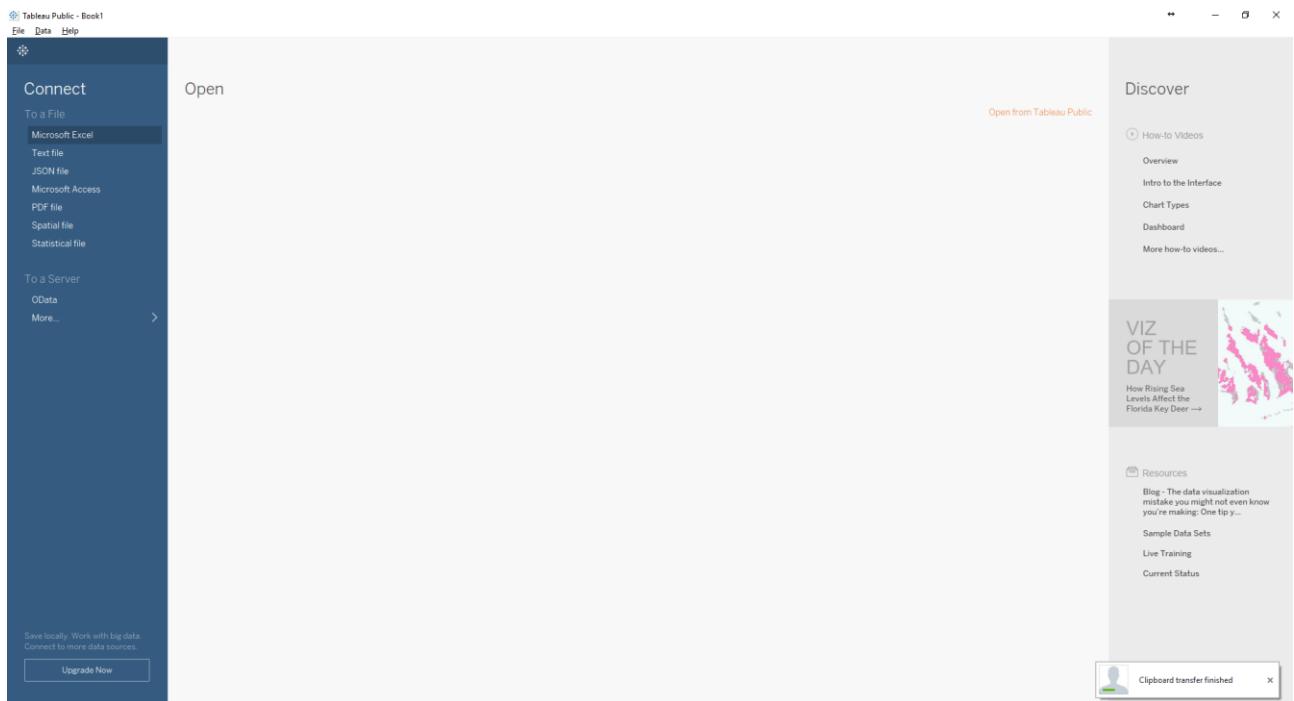


1. Creating Simple Report from Excel

1.1 Connect to Excel workbook

- Select **Connect → Microsoft Excel**. In the **Open File** dialog box, select the *2015 Sales.xlsx* file.



- The file will be loaded to Tableau, and the content is previewed. Select the sheet “Sales 2015”, and press “Sheet 1” to go to worksheet for creating your report.

The screenshot shows the 'Sales 2015 (2015 Sales)' sheet in Tableau. The left sidebar shows connections ('2015 Sales') and sheets ('Sales 2015'). The main area displays a data grid with columns: Sales 2015, Country/Region, Brand, Month, Sale 2013, Sale 2014, and Sale 2015. A tooltip 'Go to Worksheet' points to the 'Sheet 1' button at the bottom left of the grid. The bottom navigation bar includes 'Data Source', 'Sheet 1' (highlighted in orange), and other worksheet icons.

Sales 2015	Country/Region	Brand	Month	Sale 2013	Sale 2014	Sale 2015
China	A. Datum	January	3,234.00	null	1,935.00	
China	A. Datum	February	6,270.00	7,059.00	null	
China	A. Datum	March	4,352.00	null	null	
China	A. Datum	April	3,814.00	null	null	
China	A. Datum	May	6,234.00	null	null	
China	A. Datum	June	5,571.00	3,216.00	null	
China	A. Datum	July	7,424.00	null	null	
China	A. Datum	August	null	null	800.00	
China	A. Datum	September	1,254.00	1,617.00	396.00	
China	A. Datum	October	1,881.00	3,042.00	936.00	
China	A. Datum	November	null	3,653.00	null	
China	A. Datum	December	6,135.00	2,810.00	null	
China	Adventure Works	January	12,418.26	5,735.48	1,559.87	
China	Adventure Works	February	31,170.26	null	2,937.90	
China	Adventure Works	March	3,689.85	5,489.23	11,163.94	

1.2 Create Table

1. Drag *Brand* from Dimensions to Rows.

The screenshot shows the Tableau interface with a single sheet named "Sheet 1". The "Dimensions" shelf on the left contains "Brand". The "Marks" card is set to "Automatic". The data table shows 11 rows of brands and their corresponding ABC categories:

Brand	ABC
A. Datum	ABC
Adventure Works	ABC
Contoso	ABC
Fabrikam	ABC
Litware	ABC
Northwind Traders	ABC
Proseware	ABC
Southeast Video	ABC
Tallinn Toys	ABC
The Phone Company	ABC
Wide World Importers	ABC

The "Measures" shelf on the left includes Sales 2013, Sales 2014, Sales 2015, Latitude (generated), Longitude (generated), Number of Records, and Measure Values. The bottom status bar indicates 11 marks and 11 rows by 1 column.

2. Drag *Sales 2015* from Measure to the table, a summary table will be created in the report area.

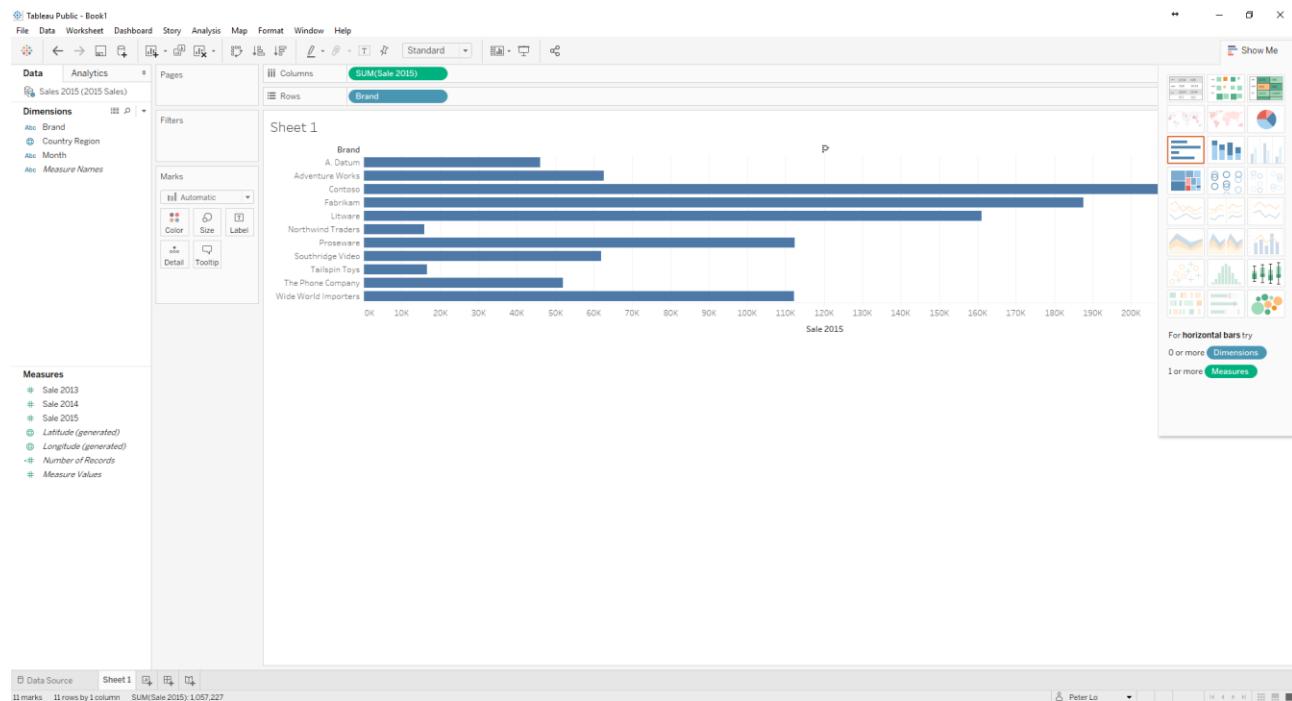
The screenshot shows the Tableau interface with a single sheet named "Sheet 1". The "Dimensions" shelf on the left contains "Brand". The "Marks" card is set to "Automatic". The data table shows 11 rows of brands and their total sales for 2015:

Brand	SUM(Sale 2015)
A. Datum	46,051
Adventure Works	63,642
Contoso	226,978
Fabrikam	187,597
Litware	161,098
Northwind Traders	15,902
Proseware	112,311
Southeast Video	61,924
Tallinn Toys	16,654
The Phone Company	51,919
Wide World Importers	112,151

The "Measures" shelf on the left includes Sales 2013, Sales 2014, Sales 2015, Latitude (generated), Longitude (generated), Number of Records, and Measure Values. The bottom status bar indicates 11 marks, 11 rows by 1 column, and SUM(Sale 2015) 1,057,227.

1.3 Create Report

- Press the **Horizontal Bars** icon in Show Me panel to change the report type.



2. Creating Simple Report from CSV File

2.1 Read Text/CSV File

- Select **Connect → Text File**. In the **Open File** dialog box, select the *0388.HK.csv* file. The file should be loaded successfully to the Power BI, and you are able to create your report.

The screenshot shows the Tableau Public interface. On the left, the 'Connections' pane lists '0388.HK' and 'Text file'. The 'Files' pane shows '0388.HK.csv' selected. The main area displays the data preview for '0388.HK.csv' with columns: Date, Open, High, Low, Close, Adj Close, and Volume. The data spans from June 27, 2000, to August 17, 2018. The bottom right corner shows the author's name, Peter Lo.

2.2 Creating Report

- Select *Date* in Dimension, *Volume* and *Close* in Measure, and select the chart type **Dual Combination**.

The screenshot shows a dual combination chart on 'Sheet 1'. The vertical axis is labeled 'Close' and ranges from 0K to 55K. The horizontal axis is labeled 'Year of Date' and shows years from 1999 to 2018. Blue bars represent the measure 'SUM(Volume)', and an orange line represents the measure 'SUM(Close)'. The chart includes a legend in the top right corner and a 'Show Me' panel on the right side.

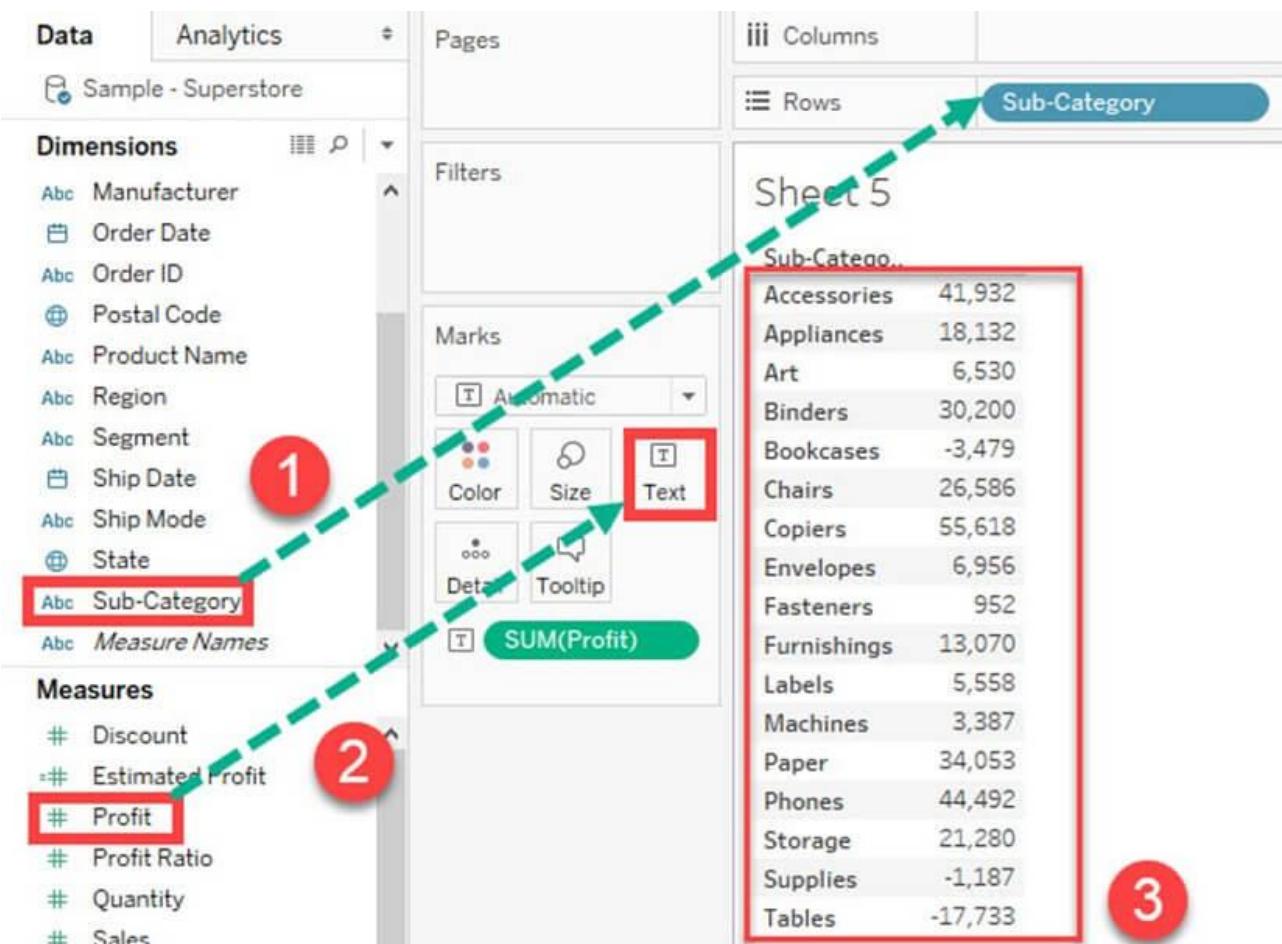
3. Introduction to Common Visual

Tableau can create interactive visuals for easy data interpretation. You can create various types of graphs in Tableau based on the purpose.

3.1 Text Tables

Text tables are used to show the exact value of measures across the different dimension. A text table is also called as a Pivot Table. It groups the dimensions and measures by default.

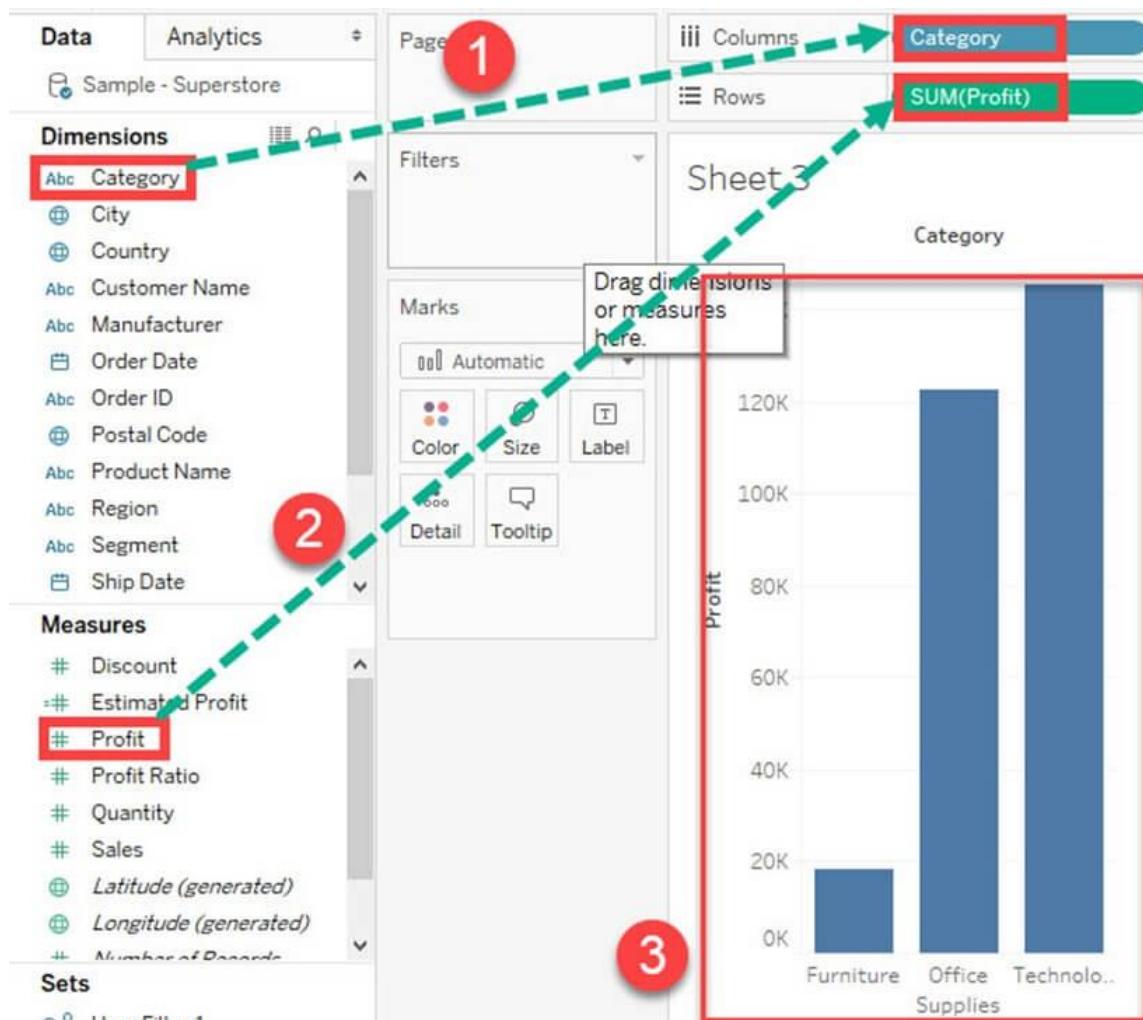
1. Select **Connect ➔ Microsoft Excel**. Import **Sample - Superstore.xls** and select “Orders” sheet.
2. Go to a new Worksheet, drag *Sub-Category* into Rows, and drag *Profit* into text box present in the marks card. It creates a text table by default.



3.2 Bar Chart

A bar chart can compare the data across different categories. The height of the bars represents the measured value of each category. It can be represented as vertical and horizontal type bar charts.

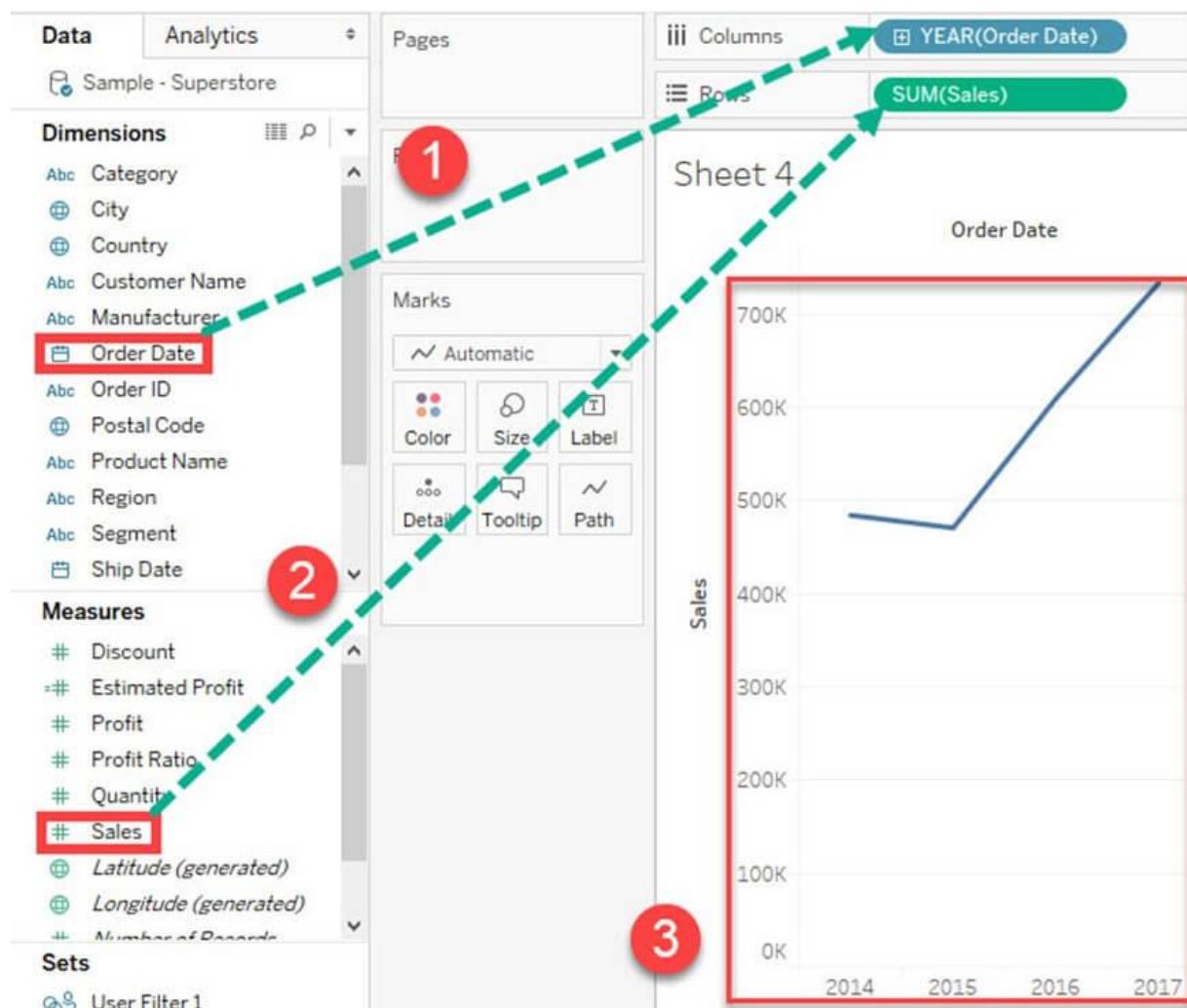
1. Select **Connect** → **Microsoft Excel**. Import **Sample - Superstore.xls** and select “Orders” sheet.
2. Go to a new Worksheet, drag *Category* into Columns, and drag *Profit* into Rows. It creates a bar chart by default.



3.3 Line Chart

A Line Chart should be used to compare the data over the different periods. A line chart is created by the series of dots. These dots represent the measured value in each period.

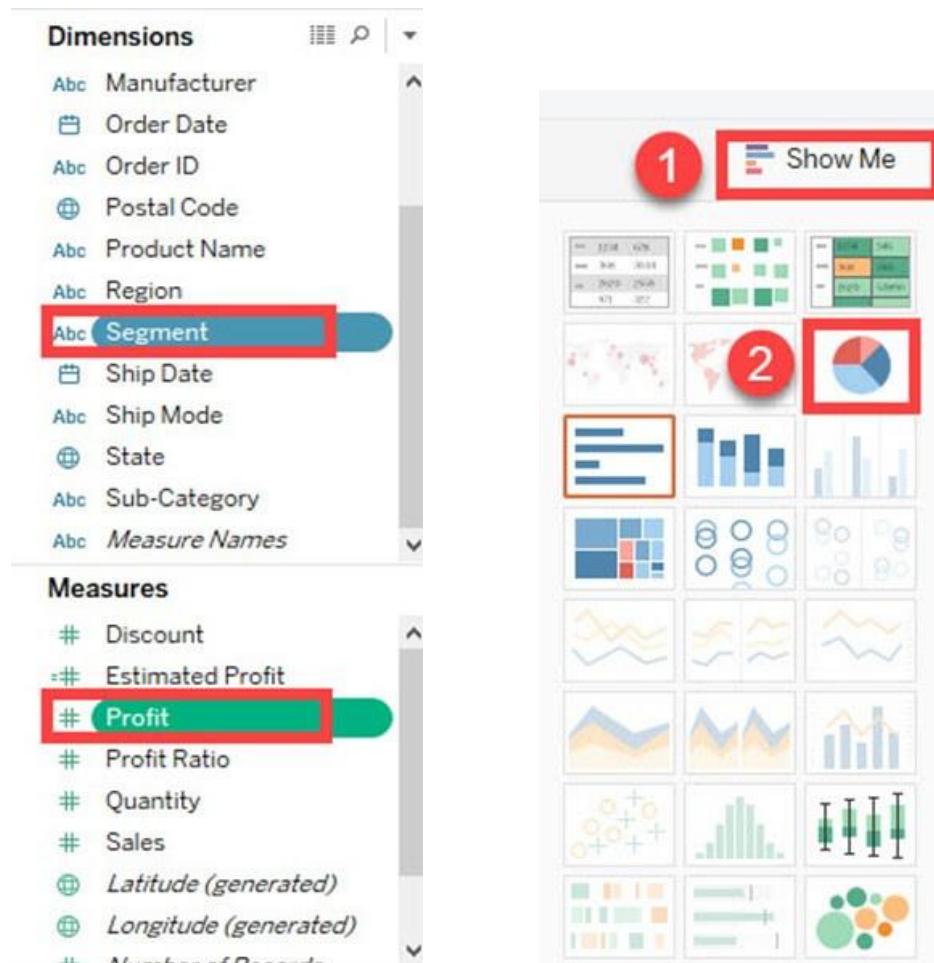
1. Select **Connect → Microsoft Excel**. Import **Sample - Superstore.xls** and select “Orders” sheet.
2. Go to a new Worksheet, drag *Order Date* into Columns, and drag *Sales* into Rows. It creates a line chart by default.



3.4 Pie Chart

A pie chart can show the segment-wise data. It can show the contribution of measure over different members in a dimension. The angle of pie determines the measured value. Different colors can be assigned to pie to represent the members in a dimension.

1. Select **Connect → Microsoft Excel**. Import Sample - Superstore.xls and select “Orders” sheet.
Go to a new Worksheet, hold the **[Ctrl]** key in keyboard and select *Segment* and *Profit*.
2. Click on 'Show Me' button present in the top right corner of the worksheet. Select 'Pie Chart' from the list



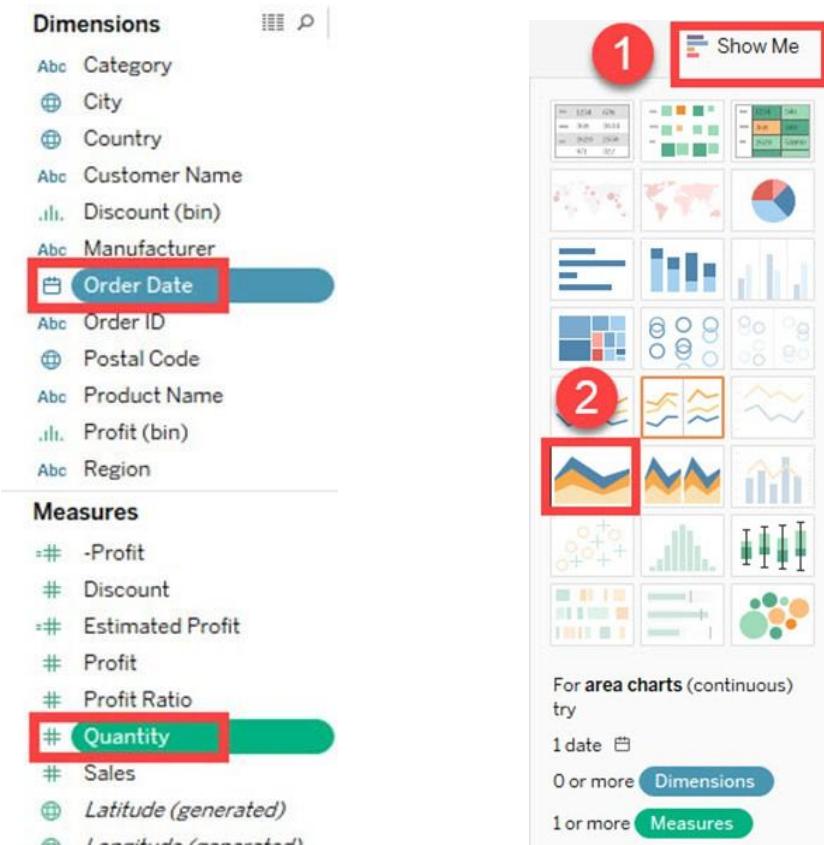
3. It creates a Pie Chart as shown below.



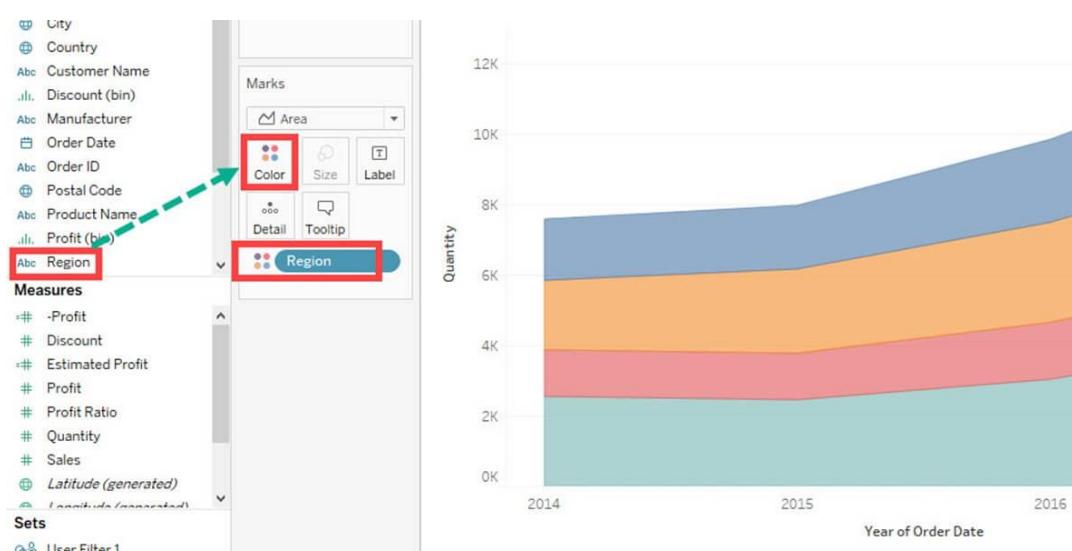
3.5 Area Chart

Area chart can represent any quantitative (measure) data over different period of time. It is basically a line graph where the area between line and axis is generally filled with color.

1. Select **Connect ➔ Microsoft Excel**. Import **Sample - Superstore.xls** and select “Orders” sheet.
Go to a new Worksheet, Hold the **[Ctrl]** key in keyboard and select *Order Date* and *Quantity*.
2. Click on 'Show Me' option present at the top right corner of the worksheet. Select the **Area chart** icon as shown in the figure.



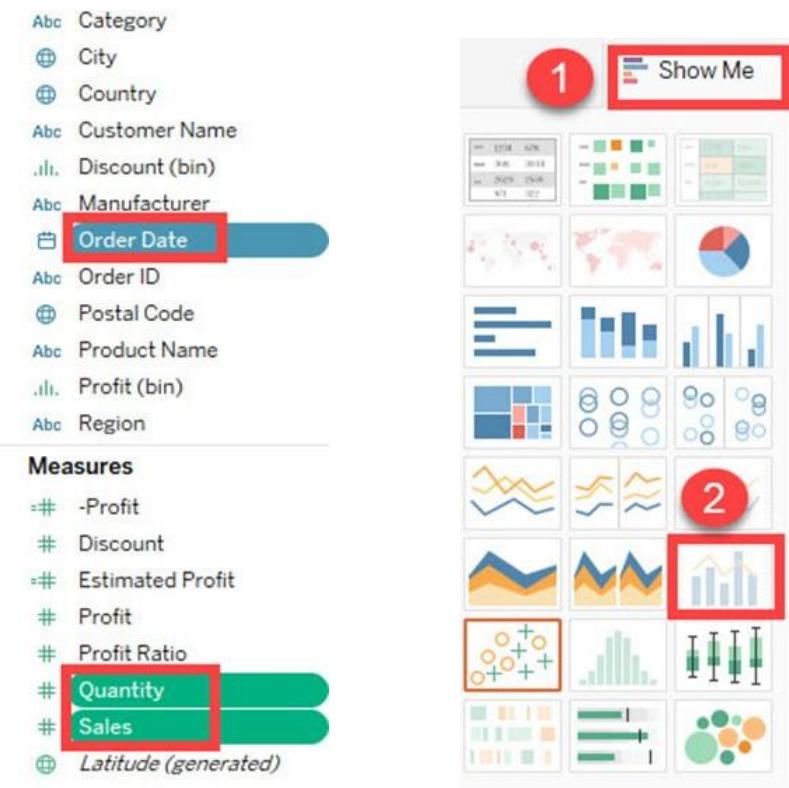
3. Drag *Region* from dimension pane and add it in color icon of Marks card. This creates an area chart as shown in the image.



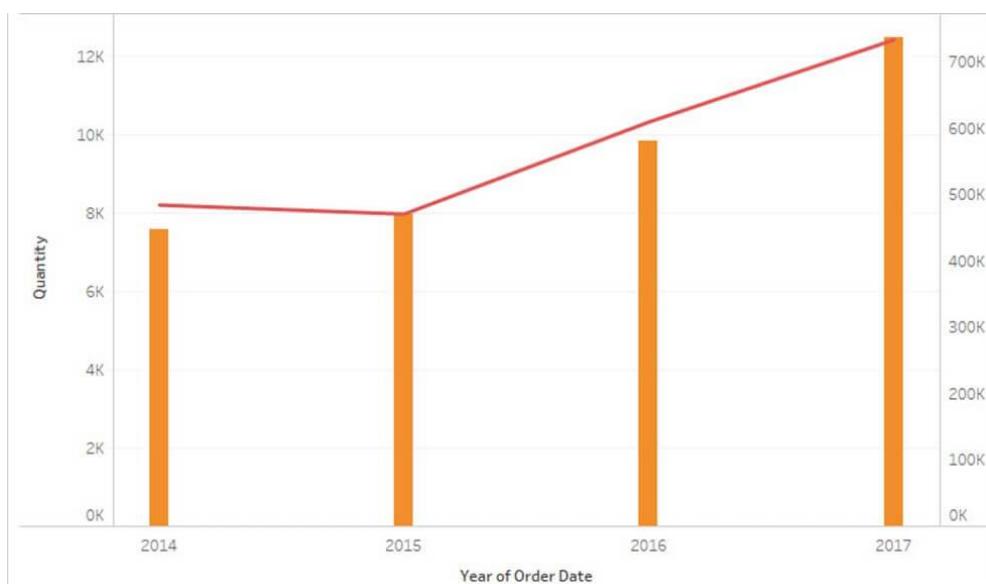
3.6 Dual Axis Chart

Dual axis chart can be used to visualize two different measures in two different chart types. A date column and two measures are necessary to build a dual axis chart. The different scales used in the graph helps the user to understand both measures.

1. Select **Connect → Microsoft Excel**. Import Sample - Superstore.xls and select “Orders” sheet.
Go to a new Worksheet, Hold the [Ctrl] key and select *Order Date*, *Sales* and *Quantity*.
2. Click on 'Show Me' option present at the top right corner of the worksheet. Select the **Dual Combination** icon as shown in the figure.



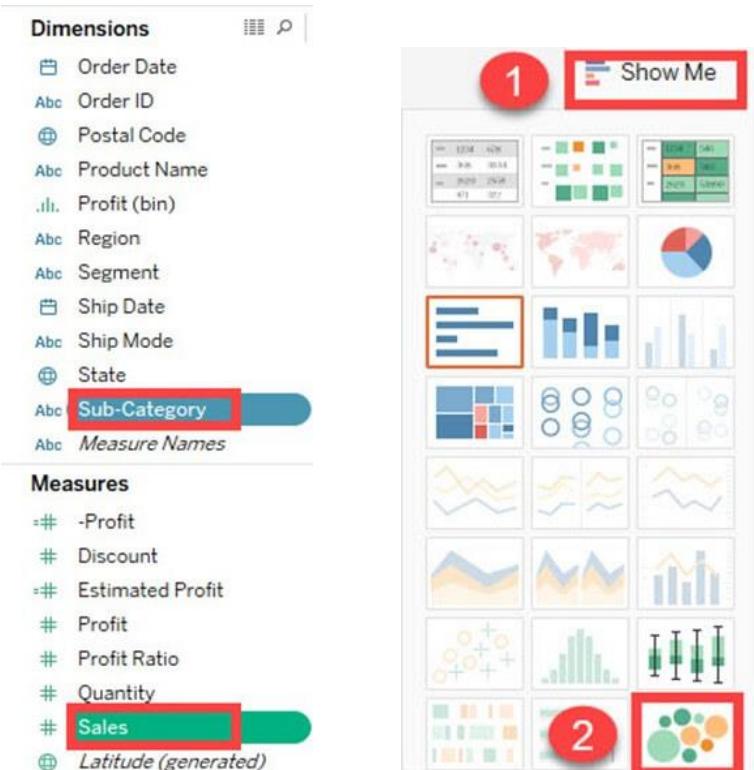
3. It creates a dual axis chart as shown in the figure.



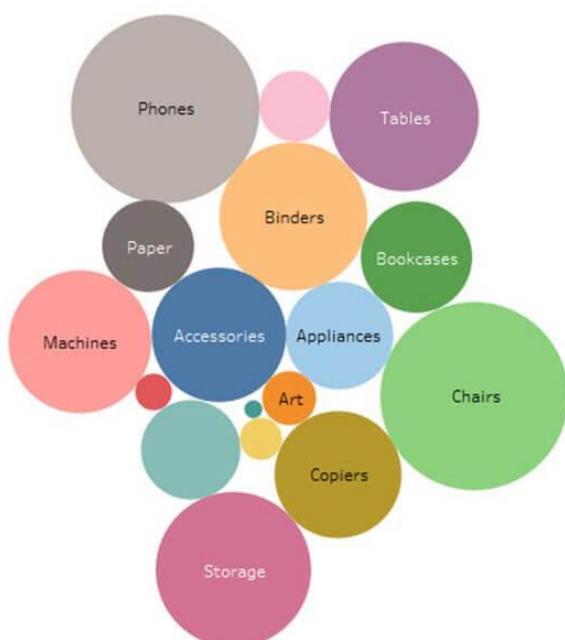
3.7 Bubble Chart

A bubble chart visualizes the measures and dimensions in the form of bubbles. The sizes of the bubbles determine the size of measure value for effective visualization. The color of bubbles can be set to differentiate the members present in a dimension.

1. Select **Connect → Microsoft Excel**. Import Sample - Superstore.xls and select “Orders” sheet. Go to a new Worksheet, Hold the **[Ctrl]** key and select *Sub-Category* and *Sales*.
2. Click on 'Show Me' option present at the top right corner of the worksheet. Select the **Packed Bubbles** icon as shown in the figure.



3. It creates a bubble chart as shown below

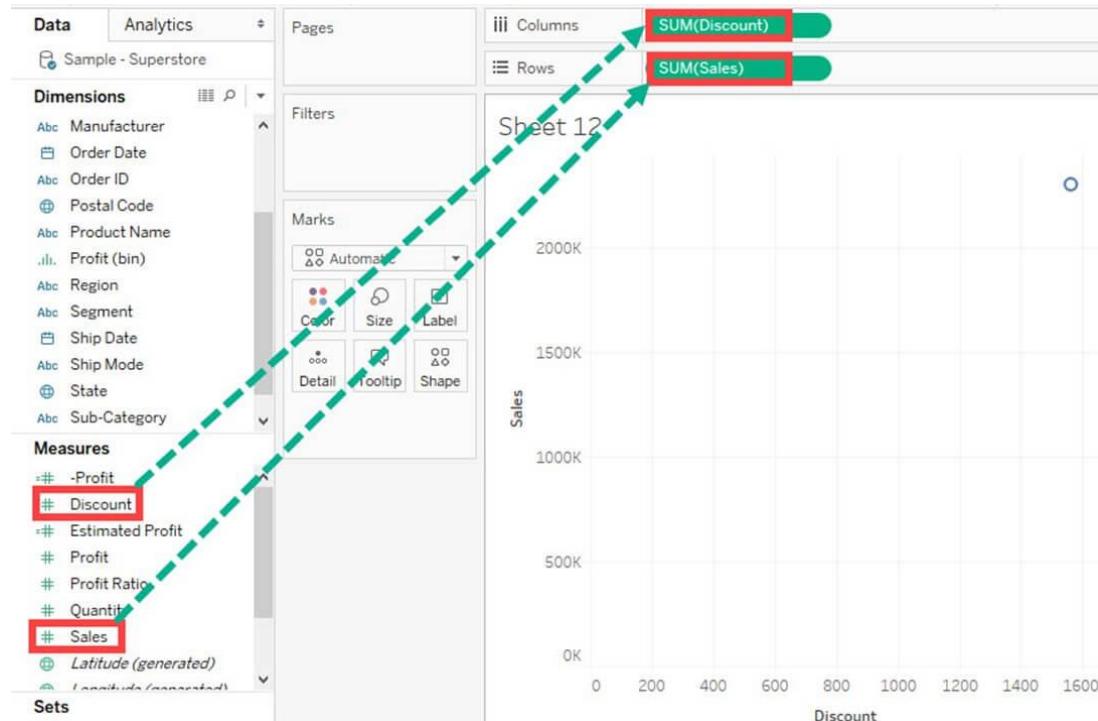


3.8 Scatter Plot

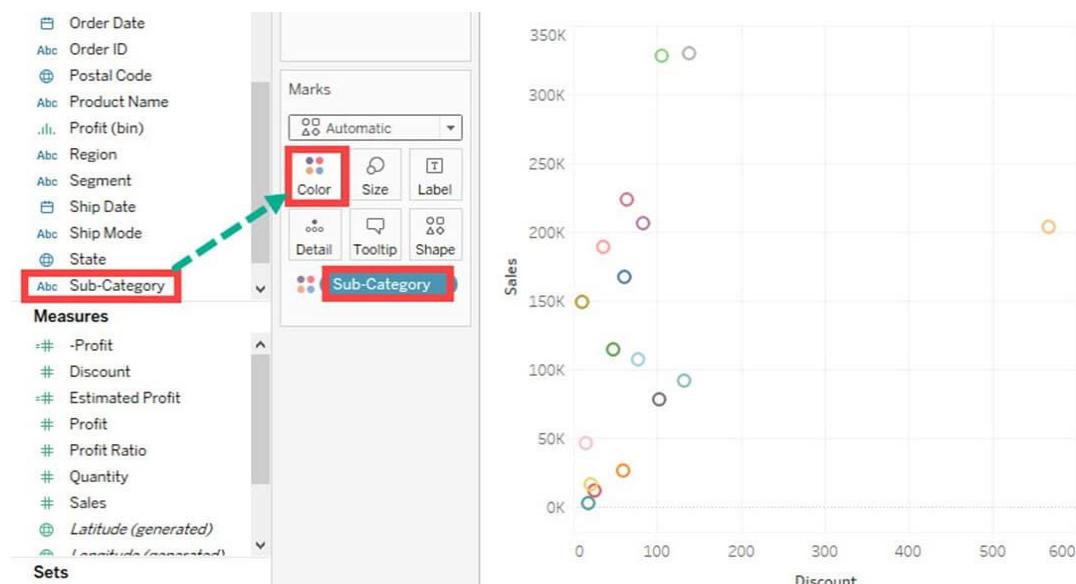
The relationship between two measures can be visualized using scatter plot. A scatter plot is designed by adding measures in both x and y-axis. This can show the trend or relationship between the measures selected.

1. Select **Connect → Microsoft Excel**. Import Sample - Superstore.xls and select “Orders” sheet.

Go to a new Worksheet, drag *Discount* into Columns and drag *Sales* into Rows. This creates a scatter plot by default.



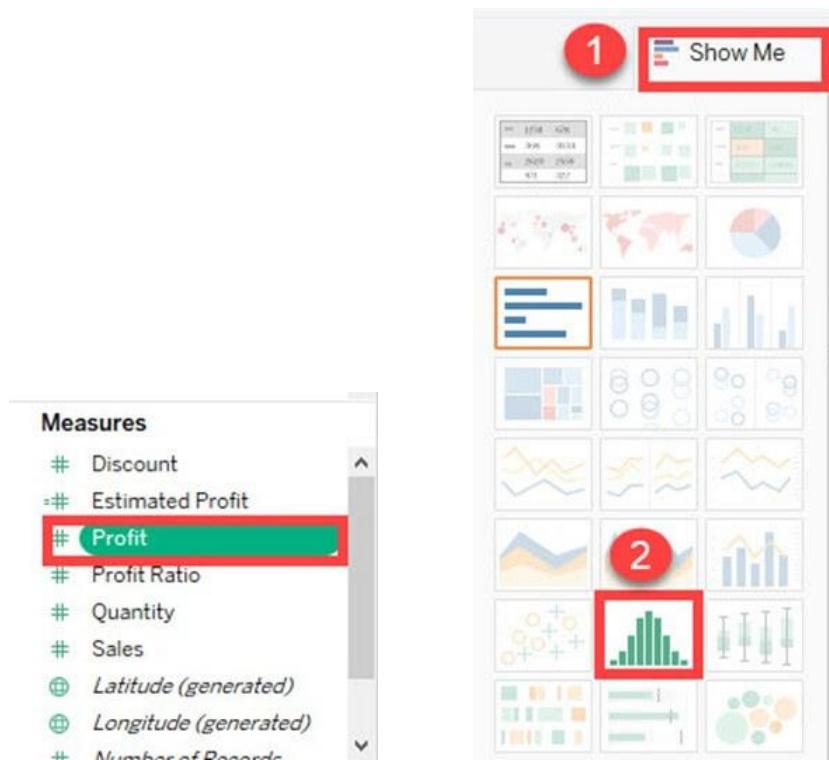
2. Drag *Sub-Category* into Color icon present in the Marks card. It creates a scatter plot showing the relationship between discount and sales for each sub-category.



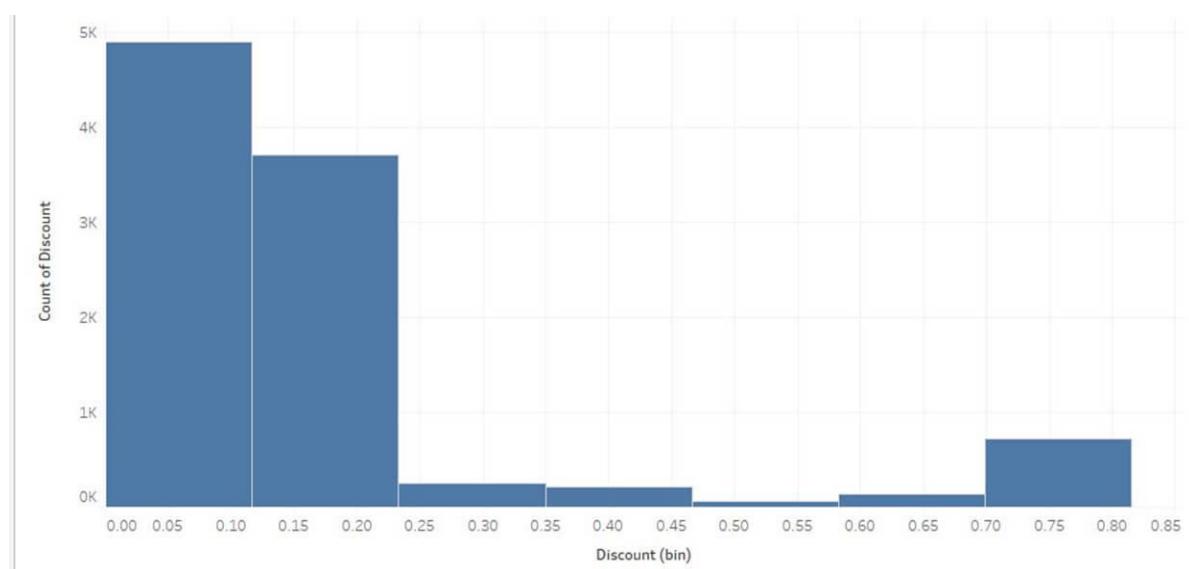
3.9 Histogram

A histogram can show the values present in a measure and its frequency. It shows the distribution of numerical data. As it shows both frequency and measure value by default, it can be useful in many cases. For example, if you want to analyze the discount given by a retail shop, you can visualize the amount of discount and its frequency using histogram.

1. Select **Connect → Microsoft Excel**. Import Sample - Superstore.xls and select “Orders” sheet. Go to a new Worksheet, select *Profit* from the measures.
2. Click on ‘Show Me’ button present in the top right corner of the worksheet. Select the “Histogram” icon as shown in the image.



3. It creates a histogram chart in Tableau.



3.10 Heat Map

A heat map can visualize the data in the form of size as well as color on different measures. Two different measures can be visualized simultaneously using heat map. One measure can be assigned to size whereas another measure can be assigned to the color of the heat map.

1. Select **Connect → Microsoft Excel** and import **Sample - Superstore.xls** file to Tableau and select “Orders” sheet. Go to a new Worksheet. Hold the **[Ctrl]** key in keyboard and select **Sub-Category** and **Sales** from the data pane.

The screenshot shows the Tableau Data pane with two items selected: "Sub-Category" and "Sales". The "Sub-Category" item is highlighted with a blue selection bar, and the "Sales" item is highlighted with a green selection bar. Other items like "Manufacturer", "Order Date", "Order ID", etc., are listed below them.

2. Click on the 'Show me' button present in the top right corner of the worksheet. Select the **Heat Map** icon as shown in the image.



3. Drag *Profit* into the Color box.

The screenshot shows the Tableau interface with the 'Marks' card open. In the 'Color' section, the 'Color' button is highlighted with a red box and a green dashed arrow pointing from the 'Dimensions' shelf below it. The 'Measures' shelf on the left has 'Profit' selected and highlighted with a red box. The 'Sheet 6' view on the right shows a list of sub-categories with corresponding color swatches, where the color for each item corresponds to its profit value.

4. Drag *Region* into Columns. This will create a Heat map. It can be used to visualize Sales and Profit across different dimension.

The screenshot shows the Tableau interface with the 'Marks' card open. The 'Color' button is highlighted with a red box and a green dashed arrow labeled '1'. The 'Dimensions' shelf on the left has 'Region' selected and highlighted with a red box. The 'Sheet 6' view on the right displays a heatmap titled 'Region' where the color of each cell represents the profit for a specific Sub-Category and Region combination. A red box highlights the heatmap area, and a red circle with the number '2' is positioned to its right.

4. Build a Basic View to Explore Your Data

4.1 Connect to Data

1. Select **Connect** → **Microsoft Excel**. Import **Sample - Superstore.xls** file to Tableau and select “Orders” sheet.

The screenshot shows the Tableau Data Source pane. On the left, under 'Connections', there is one entry: 'Sample - Superstore Excel'. Under 'Sheets', the 'Orders' sheet is selected. Below the sheet list, there are 'Sort fields' and 'Data source order' dropdowns. The main area displays a preview of the 'Orders' data with columns: Order ID, Order Date, Ship Date, and Ship Mode. The preview shows several rows of data. At the bottom, there are tabs for 'Data Source' (disabled), 'Sheet1' (selected), and other options.

4.2 Build a View from Scratch

These steps show how to build a basic view that shows year-by-year profit.

1. From the Dimensions area in the Data pane, drag the *Order Date* field to the Columns shelf.
When you drag a field over a shelf, a plus sign indicates that the shelf can accept the field.

The screenshot shows the Tableau Data pane. On the left, the 'Dimensions' section is expanded, showing categories like Customer, Order, Location, and Product, each with their respective fields. The 'Order Date' field is highlighted and being dragged with a cursor. The 'Columns' shelf on the right has a plus sign indicating it can accept the field. The 'Rows' shelf is also visible.

2. The resulting table has four columns and one row. Each column header represents a member of the *Order Date* field (the default date level is YEAR). Each cell contains an “Abc” label, which indicates that the current mark type for this view is text. Notice that the field is colored blue, which indicates that it is discrete

Order Date			
2011	2012	2013	2014
Abc	Abc	Abc	Abc

3. The default date level is determined by the highest level that contains more than one distinct value (for example, multiple years and multiple months). That means that if *Order Date* contained data for only one year but had multiple months, the default level would be month. You can change the date level using the field menu.

The screenshot shows the context menu for the 'Order Date' field. The 'Year' option is highlighted with a red box. Other options include Quarter, Month, Day, More, and Exact Date.

Year	2015
Quarter	Q2
Month	May
Day	8
More	▶
Year	2015
Quarter	Q2 2015
Month	May 2015
Week Number	Week 5, 2015
Day	May 8, 2015
More	▶
Exact Date	

4. From Measures in the Data pane, drag the *Profit* field to the Rows shelf. The *Profit* field is colored green on the Rows shelf, indicating that it is continuous. Also, the field name changes to *SUM(Profit)*. That's because measures are automatically aggregated when you add them to the view, and the default aggregation for this measure is *SUM*.

The screenshot shows the Tableau Data pane with the following structure:

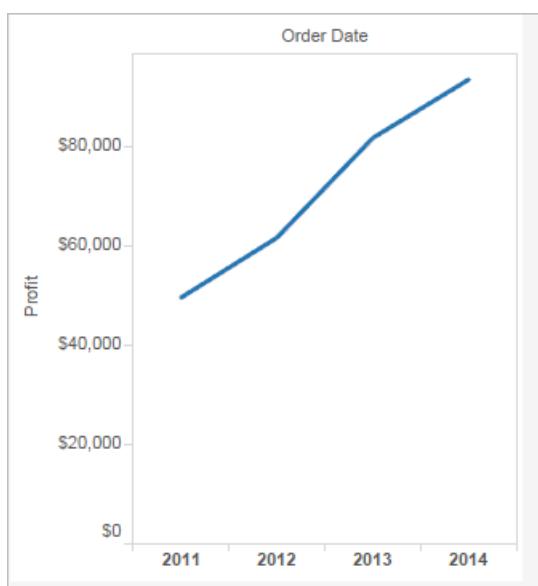
- Data:** Analytics - Sample - Superstore
- Dimensions:**
 - Customer: Customer Name, Segment
 - Order: Order Date, Order ID, Ship Date, Ship Mode
 - Location: Country, State, City, Postal Code
 - Product: Category, Sub-Category, Manufacturer, Product Name
 - Region: Profit (bin), Region
- Measures:** Profit

The **Rows** shelf contains the following items:

- YEAR(Order Date)
- SUM(Profit) (highlighted with a green background)

The **Marks** shelf includes options for Color, Size, Text, Detail, and Tooltip.

5. Tableau transforms the table into a line chart and creates a vertical axis (along the left side) for the measure. A line chart is a great way to compare data over time and identify trends effectively. This line chart shows profit over time. Each point along the line shows the sum of profit for the corresponding year.

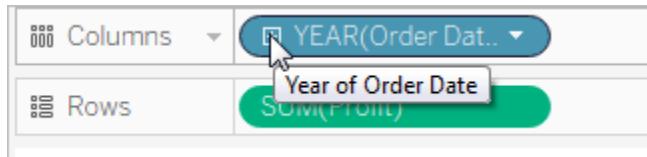


4.3 Drill into the Data

This step shows how you can modify the view to show quarters in addition to years. As you drill down into the hierarchy, the view changes to become a nested table.

1. You can show *Order Date* by quarters using either of the following methods:

- Click the plus button on the left side of the field *YEAR(Order Date)* field on Columns shelf.



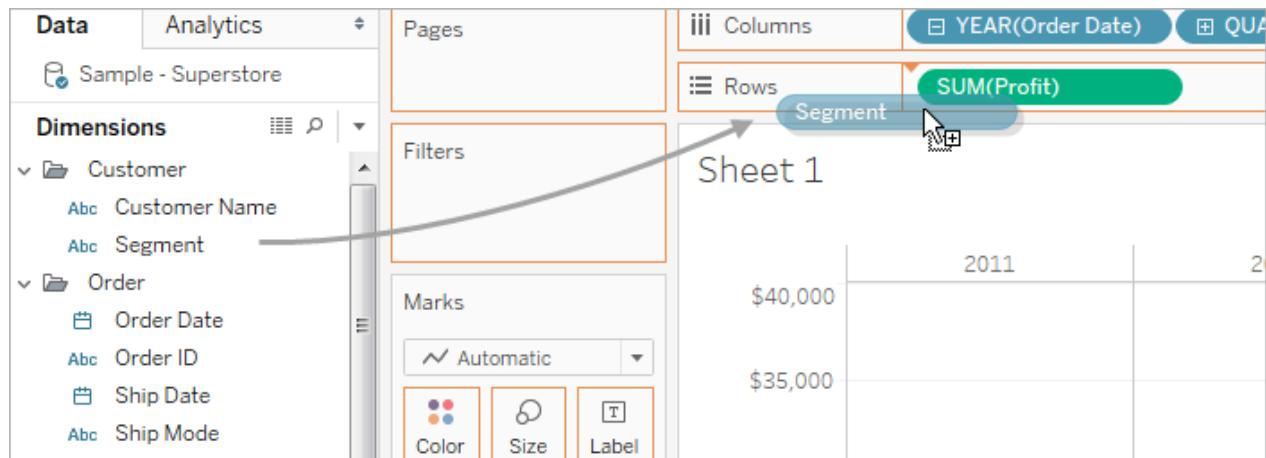
- Drag the *Order Date* field (again) from the Data pane and drop it on the Columns shelf to the right of *Year(Order Date)*.
2. The new dimension divides the view into separate panes for each year. Each pane, in turn, has columns for quarters. This view is called a nested table because it displays multiple headers, with quarters nested within years. The word "headers" might be a bit misleading because while the year headers remain at the "head" of the view (that is, the top), the quarter headers are at the foot (that is, the bottom). So it might be more accurate to call them footers.



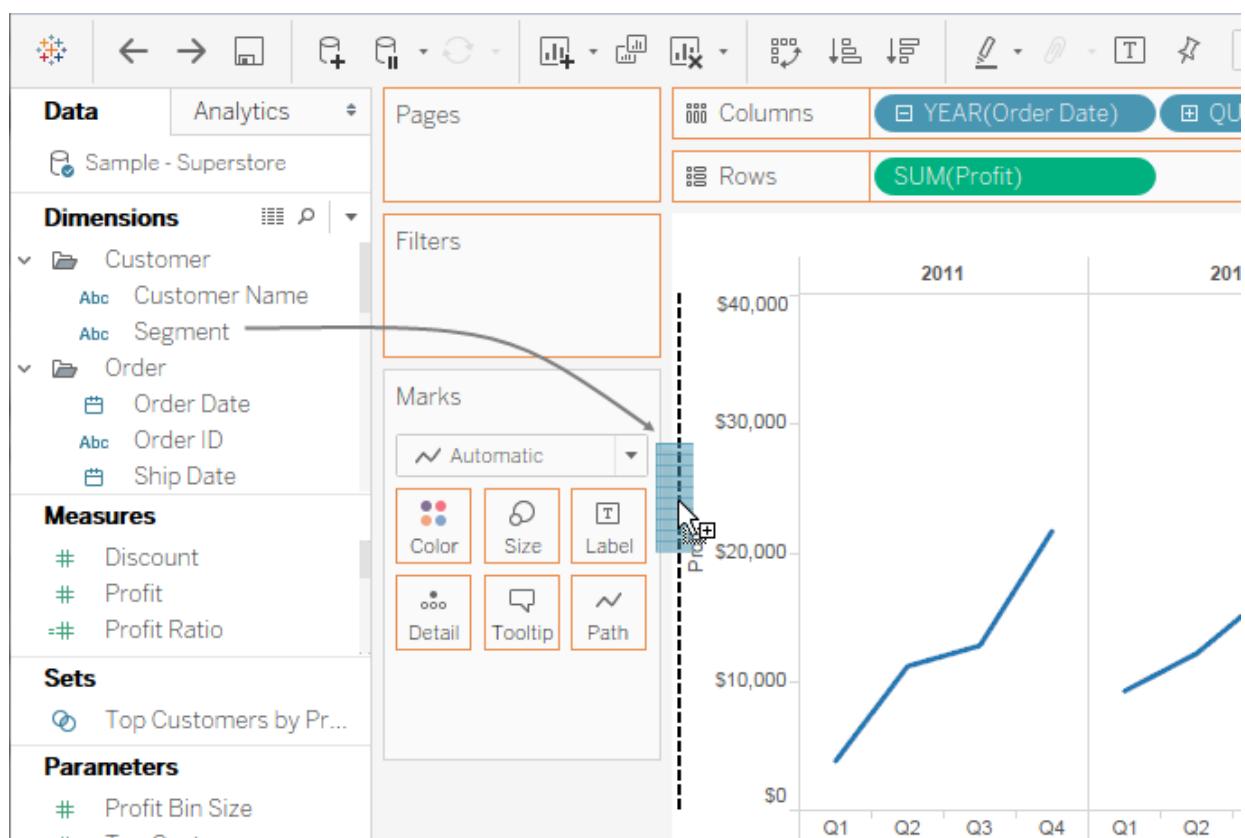
4.4 Increase the Level of Detail with Small Multiples

This step shows how you can modify the nested table view to add customer segment. This will create a small multiples view.

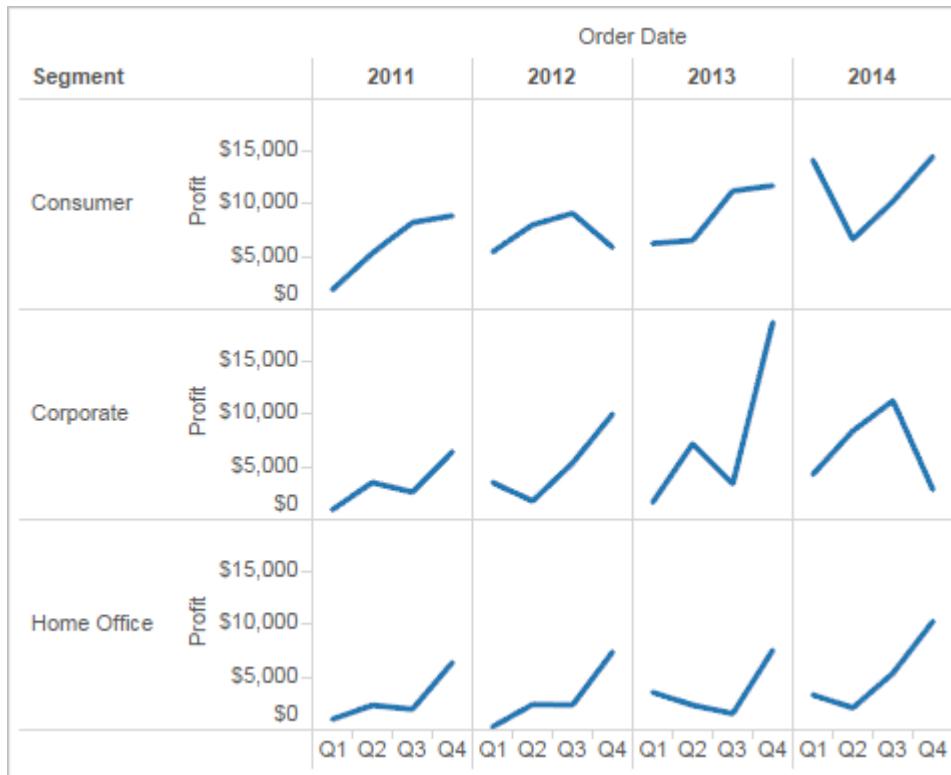
1. Drag the *Segment* dimension from the Data pane. Drop it just to the left of *SUM(Profit)* on Rows shelf.



2. The field is added to the Rows shelf and row headers are created. Each header represents a member of the Segment field. You could achieve the same result by dropping Segment just to the left of the Profit axis in the view (Tableau does not allow you to place a dimension to the right of a measure on either the Rows or Columns shelves because that visual structure would not make sense in the view).



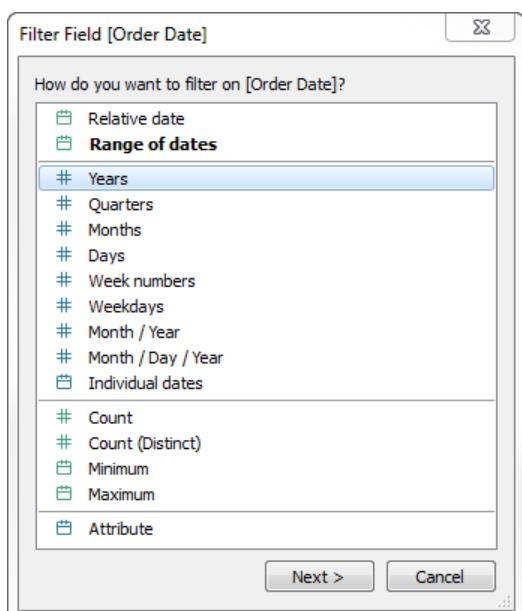
3. The new dimension divides the view into 12 panes, one for each combination of year and segment. This view is a more complex example of a nested table. Any view that contains this sort of grid of individual charts is referred to as a small multiples view. At this point you probably don't want to make the view any more granular; in fact, you may want to simplify the view by removing (that is, filtering) some data.



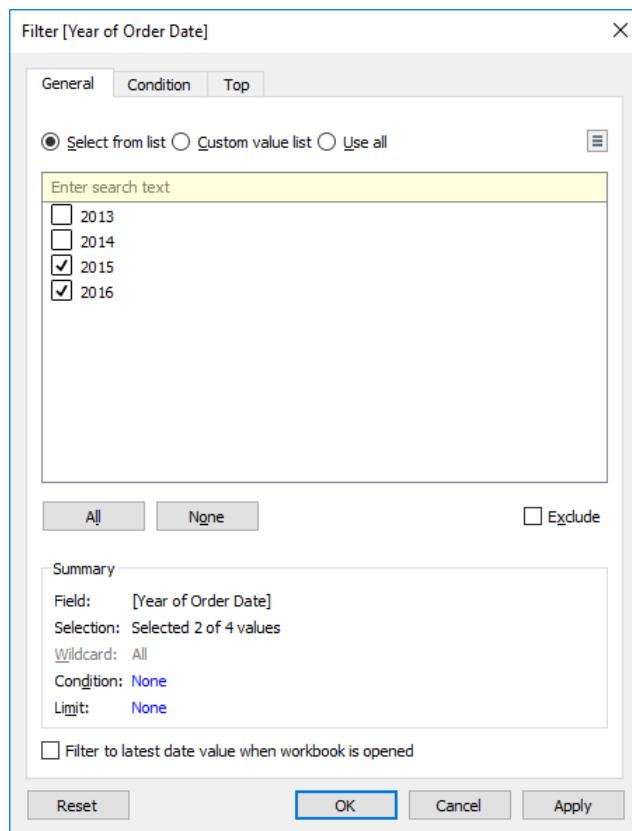
4.5 Filter the View to Focus your Exploration

This section shows how you can focus your exploration by only showing a subset of the data, such as modifying the view to show only data for orders in specified condition.

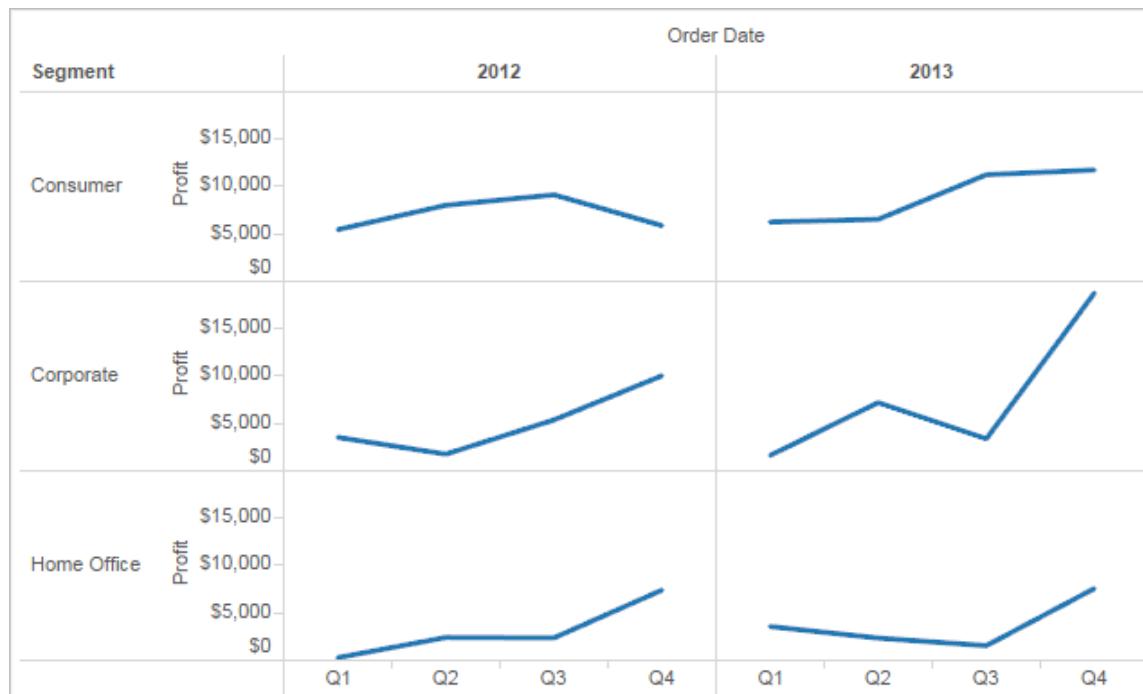
1. Drag the *Order Date* measure from the Data pane and drop it on the Filters shelf.



2. In the Filter Field dialog box, choose the date level you want to filter on— **Years**. Then click **[Next]**.
3. In the next pane, clear any two years that you do not want to include in the view. When you are finished, click **[OK]**.



4. The view updates to only show data rows where Order Date is filtered. Tableau can now allocate more space to the data that interests you.



4.6 Use the Marks Card to Add Depth to your Analysis

This step shows how you can modify the view to color the marks based on the region.

1. Drag the Region dimension from the Data pane and drop it on Color. Placing a dimension on Color separates the marks according to the members in the dimension, and assigns a unique color to each member. The color legend displays each member name and its associated color

The screenshot shows the Tableau Data pane with the following sections:

- Data:** Sample - Superstore
- Dimensions:**
 - Postal Code
 - Product
 - Category
 - Sub-Category
 - Manufacturer
 - Product Name
 - Profit (bin)
 - Region
 - Measure Names
- Measures:**
 - Discount
 - Profit
 - Profit Ratio
- Filters:** YEAR(Order Date)
- Marks:** Automatic, with a 'Region' button highlighted by a blue arrow.

2. Each pane now has four lines, one for each region. The chart is now showing profit data summarized at the Region level of detail. This view now shows profit for each customer segment and region for specified year.

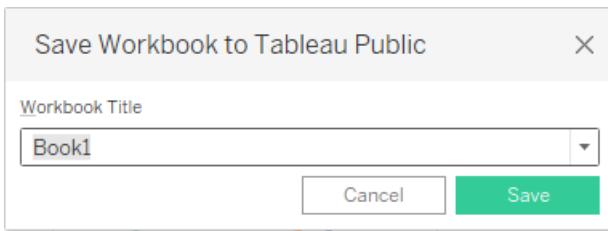


4.7 Save your Report

- Click File ➔ Save to Tableau Public.

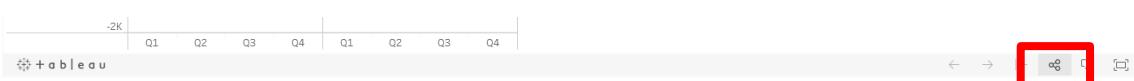
The screenshot shows the Tableau Public interface. The 'File' menu is open, with 'Save to Tableau Public...' highlighted. The main workspace shows a line chart titled 'Sheet 1'. The chart has 'Order Date' on the horizontal axis, 'Segment' on the vertical axis, and 'Profit' represented by the thickness of the lines. Three segments are tracked: Consumer (teal line), Business (orange line), and Government (red line). The chart shows a general upward trend in profit over time, with significant fluctuations.

- Input the Workbook Title and click [Save] button.



4.8 Distribute your Report

- Click the Share button.

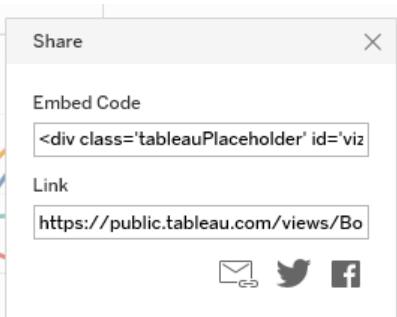


Tutorial 3 [Edit Details](#)
3 views | Peter Lo

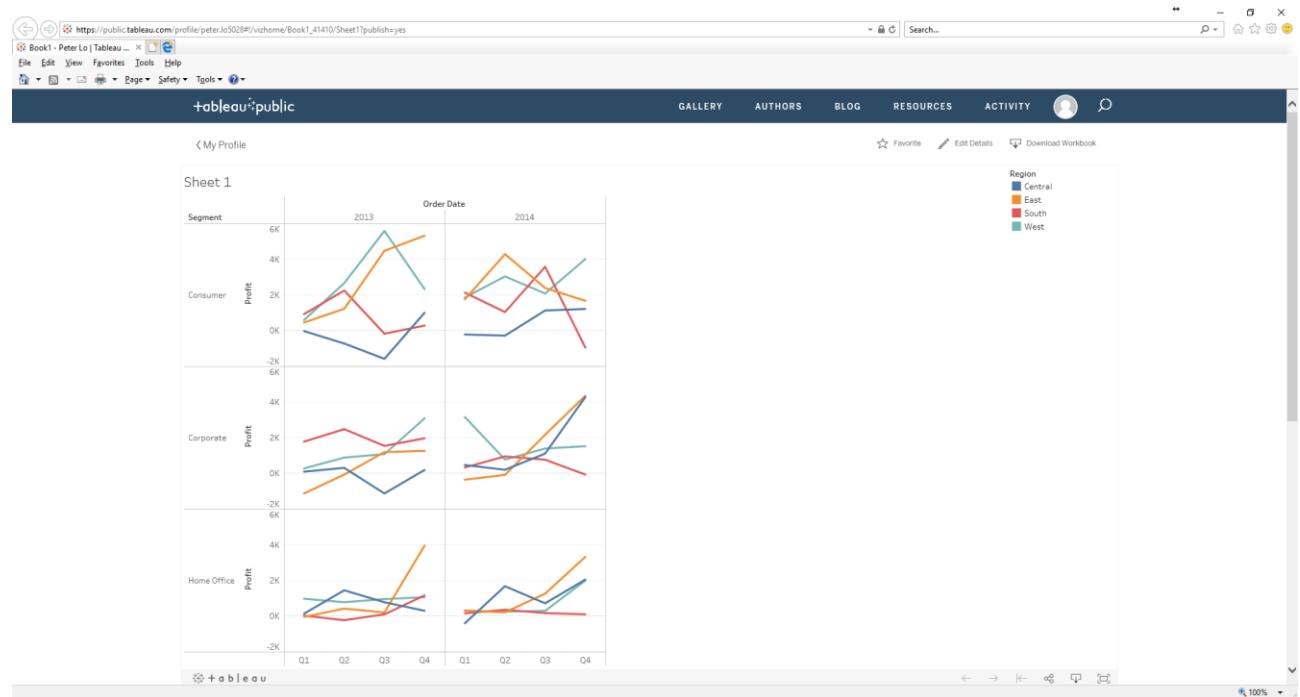
[More Detail](#)

Last Saved: Feb 12, 2019
Workbook Details: 1 Sheet
Original Author: You (Peter Lo)

- Copy the Link from the dialog box.



3. Other user can display the report by the given link.

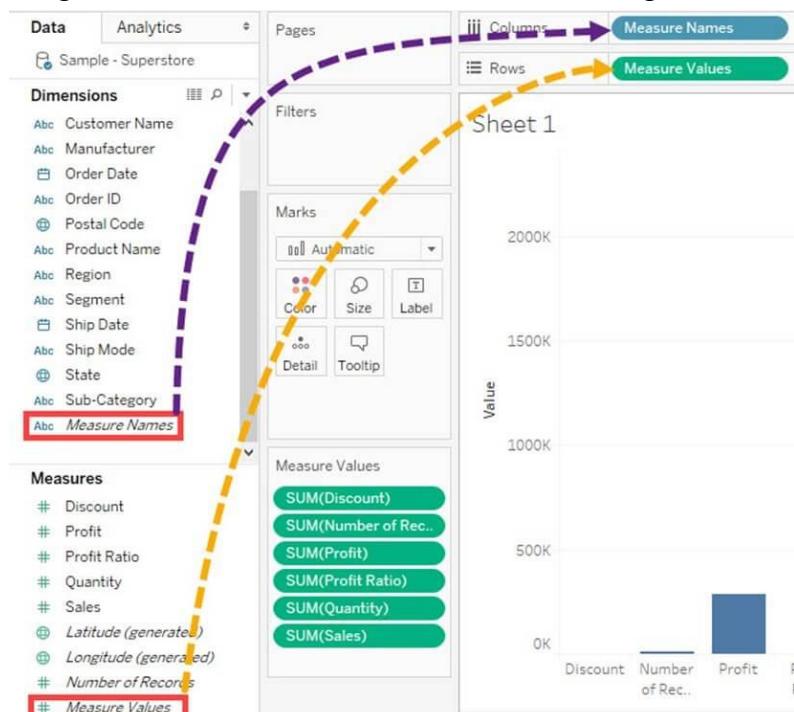


5. Tableau Generated Fields

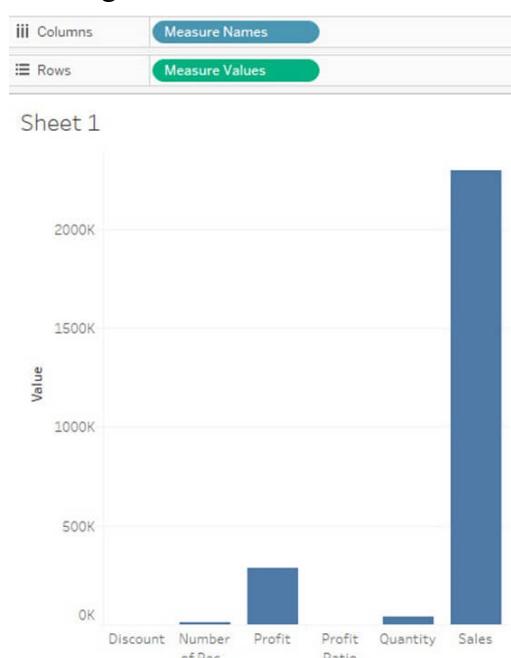
5.1 Measure Name and Measure Value

5.1.1 Aggregation of All Measure

- Measure names and Measure values can be used to see the aggregation of all measure present in a data set. These fields can be shown as different types of visualization in Tableau. Select **Connect → Microsoft Excel**. Import Sample - Superstore.xls and select “Orders” sheet.
- Drag *Measure Names* into Columns, and then drag *Measure Values* into Rows.

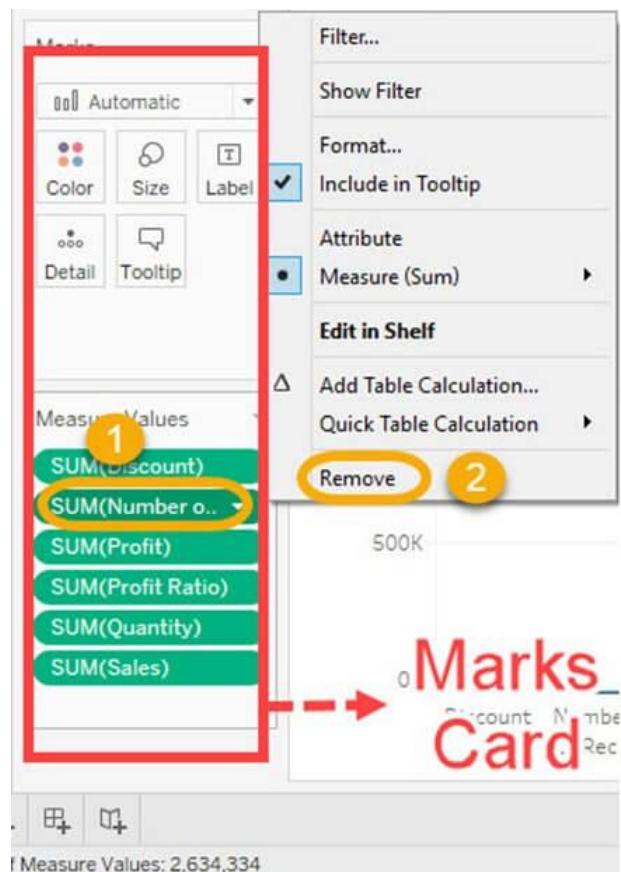


- It creates a visual for all measures present in the data set. By default, Tableau creates a bar chart showing all the measure names and their values.



5.1.2 Remove Measure

- Any measures can be removed from the visual by removing the measure from mark card. It can be removed by right-click on a measure name, and then click on “Remove” option

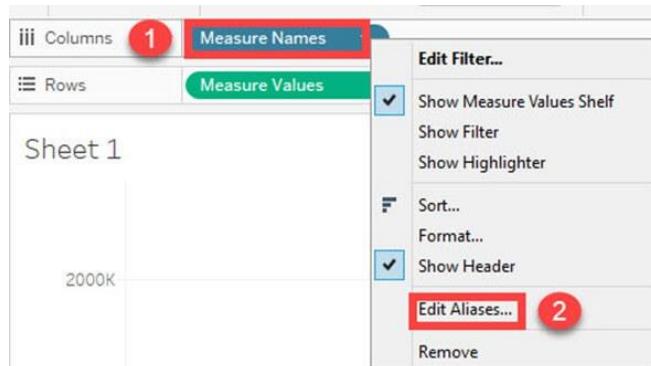


- It removes the measure from the visualization

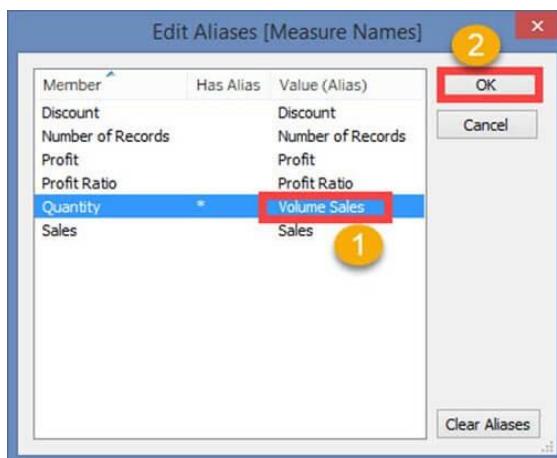


5.1.3 Rename Measure

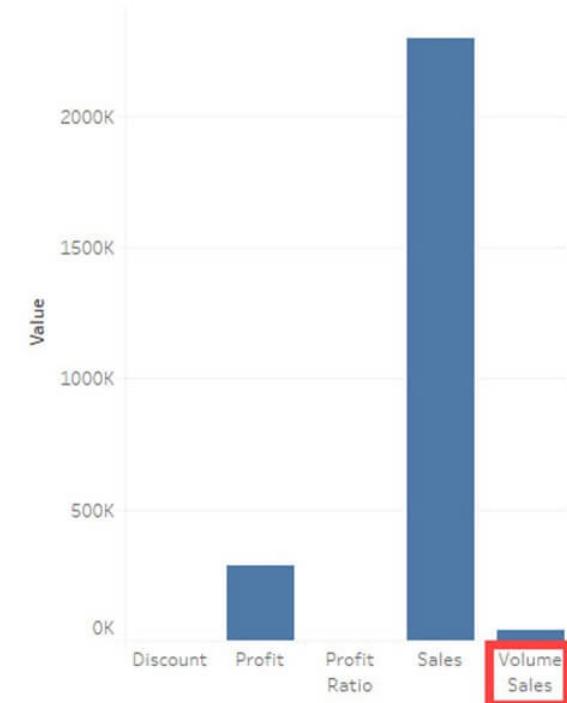
1. Alias name can be created for measure names. It can be shown in the visualization for better identification. Right click on measure name present in Columns and select 'Edit Alias'.



2. Change the Value to “Volume Sales” for member “Quantity” in the “Edit Aliases” dialog box, and then click [OK].

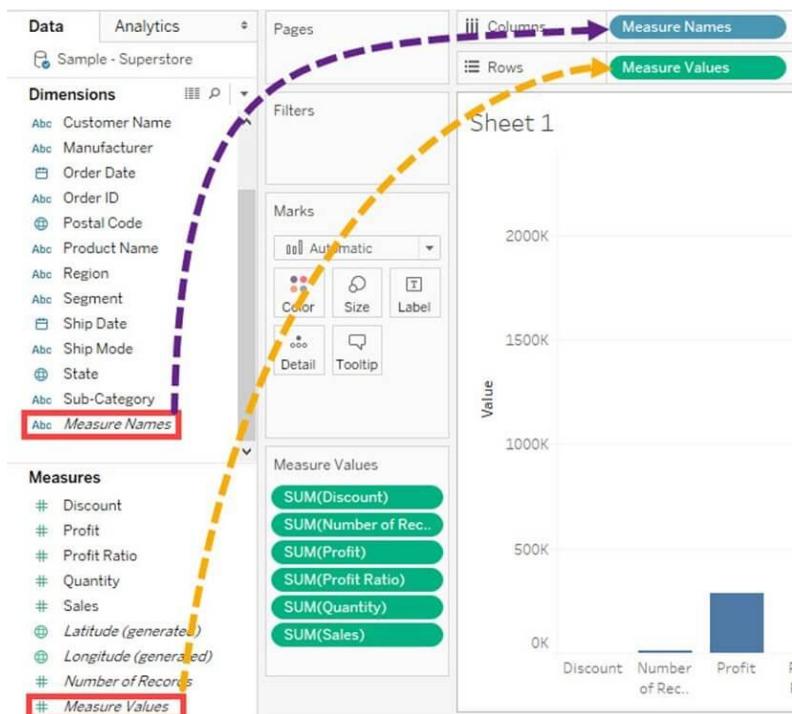


3. You can see the name change in Visualization

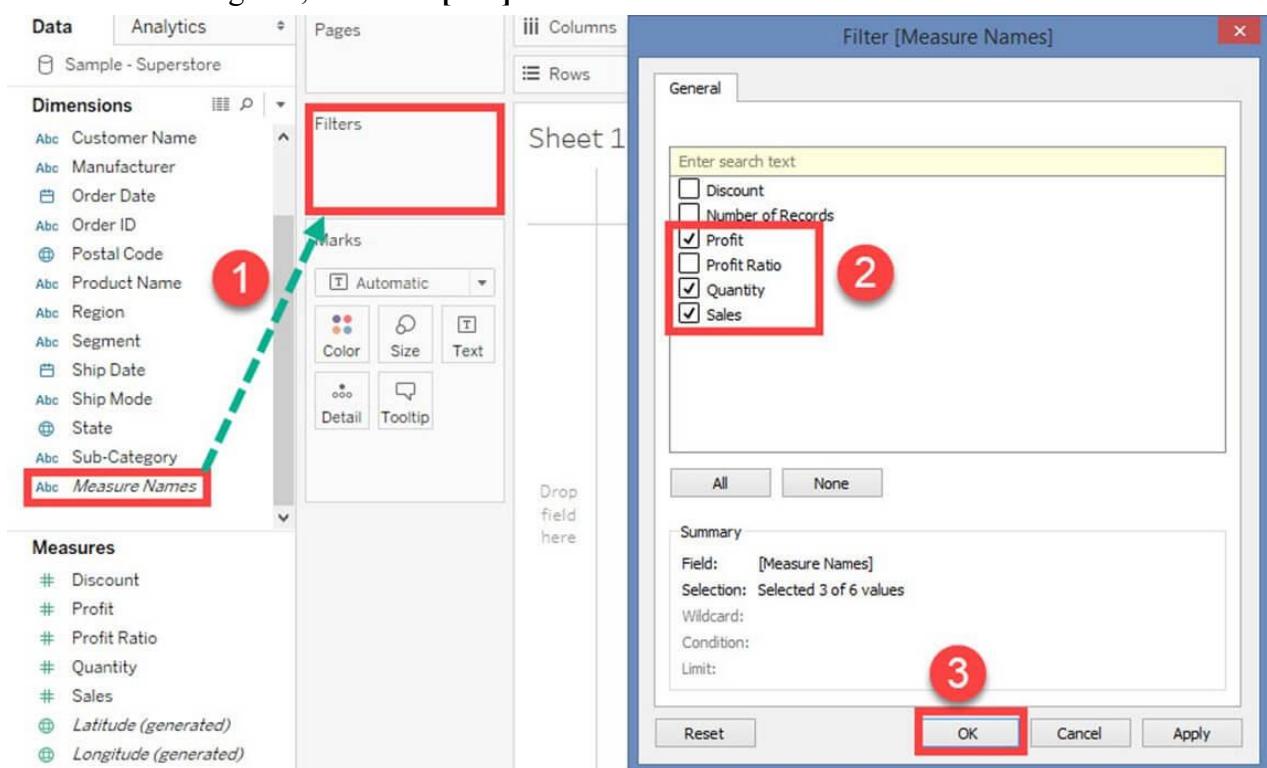


5.1.4 Filter Measure

- If you want to analyze multiple measures in a single visual, it can be done by using measure names and measure values. Select **Connect** → **Microsoft Excel**. Import **Sample - Superstore.xls** and select “Orders” sheet. Drag *Measure Names* into Columns, and then drag *Measure Values* into Rows.



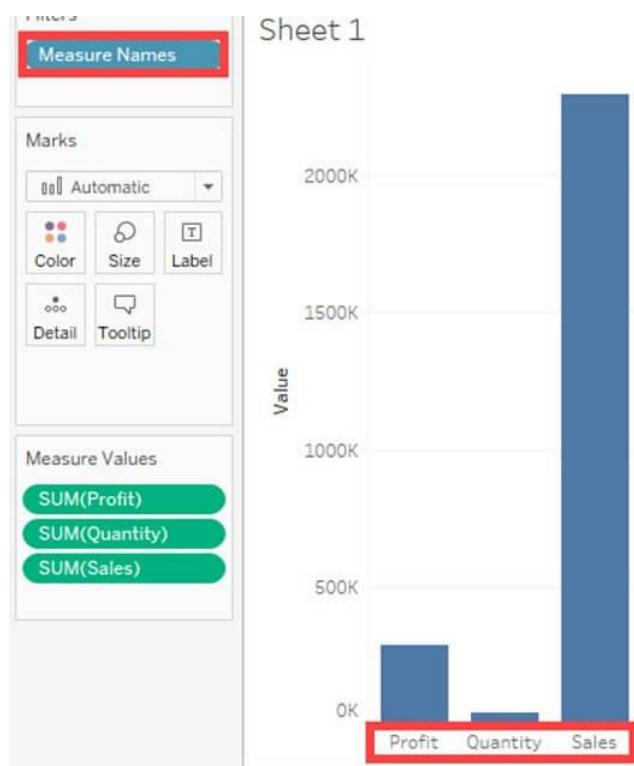
- In order to see the trend of measures namely sales, profit and quantity over the years, drag measure values into the filter box. Check out all the measures except *Profit*, *Quantity*, and *Sales* in the Filter dialog box, and click [OK].



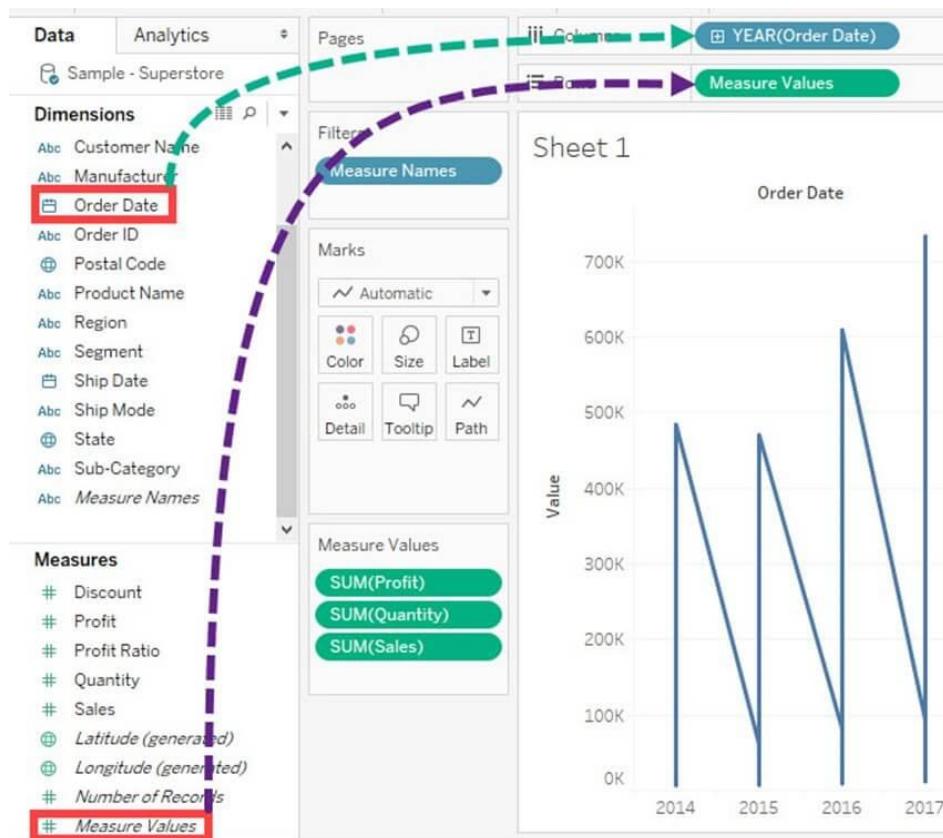
3. It adds the measure name filter in the filter box.

The screenshot shows the Tableau Data pane. On the left, under 'Dimensions', there are several items: Category, City, Country, Customer Name, Discount (bin), Manufacturer, Order Date, and Order ID. On the right, under 'Measures', there is one item: Pages. Below the dimensions, there is a 'Filters' section containing a single item: 'Measure Names'. This item is highlighted with a red box. At the bottom of the pane, there are sections for 'Marks' (Automatic, Color, Size, Label) and 'Detail' (Detail, Tooltip).

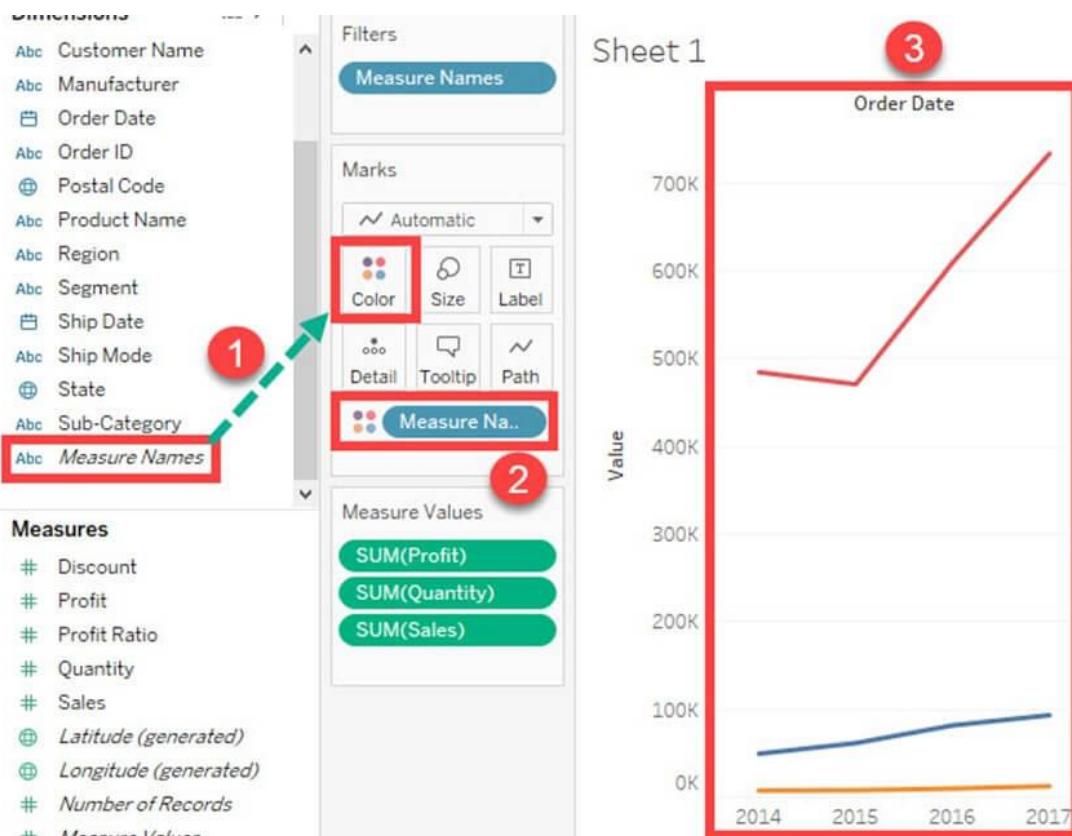
4. It creates a filter on selected measures in the worksheet as follow:



5. Drag *Order Date* into Columns to replace *Measure Names*, and drag *Measure Values* into Rows.

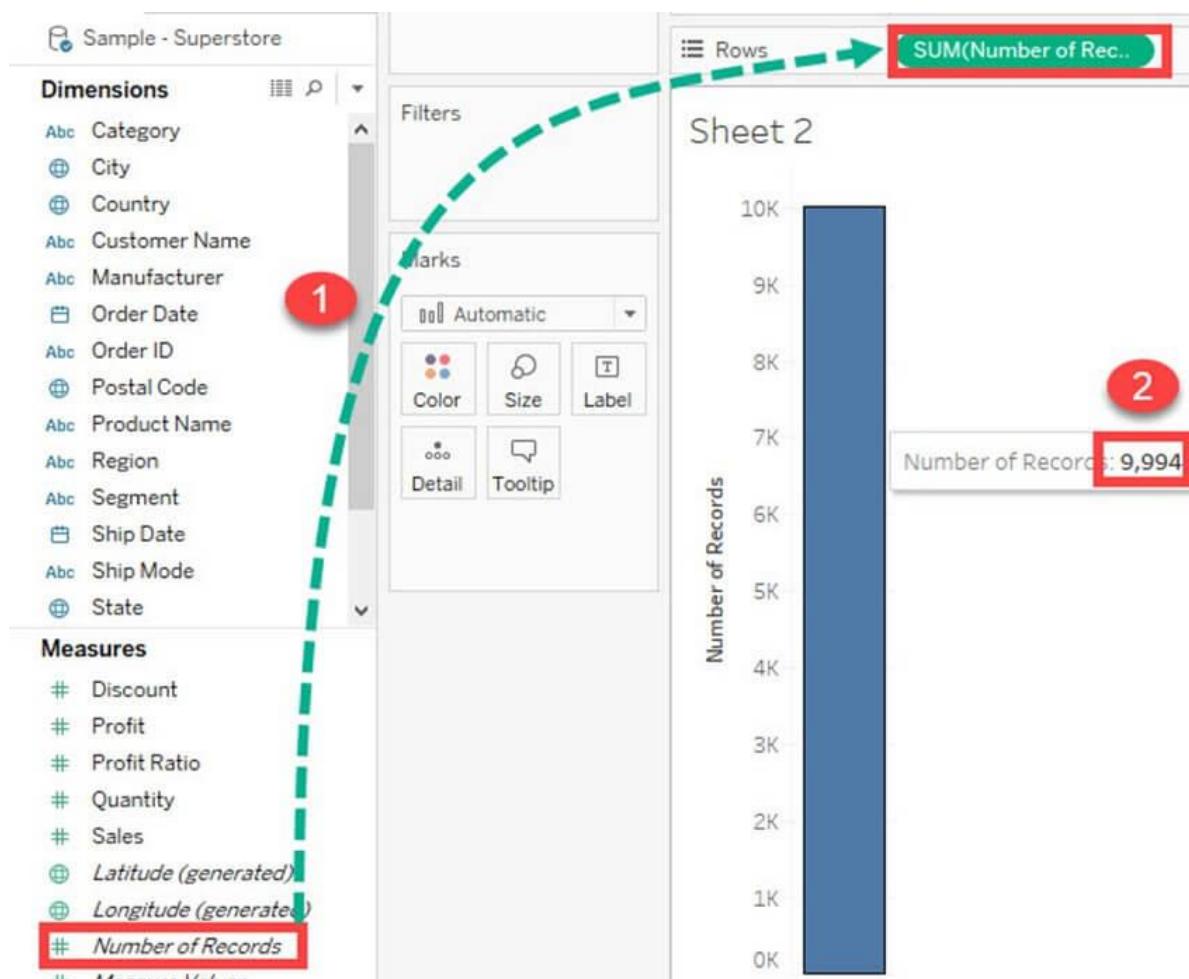


6. Drag *Measure Names* into “Color” option present in the marks card, it creates color of the visual based on the measure name. It also specifies different color to different measure names present in the visual. A line chart is generated for multiple measures over years.



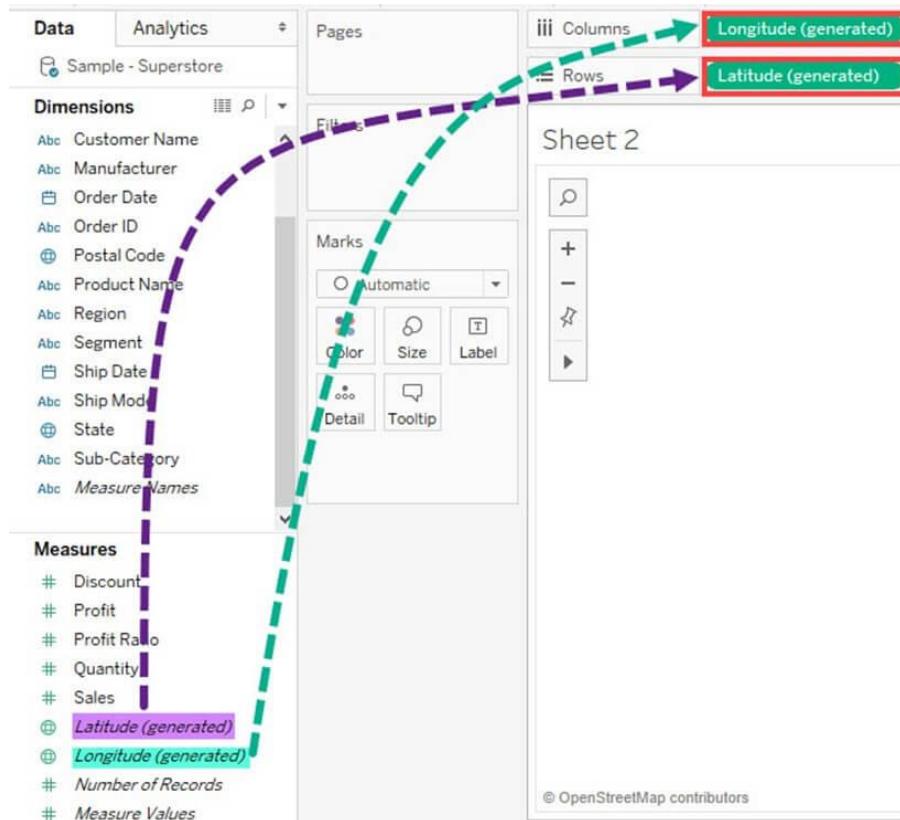
5.2 Number of Records

1. Select **Connect → Microsoft Excel**. Import Sample - Superstore.xls to Tableau and select “Orders” sheet.
2. Drag *Number of Records* present in measure pane into Rows. It creates a bar chart by default. Hover over the bar to see the number of records present in the data set.

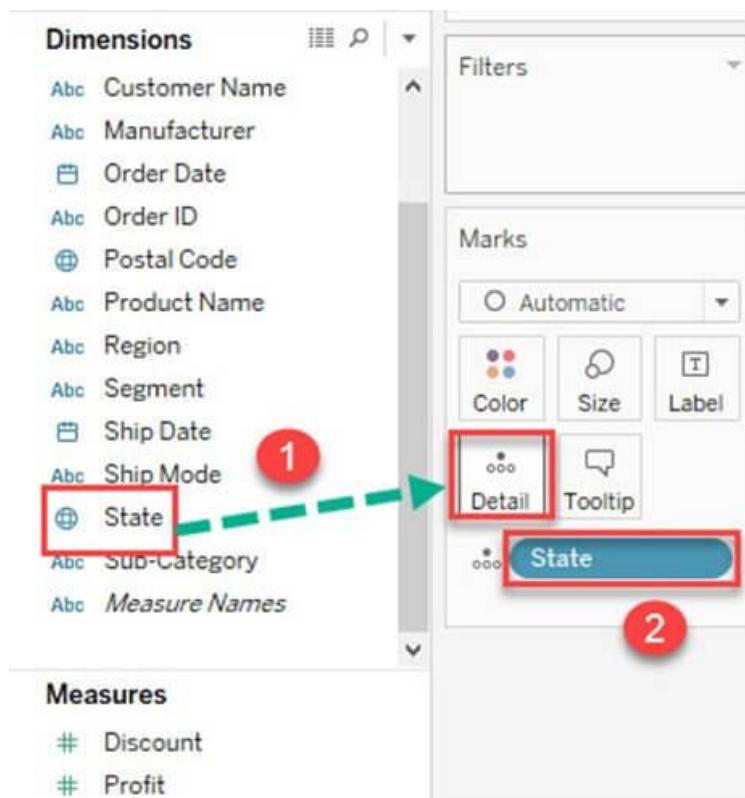


5.3 Longitude and Latitude:

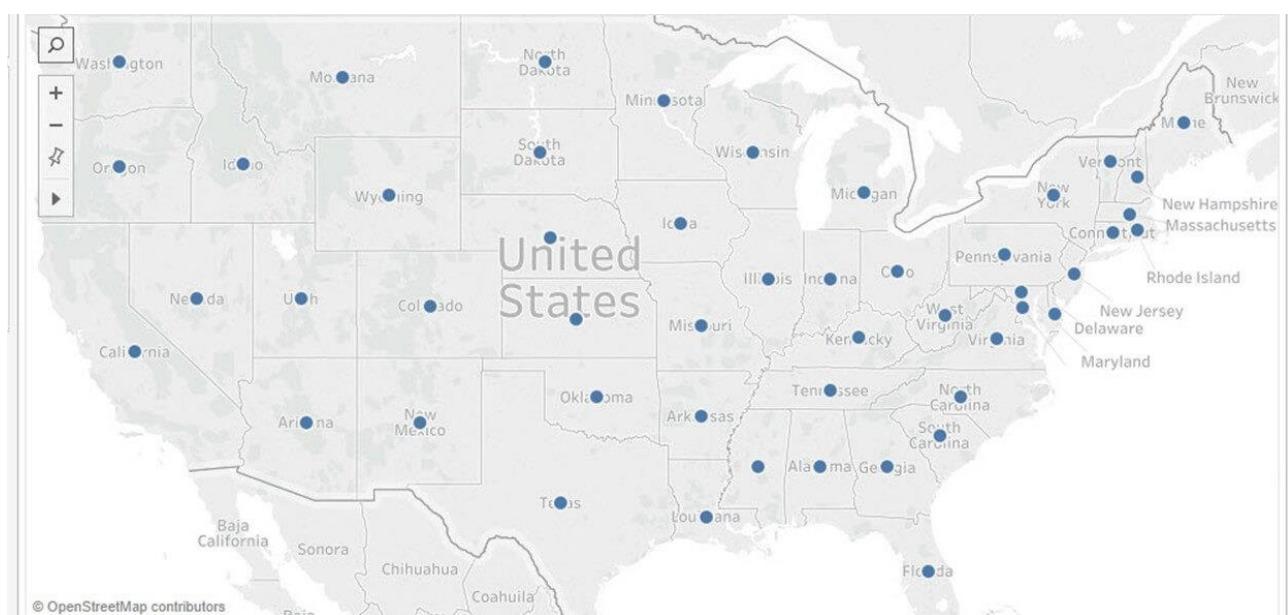
1. You can create geographical maps by select **Connect ➔ Microsoft Excel**. Import **Sample - Superstore.xls** and select “Orders” sheet.
2. Drag *Longitude (generated)* into columns and *Latitude (generated)* into Rows.



3. Drag *State* from Dimension list into 'Detail' present in Marks Card.



4. This creates a geo-mapping visual as shown below.



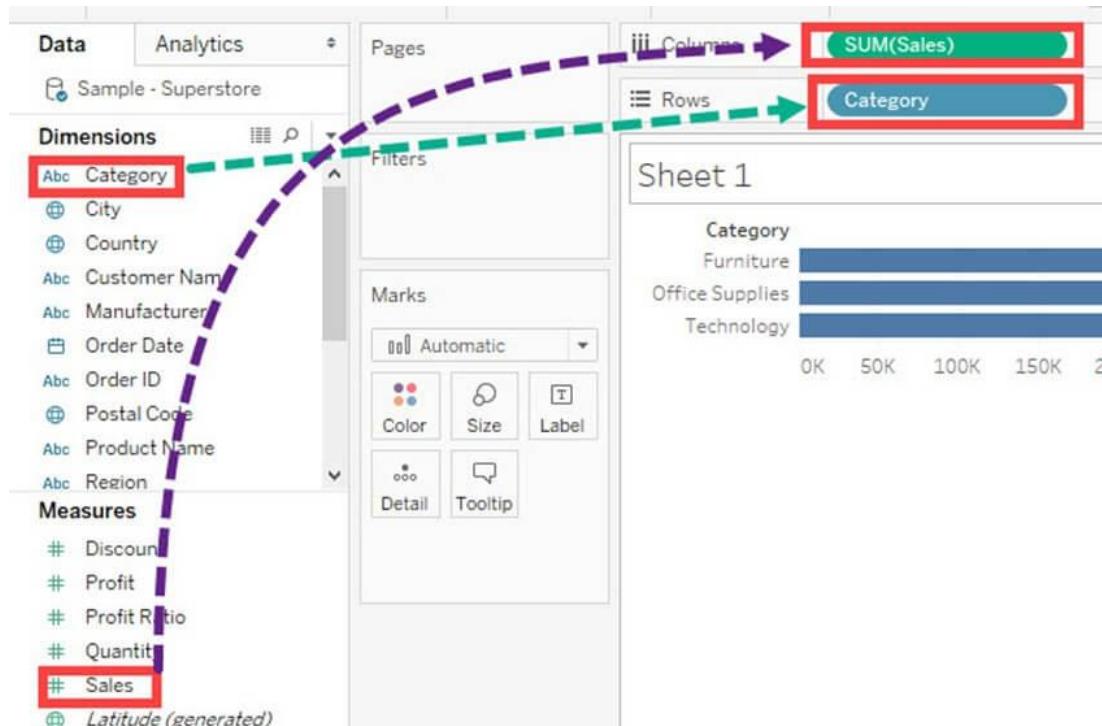
6. Sorting and Grouping

6.1 Sort Data

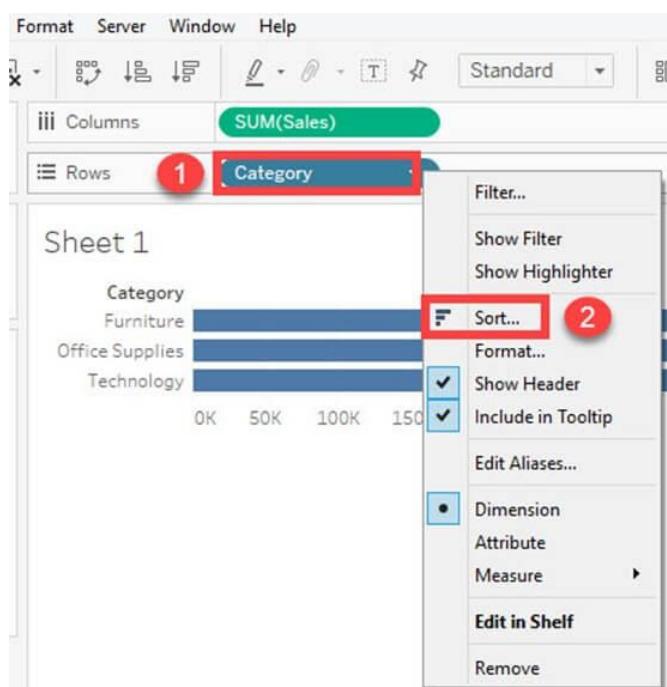
Data present in the visualization and worksheet can be sort based on the requirement. It can sort the data based on data source order, ascending, descending or depend on any measured value.

1. Select **Connect → Microsoft Excel**. Import **Sample - Superstore.xls** and select “Orders” sheet.

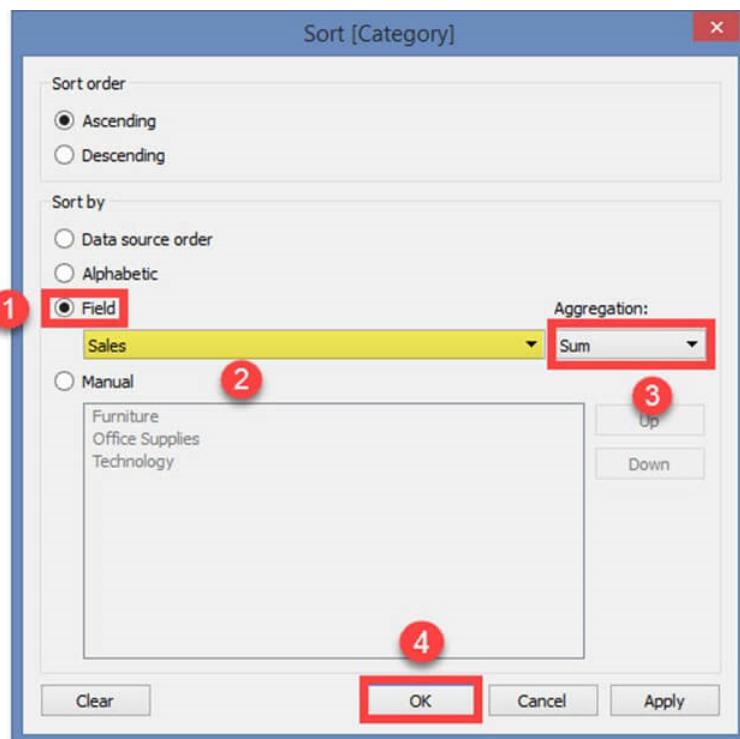
Go to a Worksheet and drag a *Category* to Column, and *Sales* to Rows.



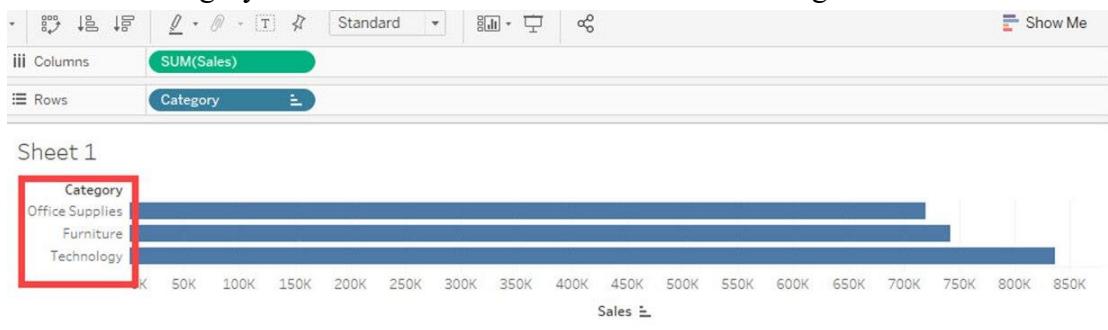
2. Right click on *Category* and select **Sort** option.



3. Click on 'Field' radio button. Select the field on which the category is to be filtered. Select the aggregation type, and click [OK] button.



4. It filters the category field based on the sum of sales in ascending order.

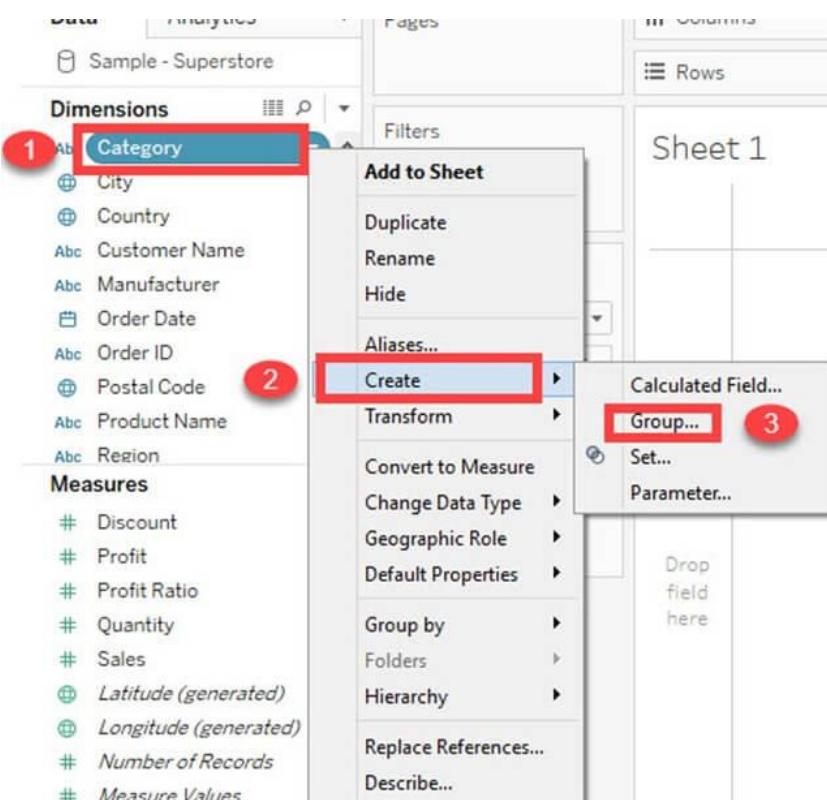


6.2 Build Groups

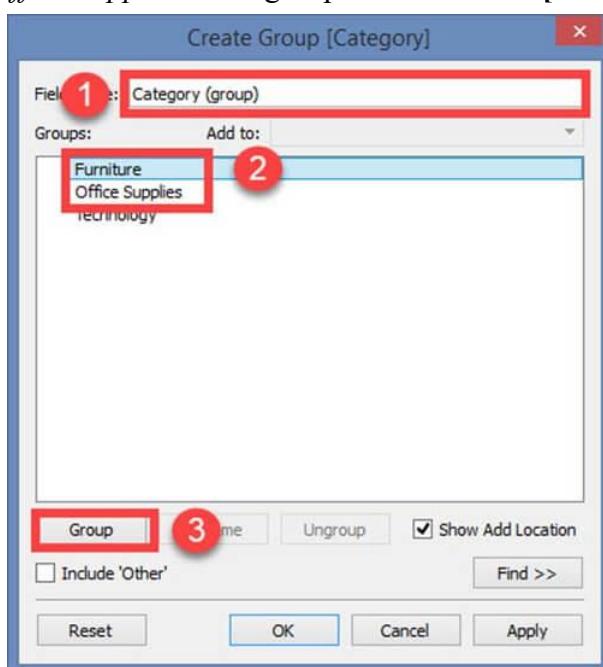
Group is used to combine members present in a field. For example, aggregated values of 'Furniture' and 'Office Supplies' can be obtained by using group. Once the group is built, aggregated value of 'Furniture' and 'Office Supplies' can be shown in the visuals.

1. Select **Connect → Microsoft Excel**. Import Sample - Superstore.xls and select “Orders” sheet.

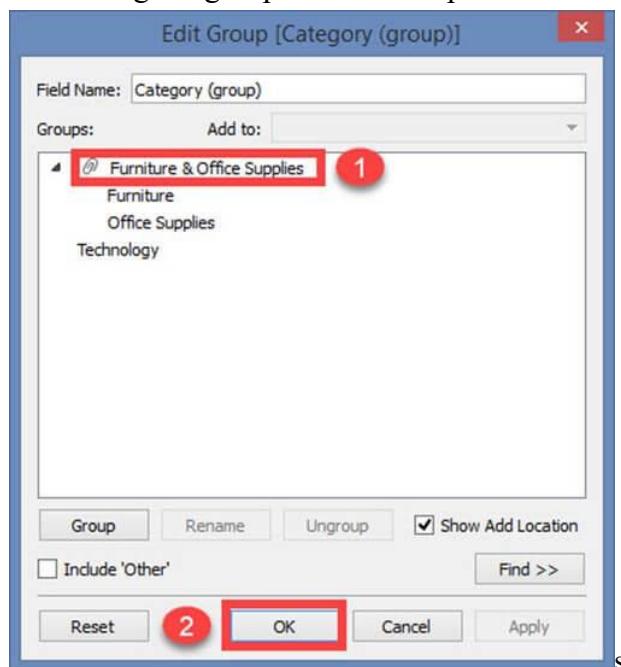
Right-click on the dimension *Category* and select **Create → Group**.



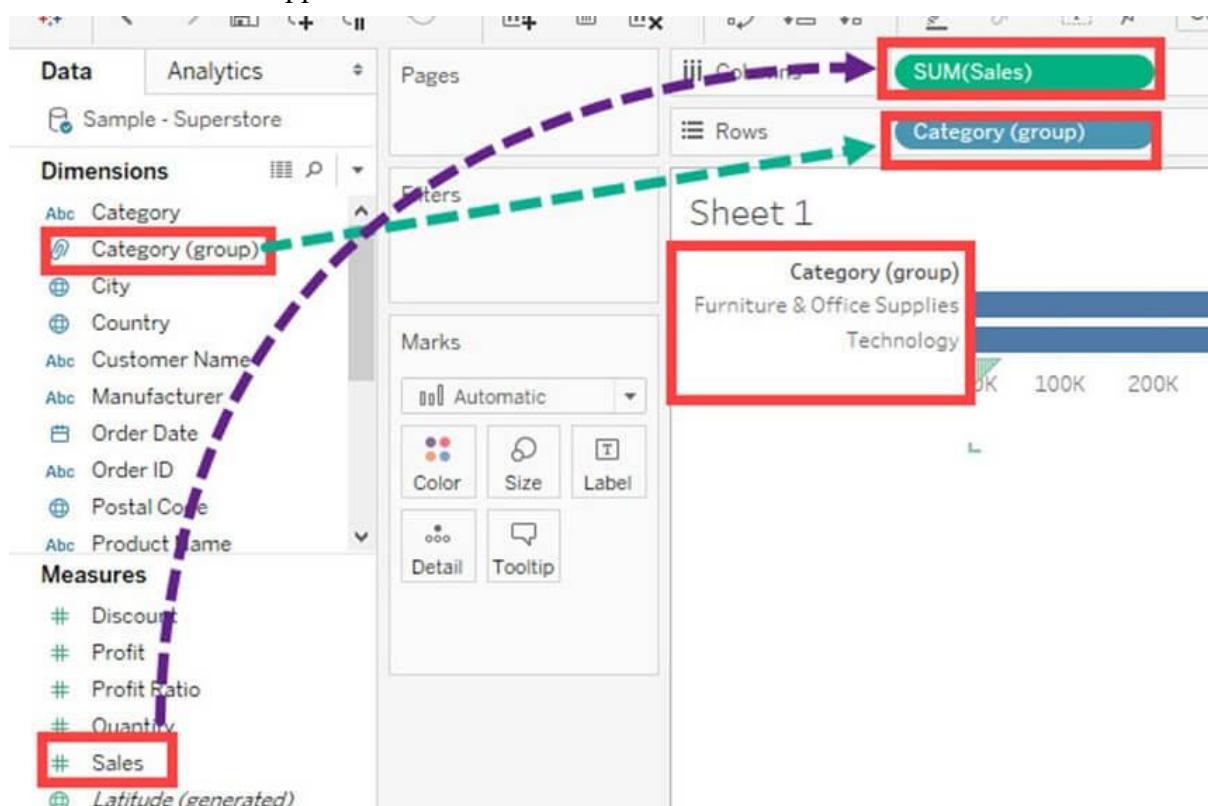
2. Type the name of the group (default as “Category (group)”). Select the members *Furniture* and *Office Supplies* to be grouped and click on [Group] button.



3. It creates a group of 'Furniture and Office supplies'. Click on [Ok] to create the group. It created a group in the name of Category (Group) and added in the dimension list. This can be used for visualizing the group of members present in a field.



4. Drag Sales to Column, and Category (Group) to Rows, the sum of sales is visualized for both furniture and office supplies.

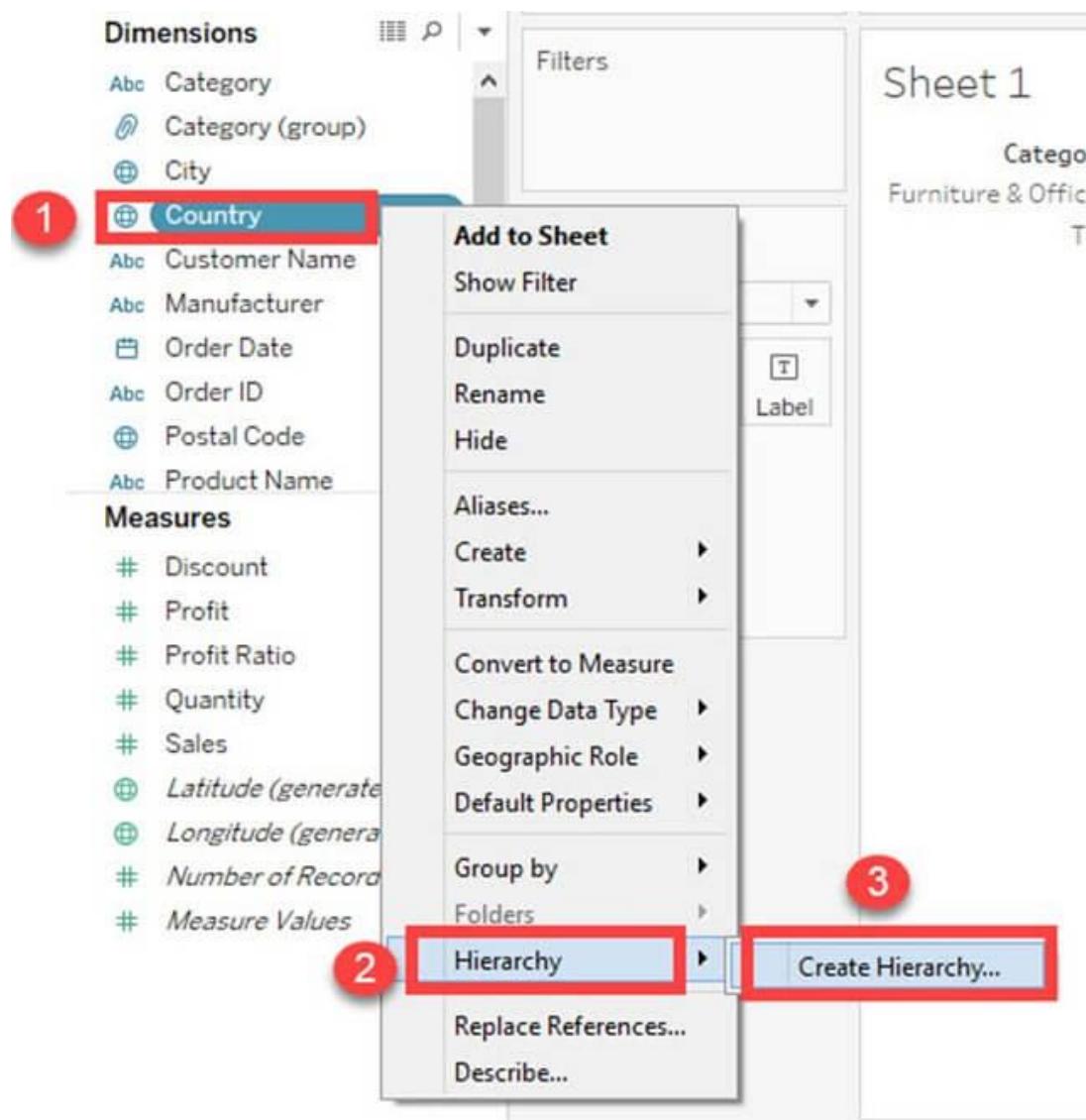


6.3 Build Hierarchy

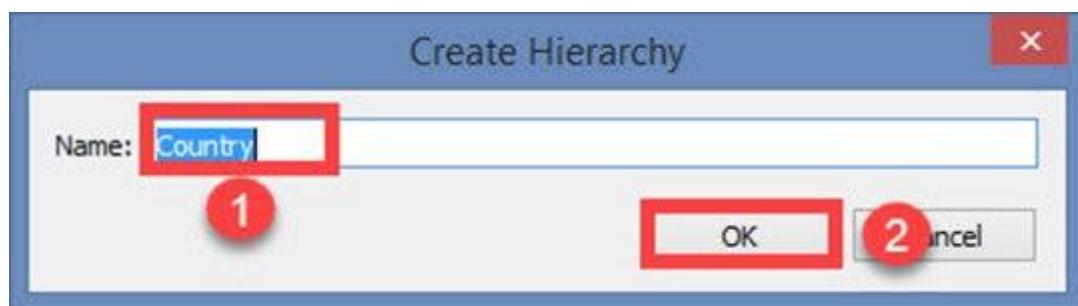
Hierarchies can be building in Tableau to visualize the data in granular level.

1. Select **Connect → Microsoft Excel**. Import Sample - Superstore.xls and select “Orders” sheet.

Right-click on the dimension *Category* and select **Hierarchy → Create Hierarchy**.



2. Enter a name (such as Country) for hierarchy, and click [OK].



3. It creates a Hierarchy as shown in the image.

Dimensions

- Abc Category
- Category (group)
 - City
 - Country
 - Country
 - Country
- Abc Customer Name
- Abc Manufacturer
- Order Date
- Abc Order ID
- Postal Code

Measures

- # Discount
- # Profit
- # Profit Ratio
- # Quantity
- # Sales
- # Latitude (generated)
- # Longitude (generated)
- # Number of Records
- # Measure Values

4. You can add another field to the box and create the hierarchy. In this example, the city is added into a country hierarchy.

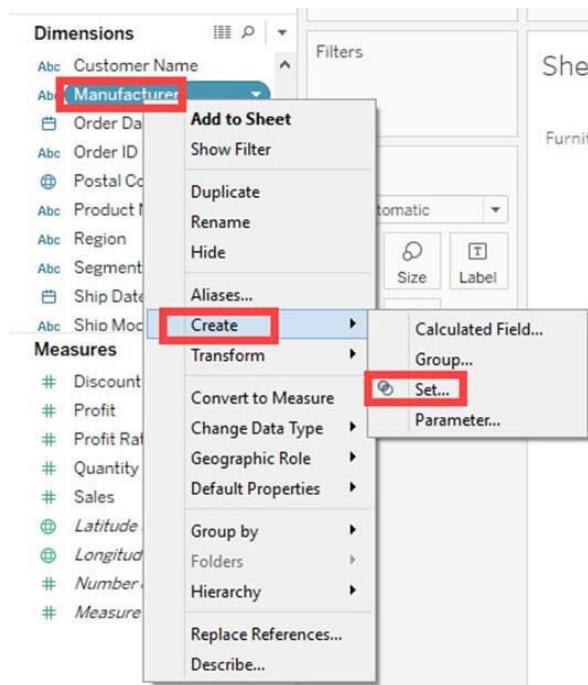
Dimensions

- Abc Category
- Category (group)
 - Country
 - Country
 - City
- Abc Customer Name
- Abc Manufacturer
- Order Date
- Abc Order ID
- Postal Code

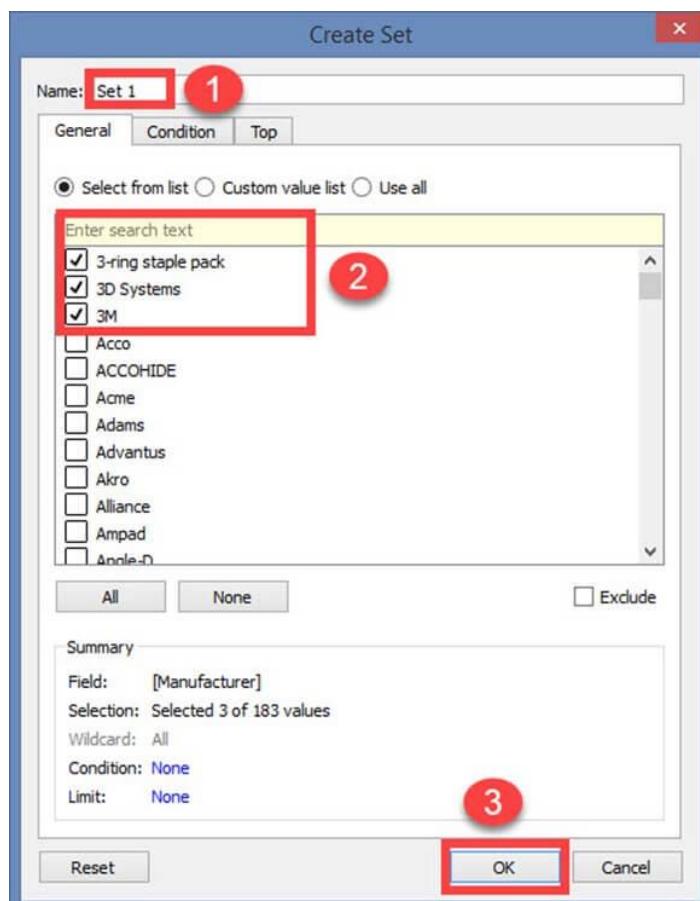
6.4 Build Sets

Sets create a set of members out of the field present in a data set. It acts as a separated field or dimension.

1. Right-click on the dimension *Manufacturer* and select **Create ➔ Set**.



2. Name the set to be created. Select the member needs to be added in the set. Click on [OK]. This creates a set of the given name.



7. Joining Data

7.1 Import First Sheet

4. Click on Excel and choose the **Sample-World-Bank-Indicators.xlsx** file. This excel file contains 4 worksheets including some World Bank indicators such as Countries, their GDP, their total traded values, etc. We are interesting on **Data by Country**.

The screenshot shows the Tableau interface with the following details:

- Top Bar:** Tableau - Book1 - Tableau license expires in 14 days, File, Data, Server, Window, Help.
- Connections:** Sample-World-Bank-Indicators (Microsoft Excel) is selected.
- Sheets:** Data by country, Data by world, Mapping data items, Regions and subregions, New Union.
- Current Worksheet:** Data by country (Sample-World-Bank-Indicators).
- Table View:** Shows data for Afghanistan from 2000 to 2008 across various indicators. The columns include Country Name, Date, Stock: Listed dom..., Stock: Market cap..., Stock: Traded. tot..., and Stock: Traded. t.
- Bottom Navigation:** Go to Worksheet, Data Source, Sheet1, and other icons.

5. Select “Sheet1” from lower left corner and rename it to “World Indicators”.

The screenshot shows the Tableau interface with the following details:

- Top Bar:** Tableau - Book1 - Tableau license expires in 14 days, File, Data, Worksheet, Dashboard, Story, Analysis, Map, Format, Server, Window, Help.
- Left Sidebar:** Data (Country Name, Date), Analytics (Measure Names), Dimensions (Business), Measures (Banks, Business, Finance).
- Middle Area:** Shows the 'Sheet1' tab, which is currently highlighted.
- Context Menu:** A context menu is open on the 'Sheet1' tab, with 'Rename' selected.
- Right Sidebar:** Show Me panel with various visualization options.

6. Drag *Country Name* from Dimension to Rows shelf, and then *Finance: GDP (current US\$)* from Measures to the table.

The screenshot shows a Tableau interface with a single column table titled "World Indicators". The "Rows" shelf contains the dimension "Country Name", which lists various countries with their corresponding GDP values. The "Measures" shelf contains the measure "SUM(Finance: GDP (current US\$))". The top navigation bar includes "File", "Data", "Worksheet", "Dashboard", "Story", "Analysis", "Map", "Format", "Server", "Window", and "Help". A "Show Me" panel on the right displays various chart and map options. The bottom status bar indicates "214 marks 214 rows by 1 column SUM(Finance: GDP (current US\$)): 505,758,041,519,526".

Country Name	Finance: GDP (current US\$)
Afghanistan	84,91,20,42,010
Albania	90,50,29,75,564
Algeria	11,46,45,72,76,510
American Samoa	
Andorra	20,41,54,24,304
Angola	4,35,84,19,41,787
Antigua and Barbuda	11,41,43,75,467
Argentina	25,98,16,51,32,541
Armenia	62,96,24,23,477
Aruba	5,66,87,15,240
Australia	76,99,12,78,44,655
Austria	33,14,16,69,04,779
Azerbaijan	2,46,49,95,84,215
Bahamas, The	
Bahrain	1,57,32,94,89,871
Bangladesh	7,10,02,35,43,526
Barbados	34,08,80,48,950
Belarus	3,58,35,70,31,479
Belgium	40,75,76,72,35,552
Belize	12,39,93,23,111
Benin	49,43,40,96,000
Bermuda	53,62,74,61,000
Bhutan	9,64,29,55,585
Bolivia	1,29,08,64,48,639

7. Insert a row by dragging *Stock: Traded, total value (% GDP)* from Measures to the table.

The screenshot shows a Tableau interface with a two-column table titled "World Indicators". The "Rows" shelf contains the dimension "Country Name". The "Columns" shelf contains the measure "Finance: GDP (current US\$)". The "Measures" shelf contains the measure "Stock: Traded, total value (% GDP)". The top navigation bar includes "File", "Data", "Worksheet", "Dashboard", "Story", "Analysis", "Map", "Format", "Server", "Window", and "Help". A "Show Me" panel on the right displays various chart and map options. The bottom status bar indicates "428 marks 214 rows by 2 columns SUM of Measure Values: 505,758,041,560,571".

Country Name	Finance: GDP (current US\$)	Stock: Traded, total value (% GDP)
Afghanistan	84,912,042,010	
Albania	90,502,975,564	
Algeria	1,146,457,276,510	
American Samoa		
Andorra	20,415,424,304	
Angola	435,841,941,787	
Antigua and Barbuda	11,414,375,467	
Argentina	2,598,165,132,541	34
Armenia	62,962,423,477	0
Aruba	5,668,715,240	
Australia	7,699,127,844,655	992
Austria	3,314,166,904,779	140
Azerbaijan	246,499,584,215	
Bahamas, The	81,571,721,000	
Bahrain	157,329,489,871	56
Bangladesh	710,023,543,526	62
Barbados	34,088,048,950	98
Belarus	358,357,031,479	
Belgium	4,075,767,235,552	306
Belize	12,399,323,111	
Benin	49,434,096,000	
Bermuda	53,627,461,000	27
Bhutan	9,642,955,585	
Bolivia	129,086,448,639	1

7.2 Adding Data from Different Sheet

1. Go to Data Source and add the sheet "Regions and subregions". Then select Left Join for select "Country Name" and "Country".

The screenshot shows the Tableau interface with the 'Data by country (Sample-World-Bank-Indicators)' sheet selected. A 'Join' dialog box is open, showing 'Left' selected for the 'Join' type. The 'Data Source' is 'Regions and subregions'. The 'Country Name' field is mapped to the 'Country' field. The main data view shows a list of countries with their respective regions and subregions.

Region	Subregion	Country
Asia		Afghanistan

2. Let's move to work sheet and you will see there is another sub-category in dimensions which is from another sheet.

The screenshot shows the Tableau interface with the 'World Indicators' worksheet selected. The 'Dimensions' shelf includes 'Data by country' and 'Regions and subregions' from the 'Data by country' sheet, with 'Region' selected. The 'Measures' shelf includes various indicators like Population and Stock. The data view shows a list of countries with their corresponding indicator values.

Country Name	Finance: GDP (current US\$)	Stock: Traded, total value (% GDP)
Afghanistan	84,912,042,010	
Albania	90,502,975,564	
Algeria	1,146,457,276,510	
American Samoa		
Andorra	20,415,424,304	
Angola	435,841,941,787	
Antigua and Barbuda	11,414,375,467	
Argentina	2,598,165,132,541	34
Armenia	62,962,423,477	0
Aruba	5,668,715,240	
Australia	7,699,127,844,655	992
Austria	3,314,166,904,779	140
Azerbaijan	246,499,584,215	
Bahamas, The	81,571,721,000	
Bahrain	157,329,489,971	56
Bangladesh	710,023,543,526	62
Barbados	34,068,048,950	98
Belarus	358,357,031,479	
Belgium	4,075,767,235,552	306
Belize	12,399,323,111	
Benin	49,434,096,000	
Bermuda	53,627,461,000	27
Bhutan	9,642,955,585	
Bolivia	129,086,448,639	1

3. Import “Region” and “Subregion” from that “Regions and subregions” sheet.

The screenshot shows the Tableau Data Source interface for the "World Indicators" data source. The interface includes a navigation bar with File, Data, Worksheet, Dashboard, Story, Analysis, Map, Format, Server, Window, and Help options. Below the navigation bar is a toolbar with various icons for data manipulation. The left side features a sidebar with sections for Dimensions (Data by country, Regions and subregions) and Measures (Population, R&D, Stock metrics). The main area displays a table titled "World Indicators" with the following columns:

Country Name	Region	Subregion	Finance: GDP (current US\$)	Stock: Traded, total value (% GDP)
Afghanistan	Asia	Null	84,912,042,010	
Albania	Europe	Independent	90,502,975,564	
Algeria	Africa	Northern Africa	1,146,457,276,510	
American Samoa	Oceania	Null	20,415,424,304	
Andorra	Europe	Independent	435,841,941,787	
Angola	Africa	Middle Africa	11,414,375,467	
Antigua and Barbuda	The Americas	Caribbean	2,598,165,132,541	
Argentina	The Americas	South America	34	62,962,423,477
Armenia	Asia	Null	0	5,668,715,240
Aruba	The Americas	Caribbean	7,699,127,844,655	992
Australia	Oceania	Null	3,314,166,904,779	140
Austria	Europe	European Union	246,499,584,215	
Azerbaijan	Asia	Null	81,571,721,000	
Bahamas, The	The Americas	Caribbean	157,329,489,871	56
Bahrain	Middle East	Null	710,023,543,526	62
Bangladesh	Asia	Null	34,088,048,950	98
Barbados	The Americas	Caribbean	358,357,031,479	
Belarus	Europe	Independent	4,075,767,235,552	306
Belgium	Europe	European Union	12,399,323,111	
Belize	The Americas	Central America	49,434,096,000	
Benin	Africa	Western Africa	53,627,461,000	27
Bermuda	The Americas	North America	9,642,955,585	
Bhutan	Asia	Null	129,086,448,639	1
Bolivia	The Americas	South America		

At the bottom of the interface, there are buttons for Data Source, World Indicators, and a summary of 428 marks, 214 rows by 2 columns, and a sum of Measure Values: 505,758,041,560,571.

8. Get Start with Calculations

8.1 Connect to Data

- Click on Excel and choose the **Sample - Superstore.xls** file, and then select the “Orders” sheet.

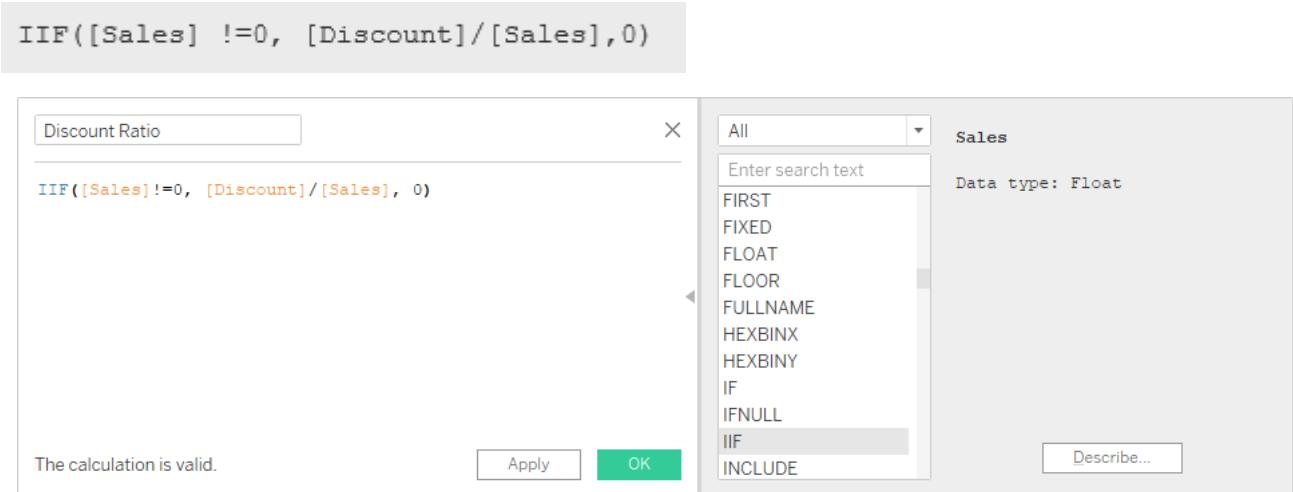
The screenshot shows the Tableau Public interface with the 'Orders' sheet selected. The data is presented in a tabular format with 1,000 rows. The columns represent various dimensions and measures from the Superstore dataset. The interface includes a sidebar for connections, a top menu bar, and various analytical tools like filters and marks.

8.2 Create a Calculated Field

- Select **Analysis → Create Calculated Field...**

The screenshot shows the Tableau Public interface with the 'Analysis' menu open, specifically highlighting the 'Create Calculated Field...' option under the 'Marks' section. The workspace is ready for creating a new calculated field, and the 'Show Me' panel on the right provides access to various visualization types.

2. When the Calculation Editor open, input the name “**Discount Ratio**” for the calculated field. Then enter the formula to checks if sales is not equal to zero. If true, it returns the discount ratio (Discount/Sales); if false, it returns zero. Click [OK] when finish.



3. The new calculated field is added to Measures in the Data pane because it returns a number. An equal sign (=) appears next to the data type icon. All calculated fields have equal signs (=) next to them in the Data pane.

The screenshot shows the Tableau Data pane. Under the `Measures` section, the `Discount Ratio` field is listed and highlighted with a green border. Other measures shown include `Sales`, `Profit`, and `Quantity`. The Data pane also displays dimensions like `Category`, `City`, and `Country`.

8.3 Use a Calculated Field in the View

- From Dimensions, drag *Region* to the Columns shelf. Then drag *Category* and *Sub-Category* from Dimension to the Rows shelf.

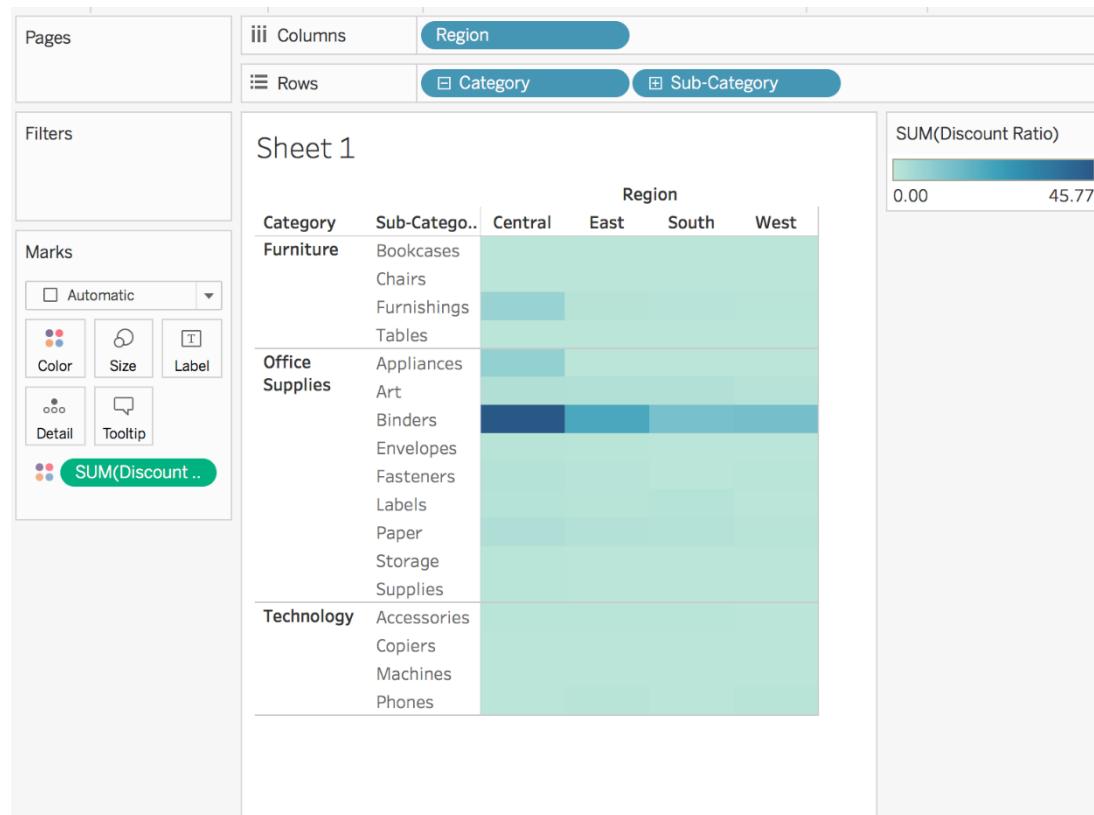
The screenshot shows the Tableau interface with the following setup:

- Columns:** Region (highlighted in blue)
- Rows:** Category, Sub-Catego.. (highlighted in blue)
- Sheet 1 Data:**

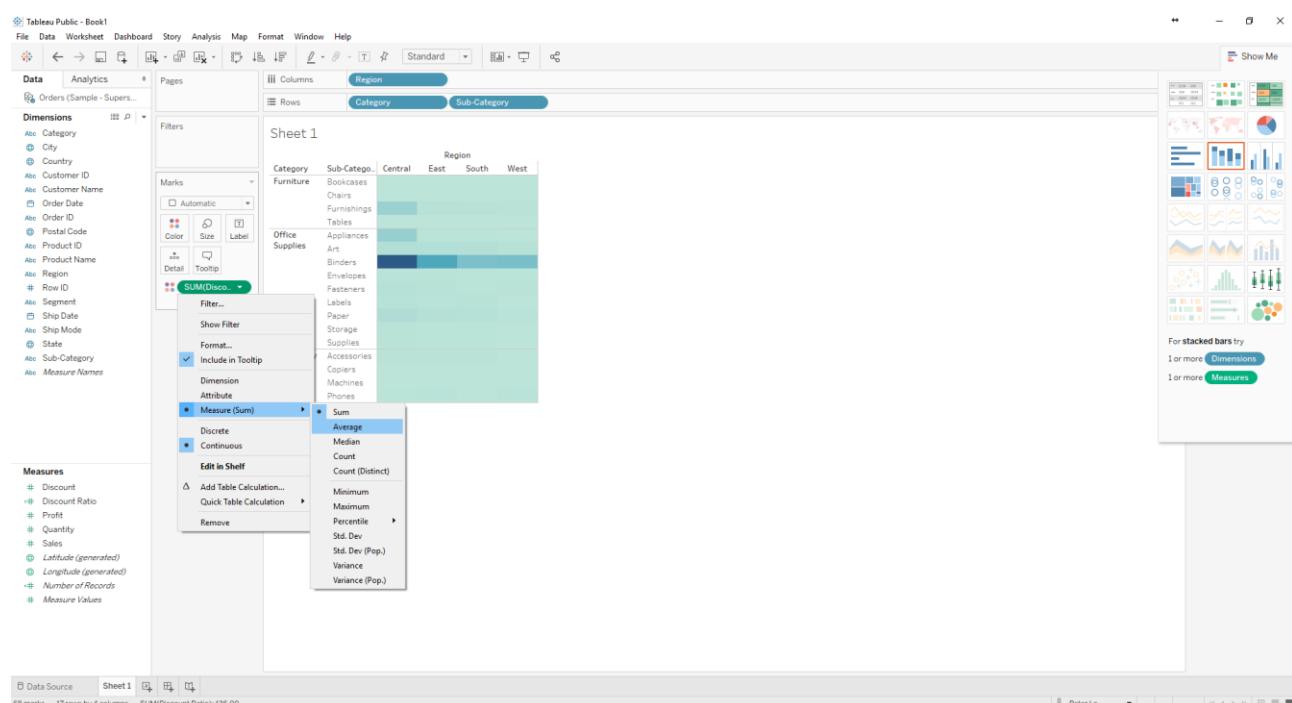
		Region			
Category	Sub-Catego..	Central	East	South	West
Furniture	Bookcases	Abc	Abc	Abc	Abc
	Chairs	Abc	Abc	Abc	Abc
	Furnishings	Abc	Abc	Abc	Abc
	Tables	Abc	Abc	Abc	Abc
Office Supplies	Appliances	Abc	Abc	Abc	Abc
	Art	Abc	Abc	Abc	Abc
	Binders	Abc	Abc	Abc	Abc
	Envelopes	Abc	Abc	Abc	Abc
	Fasteners	Abc	Abc	Abc	Abc
	Labels	Abc	Abc	Abc	Abc
	Paper	Abc	Abc	Abc	Abc
	Storage	Abc	Abc	Abc	Abc
	Supplies	Abc	Abc	Abc	Abc
Technology	Accessories	Abc	Abc	Abc	Abc

8.4 Add the Calculated Field to the View

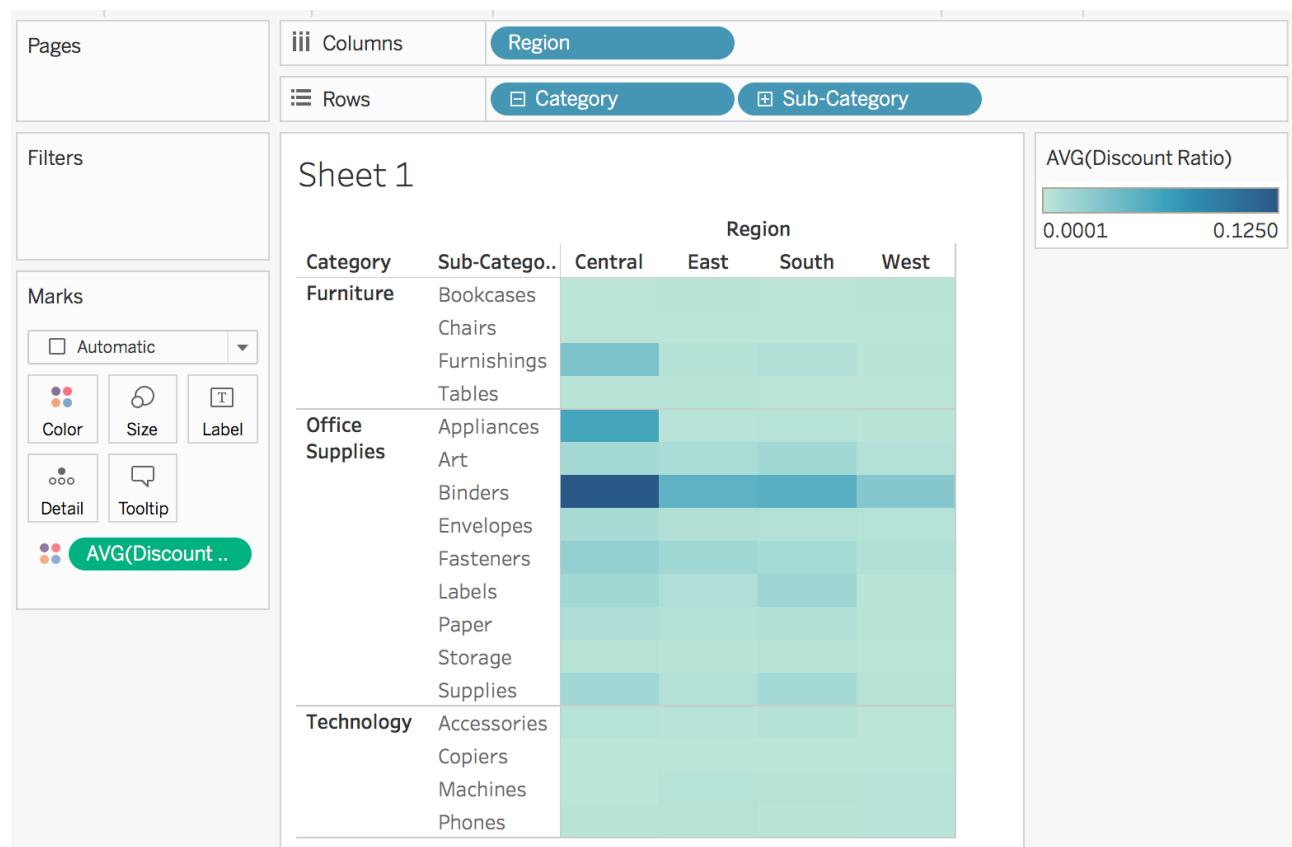
- From Measures, drag *Discount Ratio* to Color on the Marks card. The view updates to highlight table. You can see that Binders are heavily discounted in the Central region. Notice that Discount Ratio is automatically aggregated as a sum.



2. On the Rows shelf, right-click *SUM(Discount Ratio)* and select **Measure (Sum) ➔ Average**.



3. The view updates with the average of discount ratio shown.



8.5 Edit a Calculated Field

- If at any time you need to change a calculation, you can edit the calculated field and it will update across your entire workbook. To edit a calculated field, in the Data pane, right-click the calculated field and select **Edit**.

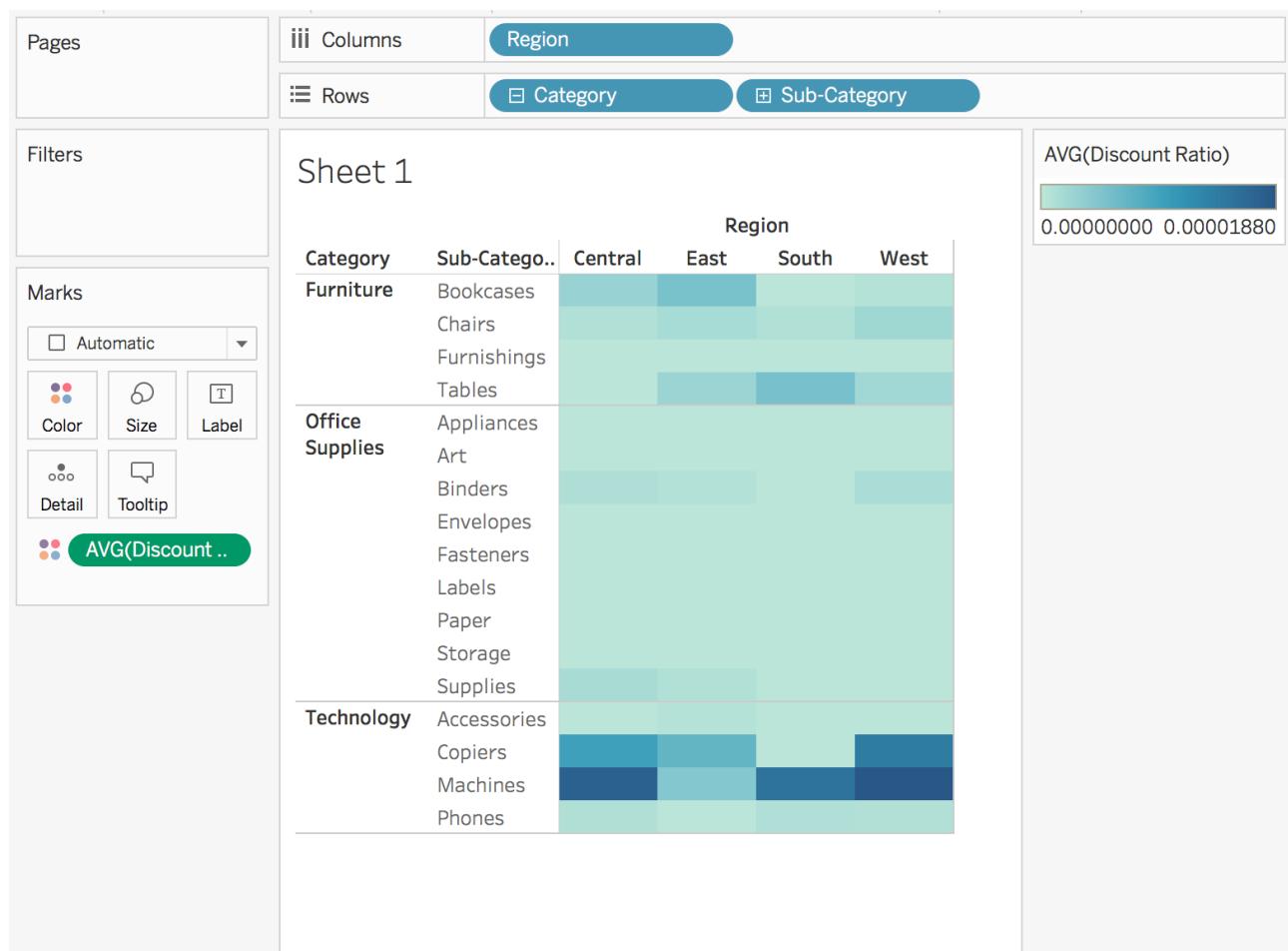
The screenshot shows the Tableau Public interface. In the Data pane on the left, under Measures, the 'Discount Ratio' field is selected and highlighted in green. A context menu is open over this field, with the 'Edit...' option highlighted in blue. The main workspace displays a treemap visualization with categories like Furniture, Office Supplies, and Technology, further subdivided by sub-categories like Chairs, Tables, Binders, etc., across three regions: Central, East, and West.

- In the Calculation Editor that opens, you can do the edit the name of the calculated field, and update the formula. For example, the formula is changed to return a discount ratio for orders over 2000 USD in sales:

```
IIF([Sales] > 2000, [Discount]/[Sales],0)
```

The screenshot shows the Tableau Calculation Editor. The formula bar contains the expression `IIF([Sales]>2000, [Discount]/[Sales],0)`. Below the formula, a message says "The calculation is valid." There are "Dependency" and "Apply" buttons, and an "OK" button. To the right, a tooltip for the `ABS` function is displayed, showing its description: "Returns the absolute value of the given number.", its parameters, and an example: `Example: ABS(-7) = 7`.

3. Once you click [OK] button, the view updates to reflect the changes automatically. You do not need to re-add the updated calculated field to the view.



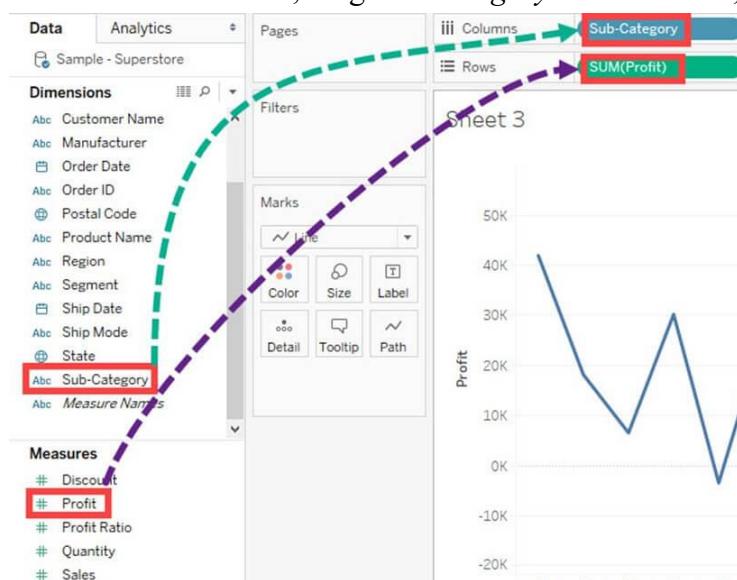
9. Advanced Interactive Visual

9.1 Pareto Chart

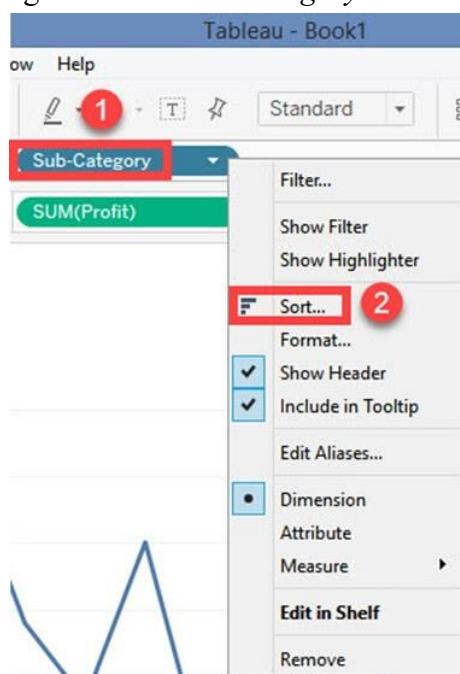
A Pareto chart consists of both bar and line graph. The same measure values are manipulated differently. The purpose of using Pareto Chart in Tableau is to identify the contribution of members present in a field. For example, Profit contributed by different subcategory of products in a retail store can be analyzed using Pareto Chart. It can show the top members and their contribution.

1. Select **Connect → Microsoft Excel**. Import Sample - Superstore.xls and select “Orders” sheet.

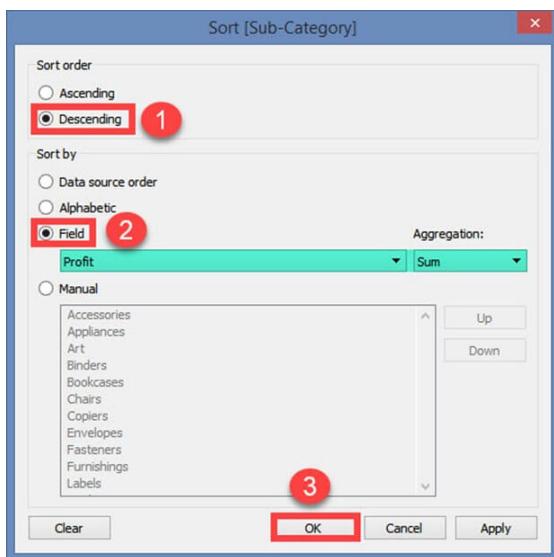
Go to a new Worksheet, drag *Sub-Category* into Columns, and drag *Profit* into Rows.



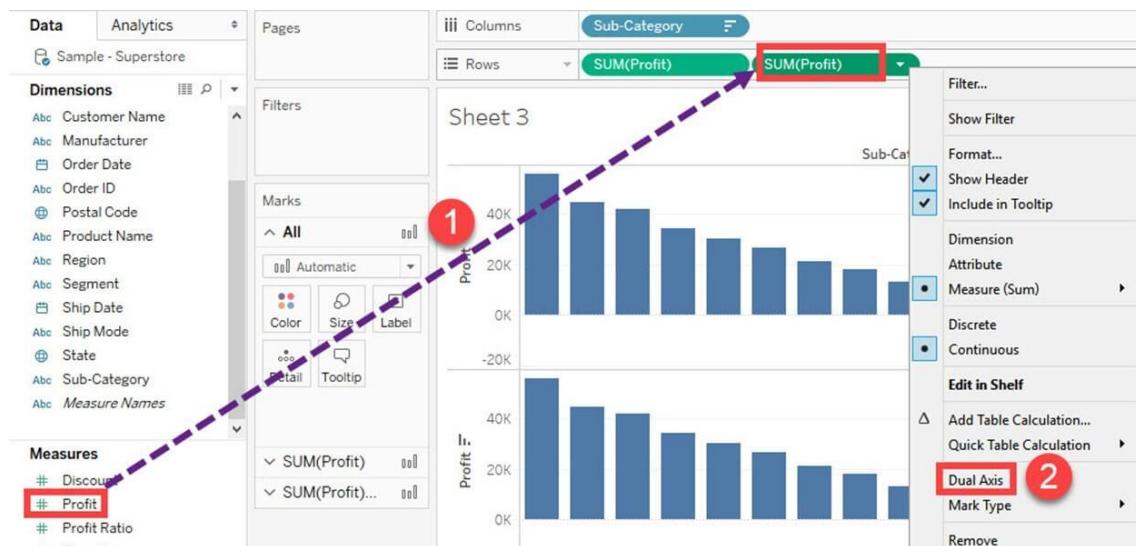
2. Right click on *Sub-Category* and select “Sort” option from the list.



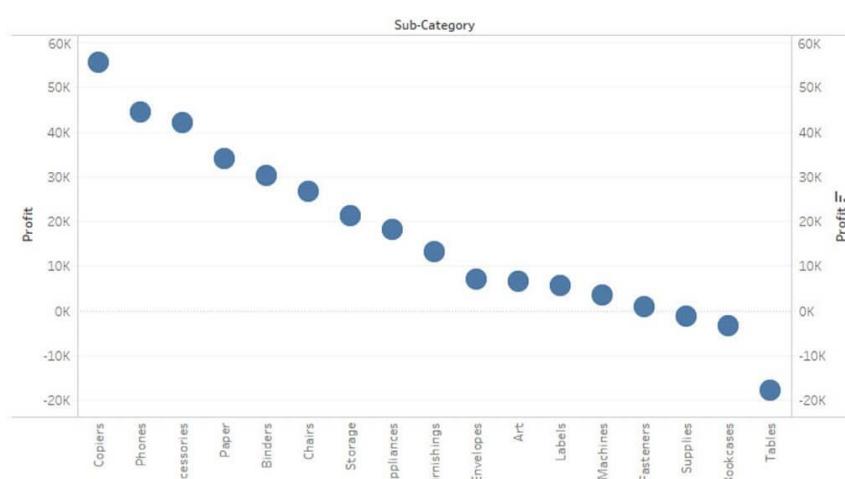
3. Select “Descending” in “Sort order”, and select “Field” in “Sort by” section. Select the field as *Profit* and choose “Sum” as aggregation. Finally, click [OK] button.



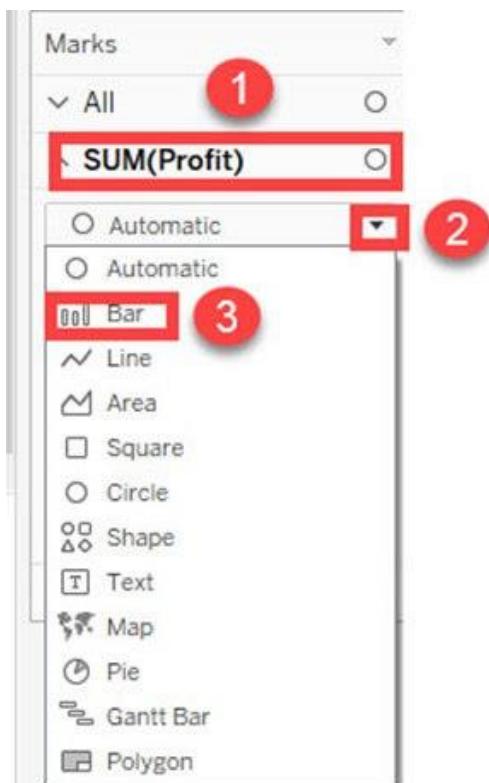
4. Drag *Profit* again into Rows. Right-click on the newly added *Profit* and Select “Dual axis” option.



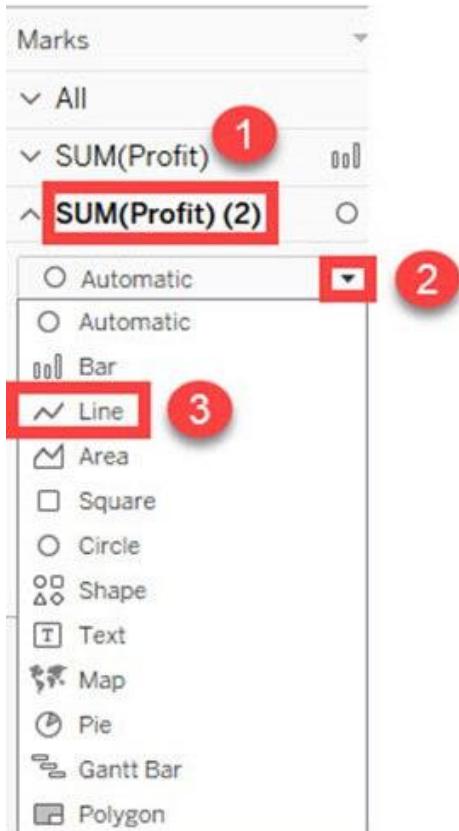
5. It merges the x-axis of both measures and converts the visualization as given below.



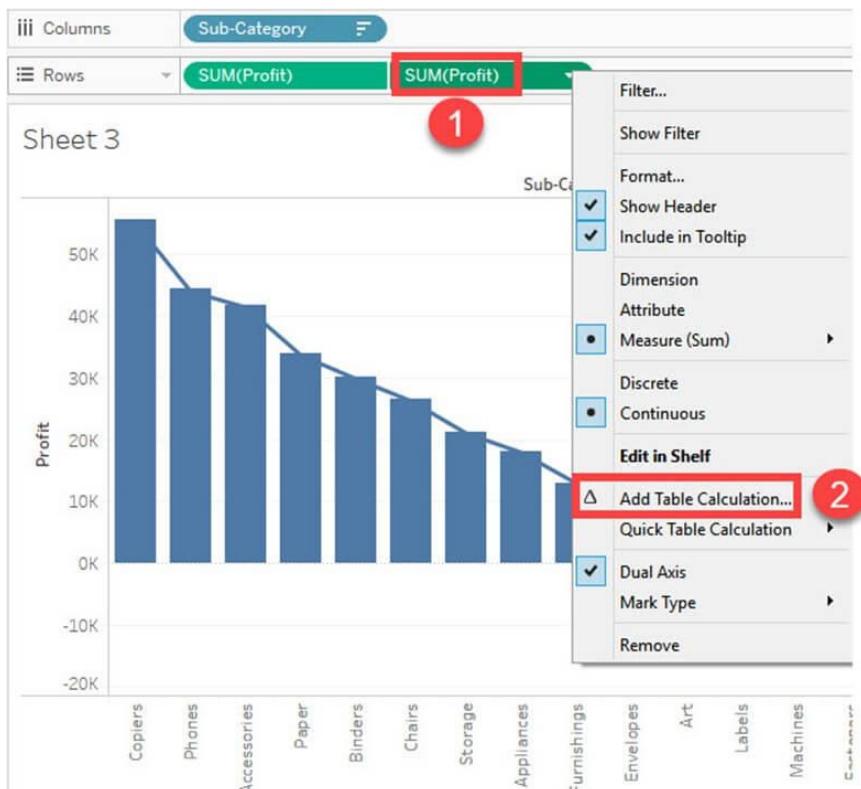
6. Select **SUM(Profit)** for the marks card list. Click on the drop-down button as shown in the image. Select “**Bar**” as chart type.



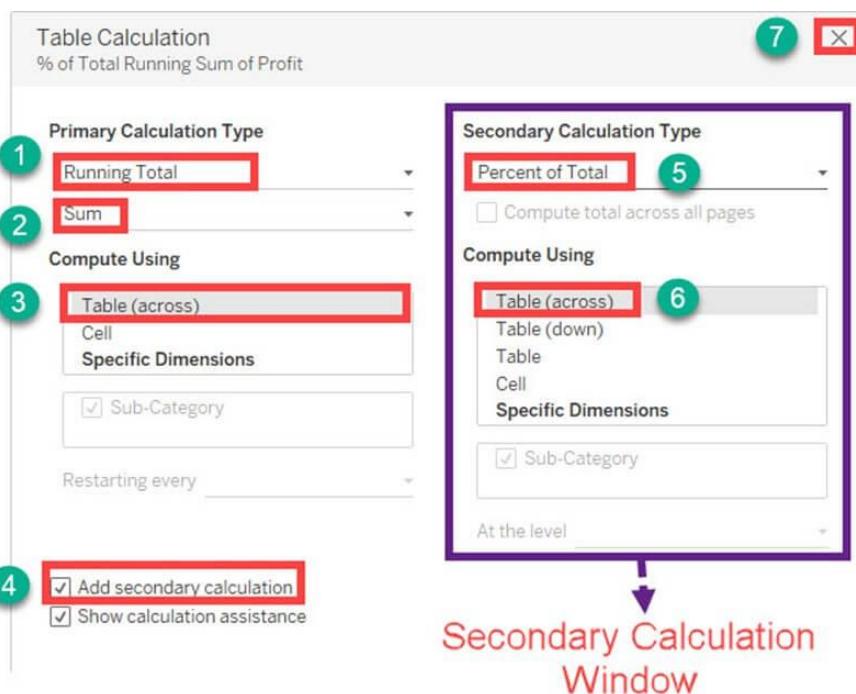
7. Select **SUM(Profit)(2)** from the marks card list. Select the drop-down button as given in the image. Click on *Line* from the list.



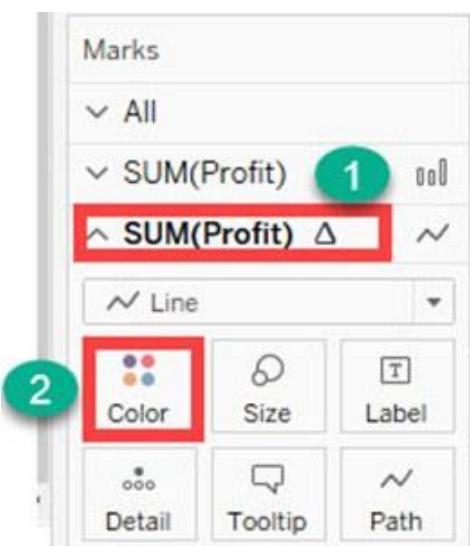
8. Select *SUM(Profit)* on the right side of rows as shown in the image. Right click on it and select “Add Table Calculation” from the list.



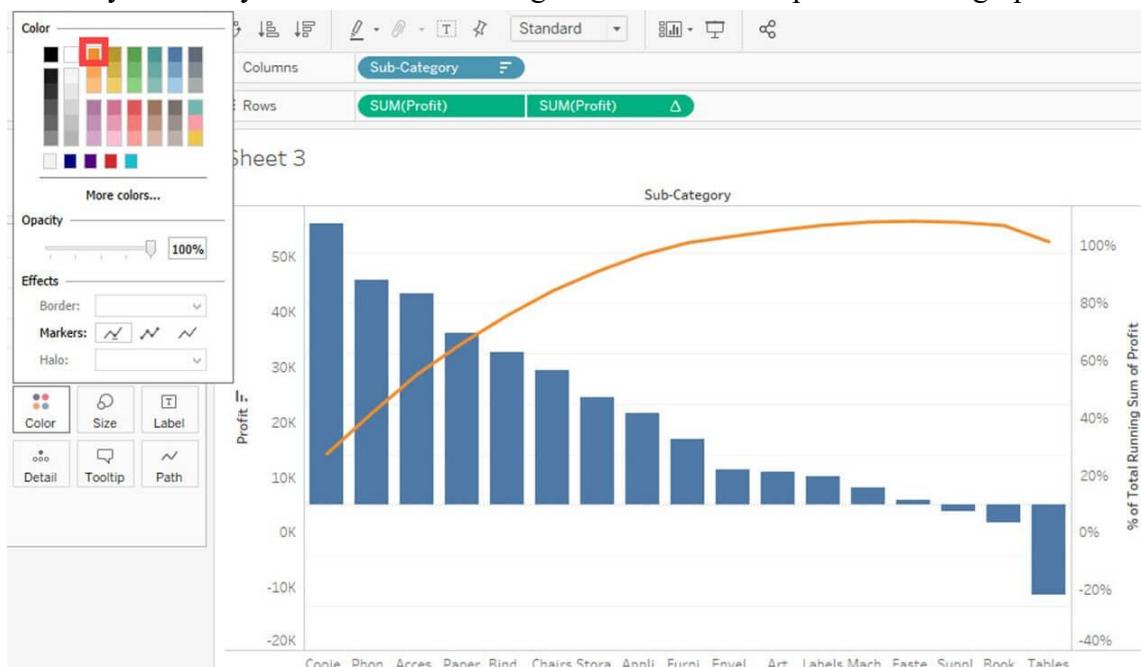
9. Select “Running Total” from the drop-down. Select 'Sum' as aggregation from the drop-down. Click on Compute Using 'Table (across)'. Check in the 'Add Secondary Calculation' box. It expands the window for 'Secondary Calculation Type'. Select 'Percent of Total' from the dropdown list. Select on Compute Using 'Table (across)'. Now close the Window by clicking on close icon as shown in the image.



10. Go to the last marks card namely 'SUM (Profit)'. Click on color icon present in the marks card.



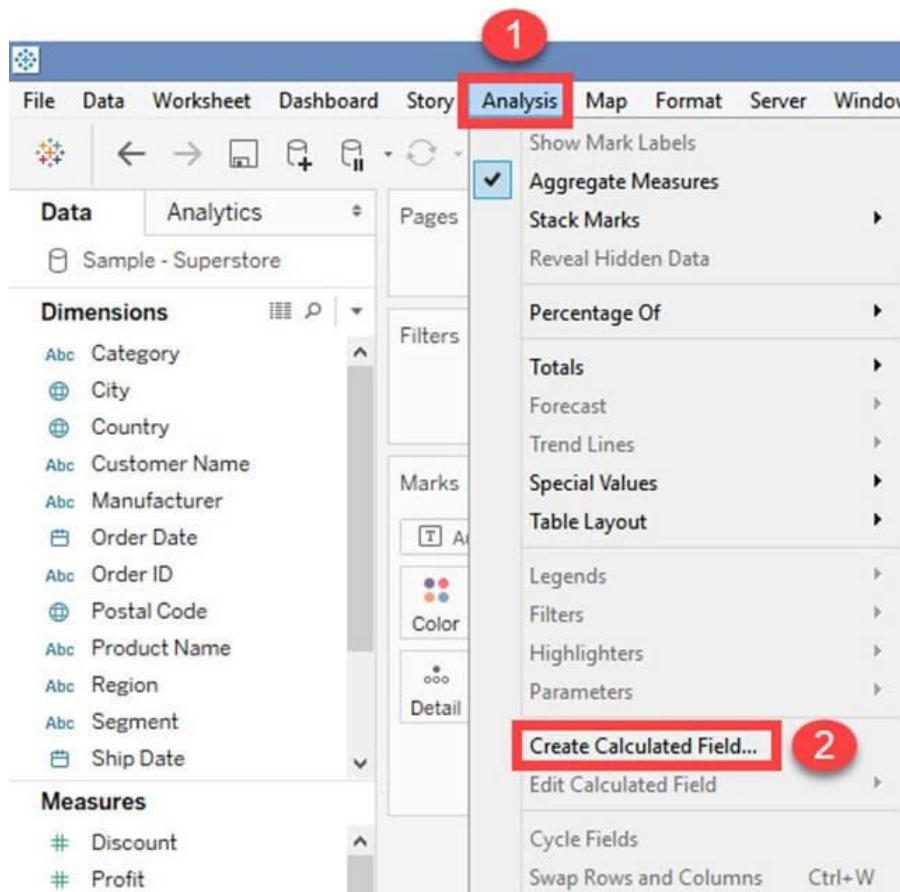
11. Select any color of your choice. This changes the color of line present in the graph.



9.2 Bullet Chart

A bullet chart can be used as a gauge or indicator to show the performance of measures. Two measures can be compared to each other using the bullet graph. For example, if we are having estimated profit and actual profit we can compare both of them using bullet chart.

1. Select **Connect → Microsoft Excel** and import **Sample - Superstore.xls** file to Tableau and select “Orders” sheet. Then select **Analysis → Create Calculated Field** from the list.



2. Enter the name “Estimated Profit” for the calculated field. Then type the estimated value of the measure. Profit is taken as the measure. So the calculated field is created for estimated profit. Click on [OK].



3. Hold the [Ctrl] key in keyboard and select *Estimated Profit* and *Profit* in Data pane.

Measures

- # Discount
- # **Estimated Profit**
- # **Profit**
- # Profit Ratio
- # Quantity
- # Sales
- (@) Latitude (generated)
- (@) Longitude (generated)
- (+) Number of Products

Sets

- User Filter 1

4. Click on 'Show me' button present in the top right corner of the worksheet. Select bullet graph icon as shown in the image.



5. It creates a bullet graph as shown below.

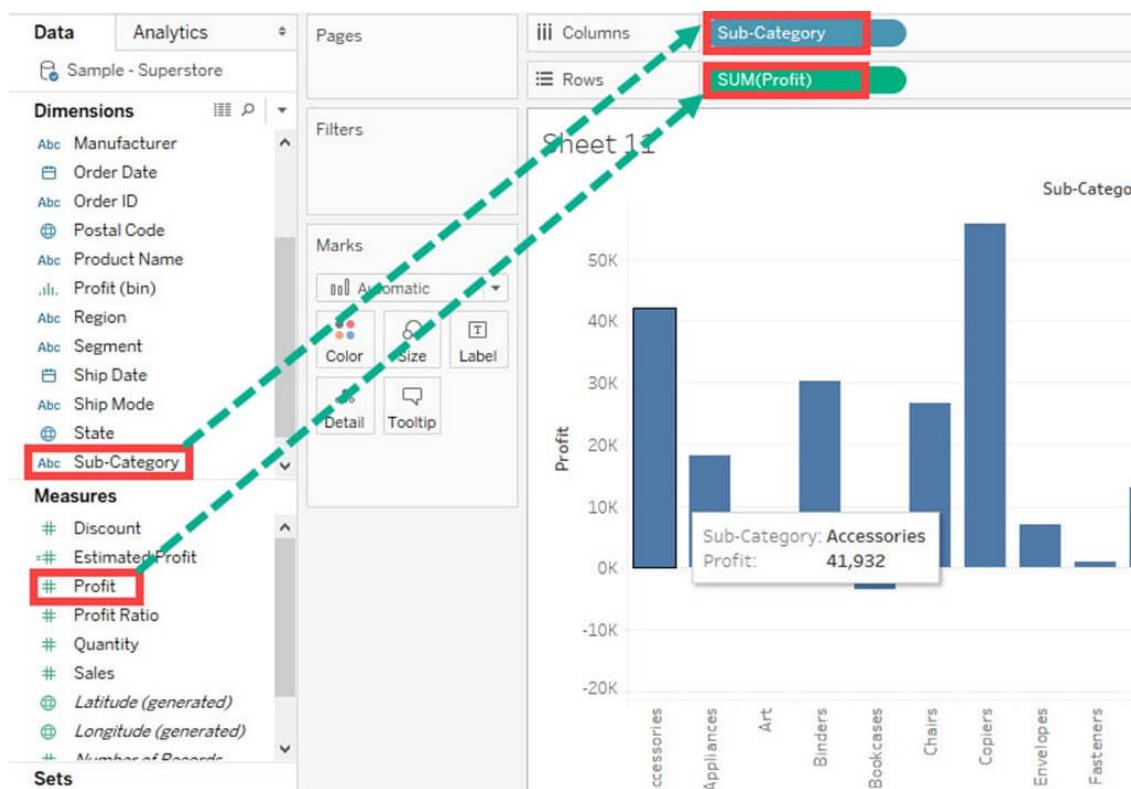


9.3 Waterfall Chart

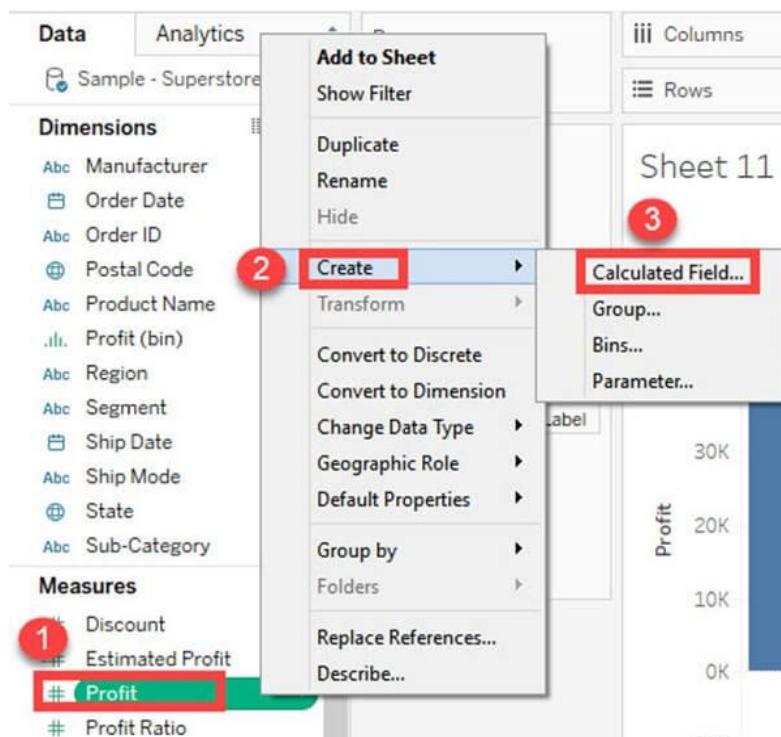
Waterfall Chart can visualize the cumulative effect of a measure over dimension. It can show the contribution of growth or decline by each member in a dimension. For example, you can see the contribution of profit by each sub-category using a waterfall chart.

1. Select **Connect → Microsoft Excel**. Import Sample - Superstore.xls and select “Orders” sheet.

Go to a new Worksheet, drag *Sub-Category* into Columns and drag *Profit* into Rows.



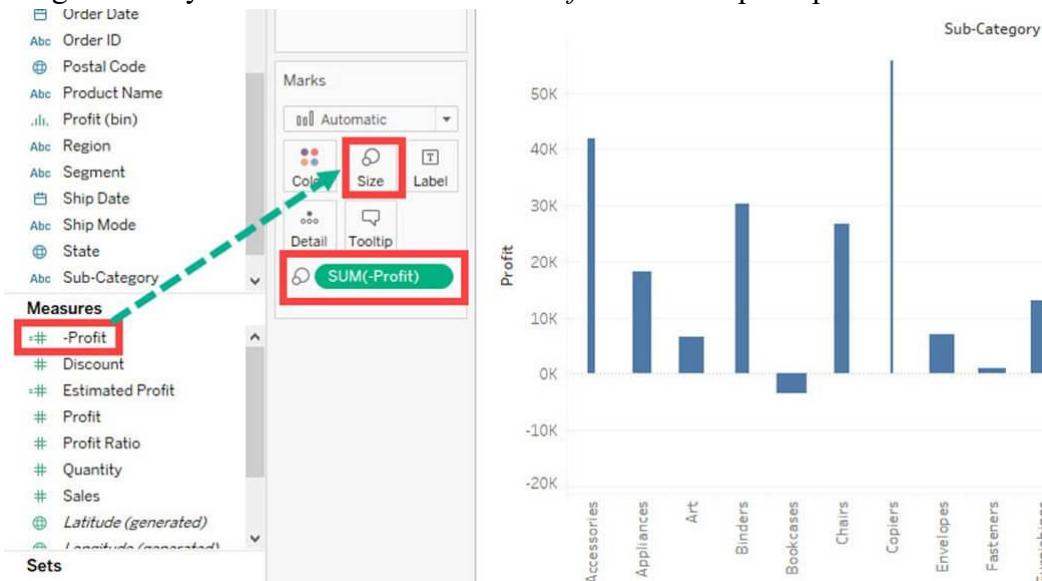
2. Right click on *Profit* present in Measures Pane, and choose **Create → Calculated Field**.



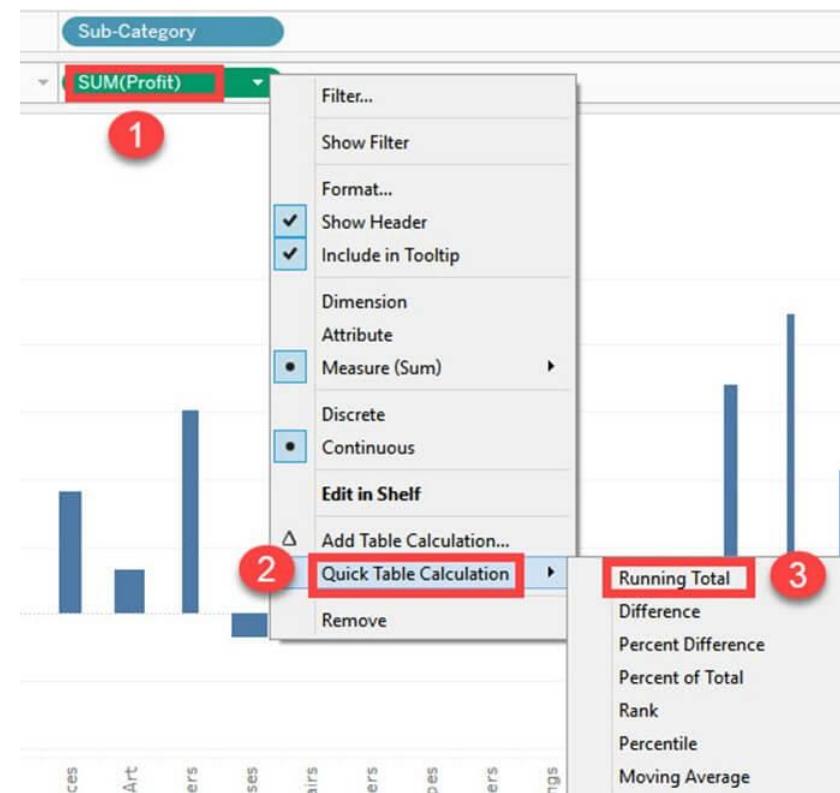
3. Enter the name “-Profit” and write the formula. Click [OK] when complete.



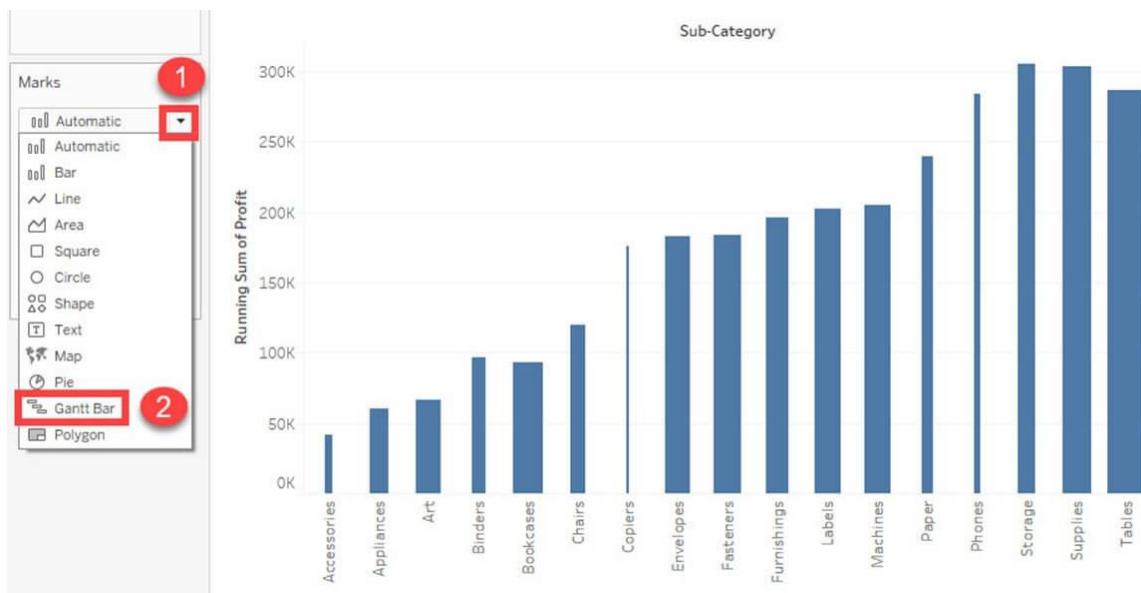
4. Drag the newly created calculated field *-Profit* into size option present in the marks card.



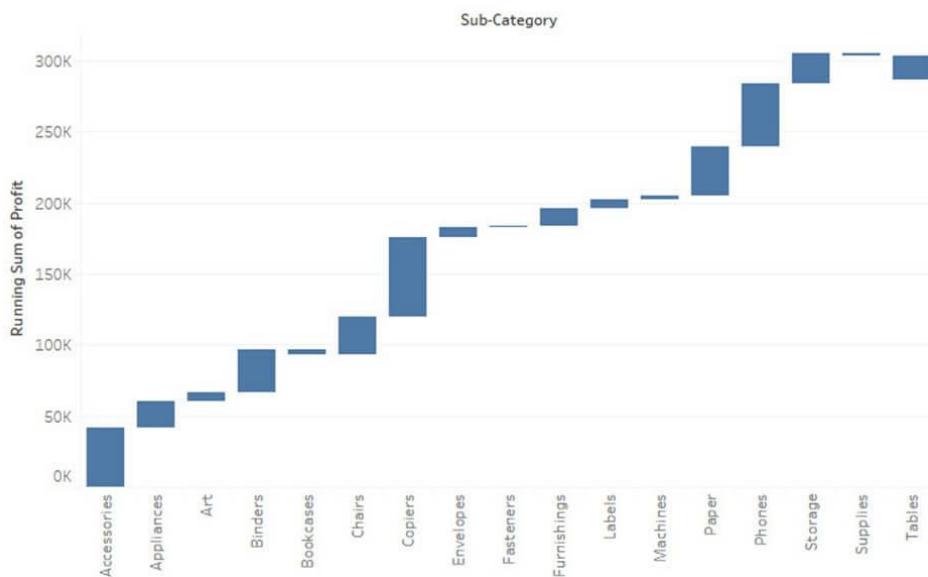
5. Right Click on 'SUM (Profit)' in Rows and select **Quick Table Calculation ➔ Running Total**.



6. Click on the drop-down option present on the marks card. Select '**Gantt Chart**' from the list.



7. This creates a waterfall chart as shown below.

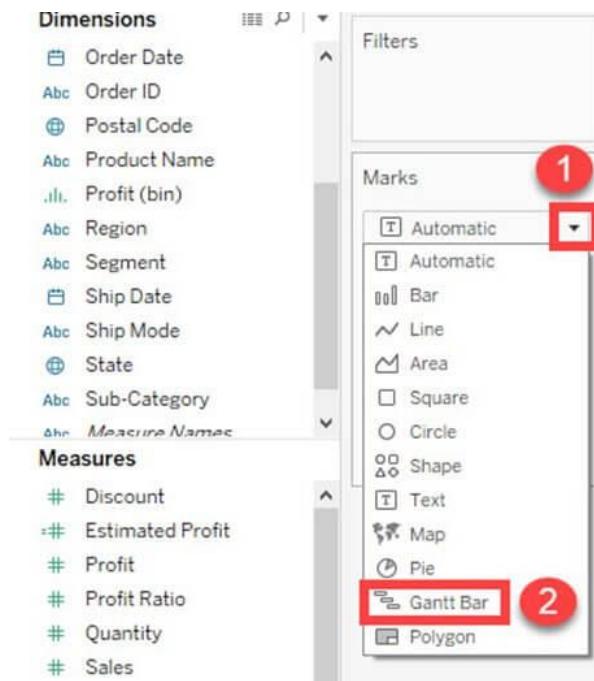


9.4 Gantt Chart

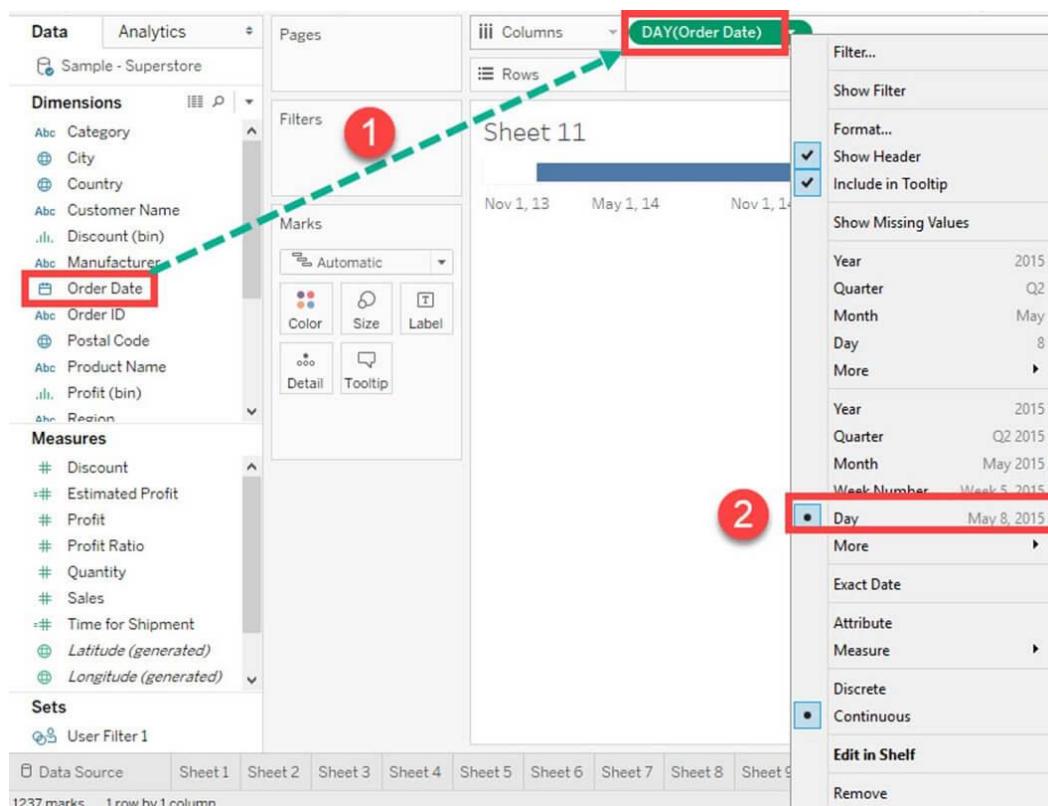
A Gantt chart can show the comparison of data between categories. It can be used to identify the time taken for each process. In the below example, time taken for shipment by each type of ship mode is given.

1. Select **Connect → Microsoft Excel**. Import Sample - Superstore.xls and select “Orders” sheet.

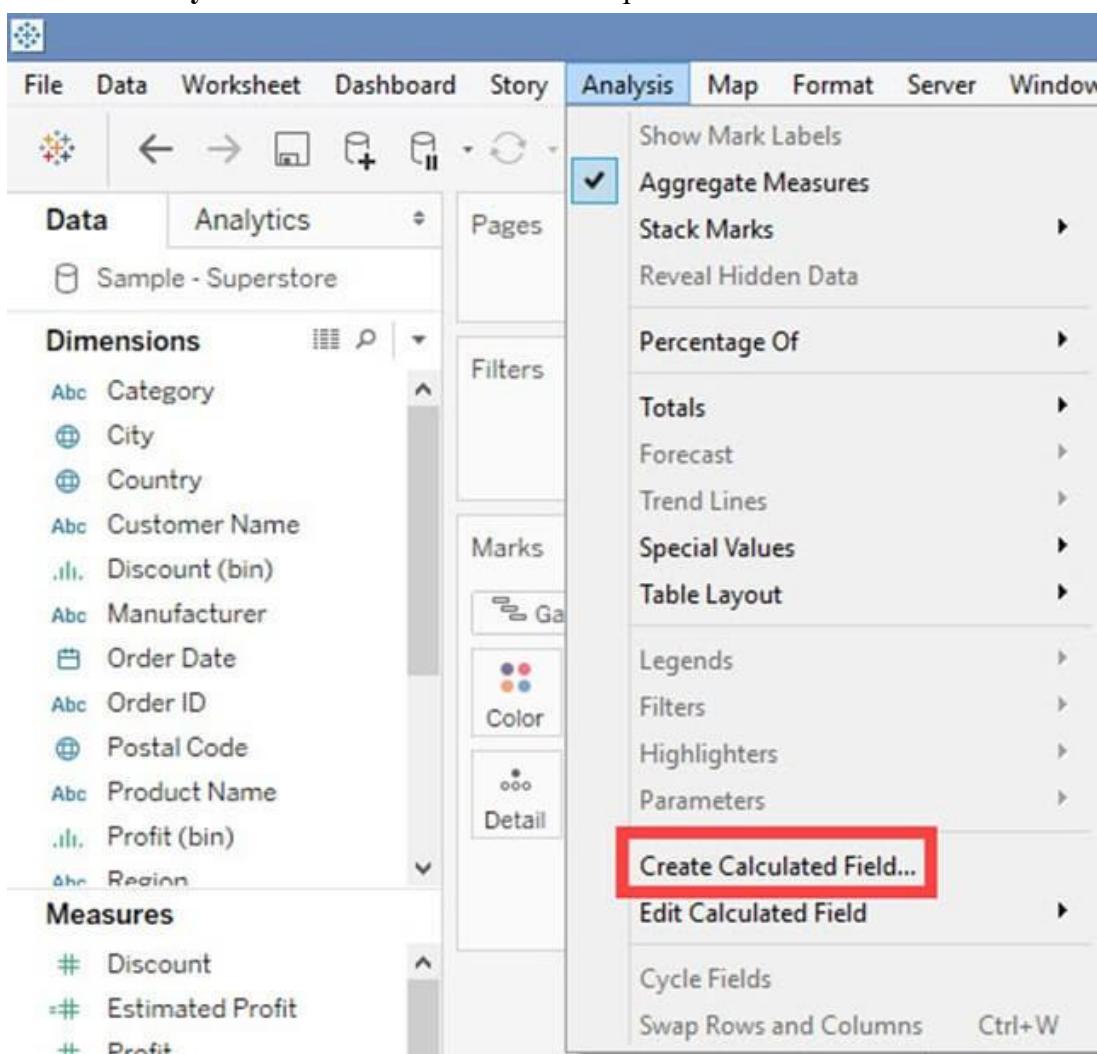
Go to a new Worksheet, click on the drop down button in Marks Card and select 'Gantt Bar' from the list.



2. Drag **Order Date** into Columns. Right Click on the **Order date** and select the 'Day'.



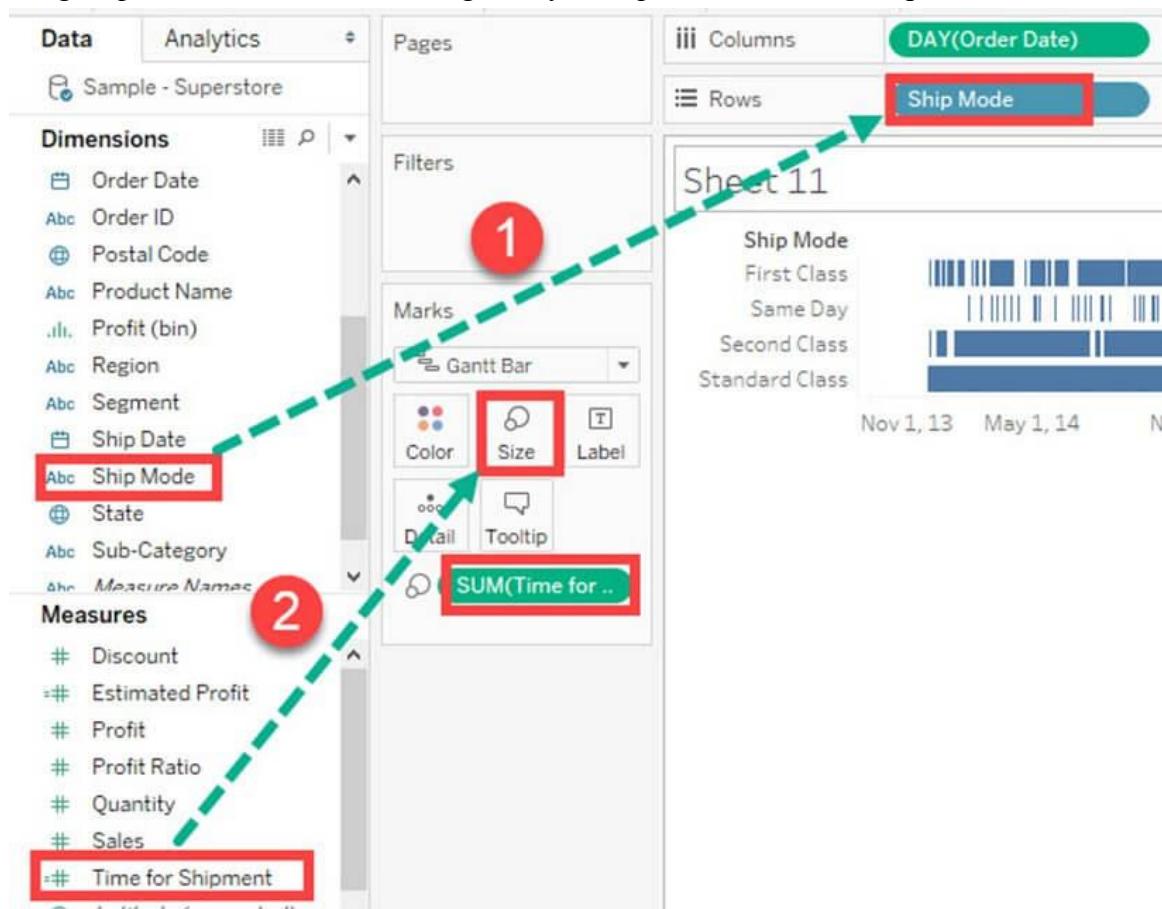
3. Click on Analysis ➔ Create Calculated Field present in the list.



4. Enter the name of calculated field as 'Time for Shipment'. Type the formula as shown in the image to create difference between order date and ship date. Click on [OK].



5. Drag *Ship Mode* into Rows and drag *Time for Shipment* into size icon present in the marks card.



6. This creates a Gantt chart. It shows the time taken for each shipment across different ship mode.

