

# DATA ANALYSIS OF A SUPERSTORE



Power BI



➤ At very first step I got this raw data of superstore. And then I performed Cleaning and transformation of data through pandas to make it appropriate For further analysis through different tools.

Sample - Superstore																							
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
1	A	Order ID	Order Date	Ship Date	Ship Mode	Customer	Customer Segment	Country/R City	State	Postal Cod	Region	Product ID	Category	Sub-Categ	Product N	Sales	Quantity	Discount	Profit				
2		4962	CA-2016-1	7/3/2016	8/3/2016	First Class	AB-10015	Aaron Berj Consumer	United Sta	Seattle	Washington	98103	West	FUR-CH-1C	Furniture	Chairs	Global Pus	48.712	1	0.2	5.4801		
3		4963	CA-2016-1	7/3/2016	8/3/2016	First Class	AB-10015	Aaron Berj Consumer	United Sta	Seattle	Washington	98103	West	OFF-AR-1C	Office Sup	Art	Newell 33i	17.94	3	0	4.6644		
4		4964	CA-2016-1	7/3/2016	8/3/2016	First Class	AB-10015	Aaron Berj Consumer	United Sta	Seattle	Washington	98103	West	OFF-ST-10	Office Sup	Storage	Carina 42"	242.94	3	0	4.8588		
5		8223	CA-2016-1	18/2/2016	24/2/2016	Standard C	AB-10015	Aaron Berj Consumer	United Sta	Arlington	Texas	76017	Central	OFF-ST-10	Office Sup	Storage	Akro Stack	12.624	2	0.2	-2.5248		
6		8802	CA-2018-1	#####	#####	First Class	AB-10015	Aaron Berj Consumer	United Sta	Oklahoma	Oklahoma	73120	Central	TEC-PH-1C	Technolog	Phones	Samsung C	221.98	2	0	62.1544		
7		8803	CA-2018-1	#####	#####	First Class	AB-10015	Aaron Berj Consumer	United Sta	Oklahoma	Oklahoma	73120	Central	FUR-BO-1F	Furniture	Bookcases	Sauder Fac	341.96	2	0	54.7136		
8		3200	CA-2019-1	18/12/201	22/12/201	Standard C	AH-10030	Aaron Hav Corporate	United Sta	Philadelphia	Pennsylv	19134	East	OFF-AR-1C	Office Sup	Art	Avery Fluo	18.704	7	0.2	2.338		
9		3312	CA-2018-1	20/3/2018	25/3/2018	Second Cl	AH-10030	Aaron Hav Corporate	United Sta	Gulfport	Mississippi	39503	South	FUR-FU-1C	Furniture	Furnishing	Eldon Imaj	86.45	7	0	38.038		
10		5355	CA-2016-1	11/3/5/2016	19/5/2016	Standard C	AH-10030	Aaron Hav Corporate	United Sta	Los Angeles	California	90004	West	FUR-CH-1C	Furniture	Chairs	Iceberg Ne	279.456	6	0.2	20.9592		
11		5356	CA-2016-1	13/5/2016	19/5/2016	Standard C	AH-10030	Aaron Hav Corporate	United Sta	Los Angeles	California	90004	West	OFF-PA-10	Office Sup	Paper	EcoTones	8	2	0	3.84		
12		6129	US-2016-1	25/10/201	28/10/201	First Class	AH-10030	Aaron Hav Corporate	United Sta	San Francisco	California	94109	West	OFF-BI-10C	Office Sup	Binders	GBC VeloB	49.408	4	0.2	18.528		
13		7164	CA-2016-1	22/4/2016	24/4/2016	Second Cl	AH-10030	Aaron Hav Corporate	United Sta	Troy	New York	12180	East	OFF-EN-1C	Office Sup	Envelopes	Staple env	247.84	8	0	121.4416		
14		7165	CA-2016-1	22/4/2016	24/4/2016	Second Cl	AH-10030	Aaron Hav Corporate	United Sta	Troy	New York	12180	East	OFF-BI-10C	Office Sup	Binders	ACCOHIDE	9.912	3	0.2	3.3453		
15		8804	CA-2016-1	31/12/201	1/1/2017	First Class	AH-10030	Aaron Hav Corporate	United Sta	New York	New York	10035	East	TEC-AC-1C	Technolog	Accessorie	Verbatim 2	34.77	3	0	11.4741		
16		8805	CA-2016-1	31/12/201	1/1/2017	First Class	AH-10030	Aaron Hav Corporate	United Sta	New York	New York	10035	East	OFF-LA-10	Office Sup	Labels	Avery 51	18.9	3	0	8.694		
17		9680	CA-2017-1	27/12/201	31/12/201	Standard C	AH-10030	Aaron Hav Corporate	United Sta	San Francisco	California	94122	West	OFF-ST-10	Office Sup	Storage	Fellowes S	323.1	2	0	61.389		
18		9681	CA-2017-1	27/12/201	31/12/201	Standard C	AH-10030	Aaron Hav Corporate	United Sta	San Francisco	California	94122	West	TEC-PH-1C	Technolog	Phones	Geomarc A	668.16	9	0.2	75.168		
19		1341	CA-2019-1	2/1/2019	4/1/2019	First Class	AS-10045	Aaron Sme Corporate	United Sta	Jacksonville	North Car	28540	South	TEC-MA-1I	Technolog	Machines	Cisco CP-7	695.7	2	0.5	-27.828		
20		1342	CA-2019-1	2/1/2019	4/1/2019	First Class	AS-10045	Aaron Sme Corporate	United Sta	Jacksonville	North Car	28540	South	OFF-BI-10C	Office Sup	Binders	Avery 3 1/	15.66	5	0.7	-12.528		
21		1343	CA-2019-1	2/1/2019	4/1/2019	First Class	AS-10045	Aaron Sme Corporate	United Sta	Jacksonville	North Car	28540	South	OFF-BI-10C	Office Sup	Binders	Avery Recy	28.854	6	0.7	-21.1596		
22		1352	CA-2018-1	28/3/2018	31/3/2018	First Class	AS-10045	Aaron Sme Corporate	United Sta	Arlington	Virginia	22204	South	OFF-ST-10	Office Sup	Storage	Hanging Pe	31.4	2	0	7.85		
23		1834	CA-2019-1	1/8/2019	7/8/2019	Standard C	AS-10045	Aaron Sme Corporate	United Sta	Austin	Texas	78745	Central	TEC-MA-1I	Technolog	Machines	Bady BDG:	1439.982	3	0.4	-263.997		
24		1835	CA-2019-1	1/8/2019	7/8/2019	Standard C	AS-10045	Aaron Sme Corporate	United Sta	Austin	Texas	78745	Central	OFF-PA-10	Office Sup	Paper	Xerox 199i	36.288	7	0.2	12.7008		
25		3040	CA-2019-1	#####	#####	Standard C	AS-10045	Aaron Sme Corporate	United Sta	Pasadena	California	91104	West	FUR-TA-1C	Furniture	Tables	Lesro Shef	171.288	3	0.2	-6.4233		
26		4580	US-2016-1	27/7/2016	2/8/2016	Standard C	AS-10045	Aaron Sme Corporate	United Sta	New York	New York	10035	East	OFF-PA-10	Office Sup	Paper	Xerox 195i	65.78	11	0	32.2322		
27		9129	US-2019-1	4/9/2019	5/9/2019	First Class	AS-10045	Aaron Sme Corporate	United Sta	Redmond	Oregon	97756	West	OFF-BI-10C	Office Sup	Binders	Avery Trap	88.074	7	0.7	-58.716		
28		9538	CA-2018-1	25/9/2018	27/9/2018	First Class	AS-10045	Aaron Sme Corporate	United Sta	San Francisco	California	94110	West	FUR-BO-1F	Furniture	Bookcases	Atlantic M	477.666	2	0.15	84.294		
29		350	CA-2018-1	1/9/2018	3/9/2018	First Class	AB-10060	Adam Belli Home Offi	United Sta	New York	New York	10009	East	TEC-AC-1C	Technolog	Accessorie	Sabrent 4-	6.79	1	0	2.3086		
30		351	CA-2018-1	1/9/2018	3/9/2018	First Class	AB-10060	Adam Belli Home Offi	United Sta	New York	New York	10009	East	OFF-PA-10	Office Sup	Paper	Xerox 188:	24.56	2	0	11.5432		
31		352	CA-2018-1	1/9/2018	3/9/2018	First Class	AB-10060	Adam Belli Home Offi	United Sta	New York	New York	10009	East	OFF-BI-10C	Office Sup	Binders	Acco Hang	3.048	1	0.2	1.0668		

- After cleaning process I imported this data in mysql,where I performed Queries to get meaningful insights from data for business growth.
- I solved queries to get data for KPIs,charts,bars,tables etc. whose reference is given

Below:-

This is table overview in mysql:-

*table name-~~superstore~~*

The screenshot displays the MySQL Workbench interface. On the left, the 'SCHEMAS' pane shows a tree view of the database structure, including tables like 'category', 'order\_details', 'orders', and 'superstore'. The 'superstore' table is selected. The main editor shows a SQL query: `USE flipkart;` followed by `SELECT * FROM superstore;`. Below the query, the 'Result Grid' shows the first 10 rows of data from the 'superstore' table. The table has 12 columns: row\_id, order\_id, order\_date, ship\_date, ship\_mode, customer\_id, customer\_name, Segment, Country, City, and State.

row_id	order_id	order_date	ship_date	ship_mode	customer_id	customer_name	Segment	Country	City	State
1	CA-2016-152156	11/8/2016	11/11/2016	Second Class	CG-12520	Claire Gute	Consumer	United States	Henderson	Kentucky
2	CA-2016-152156	11/8/2016	11/11/2016	Second Class	CG-12520	Claire Gute	Consumer	United States	Henderson	Kentucky
3	CA-2016-138688	6/12/2016	6/16/2016	Second Class	DV-13045	Darrin Van Huff	Corporate	United States	Los Angeles	California
4	US-2015-108966	10/11/2015	10/18/2015	Standard Class	SO-20335	Sean O'Donnell	Consumer	United States	Fort Lauderdale	Florida
5	US-2015-108966	10/11/2015	10/18/2015	Standard Class	SO-20335	Sean O'Donnell	Consumer	United States	Fort Lauderdale	Florida
6	CA-2014-115812	6/9/2014	6/14/2014	Standard Class	BH-11710	Brosina Hoffman	Consumer	United States	Los Angeles	California
7	CA-2014-115812	6/9/2014	6/14/2014	Standard Class	BH-11710	Brosina Hoffman	Consumer	United States	Los Angeles	California
8	CA-2014-115812	6/9/2014	6/14/2014	Standard Class	BH-11710	Brosina Hoffman	Consumer	United States	Los Angeles	California
9	CA-2014-115812	6/9/2014	6/14/2014	Standard Class	BH-11710	Brosina Hoffman	Consumer	United States	Los Angeles	California
10	CA-2014-115812	6/9/2014	6/14/2014	Standard Class	BH-11710	Brosina Hoffman	Consumer	United States	Los Angeles	California

- This is the overall structure of table superstore on which I am Currently working on this project...

The screenshot shows the MySQL Workbench interface. The left sidebar displays the 'SCHEMAS' tree with 'campusx' selected. The main editor window shows a SQL query for the 'superstore' database. The query is as follows:

```
-- Top 3 Most Profitable Products per Category
WITH Ranked_product AS
(SELECT Category, MIN(product_name),
SUM(Profit) AS 'Total_profit',
RANK() OVER(PARTITION BY Category ORDER BY SUM(Profit) DESC) AS 'rnk'
FROM superstore
GROUP BY Category , product_id
ORDER BY SUM(Profit) DESC)
SELECT * FROM Ranked_product
WHERE rnk <= 3
ORDER BY rnk;
```

Below the query editor, the 'Result Grid' is displayed, showing the top 3 most profitable products per category. The results are as follows:

Category	MIN(product_name)	Total_profit	rnk
Technology	Canon imageCLASS 2200 Advanced Copier	25199.928000000004	1
Office Supplies	Fellowes PB500 Electric Punch Plastic Comb Bind...	7753.039	1
Furniture	Hon Deluxe Fabric Upholstered Stacking Chairs,...	1927.442	1
Technology	Hewlett Packard LaserJet 3310 Copier	6983.8836	2
Office Supplies	Ibico EPK-21 Electric Binding System	3345.2823	2
Furniture	Global Deluxe High-Back Manager's Chair	1558.591	2

## ❖ KPI METRICS SUMMARY FROM SUPERSTORE DATASET-(USING SQL AND POWER BI)

This query extracts Key Performance Indicators (KPIs) from the superstore dataset, providing essential business metrics for dashboard

```
41      -- Query for Total Sales Quantity, and Profit
42      SELECT ROUND(SUM(Sales),2) AS total_sales,
43             ROUND(SUM(Quantity),2) AS total_Quantity,
44             ROUND(SUM(Profit),2) AS total_Profit FROM superstore;
45
```

Result Grid |  Filter Rows:  | Export:  | Wrap Cell Content: 

	total_sales	total_Quantity	total_Profit
▶	2272079.71	36744	282862.05

2.27M

Sum of Sales

282.86K

Sum of Profit

36.74K

Sum of Qua...

## "KPI Summary: Sales, Profit & Quantity from Superstore Data"

- **SQL Query Purpose:-**

- To summarize total sales, total profit, and total quantity sold across all records. Uses aggregate functions and ROUND for cleaner display values.

- **SQL Query Breakdown:**

- SUM(Sales): Total revenue generated from all transactions.
- SUM(Profit): Overall profit after discounts and cost.
- SUM(Quantity): Total number of units sold. ROUND(..., 2): Formats sales and profit values to 2 decimal places for readability.

- **Dashboard Display:**

- The KPI cards (shown at the bottom of the image) visually represent:
- Sales as ~2.27M
- Profit as ~282.86K
- Quantity as ~37K

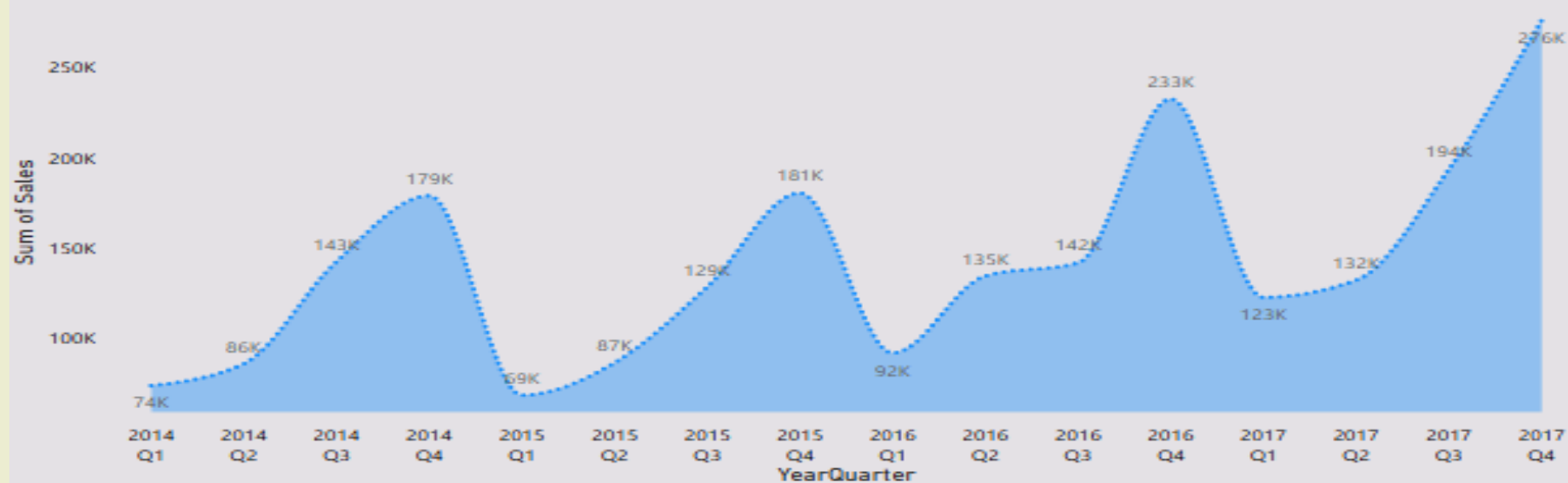
## Sales trend by year and quarter

- **Sales Trend by Year and Quarter-**

This query visualizes quarterly sales performance over the years using the superstore dataset. It helps in identifying seasonal trends, growth patterns, and year-over-year performance

```
181 -- 19 Year-over-Year Sales Growth
182 • SELECT YEAR(str_to_date(order_date,'%m/%d/%Y')) AS 'year' ,
183    QUARTER(str_to_date(order_date,'%m/%d/%Y')) AS 'quarter',
184    ROUND(SUM(Sales),2) AS 'Total_sales'
185 FROM superstore
186 GROUP BY year, quarter
...
```

Sum of Sales by YearQuarter





## **"Quarterly Profit Analysis (2014–2017)"**

**SQL Query Purpose:-** To calculate and display total sales grouped by both year and quarter of the order date. Useful for time series analysis and business trend tracking.

- **SQL Query Breakdown:-**

YEAR(Order Date): Extracts the year from the order date.

QUARTER(Order Date): Extracts the quarter (Q1 to Q4).

SUM(Profit): Total sales for each year-quarter.

ROUND(..., 2): Limits profit to 2 decimal places.

GROUP BY and ORDER BY :- organize data chronologically.

**Graph Output (on Slide):-**

- Visual: A line graph showing profit peaks and troughs per quarter from 2014 to 2017.
- Sales rose sharply in some Q4 periods (e.g., 276K in 2017 Q4).



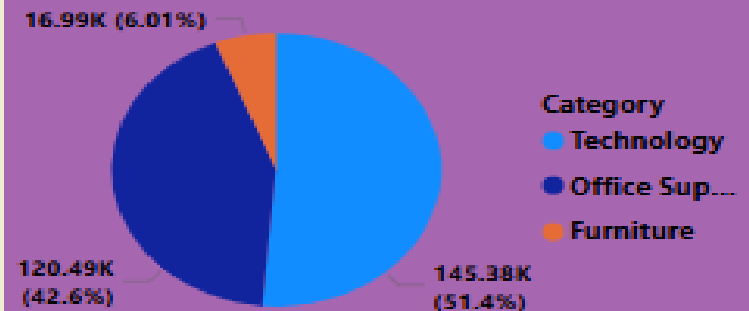
## Profit distribution by Category (Pie chart)

```
63
64 -- 5. Profit by Category
65 • SELECT Category,
66     ROUND(SUM(Profit),2) AS 'Total_profit' FROM superstore
67     GROUP BY Category
68     ORDER BY Total_profit DESC;
69
```

Result Grid | Filter Rows:  | Export: | Wrap Cell Content:

	Category	Total_profit
▶	Technology	145379.33
	Office Supplies	120489.89
	Furniture	16992.83

### Sum of Profit by Category



# **"Profit Contribution by Product Category"**

## **Profit Distribution by Category (Pie Chart):-**

This slide shows the distribution of total profit across different product categories using a pie chart. It helps identify which category contributes most to the business's overall profit.

## **SQL Query Purpose:-**

To calculate total profit for each product category from the superstore dataset and visualize the results as proportions.

## **SQL Query Breakdown:-**

- Category: Groups data by product category (e.g., Furniture, Office Supplies, Technology).
- SUM(Profit): Calculates total profit per category.
- ROUND(..., 2): Limits values to 2 decimal points for clarity.
- **Key Insights:-** Technology is the most profitable category, contributing over half of total profits. Furniture contributes the least to overall profit, signalling possible underperformance or fewer sales.

## Unique Customers Who Placed Orders

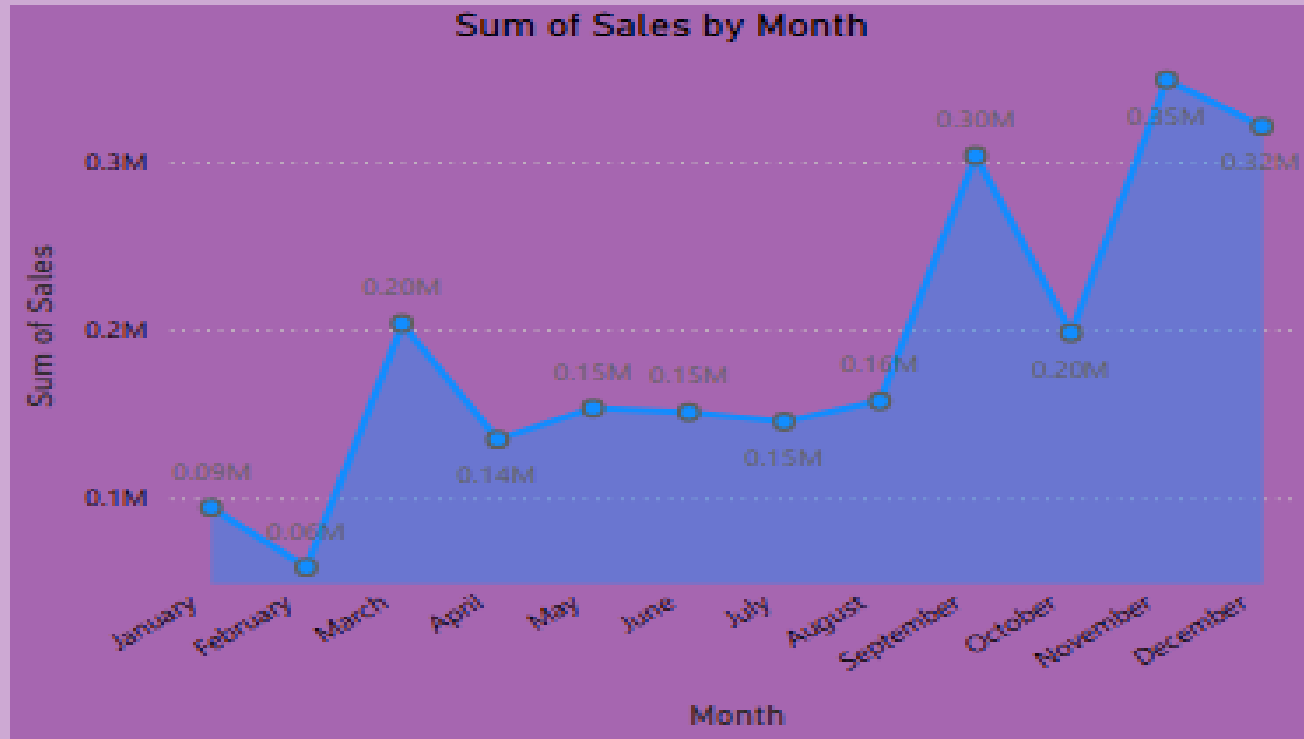
❖ Count of distinct customers: 793

## Top 5 Selling Products (by Quantity)

```
50  -- Top 5 Selling Products (by Quantity)
51  • SELECT MIN(product_name) AS 'Product Name',
52     SUM(Quantity) AS 'Quantity' FROM superstore
53     GROUP BY product_id
54     ORDER BY Quantity DESC LIMIT 5;_
```

Result Grid			Filter Rows:	Export:	Wrap Cell Content:	Fetch rows:
	Product Name	Quantity				
▶	Imation 16GB Mini TravelDrive USB 2.0 Flash Drive	75				
	Xerox 1881	70				
	GBC Premium Transparent Covers with Diagonal...	67				
	Avery Arch Ring Binders	64				
	Situations Contoured Folding Chairs, 4/Set	64				

## Monthly Sales Trend



- ❖ Peaks observed during November and December
- ❖ February recorded the lowest sales figures



## Orders with High Discount (>50%) but Negative Profit

❖ 808 such orders found, suggesting discount inefficiency

## Which Shipping Mode Delivers Fastest

❖ First Class had lowest average shipping days (approx. 2.3 days)




```
188 -- 20 Which Shipping Mode Delivers Fastest
189 • SELECT ship_mode, ROUND(AVG(DATEDIFF(STR_TO_DATE(ship_date, '%m/%d/%Y'),
190   STR_TO_DATE(order_date, '%m/%d/%Y')))) AS days_difference
191 FROM superstore
192 GROUP BY ship_mode
193 ORDER BY days difference ASC;
```

<	
Result Grid	
Filter Rows: <input type="text"/>	
Export:  Wrap Cell Content: 	
ship_mode	days_difference
Same Day	0
First Class	2
Second Class	3
Standard Class	5

## Products with High Sales but Low Profit Margins

```
127
128 -- Products with High Sales but Low Profit Margins
129 • SELECT product_name, ROUND(SUM(Sales),2) AS 'Total_sales',
130        ROUND(SUM(Profit),2) AS 'Total_profit',
131        ROUND((SUM(Profit) / SUM(Sales))*100,2) AS "Profit_Margins"
132 FROM superstore
133 GROUP BY product_id, product_name
134 HAVING Profit_Margins<5 AND Total_sales>5000
135 ORDER BY Total_sales DESC;
```

<

Result Grid |  Filter Rows:  | Export:  | Wrap Cell Content: 

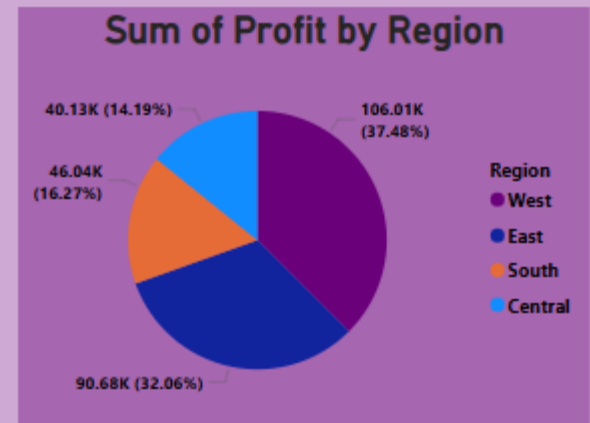
	product_name	Total_sales	Total_profit	Profit_Margins
▶	Cisco TelePresence System EX90 Videoconferen...	22638.48	-1811.08	-8
	HON 5400 Series Task Chairs for Big and Tall	21870.58	0	0
	GBC Ibimaster 500 Manual ProClick Binding System	19024.5	760.98	4
	GBC DocuBind P400 Electric Binding System	17965.07	-1878.17	-10.45
	High Speed Automatic Electric Letter Opener	17030.31	-262	-1.54
	Lexmark MX611dhe Monochrome Laser Printer	16829.9	-4589.97	-27.27
	Martin Yale Chadless Opener Electric Letter Ope...	16656.2	-1299.18	-7.8
	Riverside Palais Royal Lawyers Bookcase, Royal...	15610.97	-669.54	-4.29
	Bretford Rectangular Conference Table Tops	12995.29	-327.23	-2.52

Result 11

- ❖ Tables and Bookcases showed high revenue but minimal or negative profit

## **“Profit Distribution by Region”**

```
-- Total Profit by regions
SELECT Region,
ROUND(SUM(profit),2) AS 'Total profit'
FROM superstore
GROUP BY Region
ORDER BY 'Total profit' ASC;
```





## **"Regional Profit Contribution Breakdown"**

### **Profit Distribution by Region (Pie Chart)-**

This slide visualizes the sum of profits from different regions using a pie chart. It helps identify regional performance in terms of total profit contribution.

**SQL Query Purpose:** To calculate and display total profit from each region using the superstore dataset.

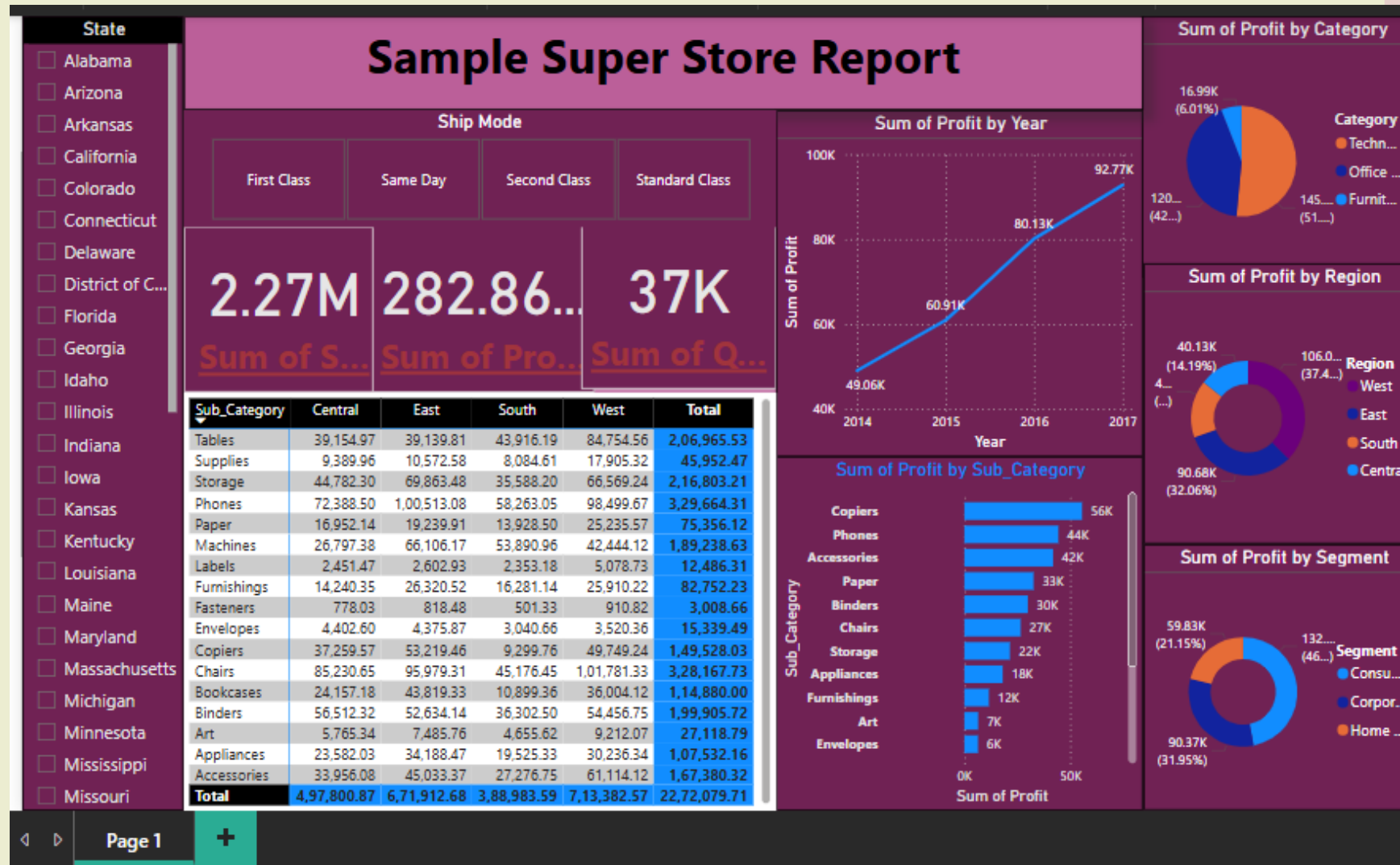
### **Chart Output (on Slide):**

- Title: "Sum of Profit by Region"
- Chart Type: Pie chart
- Segment details:
  - West: ₹106.01K (~37.48%)
  - East: ₹90.68K (~32.06%)
  - Central: ₹40.13K (~14.19%)
  - South: ₹46.04K (~16.27%)

### **Key Insights:-**

West region is the top performer, generating the highest profit. South region contributes the least, indicating potential for strategic improvement.

# COMPREHENSIVE SAMPLE SUPERSTORE REPORT DASHBOARD



Page 1

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## **Attached power BI dashboard includes(Summary)**

1. Key KPIs Displayed .
2. Trend Analysis: Profit by Year and Quarter
3. Profit Distribution Charts:
4. Technology leads in profit contribution.
5. Sum of Profit by Region (Middle Right - Pie Chart):
6. The West region contributes the most profit.
7. Sum of Profit by Segment (Bottom Right - Donut Chart):
8. Consumers are the largest profit-generating segment.
9. Profit Table: Profit by Sub-Category and Region
- 10.Horizontal Bar Chart: Sum of Profit by Sub-Category
- 11.Shows which product types are most profitable.

# **Business -insights**

## **1. Profit Trends by Year and Quarter:-**

There is a consistent upward trend in profit from 2014 to 2017. Quarterly peaks suggest seasonal purchasing behavior, likely driven by end-of-year holidays or promotional campaigns.

- **Recommendation:** Capitalize on high-profit quarters by increasing marketing spends and inventory ahead of these periods.

**2.Profit by Category:-** Technology contributes the highest profit (₹145.38K), over 51% of total profits. Furniture is significantly underperforming (₹16.99K).

- **Recommendation:** Increase focus on Technology through promotions and bundling. Reevaluate Furniture pricing, vendor terms, or reduce SKUs to improve profitability.

### 3. Profit by Region: -

- West and East regions are top performers, contributing ~70% of total profit combined. South region underperforms significantly (₹46.04K).
- **Recommendation:** Allocate more resources and inventory to West and East regions. Investigate customer needs and delivery logistics in South to boost performance.

**4.Profit by Segment:-** Consumer segment yields the highest profit (₹134.12K).Home Office lags behind (₹60.3K).

- **Recommendation:** Double down on consumer-targeted campaigns.Explore product-market fit improvements for the Home Office segment.

**5. Sub-Category Performance:** -Copiers, Phones, and Accessories are the most profitable sub-categories. Items like Furnishings and Appliances generate the lowest returns.

- **Recommendation:** Focus promotions and stock investments on top sub-categories. Consider phasing out low-performing items or repositioning them in the market.

**6.Regional Sub-Category:-**TrendsPerformance varies by region—e.g., Phones sell well in the West, while Chairs do better in the East.

- Recommendation: implement region-specific product strategies to align inventory and marketing with local preferences.

## **Strategic Actions: -**

- ❖ ***Prioritize investment in Technology and Consumer segment.***
- ❖ ***Perform deep-dive analysis on underperforming regions (South) and categories (Furniture).***
- ❖ ***Use seasonal trends to plan sales campaigns and inventory buildup.***
- ❖ ***Tailor marketing strategies regionally using sub-category insights.***
- ❖ ***Reassess high discounting strategies on low-margin products.***



THANK-YOU..