

## **Experiment – 5**

### **To create a dashboard in PowerBI for grocery store dataset.**

#### **1.Introduction to Data Modelling-**

Data modelling is the process of analysing and defining all the different data types your business collects and produces, as well as the relationships between those bits of data.

Now that you know what data modelling is and why it's important, let's look at the three different types of data modelling concepts as examples.

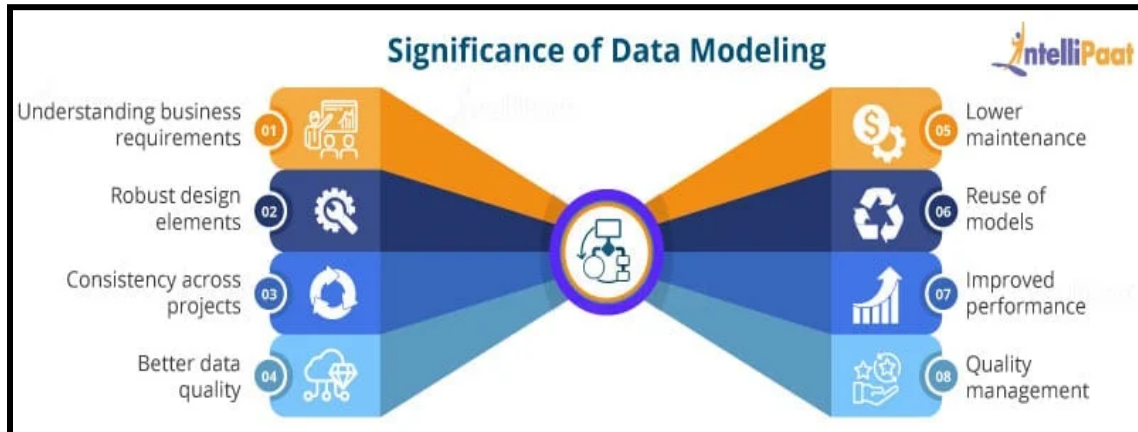
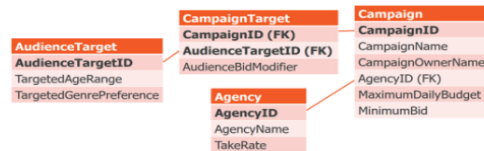
**Conceptual data modelling**-A conceptual data model defines the overall structure of your business and data. Used for organising business concepts, your conceptual data model is defined by your business stakeholders and data engineers or architects. For instance, you may have customer, employee, and product data and each data bucket, known as entities, has relationships with other entities. Both the entities and the entity relationships are defined within your conceptual data model.

**Logical data modelling**-A logical data model builds upon the conceptual data model with specific attributes of data within each entity and the relationships between those attributes. For instance, Customer A buys Product B from Sales Associate C. This is your technical model of the rules and data structures as defined by data engineers, architects, and business analysts, helping drive decisions about what physical model your data and business require.

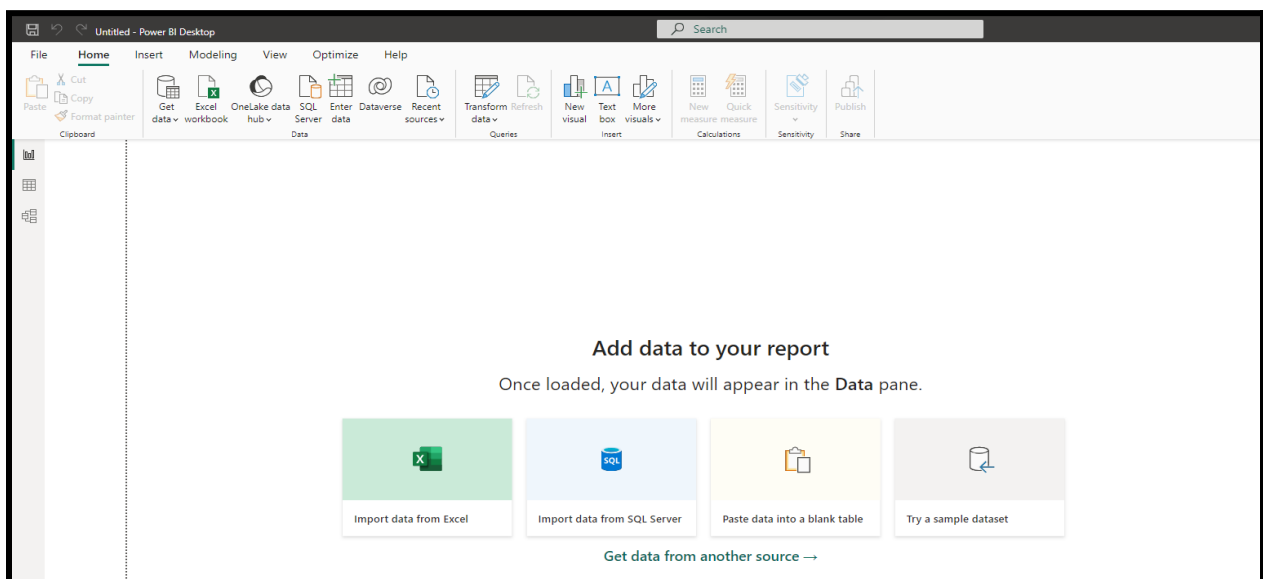
**Physical data modelling**-A physical data model is your specific implementation of the logical data model created by database administrators and developers. It is developed for a specific database tool and data storage technology, and with data connectors to serve the data throughout your business systems to users as needed. This is the “thing” the other models have been leading to—the actual implementation of your data estate.

## Data modeling

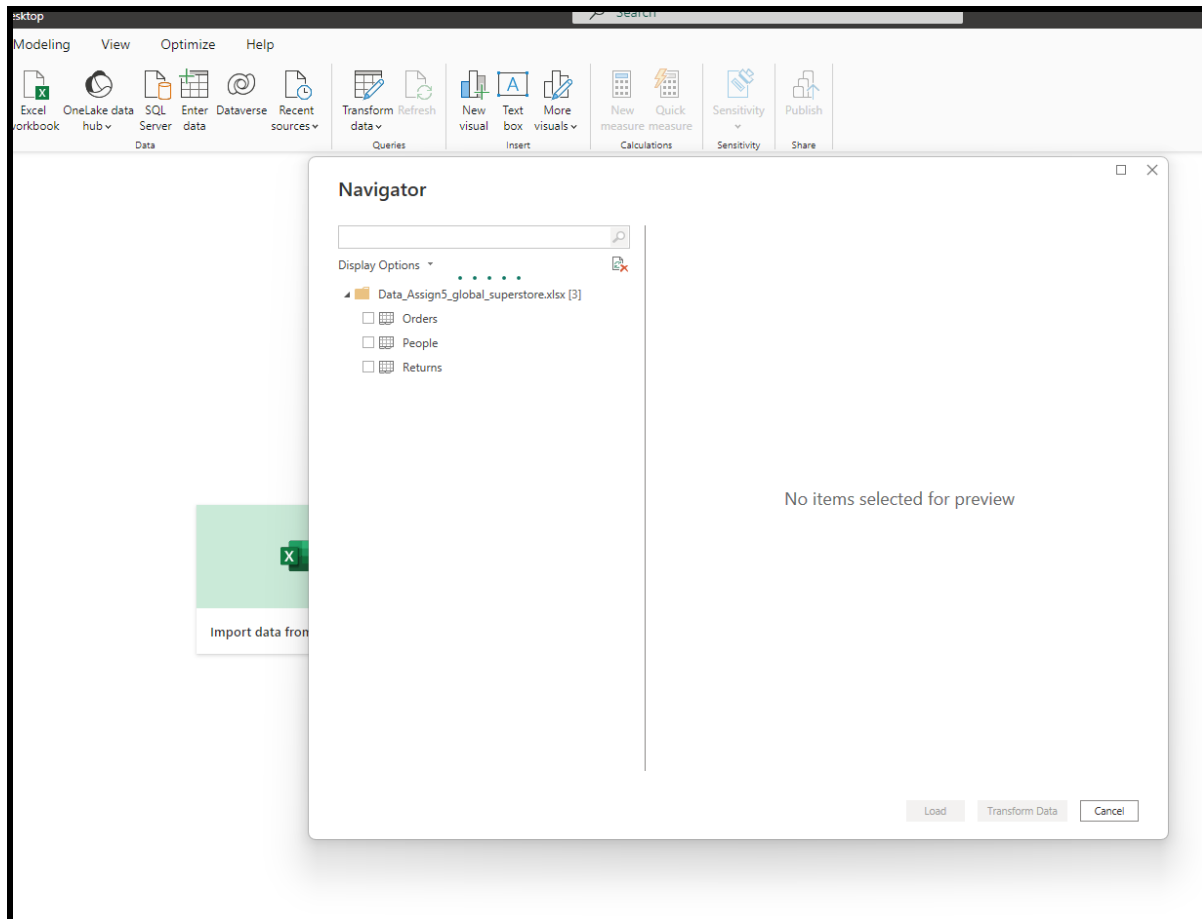
- The process of creating a data model
- Why model data?
  - Data  $\neq$  perfect



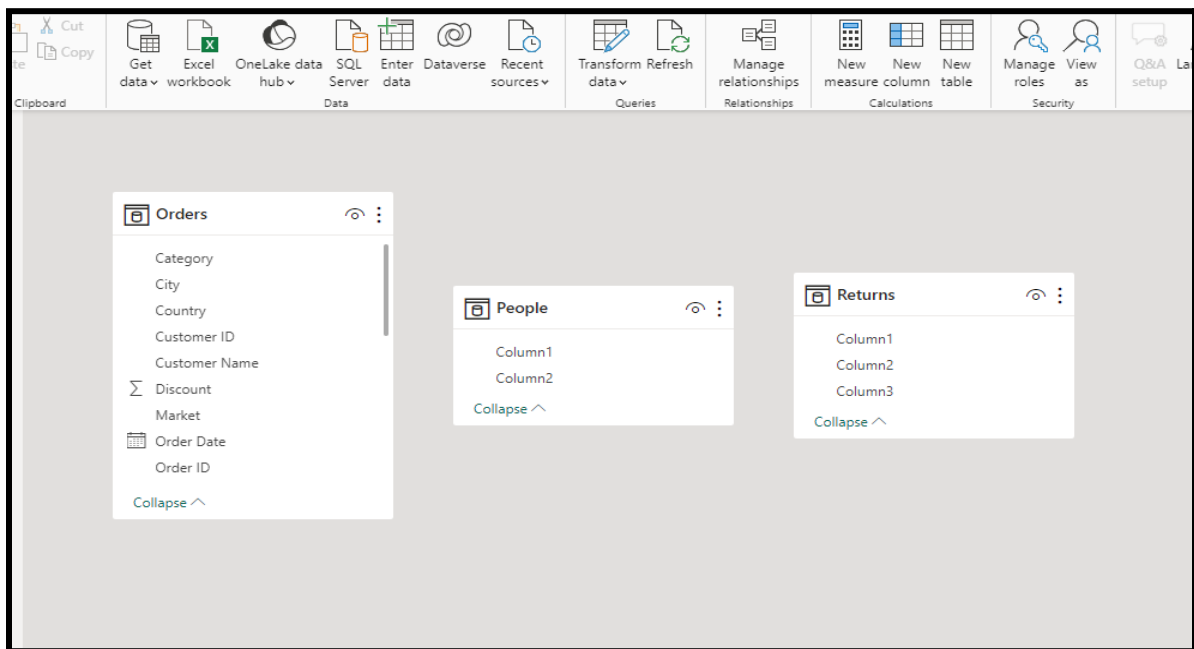
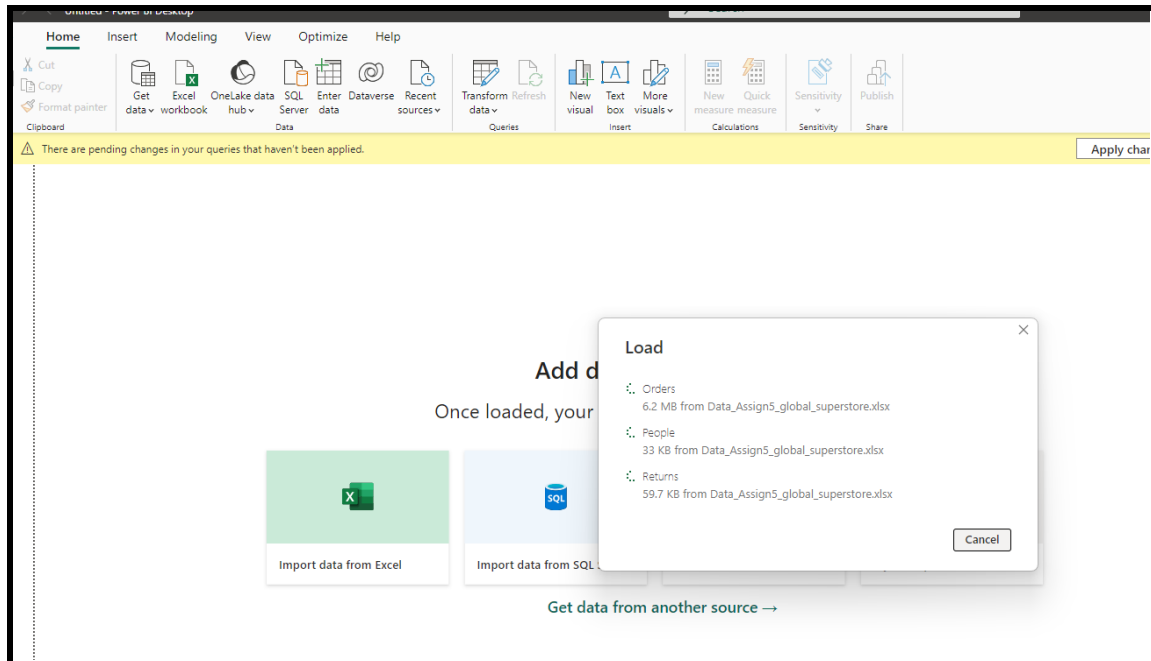
In above figure shows what is the significance of data modelling why we need us . This pdf includes different visualizations tools . This is about the development of a dashboard for the global supermarket sales dataset.



This dataset comprises three subsets, namely ,orders, people and returns. First we import the dataset from folders where we save this dataset in Power BI desktop software.

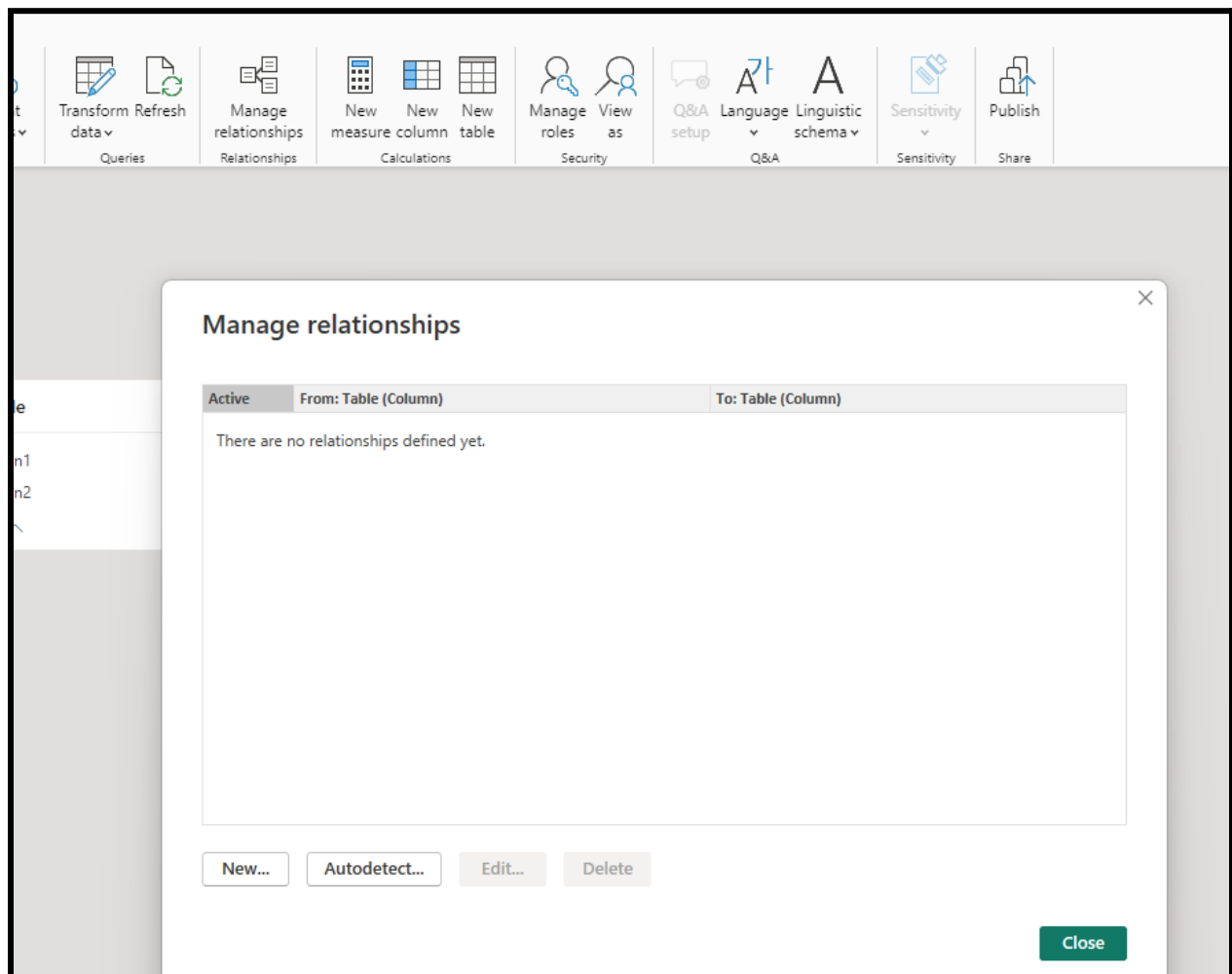






After loading the dataset we have seen three tables are there first is Orders, People, Returns.

There is no relationship between them. First we click in Manage relationships and the below dashboard has open click new and create relationships then press apply changes.



In below figure we find out first relationship between in People and Returns tables.

## Create relationship

Select tables and columns that are related.

People

Column1	Column2
Person	Region
Marilène Rousseau	Caribbean
Andile Ihejirika	Central Africa

Returns

Column1	Column2	Column3
Yes	ES-2015-RA1994545-42218	Western Europe
Yes	ES-2012-SC208458-41070	Western Europe
Yes	ES-2015-CC1210045-42182	Western Europe

Cardinality

One to many (1:\*)

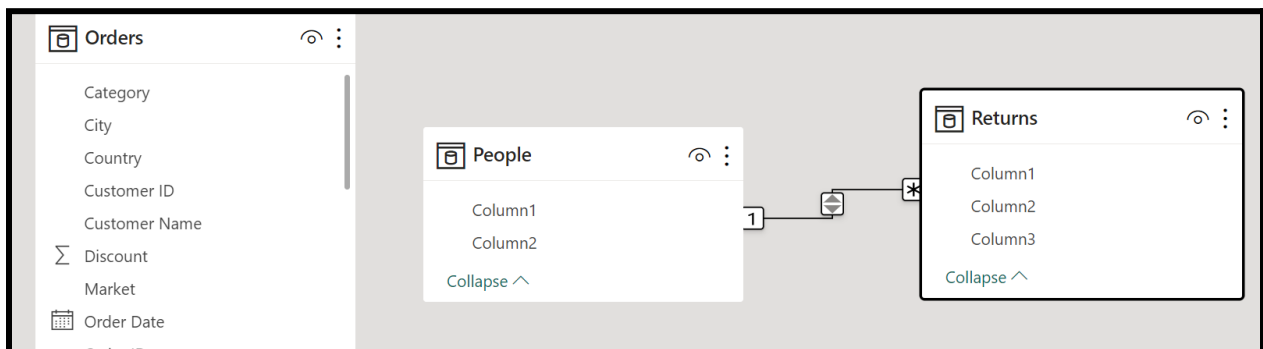
Cross filter direction

Both

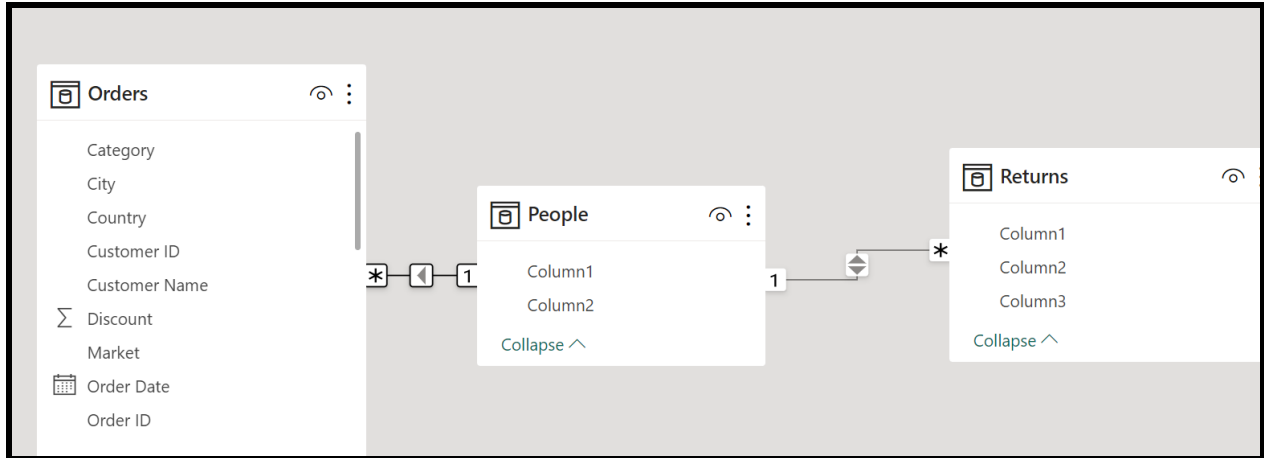
☒ Make this relationship active

☐ Apply security filter in both directions

☐ Assume referential integrity





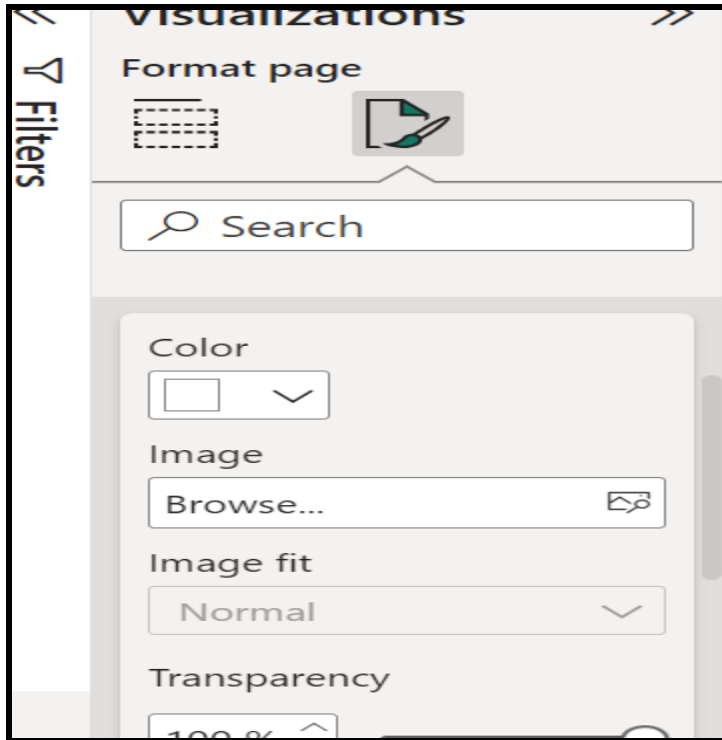


*Model view* shows all of the tables, columns, and relationships in your model. This view can be especially helpful when your model has complex relationships between many tables.

Select the Model view icon near the side of the window to see a view of the existing model. Hover your cursor over a relationship line to show the columns used.

### **Create Visualization**

In Power BI, you can create visualization in two ways. First is by adding from the right side pane to Report Canvas. By default, it is the table type visualization, which is selected in Power BI. Another way is to drag the fields from right side bar to the axis and value axis under Visualization.

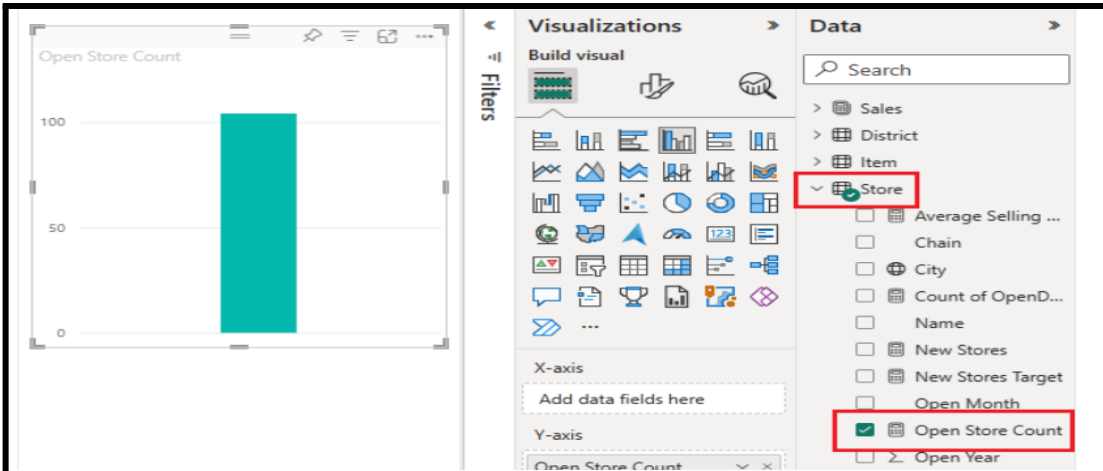


## Create a card using the report editor

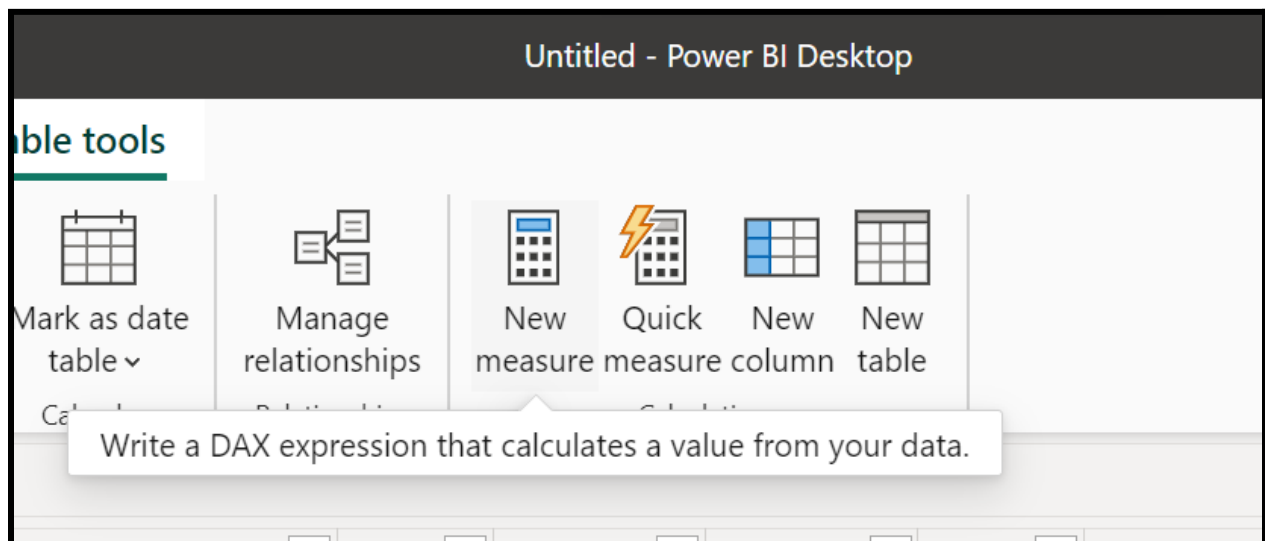
The first method to create a card is to use the report editor in Power BI.

1. On the Data pane, expand Store and select the Open Store Count checkbox.

By default, Power BI creates a clustered column chart with the single data value. You can convert the chart to a card visualization.



This visualization is to represent the shipping costs, discounts, sales and profits all in one card. For this, we need to create new measures which have the following formula in screenshots. This value is represented by using a multi-row card since it can display multiple values in a single card.



ne

Measure

Format

Data category

Uncategorized

New Quick  
measure measure

ne table

Orders

\$ % , .00 →.0 Auto

Structure

Formatting

Properties

Calculations

✕ ✓

1 Total profit = SUM(Orders[Quantity])

Row ID

Order ID

Order Date

Ship Date

Ship Mode

Customer ID

Customer Name

Se

12355

ES-2013-MC1813045-41597

19 November 2013

24 November 2013

Standard Class

MC-1813045

Mike Caudle

Co

11090

ES-2015-SG2060545-42199

14 July 2015

20 July 2015

Standard Class

SG-2060545

Speros Goranitis

Co

Home table

Orders

\$ % ↺ ↻ 0

Structure

Formatting

Properties

✕ ✓

1 Total Quantity = SUM(Orders[Quantity])

Category

Product Name

Sales

Quantity

Discount

Profit

Shipping

Binney & Smith Sketch Pad, Water Color

346.5

7

0

114.24

BIC Canvas, Water Color

284.4

5

0

2.7

Boston Sketch Pad, Easy-Erase

244.35

5

0

70.8

Stanley Markers, Water Color

177.66

7

0

58.59

Boston Sketch Pad, Water Color

207.12

4

0

6.12

table

Orders

\$ % , .00 Auto

Structure

Formatting

Properties

✓

1 Average Shipping Cost = AVERAGE(Orders[Shipping Cost])

ID	Order ID	Order Date	Ship Date	Ship Mode	Customer
12355	ES-2013-MC1813045-41597	19 November 2013	24 November 2013	Standard Class	MC-18

Name	Average profit	\$% Format	General	Data category	Uncategorized	New measure	Quick measure
Home table	Orders	\$ %	Auto				
Structure	Formatting	Properties	Calculations				
1 Average profit = AVERAGE(Orders[Profit])							
Row ID	Order ID	Order Date	Ship Date	Ship Mode	Customer ID	Customer Name	Segment

Home

Help

Table tools

Measure tools

Name

Measure

\$%

Format

\$

%

Auto

Data category

Uncategorized

New measure

Quick measure

Calculations

Commit

Structure

Formatting

Properties

1 Average Sales = AVERAGE[Orders[Sales]]

Row ID

Order ID

Order Date

Ship Date

Ship Mode

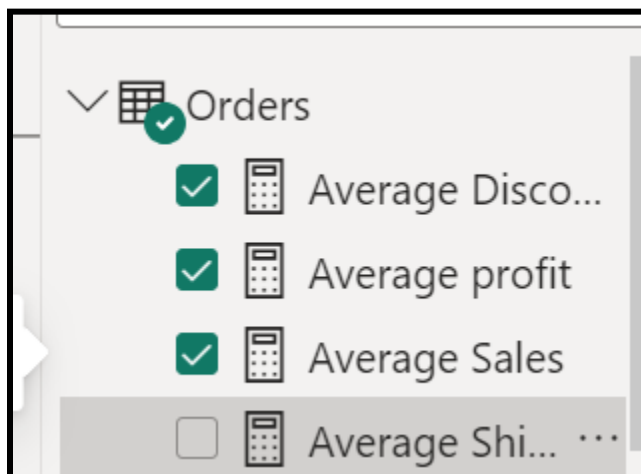
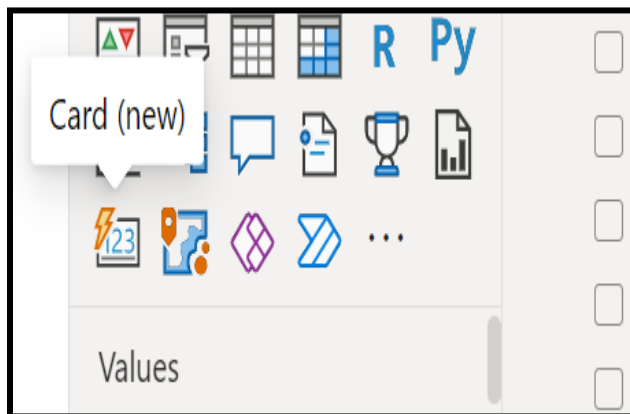
Customer ID

Customer Name

Segment

Average Discount	Format	General	Data category	Uncategorized		
Orders	\$ %	Auto			New measure Quick measure	
Structure	Formatting		Properties		Calculations	
1 Average Discount = AVERAGE(Orders[Discount])						
Order ID	Order Date	Ship Date	Ship Mode	Customer ID	Customer Name	Segment
55 ES-2013-MC1813045-41597	19 November 2013	24 November 2013	Standard Class	MC-1813045	Mike Caudle	Corporate

Select card in report pane and select measure which you want to show in this card.

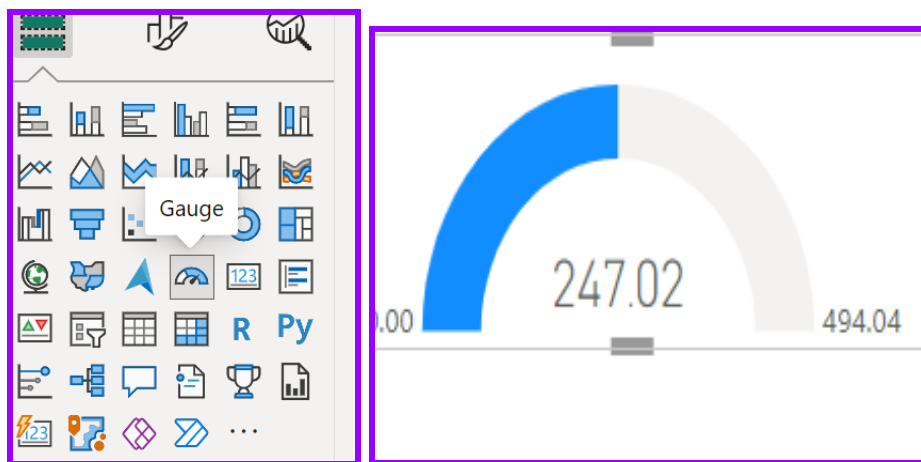


board	Data				Queries
Total profit	Total Quantity	Average Discount	Average profit	Average Sales	Average Shipping Cost
178K	178K	0.14	28.61	246.49	26.48

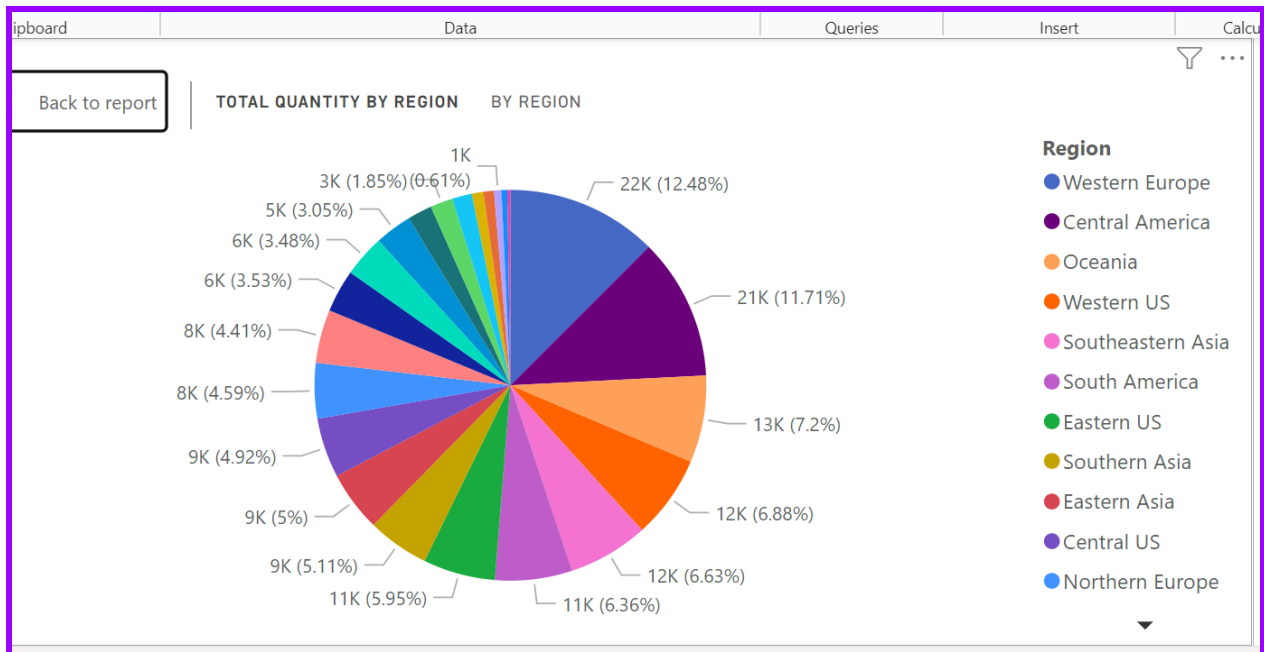
Card is shown in above pic First visualization is created.

This is the second visualization first we select gauge chart. A radial gauge chart uses a circular arc to show how a single value progresses toward a goal or a Key Performance Indicator (KPI). The gauge line (or *needle*) represents the goal or target value. The shading represents the progress toward the goal. The value inside the arc represents the progress value. Power BI spreads all possible values evenly along the arc, from the minimum (left-most value) to the maximum (right-most value).

The following example shows a radial gauge chart for same day order sales..

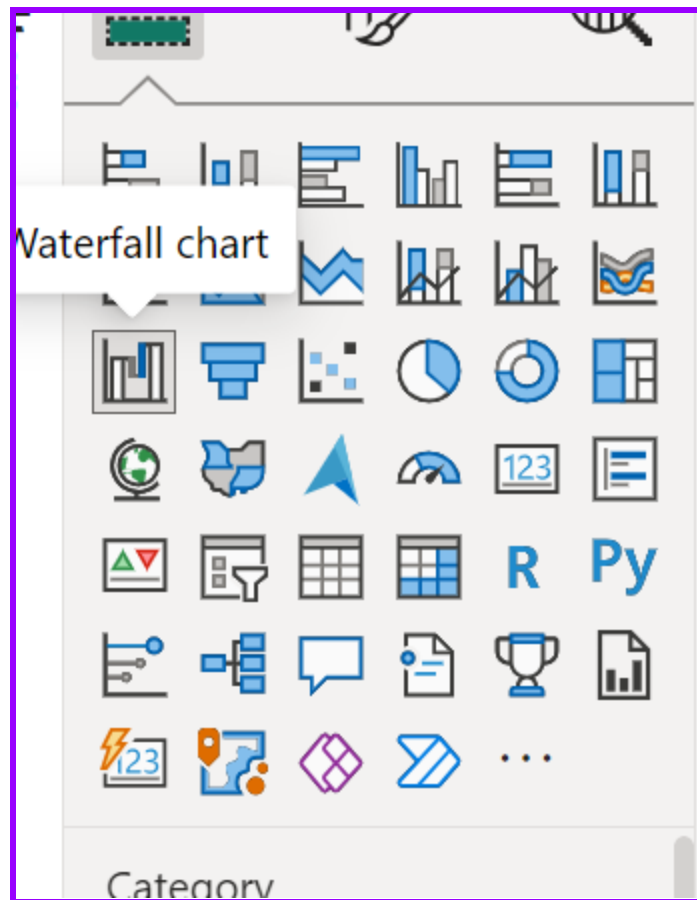


Pie chart that depicts the quantities of the products bought by different countries. For this we use the pie chart icon, keeping the countries and the quantity in the axes. But there is an issue with this, the visualization comes with white background which interferes with the dashboard background. To disable the background of the pie chart select the effects option. The below figure shows the original pie chart and one without the background. This approach would be followed for all the visualizations done in this visualization so that they match with the background.



**A waterfall chart** shows a running total as values are added or subtracted. It's useful for understanding how an initial value (for example, net income) is affected by a series of positive and negative values. The columns are color coded so you can quickly tell positive from negative numbers.

The next visualization is a waterfall chart which represents the quantities of products sold in the different countries based on the priority of the order.

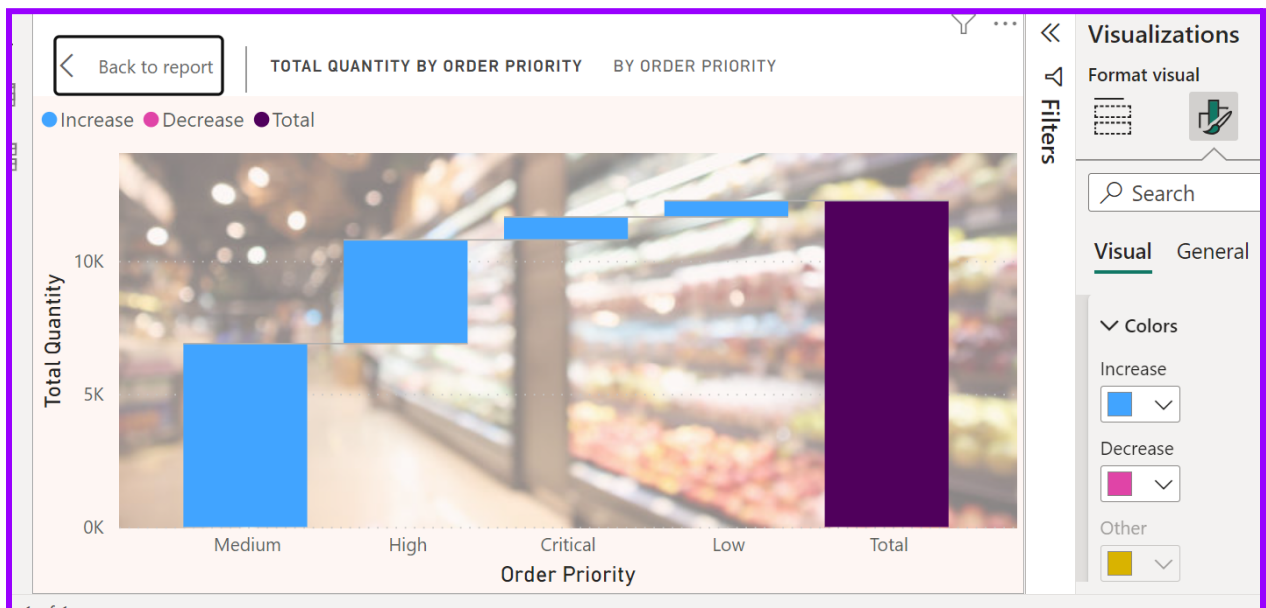
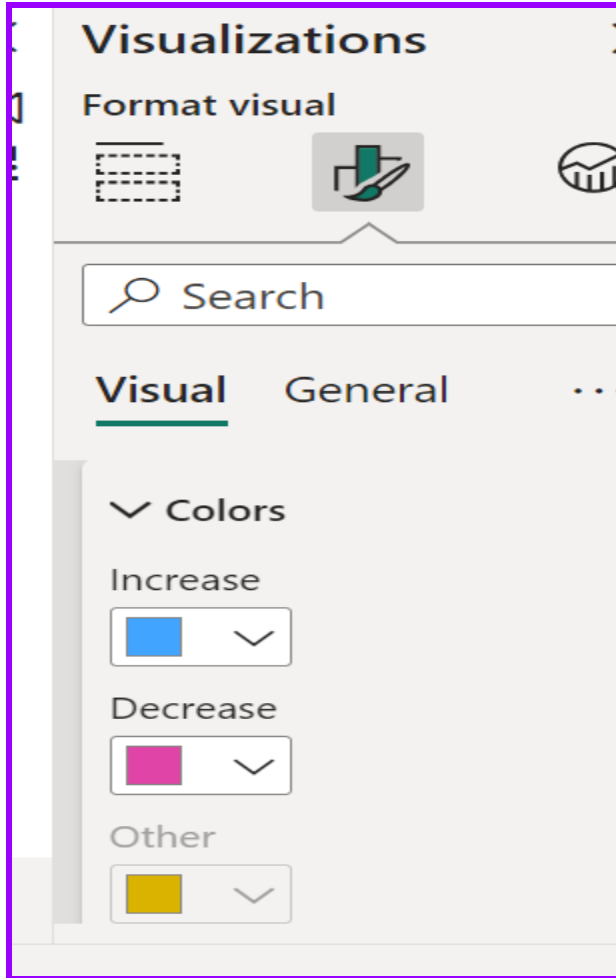


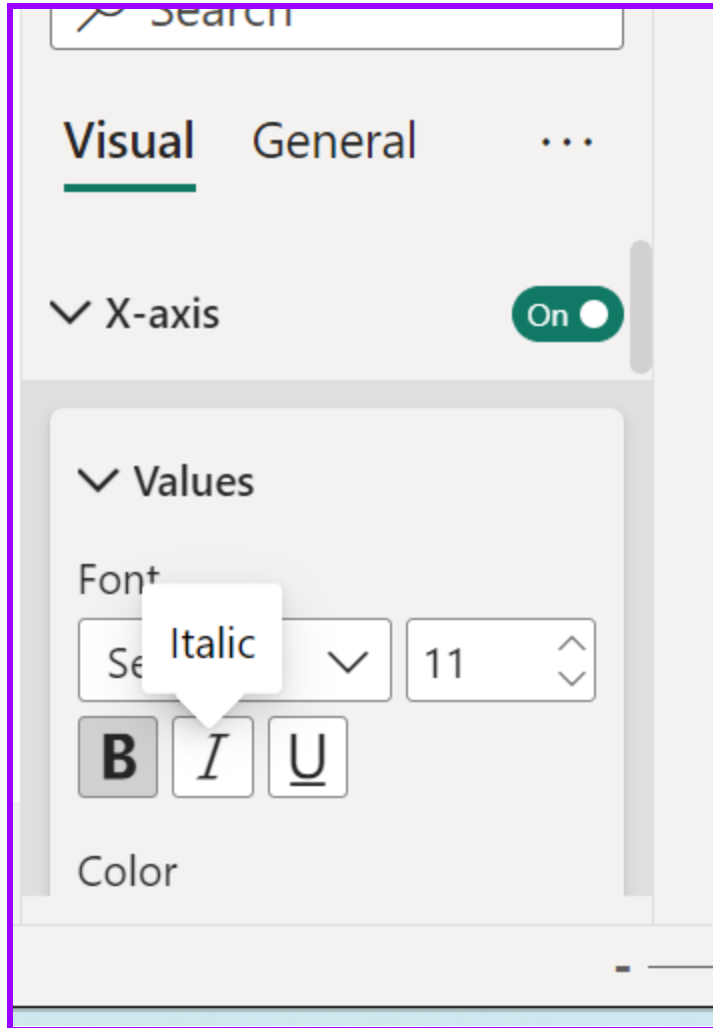




Waterfall charts are also commonly used in financial analysis to display how a net value is arrived at through gains and losses over time or between actual and budgeted amounts.

We change the colour of increase and decrease pane in below I have changed the colours the difference you have seen in both pictures and also added the background of supermarket image and adjust the transparency of image.





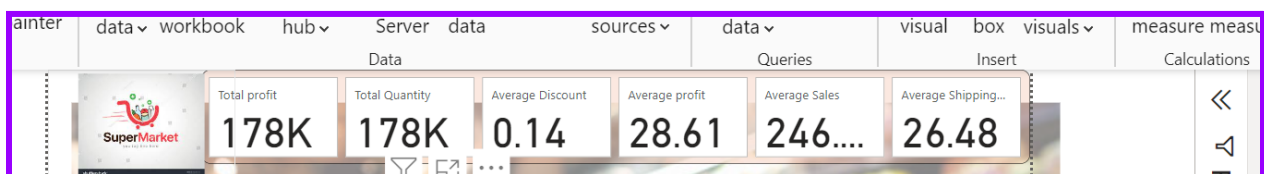
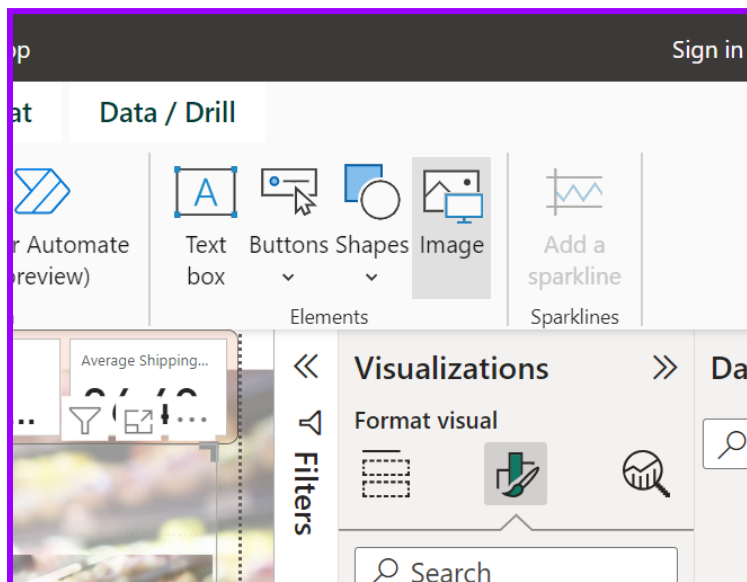
From visuals tab you can change the font size and colours.

### Add an image

If you want to add your company logo or some other image to your dashboard, you save the image file online and link to it. Make sure security credentials aren't required to access the image file. For example, because OneDrive and SharePoint require authentication, images stored there can't be added to a dashboard this way. Also, images can't be in .svg format.

1. From the Add tile window, select Image > Next.

2. From the Add image tile window, add the image information:
  - a. To display a title above the image, select Display title and subtitle and enter a Title and an optional Subtitle.
  - b. Enter the image URL.
  - c. To make the tile a hyperlink, select Set custom link and enter the URL. When colleagues click the image or title, they'll be taken to this URL.
  - d. Select Apply.

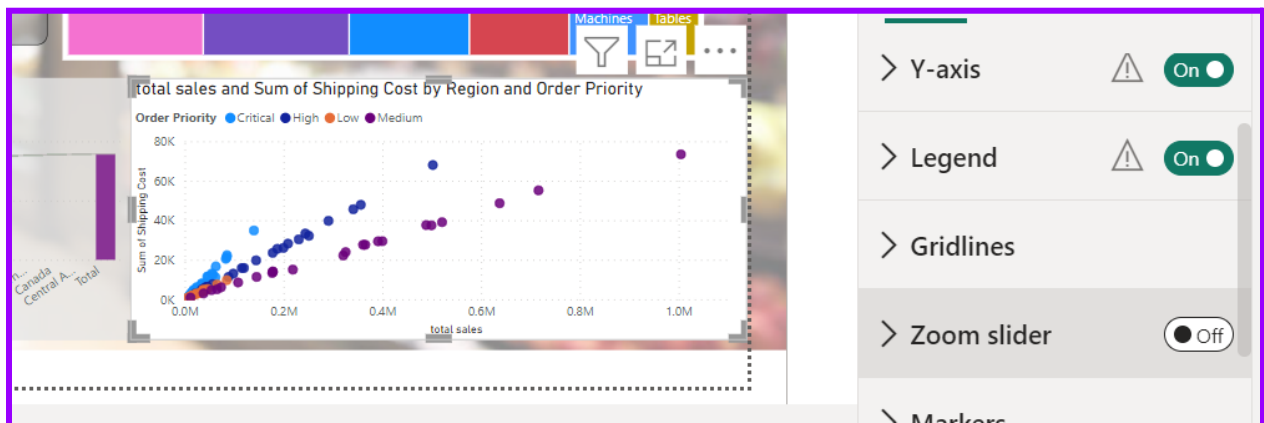
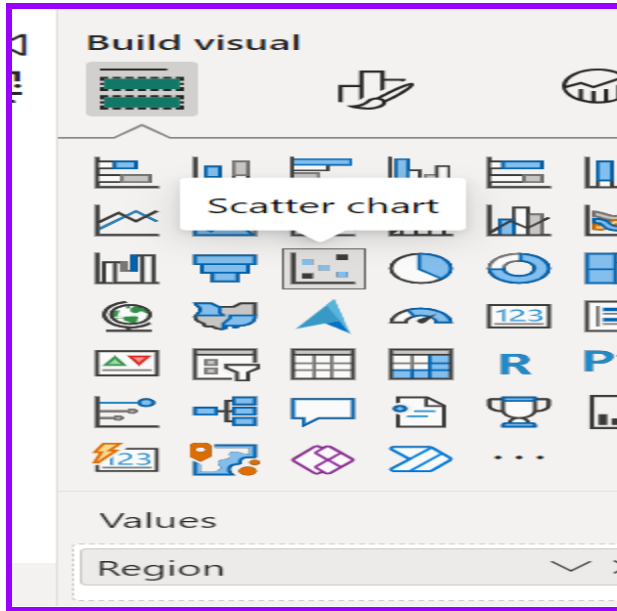


**Treemaps** display hierarchical data as a set of nested rectangles. Each level of the hierarchy is represented by a colored rectangle called a branch node. Each branch contains smaller rectangles called leaf nodes. Power BI uses the measure value to determine the rectangle size for branches and leaves.

In this visualization tool is used to visualize the profits per category of products. This tool gives good idea of the weightage of each discrete class on continuous values. Based on the diagram, we can see that the total profit by subcategory.



**Scatter plot :** Scatter charts display data along a horizontal (x) and vertical (y) axis. The chart reveals how numerical values along the two axes are related. When data intersects on the two axes, Power BI displays a data point. You can analyze data points to identify relationships in your data. The final visualization is a scatter plot depicting the profit values based on Total sales and shipping cost by region and order priority. We can view the individual order priority.



We can enable zoom sliders by clicking on the visualisation, navigating to the Format tab, then toggling 'Zoom sliders' to 'On'. We can now intuitively zoom into any part of the data we want using this slider: Notice that the x-Axis will automatically scale to our selection. We can see the difference in scatter plot charts in both pictures.



What are the dashboards in Power BI-

A Power BI dashboard is a single page, often called a canvas, that tells a story through visualizations. Because it's limited to one page, a well-designed dashboard contains only the highlights of that story. Final dashboard is created of Global supermarket sales dataset.

