID

Profit

Profit Margin %

Quantity

Region

Sales

Total Profit

Total Sales

UnitPrice

21:23
09-02-2026

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File Home Help Table tools Measure tools

Name: Total Sales

Format: General

Data category: Uncategorized

Home table: Sales

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

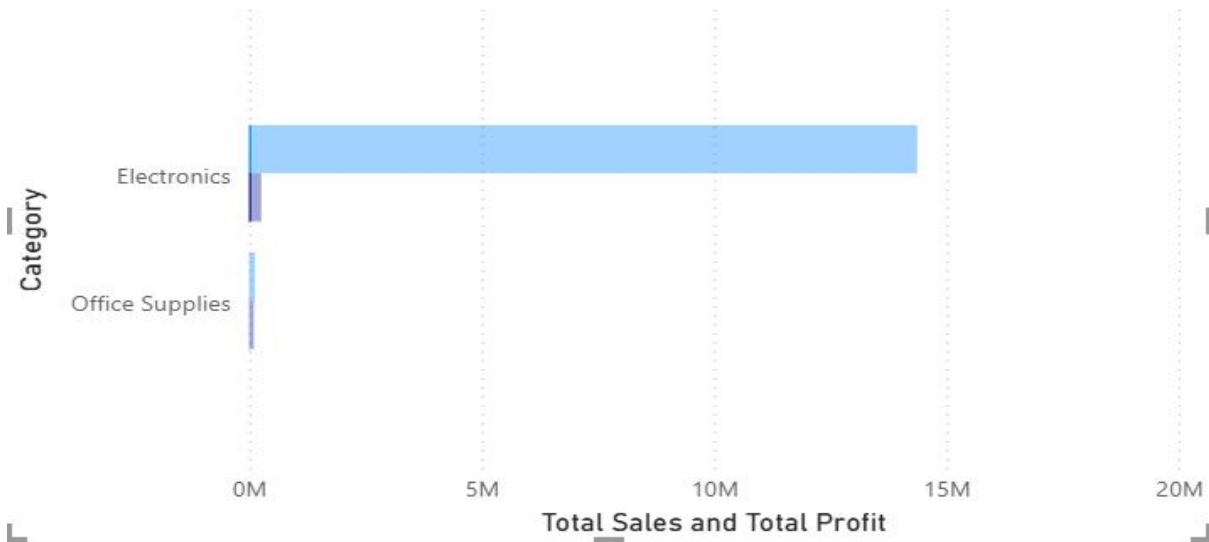
OrderID	OrderDate	CustomerID	ProductID	Region	Quantity	UnitPrice	Discount	Profit	Sales
1001	01-02-2024	C004	P006	East	2	5000	0	76	10000
1002	28-01-2024	C003	P001	South	5	45000	0.19	6146	225000
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1004	04-02-2024	C027	P001	South	8	45000	0.24	-720	360000
1005	10-02-2024	C026	P002	North	1	1200	0.11	1578	1200
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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
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1012	01-01-2024	C020	P005	East	2	300	0.13	4921	600
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1018	13-01-2024	C009	P006	West	10	5000	0.01	7629	50000
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1020	22-02-2024	C015	P003	West	9	8000	0.22	3634	72000
1021	21-01-2024	C029	P005	North	1	300	0.24	7754	300

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

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

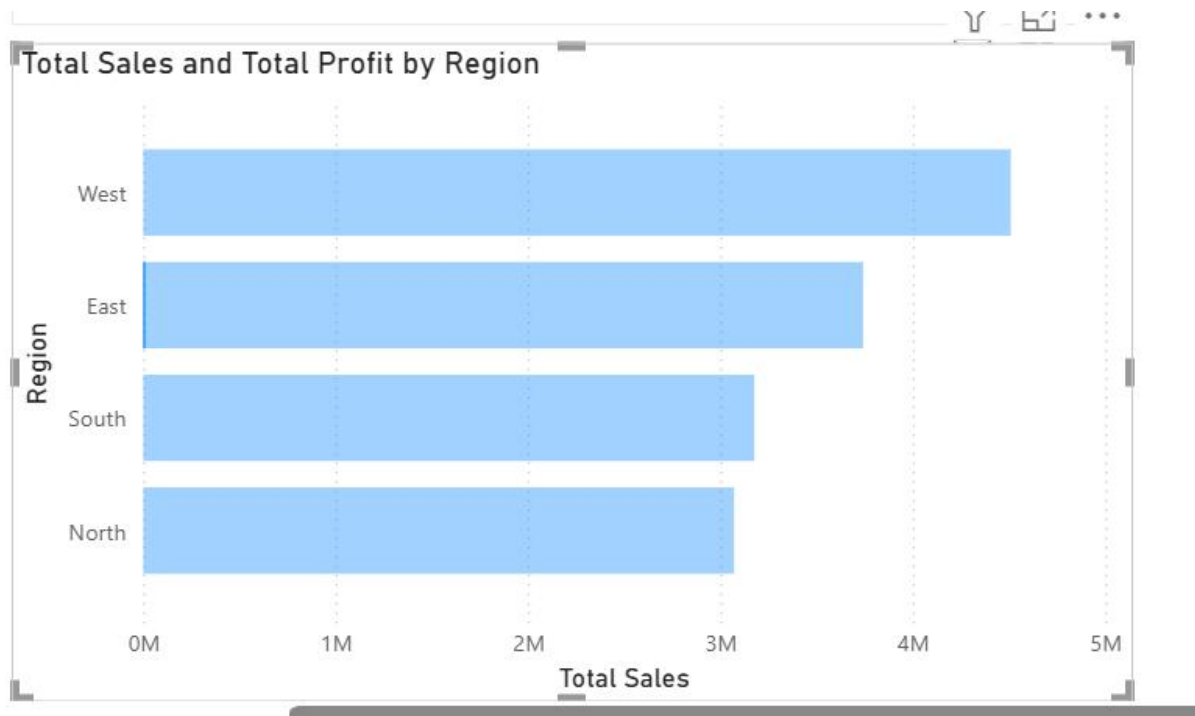
Total Sales and Total Profit by Category

● Total Sales ● Total Profit



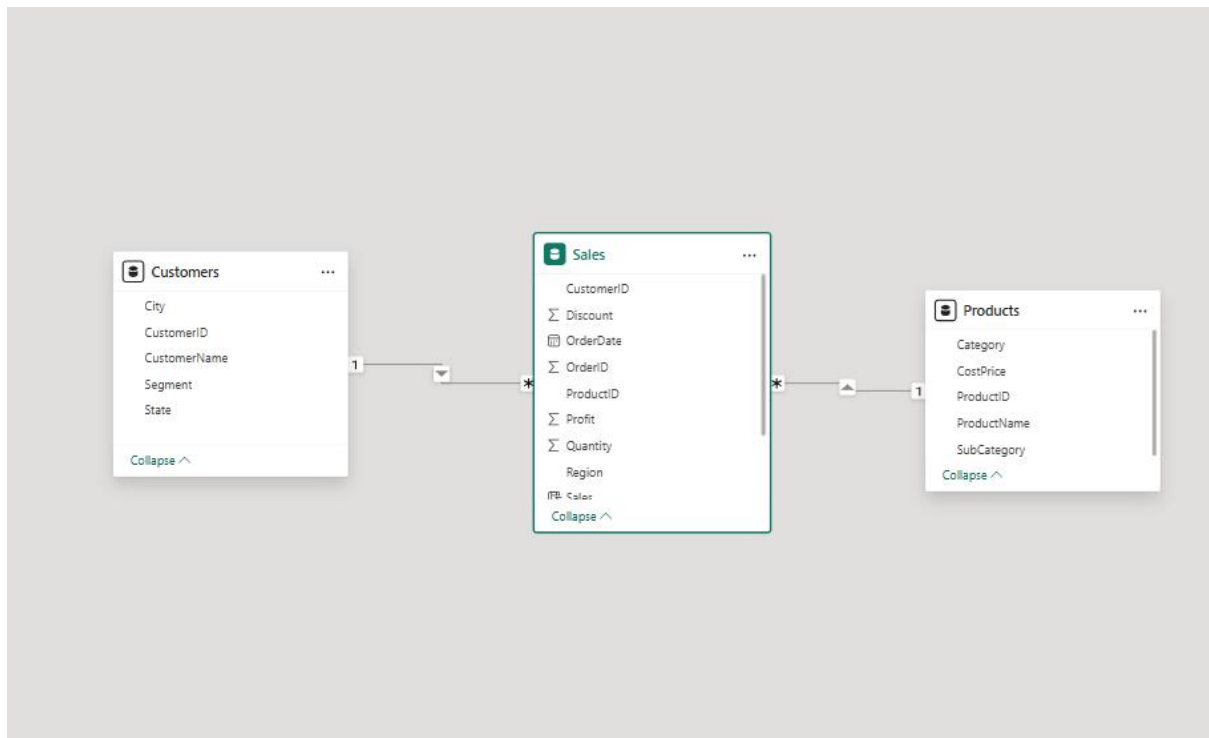
Electronics category contributes the highest revenue and profit in the dataset. Office Supplies category has significantly lower sales and profit, indicating weak performance compared to Electronics.

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

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

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1021	21-01-2024	C029	P005	North	1	300	0.24	7254	300

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

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

File Home Help Table tools Measure tools

Name: Total Profit Format: General Data category: Uncategorized

Home table: Sales

Structure: 1 Total Profit = SUM(Sales[Profit])

OrderID	OrderDate	CustomerID	ProductID	Region	Quantity	UnitPrice	Discount	Profit	Sales
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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
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1021	21-01-2024	C029	P005	North	1	300	0.24	7254	300

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

Profit Margin (%) and low-margin products

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File Home Help Table tools Measure tools

Name Profit Margin % Format General Data category Uncategorized

Home table Sales \$ % Auto

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
1001	01-02-2024	C004	P006	East	2	5000	0	76	10000
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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
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1020	22-02-2024	C015	P003	West	9	8000	0.22	3634	72000
1021	21-01-2024	C026	P006	North	1	300	0.24	7754	300

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

Data

Search

ProductID
ProductName
SubCategory

Sales

CustomerID

Discount

OrderDate

OrderID

ProductID

Profit

Profit Margin %

Quantity

Region

Sales

Total Profit

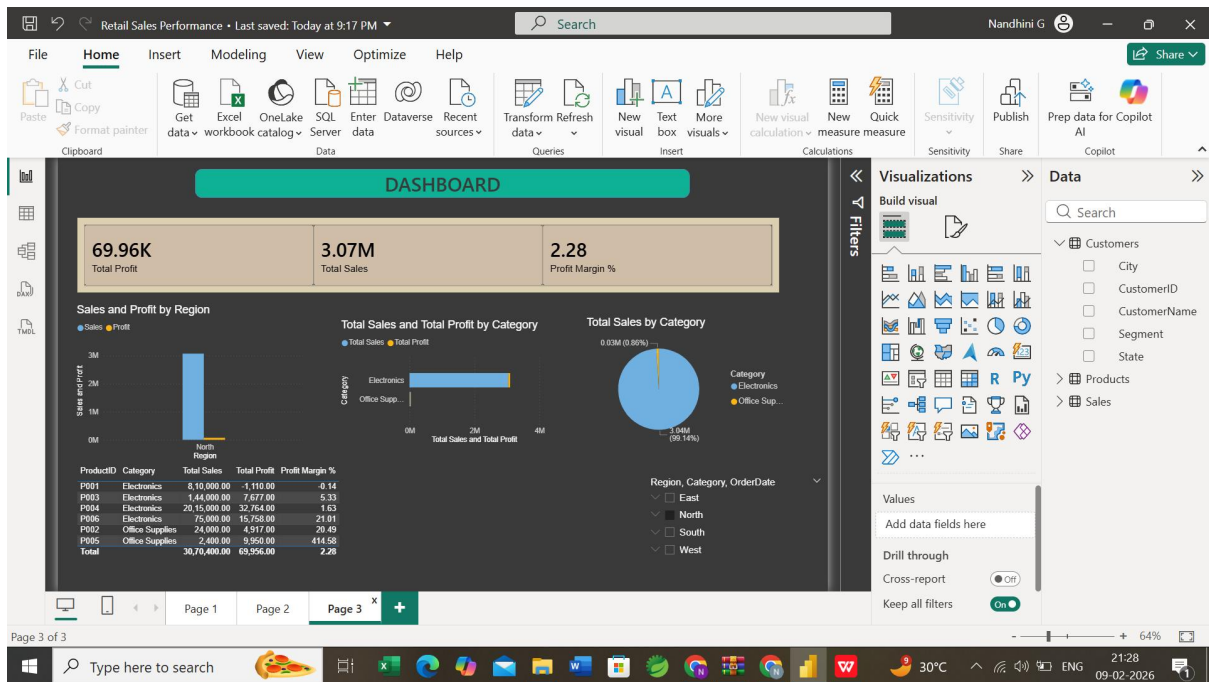
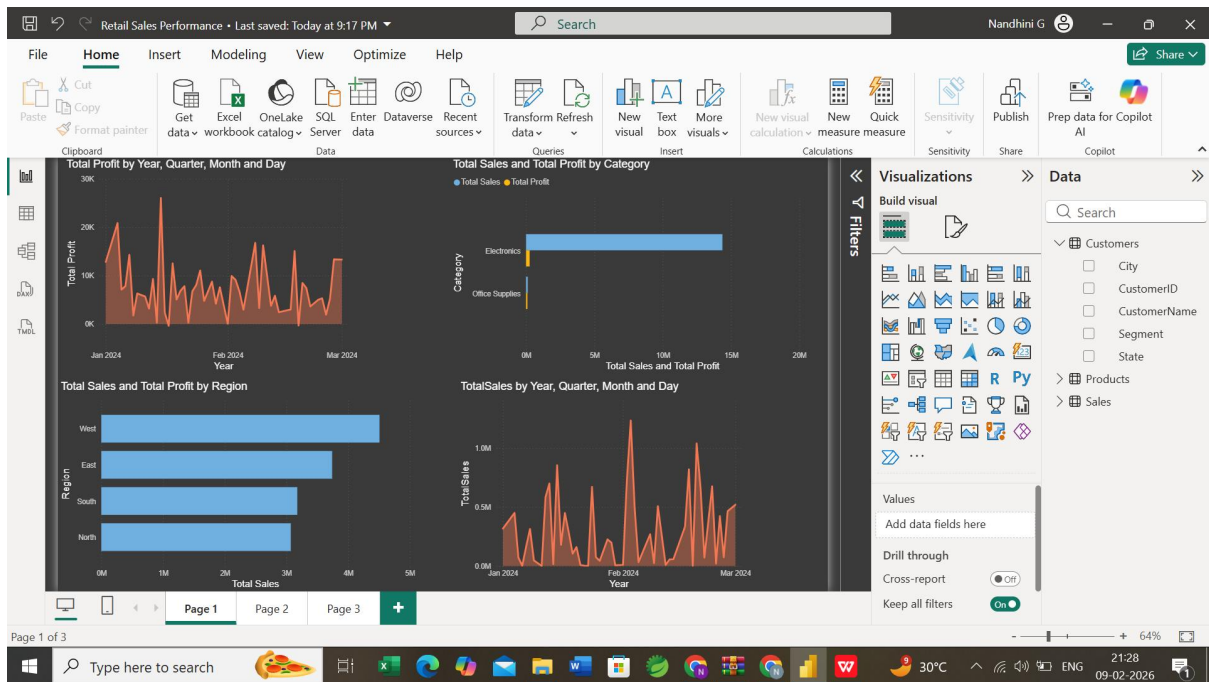
Total Sales

UnitPrice

Name Profit Margin %

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



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.