

GETTING STARTED WITH TABLEAU

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This material is sourced from https://www.analyticsvidhya.com/blog/2017/07/data-visualisation-made-easy/?utm_source=blog&utm_medium=learning-path-tableau-expert

I have reorganized a bit, and changed some instructions that were specific to the US version of Tableau, but left the instructions, to make it quicker to go through. If anything is unclear, please refer to Pavleen Kaur's excellent original via the link above.

DOWNLOAD TABLEAU

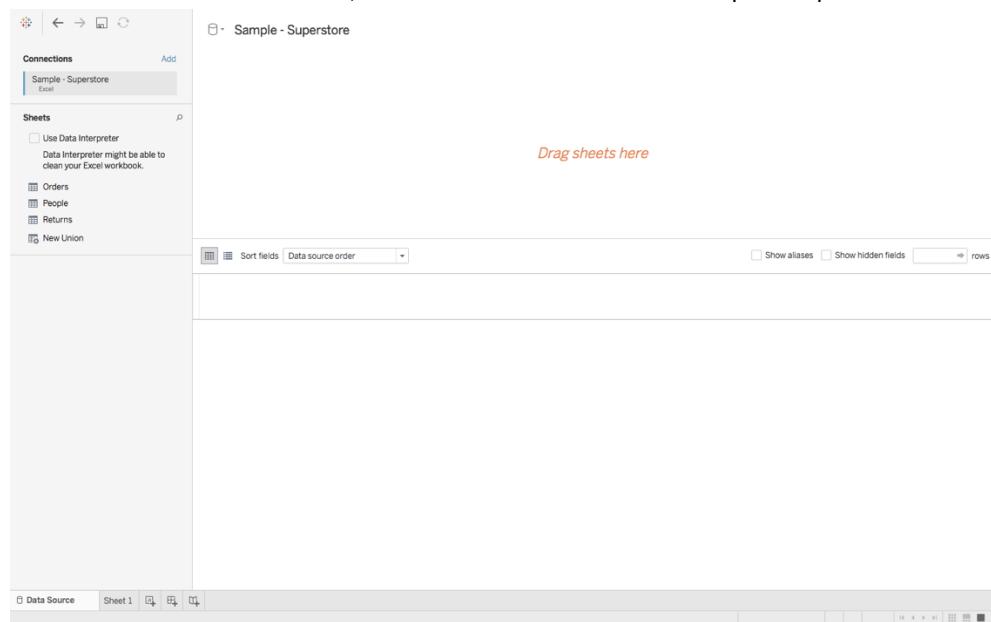
- I. Download [Tableau Public](#). This is free and does not require any licence. But all of your data and workbooks are made public to all Tableau users.
- II. Start the App.

LOAD AND PREPARE THE DATA

Pavleen's data which is used in this tutorial, can be found [here](#). The data is that of a United States' Superstore which is deliberating over its expansion. It wishes to know the prospective regions of the country where it could expand, and hence requires your help.

- I. Download the data
- II. Import the data onto Tableau. So quickly follow the below steps:

Since the data is in an Excel File, click on **Excel** and choose the Sample – Superstore.xls file to get :



You can see three sheets on the screen, but we are only going to be dealing with Orders here, so go ahead and drag the same on *Drag sheets here* :

The screenshot shows the Tableau Data Interpreter interface. On the left, the 'Connections' pane shows 'Sample - Superstore' is connected via 'Excel'. The 'Sheets' pane lists 'Orders', 'People', 'Returns', and 'New Union'. The main workspace displays a table titled 'Orders' with columns: #, Order ID, Superstore Sales, Order Date, Ship Mode, Customer ID, Customer Name, Segment, Country, City, State, and Orders. The first few rows contain null values and then transition to real data starting at row 7981. A tooltip 'Go to Worksheet' is visible over the table.

The imported data looks a bit different for the first few rows, but we can clean it up.

Data Interpreter

Find **Use Data Interpreter** Click on it to get the following clean view :

This screenshot shows the same Tableau interface after using the 'Use Data Interpreter' feature. The 'Cleaned with Data Interpreter' checkbox is checked, and a tooltip indicates 'Data Interpreter removed some data. Review the results. (To undo changes, clear the check box.)'. The table structure remains the same, but the data is now consistently populated from row 7981 onwards, with no null values in the first few rows.

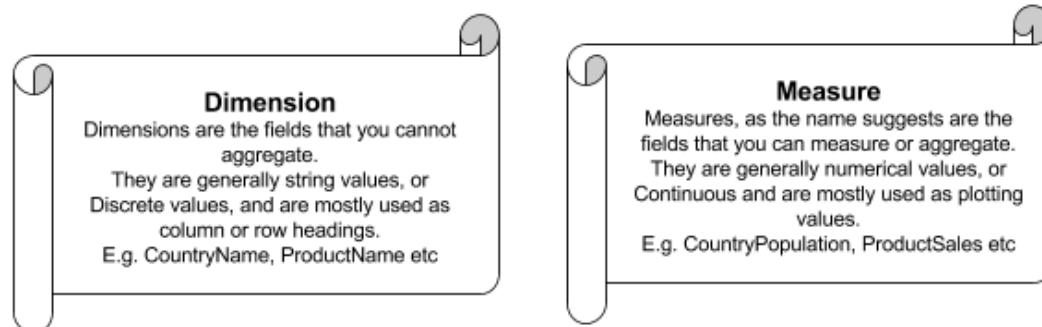
The original excel file contained metadata, that tableau has removed. If you want, you can **Review the results**.

DEVELOP THE WORKSHEETS

Now Go to Worksheet. A Worksheet is where you make all of your graphs, so click on that tab to reach the following screen :

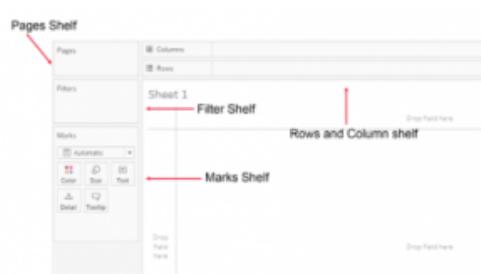
The screenshot shows the Tableau desktop application. On the left, the Data pane lists dimensions like Category, City, Country, and measures like Discount, Profit, Quantity, Sales. The Analytics pane contains filters and marks (Color, Size, Text, Detail, Tooltip). The main workspace, Sheet 1, has three 'Drop field here' placeholder boxes. The bottom navigation bar includes 'Data Source', 'Sheet 1', and other standard Tableau icons.

Remember from the lecture glossary **Dimensions and Measures** :



Moving onto **Shelves** :

Visualisation in Tableau is possible through dragging and dropping Measures and Dimensions onto these different Shelves.



Rows and Columns : x and y – axis of your graphs / charts.

Filter : Filters help you view a strained version of your data.

For example, instead of seeing the combined Sales of all the Categories, you can look at a specific one, such as just Furniture.

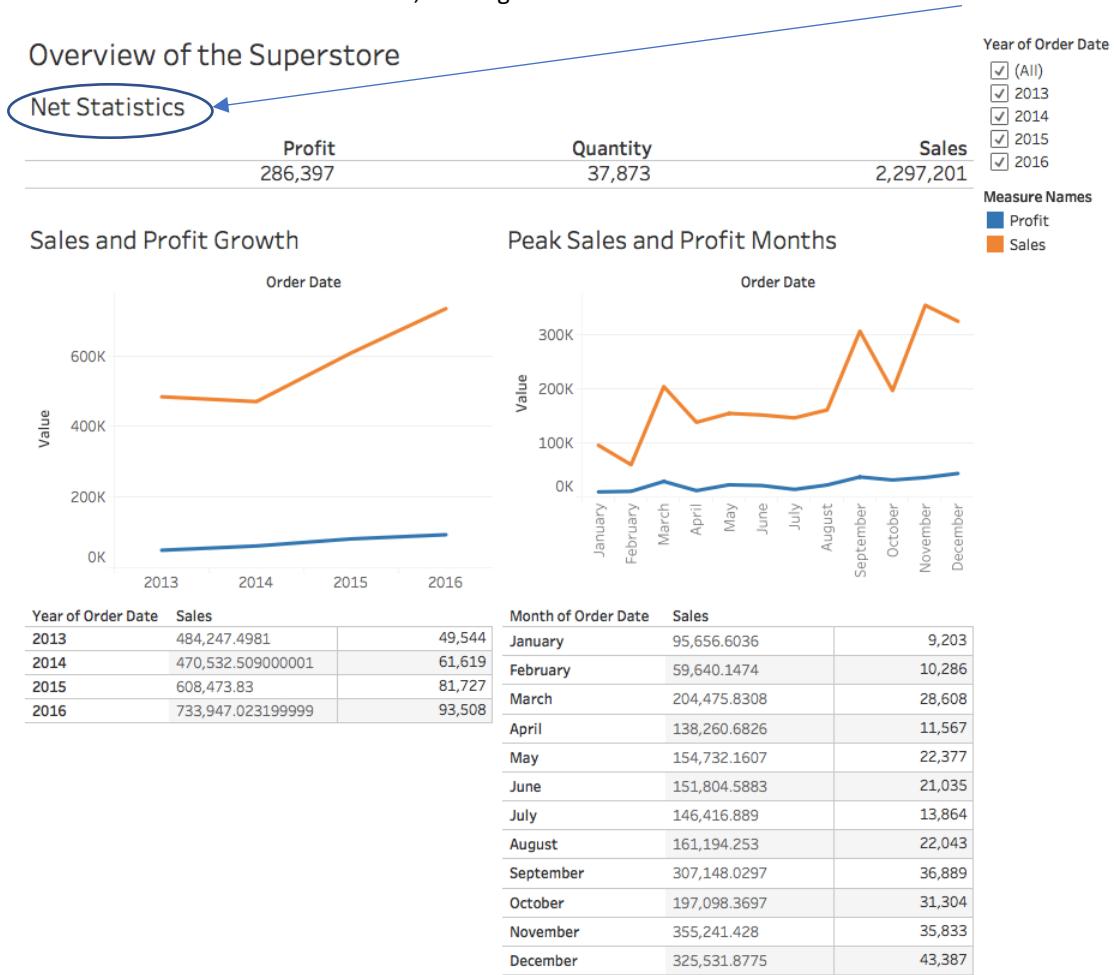
Pages : same principle as Filters, but you can see the changes as you shift between the Paged values.

Marks : The mark types - different shapes, sizes or text.

Show Me: (Top right) When you drag and drop fields onto the visualisation area, Tableau makes default graphs for you, but you can change these by referring to the **Show Me** option.

Note : Not every graph can be made with any combination of Dimensions or Measures. Each graph has its own conditions for the number and types of fields that can be used.

We will get an overview of the Superstore Sales and Profit Statistics, including Net Sales, the Net Profit and the growth of the two measures, to name a few. Here is a gist of what we will be making. This dashboard includes several worksheets that we will make first, starting with [Net Statistics](#) :



From what can be observed, the net Sales are on the rise, but the Profit is creeping up slowly. We can also quite clearly see the peak Sales Months, which could be attributed to various reasons. We can only know more as we explore more.

Give your Worksheet the same names as Paveen has, so that you can find them when she refers back to them.

a) NET STATISTICS

Tableau computes values under **Measure Names** and **Measure Values**. Follow the steps to make a **Text Table**:

1. Drag **Measure Names** from Dimensions onto the central empty area so that you see a Text Table.
2. **Measure Names** will be displayed automatically onto Rows, so drag it from Rows to Columns.
3. Drag anything other than Profit, Quantity and Sales off **Measure Values**.

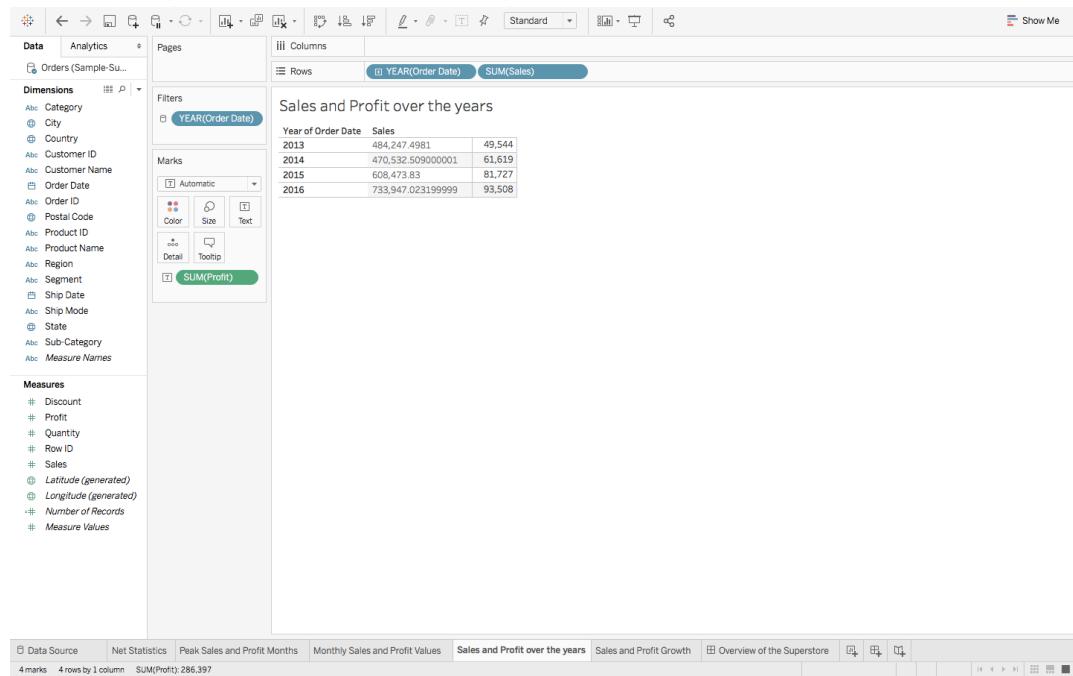
The screenshot shows the Tableau Data Editor interface. In the top navigation bar, 'Analytics' is selected. The left sidebar lists dimensions and measures. Under 'Dimensions', 'Order Date' is selected, and 'YEAR(Order Date)' is used as a filter. Under 'Measures', 'Profit', 'Quantity', and 'Sales' are listed. The main canvas displays a text table titled 'Net Statistics' with three columns: Profit, Quantity, and Sales. The data values are 286,397, 37,873, and 2,297,201 respectively. The 'Measure Names' section is highlighted with a blue border. The bottom navigation bar shows the current sheet is 'Net Statistics'.

Profit	Quantity	Sales
286,397	37,873	2,297,201

Note : Blue means **Discrete** and Green, **Continuous**.

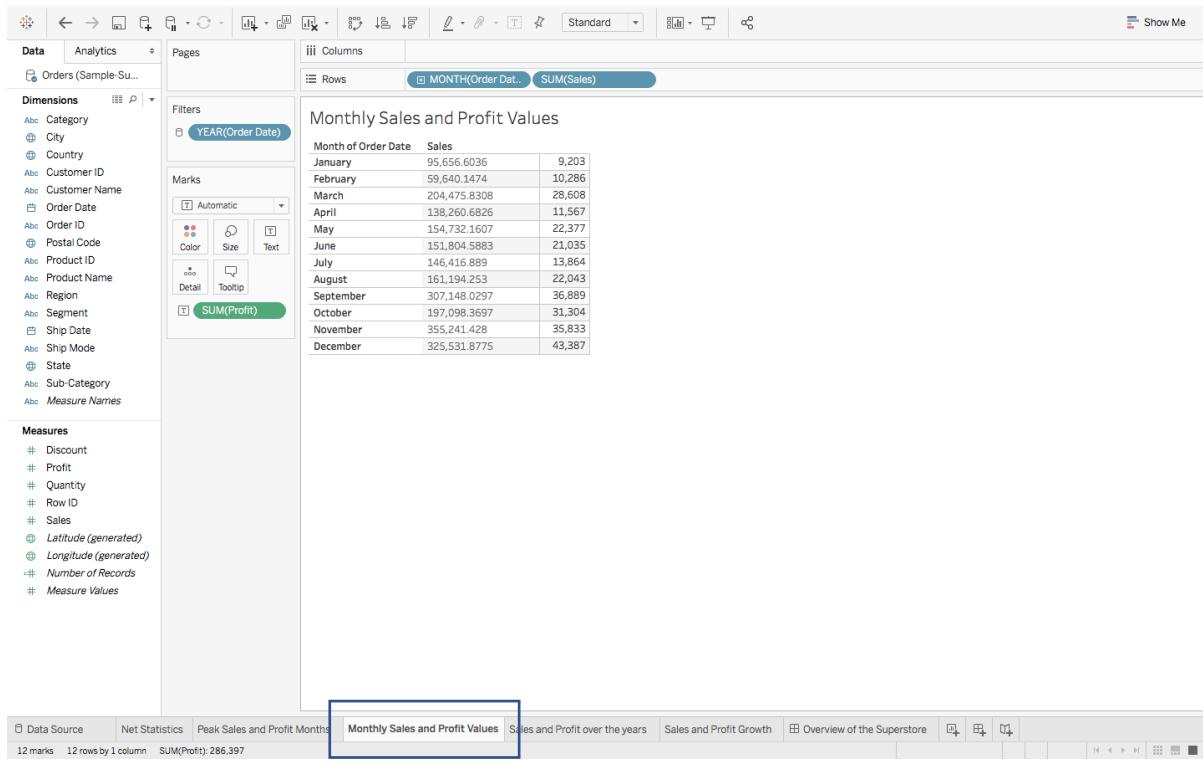
b) SALES AND PROFIT VALUES OVER THE YEARS.

1. Open a new worksheet with the name 'Sales and Profit Values over the years'.
2. Drag **Order Date** from Dimensions and **Sales** from Measures to Rows.
3. Right click on the green **Sales Pill**, and select **Discrete**, in place of **Continuous**, since we want the explicit values and not the bar graphs.
4. Finally drag **Profit** on the 'abc' column to get



c) MONTHLY SALES AND PROFIT VALUES

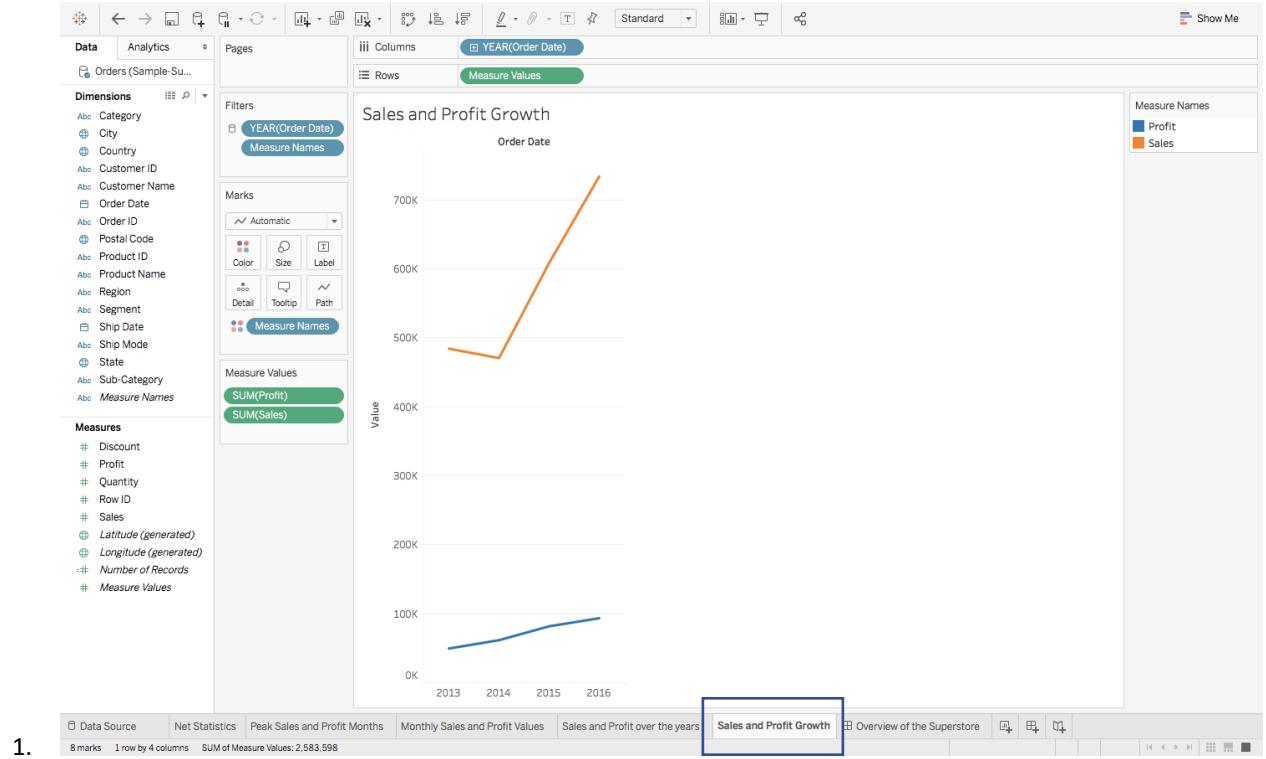
5. On a new worksheet, do the same thing for **Monthly Sales and Profit Values**, but this time change the format of **Order Date**, from **Year to Month**, by right clicking on **Order Date** in the **Rows**, and choosing **Month**, to get something like this :



We have just covered the numeric part of the Dashboard.

d) SALES AND PROFIT GROWTH

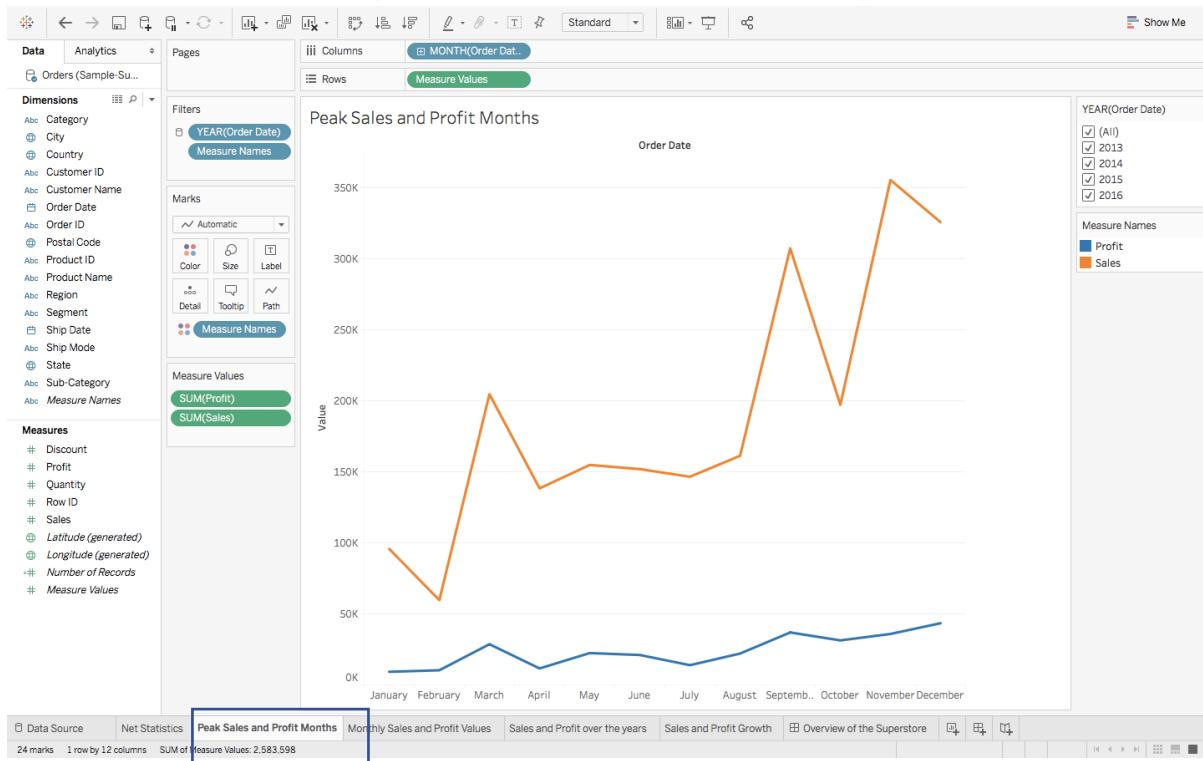
To create the chart of **Sales and Profit Growth**, drag **Order Date** over the **Columns**, **Sales** over **Rows** and then **Profit** over the formed **Sales** axis – so that you see a big equals sign – to get the following:



1.

e) PEAK SALES AND PROFIT MONTHS

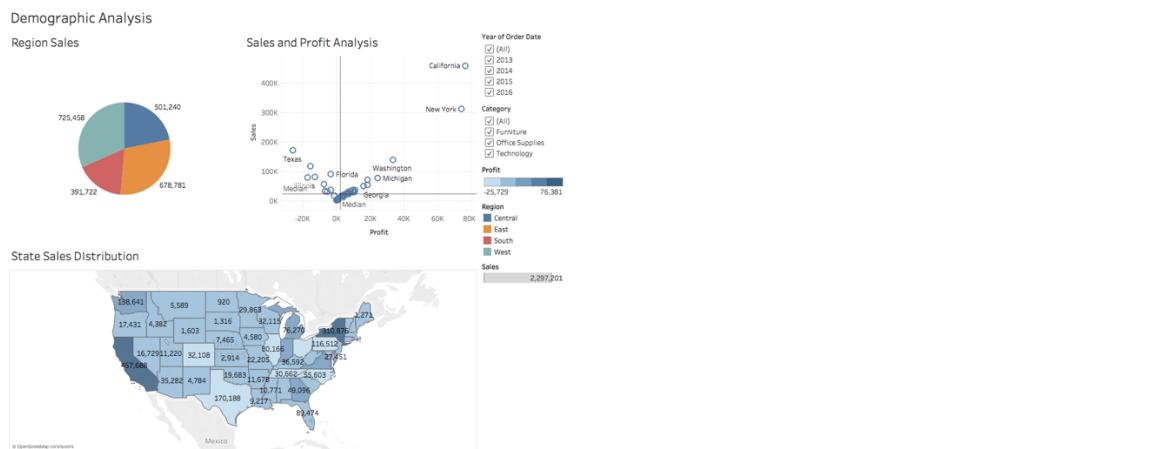
Repeat the same to find the **Peak Sales and Profit Months**, but again change the format of **Order Date**, from **Year to Month**, and drag **Measure Names** to the **color marks** box to get :



If you were to click on **Show Me**, you will see the different types of Line Charts that you can make, and if you were to hover over each of them, you will get to see their Dimension and Measure requirements too. If you ever feel lost, refer to Show Me.

Explanation

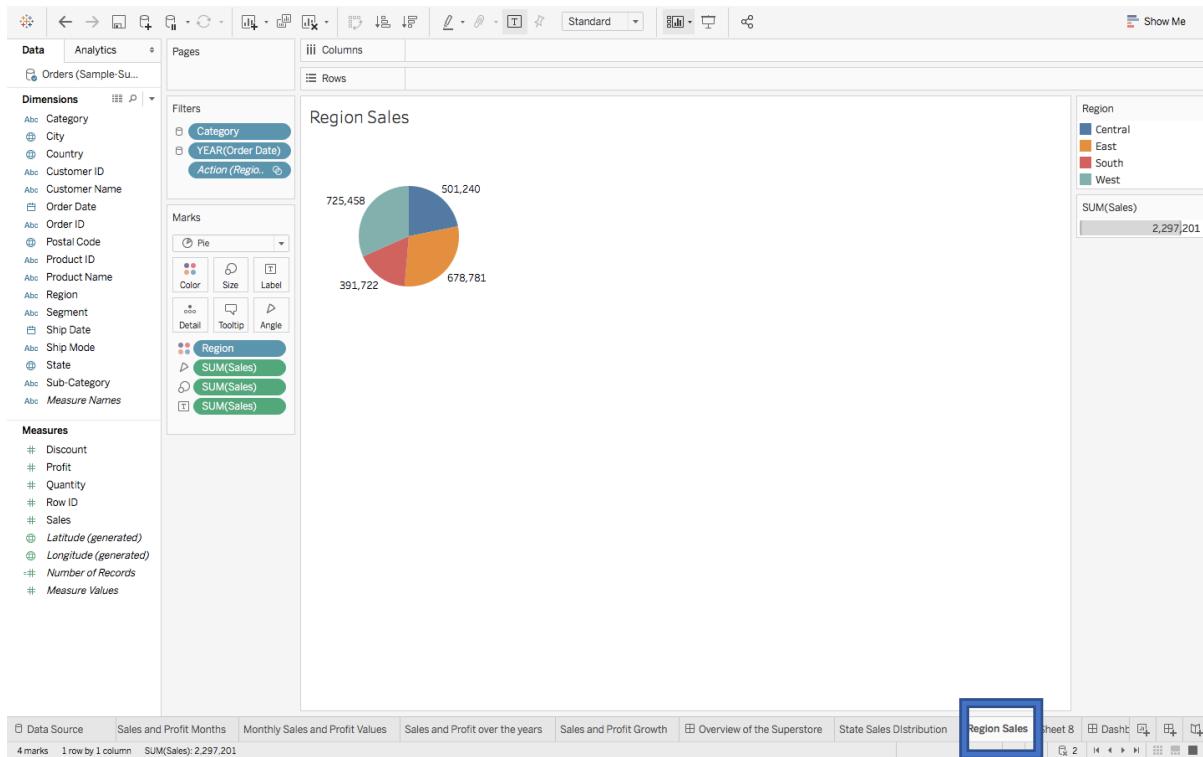
With the previous visualisations, we had gotten a brief overview of the Superstore. Let's dig a little deeper now. The next thing that I can think of exploring is the demographic of the Sales and Profit. What are the States that have the highest Sales Revenue, which ones are generating the maximum Profits:



f) REGIONAL SALES

Before discussing the inferences, let's first create the **Pie Chart of Region Sales** :

1. Drag **Region** onto Rows and **Sales** onto Columns.
2. Go to **Show Me**, and select the **Pie Chart**.
3. And finally drag **Sales** over the **Label** in the **Marks Pane** to get :



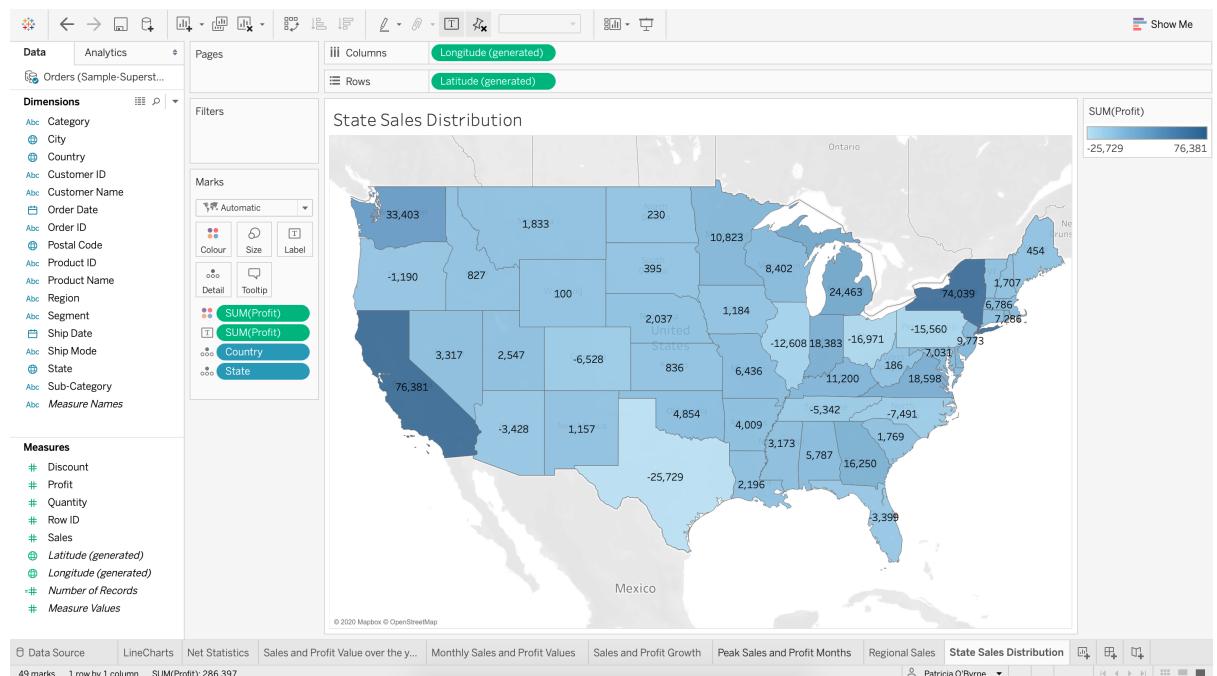
From the visual it's pretty evident that the two opposite ends, East and West are leading in the Sales game. Let's dissect this a bit more.

Note : Whenever you have some geographical data, it is always advisable to plot and see it on a Map to gain better insights.

g) STATE SALES DISTRIBUTION

So, we are now going to make the **Map Chart of State Sales Distribution**:

1. Since it's the United States that we wish to analyse, first drag **Country** onto the empty area, then drag **State**, so that you automatically see a Map, with small Circles. Follow this step by dragging **Profits** next. You will notice the size of these circles changing to represent the varying values of Profits. This is called a **Symbol Map**. But we are going to convert this into a **Filled** one, by going to Show Me, and selecting the **Filled Map**.
 2. Drag **Profits** again, but this time onto **Label** in the **Marks Pane**, to view the Profit Values mapped as well, like so :

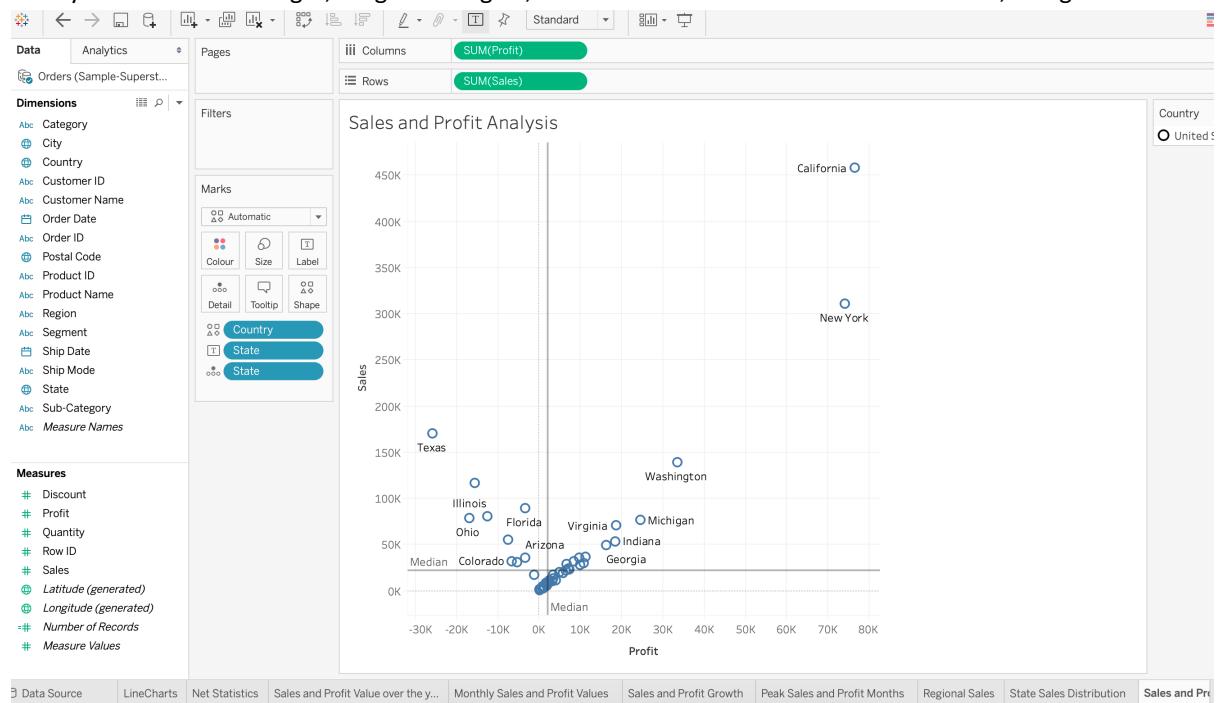


California and New York are the top most sellers from West and East region, but unfortunately there are other States such as Texas, Colorado which even after having good Sales, have negative Profits! This is certainly not good news for the Superstore. You can perceive a good analysis for the other States as well.

h) SALES AND PROFIT ANALYSIS

And lastly, here are the steps for making the **Scatter Plot of Sales and Profit Analysis** :

1. Drag **Sales** onto Rows, and **Profit** onto Columns. You will see one tiny circle, which actually represents the Total Sales and Profit Values.
2. To get more information, drag **Country** and **State** onto the graph created, so that these circles / bubbles scatter to represent the individual States.
3. To better understand the central tendency of the data, we have also added a **Median axis** as Reference Line. This can be easily done by right clicking on the **Sales Axis** – > **Adding Reference Line** and choosing Median over the default Average Reference. Repeat this for the **Profit Axis**.
4. Finally for some more insight, drag **States** again, but this time onto **Label** in the Marks Pane, and get:



The findings from the **Map chart** become more prominent with the following **Scatter plot** inferences :

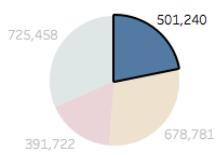
- The states in the top right, with high Sales and high Profits mean good business for the organisation.
- States with positive Sales and Profits, but near the two respective axis are the ones where there is some scope of improvement.
- Whereas the states that belong to the 2nd or 3rd quarter are the ones which are not generating much revenue.

Explanation

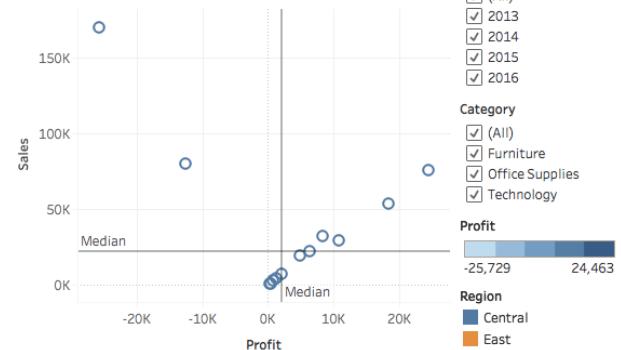
One of the great things about Tableau is that it lets you interact with the visuals. Have a look at an example :

Demographic Analysis

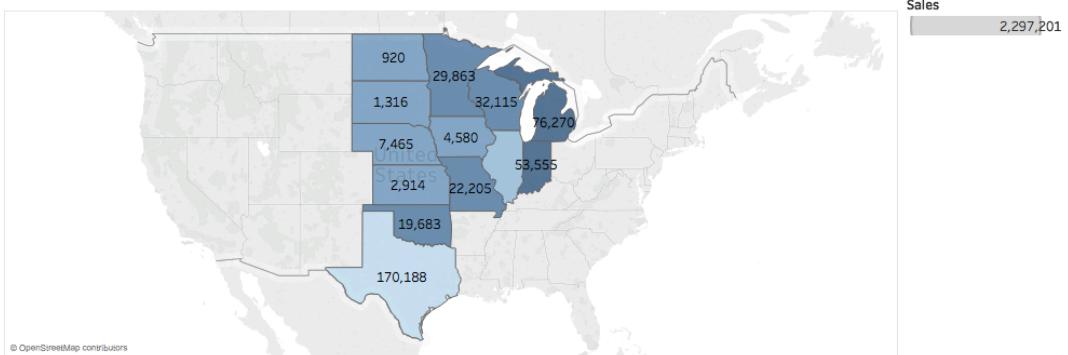
Region Sales



Sales and Profit Analysis



State Sales Distribution



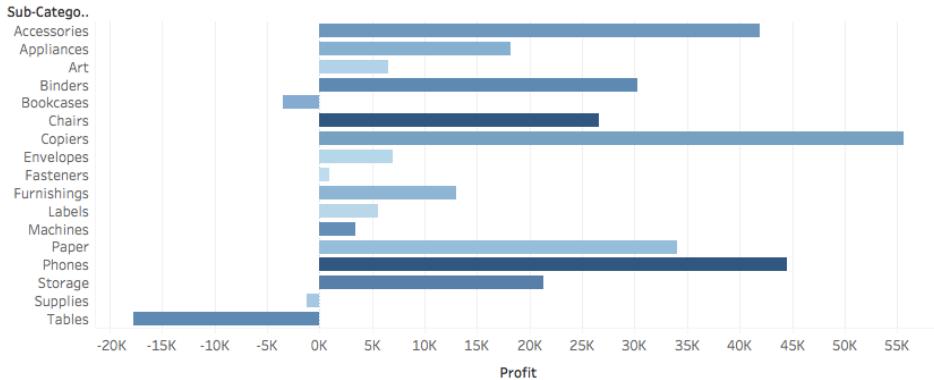
When we clicked on the Central Region, it highlighted and showed the Central States of US, along with their respective Sales and Profit scatter. Here we used the chart as a Filter itself which is a feature of a Dashboard. We shall learn how to make one at a later stage.

i) PRODUCT CATEGORY SALES

There is one pretty important analysis that we have yet to touch, and that is Product Statistics. High Sales could be easily attributed to the high cost of the products being sold. Also, when you are considering expansion, you will want to know the Sales distribution of the Products too:

Product Category Sales													Category	
Category	Year of Ord..	Order Date												
		January	February	March	April	May	June	July	August	Septem..	October	Novemb..	Decemb..	
Furniture	2013	6,243	1,840	14,574	7,945	6,913	13,206	10,821	7,320	23,816	12,304	21,565	30,646	(All)
	2014	11,740	3,134	12,500	10,476	9,375	7,714	13,674	9,639	26,273	12,027	30,881	23,086	Furniture
	2015	7,623	3,926	12,473	13,406	15,031	12,027	13,199	13,619	26,739	10,131	33,659	37,069	Office Supplies
	2016	5,964	6,866	10,893	9,066	16,958	19,009	11,813	15,442	29,028	21,884	37,057	31,407	Technology
Office Supplies	2013	4,851	1,072	8,606	11,155	7,136	12,953	15,121	11,379	27,423	7,211	26,862	18,006	(All)
	2014	1,809	5,368	15,883	12,559	9,114	10,648	4,720	11,735	19,306	8,673	21,218	16,202	2013
	2015	5,300	6,683	17,458	10,640	13,007	10,902	12,677	9,219	23,286	14,799	21,428	38,112	2014
	2016	21,704	7,408	14,550	15,072	13,737	16,912	10,241	30,060	31,896	23,037	31,472	30,437	2015
Technology	2013	3,143	1,609	32,511	9,195	9,600	8,436	8,004	9,210	30,538	11,938	30,201	20,893	2016
	2014	4,625	3,449	10,344	11,161	11,643	6,435	10,371	15,525	19,017	10,705	23,874	35,632	(All)
	2015	5,620	12,259	21,255	15,203	28,653	16,502	12,564	10,427	22,883	31,533	27,105	22,057	2013
	2016	17,035	6,027	33,429	12,383	13,567	17,061	23,210	17,619	26,943	32,856	49,919	21,985	2014

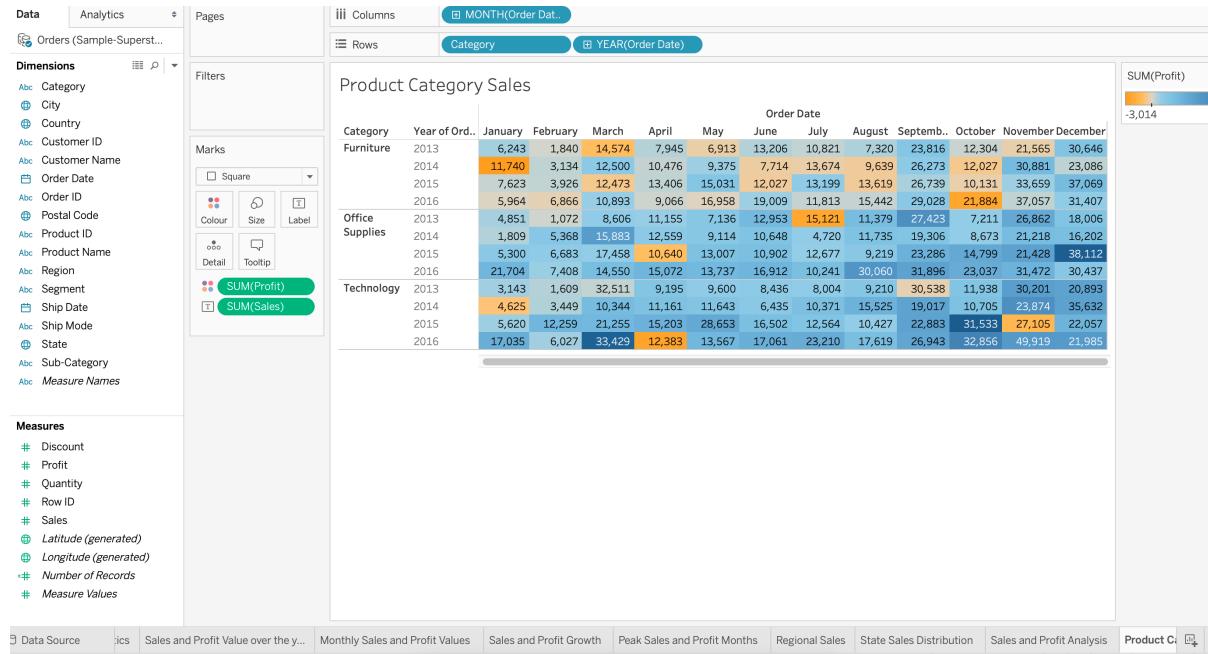
Product Sub Category Sales



Here we have visualised not just the Sales but also the Profits.

Its quite surprising to see Categories that have high Sales, generating negative profits, like Technology in November 2015, or Furniture in October 2016 and this is inferred from the first chart, which is also called a **Highlight Table**. As the name suggests, it highlights the relative proportion of the Measure Values of our data. So let's learn how to make one :

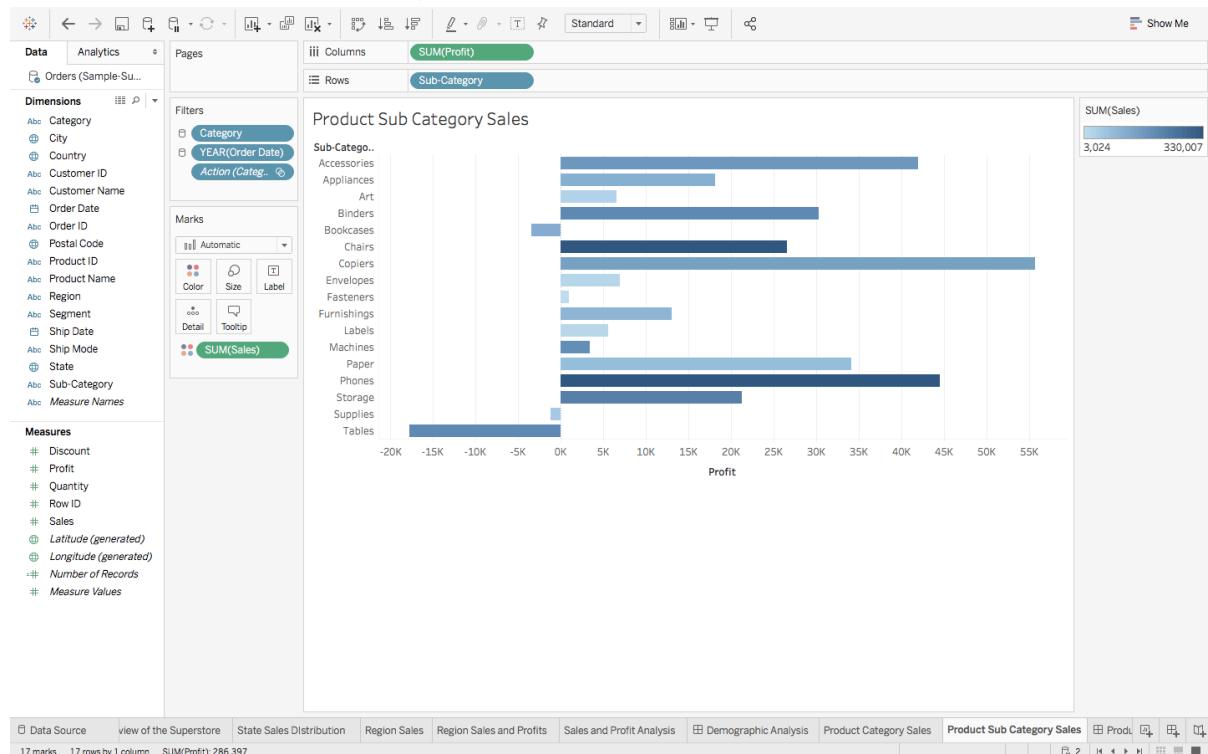
1. Drag **Category** and **Order Date (Year)** in Rows.
2. Drag **Order Date (Month)** over Columns, and **Sales** over the empty 'abc' fields
3. Select **Highlight Table** from Show Me, and drag **Order Date (Year)** back to Rows, in case it got re-shuffled.
4. Finally drag **Profits** over **Colour** in the **Marks Pane**, to get :



j) PRODUCT SUB CATEGORY SALES

The **Product Sub Category Sales** is a **Bar Chart**, which is also quite easy to make :

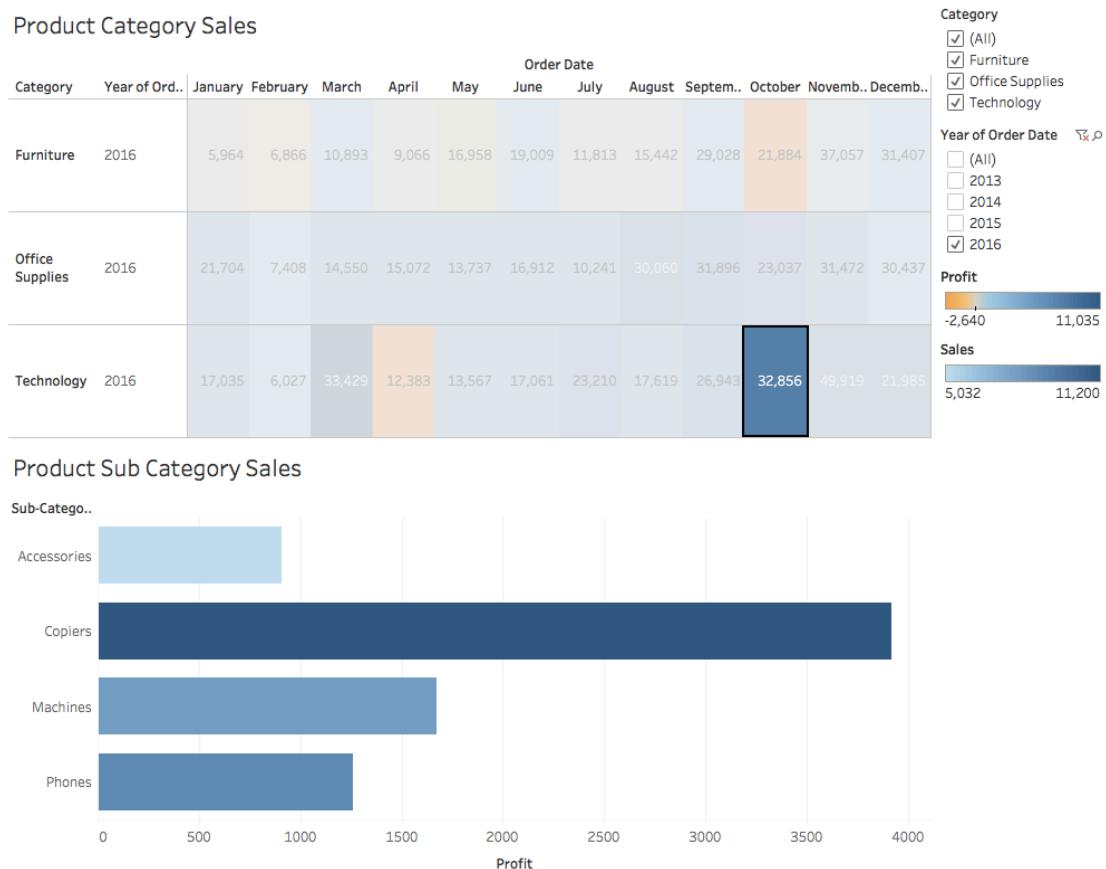
1. Just drag **Sub – Category** over to the Rows
2. Drag **Profit** onto the Columns
3. Go to Show Me and choose the **Horizontal Bars**
4. For some customisation, drag **Sales** over **Colour** in the Marks Pane to attain this final visualisation:



From the above graph, we are getting a good idea of the Net Sales and Profit margins of the various products. Notice that even though Tables' Sales are quite high on the scale, it's the only product with the least profit.

Explanation:

Now, just like before, consider an interaction with the visualisation :



We are now able to view each Category's Products' Sales and Profits, at a low level granularity of Year and Month!

3. Other Functionalities

Congratulations! You have now covered one of the important aspects of Tableau! But it's not the end of your learning just yet. Tableau offers some advanced functionalities too, some of which we will cover next :

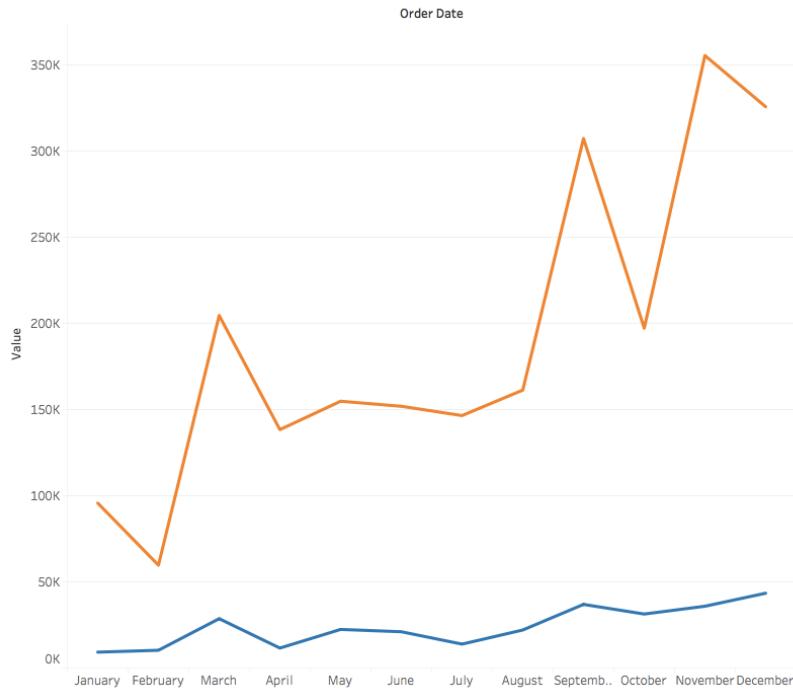
k) UPDATE PEAK SALES AND PROFIT MONTHS

3.1 Filters

Till now we have only made simple charts, that actually provide cumulative data, that is combined data over the lifetime of the Superstore. To look at Sales of a particular Year, a Month, for a certain Product, or to basically view the distinct aspects of the data, **Filters** are the way to go.

Let's head back to the first ever Chart that we had made, of **Peak Sales and Profit Months** :

Peak Sales and Profit Months

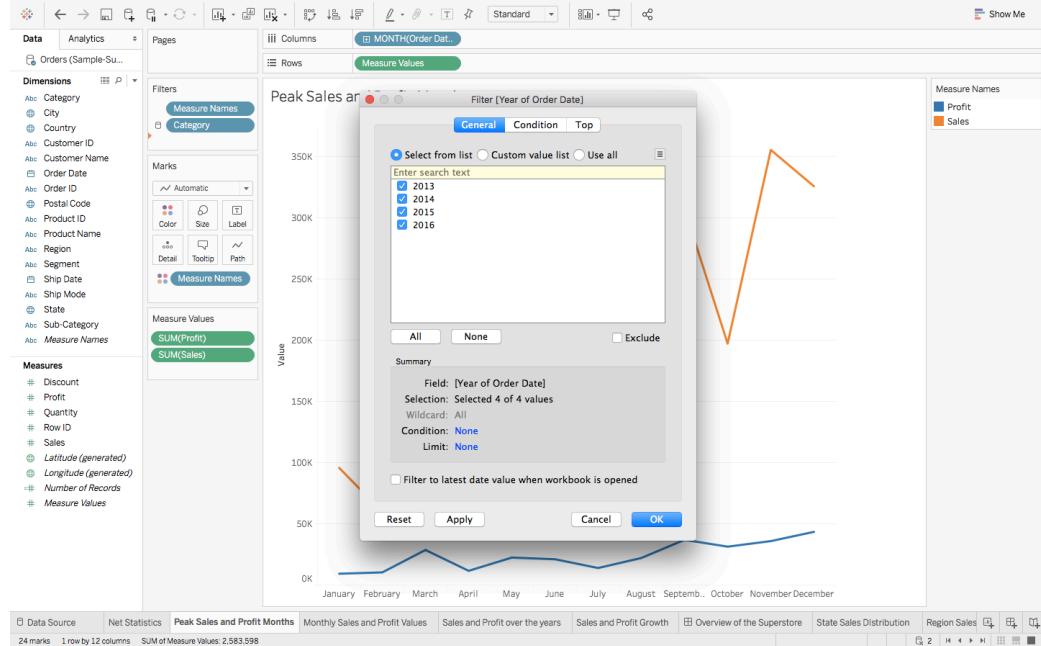


The visual here is an accumulation of all 4 years of data, for all Regions, States, Categories and Sub Categories. The steps of turning any Dimension into a Filter are the same. Let's first experiment with the Order Date (formatted to Year) :

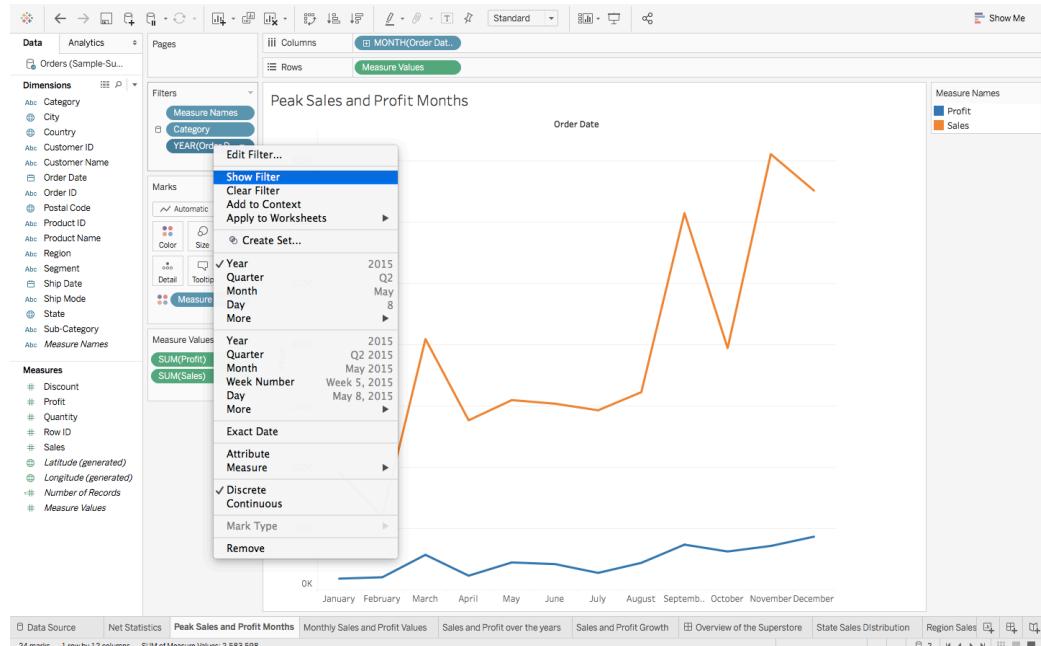
1. Drag the Dimension to the **Filters' Shelf**, to see the following pop up. Here we will be choosing Years:

- 2.

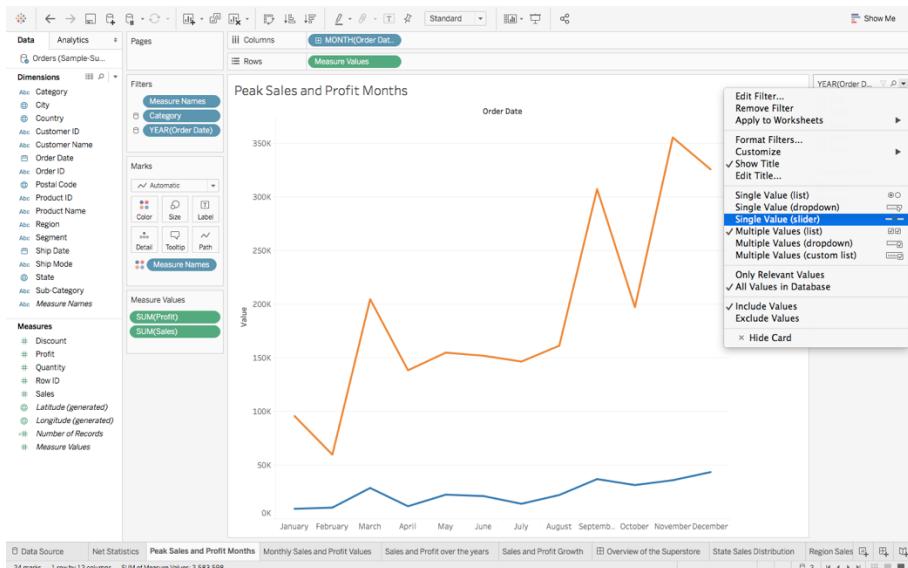
3. Choose the values that you want to be part of your filter:



4. Right click on the newly generated Filter, and then choose Show Filter:

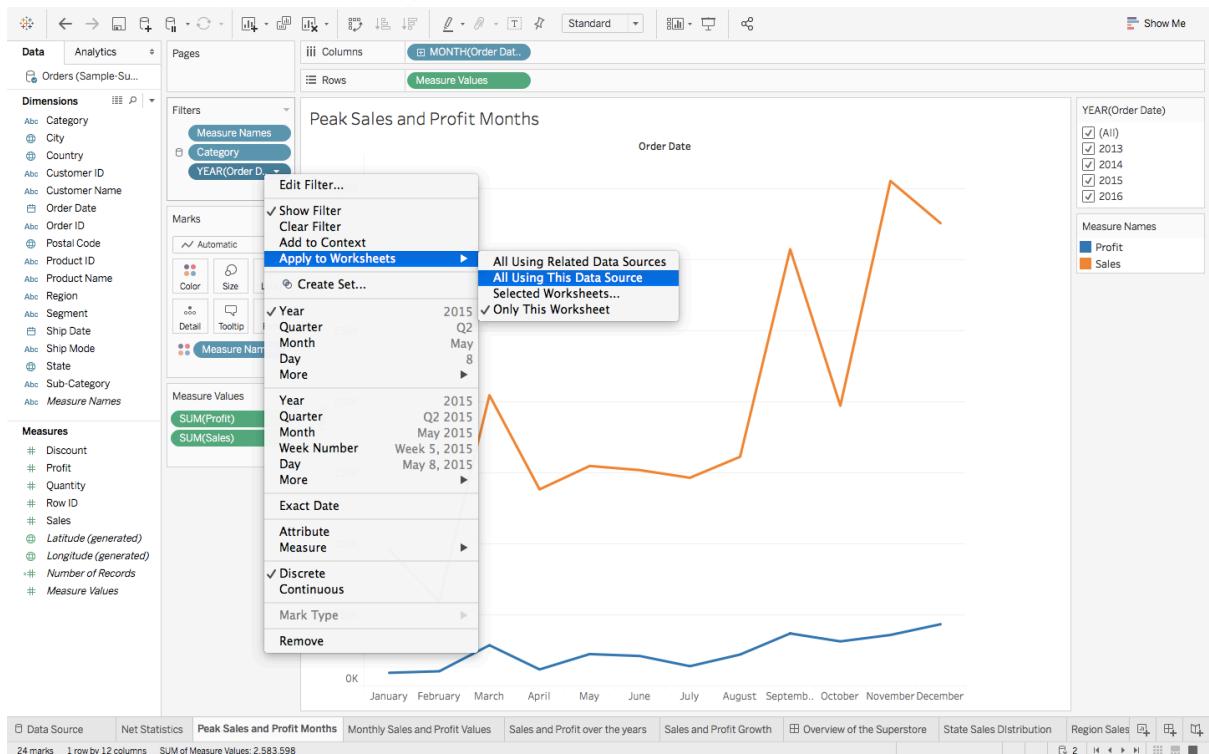


5. You can also change the format of your Filter, for example whether you wish for a Dropdown list, a Slider, a Single Value List, etc



6.

7. If you feel that some of your filters can be applied to other sheets as well, then rather than repeating the steps, you can simply **Apply the Filter** to all other relevant Worksheets :

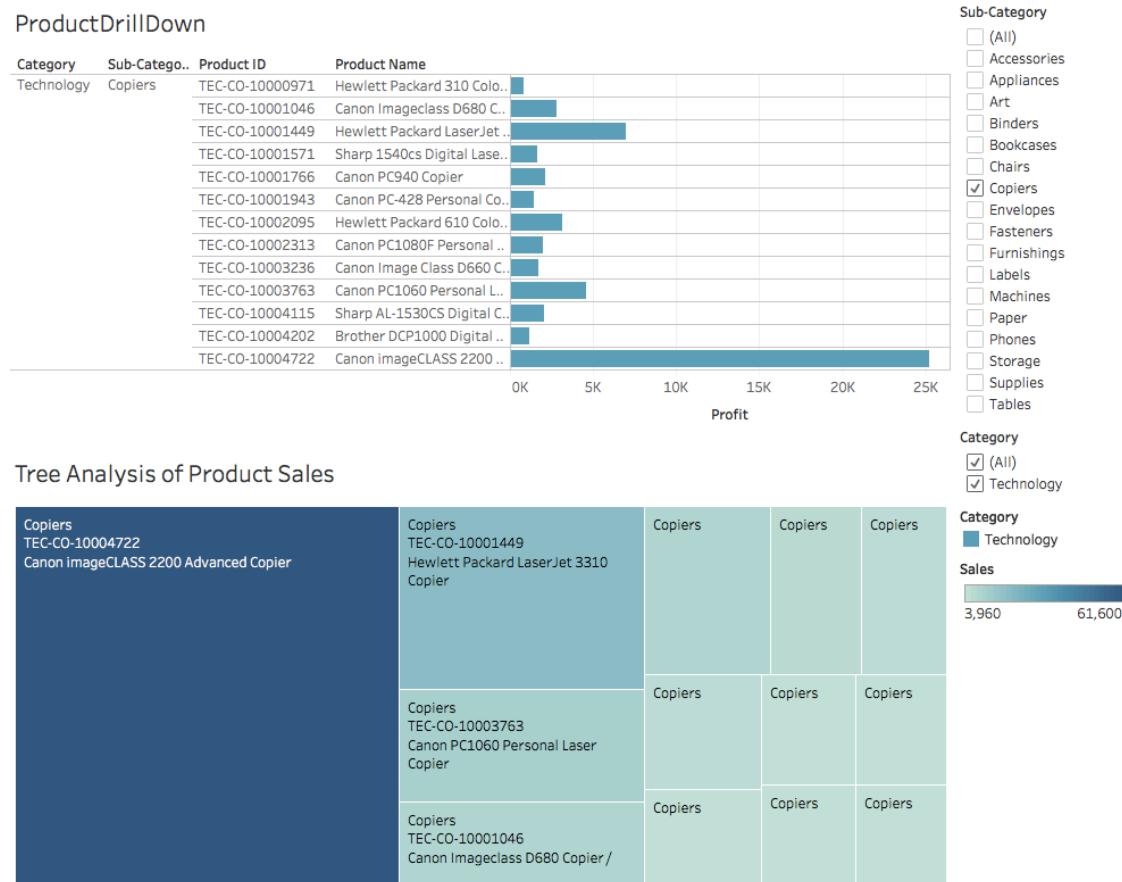


I) PRODUCTDRILLDOWN

3.2 Drill Down and Drill Up

By now you must have gotten some picture of the way our Data is built. We have Category as the main Field, divided into Sub – Category, which is further distinguished into the various Product IDs and their corresponding Product Names.

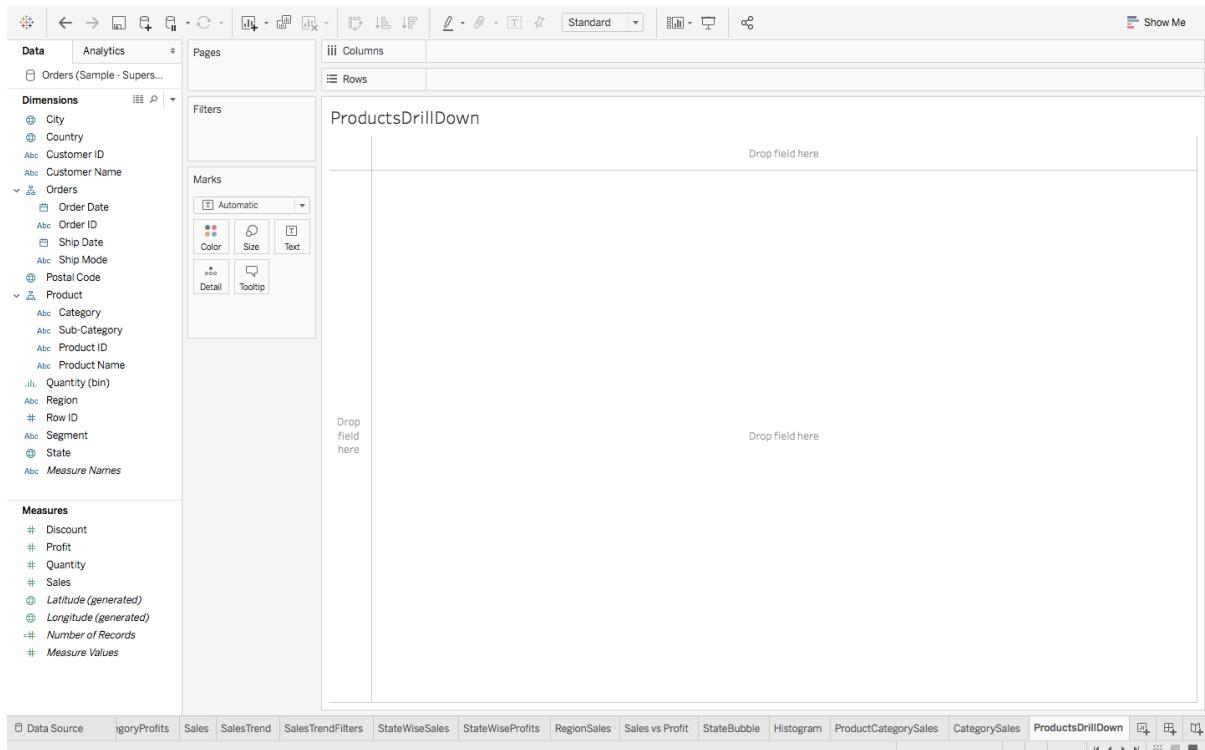
This concept of breaking down our data to reach the absolute depth is called **Drilling Down** :



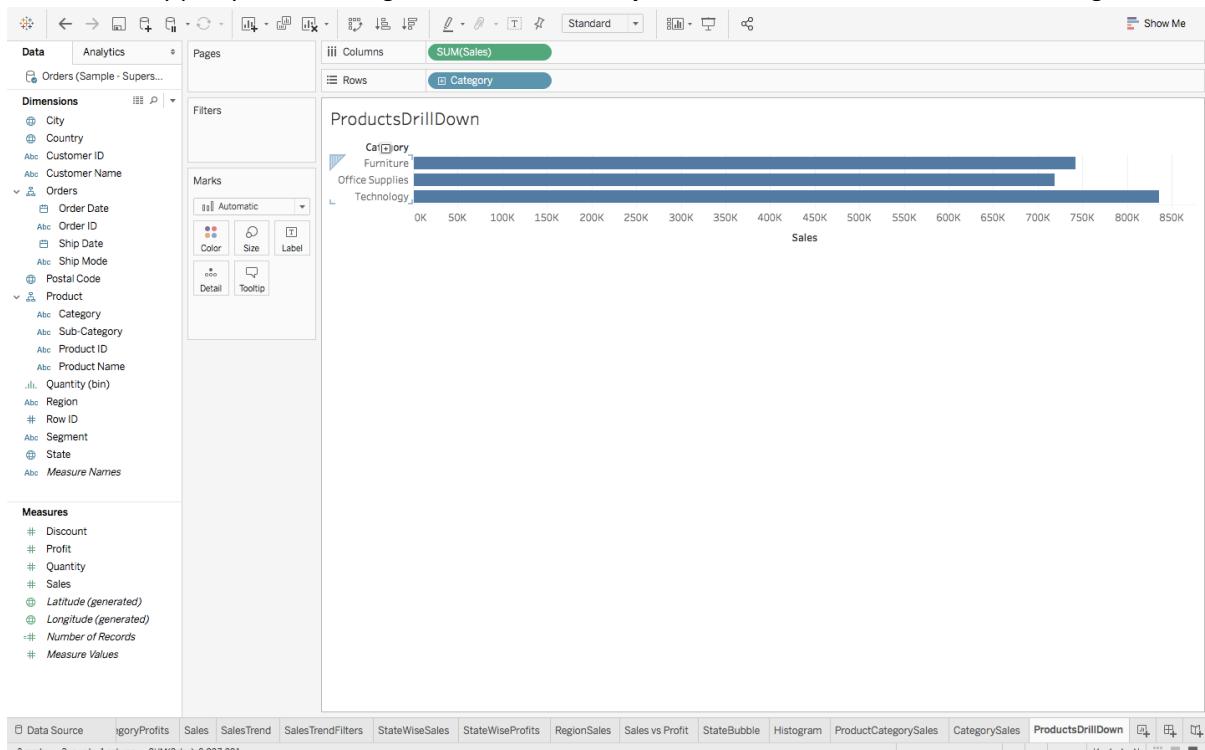
Similarly you can drill down from **Order Date** to Order ID to Ship Date to **Ship Mode**. This is also referred to as making an **Hierarchy** of data.

Let's consider the **ProductDrillDown** first, which is really a **Bar Graph** :

1. First you need to group the Dimensions you want in a single Hierarchy. So, drag **Sub – Category** from Dimensions **on top of Category** in the Dimensions itself, and change the Name of the hierarchy to **Product**.
2. Now drag **Product ID** and **Product Name** over this **Product** Hierarchy
3. Do the same for Order Hierarchy to get :



4. To finally plot your data, drag the **Product Hierarchy** onto Rows and **Sales** onto Columns, and get:

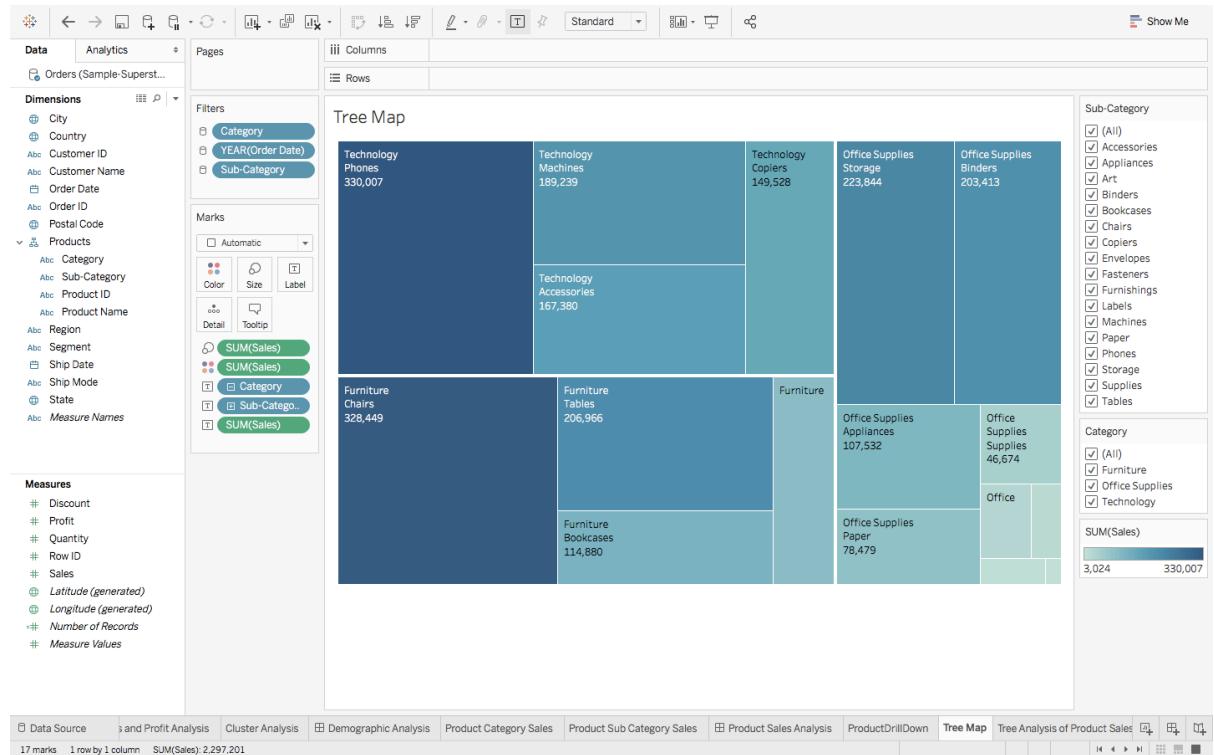


This was just a simple Bar Graph, but if you hover over the **Category** axis, you will see a small plus sign. Click on it to get a granulated version of your data. Do the same for the other generated axis as well to get to the absolute depth.

m) TREEMAP

The **Tree Analysis of Product Sales** is a **Tree Map**, which is a great way of representing Drilled Down data, and is quite easy to make :

5. Following the drill down from **Step 4**, simply go to Show Me and select the **Tree Map** chart, to get the following :



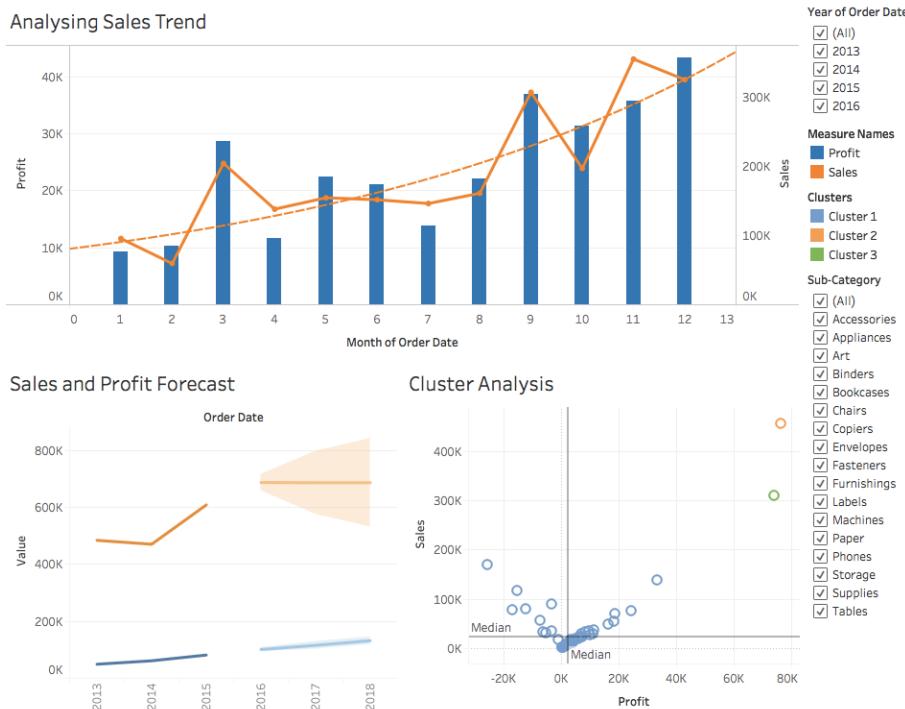
n) ANALYSING SALES TREND

So far you have analysed the present scenario, but for expansion consideration, let's try and analyse the future too.

With the following Dashboard, you can not only see the **Trends over the Sales Months**, but also a **Forecast over the Years** too. And both of them tell a different story altogether :

Trends and Forecasts

Analysing Sales Trend

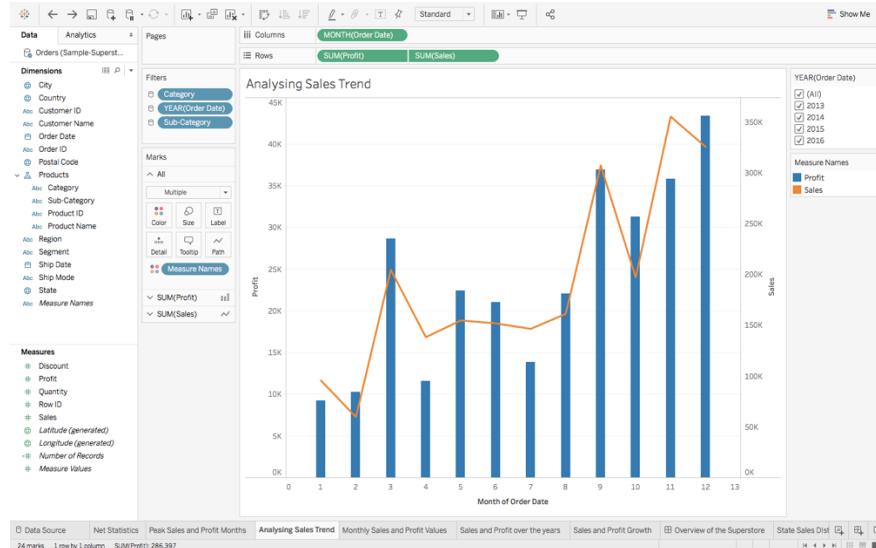


Although the Sales

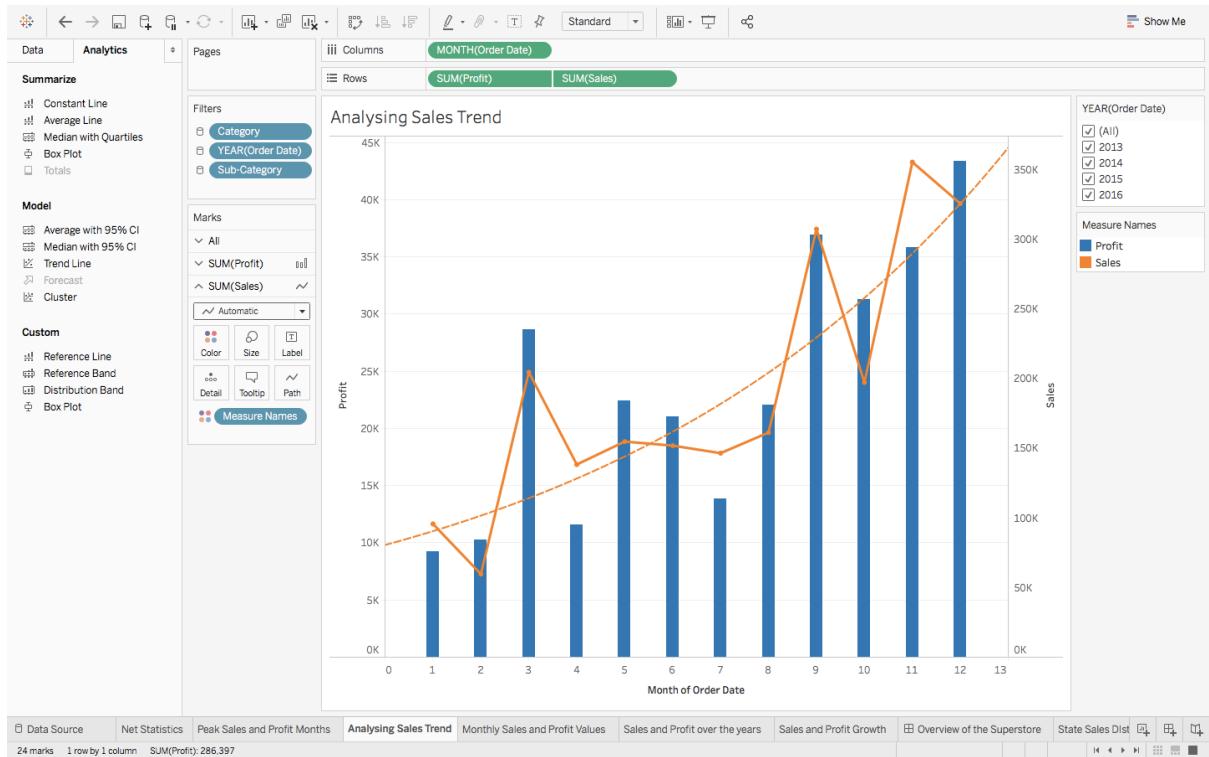
of the Superstore are increasing over the months of a Year, the future in general looks a bit bleak. The sales seem to become constant for the next 3 years, but fortunately for the Superstore, the Profit is increasing steadily.

To make the above, traverse back to the **Peak Sales and Profit Month** Chart and follow these steps to make a Trend Line of your own :

1. Go to **Show Me** and choose the **Dual Combination** chart, to get this chart :



2. To get the Trend Line, go to **Analytics**, and simply drag **Trend Line** over the chart, to get :

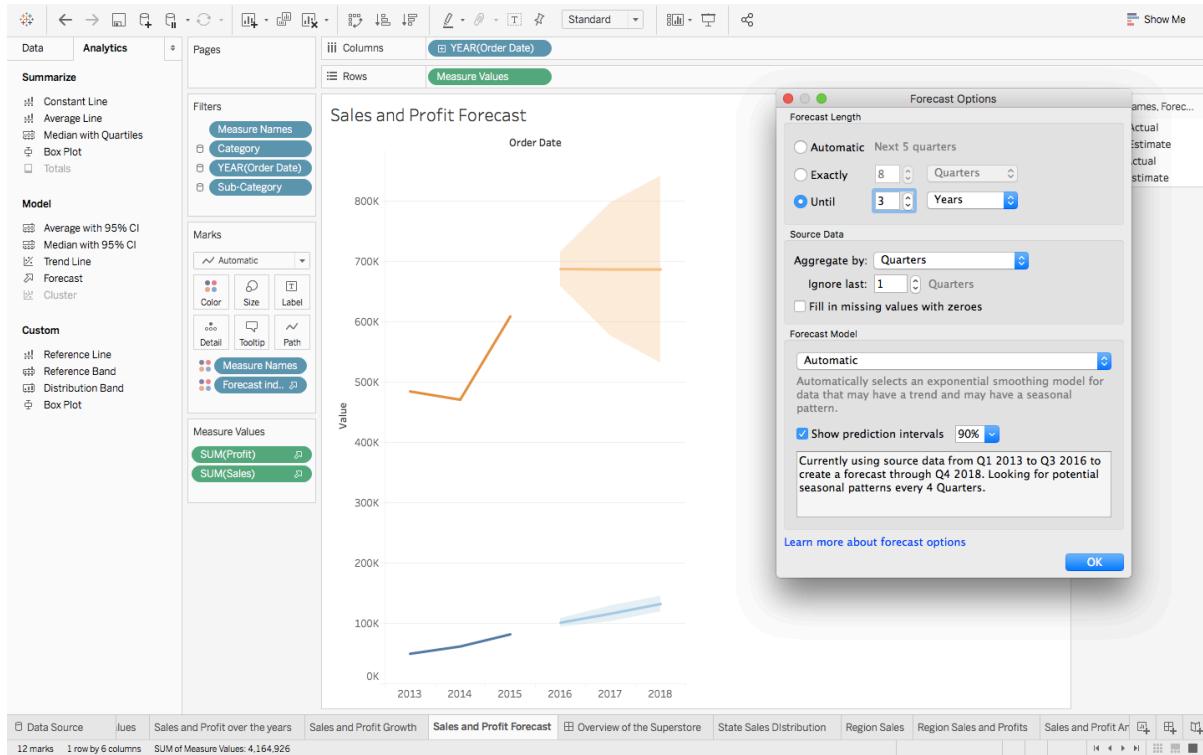


o) SALES AND PROFIT FORECAST

3.4 Forecasting

For **forecasting**, we are going to deal with the **Sales and Profit Growth** chart. The construction is similar to that of Trend Lines, but with a small change. The steps are :

1. Drag **Forecast** over the chart.
2. You can also change the time frame of the Forecast, by right clicking on the Forecast Area and opting for **Forecast Options**, after which you can make your customisations :

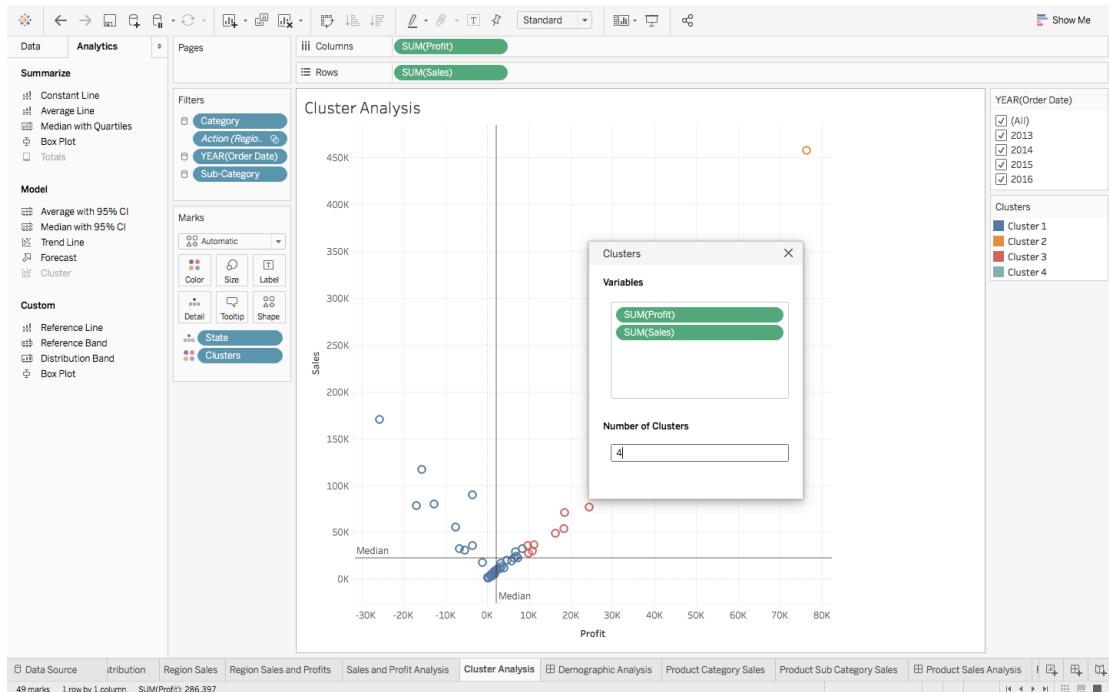


p) CLUSTER ANALYSIS

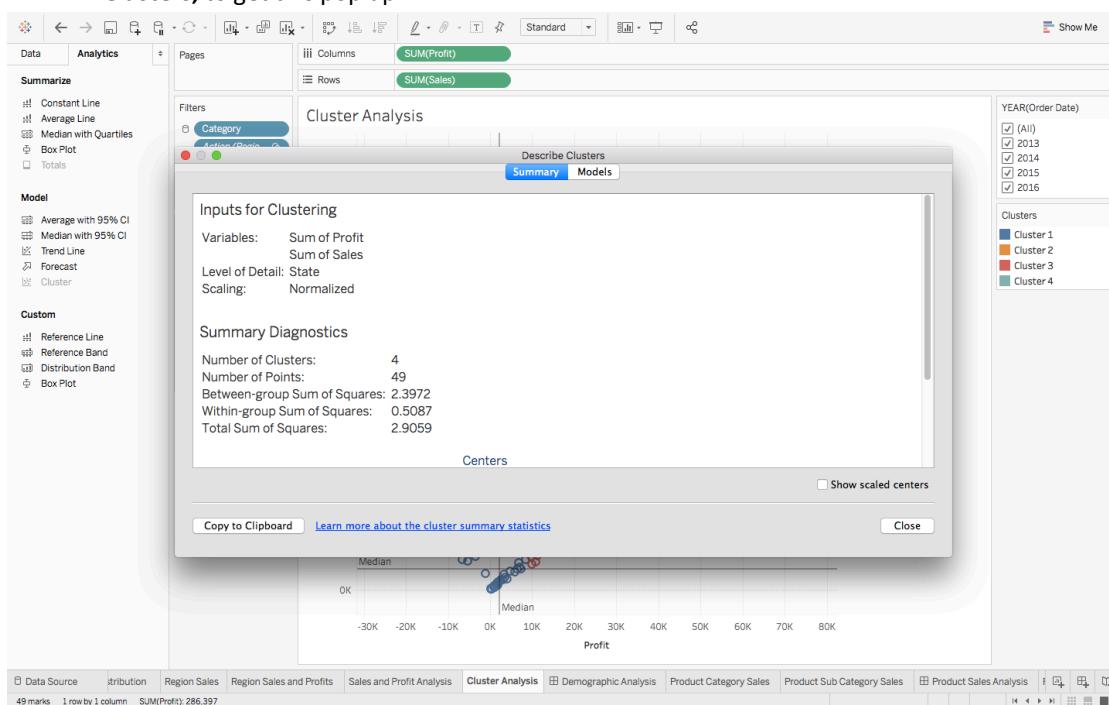
3.5 Clusters

Let's head back to the **Sales and Profit Analysis** chart that we had made. Remember the detailed inference that we had generated from it? We are just going to make that a bit more prominent now, using **Clusters**. To make them :

1. Go to **Analytics** and choose **Clusters**.
2. You can format the Cluster formation as per your wishes. Here we are clustering based on the **Sum of Sales and Profit**, choosing the **number of clusters to be 4** :



3. To view the Cluster information, right click on **Clusters** in the **Marks Pane**, and select **Describe Clusters**, to get this pop up :

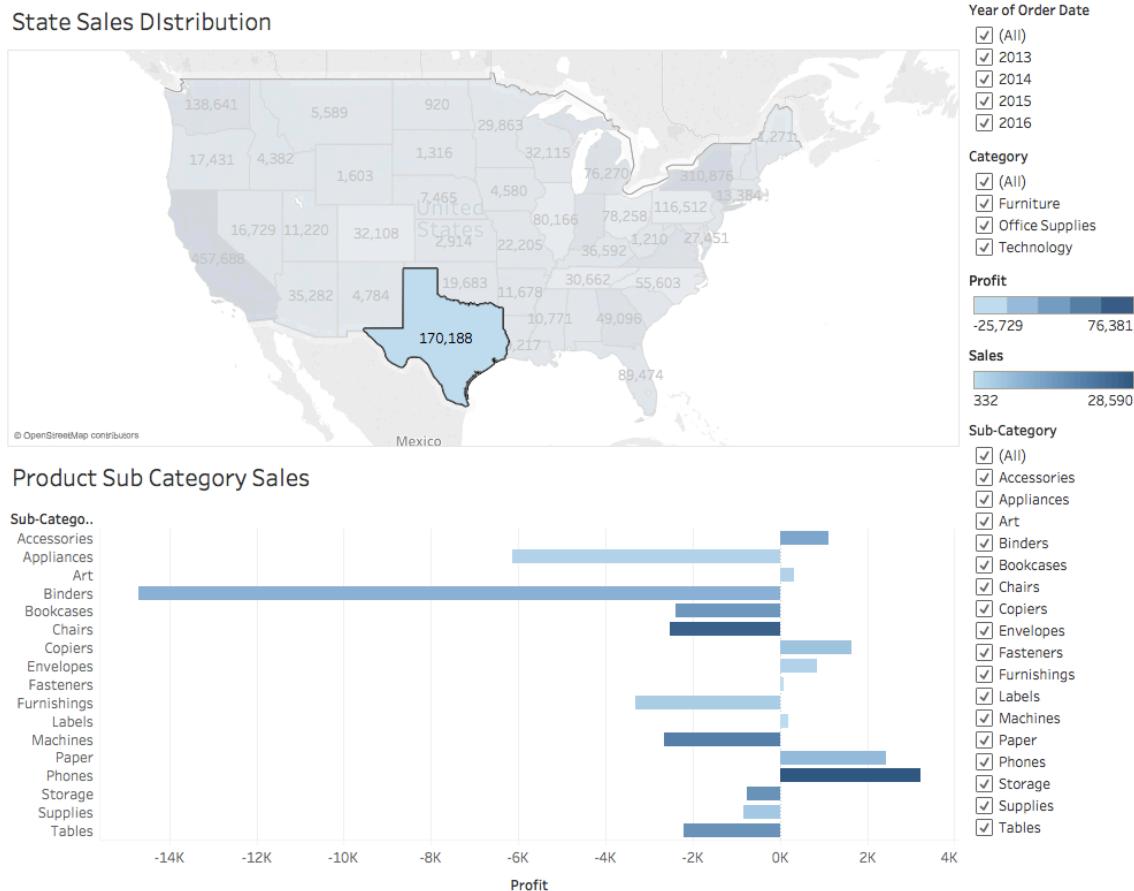


MAKE THE DASHBOARD

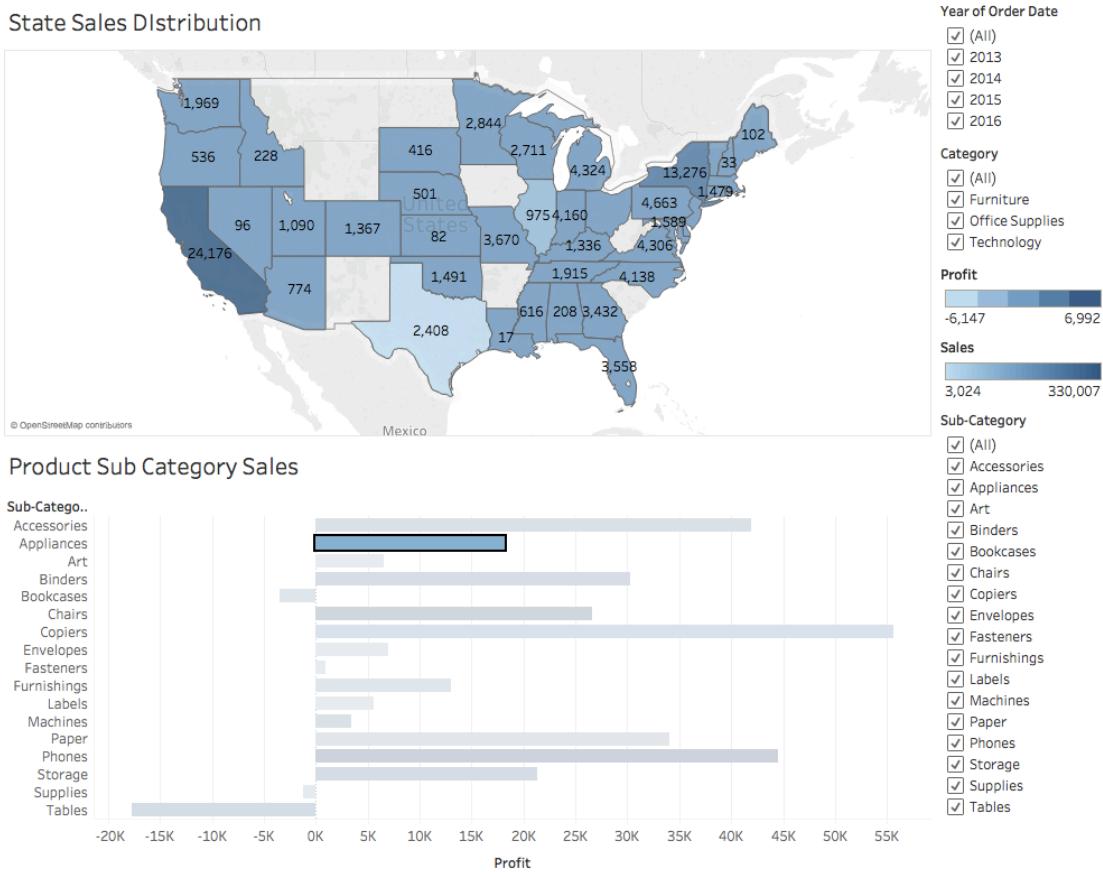
A Dashboard is simply a means of combining Worksheets together so that they convey some message.

Consider the **State Sales Distribution** Map chart and **Product Sub Categories**.

What if you wanted to know the various Sales margin of each Product within separate States? We had observed that Texas was one of the States with the lowest Profits. By looking at the following Dashboard, you will see that the reason is it's not managing to generate Profits in majority of the Products :



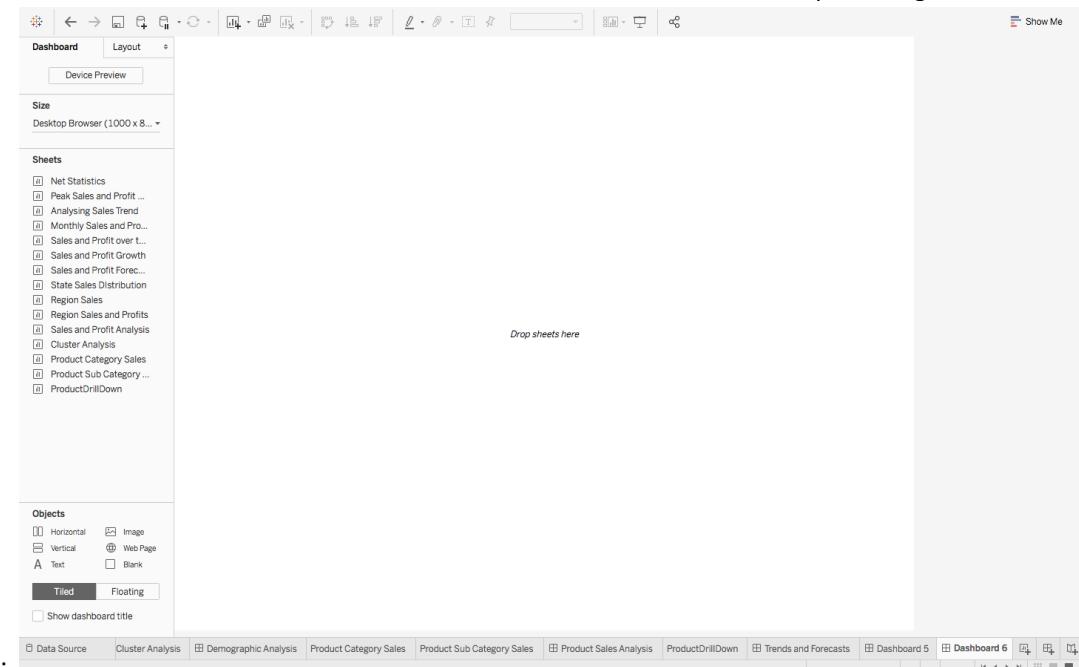
Now consider the state wise Sales distribution of a Sub – Category :



The above beautifully shows the distribution of **Appliances** over the country, where California seems to be the major Profit contributor.

Making such a Dashboard is actually quite easy. Let's see how :

1. This time instead of creating a New Worksheet, we are going to create a new Dashboard. Click on the **window like icon** next to the 'New Worksheet' icon in the bottom pane to get the following

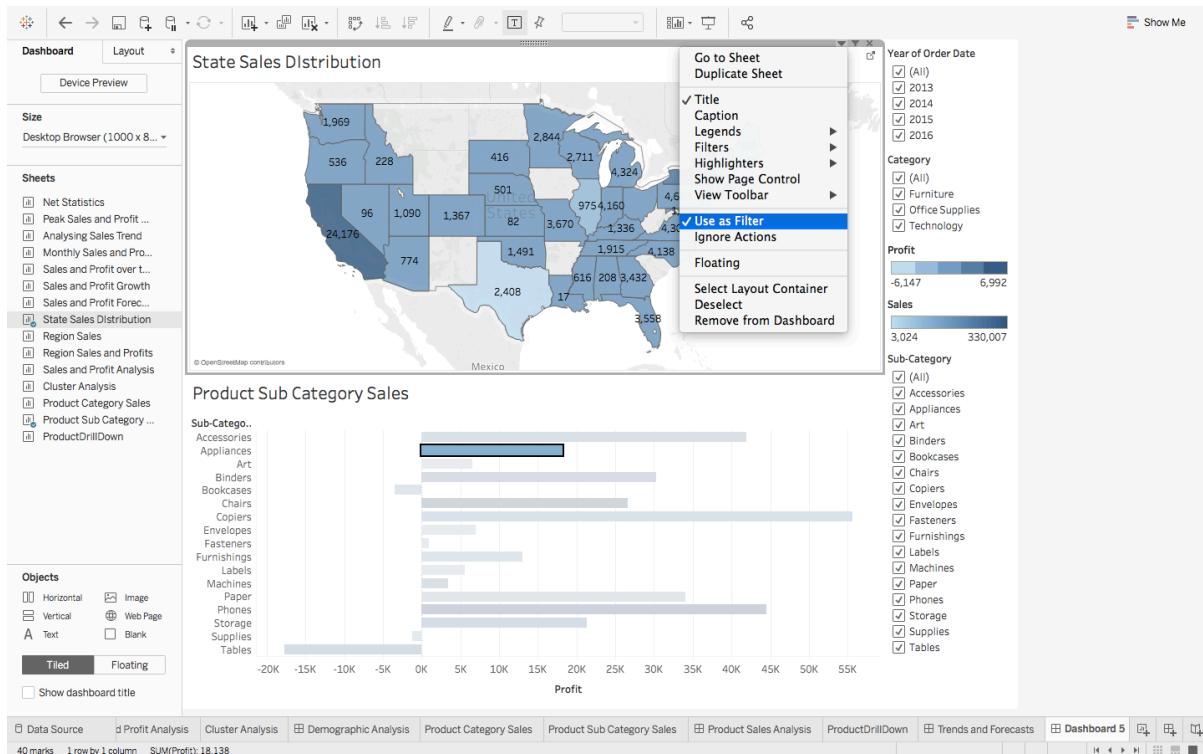


- See the multiple Worksheets that we had made till now over on the left? All that we have to do to make a Dashboard is drag these sheets from the pane to the empty area '**Drop sheets here**'.
- So to make the previously displayed Dashboard, simply drag State Sales Distribution and Product Sub Category Sales. The Dashboard will automatically make space available for both of them.

Note : Even after the creation of the Dashboards, you can still edit your Worksheets, and the same changes shall be reflected here.

If you were to click on the States or the Products after creating your first ever Dashboard, you won't observe any change. Because for such visuals, we first have to convert the Charts themselves into filters.

- Simply click on the small Down Arrow on each chart you wish to turn into a Filter, and select **Use as Filter**:

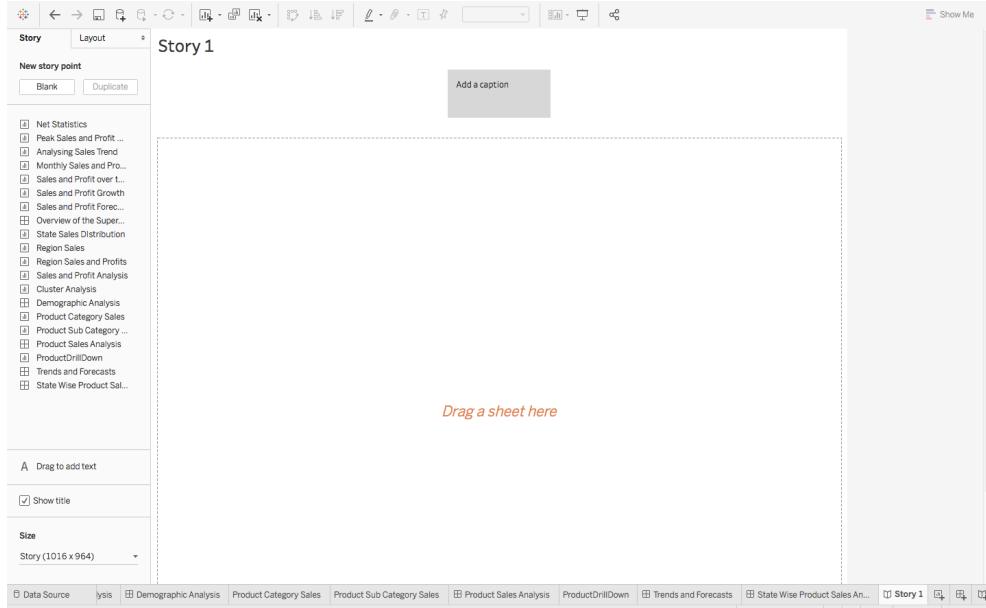


Note : While making Dashboards, it is preferred to **use your charts** as Filters, rather than cluttering up the view with custom ones.

TELL THE STORY

Just like Dashboards were a way to combine the Worksheets, a Story is where you combine all the dashboards, and if need be individual Sheets as well, to convey, as the name suggests – a Story.

1. Just like before, you simply drag your Worksheets and Dashboards onto the empty space :



So let's combine all those Dashboards that we had made into what could perhaps make a decent presentation for a beginner. Do ensure to **Add a Caption** to all of your Dashboards, to convey your message clearly :



Overview of the Superstore

Net Statistics

Profit	Quantity	Sales
286,397	37,873	2,297,201

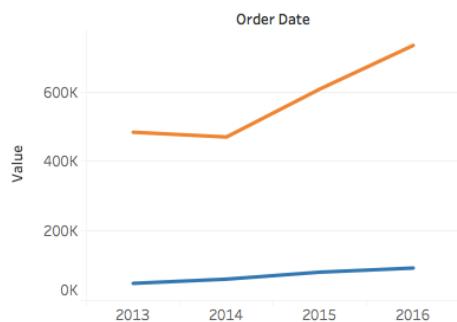
Year of Order Date

- (All)
- 2013
- 2014
- 2015
- 2016

Measure Names

- Profit
- Sales

Sales and Profit Growth



Peak Sales and Profit Months



Year of Order Date

Year of Order Date	Sales
2013	484,247.4981
2014	470,532.509
2015	608,473.83
2016	733,947.0232
	49,544
	61,619
	81,727
	93,508

Month of Order Date

Month of Order Date	Sales
January	95,656.6036
February	59,640.1474
March	204,475.8308
April	138,260.6826
May	154,732.1607
June	151,804.5883
July	146,416.889
August	161,194.253
September	307,148.0297
October	197,098.3697
...	...
	9,203
	10,286
	28,608
	11,567
	22,377
	21,035
	13,864
	22,043
	36,889
	31,304
	...

This is a whirlwind tour of the basics of Tableau. The following Dashboard is made from the same data as you've been using.

