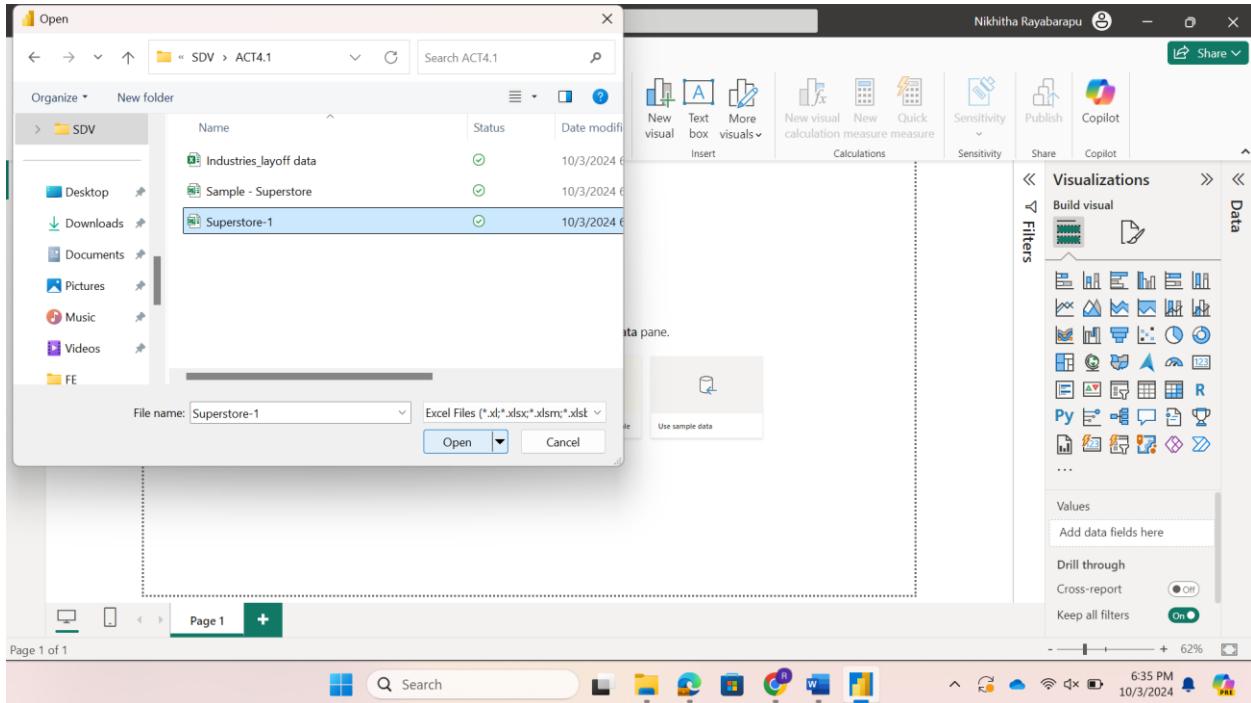


# POWERBI

## TUTORIAL 1

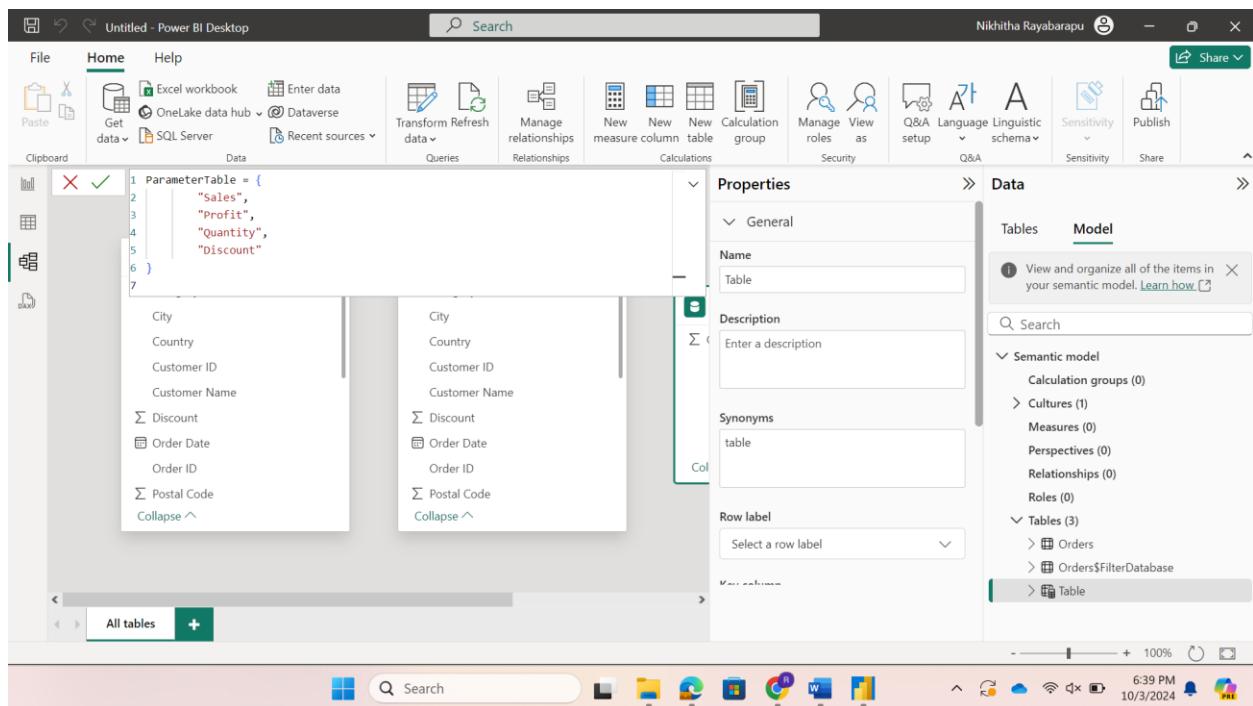
Step 1: Load the Superstore data.



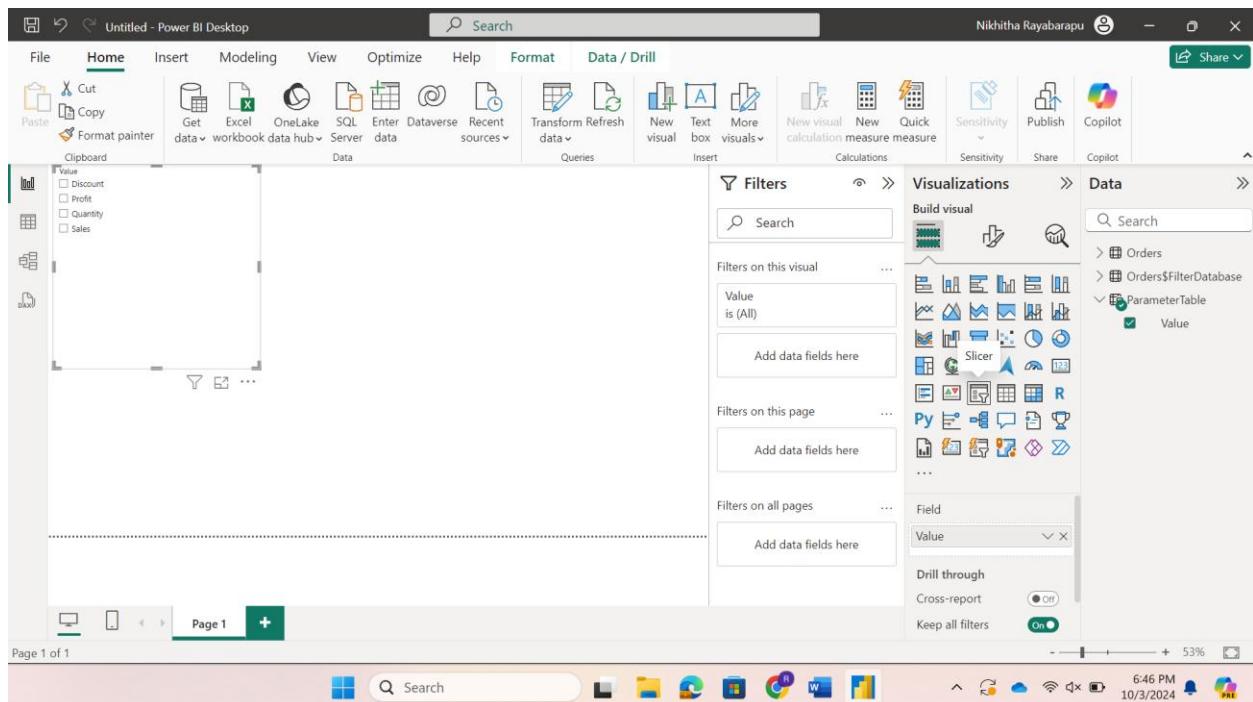
A **parameter table** is used to allow users to select a value (like “Sales”, “Profit”, or “Quantity”) and dynamically update the measure displayed. Follow these steps to create it:

Step 2: Go to the **Modeling** tab and select **New Table**. Enter the following code to create a simple table with different metrics:

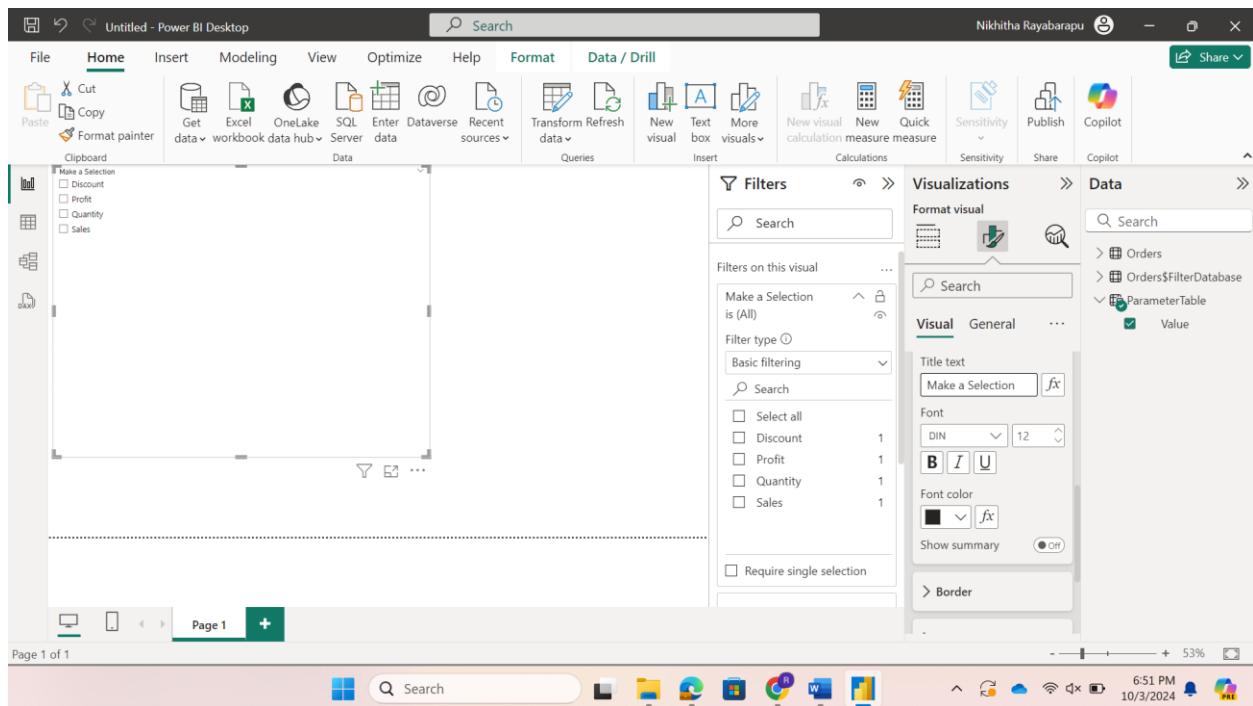
```
ParameterTable = {  
    "Sales",  
    "Profit",  
    "Quantity",  
    "Discount"  
}
```



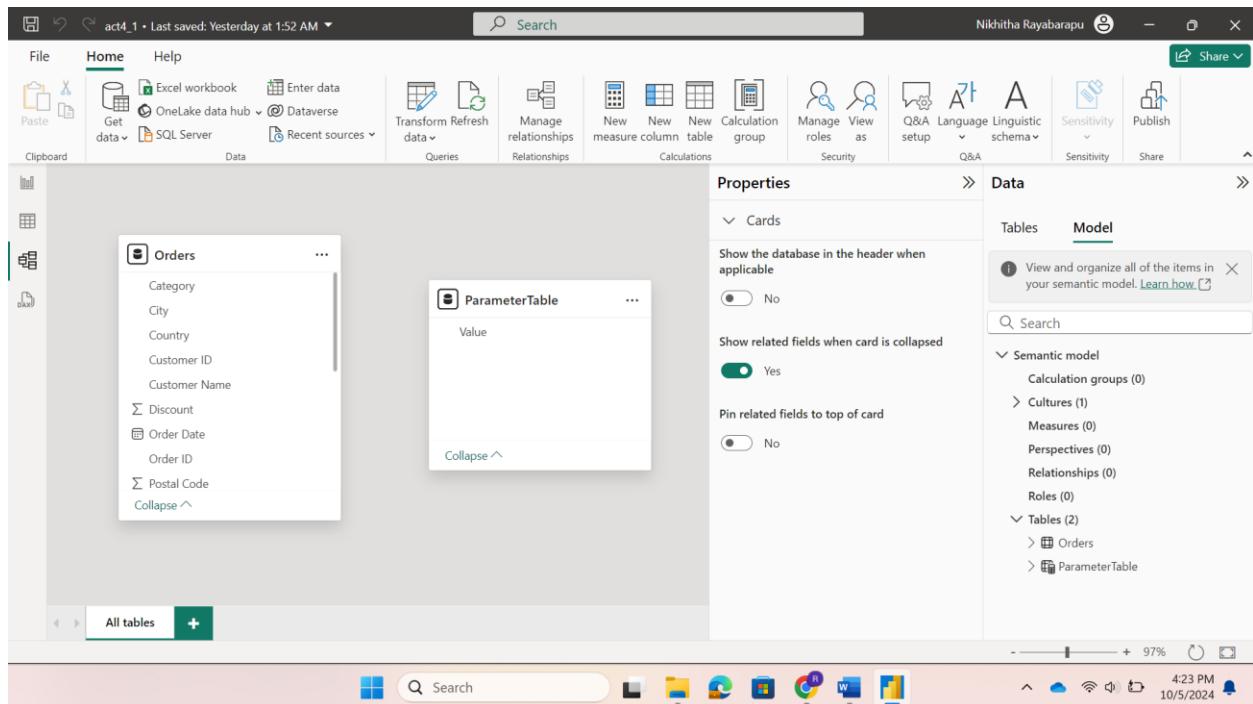
Step 3: After creating this table, go to the Report View. Drag it into a **slicer** visual in your report. This slicer will now act as the control for selecting which metric to display in your visualizations.



Step 4: Rename “Value” to “Make a selection”



Step 5: Now we will create a dynamic measure that changes based on the value selected in the slicer.



The screenshot shows the Power BI Data Editor interface. In the center, there is a code editor window displaying the following DAX formula:

```
ParameterTable = {
    "Sales",
    "Profit",
    "Quantity",
    "Discount"
}
```

To the right of the code editor is a Properties panel for the "ParameterTable". The "Name" field is set to "ParameterTable". The "Description" field contains the placeholder "Enter a description". The "Synonyms" field lists "parameter table, ParameterTable". The "Row label" field is set to "Select a row label".

On the far right, a context menu is open over the "ParameterTable" entry in the "Tables" section of the Model tab. The menu includes options like "Add related tables", "New measure", "New column", "Manage relationships", "Select columns", "Select measures", "Rename", "Delete from model", "Hide in report view", "Unhide all", "Collapse all", and "Expand all".

Go to the **Modeling** tab and select **New Measure**. Enter the following DAX formula:

User Selection = SELECTEDVALUE(ParameterTable[Value])

The screenshot shows the Power BI Data Editor interface. In the center, there is a code editor window displaying the following DAX formula:

```
User Selection = SELECTEDVALUE(ParameterTable[Value])
```

To the right of the code editor is a Properties panel for the new measure. The "Name" field is set to "Measure". The "Home table" dropdown is set to "ParameterTable". The "Description" field contains the placeholder "Enter a description". The "Synonyms" field lists "measure".

On the far right, a context menu is open over the "Measure" entry in the "Tables" section of the Model tab. The menu includes options like "Add related tables", "New measure", "New column", "Manage relationships", "Select columns", "Select measures", "Rename", "Delete from model", "Hide in report view", "Unhide all", "Collapse all", and "Expand all".

Step 6: Create another **New Measure** by following DAX formula:

Calculation =

SWITCH(

TRUE(),

[User Selection] = "Sales", SUM(Orders[Sales]),

[User Selection] = "Profit", SUM(Orders[Profit]),

[User Selection] = "Quantity", SUM(Orders[Quantity]),

[User Selection] = "Discount", AVERAGE(Orders[Discount]),

"Select any single calculation"

)

This measure uses SWITCH to select the appropriate calculation based on the value in User Selection. When “Sales” is selected, it will sum up the Sales column; if “Profit” is selected, it will sum up the Profit column, and so on.

The screenshot shows the Power BI Desktop interface with the DAX editor open. The formula in the editor is:

```
1 Calculation =
2 SWITCH(
3     TRUE(),
4     [User Selection] = "Sales", SUM(Orders[Sales]),
5     [User Selection] = "Profit", SUM(Orders[Profit]),
6     [User Selection] = "Quantity", SUM(Orders[Quantity]),
7     [User Selection] = "Discount", AVERAGE(Orders[Discount]),
8     "Select any single calculation"
9 )
```

The 'Properties' pane shows:

- Name: Calculation
- Type: ParameterTable
- Description: Enter a description
- Synonyms: calculation

The 'Data' pane shows:

- Tables: Orders, ParameterTable
- ParameterTable: Calculation, User Selection, Value

Step 7: Drag a card. Add **Parameter Table > Value** to Fields. Click on one of the slicer options to see the change on the card.

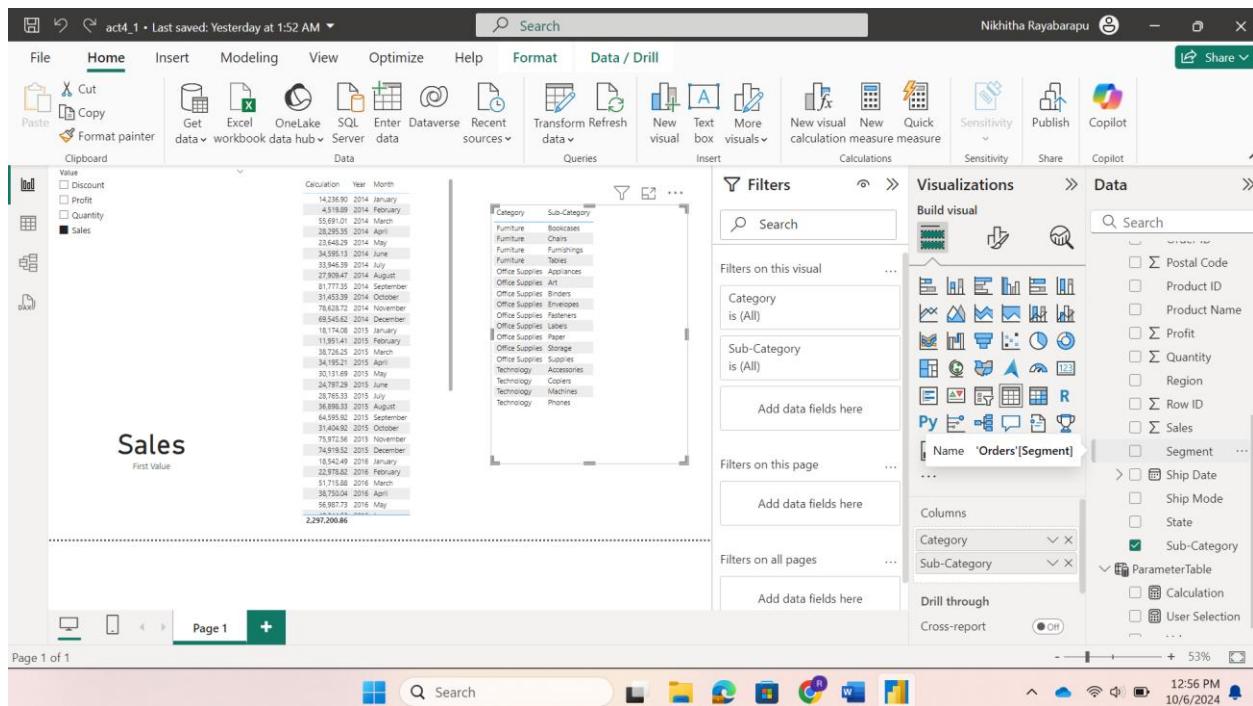
The screenshot shows the Power BI desktop interface. The ribbon is at the top with tabs like File, Home, Insert, Modeling, View, Optimize, Help, Format, and Data / Drill. The Home tab is selected. On the left, there's a clipboard with items like Value, Discount, Profit, Quantity, and Sales. In the center, there's a visual titled 'Discount' with a subtitle 'First Value'. On the right, the Data pane shows the 'Orders' table with a selected 'Value' column. The status bar at the bottom shows the date as 10/5/2024 and the time as 4:40 PM.

## Step 8: Select table and drag Year and Month from Orders Table and Calculation from Parameter Table

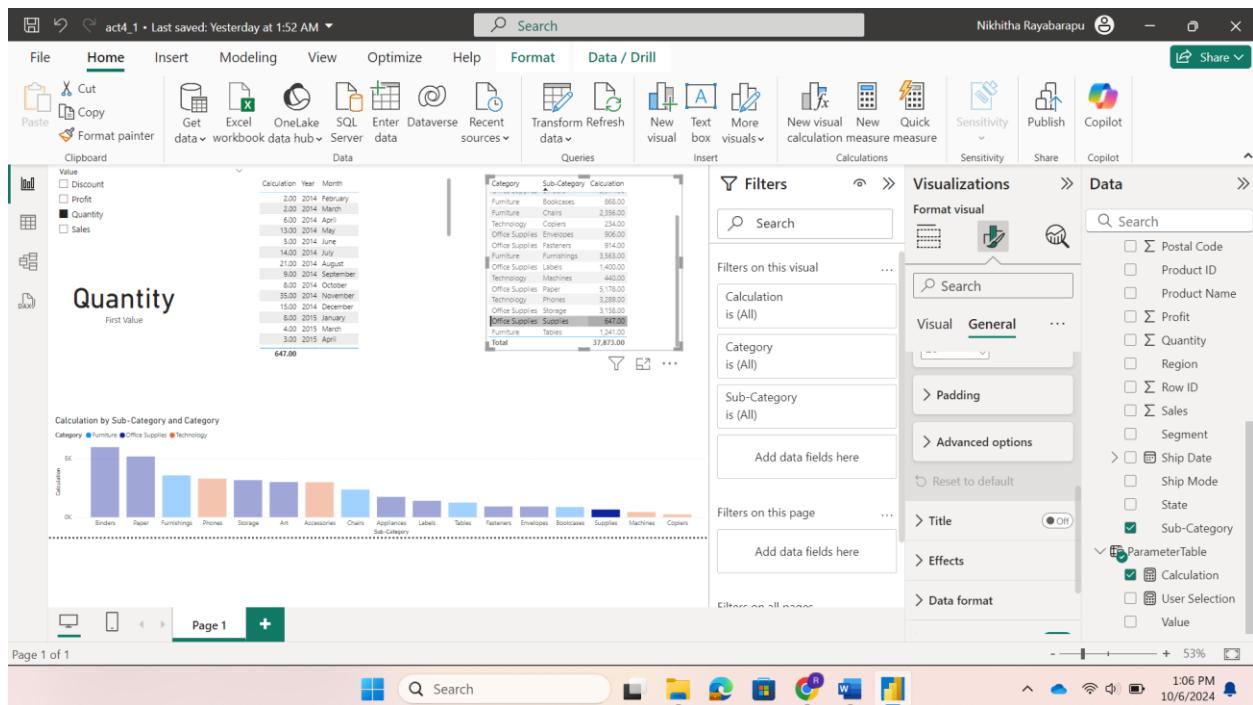
The screenshot shows the Power BI desktop interface. The ribbon is at the top with tabs like File, Home, Insert, Modeling, View, Optimize, Help, Format, and Data / Drill. The Home tab is selected. On the left, there's a clipboard with items like Value, Discount, Profit, Quantity, and Sales. In the center, there's a visual titled 'Quantity' with a subtitle 'First Value'. On the right, the Data pane shows the 'ParameterTable' with selected fields: Postal Code, Product ID, Product Name, Profit, Quantity, Region, Row ID, Sales, Segment, Ship Date, Ship Mode, State, and Sub-Category. The status bar at the bottom shows the date as 10/6/2024 and the time as 12:53 PM.

Now, changing the value in the slicer will update the visuals dynamically.

## Step 9: Select another table. Drag **Category** and **Sub-category** to the table.

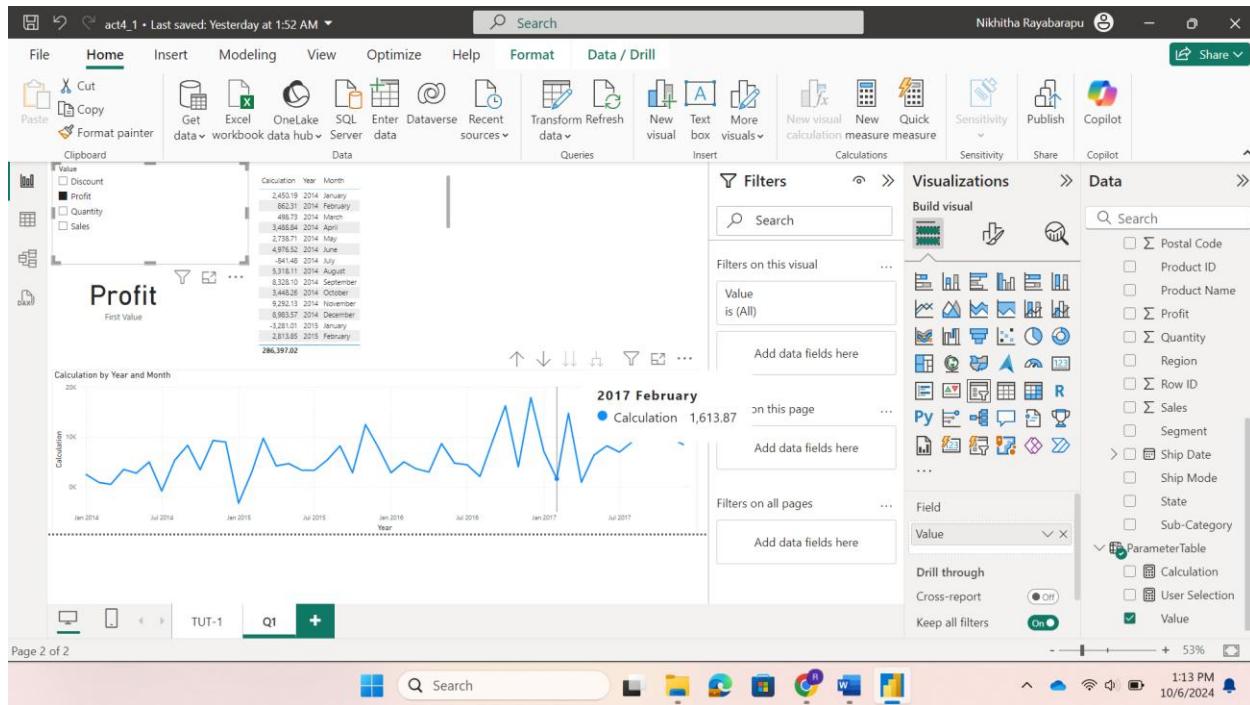


Step 9: Select a column chart. Drag Category, Sub-category and Calculation into the chart.

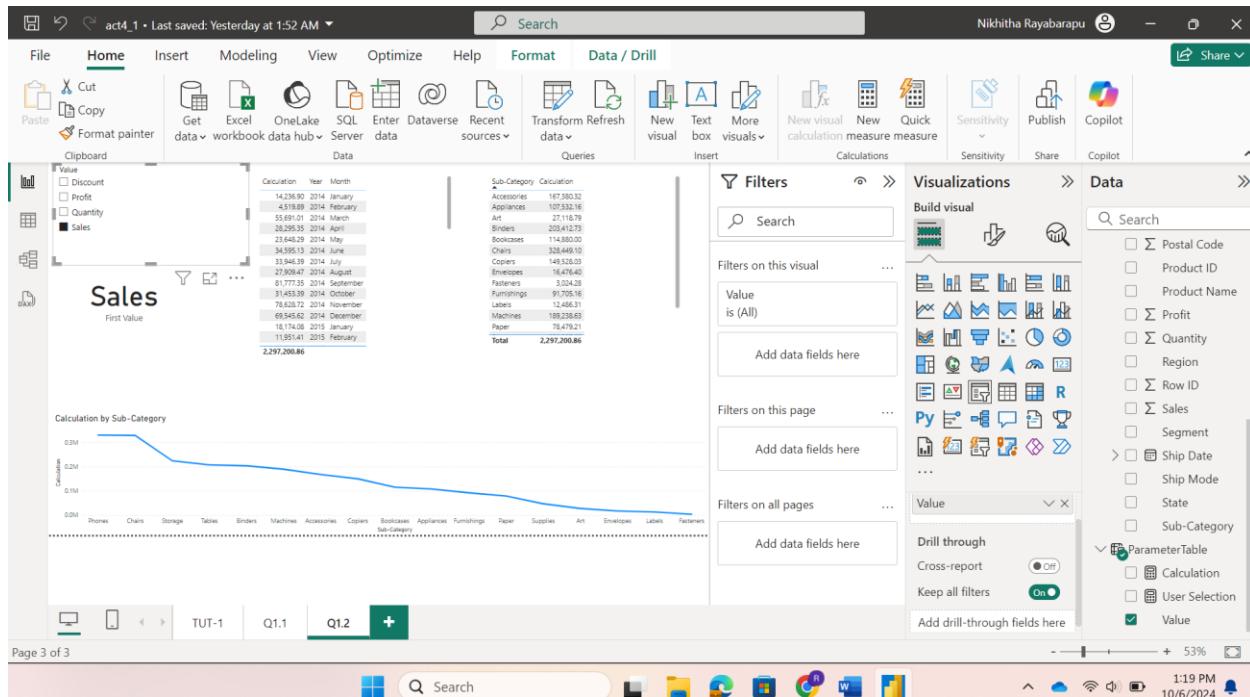


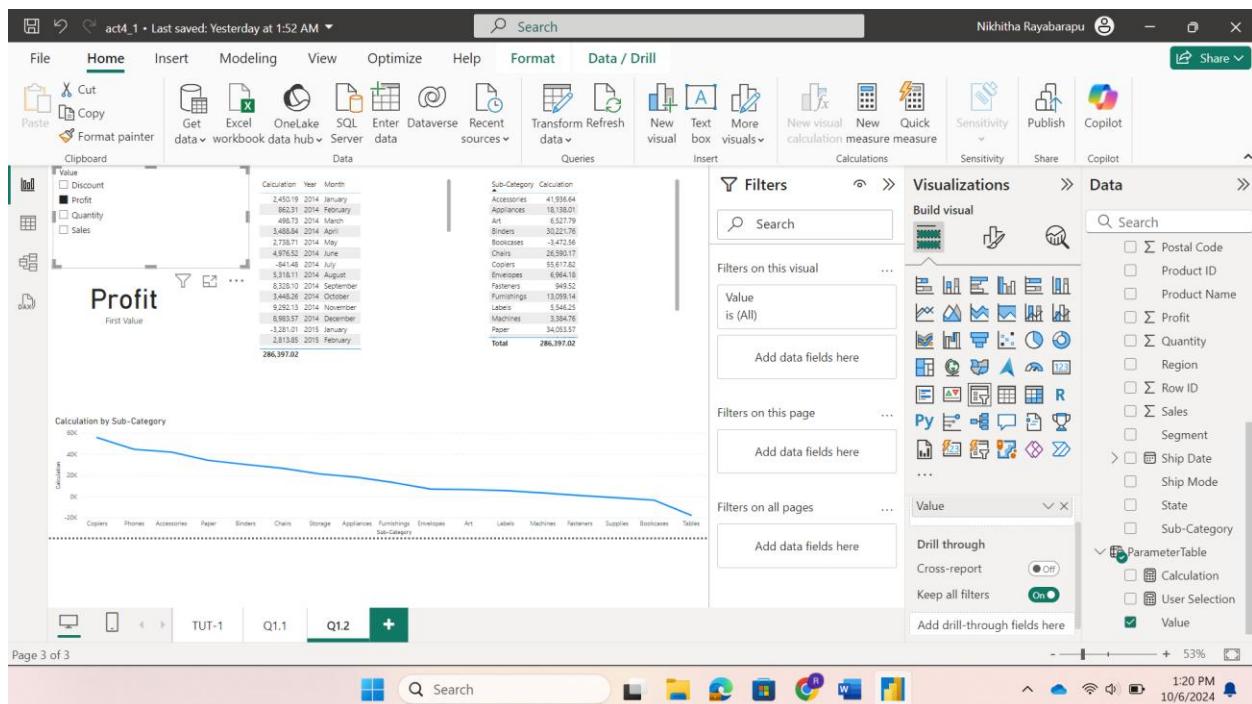
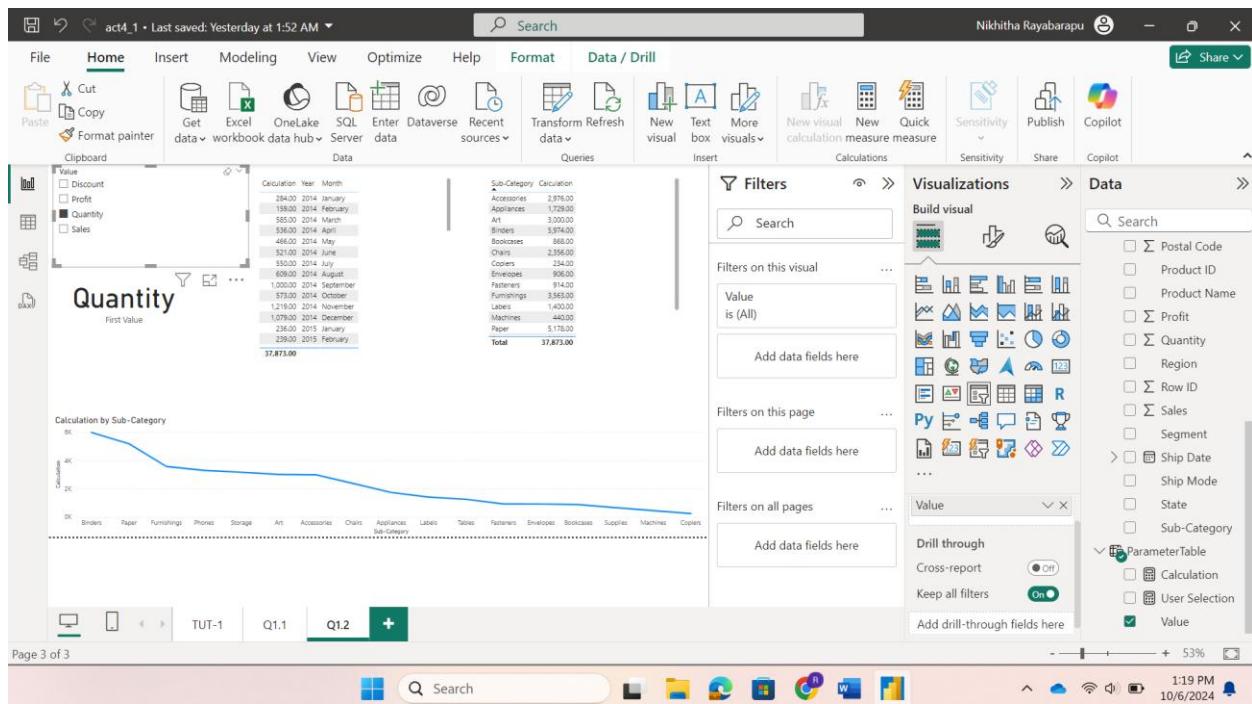
## QUESTION 1:

1. Implement a line chart showing the selected metric's trend over time (by Year and Month).



2. Explore the patterns in Sales, Profit, and Quantity across different Sub-Categories over time. How do the trends shift when switching between these metrics? What insights can you gather regarding seasonal trends, high-performing categories, or products?





**Ans:** The graph changes based on the selected value. We can visualize the sales, profit, quantity & discount of different sub categories and analyse them. **Insights:** Binders are the highest in Quantity whereas copiers are the least in quality. In contrast, Copiers has brought the highest amount of profit of more than 55k units. Binder's profit falls around 33k units.

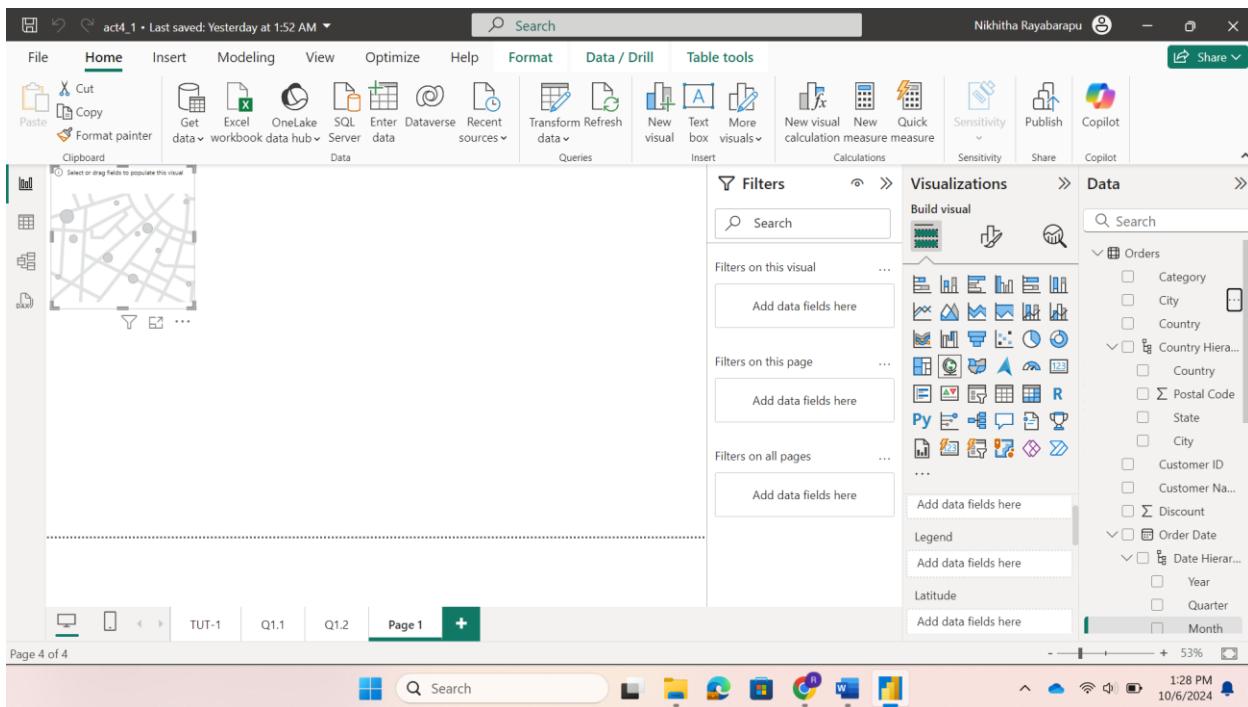
3. Explain how the SWITCH function in your DAX calculation enables dynamic switching between the metrics in the charts.

A: The SWITCH function in the DAX calculation evaluates an expression and returns a result corresponding to the first matching condition. [User Selection] refers to the parameter that users can choose through the slicer. For example, When the [User Selection] is "Sales", the SWITCH function returns SUM(Orders[Sales]), calculating the total sales.

## Tutorial 2

Step 1: Load the Superstore dataset.

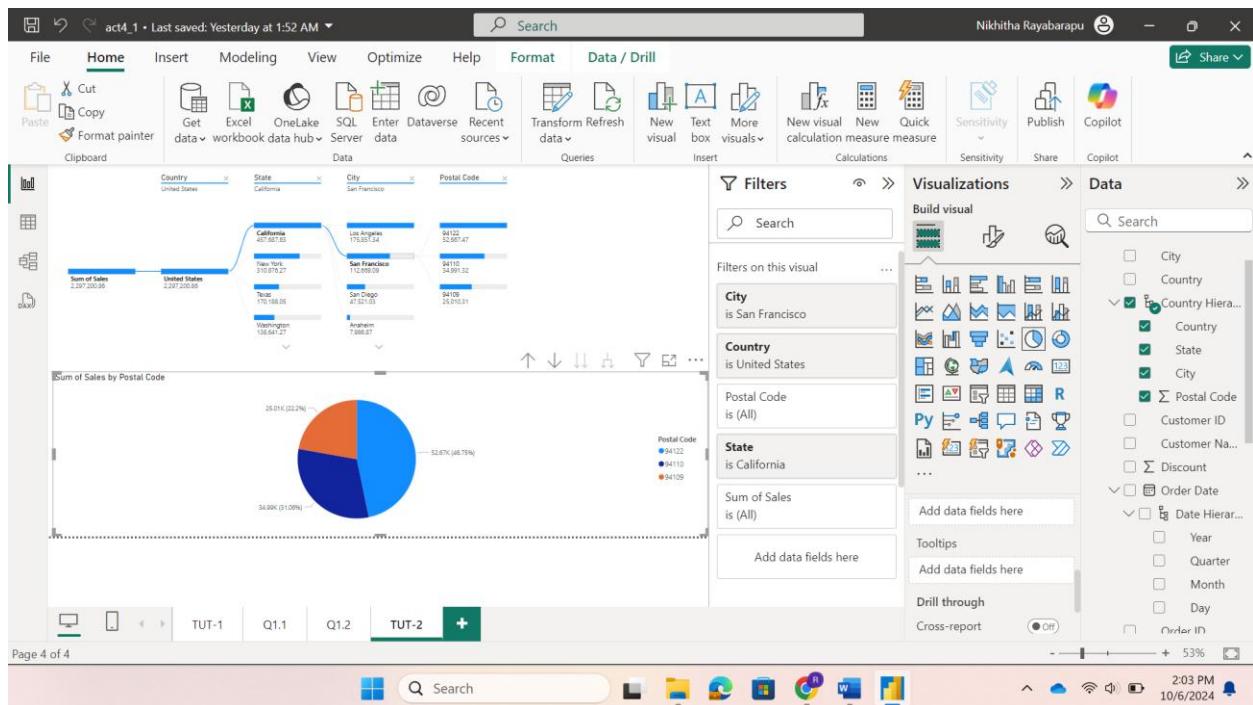
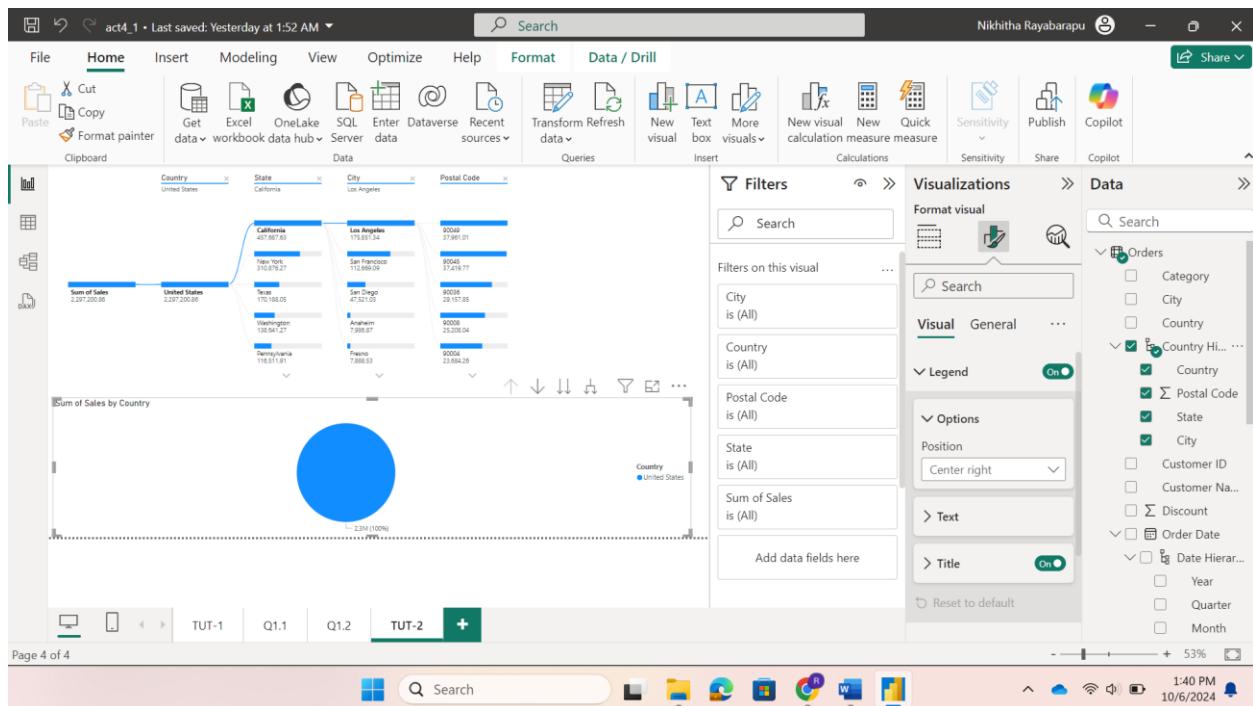
Step 2: In the **Data View**, find columns such as **Country**, **State**, **City**, and **Postal Code**. Right-click on **Country**, select **New Hierarchy**. This will create the hierarchy. Add **State**, **City**, and **Postal Code** to this hierarchy by right-clicking on each of these columns and selecting **Add to Hierarchy > Country Hierarchy**.



Step 3: Go to **Report View**. In the **Visualizations Pane**, select the **Decomposition Tree** visual. Drag the newly created **Country Hierarchy** to the **Explain By** section of the Decomposition Tree. Drag **Sales** to the **Analyze** section.

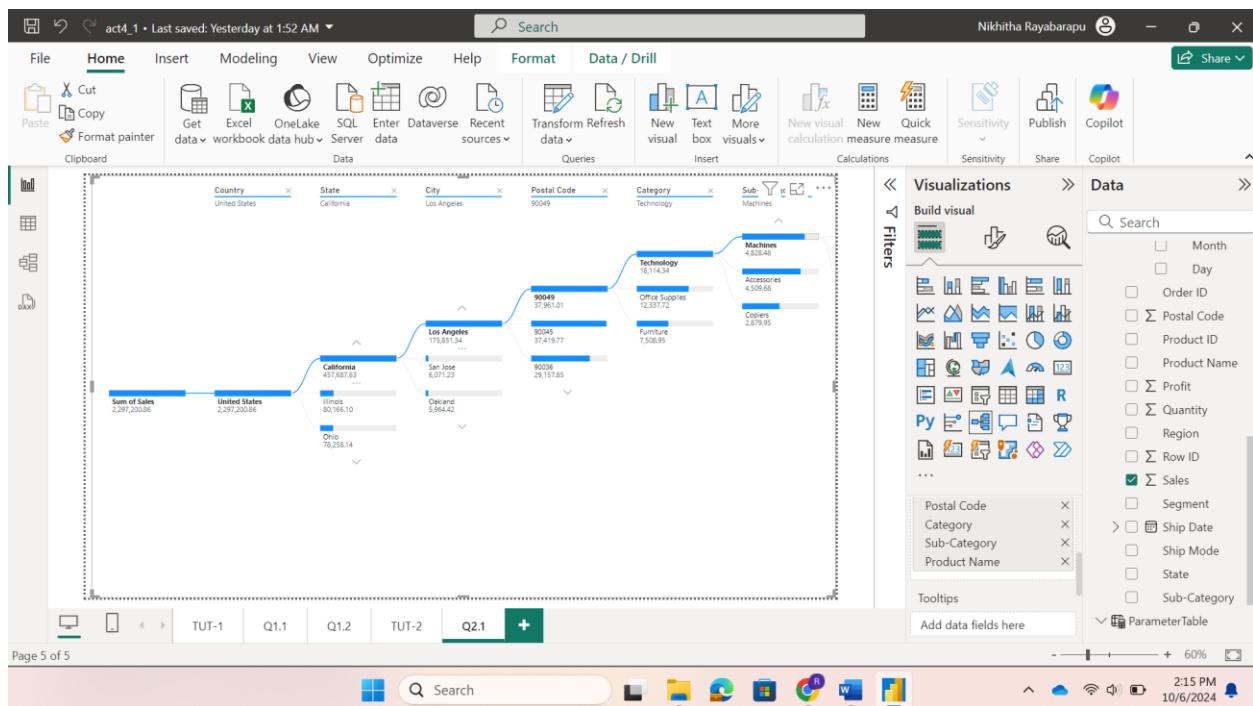
Step 4: In the report, click on the + and select **Country** to drill down into the **Country**, followed by **State**, **Cities**, and then **Postal Codes**. As you drill down, the Decomposition Tree will show a breakdown of **Sales** by different geographical levels.

Step 5: Select a **Pie Chart** from the **Visualizations** pane. Drag **Sales** to the **Values** field. Add **Country Hierarchy** to the **Legend** field.



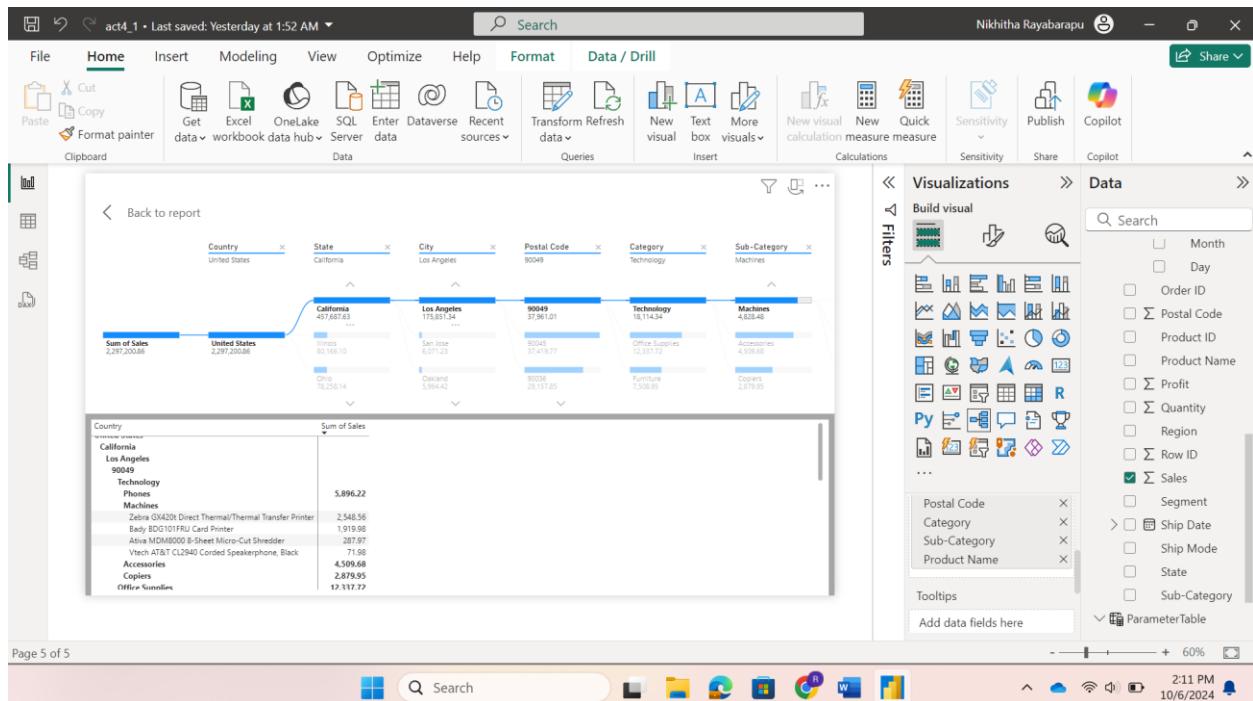
## Questions:

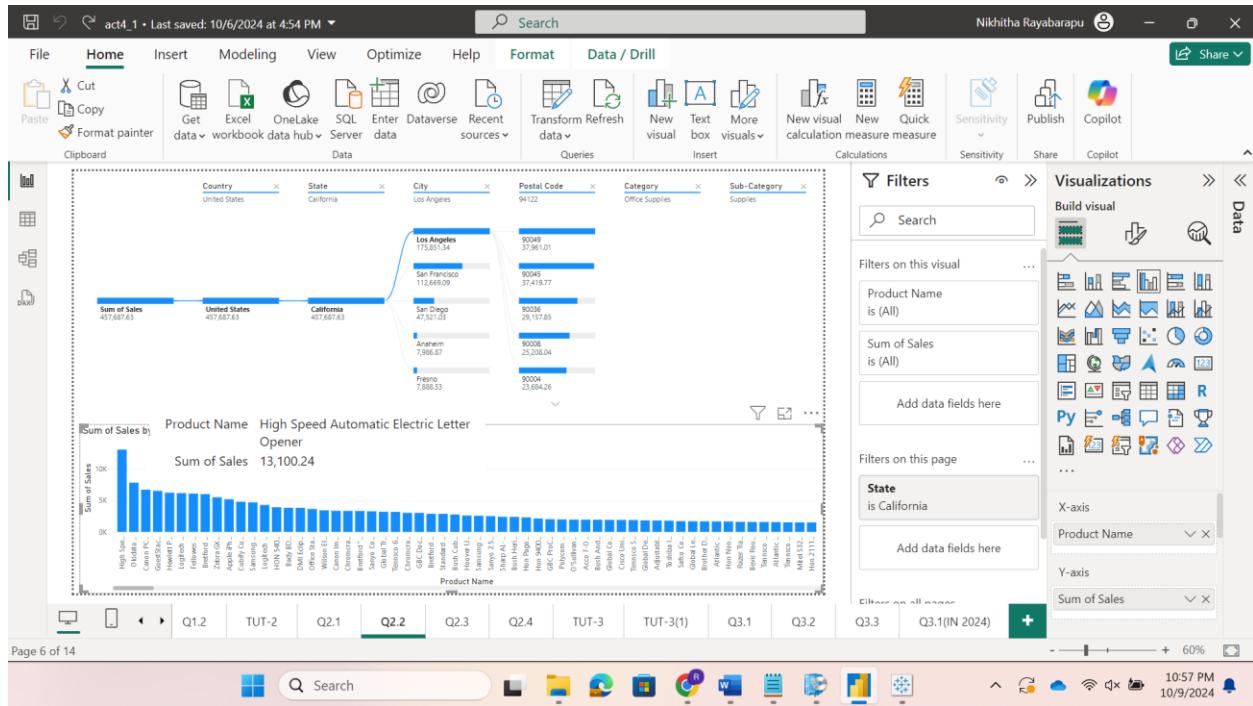
- 1. Extend the hierarchy to include Category, Sub-Category, and Product Name from the Superstore dataset. Drill down from Country to Product Name to view the sales performance of each product. What insights can you gather from the sales data at the product level?**



**Ans:** We can get what are the products with the most sales in different categories in different cities of the chosen state. For Example, In New York City, In Phones subcategory “Wilson Amplifier Kit has the highest sales of 2879 units.

2. Explore the **State of California** specifically and continue drilling down into **City, Postal Code, and Product Name**. Identify which products contribute the most to sales in **California**.



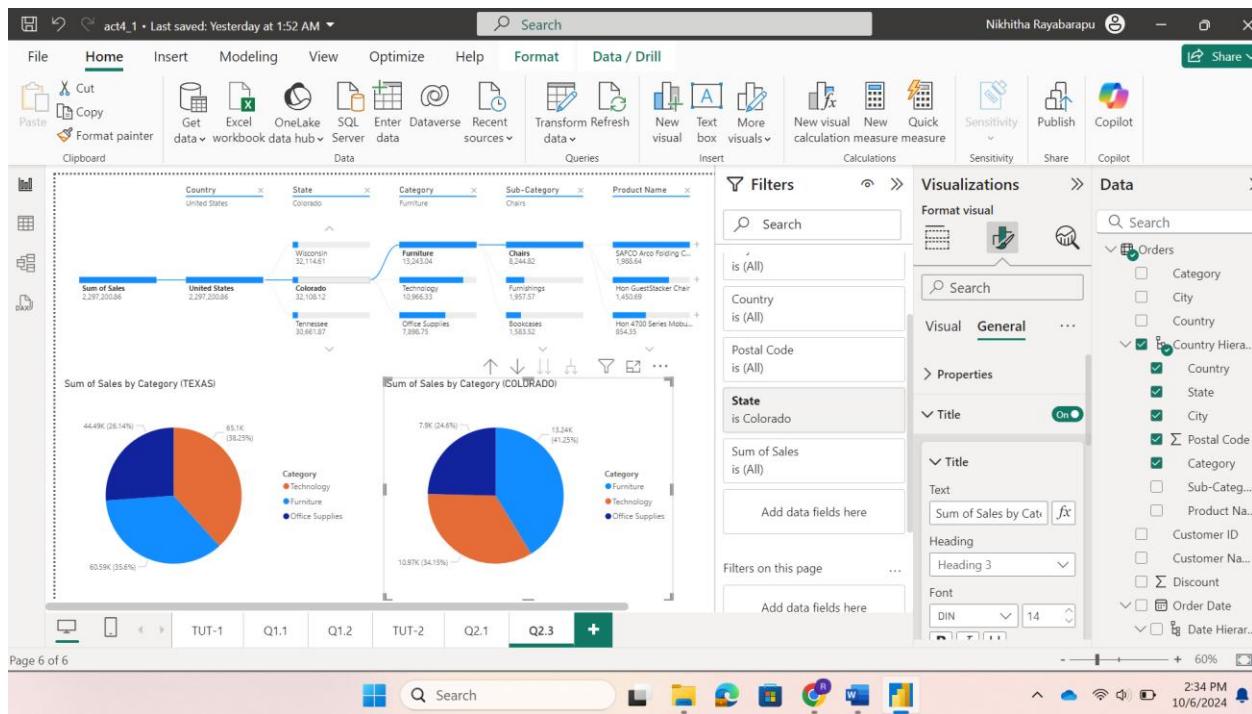
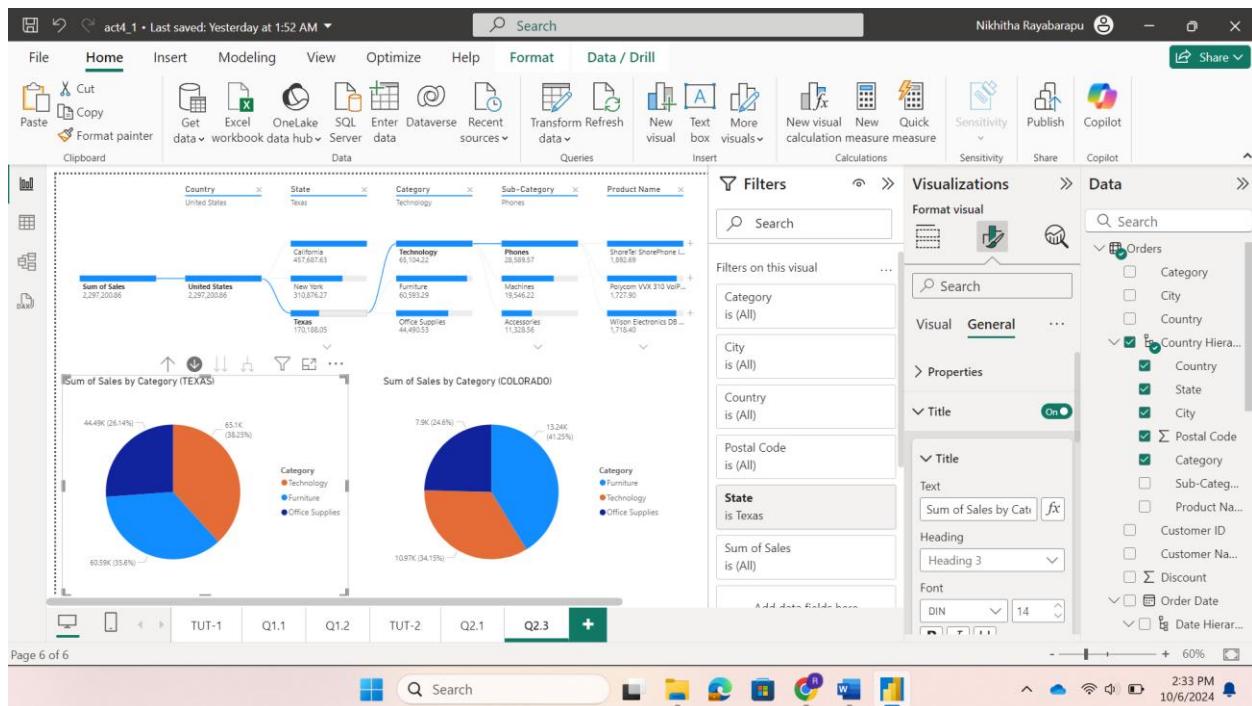


### Products that contribute the most to sales in California:

High speed Automatic Electric letter Opener – Overall Sales – 13,100.24 (Highest sale in San Francisco which is about 8187.65 units)

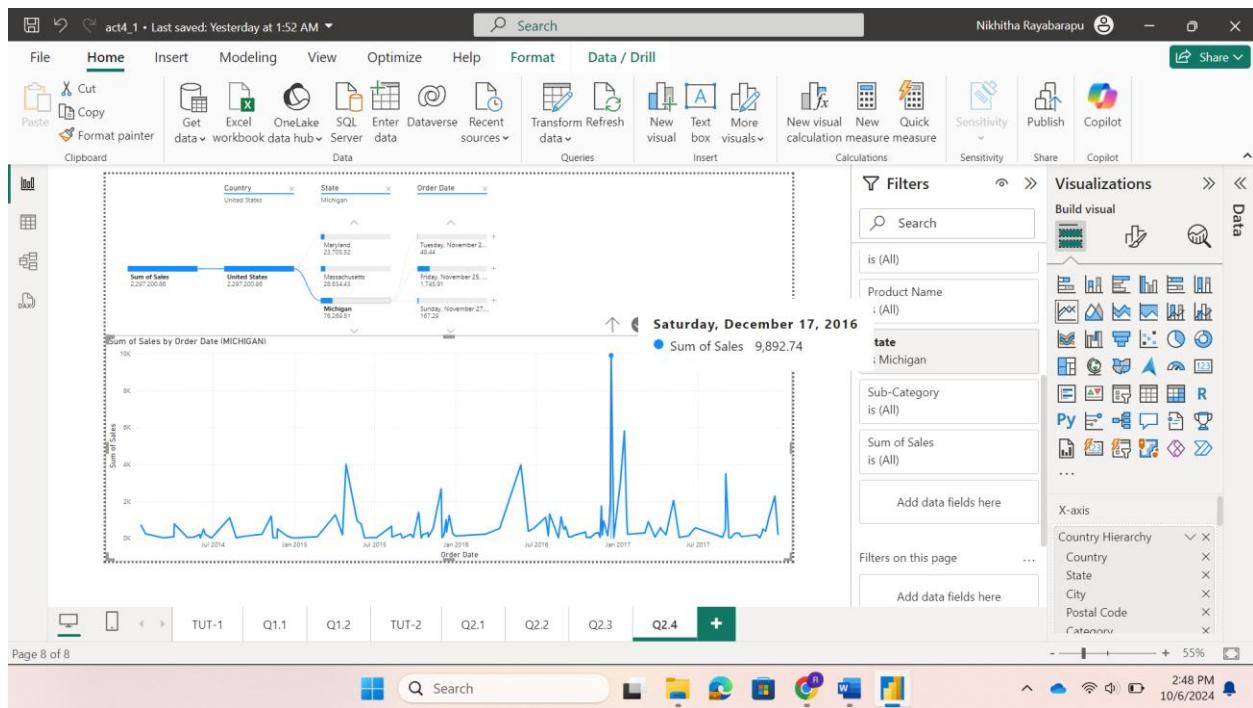
Okidata Printer – Overall sales – 7834 units

3. Using the pie chart, compare the total sales between two states of your choice (e.g., **New York** and **Texas**). How do the sales patterns differ between the two states across different product categories?



**Ex:** I have compared the total sales of Texas and Colorado states based on different categories (Furniture, Technology, and Office Supplies) – Texas has the most sales in Technology and Colorado has the most in Furniture. Both states have the least sales of Office Supplies.

**4. Add Order Date to the tree decomposition and analyze sales trends over time in a specific state (e.g., Florida). What are the high-performing quarters or months?**



I have analyzed sales over time based on Order Date for Michigan State and the highest performing month is December 2016.

### TUTORIAL 3:

1. Download the Excel file titled "Industries Layoff Data" and import it into Power BI as demonstrated.

The screenshot shows the Microsoft Power BI desktop application. A file dialog window titled "Open" is open, showing a list of files in the "SDV" folder. The file "Industries\_layoff data" is selected. The preview pane below shows a table with columns "Row ID", "Order ID", and "Ship Mode". The data in the preview pane includes rows from 11/8/2016 to 6/14/2014. The properties pane on the right shows the file is named "Orders". The ribbon menu at the top includes File, Home, Insert, Modeling, View, Optimize, Help, Format, Data / Drill, and various data sources like Excel, OneLake, SQL Server, and Data. The status bar at the bottom shows "21 COLUMNS, 999+ ROWS" and "Column profiling based on top 1000 rows".

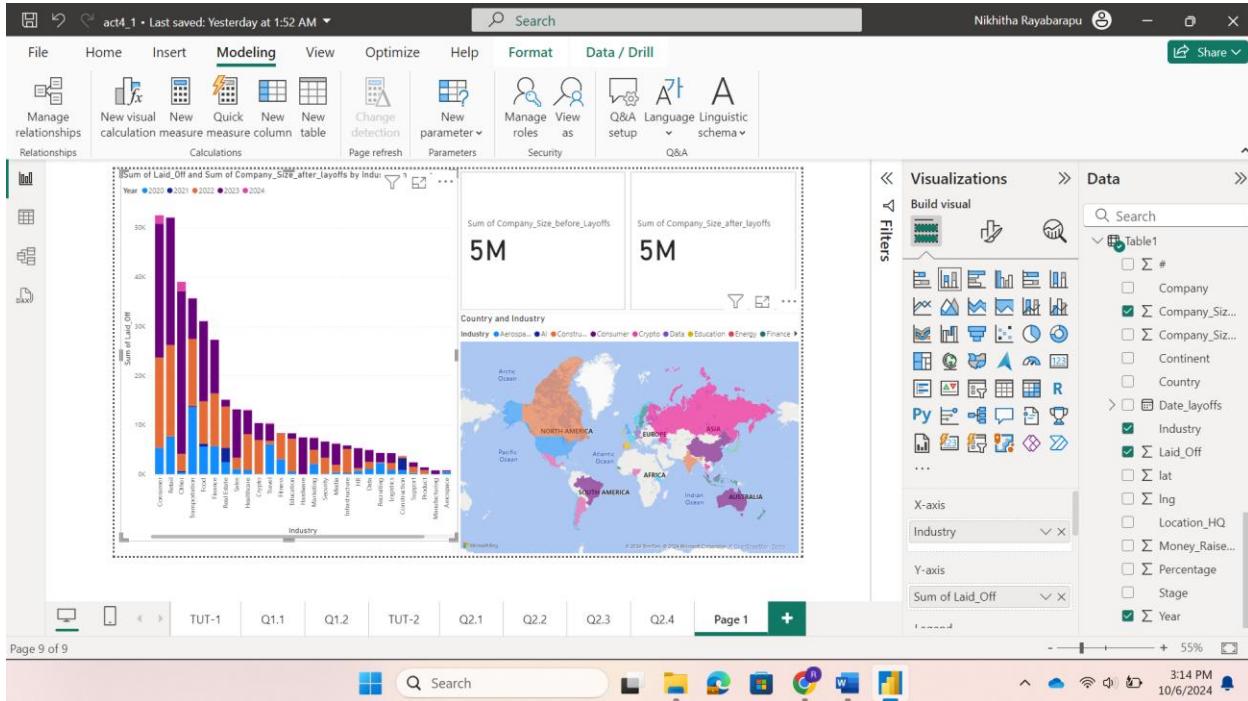
The screenshot shows the Microsoft Power BI Data Editor interface. On the left, the ribbon has tabs for File, Home, Transform, and File. The Home tab is selected. The main area displays a table named 'Table1' from the file 'Industries\_layoff data.xlsx'. The table has columns: #, Company, Location\_HQ, Country, and Continent. There are 999+ rows of data. Below the table, the status bar indicates 'REVIEW DOWNLOADED ON THURSDAY'.

2. Choose the 'Stacked Column Chart' option from the visualizations panel.
3. Assign the **Industry** field to the X-axis, the **Laid\_off** field to the Y-axis, and the **Year** field to the legend to display the layoffs by industry and year.

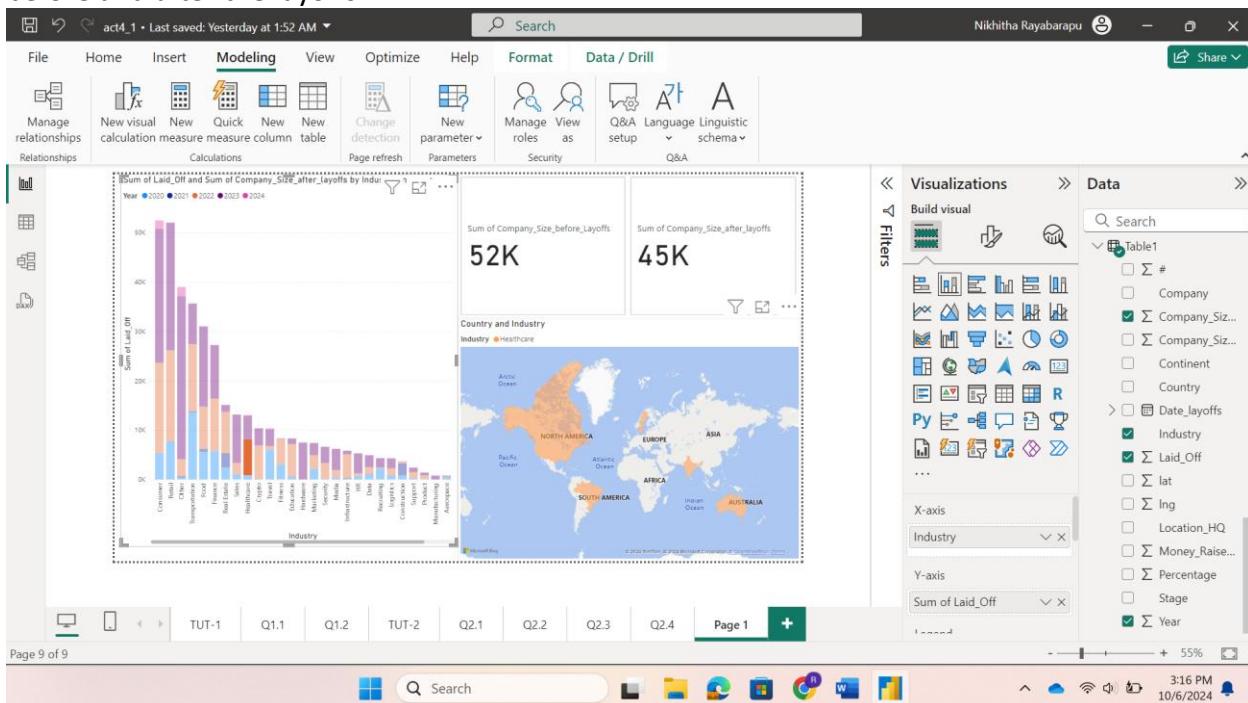
The screenshot shows the Microsoft Power BI Desktop interface. The ribbon tabs are Home, Insert, Modeling, View, Optimize, Help, Format, and Data / Drill. The Home tab is selected. In the center, there is a stacked column chart titled 'Sum of Laid\_Off by Industry and Year'. The chart shows data for four years: 2020, 2021, 2022, and 2023. The X-axis represents different industries, and the Y-axis represents the sum of laid-off employees. To the right, the 'Visualizations' pane shows the chart, and the 'Data' pane shows the fields used: Industry, Laid\_Off, and Year. The status bar at the bottom right shows '2:54 PM 10/6/2024'.

In the above, we have used stacked column chart to visualize the people laid off in various industries.

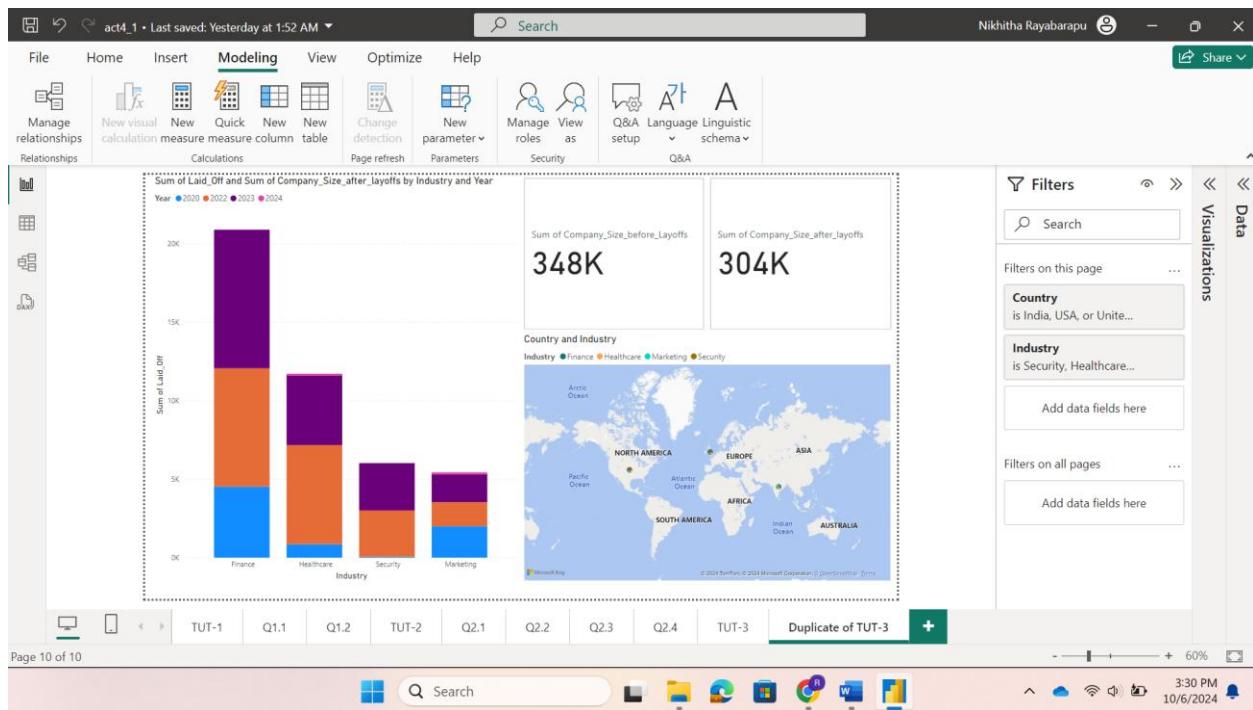
- Add cards to display the company size before layoffs and the company size after layoffs.
- Incorporate a map into the dashboard by selecting the industry and country attributes.



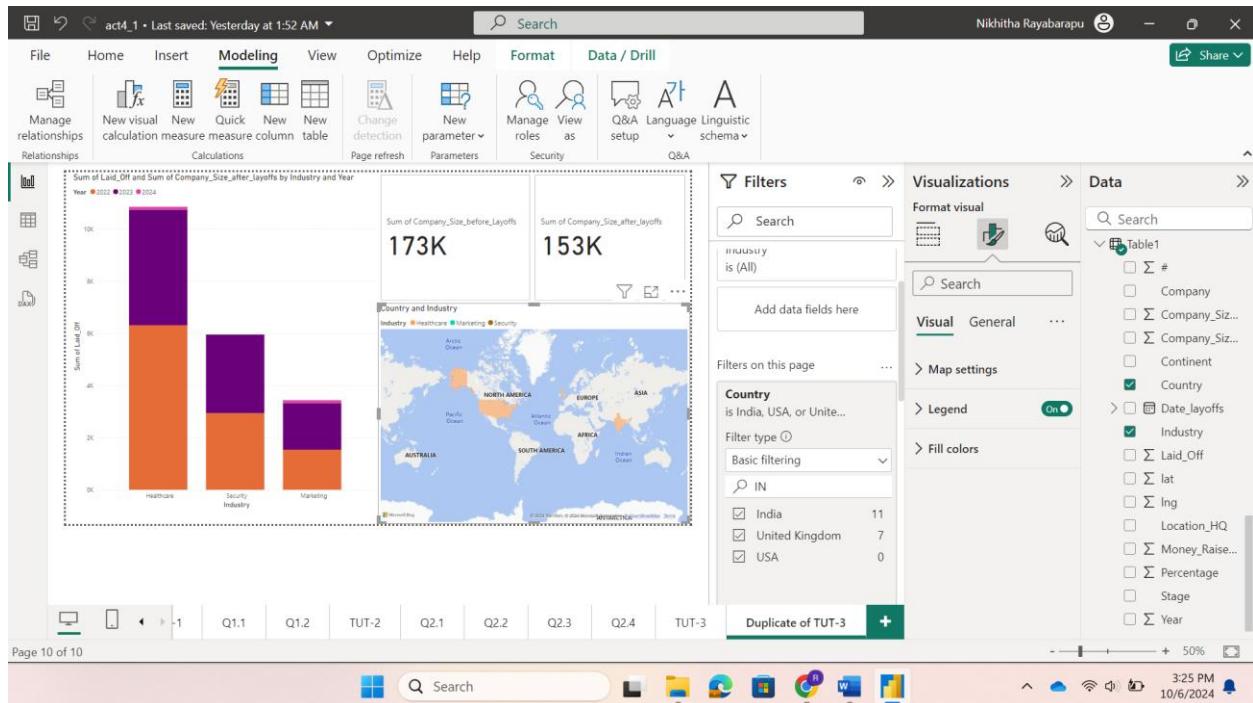
- By selecting a specific industry, you can view the count of layoffs as well as the company size before and after the layoffs.



- Now in the filters select only "India", "United Kingdom" and "USA" under Country. Select "Finance", "Healthcare", "Marketing" and "Security" under Industry.



**Observation:** - Based on the above graph we can see that Finance leads the number of layoffs in the industries we have selected.



**Observation:** - Based on the above graph we can see that HealthCare leads the number of layoffs in the industries we have selected.

Questions:

1. Apply the filter for **Country** and select only USA.

How does the number of layoffs in various industries change when focusing solely on USA?

The screenshot shows a Power BI desktop interface with a dashboard containing three visualizations. The first visualization is a stacked bar chart titled "Sum of Laid\_Off by Industry and Year" for the year 2024. The second is a map of North America with two callout boxes: "Sum of Company\_Size\_before\_Layoffs" and "Sum of Company\_Size\_after\_Layoffs", both showing "4M". The third is a scatter plot titled "Country and Industry". The Filters pane on the right shows a selected filter for "Country is USA". The Data pane lists various data fields such as Customer ID, Order Date, Product ID, and Profit.

In USA, Consumers Industry has the highest layoff rates overall and Retail Industry seconds that.

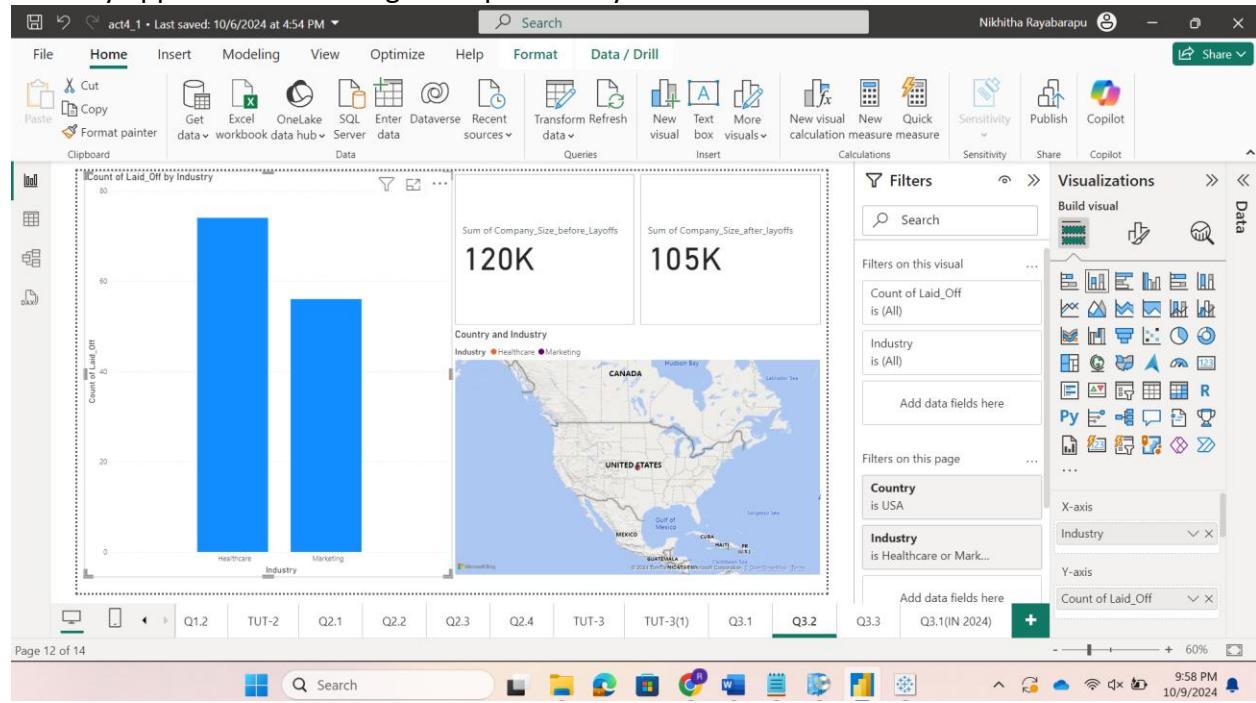
The screenshot shows a Power BI desktop interface with a dashboard containing three visualizations. The first visualization is a bar chart titled "Sum of Laid\_Off by Industry and Year" for the year 2024. The second is a map of North America. The third is a scatter plot titled "Country and Industry". The Filters pane on the right shows selected filters for "Industry" and "Laid\_Off". The Data pane lists various data fields such as Company, Company\_Siz..., and Continent.

Which industry shows the most significant layoffs in 2024?

Ans: "Other" Industry has the most number of layoffs in 2024.

2. Apply filter to select only the **Healthcare** and **Marketing** industries.

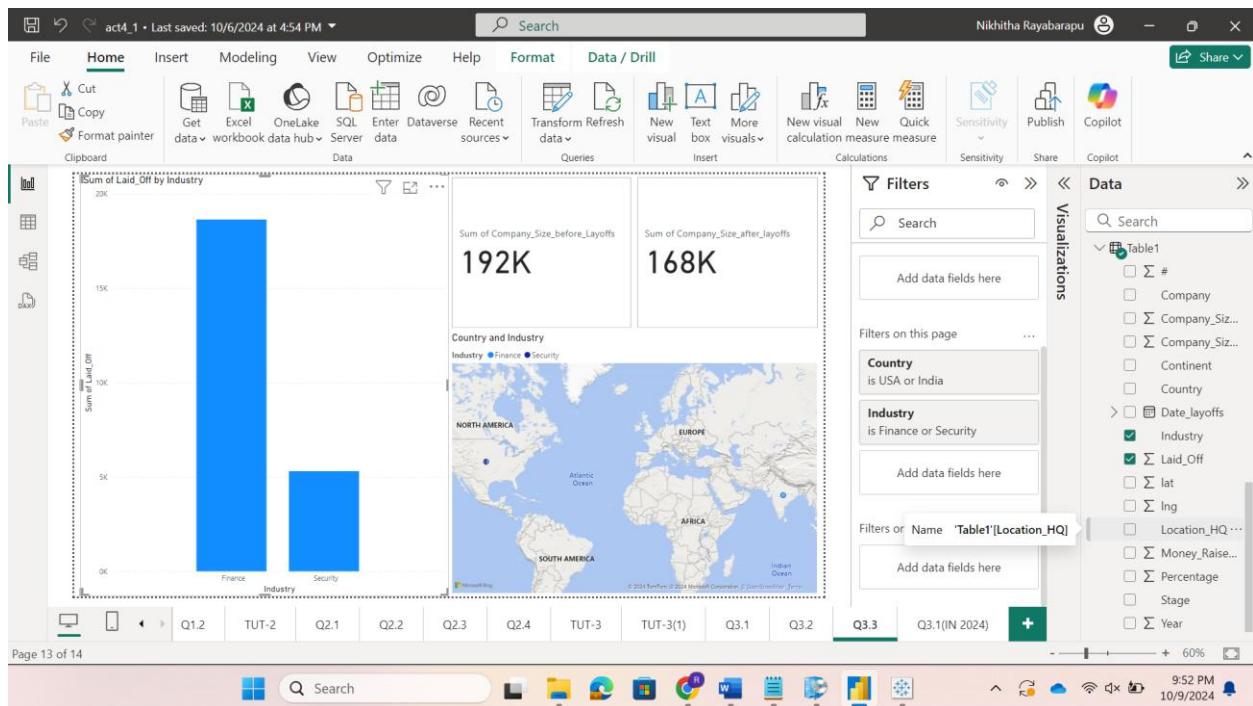
What differences do you notice in the layoff counts between these two industries? Which industry appears to have a higher impact on layoffs?



**Ex:** Layoff counts in Healthcare are almost more than in the Marketing industry overall. The healthcare layoff count is 74 and the Marketing layoff count is 56. The healthcare industry appears to have the highest impact on Layoffs.

3. Apply filters for **Country** (select **India, USA**) and **Industry** (select **Finance and Security**).

How do the layoffs in Finance and Security compare in the selected countries? Are there notable differences in the company sizes before and after layoffs in these sectors?



**Ans:** Finance has the largest layoff sum compared to Security. Finance company size difference before layoff - 138k, after layoff - 120k. Security company size difference before layoff – 54k, after layoff – 48k.

### Understanding of the task:

I understood visualizing the layoffs based on different categories and how to create cards and slicers as a part of this activity. We can create overall page filters as well as filters per different graphs.