

**DATA AND
ARTIFICIAL INTELLIGENCE**

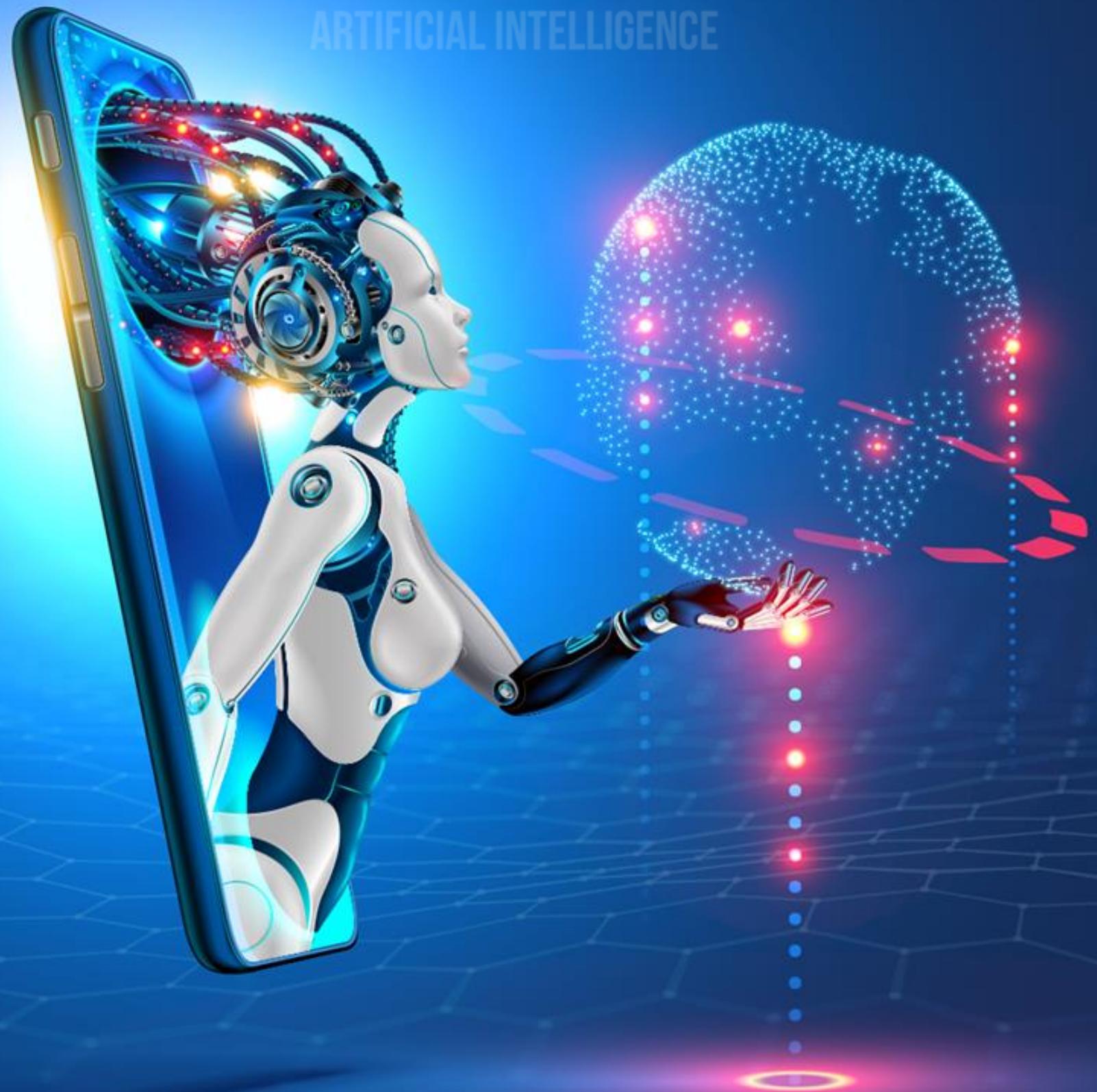


Tableau Training



Creating Charts and Graphs

Learning Objectives

By the end of this lesson, you will be able to:

- Create charts and graphs in Tableau
- Describe various charts used in Tableau
- Use maps in Tableau
- Evaluate the geocoding in Tableau



A Day in the Life of a Data Analyst



As a Data Analyst of an organization:

You are asked to visualize a large amount of data to get better insights from the dataset.

Also, it is important to select the most suitable chart or graph for a particular type of dataset.

To achieve these tasks, you are required to learn various types of charts and graphs present in the tableau, how to create them and when to use them.

Creating Charts in Tableau

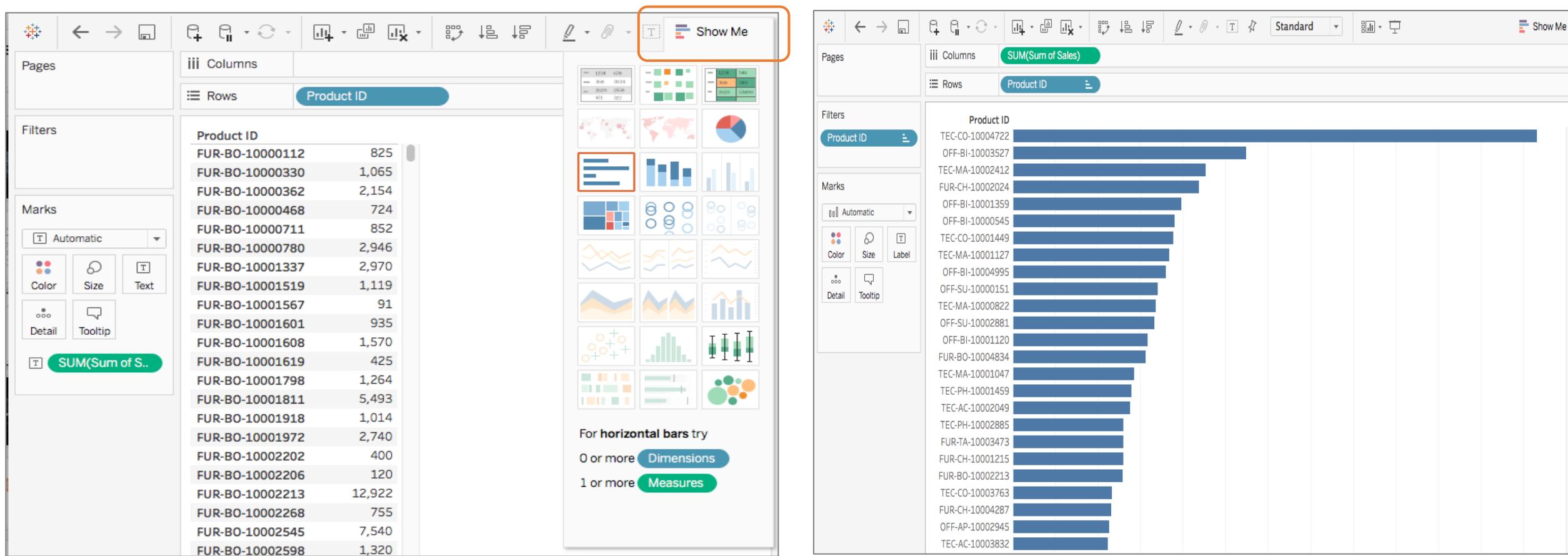
Creating Charts in Tableau

Charts contain visually-appealing data representations that are usually easier to understand than tables with numbers.



Creating Charts in Tableau

To create a chart from a worksheet, click on the **Show Me** button to see chart options.



Text Table and Cross Table

Text Table and Cross Table

Text table and cross table display data in rows and columns in a tabular format.

A text table has comprehensive aggregated data in a table, whereas a cross table has a two-way display of total and subtotal.

These table forms are used to provide reference data to the user.

Text Table and Cross Table

Steps to create cross table:

The screenshot shows the Tableau Data Source interface. The 'Tables' pane on the left lists various dimensions and measures, including Customer Name, Order Date, Order ID, Postal Code, Product ID, Product Name, Region, Row ID, Segment, Ship Date, Ship Mode, State, Sub-Category, Measure Names, Discount, Profit, Quantity, Sales, Latitude (generated), Longitude (generated), Orders (Count), and Measure Values. The 'Data' tab is selected. In the top right, the 'Rows' shelf is highlighted with the 'Sub-Category' field selected. The 'Marks' shelf shows 'Automatic' as the mark type, with options for Color, Size, and Text.

Step 1

Drag Sub-Category to Rows

Text Table and Cross Table

Steps to create cross table:

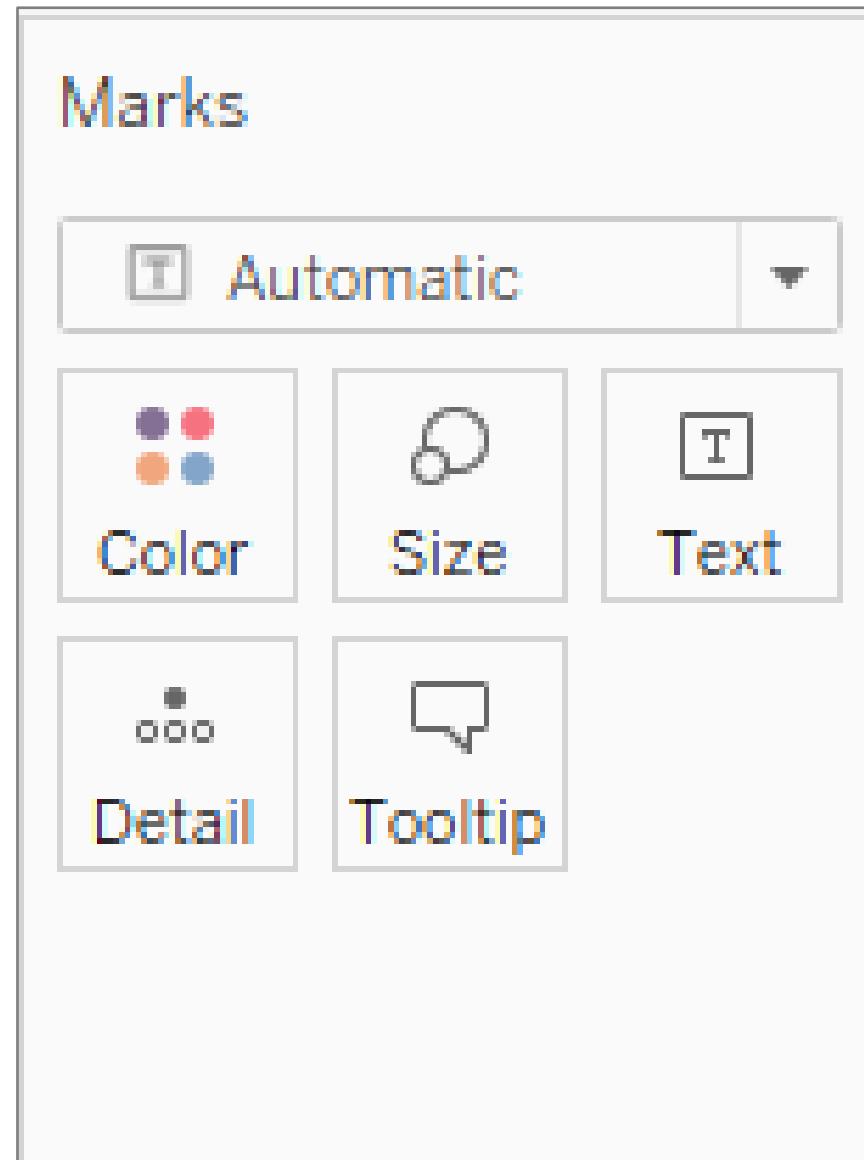
The screenshot shows the Tableau Data Editor interface. In the top navigation bar, 'Data' is selected. Below the menu, there are two sections: 'Pages' and 'Filters'. The 'Pages' section has 'Columns' set to 'Region' and 'Rows' set to 'Sub-Category', both highlighted with a red box. The 'Filters' section contains a 'Tables' list on the left and a 'Marks' card on the right. The 'Marks' card includes options for 'Automatic', 'Color', 'Size', 'Text', 'Detail', and 'Tooltip'. The main workspace displays a data grid titled 'Region' with columns 'Central', 'East', 'South', and 'West'. The data rows include 'Accessories', 'Appliances', 'Art', 'Binders', 'Bookcases', 'Chairs', 'Copiers', 'Envelopes', 'Fasteners', 'Furnishings', 'Labels', 'Machines', 'Paper', 'Phones', 'Storage', 'Supplies', and 'Tables'. Each row has four entries corresponding to the columns.

Step 2

Drag Region to Columns

Text Table and Cross Table

Steps to create cross table:

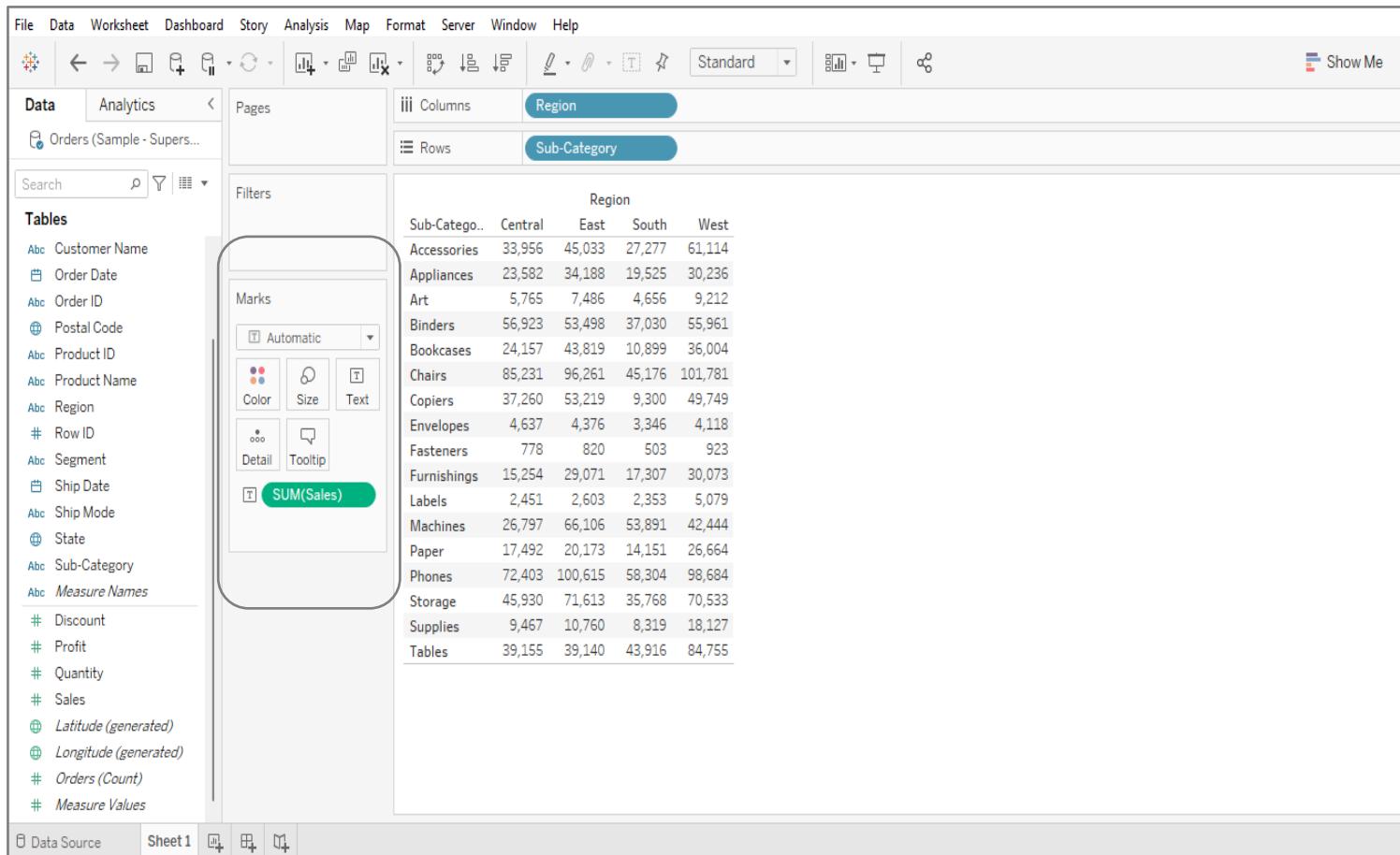


Step 3

The **Marks** type would be automatically marked as **Text**

Text Table and Cross Table

Steps to create cross table:



Step 4

Drag **Sales** to **Text** under Marks card to display the text in the table

Highlight Tables

Highlight Tables

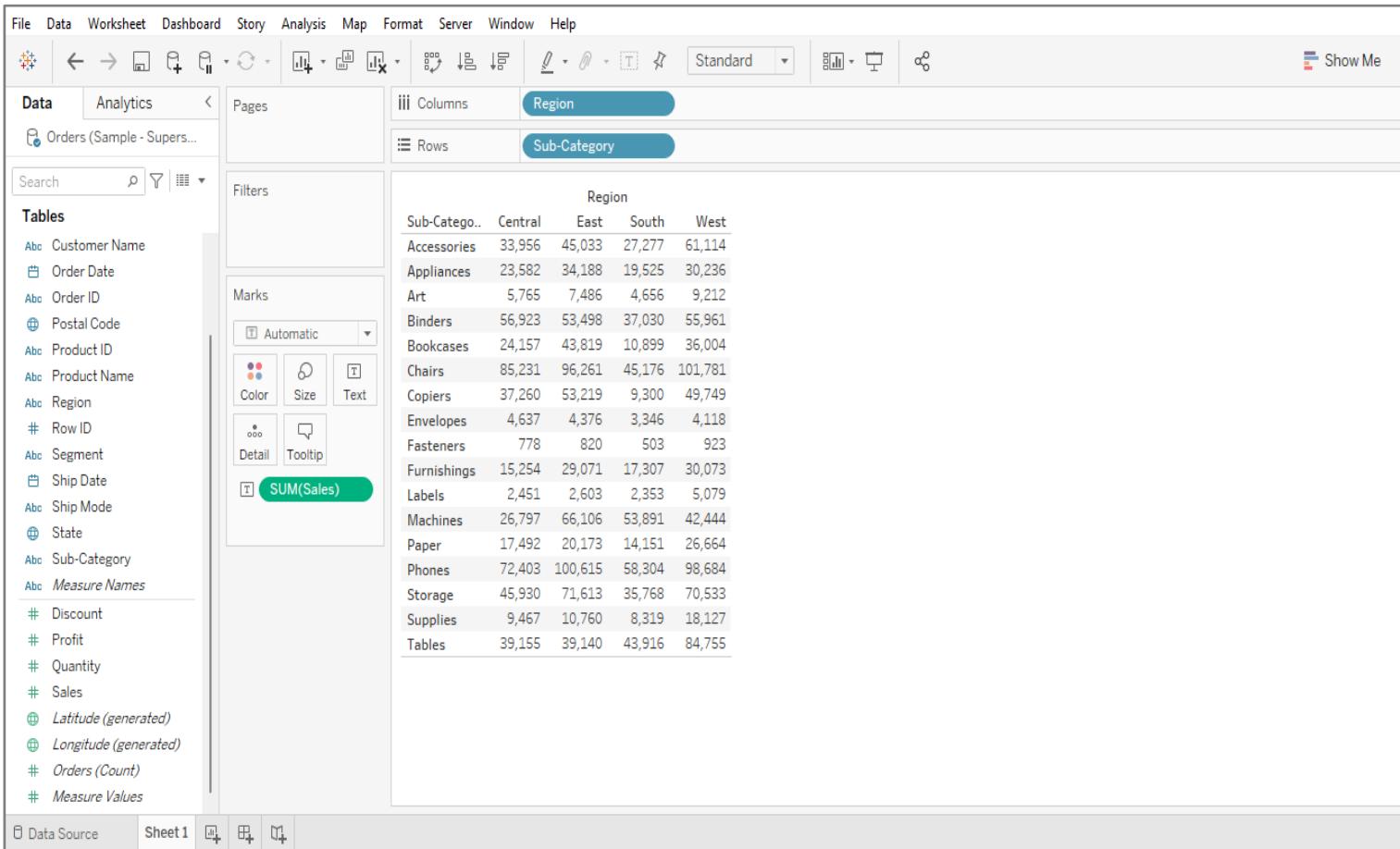
Colors are used to highlight text in highlight tables, depending on the value.

Sub-Catego..	Region			
	Central	East	South	West
Accessories	33,956	45,033	27,277	61,114
Appliances	23,582	34,188	19,525	30,236
Art	5,765	7,486	4,656	9,212
Binders	56,923	53,498	37,030	55,961
Bookcases	24,157	43,819	10,899	36,004
Chairs	85,231	96,261	45,176	101,781
Copiers	37,260	53,219	9,300	49,749
Envelopes	4,637	4,376	3,346	4,118
Fasteners	778	820	503	923
Furnishings	15,254	29,071	17,307	30,073
Labels	2,451	2,603	2,353	5,079
Machines	26,797	66,106	53,891	42,444
Paper	17,492	20,173	14,151	26,664
Phones	72,403	100,615	58,304	98,684
Storage	45,930	71,613	35,768	70,533
Supplies	9,467	10,760	8,319	18,127
Tables	39,155	39,140	43,916	84,755

Highlighting is based on set conditions for a value.

Highlight Tables

Steps to create highlight table:

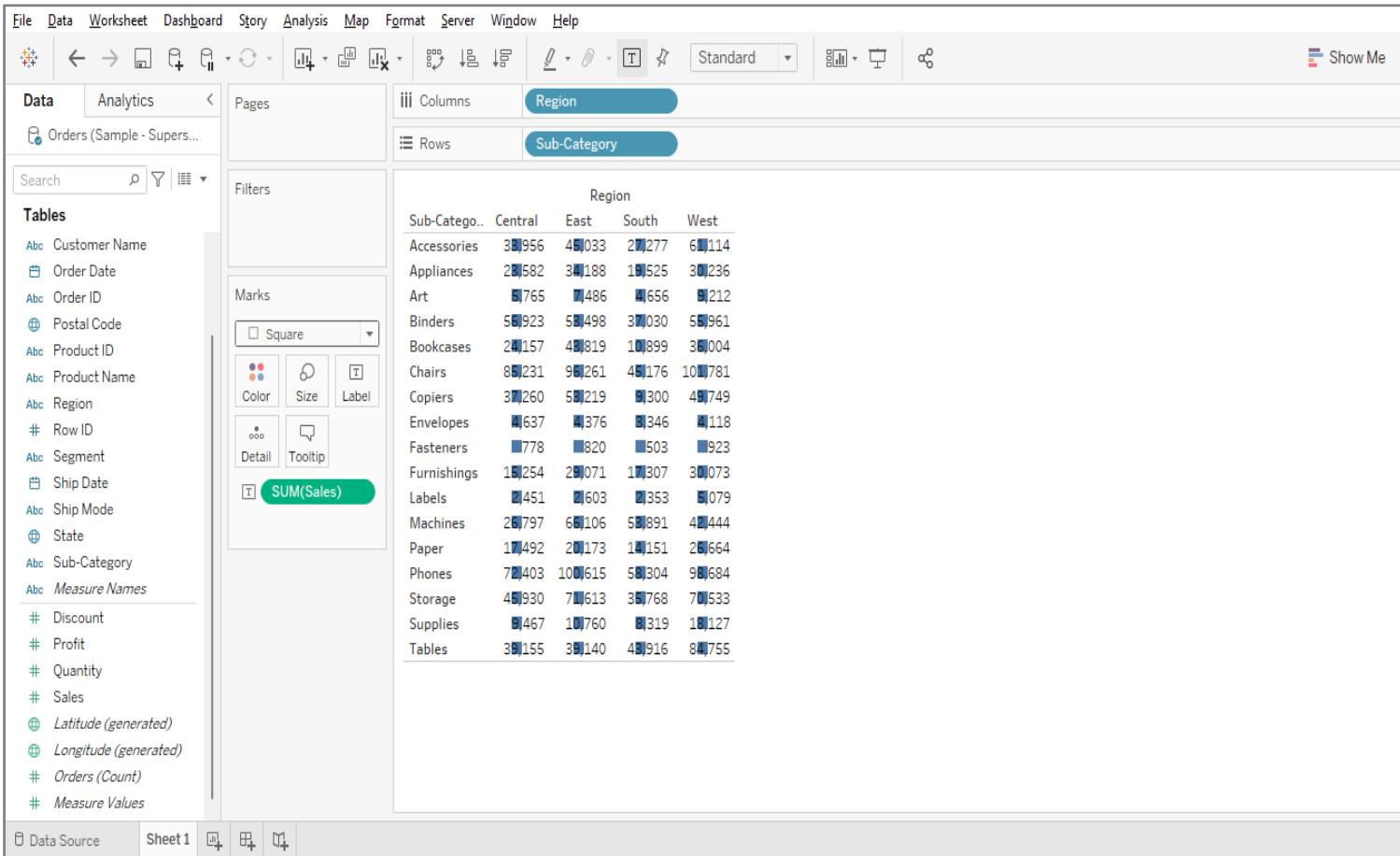


Step 1

Create a text table

Highlight Tables

Steps to create highlight table:

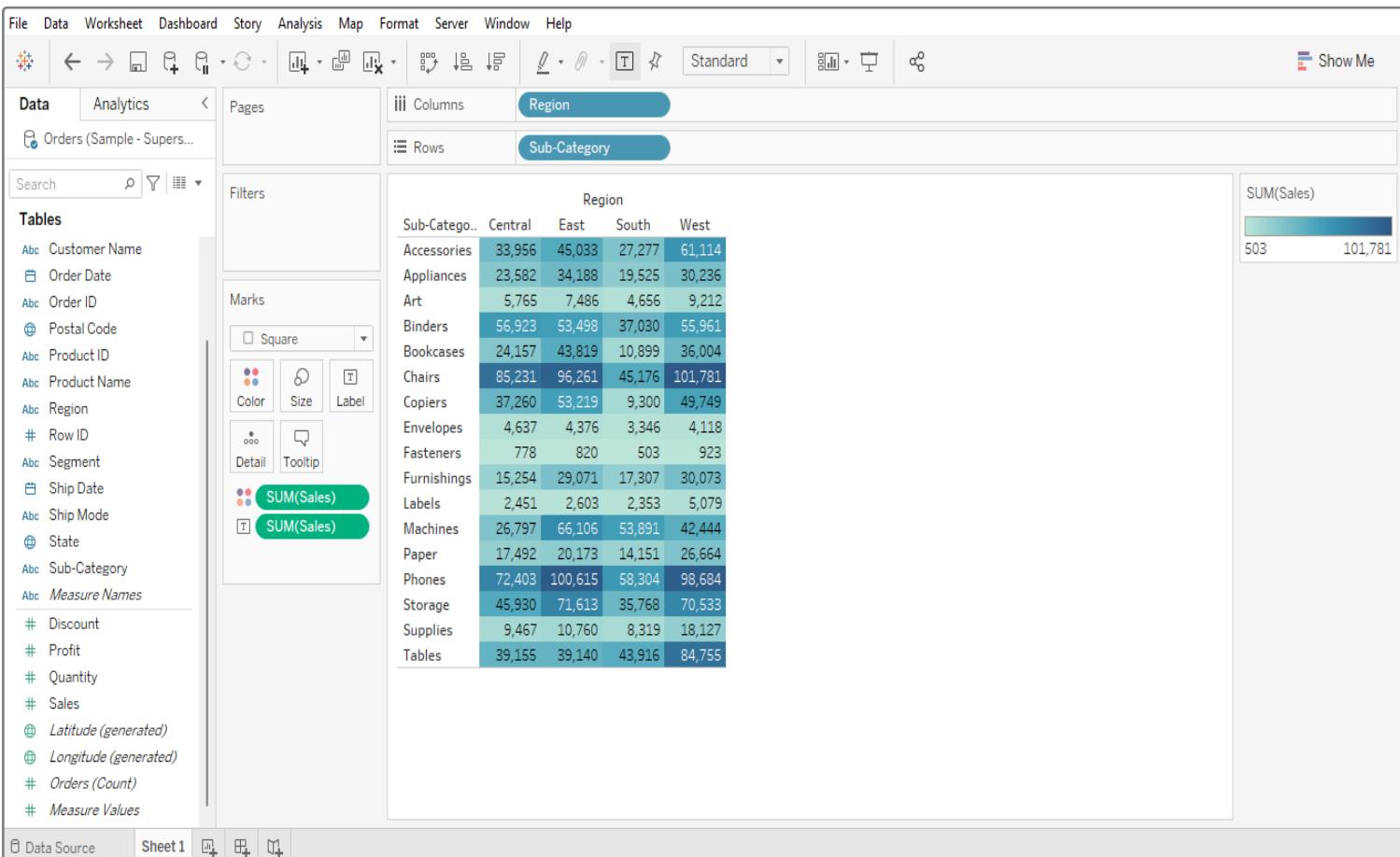


Step 2

Change the Marks Type to Square

Highlight Tables

Steps to create highlight table:

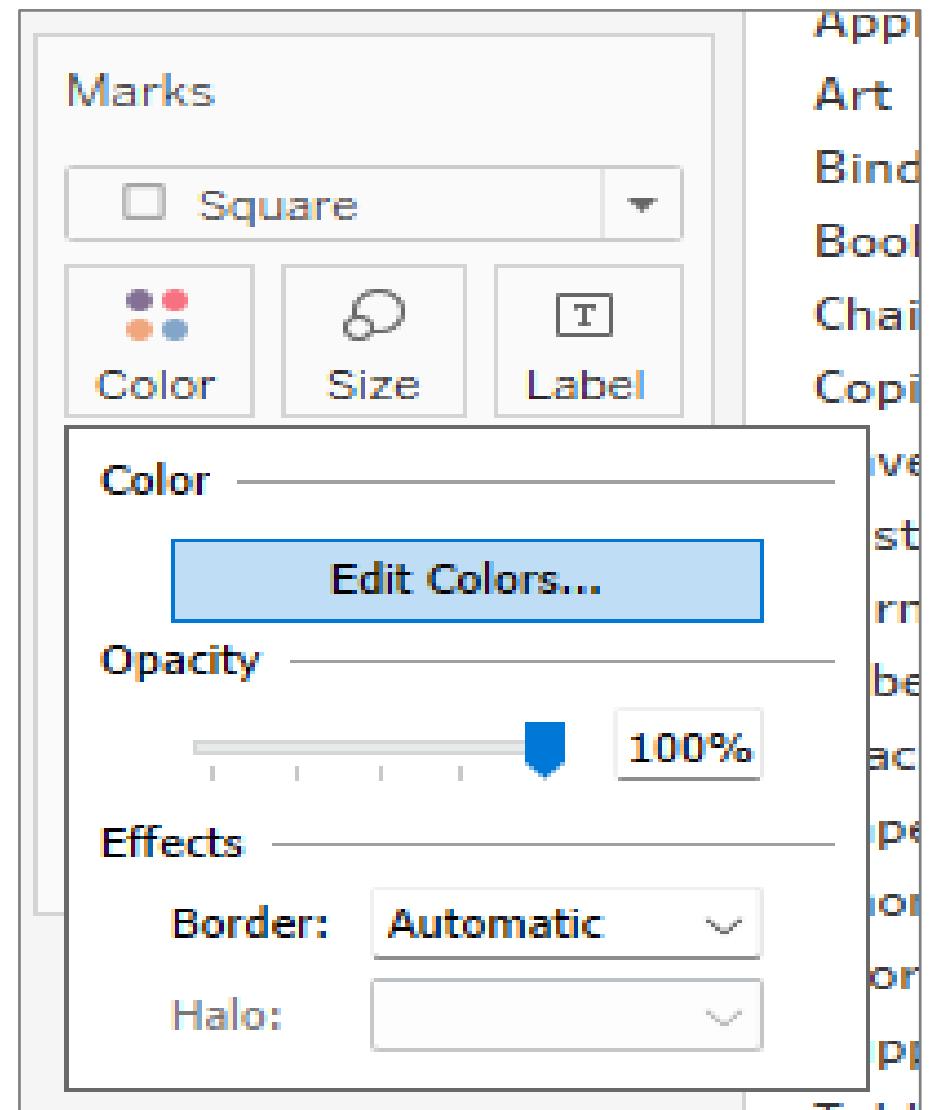


Step 3

Drag Sales to Colors in marks card

Highlight Tables

Steps to create highlight table:

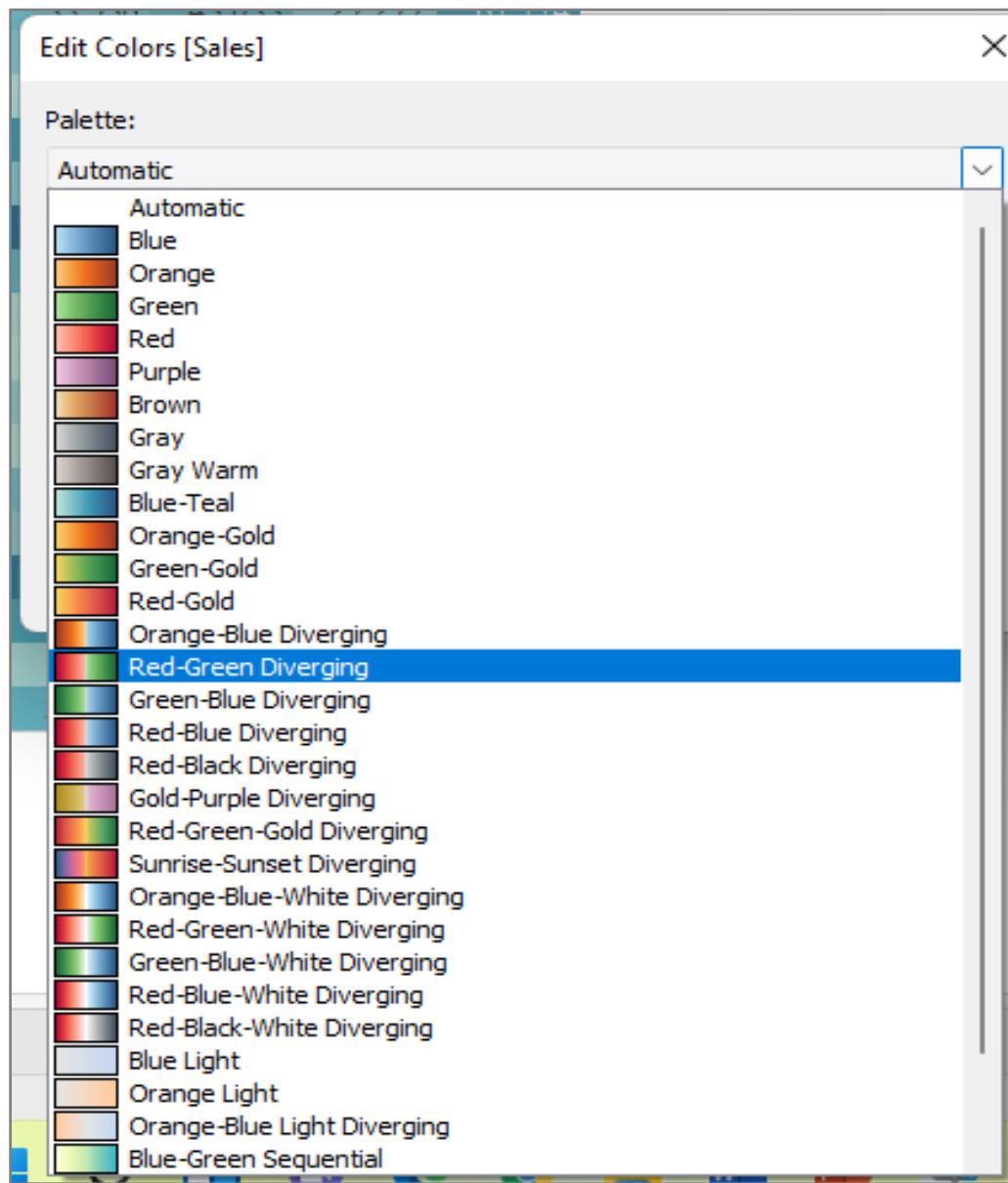


Step 4

To change the colors, click on the colors card and select **Edit Colors**

Highlight Tables

Steps to create highlight table:

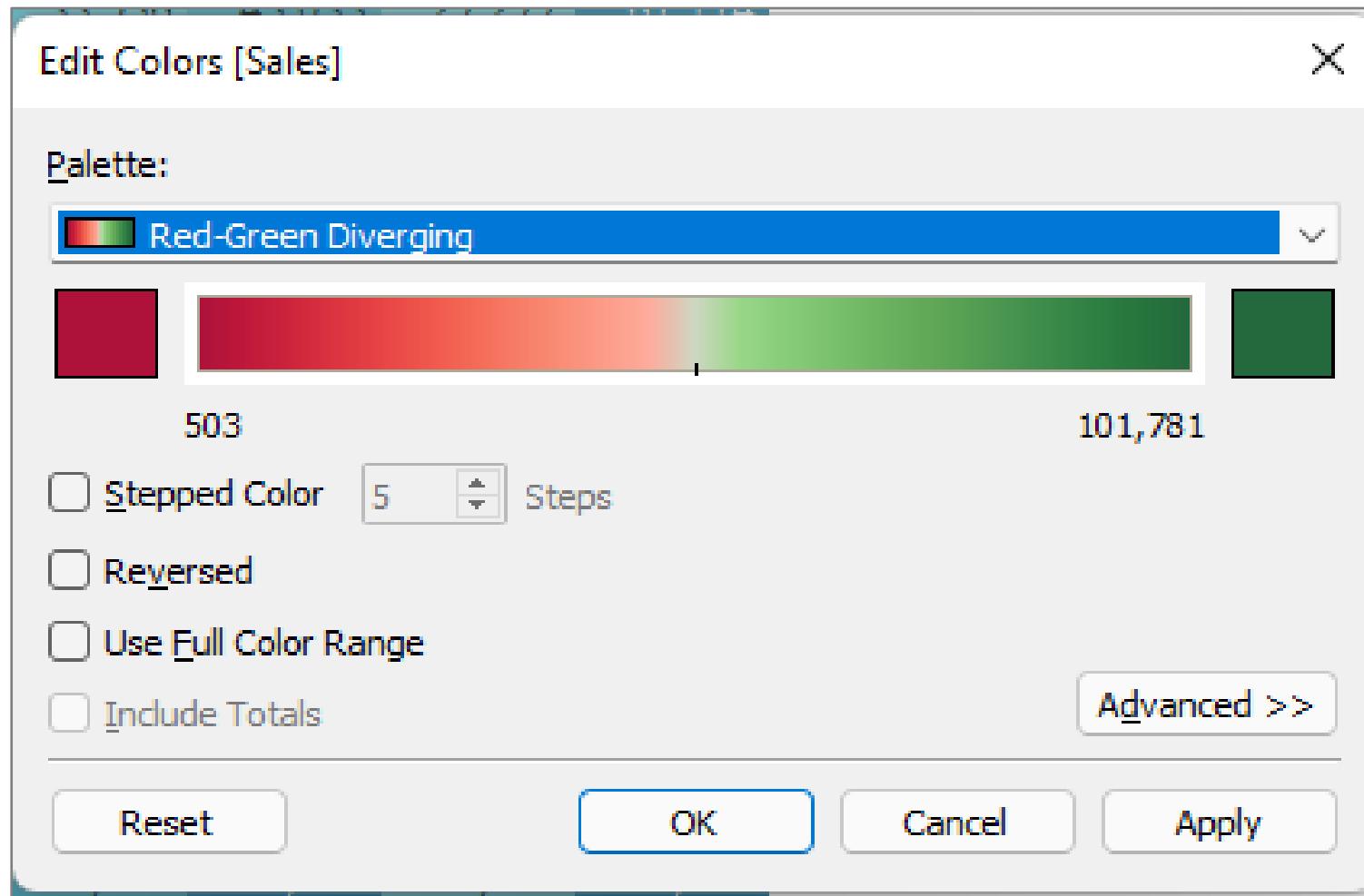


Step 5

Select the **color palette** per the requirement

Highlight Tables

Steps to create highlight table:

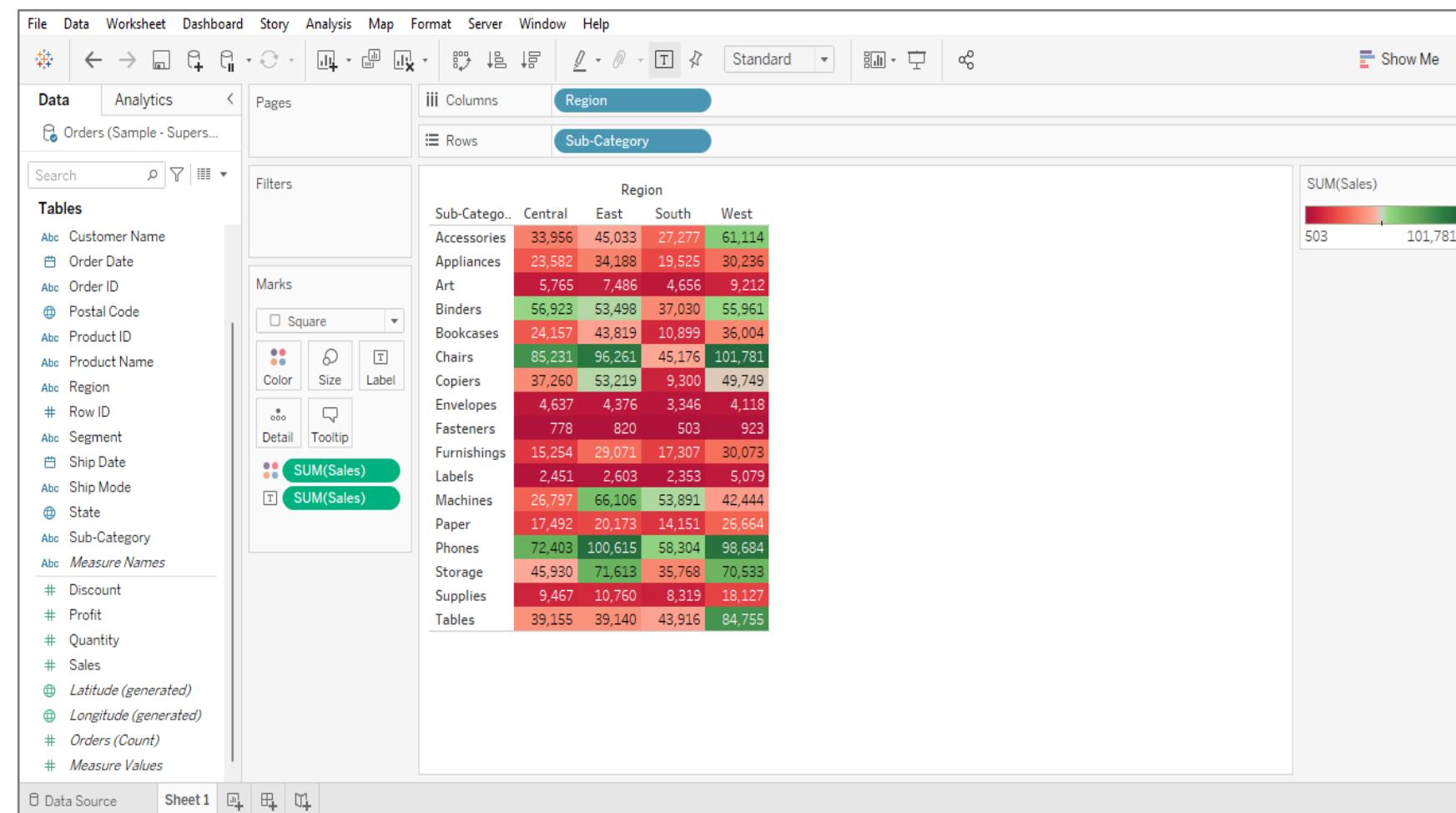


Step 5

Click **OK** when done

Highlight Tables

Observe the changes in colors in the highlight table

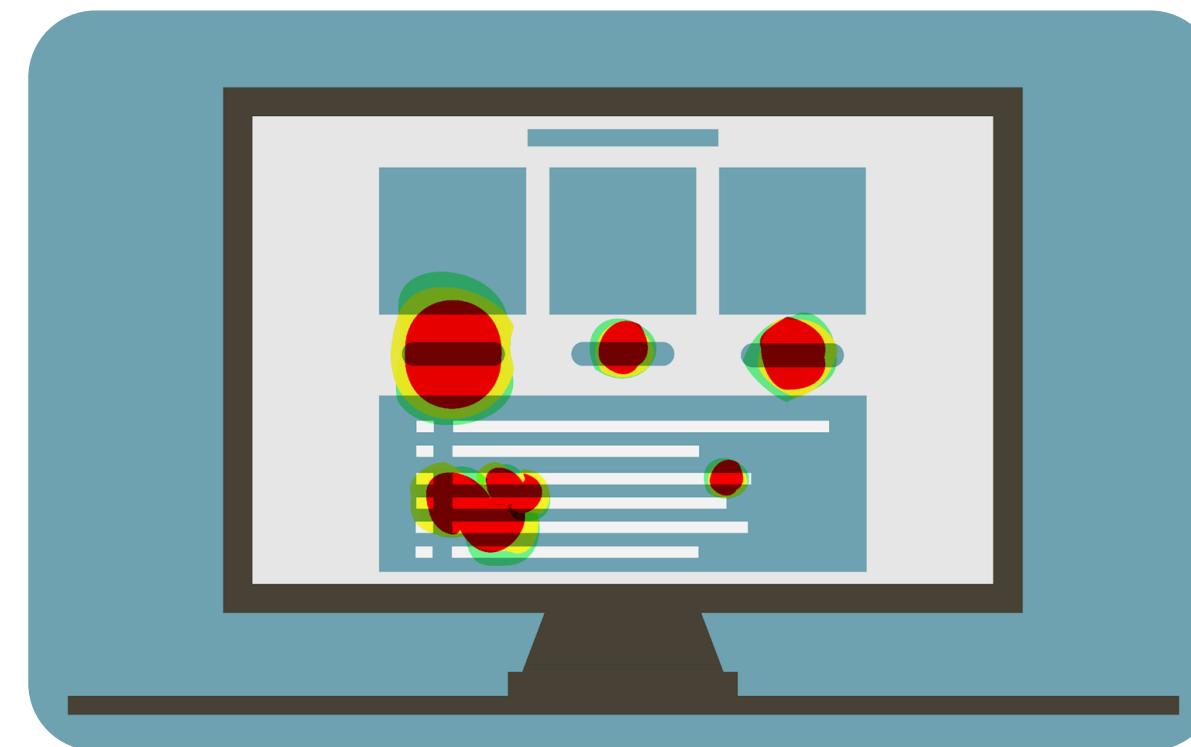


Heat Maps

Heat Maps



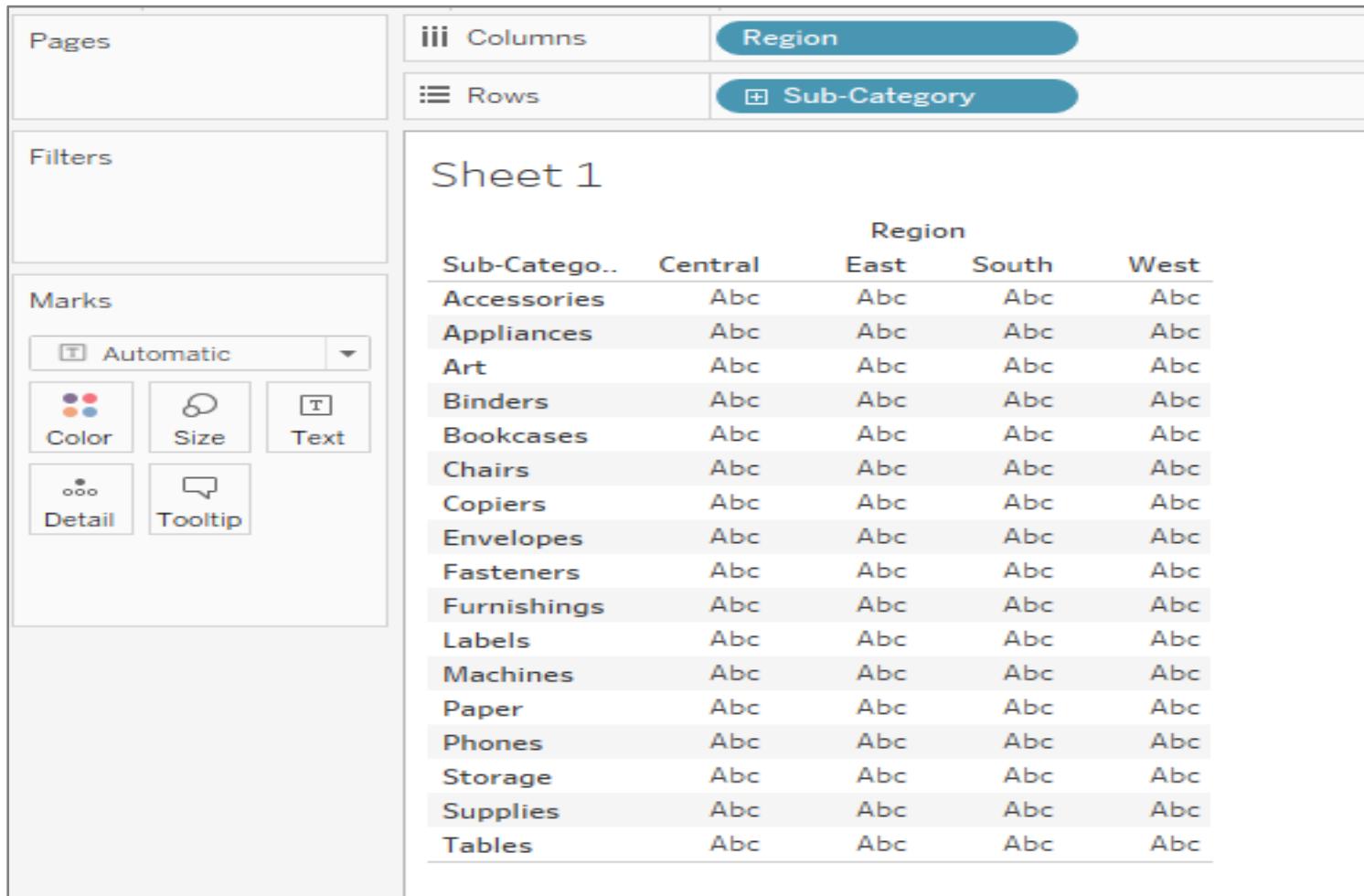
A heat map is a two-dimensional representation of data that uses colors to convey information.



As the density of records per mark increases, the color intensity increases.

Heat Maps

Steps to create Heat Maps:

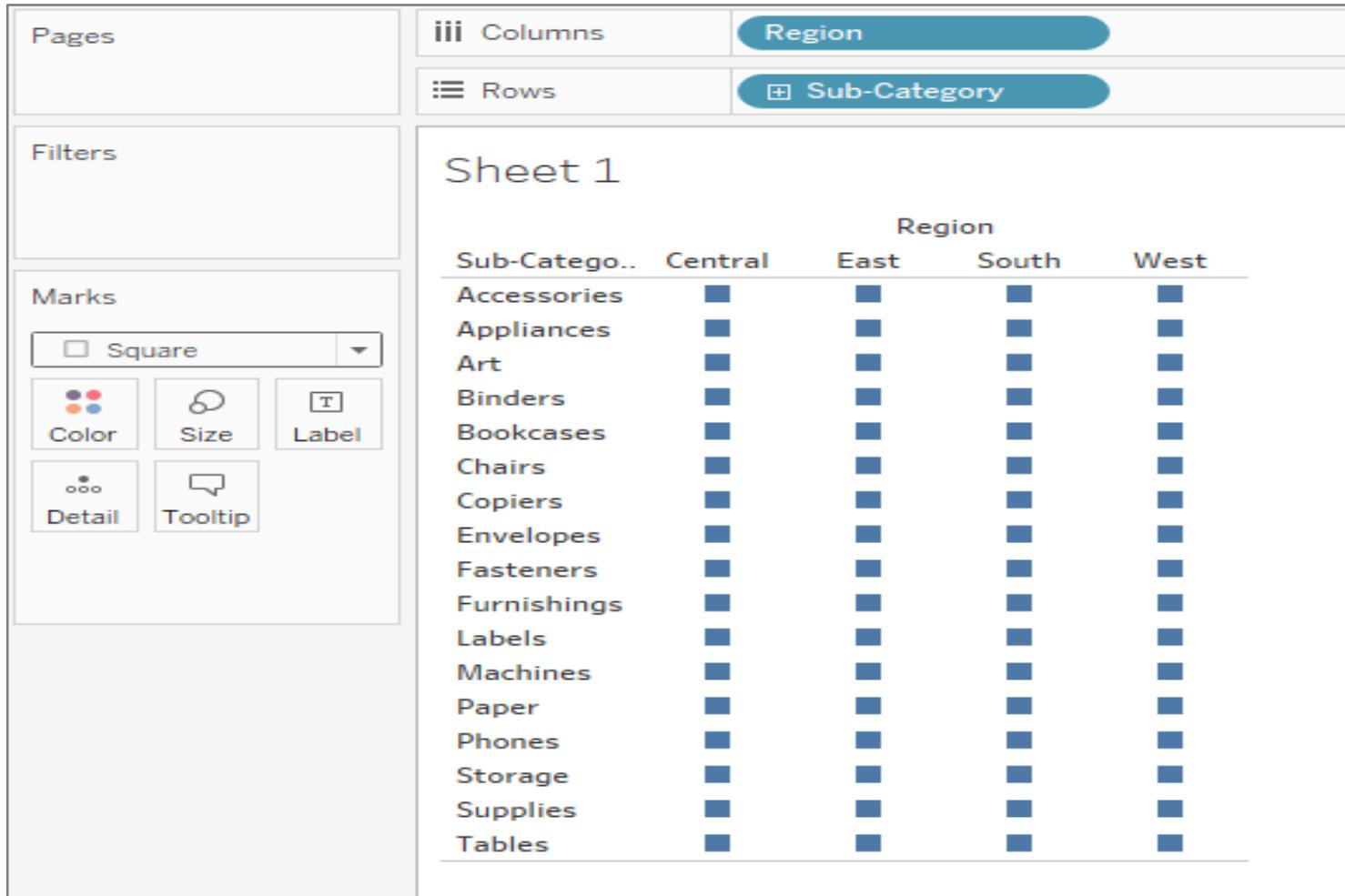


Step 1

Add **Sub-Category** to **Rows** and **Region** to **Columns**

Heat Maps

Steps to create Heat Maps:

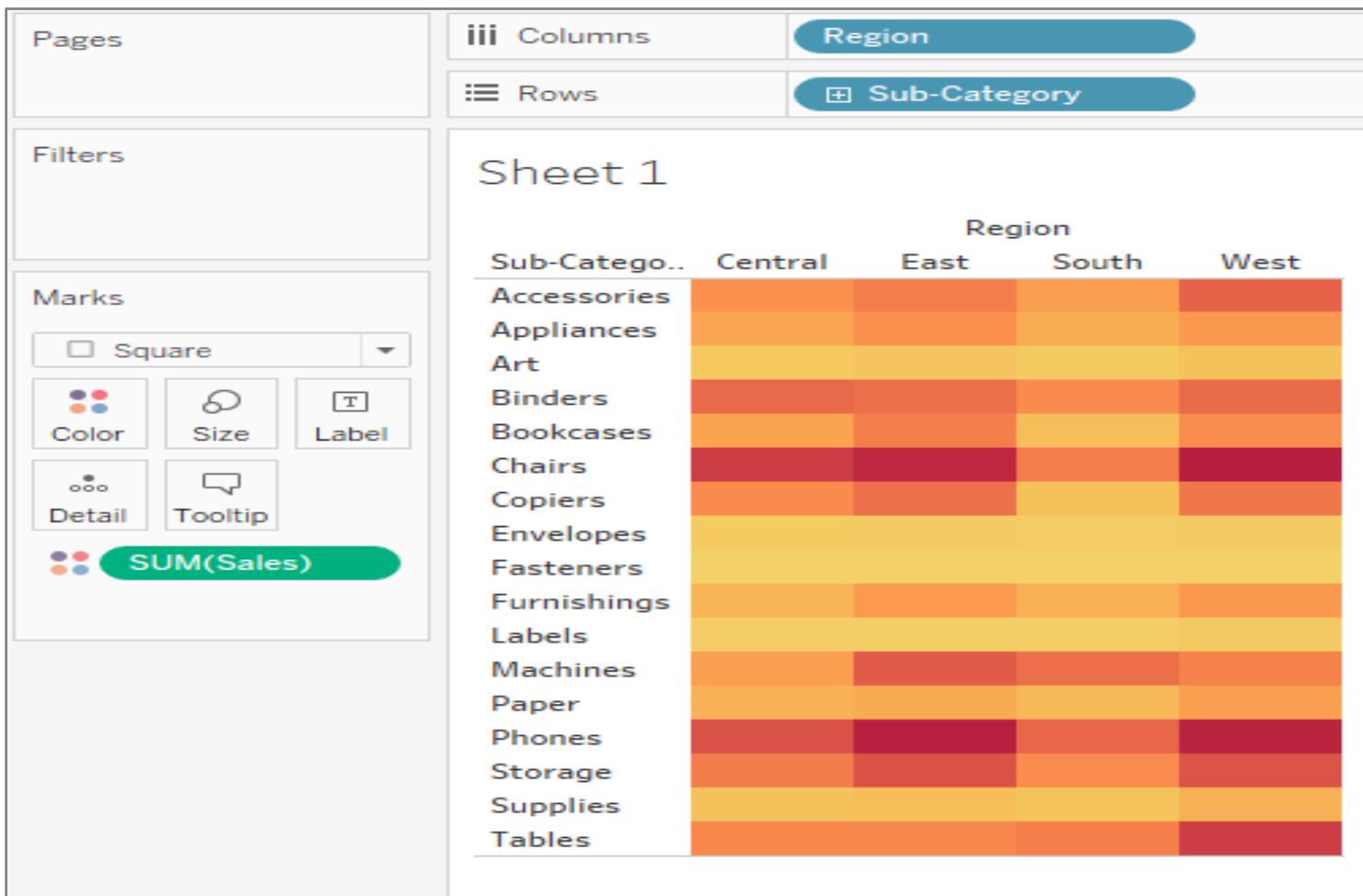


Step 2

Select **Marks** type as Square

Heat Maps

Steps to create Heat Maps:



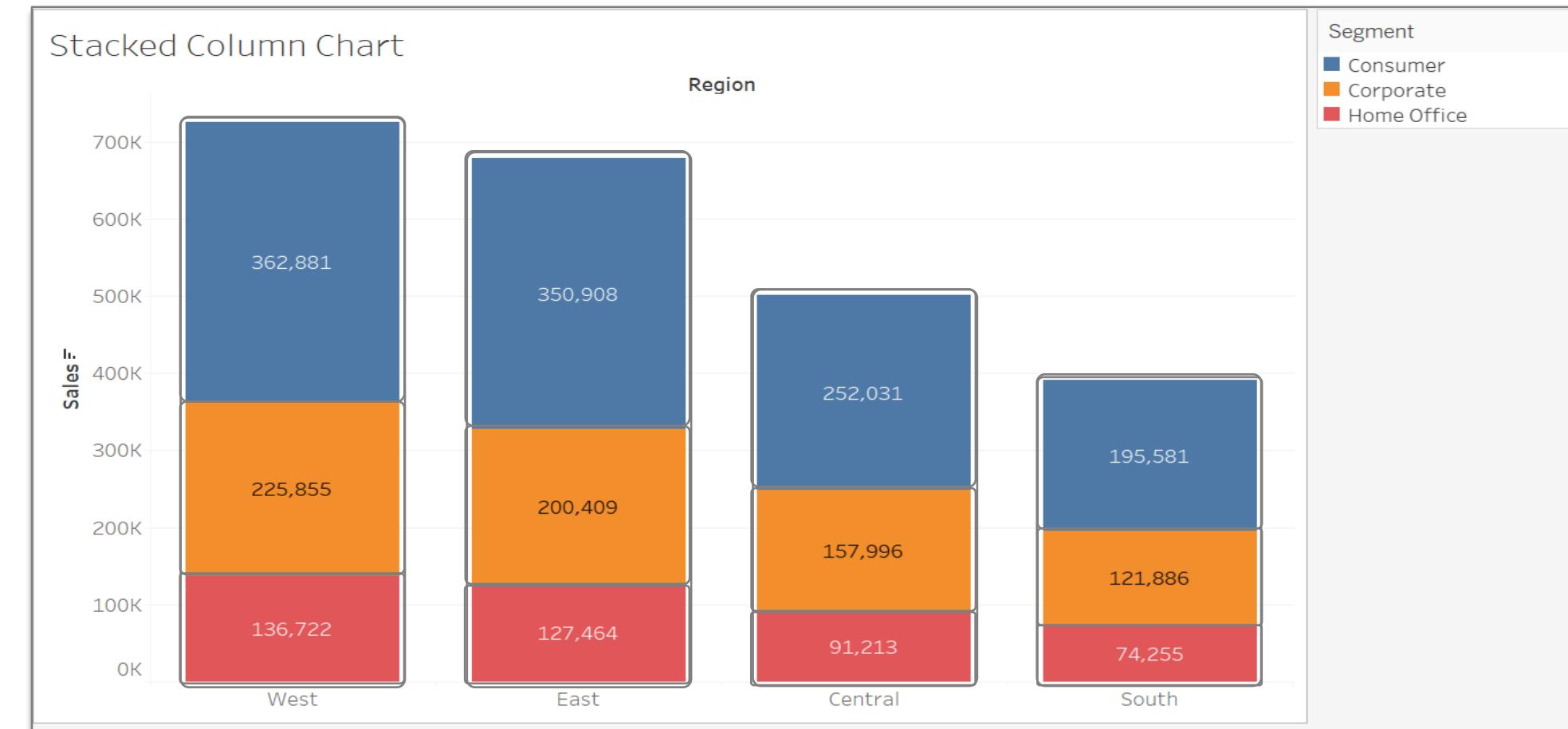
Step 3

Click on **Color** and edit colors for selecting the color scales

Stacked Bar Chart

Stacked Bar Chart

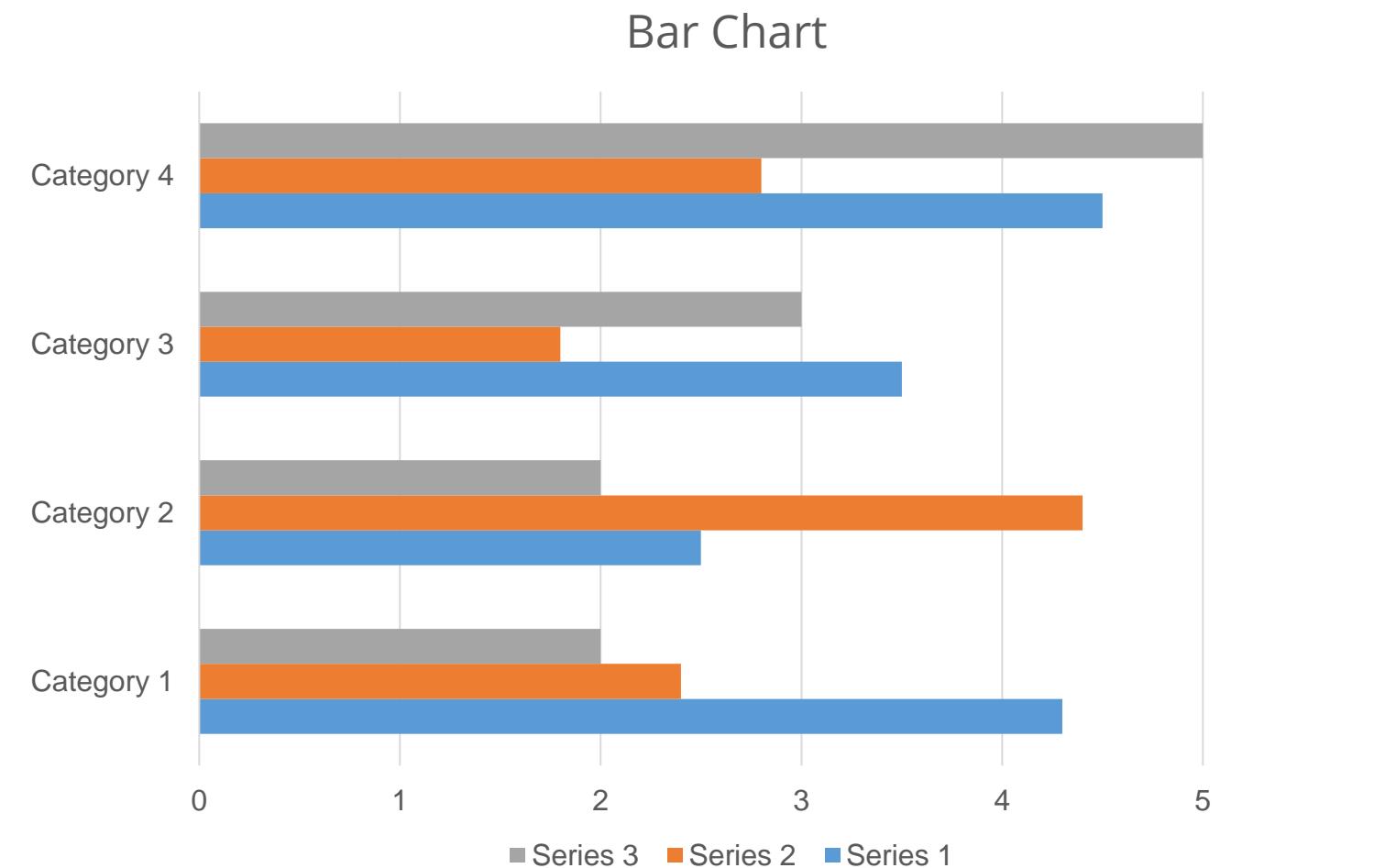
A bar chart is used to showcase one measure against a few categorical values.



In a stacked bar chart, each category is divided into subcategories for detailed analysis.

Stacked Bar Chart

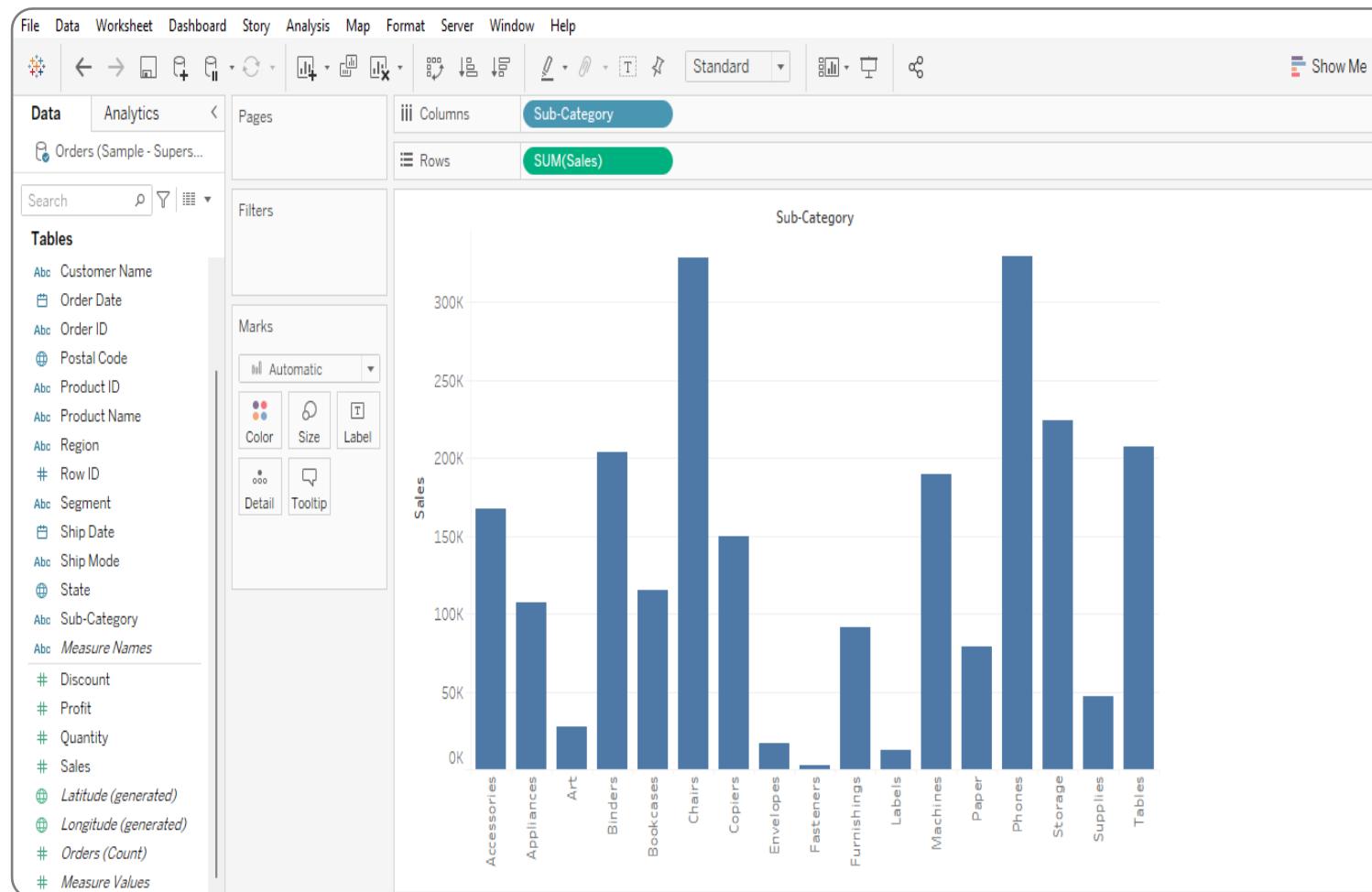
A stacked bar chart can be used to split the bar into categories.



The bar gets split into separate bars and is displayed as stacked on top of another.

Stacked Bar Chart

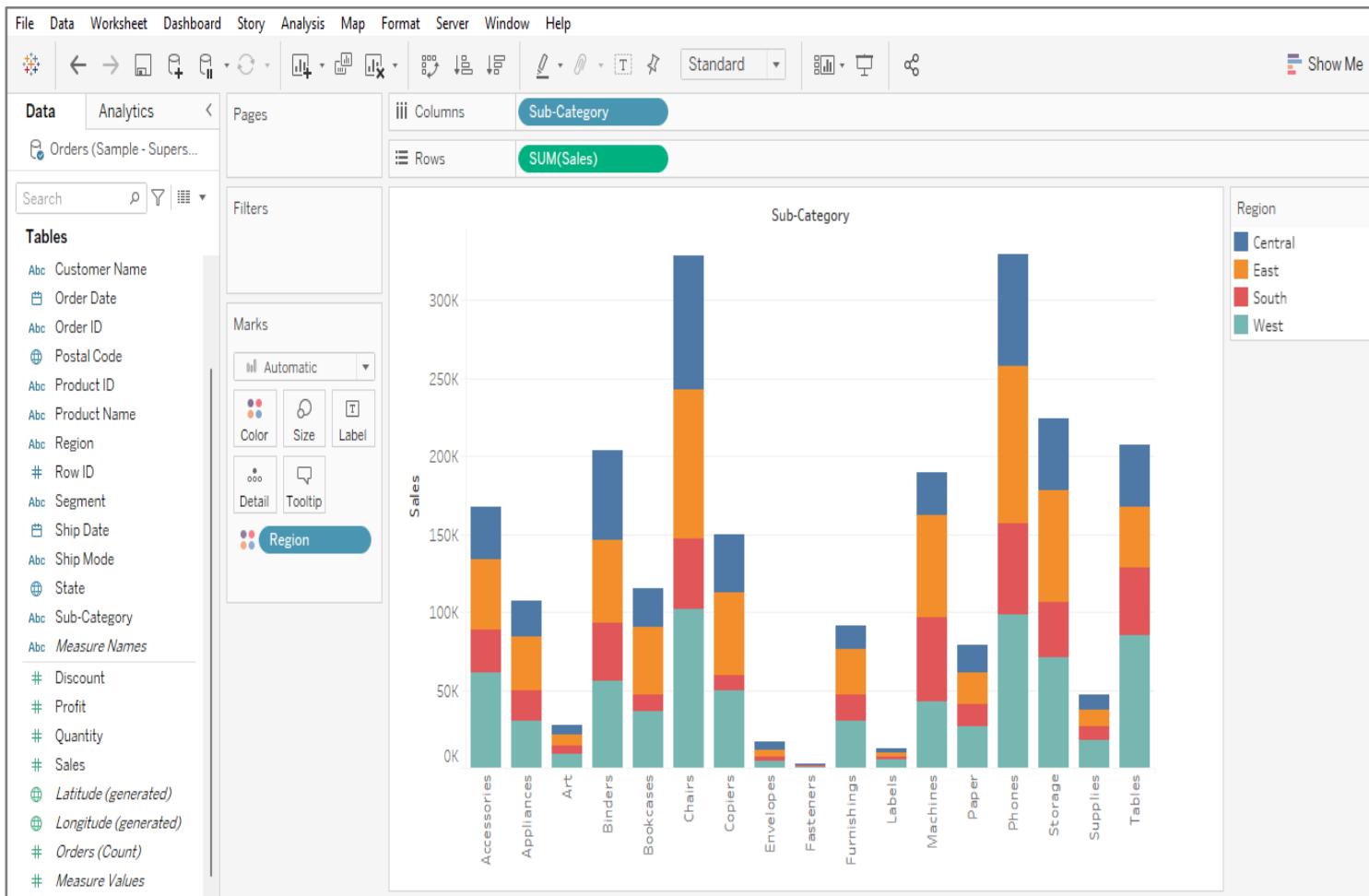
Steps to create a stacked bar chart



Create a vertical bar chart

Stacked Bar Chart

Steps to create a stacked bar chart



Step 2

Drag **Region** to Color under Marks card

Use label field to display the data labels.

Assisted Practice: Histogram



Duration: 20 minutes

Problem statement:

The plant manager wants to analyze the distribution of distinct orders placed by the customers and the performance of those customers by creating visualizations that will help him analyze the profit ranked by customer orders.

How many orders have been placed in bin 4? (Note: Enable Labels)

Which customer is generating the highest profit, and what is the value and number of orders placed by that customer?

ASSISTED PRACTICE

Assisted Practice Guidelines



Steps to follow:

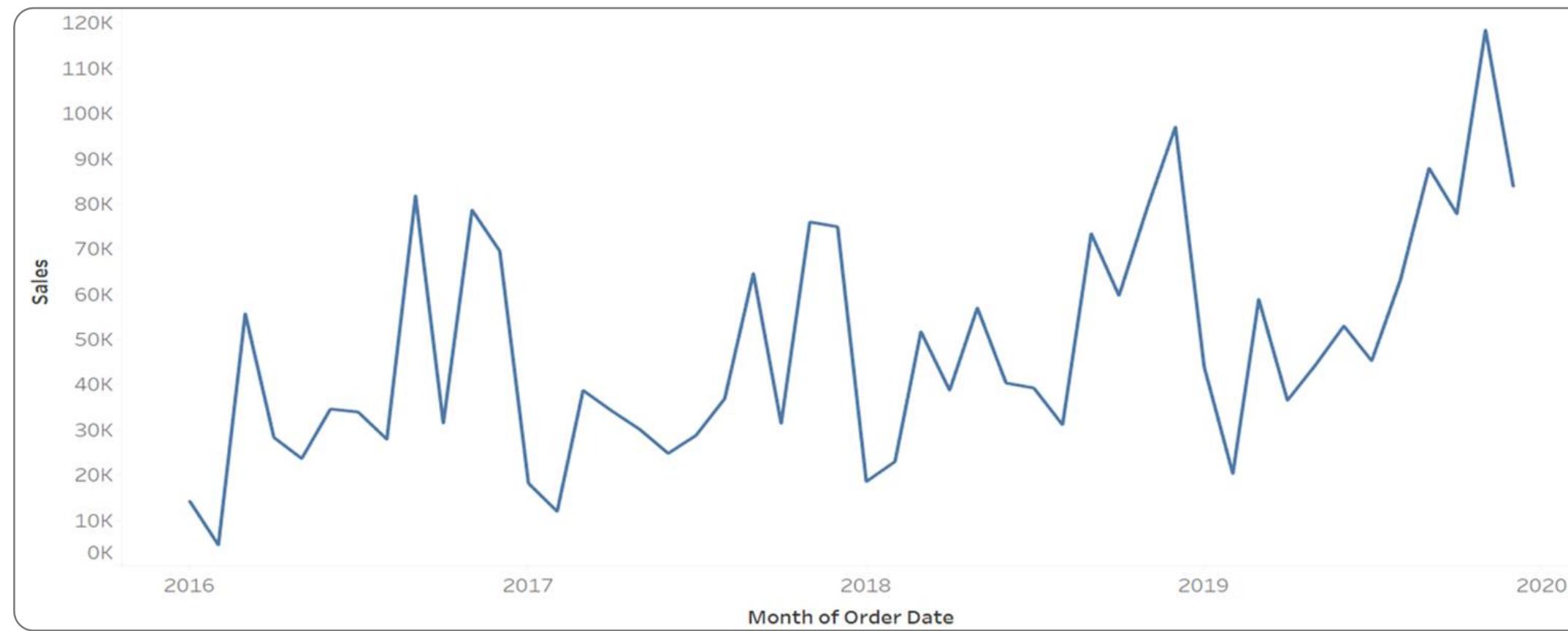
- Step 1: Create a calculated field to show distinct orders placed by the customer using an LOD calculation
- Step 2: Create a calculated field to generate the rank of customers using the index function
- Step 3: Create a view using these calculated fields
- Step 4: Break the view by placing the customer's name in detail

ASSISTED PRACTICE

Line Chart

Line Chart

A line chart showcases the trend of data over a period of time.



It is used when there is a date data type in the visualization.

Line Chart

Create a line chart to analyze the trend of sales over a period using a **sample superstore dataset**.



Order ID	Customer Name	Segment	Country/Region	Postal Code	Product Category	Sub-Category	Product Name
1 CA-2019-152158	Second C CO-12523	Clare Gut	Consumer United States	42420 South	FURNITURE	BASIC DESK	Demarco Collection Bookcase
2 CA-2019-152158	Second C CG-12523	Clare Gut	Consumer United States	42420 South	FURNITURE	CHAIRS	Han Deluxe Fabric Upholstered Stackable Chair
3 CA-2019-158508	Second C CO-13045	Daren Vika	Corporate United States	90036 West	OFFICE SUPPLIES	SERIAL ACTIVE LINE ADDRESS LABELS	Self-Adhesive Address Labels for Typewriters
4 US-2018-188966	Standard CO-23335	Dean Udo	Consumer United States	33011 South	FURNITURE	TABLES	Brentford Office Series Slim Rectangular
5 US-2018-188966	Standard CO-23335	Dean Udo	Consumer United States	33011 South	OFFICE SUPPLIES	STORAGE	Brentford Office Series Slim Rectangular
6 US-2018-188966	Standard CO-23335	Dean Udo	Consumer United States	33011 South	OFFICE SUPPLIES	STORAGE	Brentford Office Series Slim Rectangular
7 CA-2017-115812	Standard BH-11710	Eugenia H.	Consumer United States	90032 West	FURNITURE	FURNITURE	Elida Fold 'N Roll Cart System
8 CA-2017-115812	Standard BH-11710	Eugenia H.	Consumer United States	90032 West	OFFICE SUPPLIES	ART	Newell 312
9 CA-2017-115812	Standard BH-11710	Eugenia H.	Consumer United States	90032 West	TECHNOLOGY	PHONES	Mitel E323 IP Phone VoIP phone
10 CA-2017-115812	Standard BH-11710	Eugenia H.	Consumer United States	90032 West	OFFICE SUPPLIES	BINDERS	OKI Angle View Binders with Locking S-
11 CA-2017-115812	Standard BH-11710	Eugenia H.	Consumer United States	90032 West	OFFICE SUPPLIES	APPLIANCES	Bellin FS-CD35VTEL 8 Outlet Surge
12 CA-2017-115812	Standard BH-11710	Eugenia H.	Consumer United States	90032 West	FURNITURE	TABLES	Christine88 Rectangular Conference Table
13 CA-2017-115812	Standard BH-11710	Eugenia H.	Consumer United States	90032 West	TECHNOLOGY	PHONES	Konftel 250 Conference phone - White
14 CA-2019-144412	Standard AA-10480	Andrew Al	Consumer United States	20827 South	OFFICE SUPPLIES	PAPER	Xerox 1307
15 CA-2018-161368	Standard WA-19273	Isaac Mad	Consumer United States	80103 West	OFFICE SUPPLIES	BINDERS	Followes PB260 Plastic Comb Binding
16 US-2018-118893	Standard HP-14075	Harold Pe	Home Office United States	76136 Central	OFFICE SUPPLIES	APPLIANCES	Holmes Replacement Filter for HEPA Air Purifiers
17 US-2018-118893	Standard HP-14075	Harold Pe	Home Office United States	76136 Central	OFFICE SUPPLIES	BINDERS	Stapco DuraTech Recycled Plastic F
18 CA-2017-106393	Standard PK-19075	Pete Kris	Consumer United States	52011 Central	OFFICE SUPPLIES	STORAGE	Star-D Star Shelving Vertical S-Shelf 7
19 CA-2017-167164	Standard CA-13070	Alejandro	Consumer United States	84084 West	OFFICE SUPPLIES	STORAGE	P Fellowes Super Star Drawer
20 CA-2017-143336	Second C CO-21825	Zacharias	Consumer United States	34020 West	OFFICE SUPPLIES	ART	Newell 311
21 CA-2017-143336	Second C CO-21825	Zacharias	Consumer United States	91039 West	TECHNOLOGY	PHONES	Cisco SPA 501G IP Phone
22 CA-2017-143336	Second C CO-21825	Zacharias	Consumer United States	34020 West	OFFICE SUPPLIES	BINDERS	Wilson Jones Hanging View Binder, W
23 CA-2019-130328	Standard XS-16505	Ken Black	Corporate United States	90026 Central	OFFICE SUPPLIES	ART	Newell 318
24 CA-2019-130328	Standard XS-16505	Ken Black	Corporate United States	90026 Central	OFFICE SUPPLIES	APPLIANCES	Acco Six-Outlet Power Strip, 4 Cord Lo
25 US-2018-150630	Standard CP-20065	Sondra PI	Consumer United States	19140 East	FURNITURE	CHAIRS	Global Deluxe Stacking Chair Grey
26 CA-2019-106393	Standard FB-13870	Emily Bur	Consumer United States	84087 West	FURNITURE	TABLES	Gretchen OPI400 Series Slim Rectangu
27 CA-2019-121755	Second C EH-13045	Eric Hollie	Consumer United States	30048 West	OFFICE SUPPLIES	BINDERS	Wilson Jones Active Use Binders
28 CA-2019-121755	Second C EH-13045	Eric Hollie	Consumer United States	30048 West	TECHNOLOGY	ACCESORIES	Academy Innovate 8GB Mini TravelDrive USB 2.0
29 US-2018-150630	Standard TB-21520	Tracy Blue	Consumer United States	19140 East	FURNITURE	BASIC DESK	Riverside Praise Royal Layslays Book
30 US-2018-150630	Standard TB-21520	Tracy Blue	Consumer United States	19140 East	OFFICE SUPPLIES	BINDERS	Avery Recycled MaxView Covers for
31 US-2018-150630	Standard TB-21520	Tracy Blue	Consumer United States	19140 East	FURNITURE	FURNITURE	Howard Miller 13-3/4" Diameter Brushed
32 US-2018-150630	Standard TB-21520	Tracy Blue	Consumer United States	19140 East	OFFICE SUPPLIES	ENVELOPES	OPI400 Office Poly String Tie Envelopes

Line Chart

Steps to create a line chart:

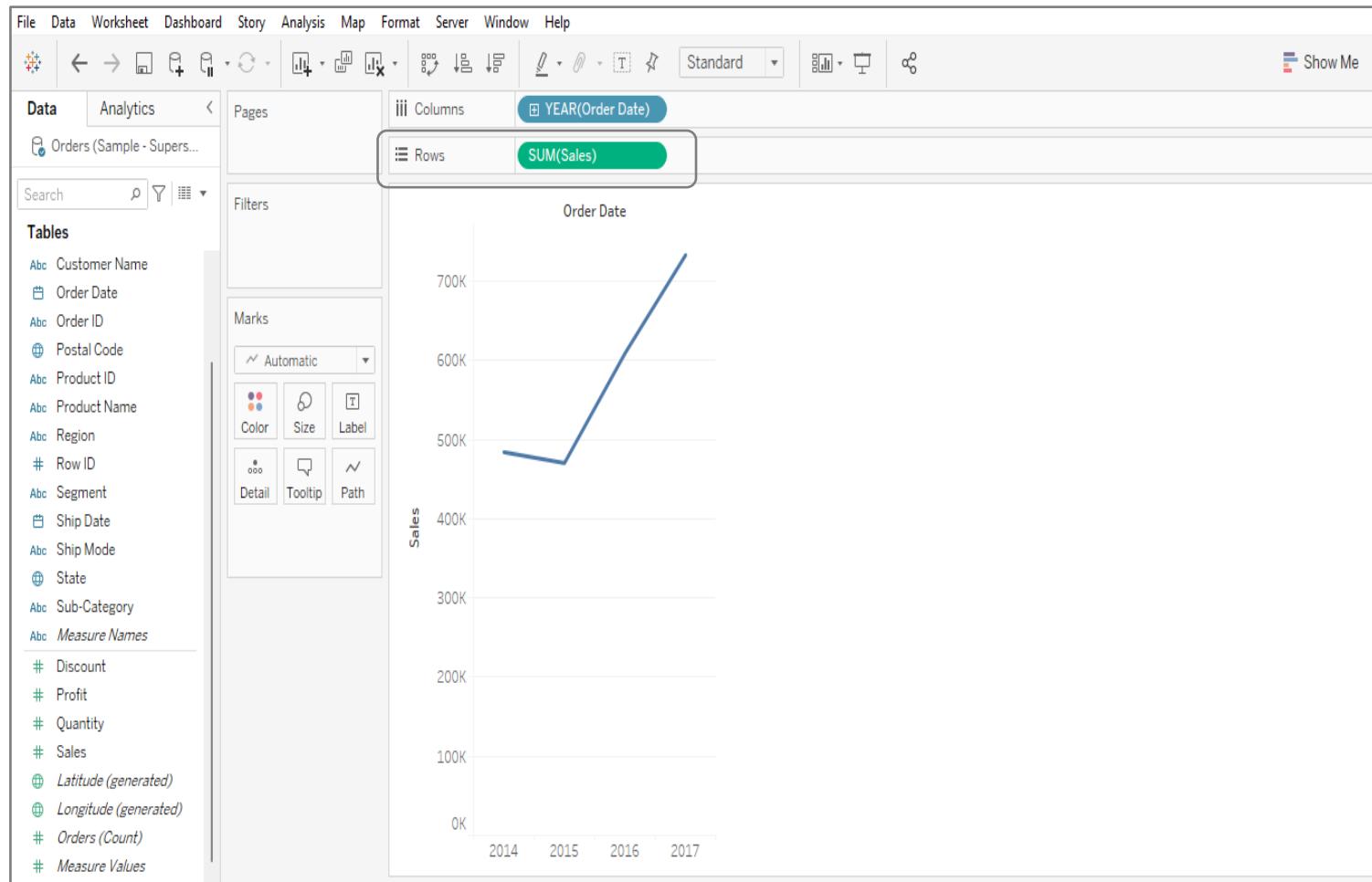
The screenshot shows the Tableau Data Source interface. The top menu bar includes File, Data, Worksheet, Dashboard, Story, Analysis, Map, Format, Server, Window, and Help. Below the menu is a toolbar with various icons. The main area is divided into several sections: 'Data' (selected), 'Analytics' (disabled), 'Pages' (disabled), 'Columns' (highlighted with a red box), 'Rows' (disabled), 'Filters' (disabled), and 'Marks' (disabled). On the left, there's a 'Tables' pane listing various dimensions and measures. A search bar is also present. The 'Columns' shelf at the bottom has one item: 'YEAR(Order Date)'. The 'Rows' shelf is empty.

Step 1

Drag Order Date to Columns

Line Chart

Steps to create a line chart:

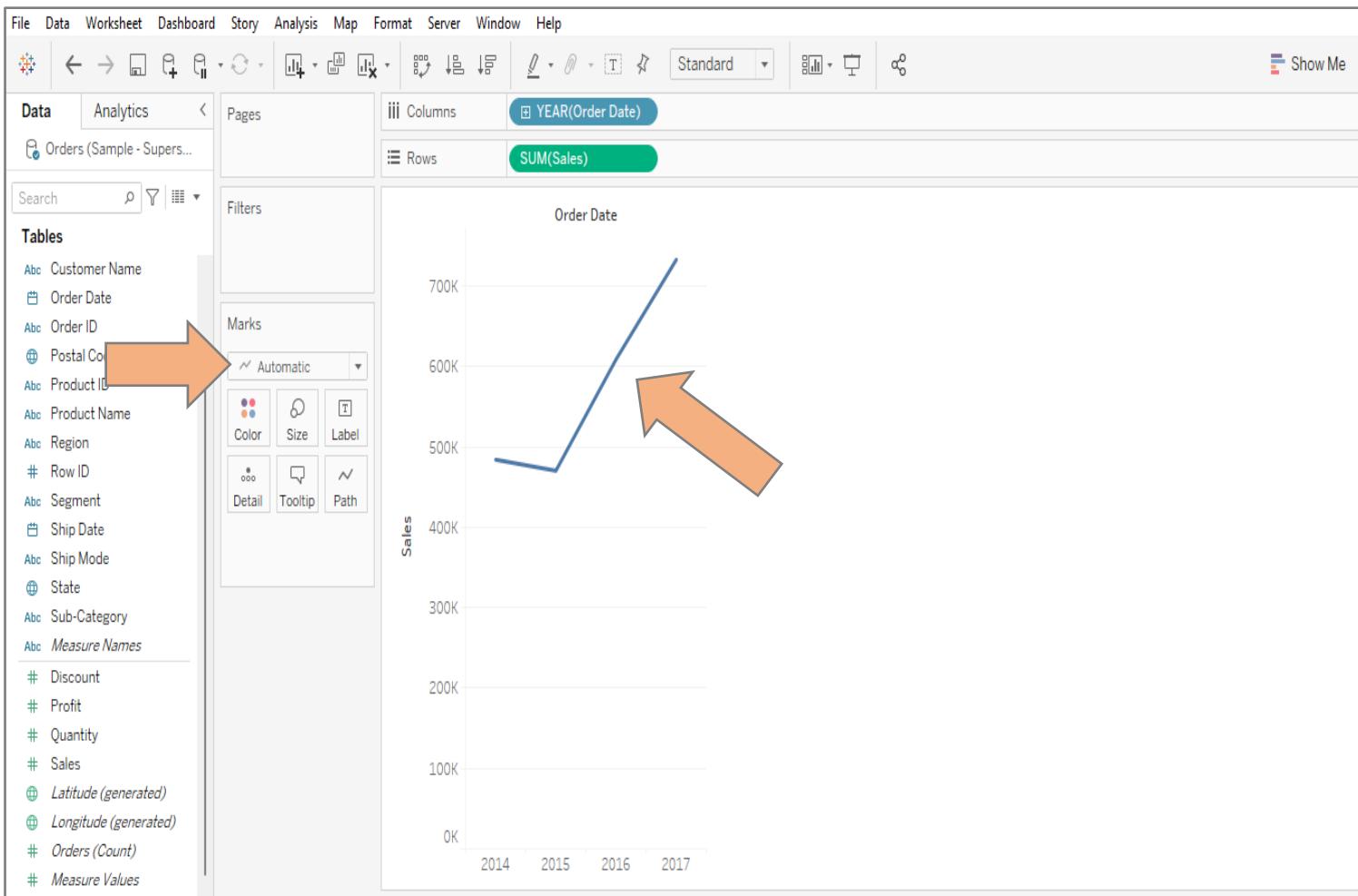


Step 2

Drag Sales to Rows

Line Chart

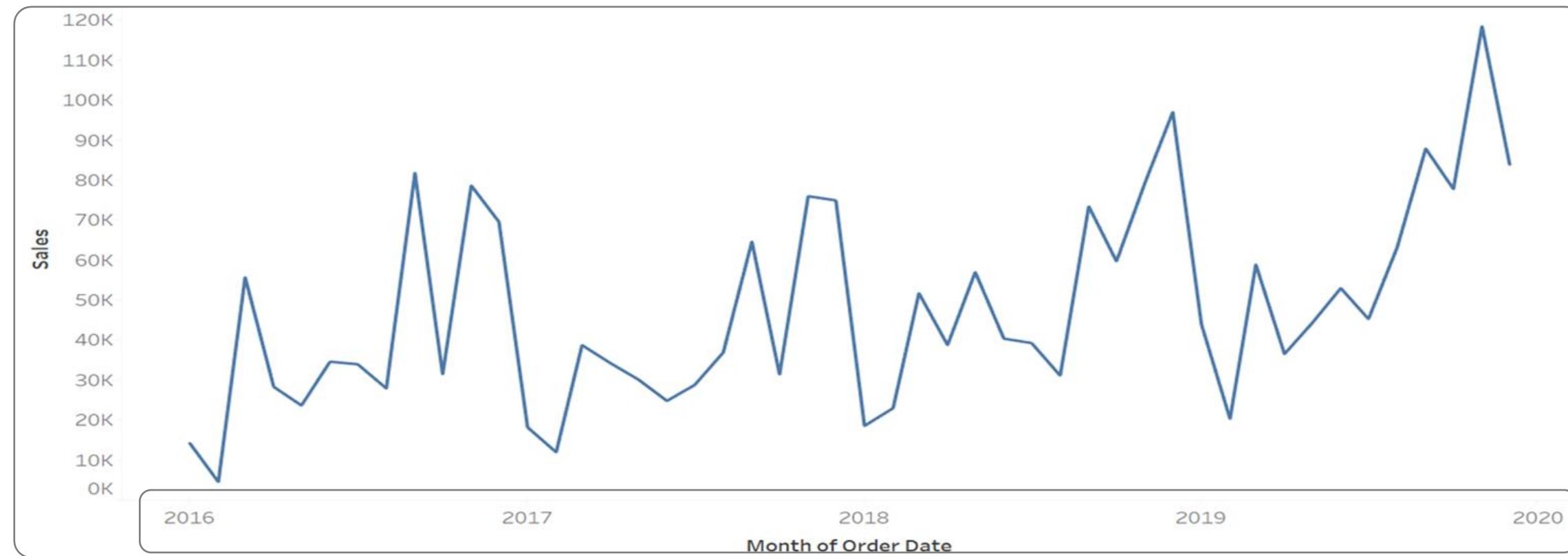
A line chart will be displayed on the screen.



Marks type will be changed to line automatically

Line Chart

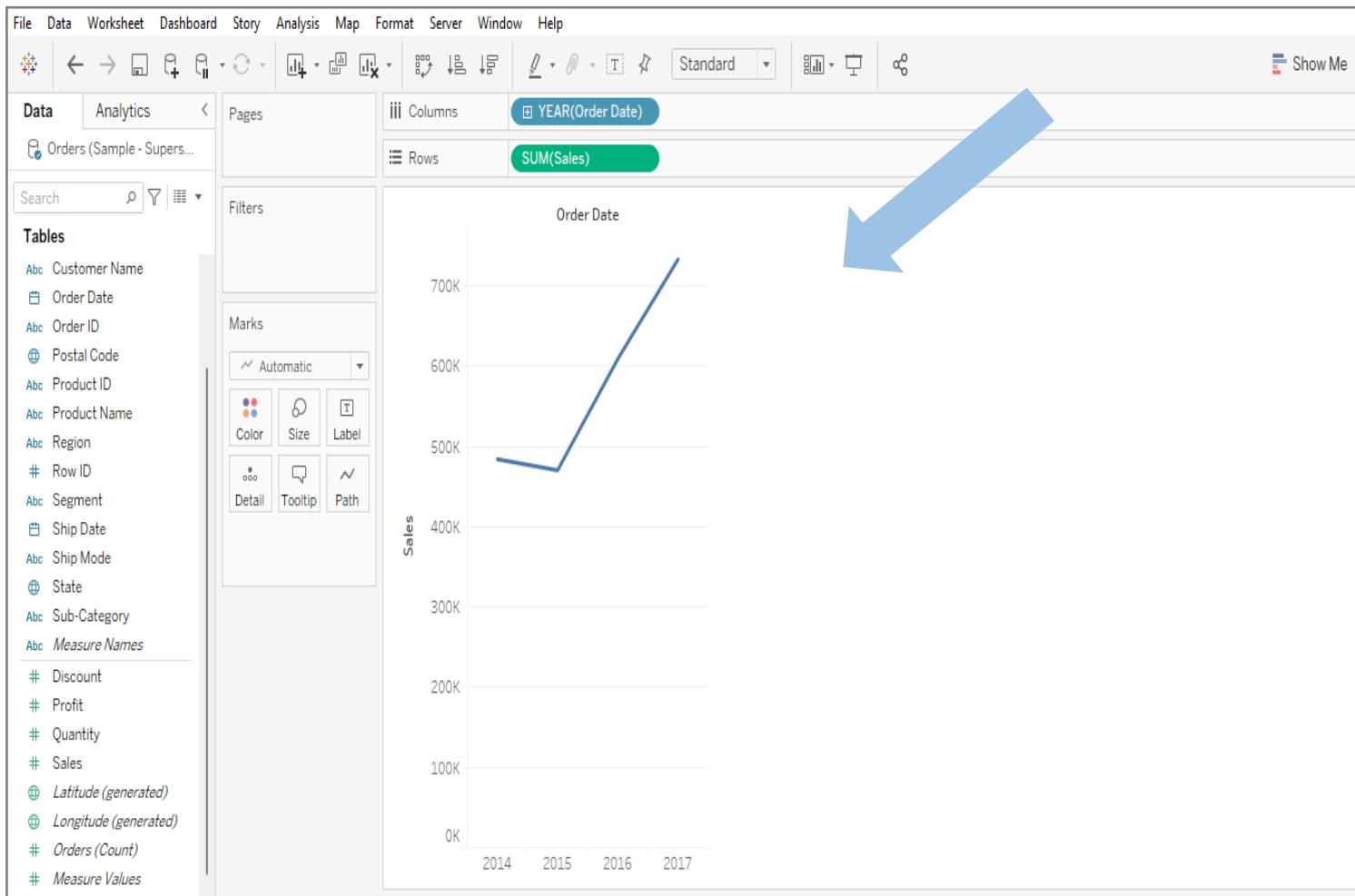
The date field is unique.



It can be discrete and continuous based on the way it is used.

Line Chart

To toggle between the **Date Part** and **Date Value**:



Right-click on the **Order Date** added in **Columns**

Line Chart

The given visual explains how to toggle between the **Date Part** (discrete dates) and **Date Value** (continuous dates).

The screenshot shows a context menu for a date field with two main sections highlighted by yellow boxes:

- Date Part**: Shows discrete date components like Year (2015), Quarter (Q2), Month (May), Day (8), and Week Number (Week 5, 2015). The "Year" item is selected.
- Date Value**: Shows continuous date values like "2015", "Q2 2015", "May 2015", and "May 8, 2015".

A callout bubble on the right side of the interface contains the text: "Change the aggregation of the dates and observe the changes in the chart".

Context menu items include:

- Filter...
- Show Filter
- Show Highlighter
- Apply to Worksheets ▾
- Sort...
- Format...
- Show Header
- Show Missing Values
- Standard Gregorian
- ISO-8601 Week-Based
- 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
- Attribute
- Measure ▾
- Discrete
- Continuous
- Edit in Shelf
- Remove

Sparkline

Sparkline



Sparklines are densely populated line chart.

It helps in understanding the anomalies in the data.

Sparkline

Creating Sparkline

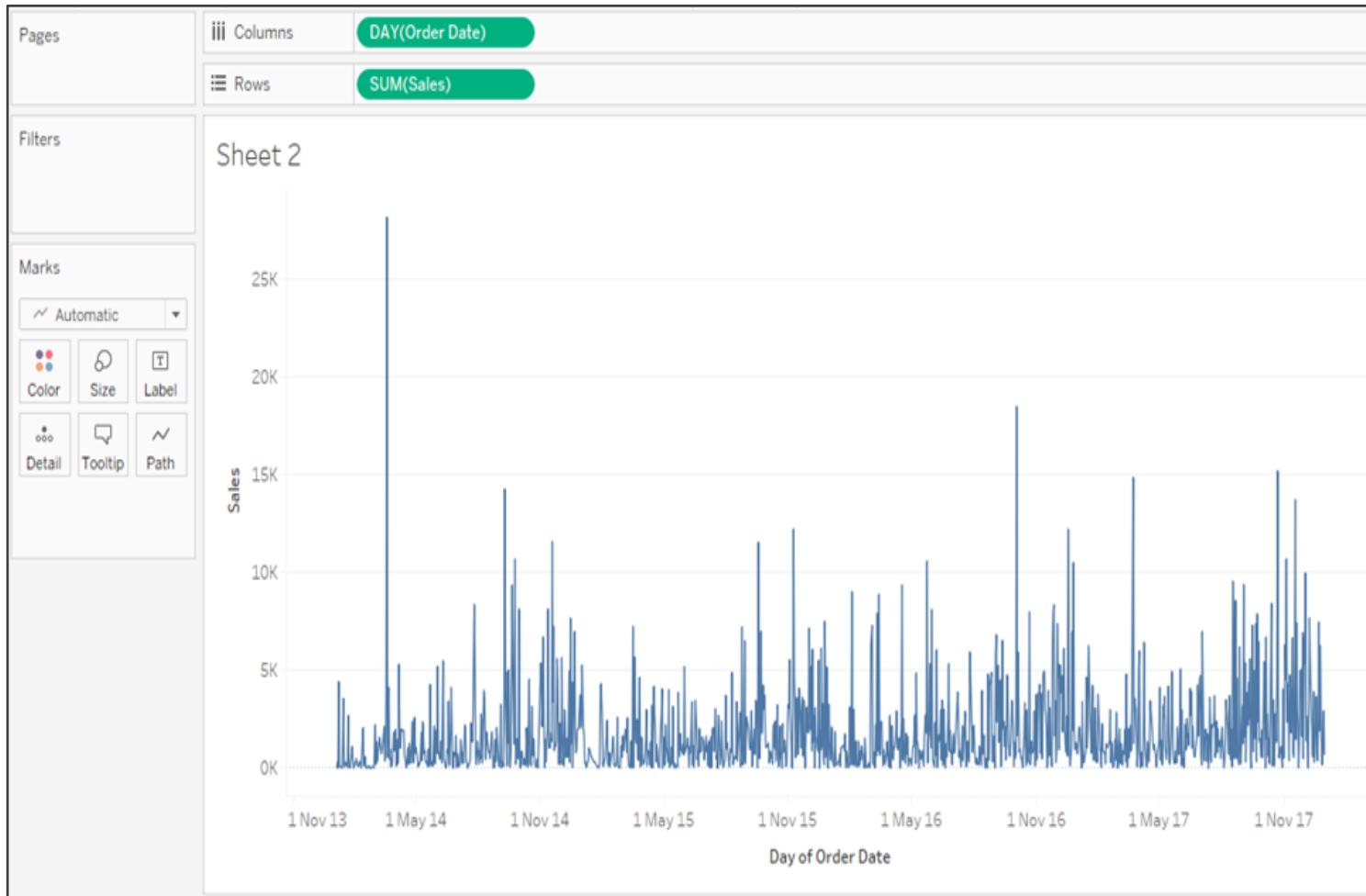
The screenshot shows the Tableau desktop application interface. On the left, there's a navigation bar with 'Story', 'Analysis', 'Map', 'Format', 'Server', 'Window', and 'Help'. Below it are sections for 'Pages' and 'Filters'. The main area is titled 'Sheet 2' and contains a table with four columns labeled 'Order Date' (2014, 2015, 2016, 2017) and one row with the value 'Abc' repeated four times. To the right of the table is a context menu open over the 'Order Date' column header. The menu has several sections: 'Filter...', 'Show Filter', 'Show Highlighter', 'Apply to Worksheets', 'Sort...', 'Format...', 'Show Header', 'Include in Tooltip', 'Show Missing Values', 'Standard Gregorian ISO-8601 Week-Based', and a detailed 'Year' section. Under 'Year', it shows '2015' with 'Quarter' (Q2), 'Month' (May), 'Day' (8), and 'More'. It also lists '2015' with 'Quarter' (Q2 2015), 'Month' (May 2015), 'Week Number' (Week 5, 2015), and 'Day' (May 8, 2015). Other options like 'Exact Date', 'Attribute', 'Measure', 'Discrete', and 'Continuous' are also listed.

Step 1

The first step is to place **Order Date** in the **Column** and select **Day** under the data value of the data field.

Sparkline

The anomalies in the data can be observed when the number of data points increases in a line chart



There is a sudden spike or change in the pattern for one instance, and then it's back to normalcy.

Scatter Plot

Scatter Plot

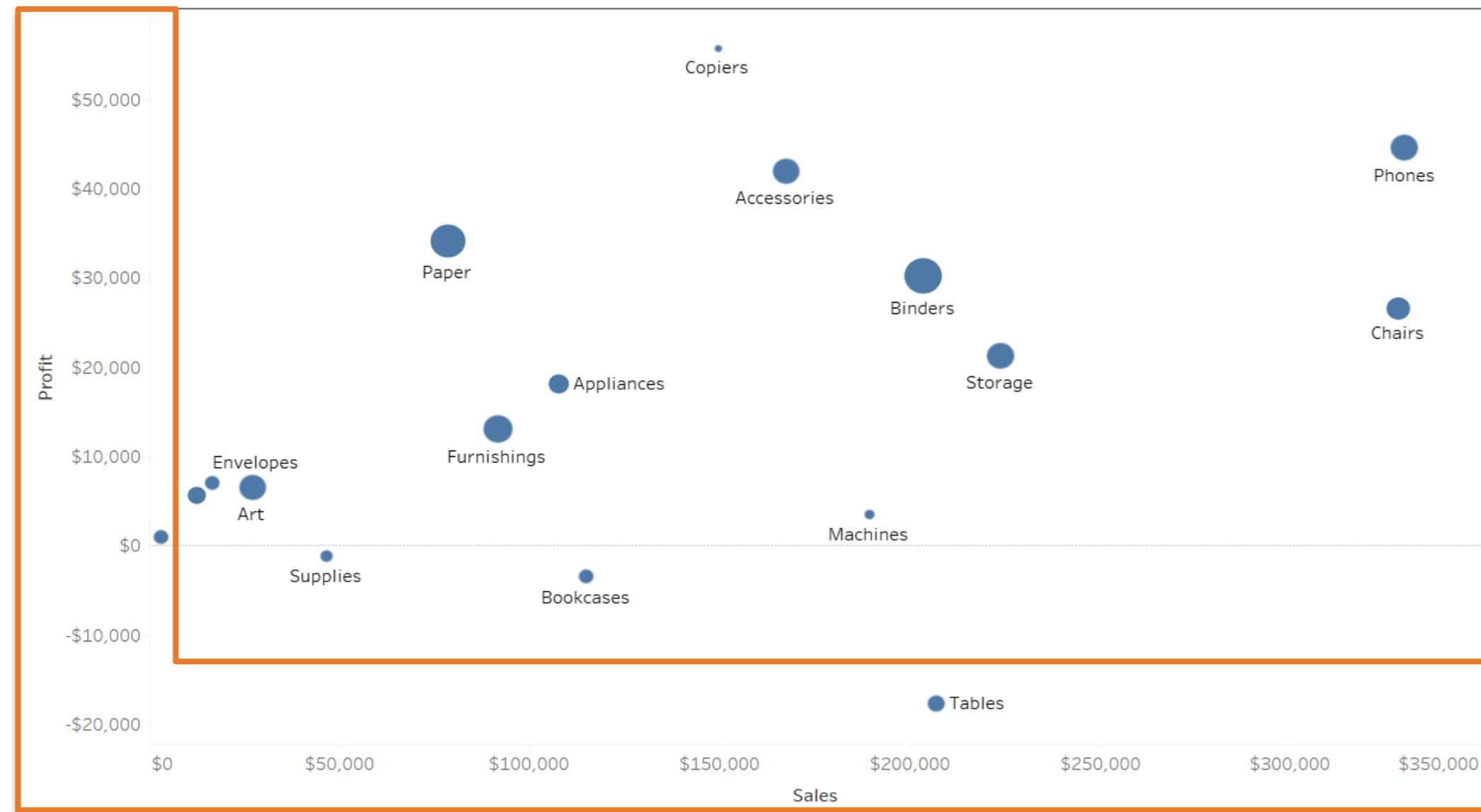
Scatter plots are used to showcase the correlation between two measures.



These are mostly used to create magic quadrants and identify the relationships between measures.

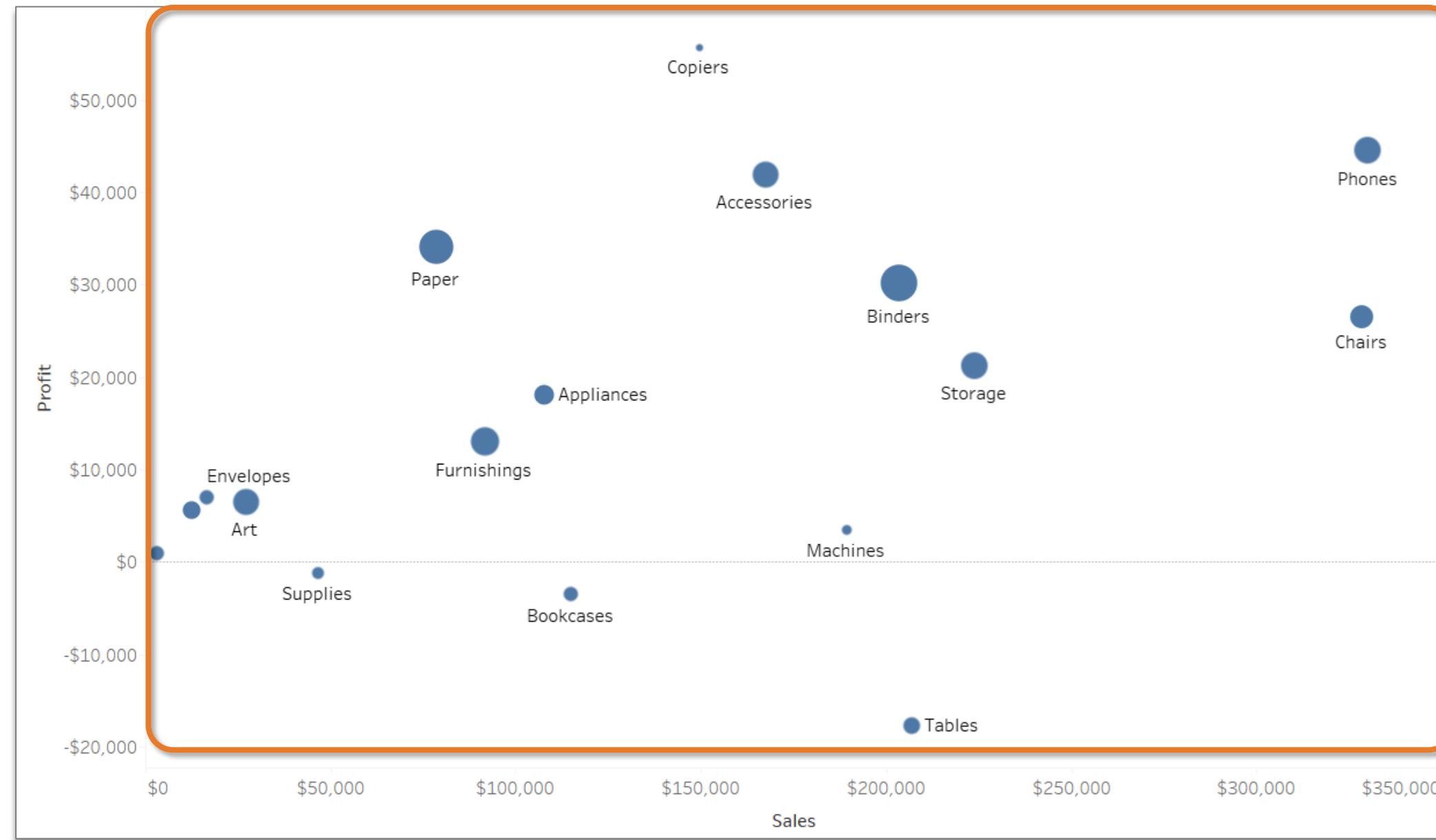
Scatter Plot

Both X axis and Y axis have numerical fields.



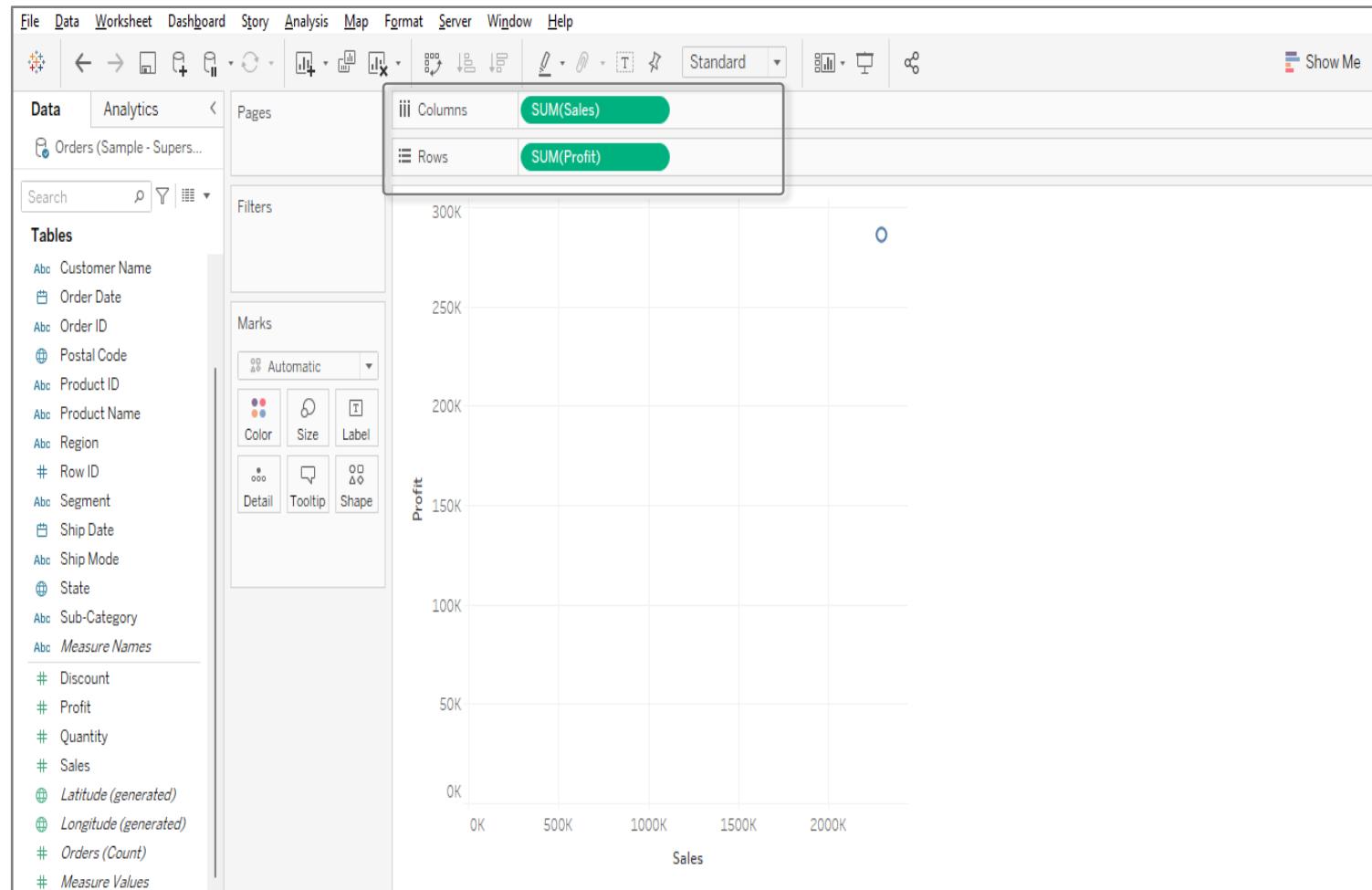
Scatter Plot

An additional numerical field can be added via color, size, or shape.



Scatter Plot

Let us create a scatter plot between Profit and Sales using Sample Superstore database.

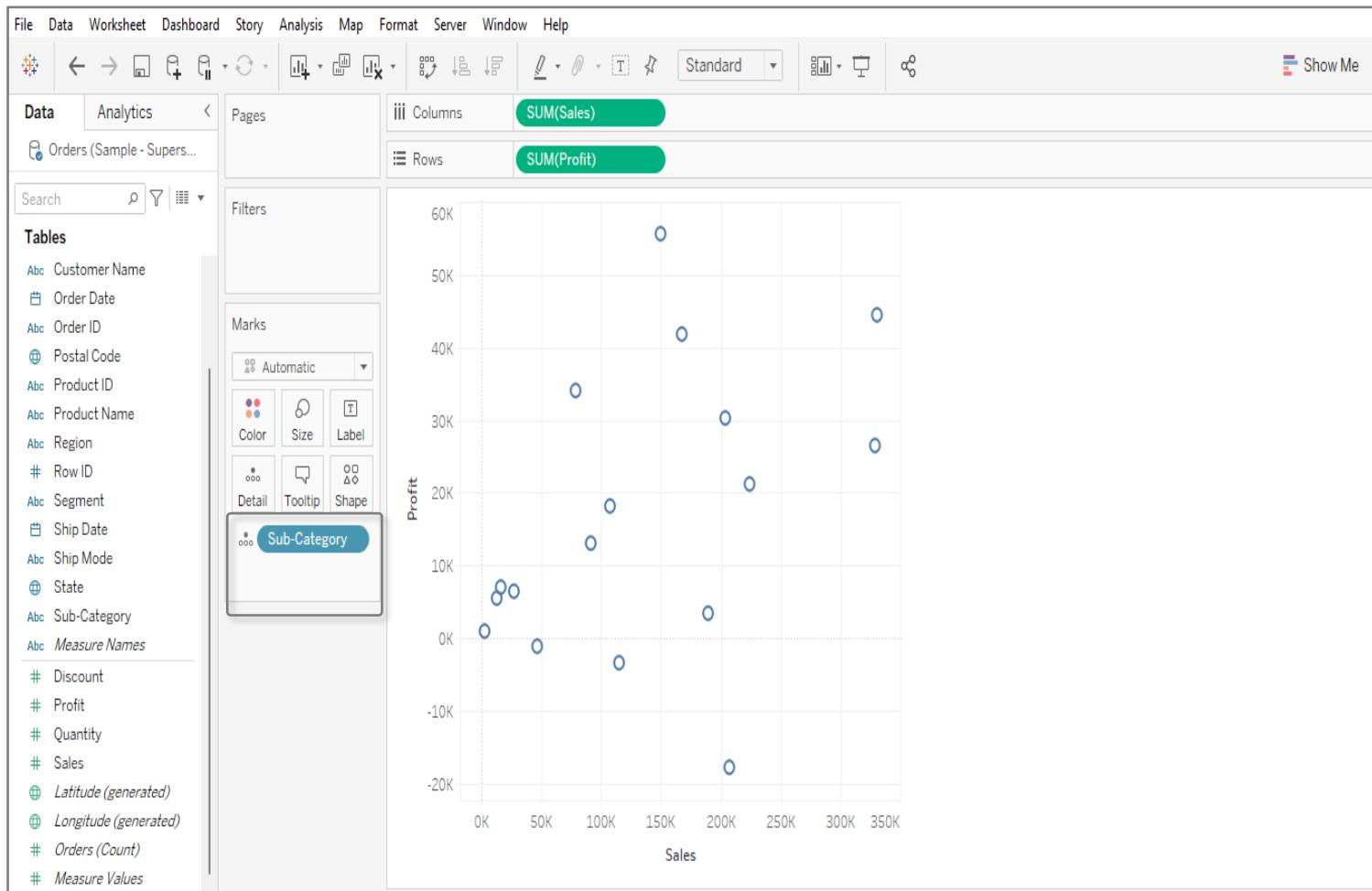


Step 1

Create a scatter plot with only one mark by dragging **Sales** to **Columns** and **Profit** to **Rows**

Scatter Plot

The marks type will be changed to **Shapes** automatically.

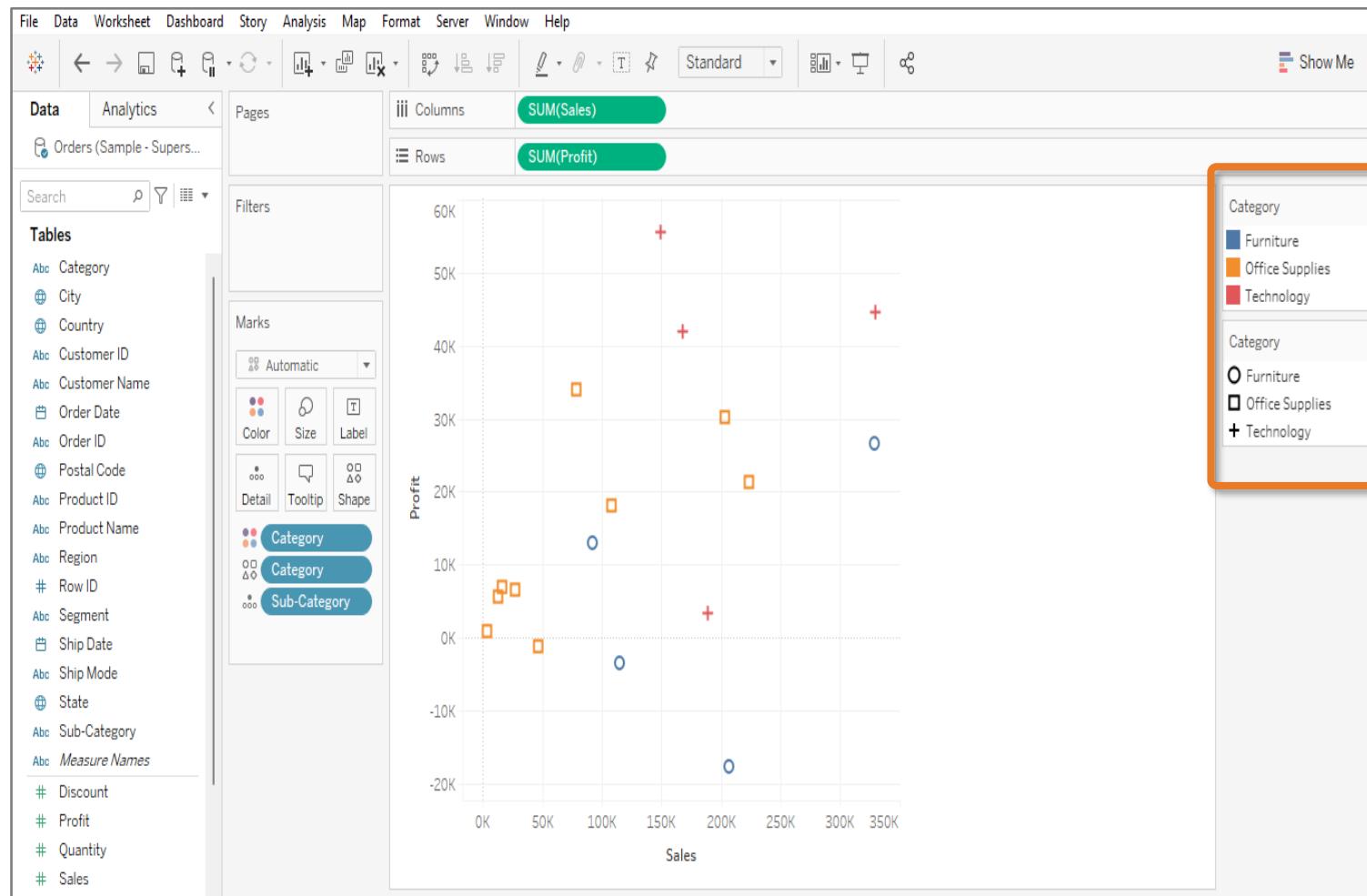


Step 2

In order to expand the plots to each Sub-Category, drag **Sub-Category** to **Detail** in the Marks Card

Scatter Plot

The scatter plot will be created.



Step 3

Adjust the colors and shapes as required

Assisted Practice: Scatter Plots and Motion Charts



Duration: 20 minutes

Problem statement:

A plant manager wants to accomplish a time-based breakdown of each product's performance in terms of sales and profit. Create a visualization that will benefit him to get performance comprehension across time to produce a list of low-performing products in terms of sales and profit across different regions.

ASSISTED PRACTICE

Assisted Practice Guidelines



Steps to follow:

- Step 1: Create a scatter plot with Sales, Profit, Region, and Product Name
- Step 2: Add Category to the Color shelf
- Step 3: Use the Pages shelf to create a motion chart with Order Date at the Monthly level

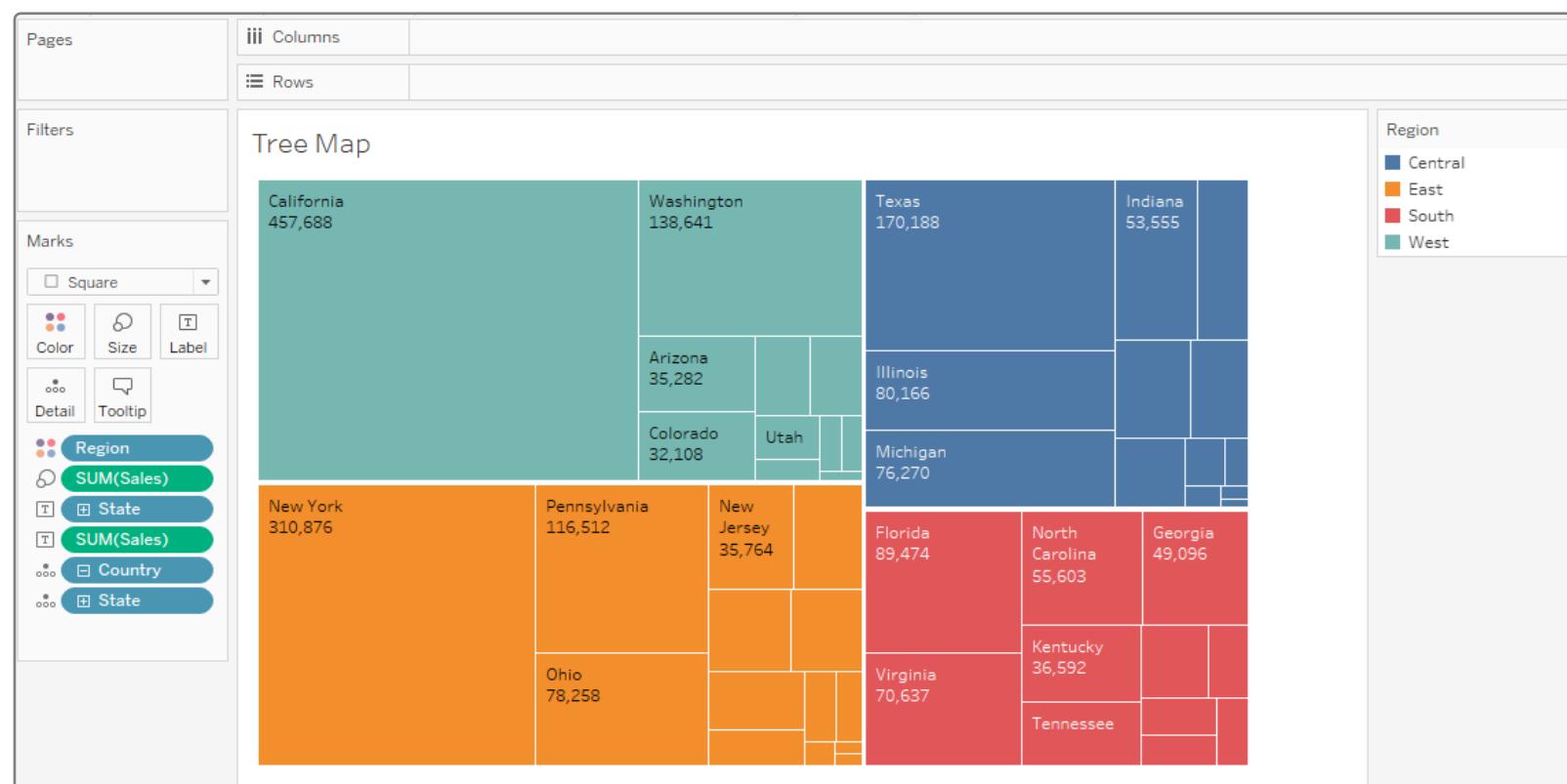
ASSISTED PRACTICE

Tree Map

Tree Map



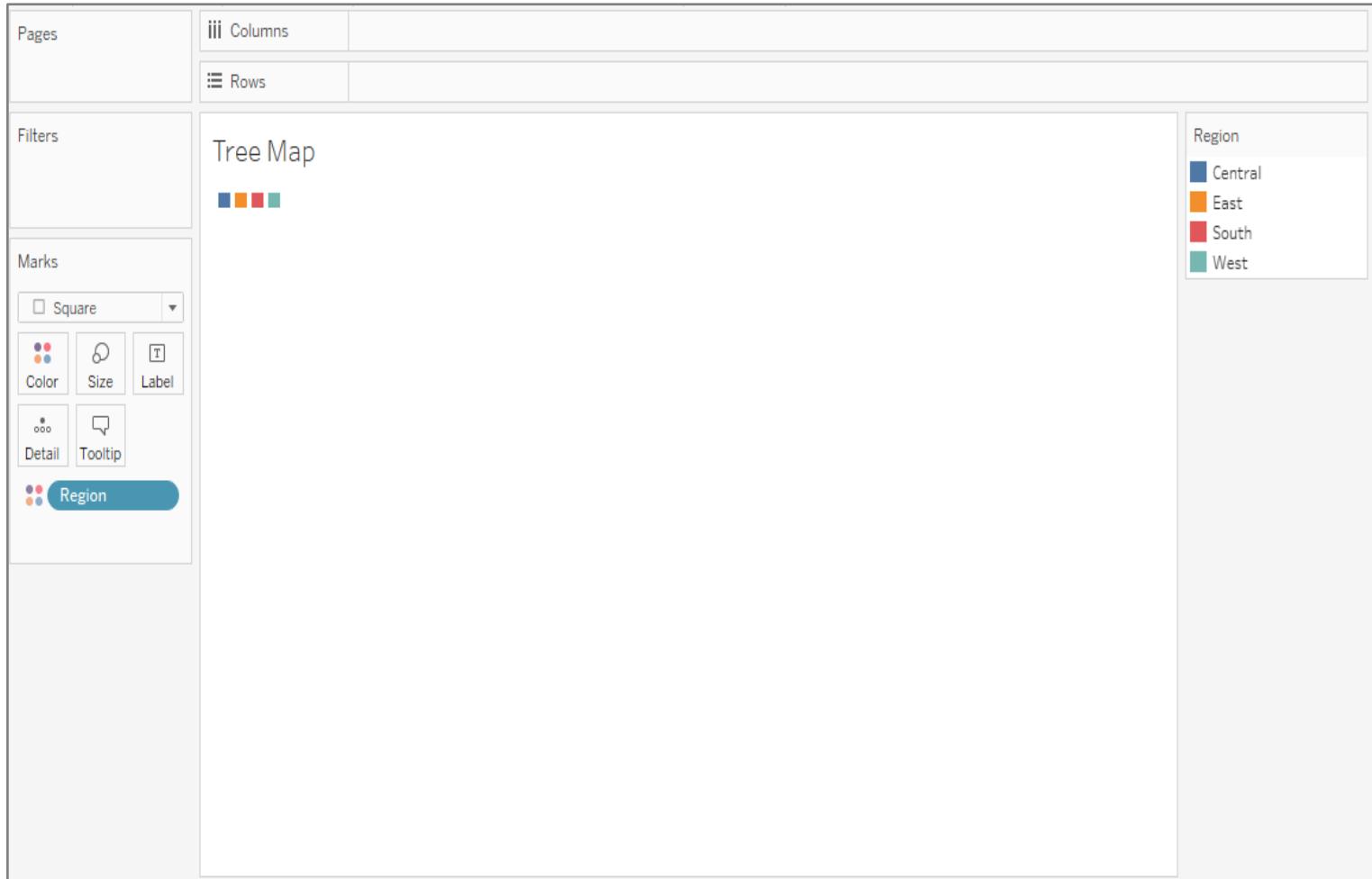
The tree map displays hierarchical items in rectangular boxes that represent the tree structure.



The arrangement consists of a rectangular area divided up into smaller rectangles to represent sub-categories.

Tree Map

Steps to create a Tree Map:

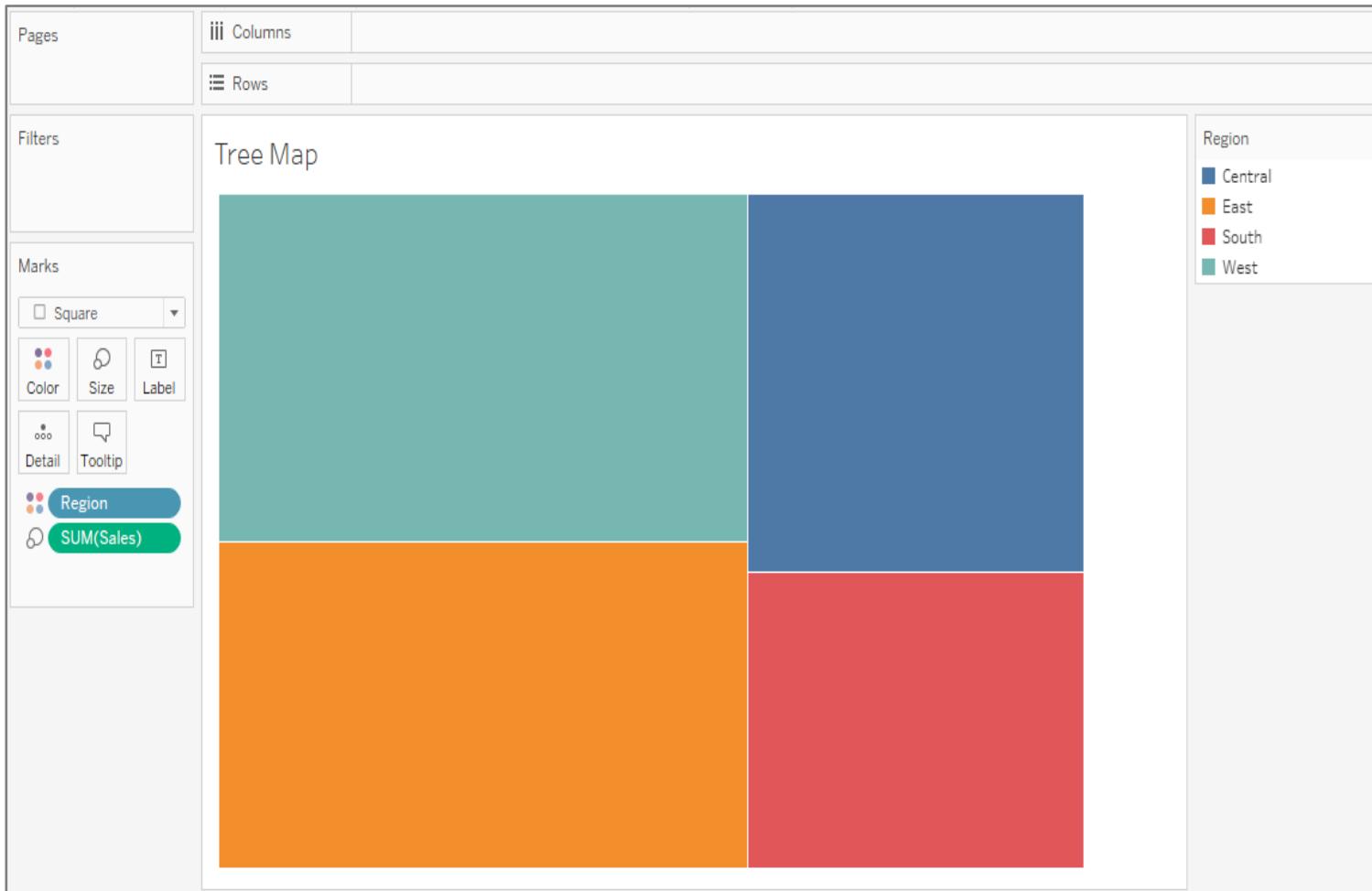


Step 1

Drag **Region** to **color** Select **Mark Type** as square

Tree Map

Steps to create a Tree Map:

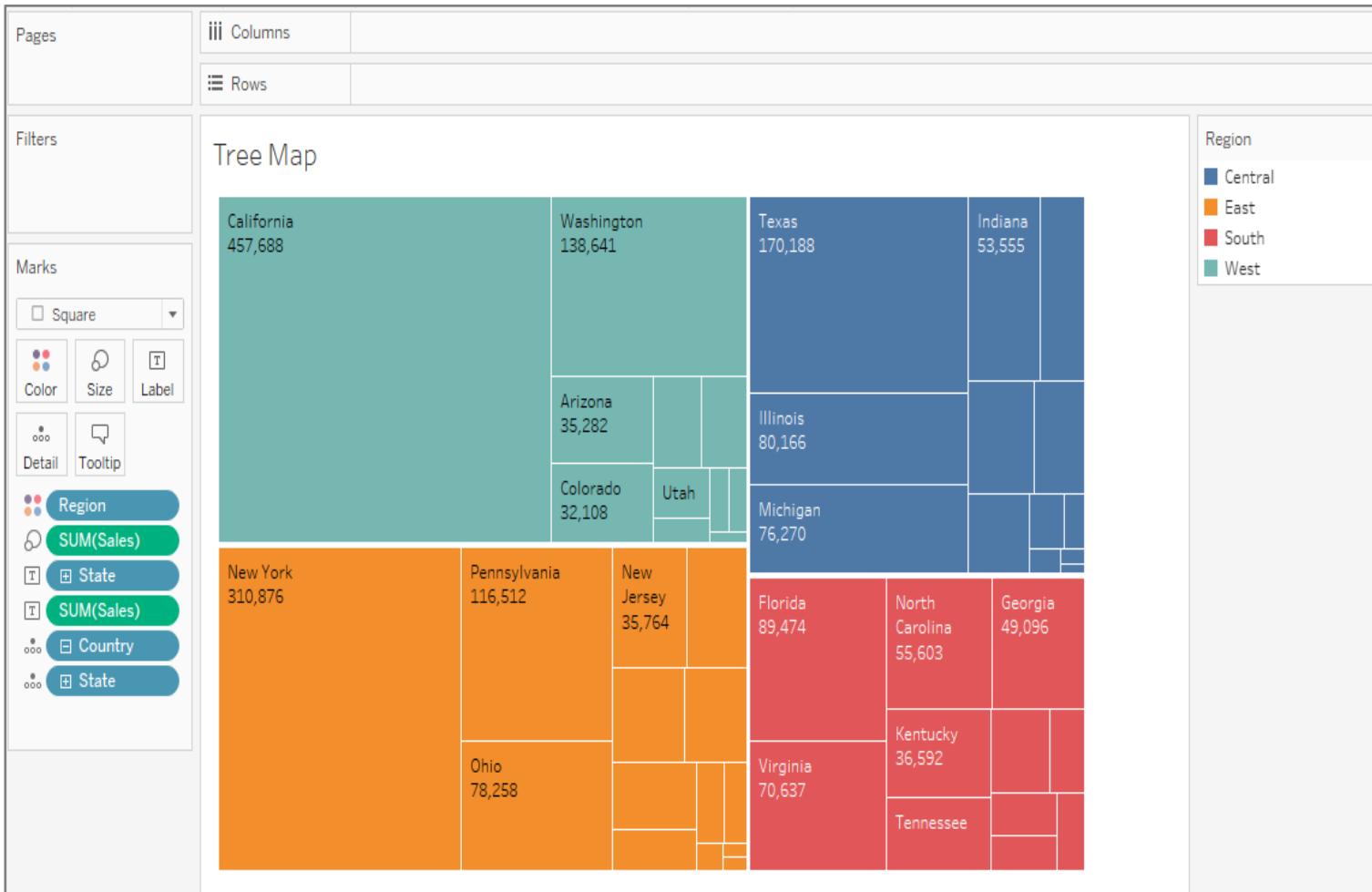


Step 2

Drag Sales to Size

Tree Map

Steps to create a Tree Map:



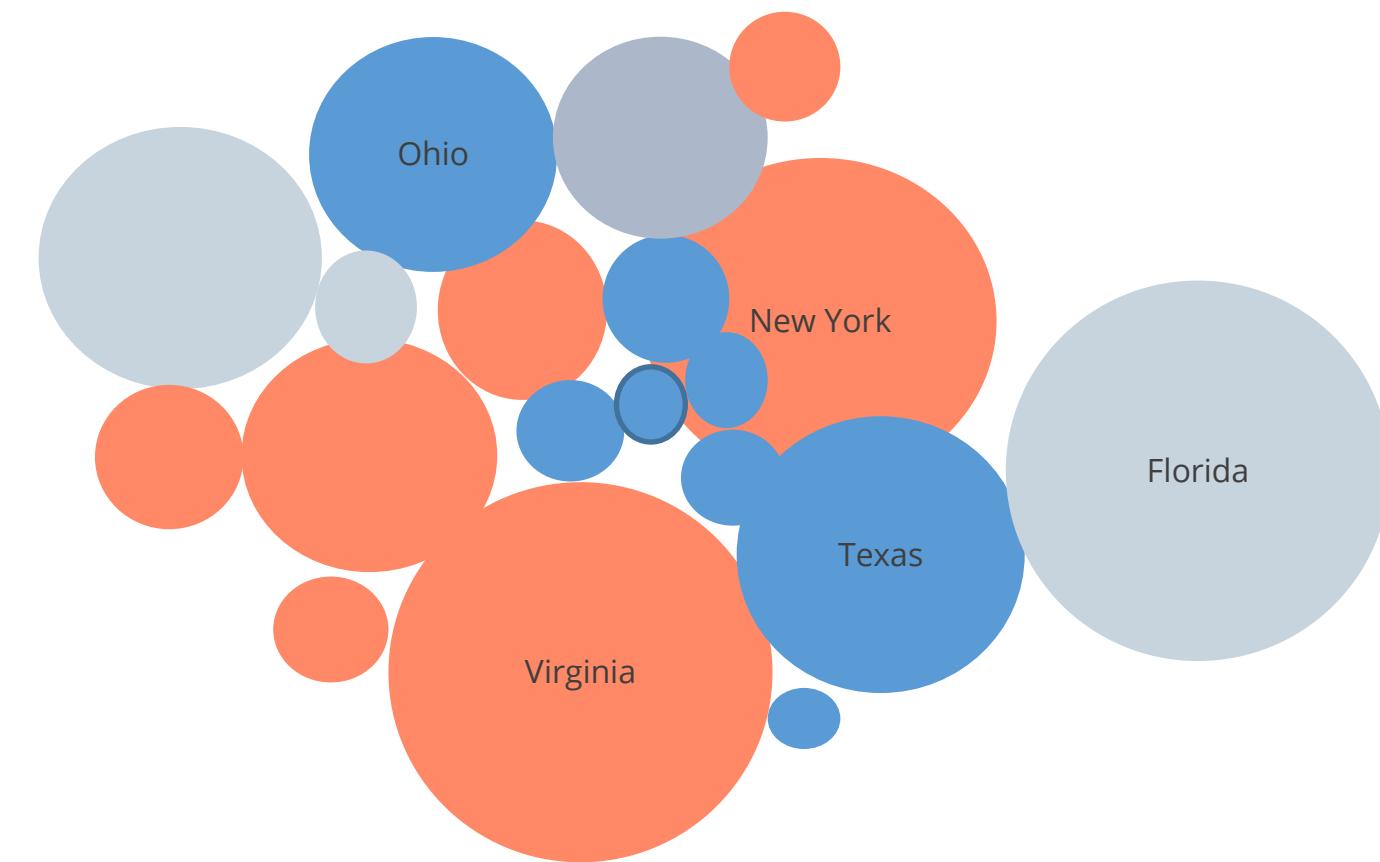
Step 2

Use **State** in **Detail** and **Text** to partition the boxes and add texts.

Bubble Chart

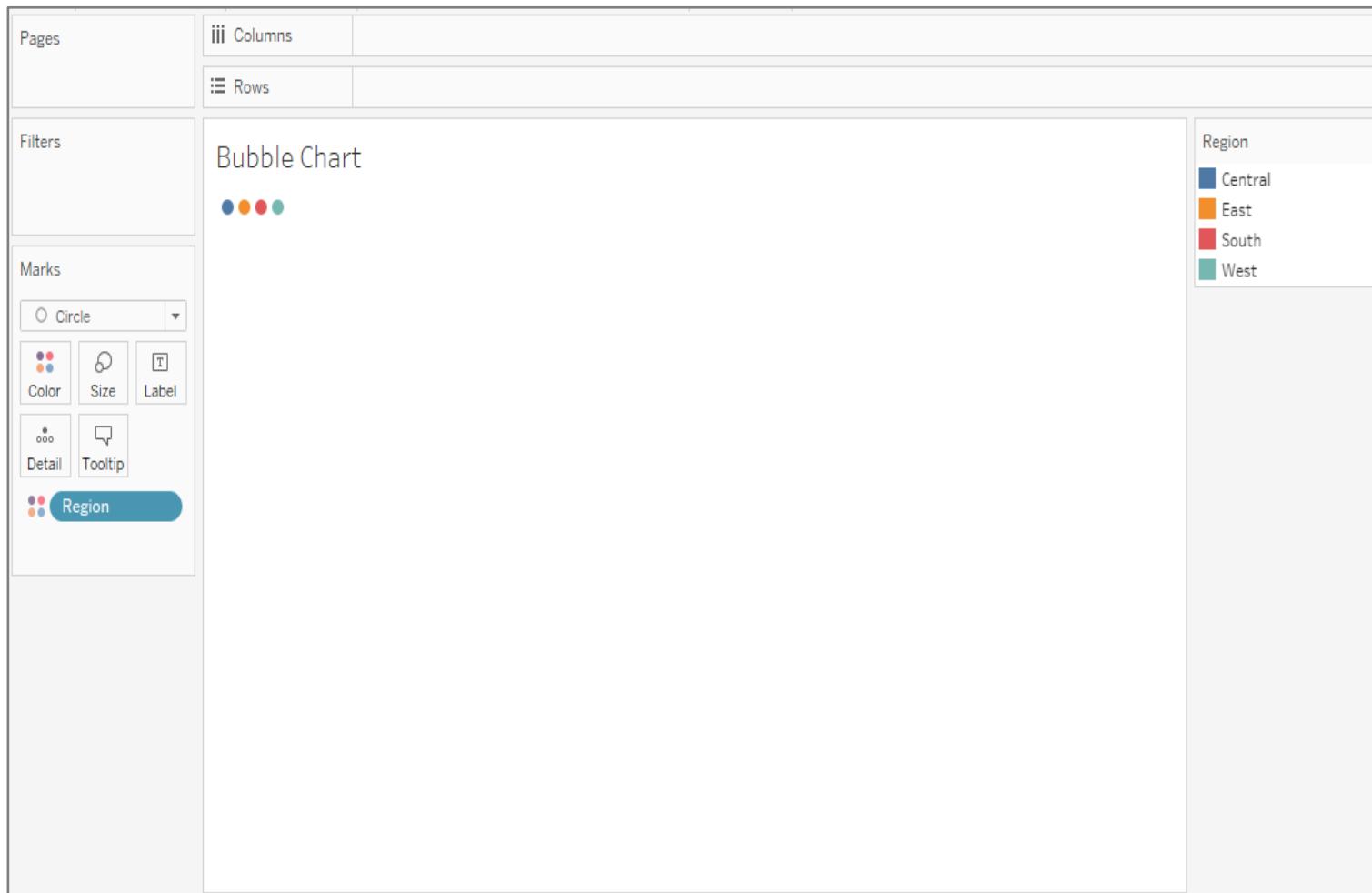
Bubble Chart

Circles show the data in bubble charts where the size of the circles denotes the quantity of the metric.



Bubble Chart

Steps to create a bubble chart:

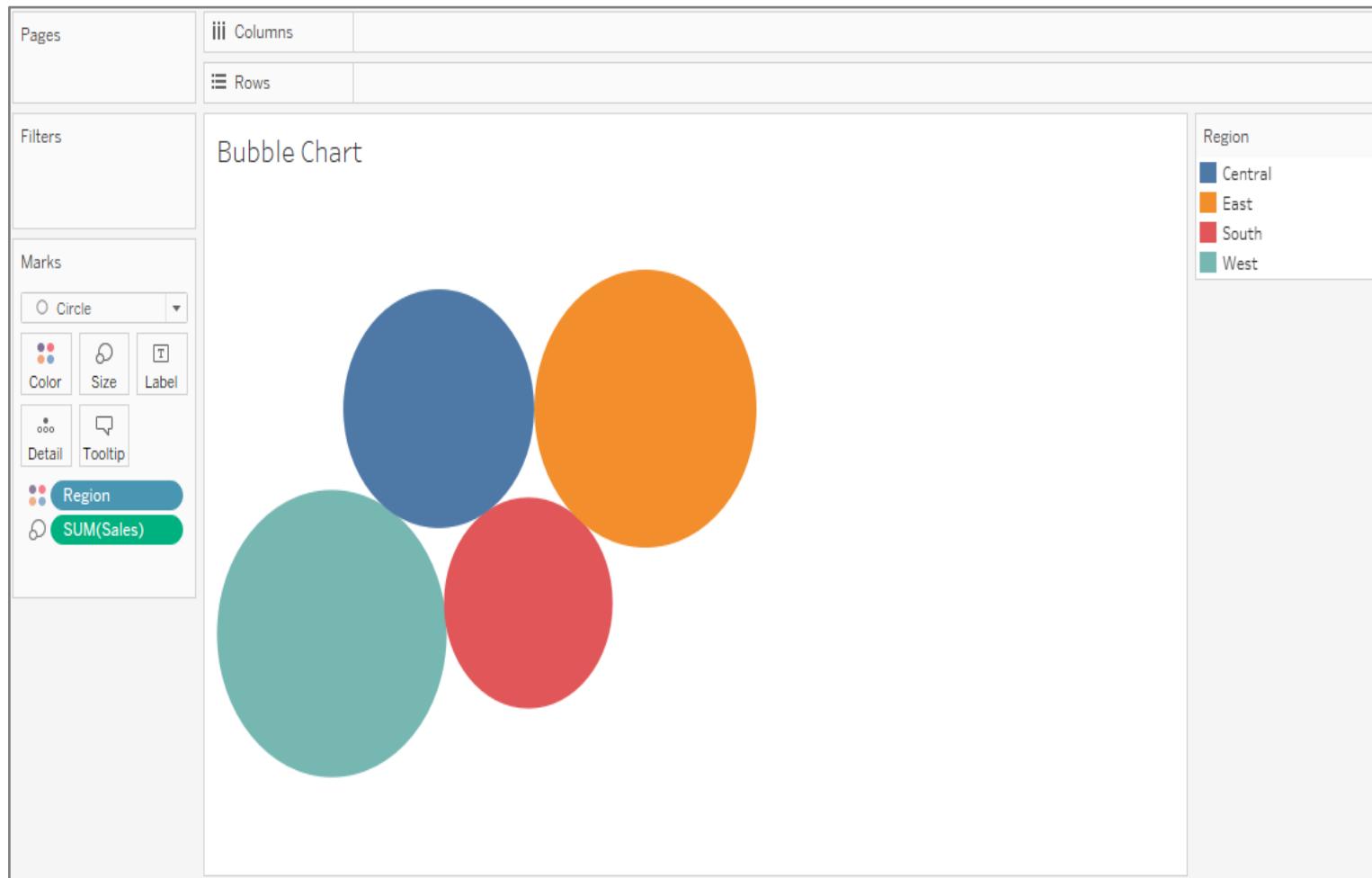


Step 1

Drag **Region** into **Color** and select **Mark type** as **Circle**

Bubble Chart

Steps to create a bubble chart:

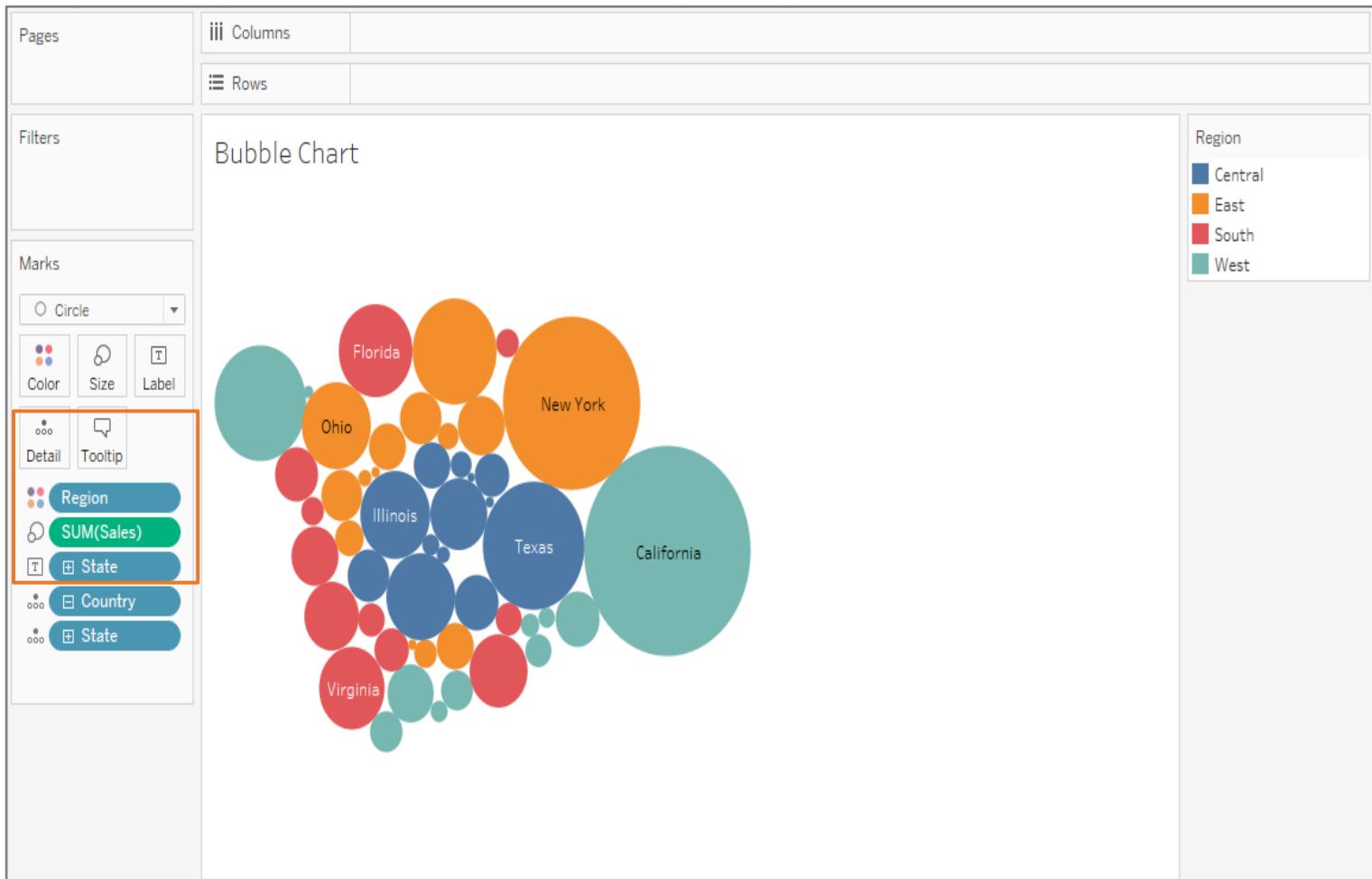


Step 2

Drag Sales into Size

Bubble Chart

Steps to create a bubble chart:



Step 3

Use **State** in **Detail**, and **Text** to partition the boxes and add text

Word Cloud

Word Cloud

A word cloud displays the frequency of words in a text by making the size of each word proportional to its frequency.

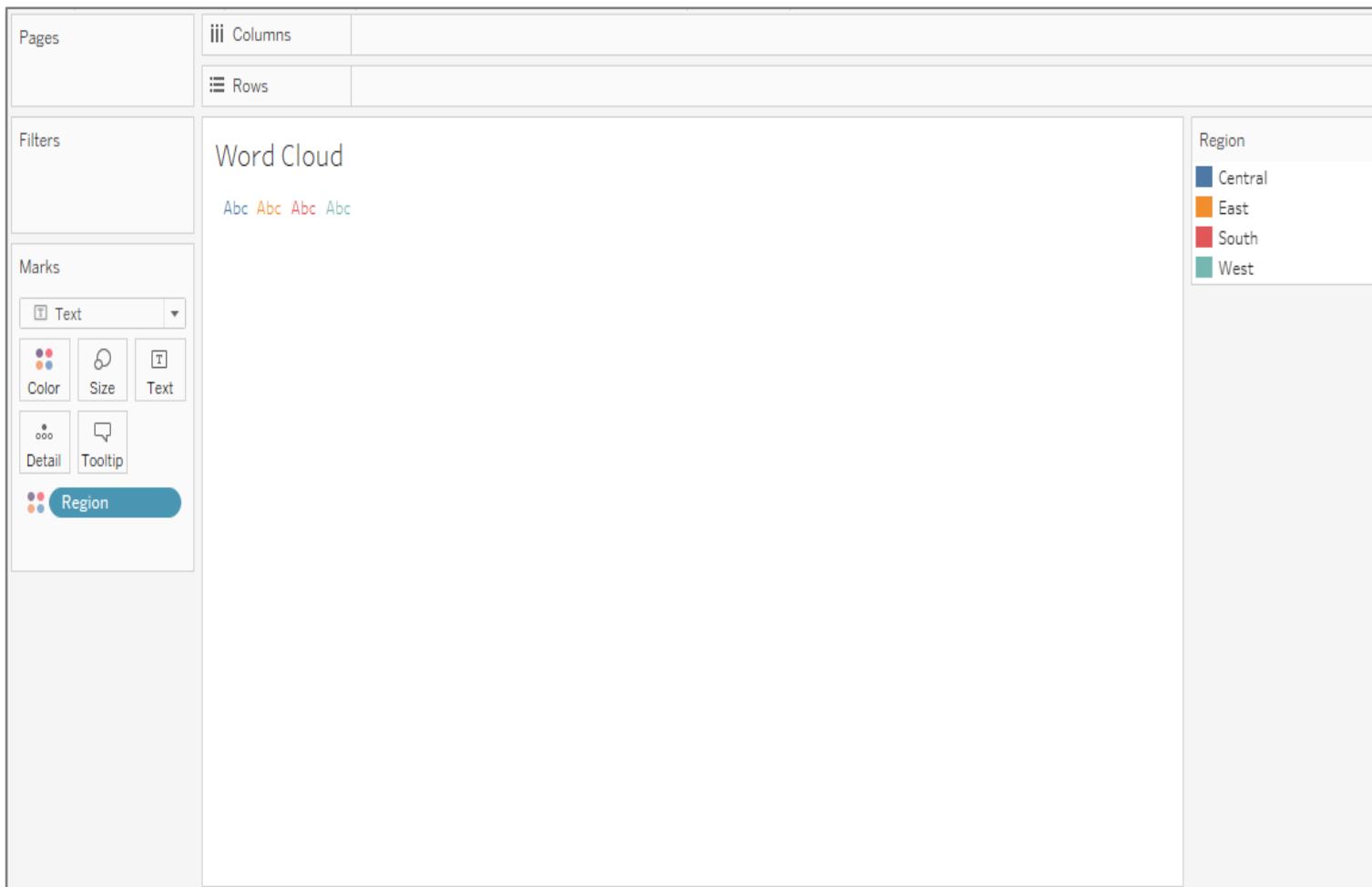


Words are arranged in a cloud or cluster.

A word cloud can display words that have meta-data associated with them.

Word Cloud

Steps to create a word cloud:

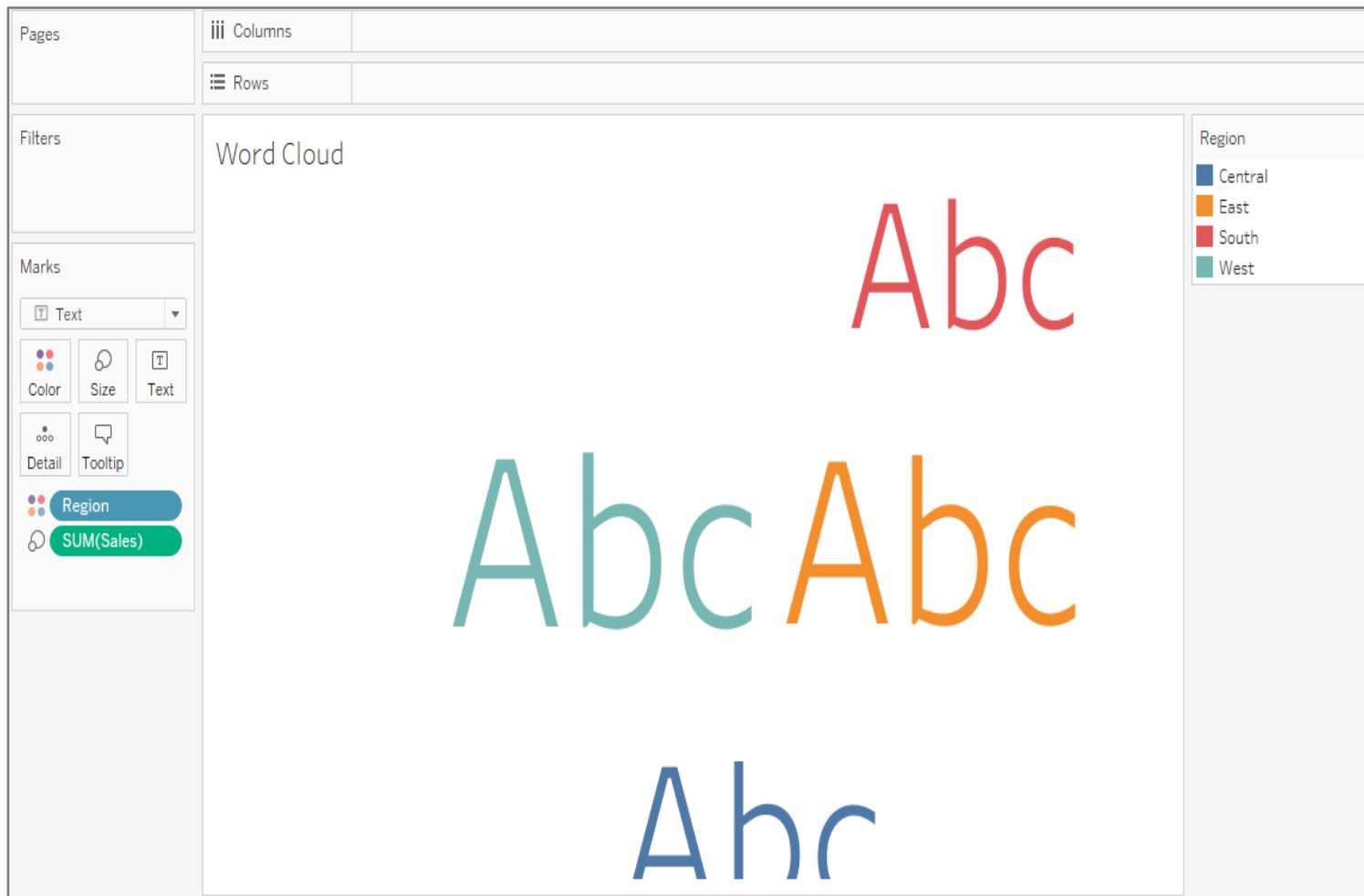


Step 1

Drag **Region** into **Color** and select **Mark type** as **Text**

Word Cloud

Steps to create a word cloud:

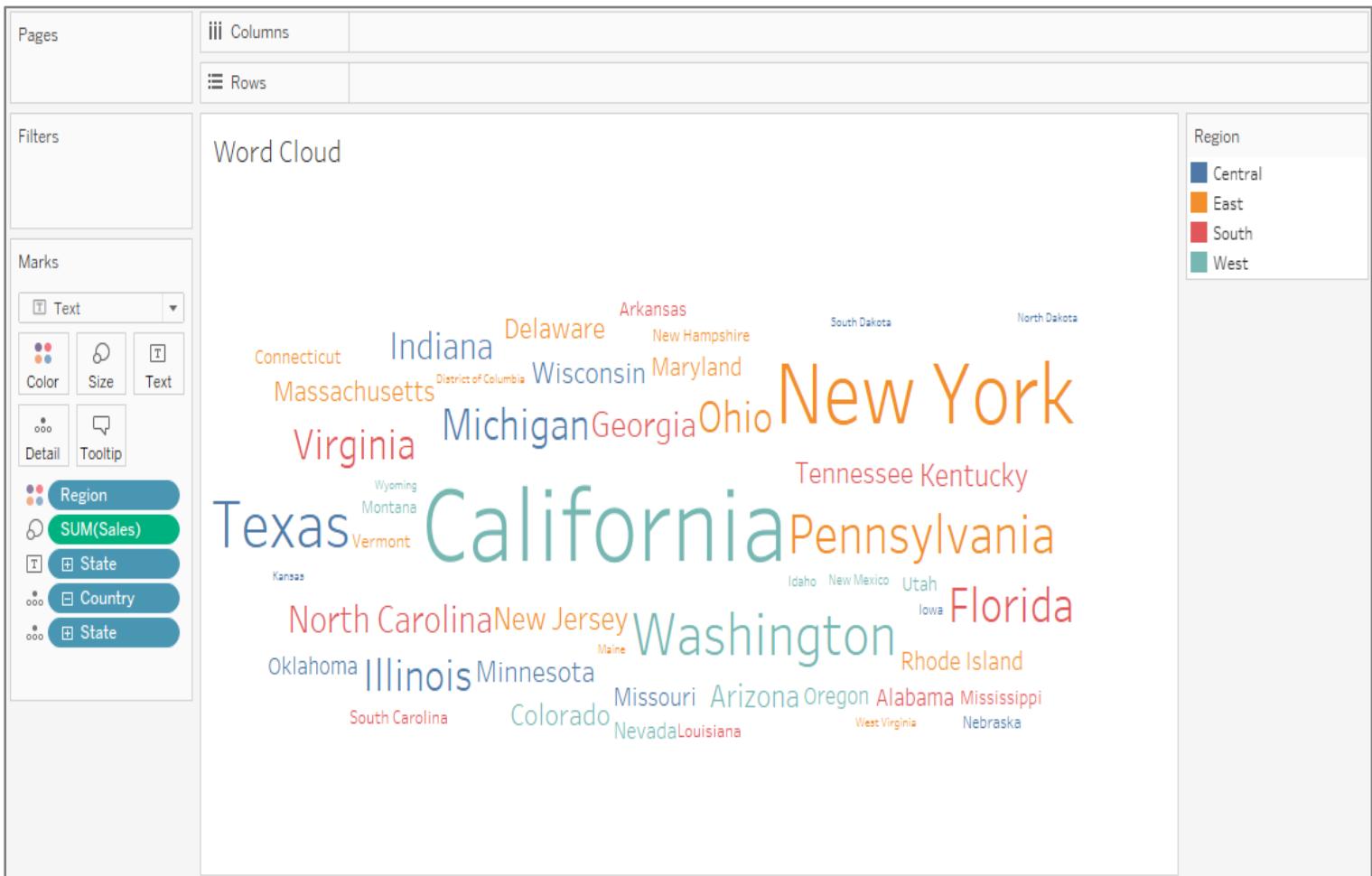


Step 2

Drag **Sales** into **Size**

Word Cloud

Steps to create a word cloud:



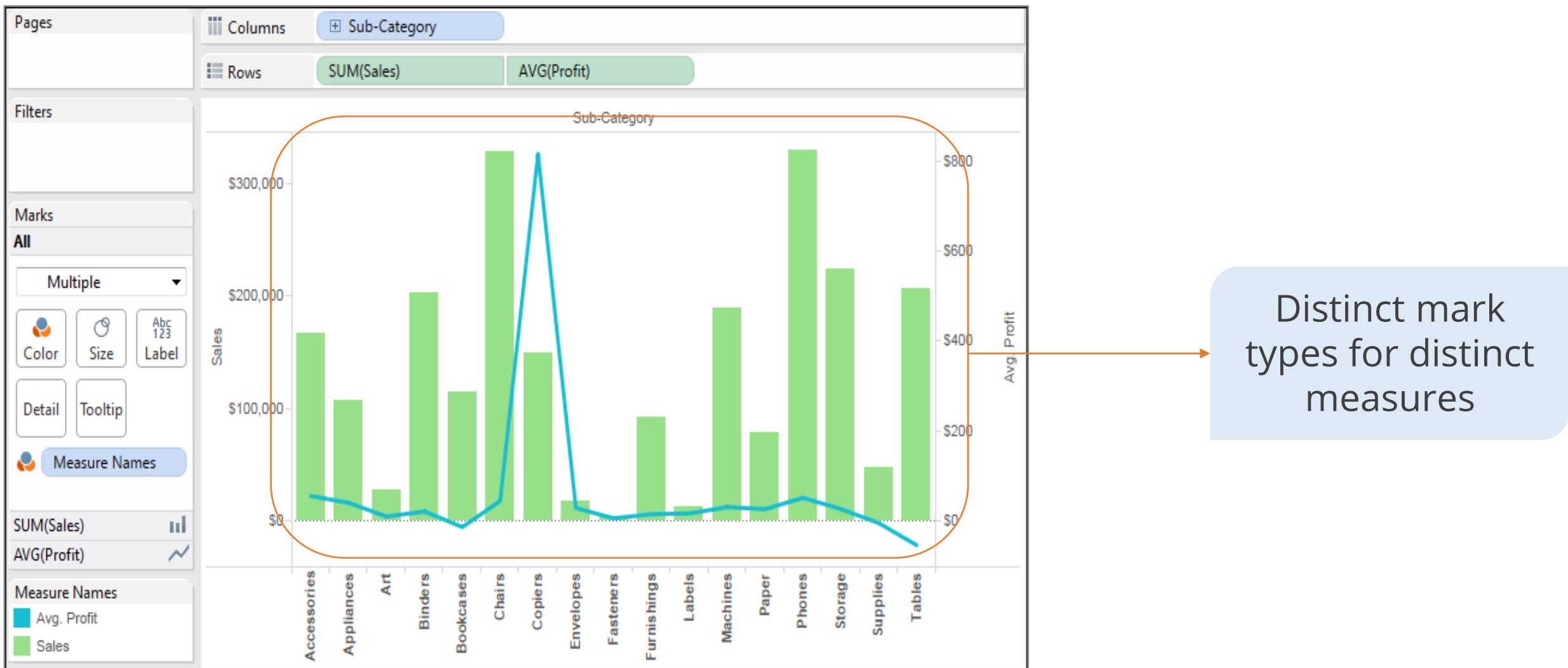
Step 3

Use **State** in **Detail**, and **Text** to display all states

Combined Axis Chart

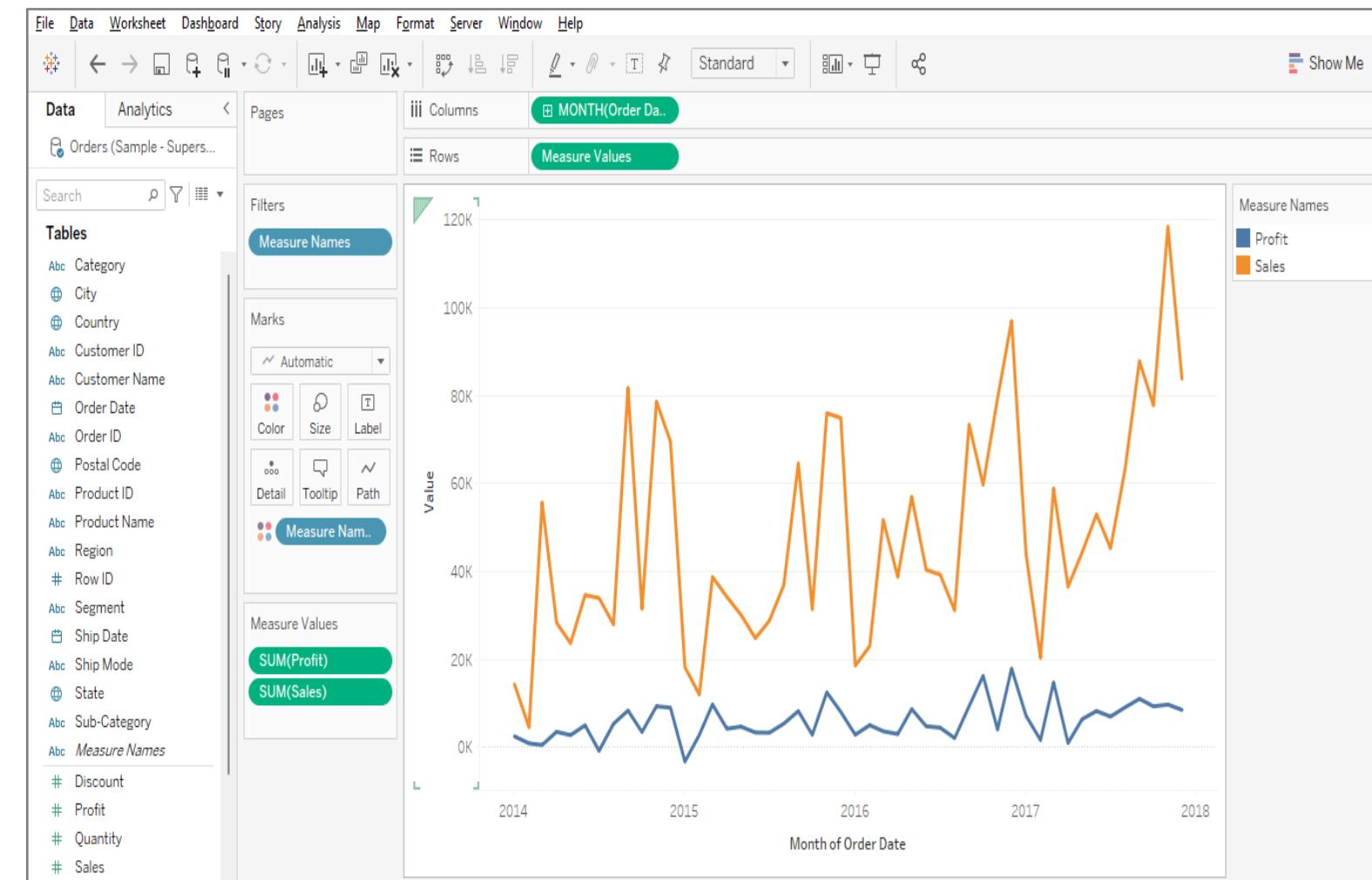
Combined Axis Chart

Combined axis charts are views that use multiple mark types in the same sheet.



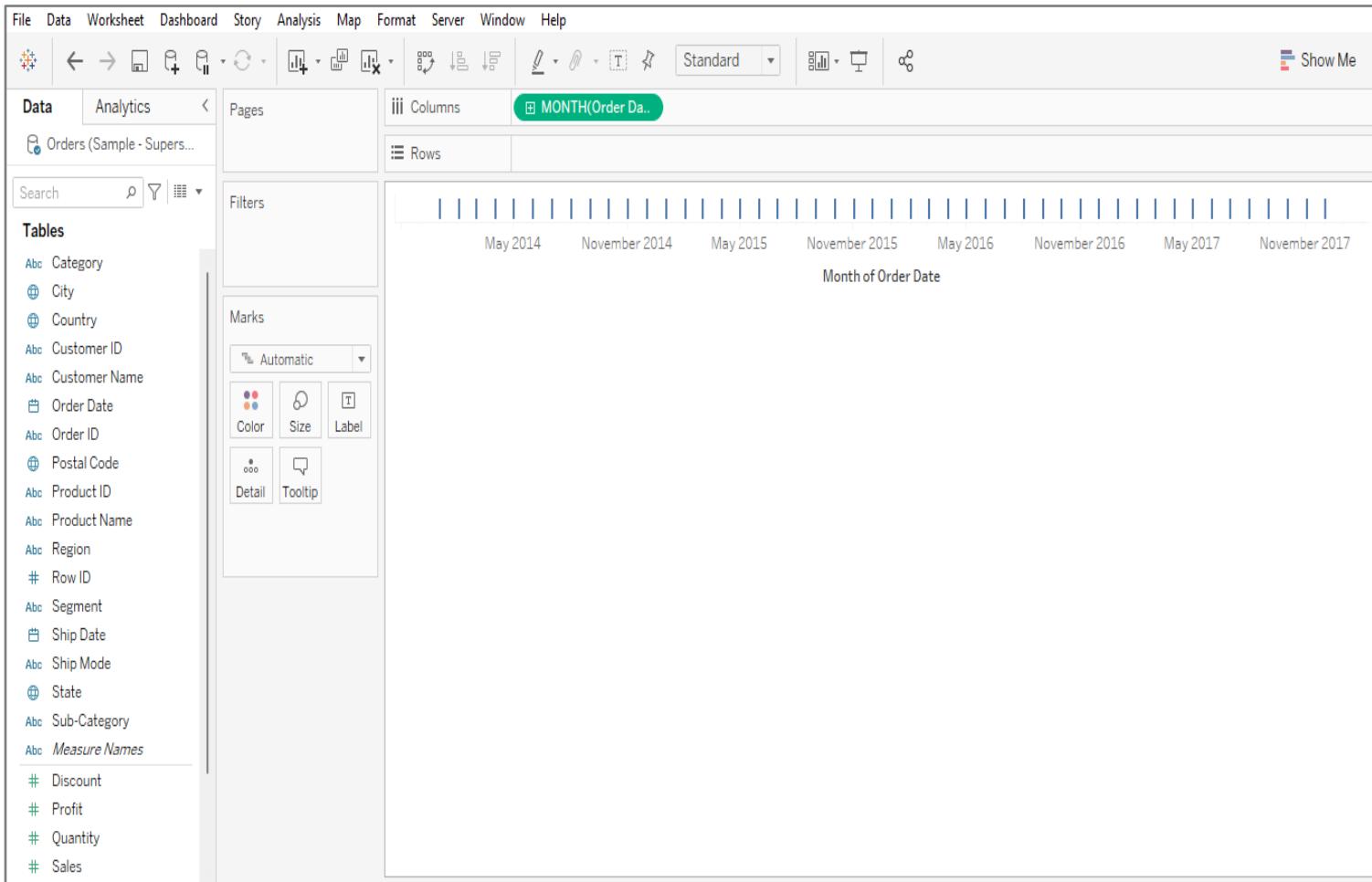
Combined Axis Chart

Steps to create a combined axis chart to showcase profit and sales across the order date



Combined Axis Chart

Steps to create a combined axis chart to showcase profit and sales across the order date

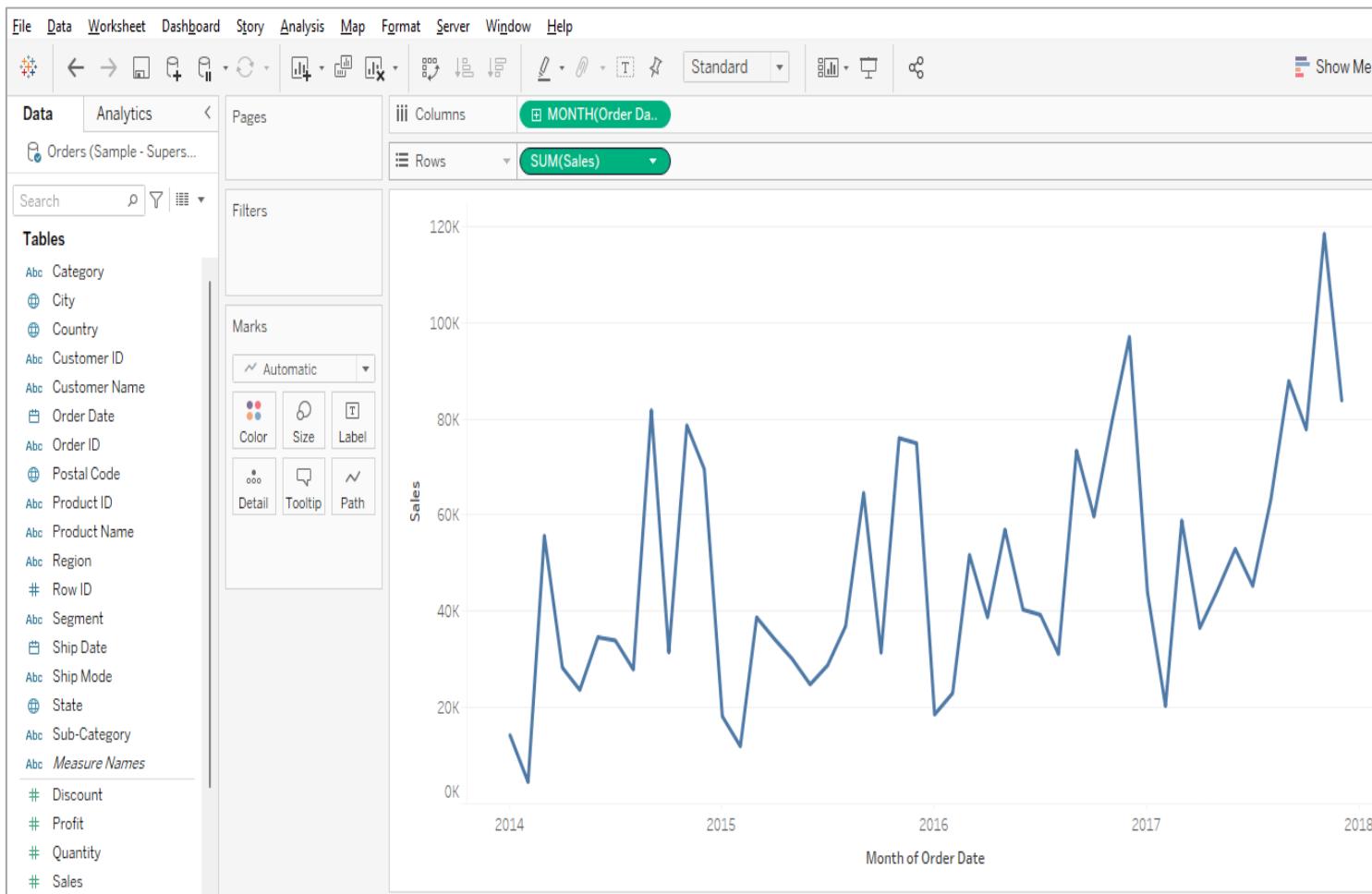


Step 1

Drag Order Date to Columns and select Month in Date Value

Combined Axis Chart

Steps to create a combined axis chart to showcase profit and sales across the order date

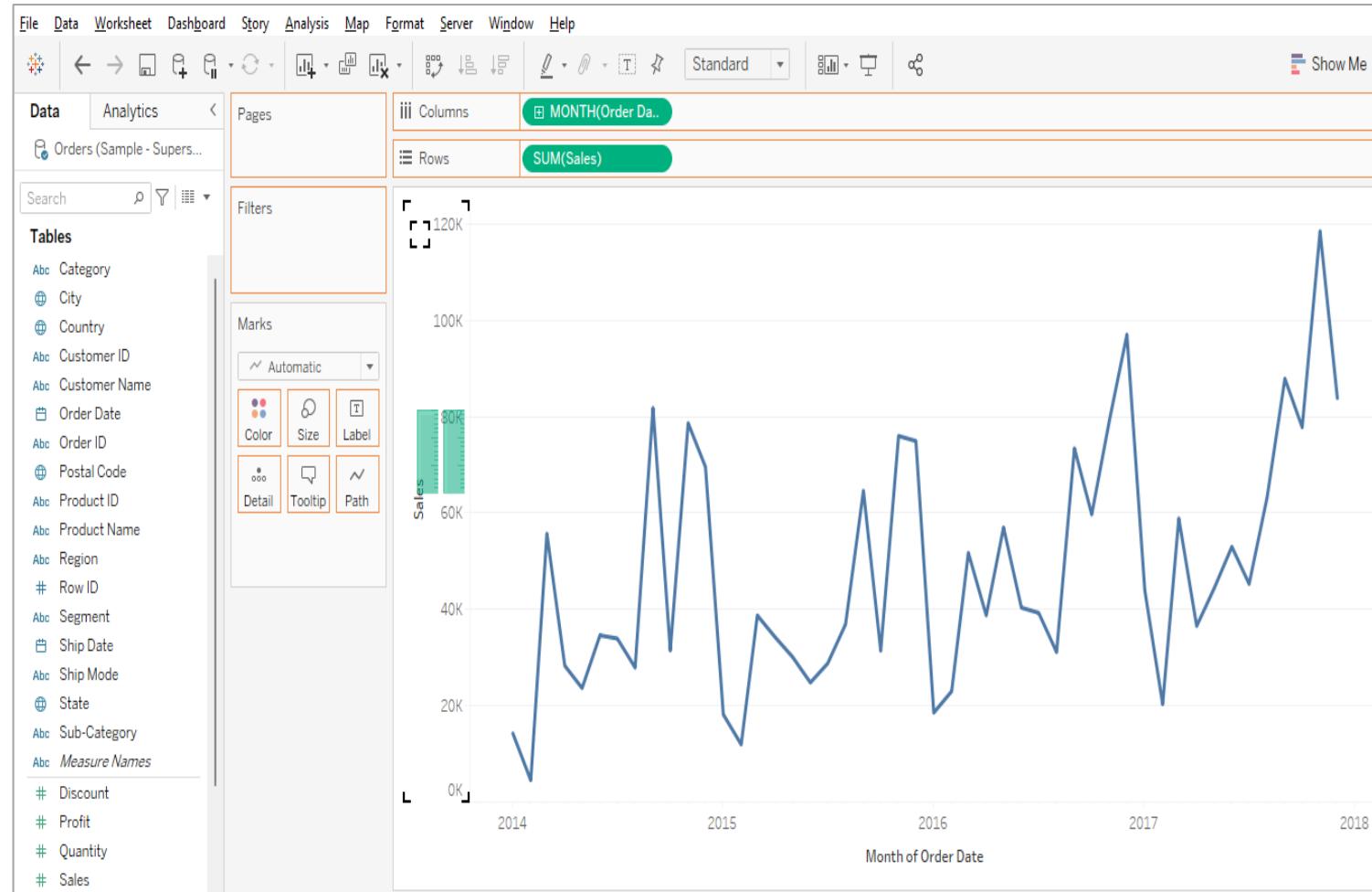


Step 2

Drag sales to rows

Combined Axis Chart

Steps to create a combined axis chart to showcase profit and sales across the order date

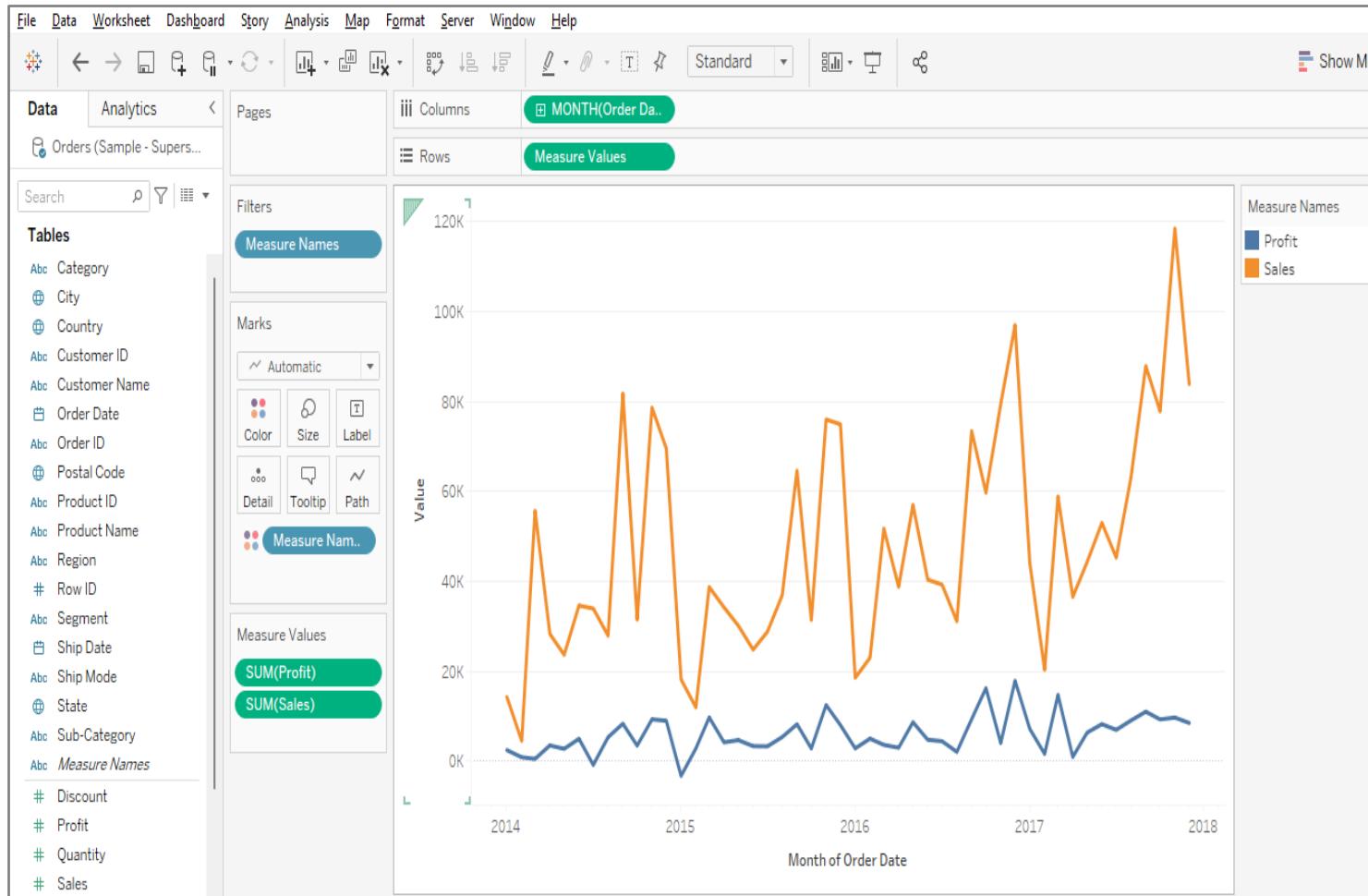


Step 3

Drag Profit on top of Sales
axis in the chart and stop
when two scale symbol is
visible

Combined Axis Chart

Steps to create a combined axis chart to showcase profit and sales across the order date

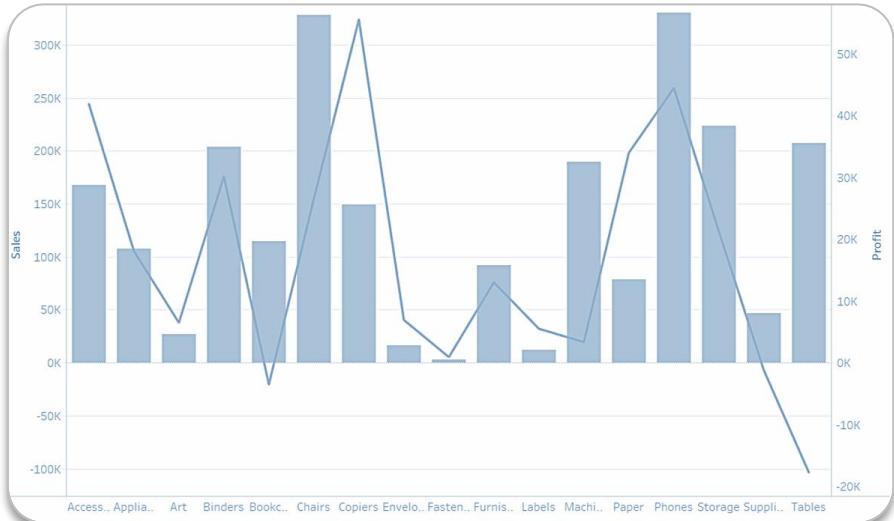


Step 4

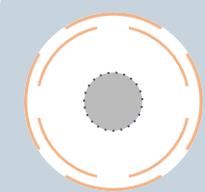
This creates the combined axis chart with Profit and Sales sharing the same axis, and shows the trend of sales and profit in the same chart

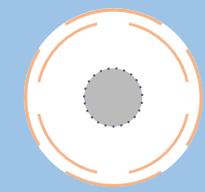
Dual Axis Chart

Dual Axis Chart



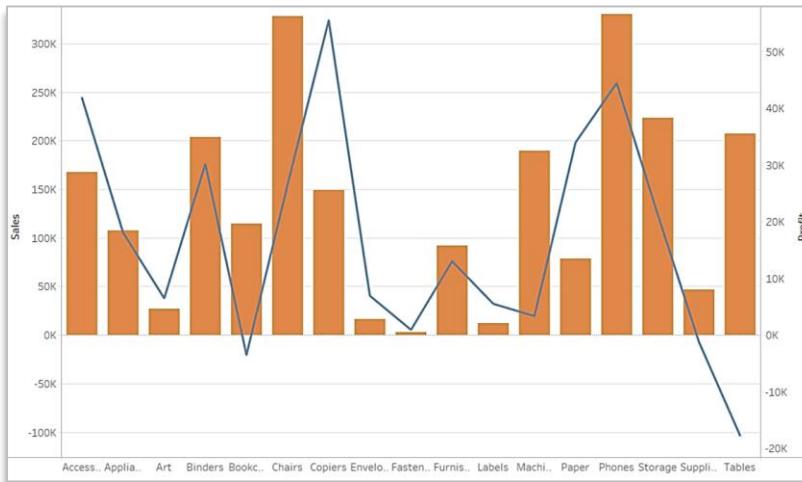
 Dual axis chart consists of two independent axes that are layered one on top of the other.

 It illustrates the relationship between two variables.

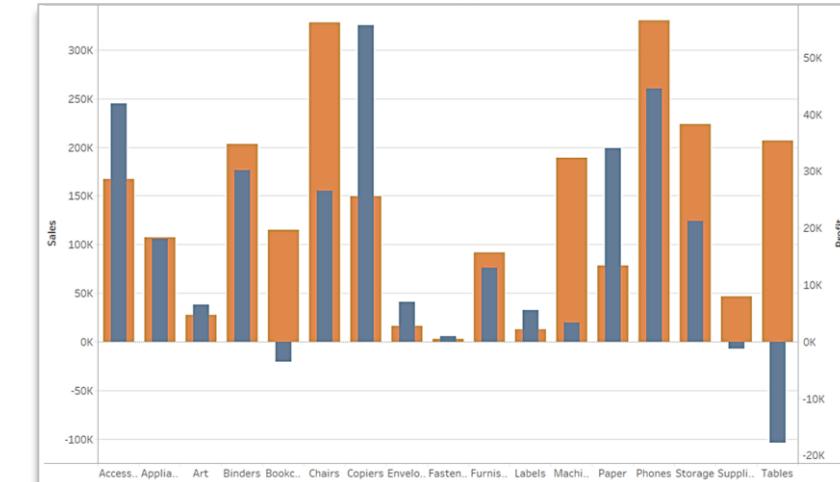
 It is used to compare multiple measures of the same category.

Dual Axis Chart

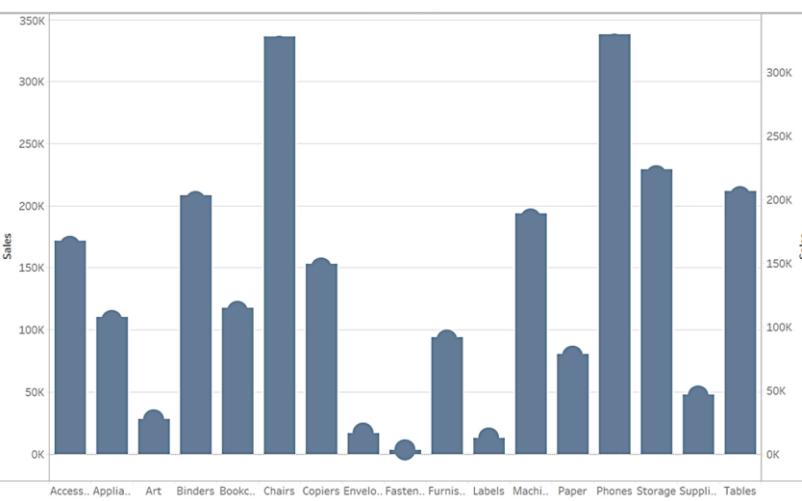
Types of dual axis chart:



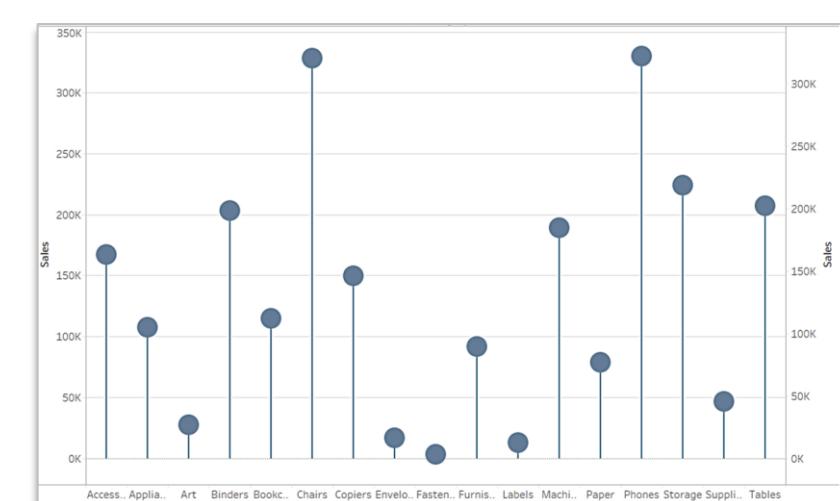
Bar vs. line chart



Bar in bar chart



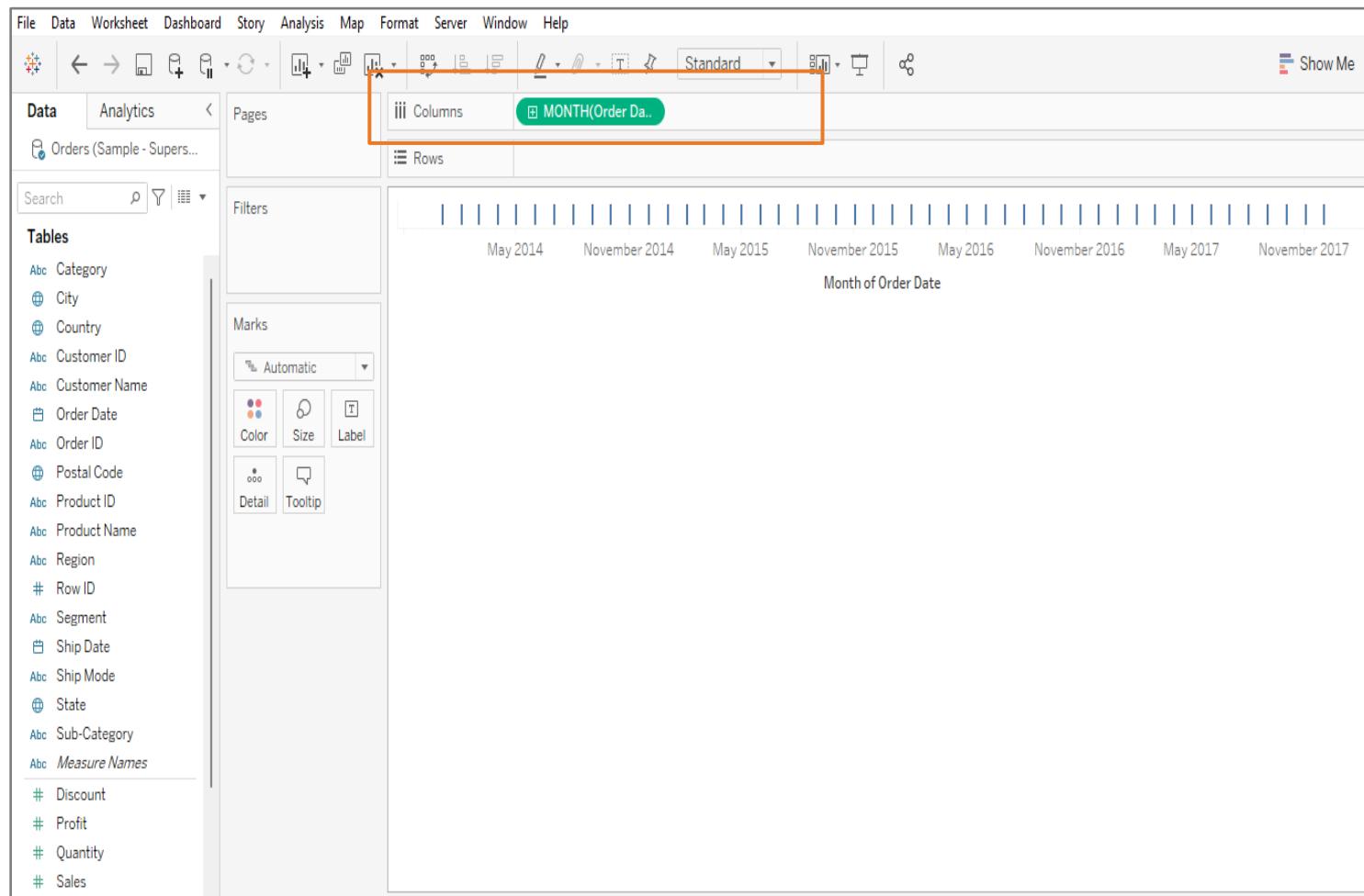
Bar vs. circle chart



Lollipop chart

Dual Axis Chart

Steps to create a dual axis chart:

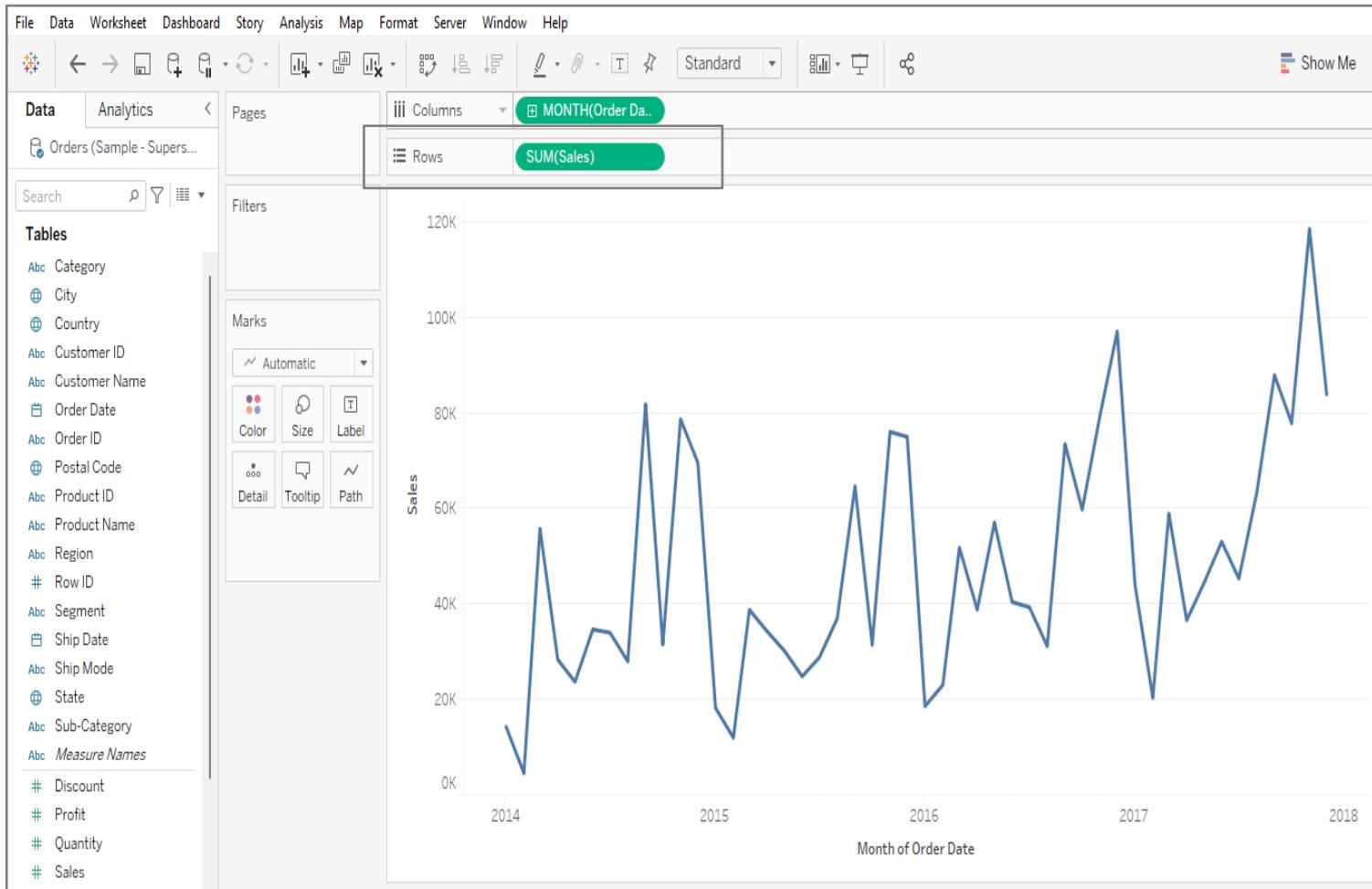


Step 1

Use sample superstore dataset and drag Order date by Date value months to **columns**

Dual Axis Chart

Steps to create a dual axis chart:

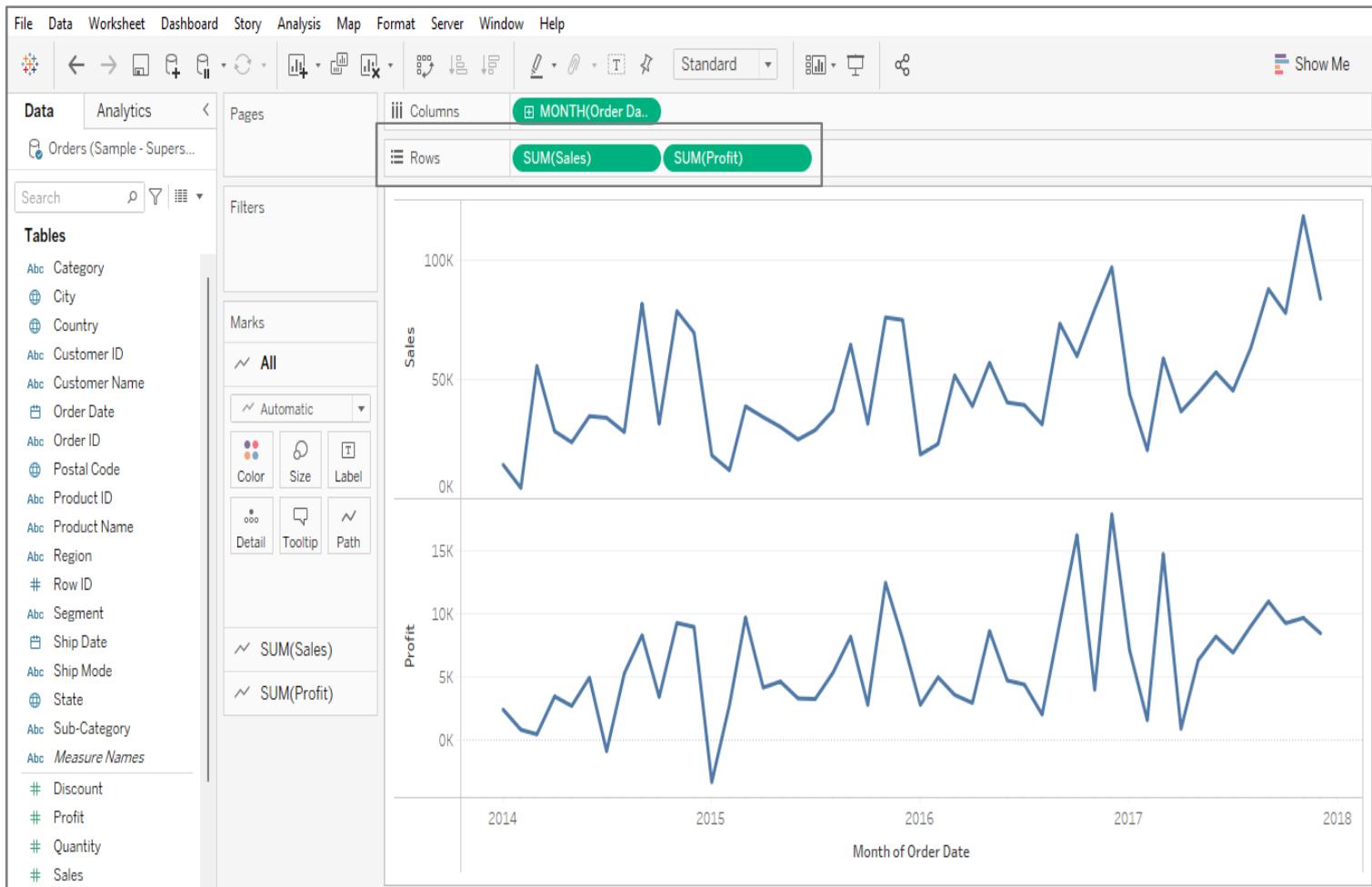


Step 2

Drag Sales to Rows

Dual Axis Chart

Steps to create a dual axis chart:

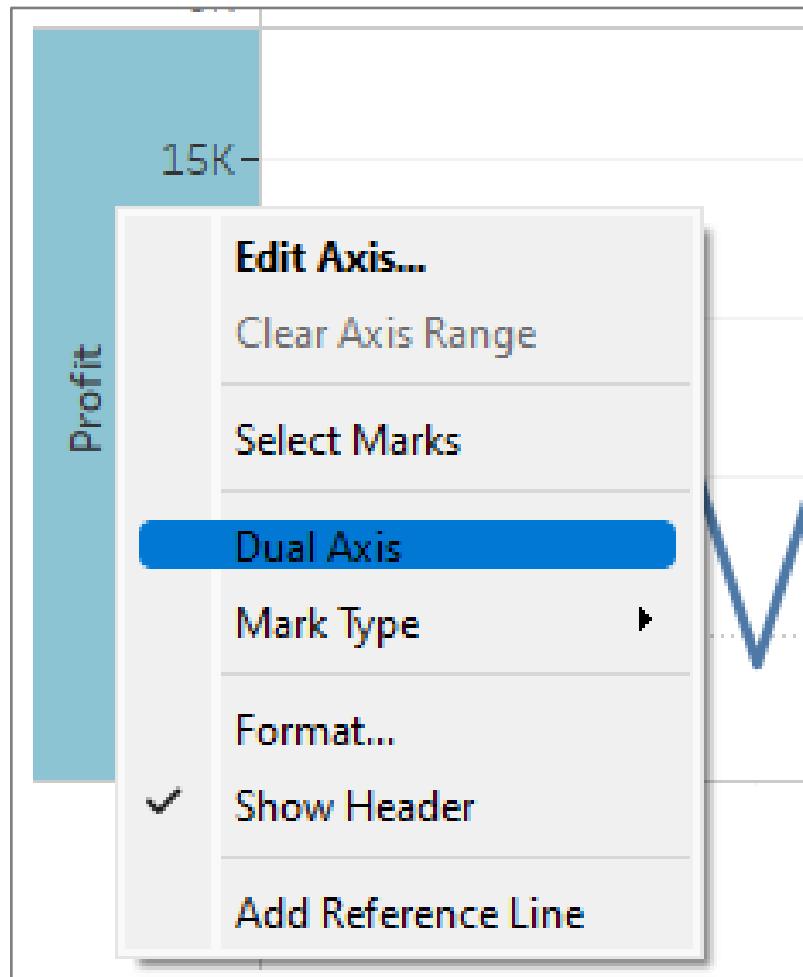


Step 3

Drag **Profit** next to **Sales** in **Rows**

Dual Axis Chart

Steps to create a dual axis chart:

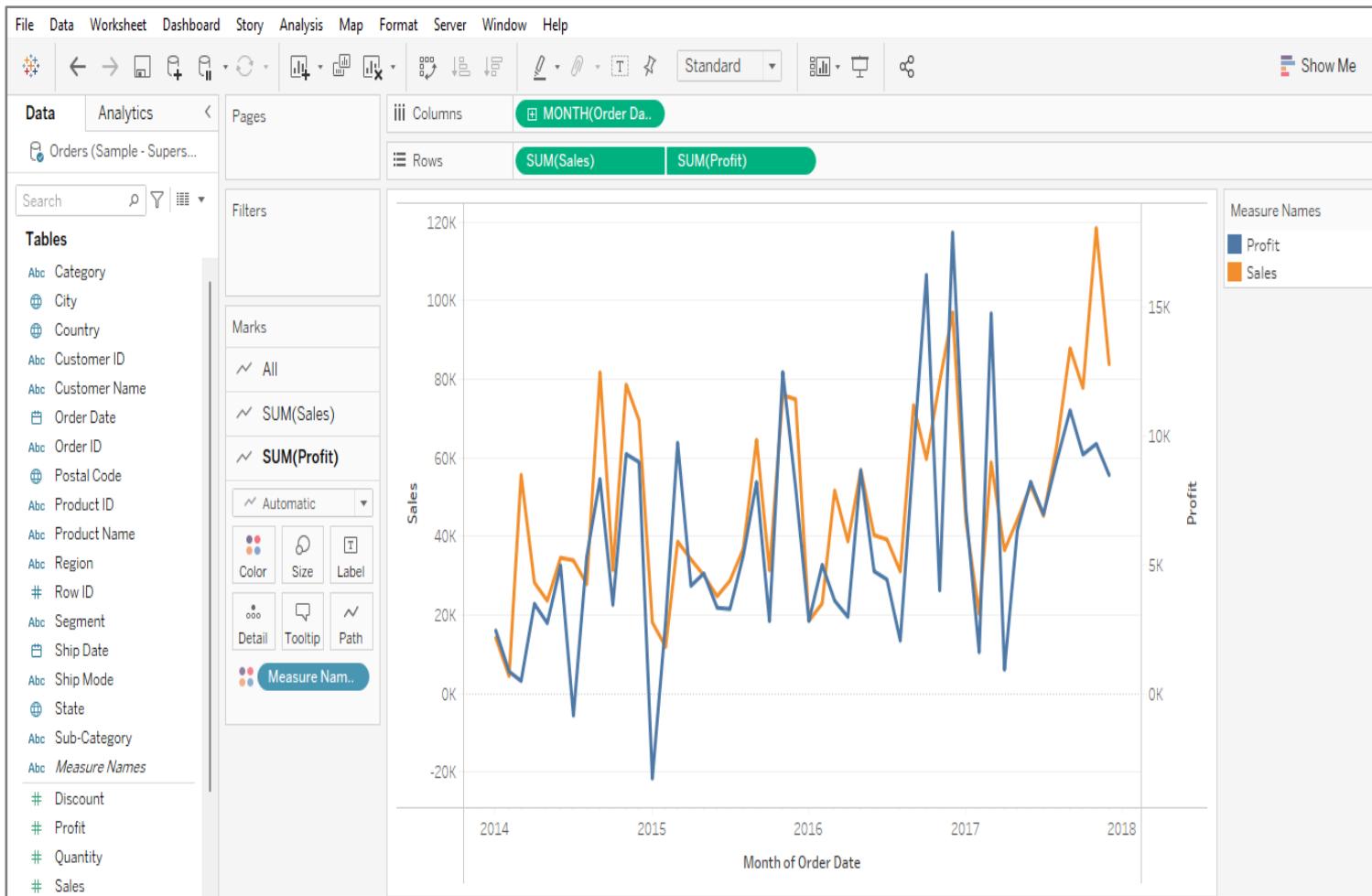


Step 4

Right-click on **Profit** axis and Select **Dual Axis**

Dual Axis Chart

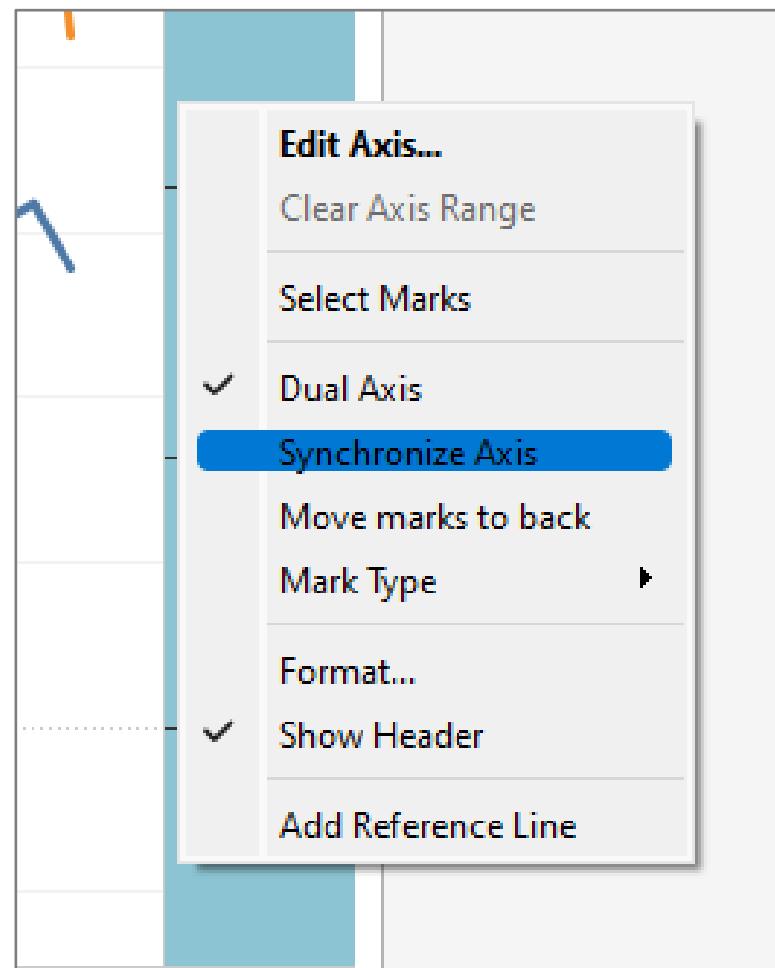
This creates the dual axis chart.



- Observe the Marks card which has created individual Marks for individual measure.
- Observe how the sales and profit has combined to the giant pill in the Rows area.

Dual Axis Chart

Steps to create a dual axis chart:

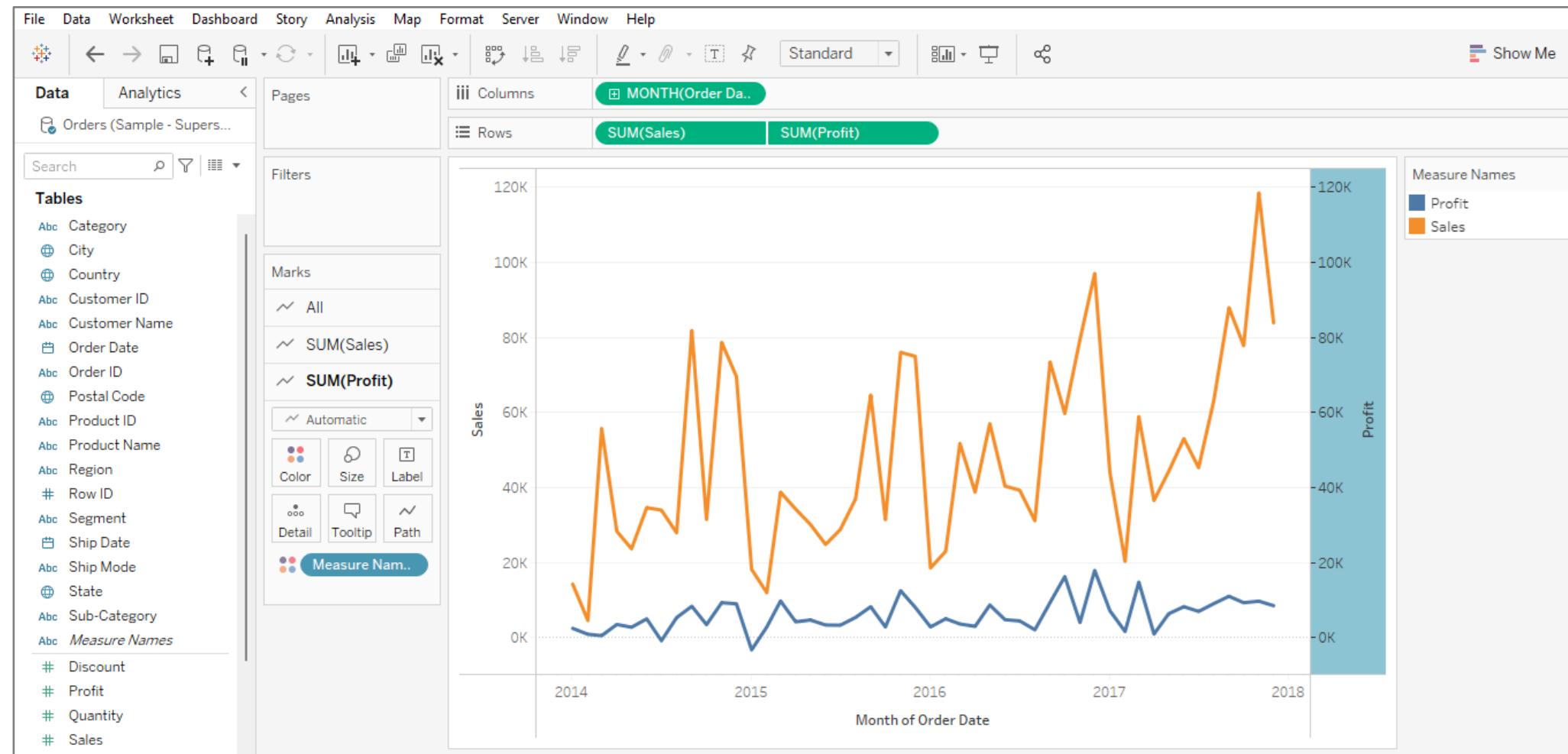


Step 5

To change the axis range of Profit, right-click on profit axis and select **Synchronize axis**

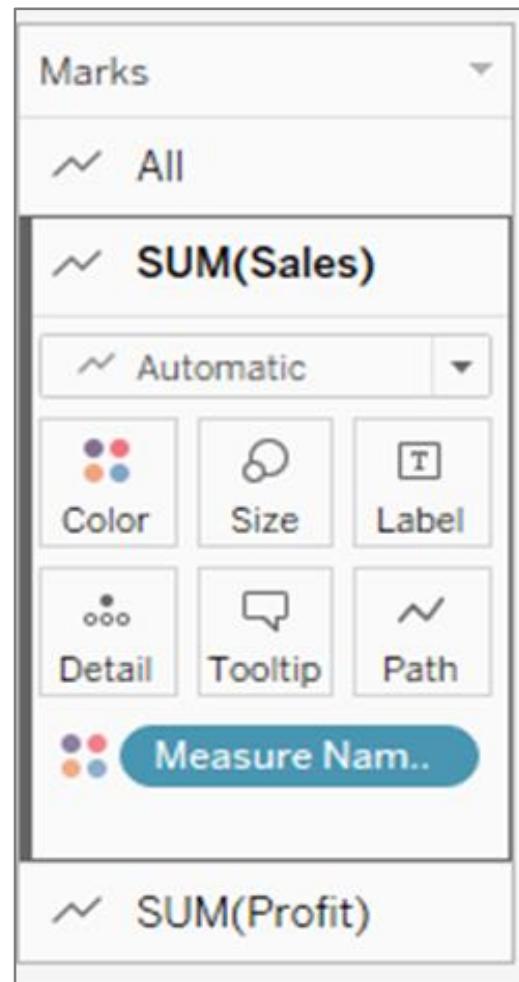
Dual Axis Chart

This synchronizes the axis between Sales and Profit.



Dual Axis Chart

Steps to create a dual axis chart:

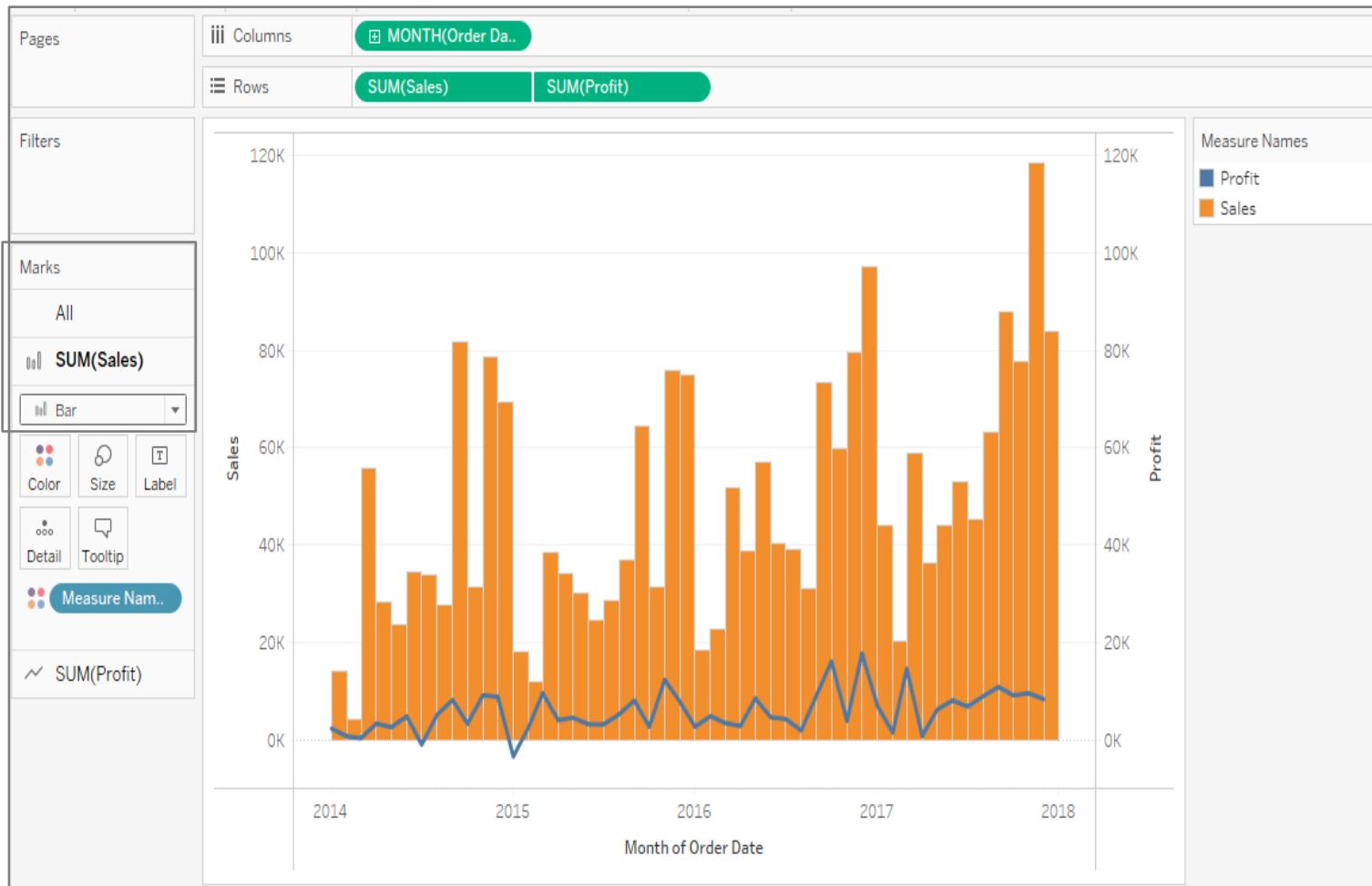


Step 6

To change the type of Mark of **Sales** navigate to Sales in **Marks Card**

Dual Axis Chart

Steps to create a dual axis chart:

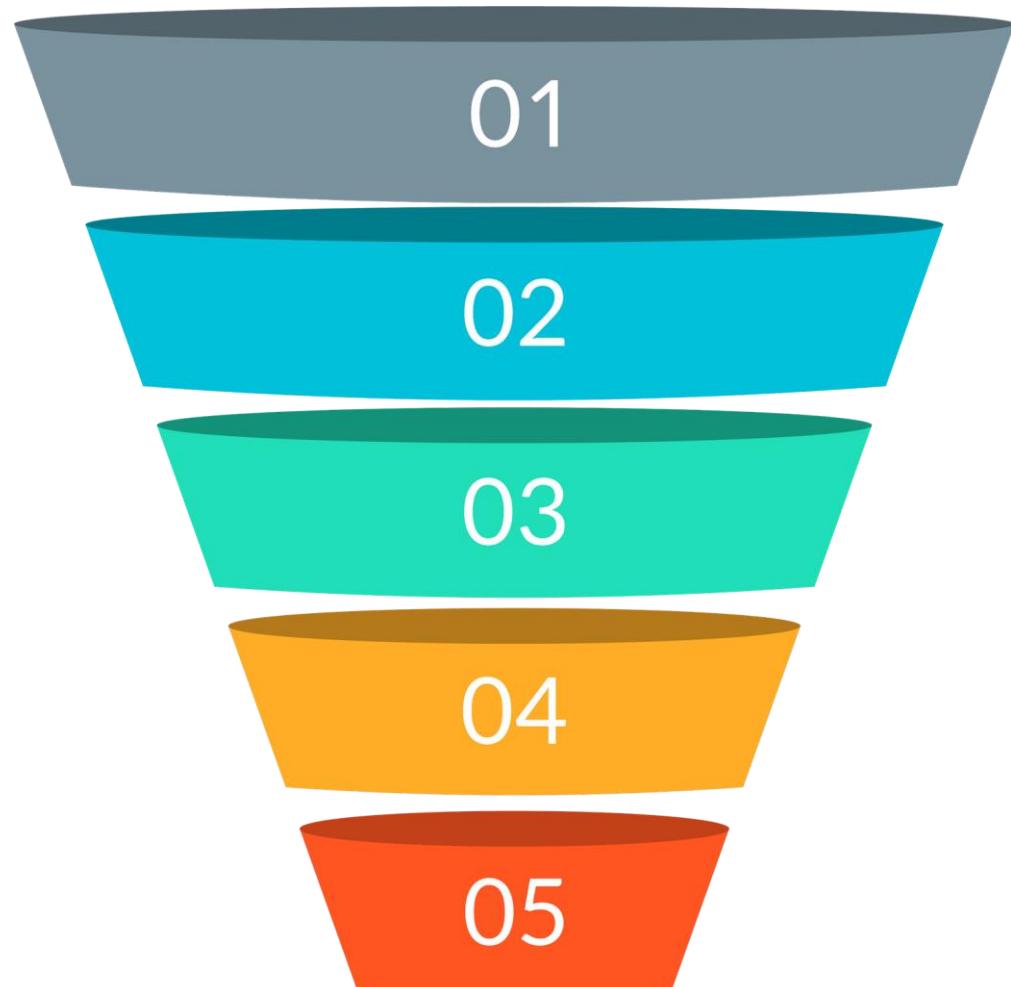


Step 7

Change the type of mark to **Bar** and observe the dual axis chart

Funnel Chart

Funnel Chart



These charts are
in the form of a
funnel.

It is used in the
marketing and
sales domain.

It helps present
sales, profit, and
revenue at
different stages.

Funnel Chart

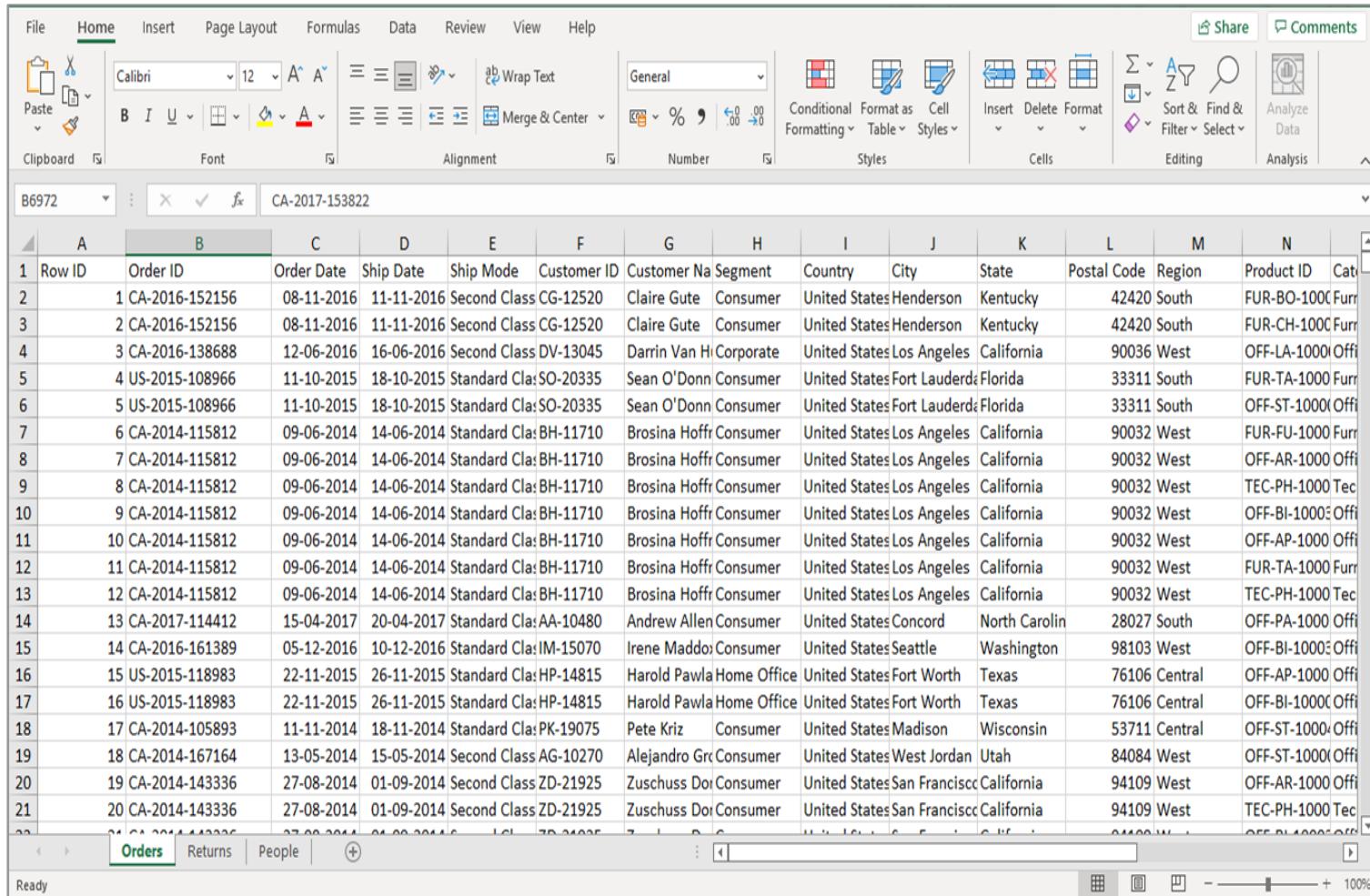
In Tableau, funnel charts are created for:

Single measure value

Multiple measure value

Funnel Chart

Steps to create a funnel chart for a single measure value:



The screenshot shows a Microsoft Excel spreadsheet titled 'Orders'. The ribbon is visible at the top with the 'Home' tab selected. The main area displays a dataset with columns including Row ID, Order ID, Order Date, Ship Date, Ship Mode, Customer ID, Customer Name, Segment, Country, City, State, Postal Code, Region, Product ID, and Category. The data consists of approximately 20 rows of order information. The bottom of the screen shows the 'Ready' status.

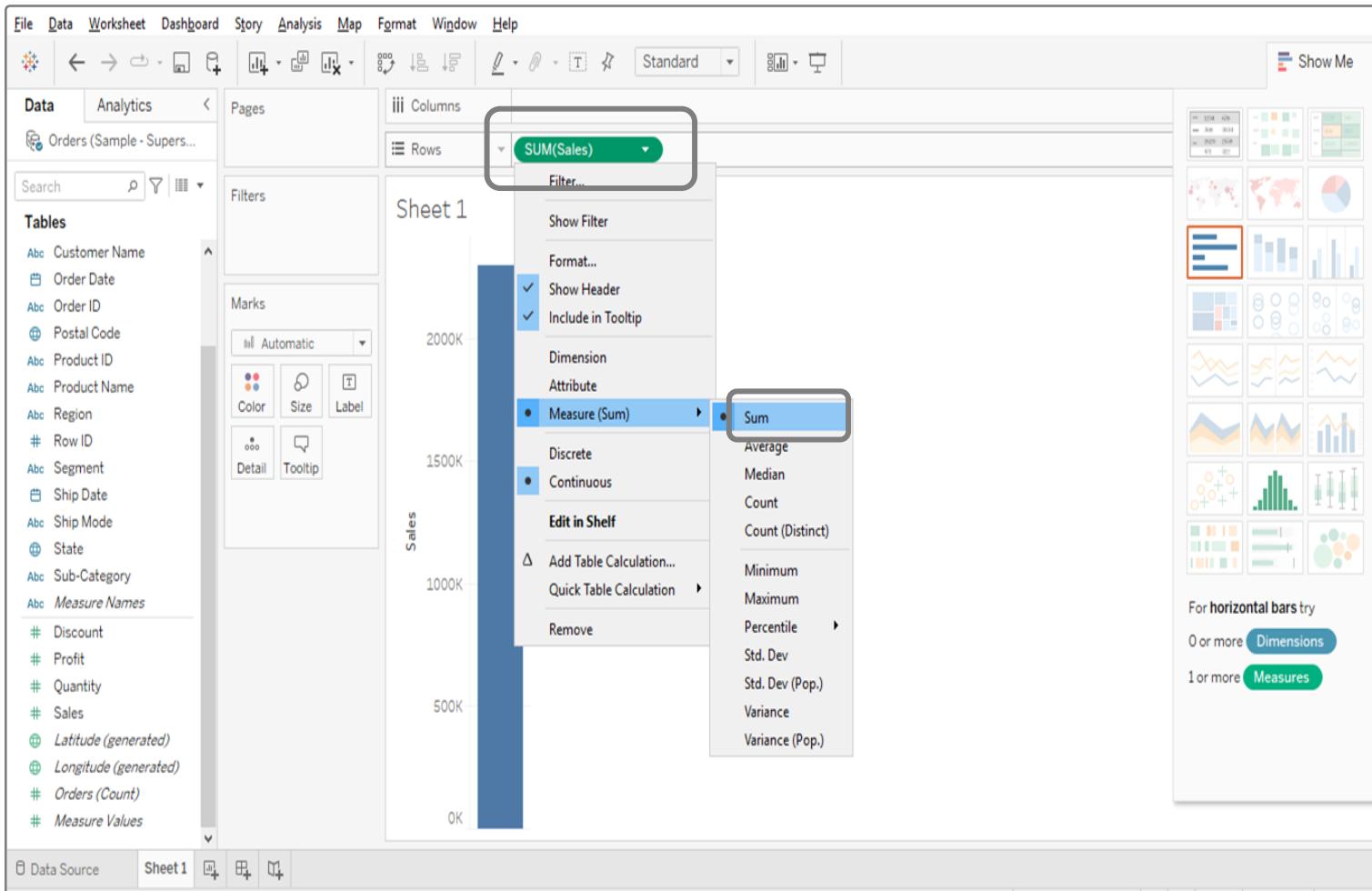
Row ID	Order ID	Order Date	Ship Date	Ship Mode	Customer ID	Customer Name	Segment	Country	City	State	Postal Code	Region	Product ID	Category
1	CA-2016-152156	08-11-2016	11-11-2016	Second Class	CG-12520	Claire Gute	Consumer	United States	Henderson	Kentucky	42420	South	FUR-BO-1000	Furniture
2	CA-2016-152156	08-11-2016	11-11-2016	Second Class	CG-12520	Claire Gute	Consumer	United States	Henderson	Kentucky	42420	South	FUR-CH-1000	Furniture
3	CA-2016-138688	12-06-2016	16-06-2016	Second Class	DV-13045	Darrin Van Ho	Corporate	United States	Los Angeles	California	90036	West	OFF-LA-1000	Office Supplies
4	US-2015-108966	11-10-2015	18-10-2015	Standard Class	SO-20335	Sean O'Donnell	Consumer	United States	Fort Lauderdale	Florida	33311	South	FUR-TA-1000	Furniture
5	US-2015-108966	11-10-2015	18-10-2015	Standard Class	SO-20335	Sean O'Donnell	Consumer	United States	Fort Lauderdale	Florida	33311	South	OFF-ST-1000	Office Supplies
6	CA-2014-115812	09-06-2014	14-06-2014	Standard Class	BH-11710	Brosina Hoff	Consumer	United States	Los Angeles	California	90032	West	FUR-FU-1000	Furniture
7	CA-2014-115812	09-06-2014	14-06-2014	Standard Class	BH-11710	Brosina Hoff	Consumer	United States	Los Angeles	California	90032	West	OFF-AR-1000	Office Supplies
8	CA-2014-115812	09-06-2014	14-06-2014	Standard Class	BH-11710	Brosina Hoff	Consumer	United States	Los Angeles	California	90032	West	TEC-PH-1000	Technology
9	CA-2014-115812	09-06-2014	14-06-2014	Standard Class	BH-11710	Brosina Hoff	Consumer	United States	Los Angeles	California	90032	West	OFF-BI-1000	Office Supplies
10	CA-2014-115812	09-06-2014	14-06-2014	Standard Class	BH-11710	Brosina Hoff	Consumer	United States	Los Angeles	California	90032	West	OFF-AP-1000	Office Supplies
11	CA-2014-115812	09-06-2014	14-06-2014	Standard Class	BH-11710	Brosina Hoff	Consumer	United States	Los Angeles	California	90032	West	FUR-TA-1000	Furniture
12	CA-2014-115812	09-06-2014	14-06-2014	Standard Class	BH-11710	Brosina Hoff	Consumer	United States	Los Angeles	California	90032	West	TEC-PH-1000	Technology
13	CA-2017-114412	15-04-2017	20-04-2017	Standard Class	AA-10480	Andrew Allen	Consumer	United States	Concord	North Carolina	28027	South	OFF-PA-1000	Office Supplies
14	CA-2016-161389	05-12-2016	10-12-2016	Standard Class	IM-15070	Irene Maddo	Consumer	United States	Seattle	Washington	98103	West	OFF-BI-1000	Office Supplies
15	US-2015-118983	22-11-2015	26-11-2015	Standard Class	HP-14815	Harold Pawlak	Home Office	United States	Fort Worth	Texas	76106	Central	OFF-AP-1000	Office Supplies
16	US-2015-118983	22-11-2015	26-11-2015	Standard Class	HP-14815	Harold Pawlak	Home Office	United States	Fort Worth	Texas	76106	Central	OFF-BI-1000	Office Supplies
17	CA-2014-105893	11-11-2014	18-11-2014	Standard Class	PK-19075	Pete Kriz	Consumer	United States	Madison	Wisconsin	53711	Central	OFF-ST-1000	Office Supplies
18	CA-2014-167164	13-05-2014	15-05-2014	Second Class	AG-10270	Alejandro Gómez	Consumer	United States	West Jordan	Utah	84084	West	OFF-ST-1000	Office Supplies
19	CA-2014-143336	27-08-2014	01-09-2014	Second Class	ZD-21925	Zuschuss Doe	Consumer	United States	San Francisco	California	94109	West	OFF-AR-1000	Office Supplies
20	CA-2014-143336	27-08-2014	01-09-2014	Second Class	ZD-21925	Zuschuss Doe	Consumer	United States	San Francisco	California	94109	West	TEC-PH-1000	Technology

Step 1

Use Sample Superstore dataset

Funnel Chart

Steps to create a funnel chart for a single measure value:

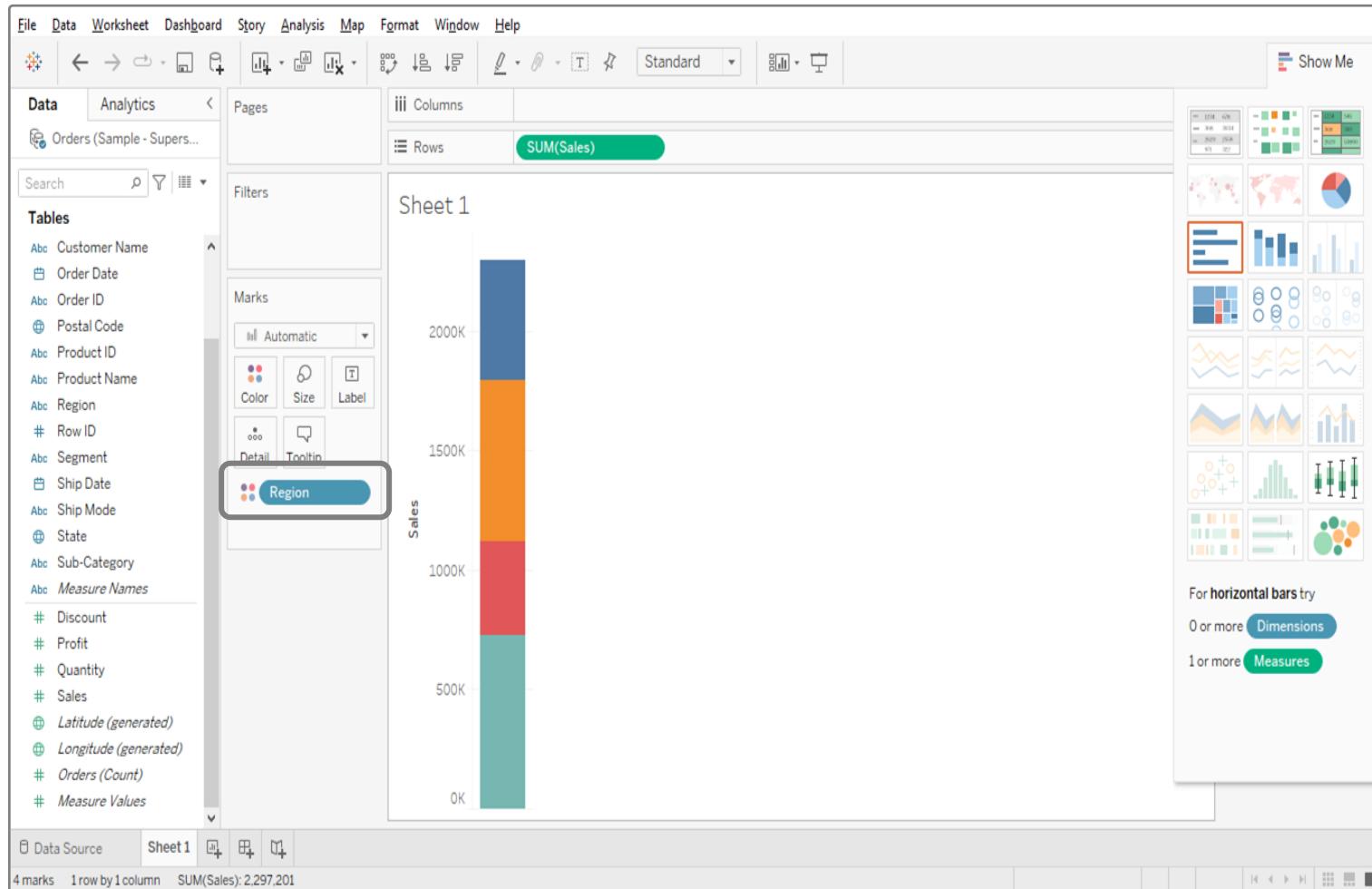


Step 2

Add **Sales** to the Rows section and Select the aggregation type as **Sum**

Funnel Chart

Steps to create a funnel chart for a single measure value:

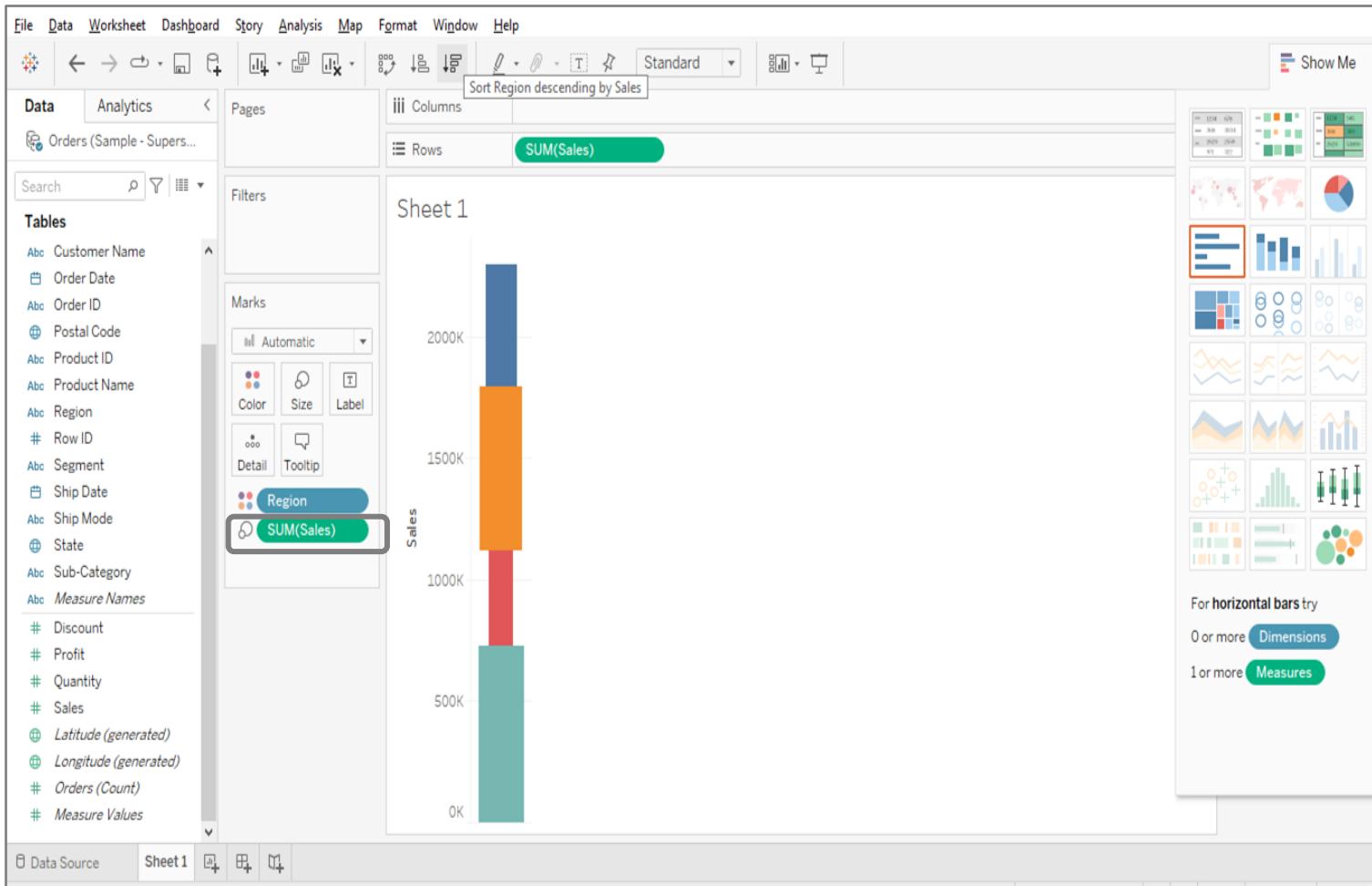


Step 3

Drag Region Dimension to Color

Funnel Chart

Steps to create a funnel chart for a single measure value:

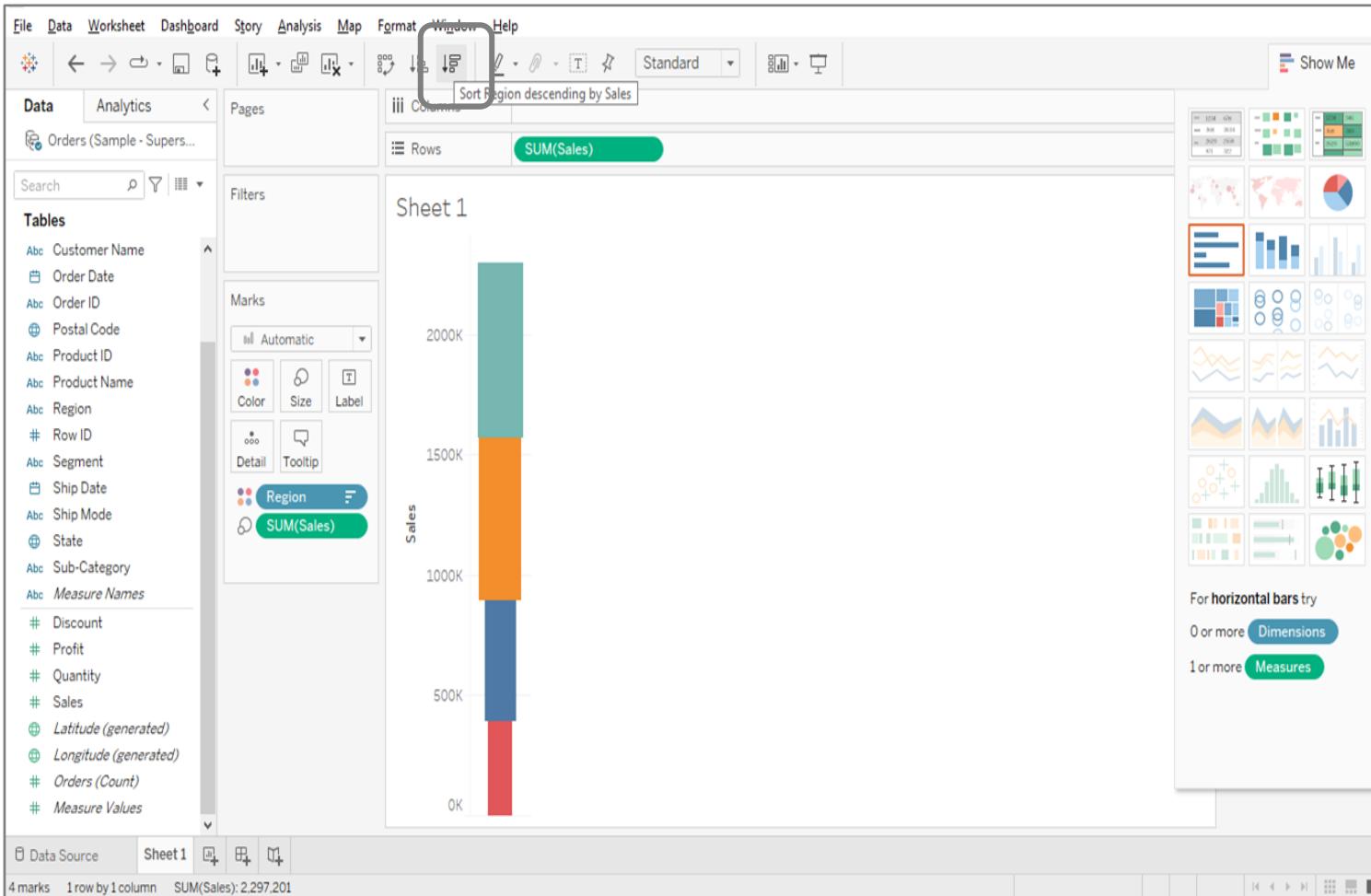


Step 4

Add **SUM(Sales)** into the **Size** box present in the **Marks** section

Funnel Chart

Steps to create a funnel chart for a single measure value:

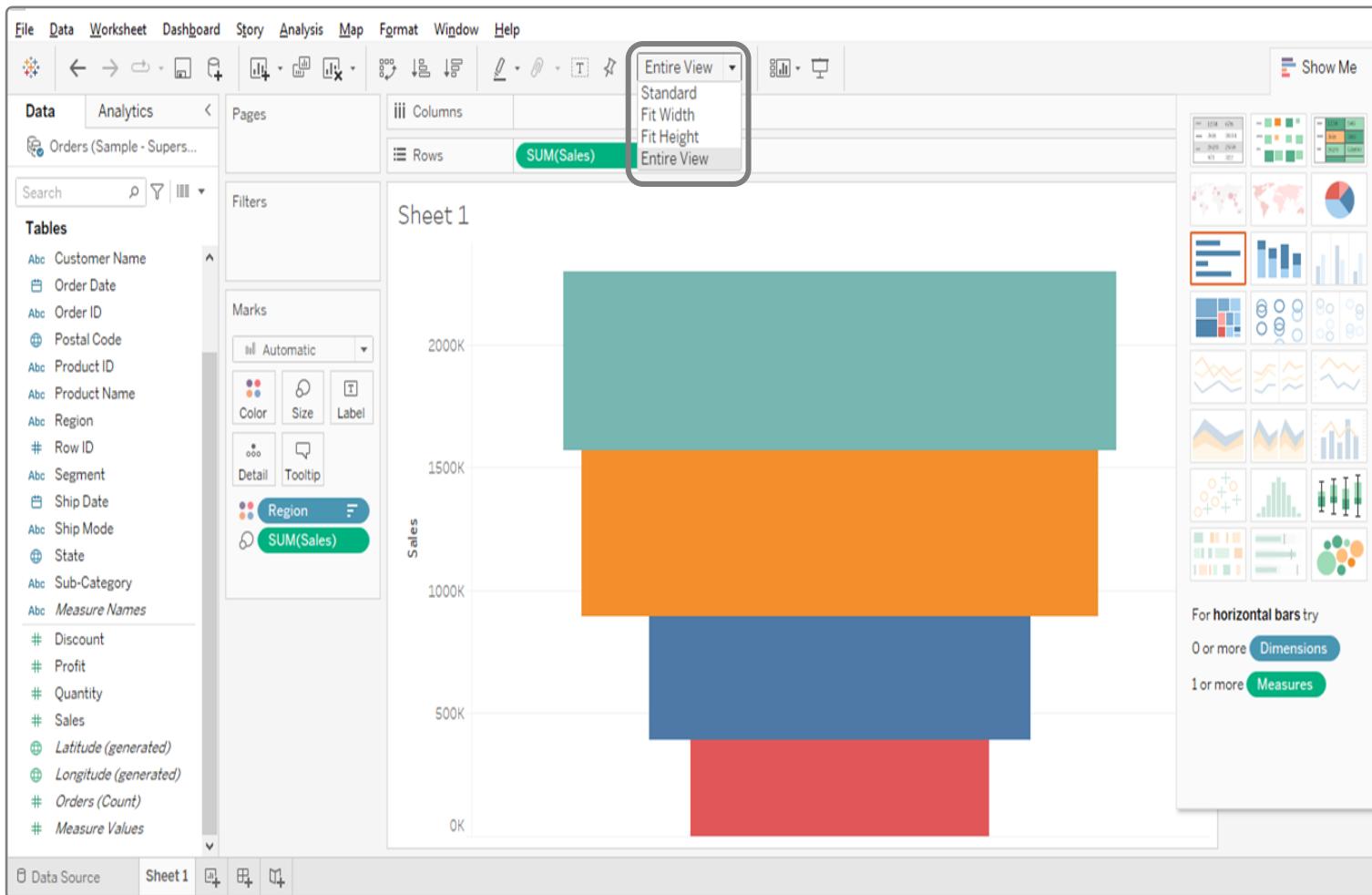


Step 5

Select the icon **Sort Region descending by Sales**

Funnel Chart

Steps to create a funnel chart for a single measure value:

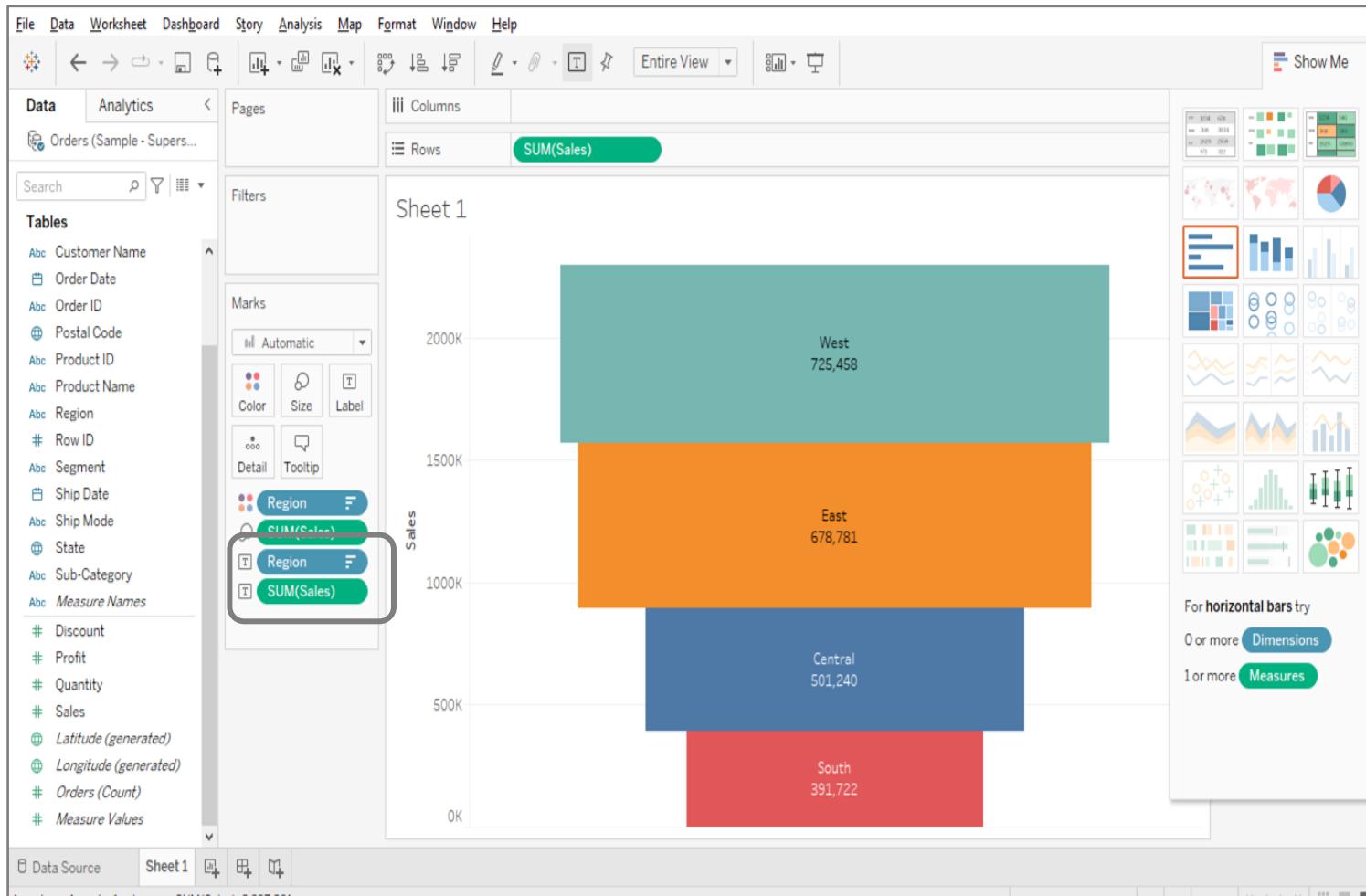


Step 5

Convert **Standard View** to **Entire View**

Funnel Chart

Steps to create a funnel chart for a single measure value:

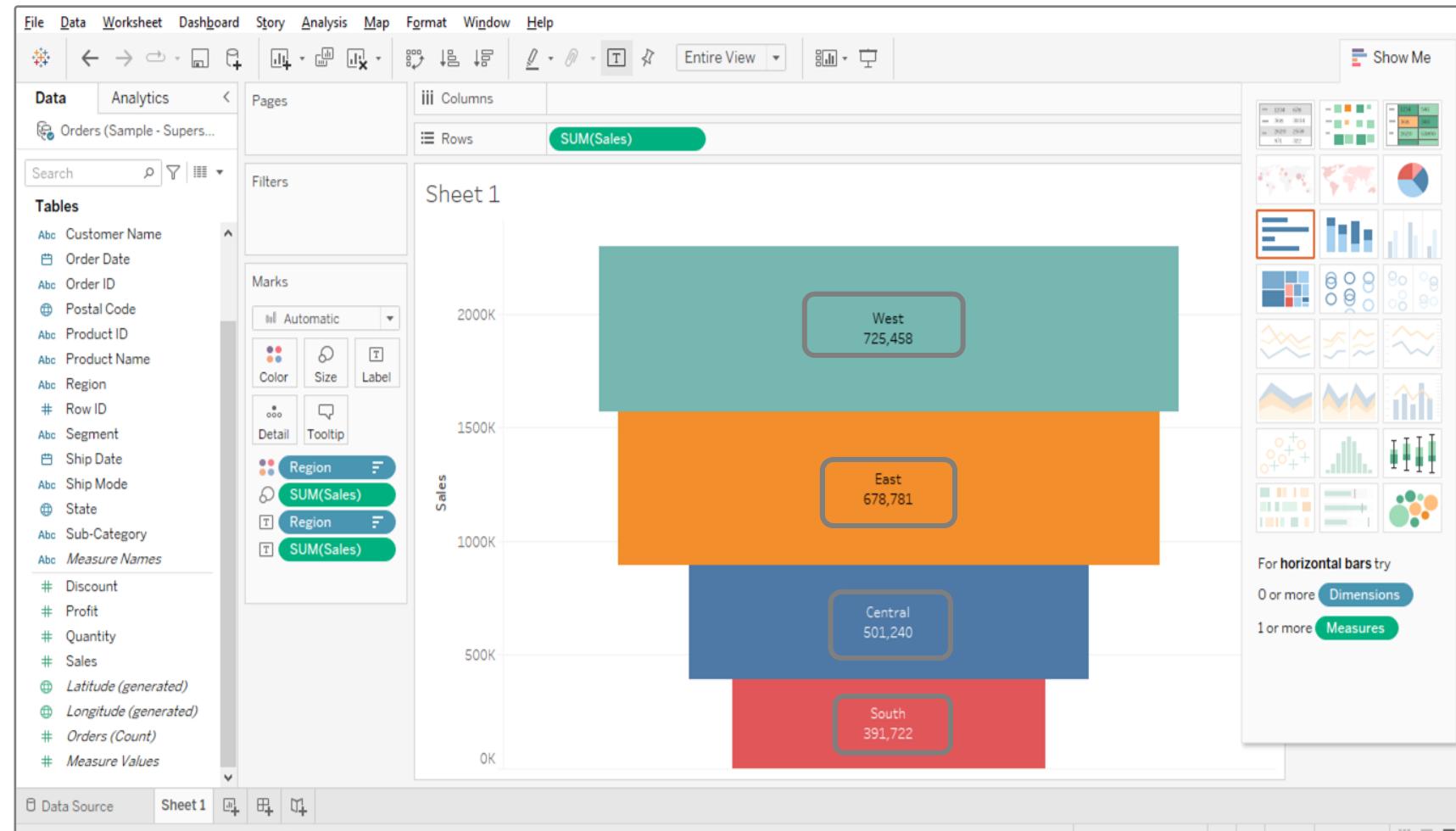


Step 6

Add the fields **Region** and **SUM(Sales)** into the Label box

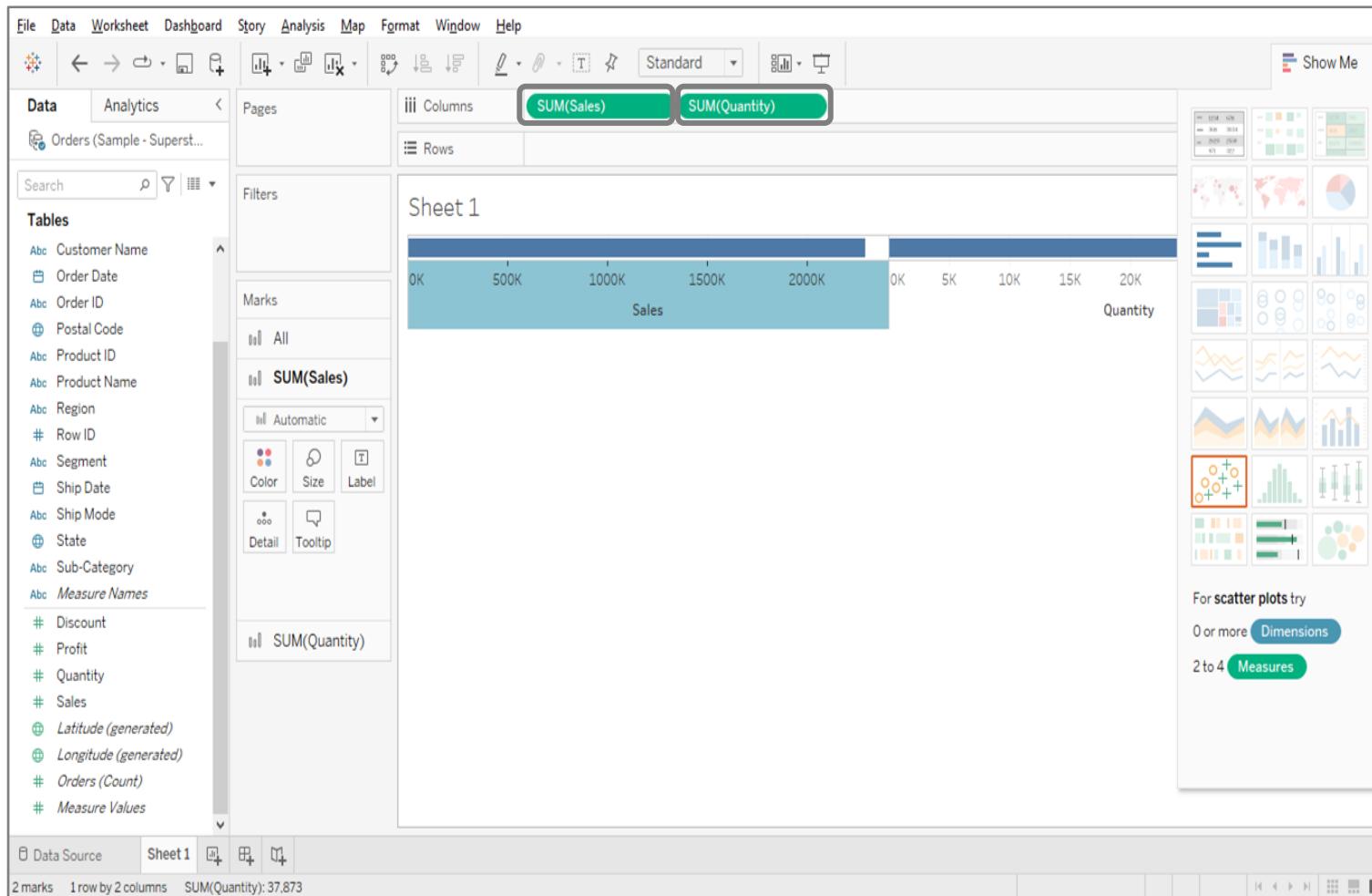
Funnel Chart

The final chart will look like:



Funnel Chart

Steps to create a funnel chart for multiple measure values:

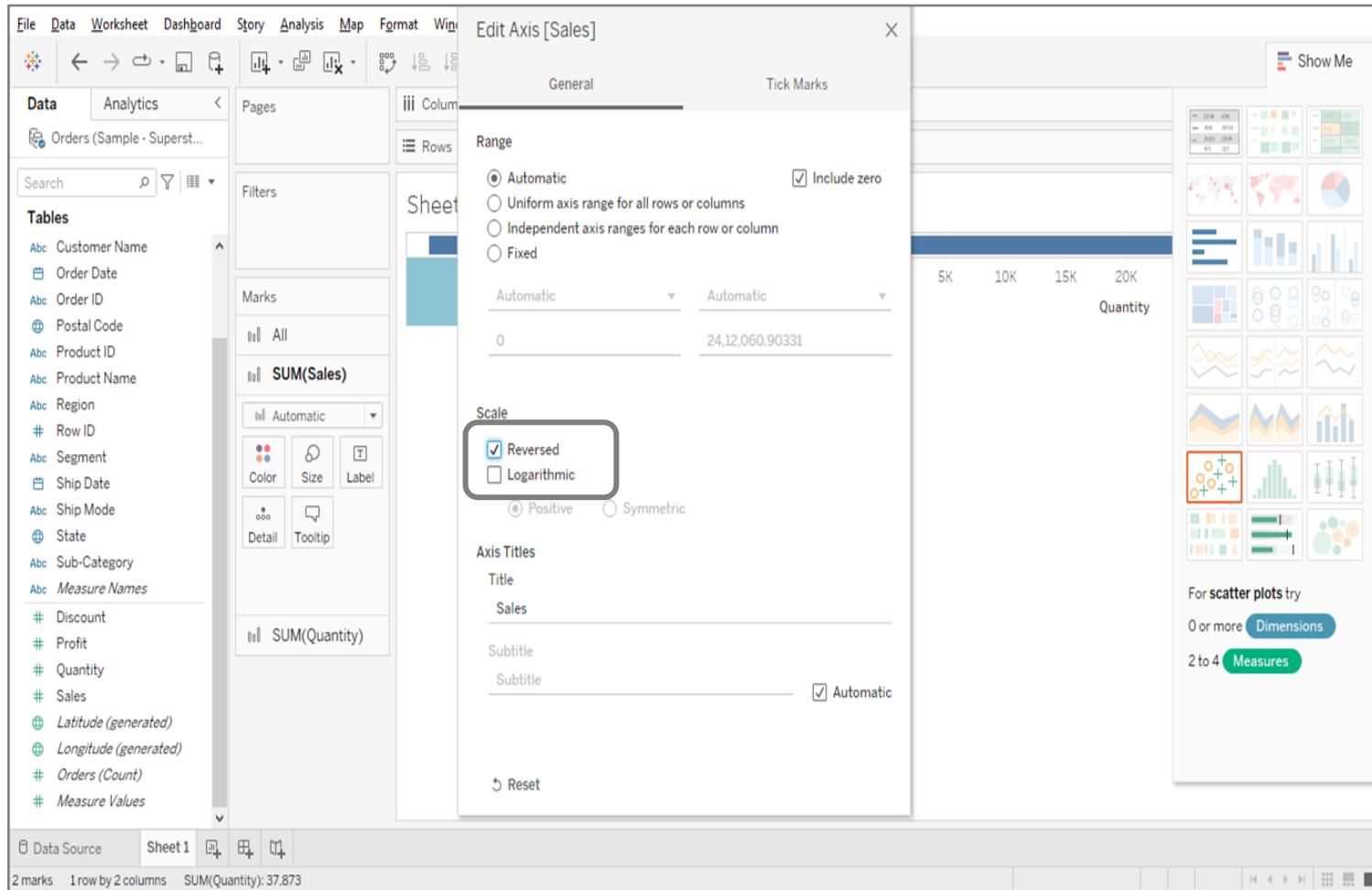


Step 1

Drag **Sales** and **Quantity** from data pane to the Columns shelf

Funnel Chart

Steps to create a funnel chart for multiple measure values:

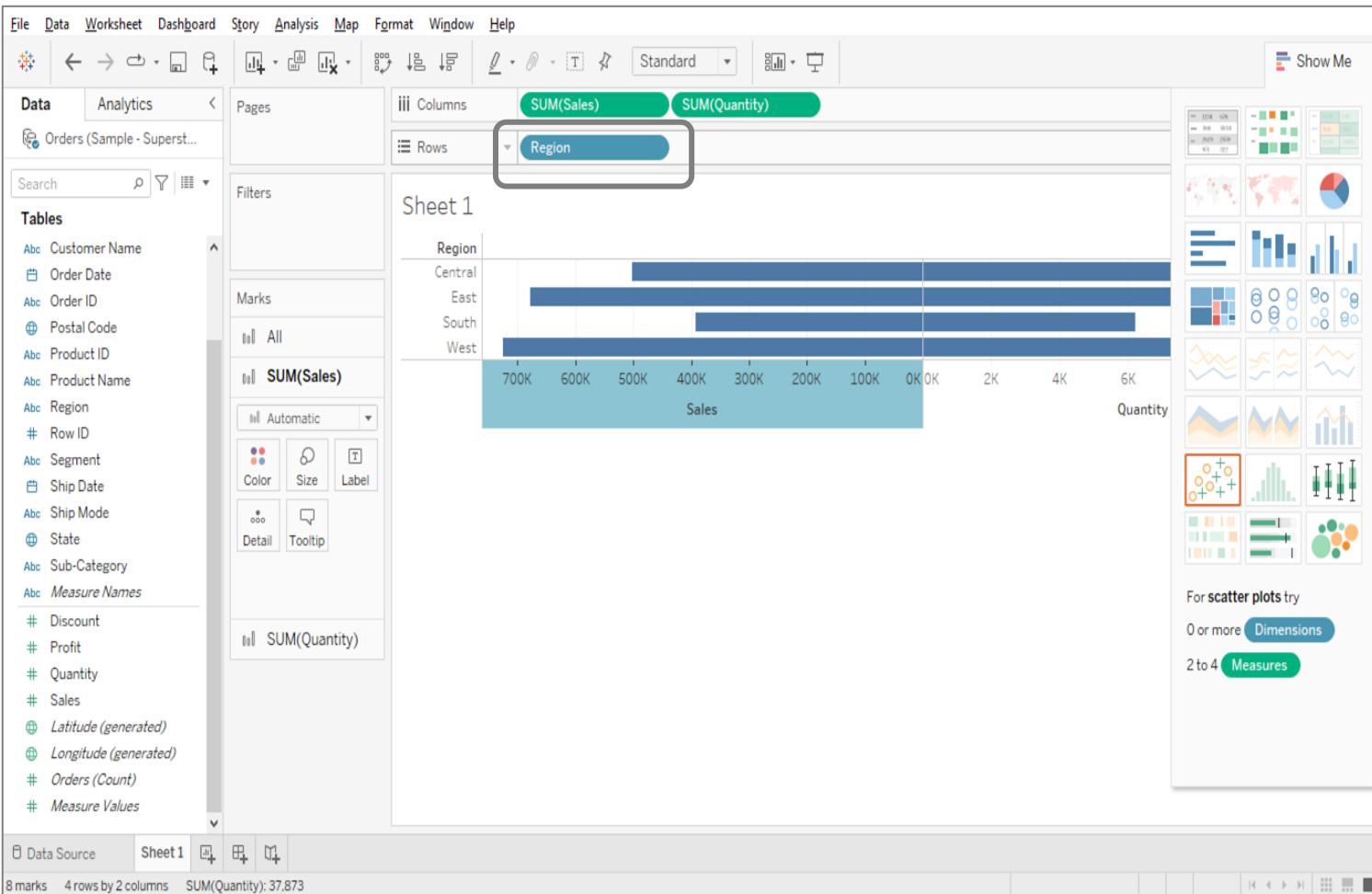


Step 2

Reverse one of the two measure axis. Double-click on the **X-axis** to find the option.

Funnel Chart

Steps to create a funnel chart for multiple measure values:

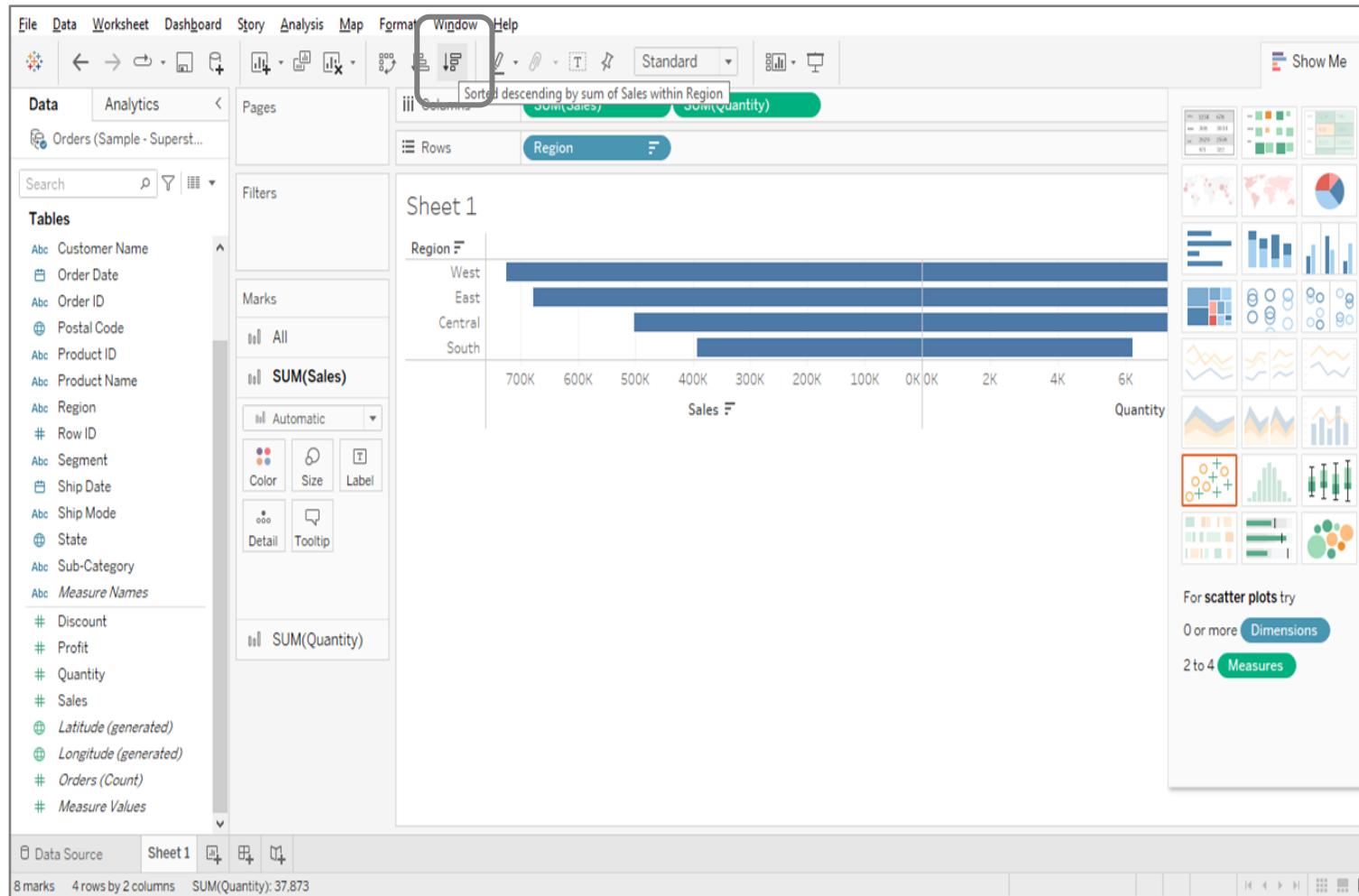


Step 3

Drag **Region** to **Rows** to split the funnel

Funnel Chart

Steps to create a funnel chart for multiple measure values:

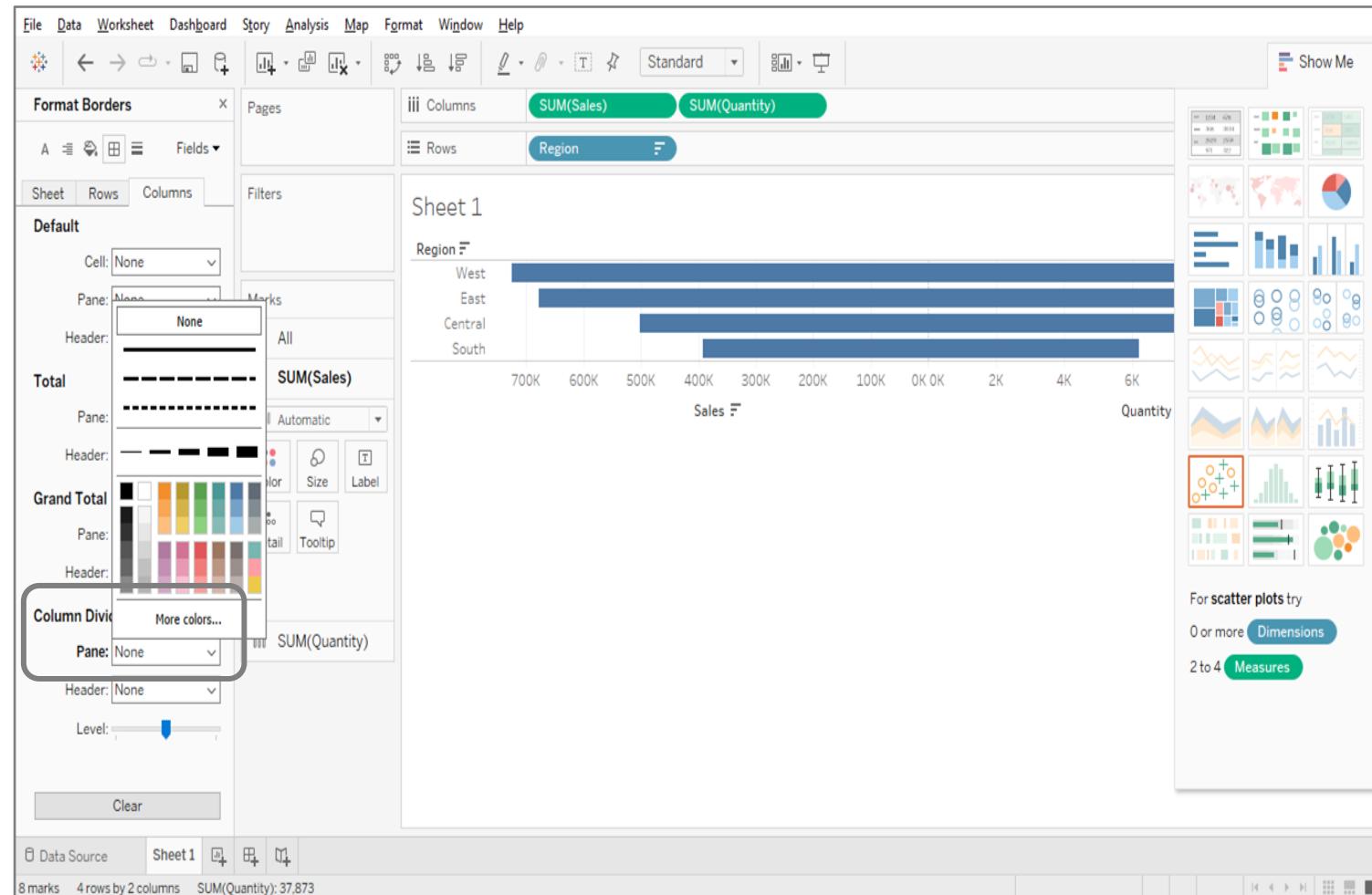


Step 4

Select the icon **Sort Region descending by Sales**

Funnel Chart

Steps to create a funnel chart for multiple measure values:

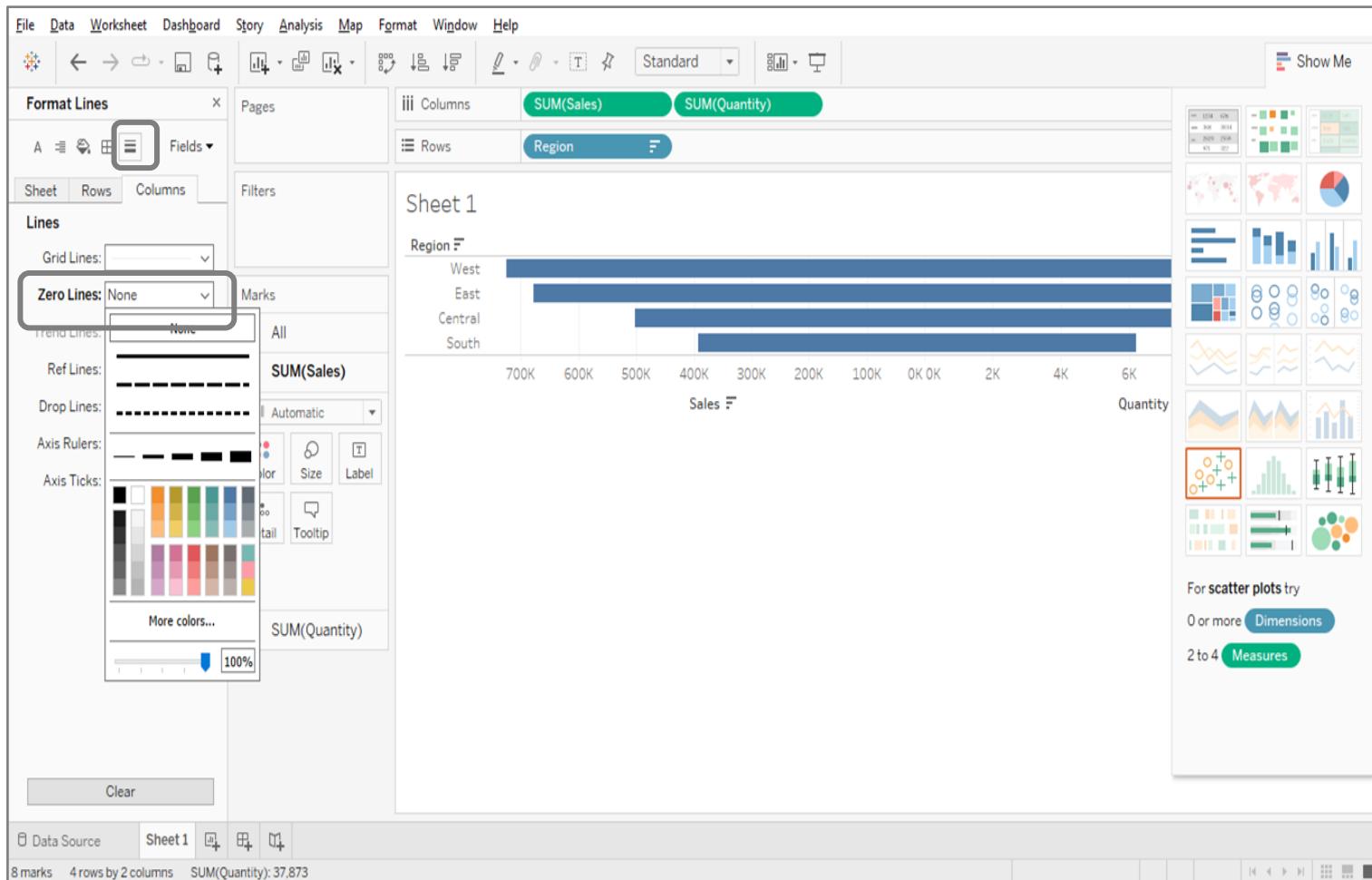


Step 5

Under the **Column Divider**, Select **Pane** as **None**

Funnel Chart

Steps to create a funnel chart for multiple measure values:

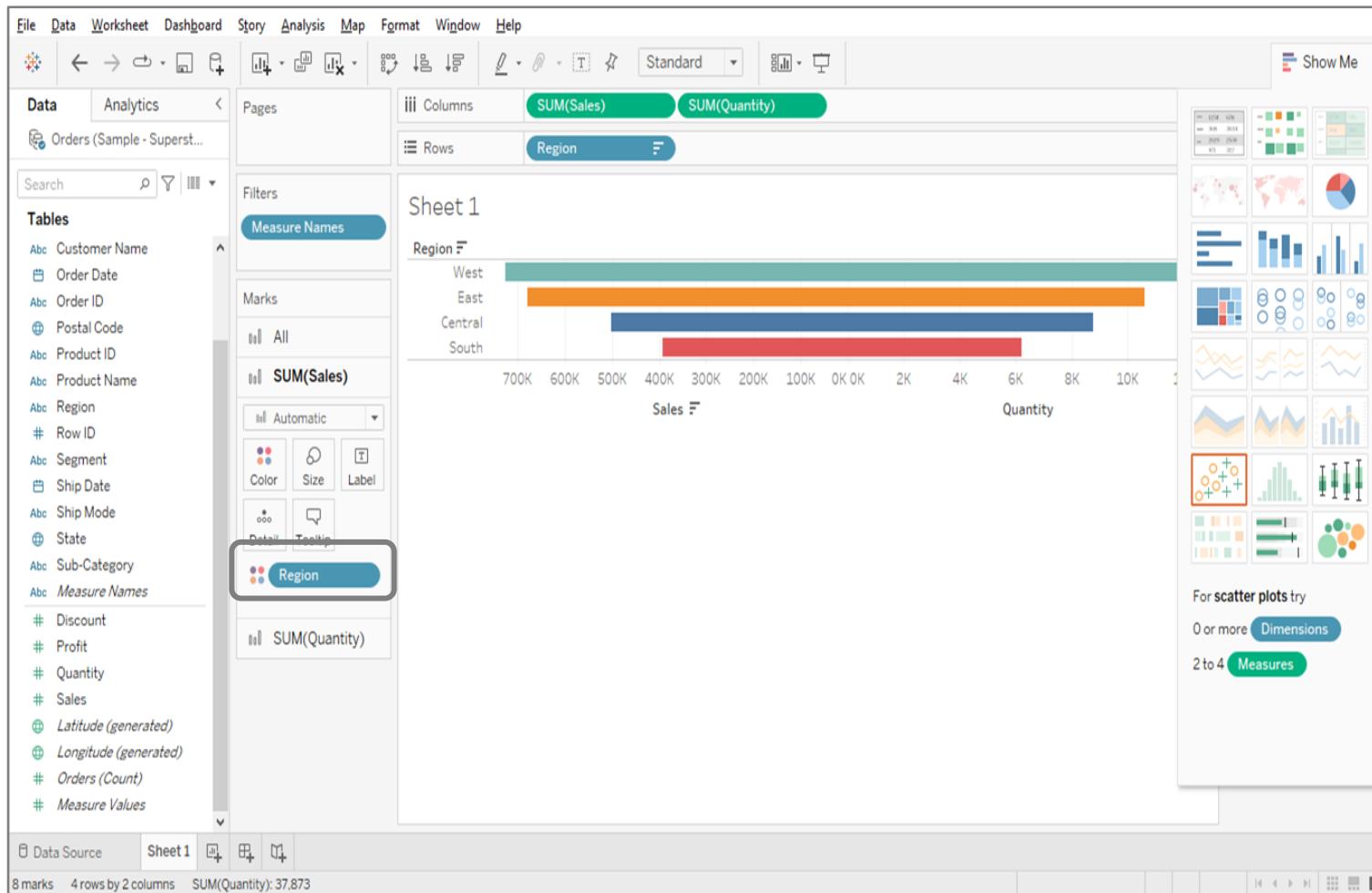


Step 6

Under the borders, select **Zero Lines** as **None**

Funnel Chart

Steps to create a funnel chart for multiple measure values:

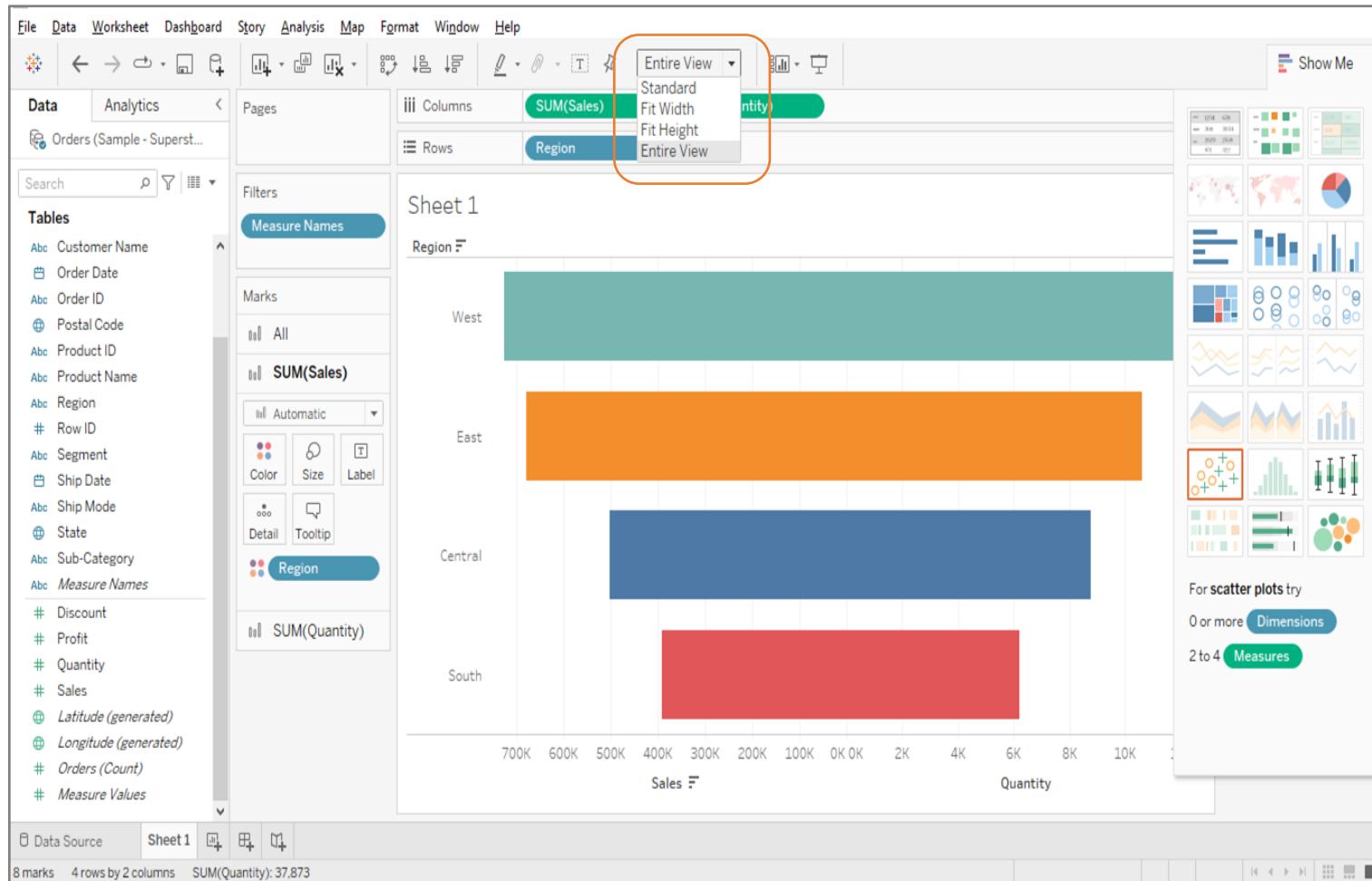


Step 7

Drag **Region** to **Color** in the Marks
Sum(Sales) and **Sum(Quantity)**

Funnel Chart

Steps to create a funnel chart for multiple measure values:



Step 7

Convert **Standard View** to **Entire View**

Importance of Maps

Importance of Maps

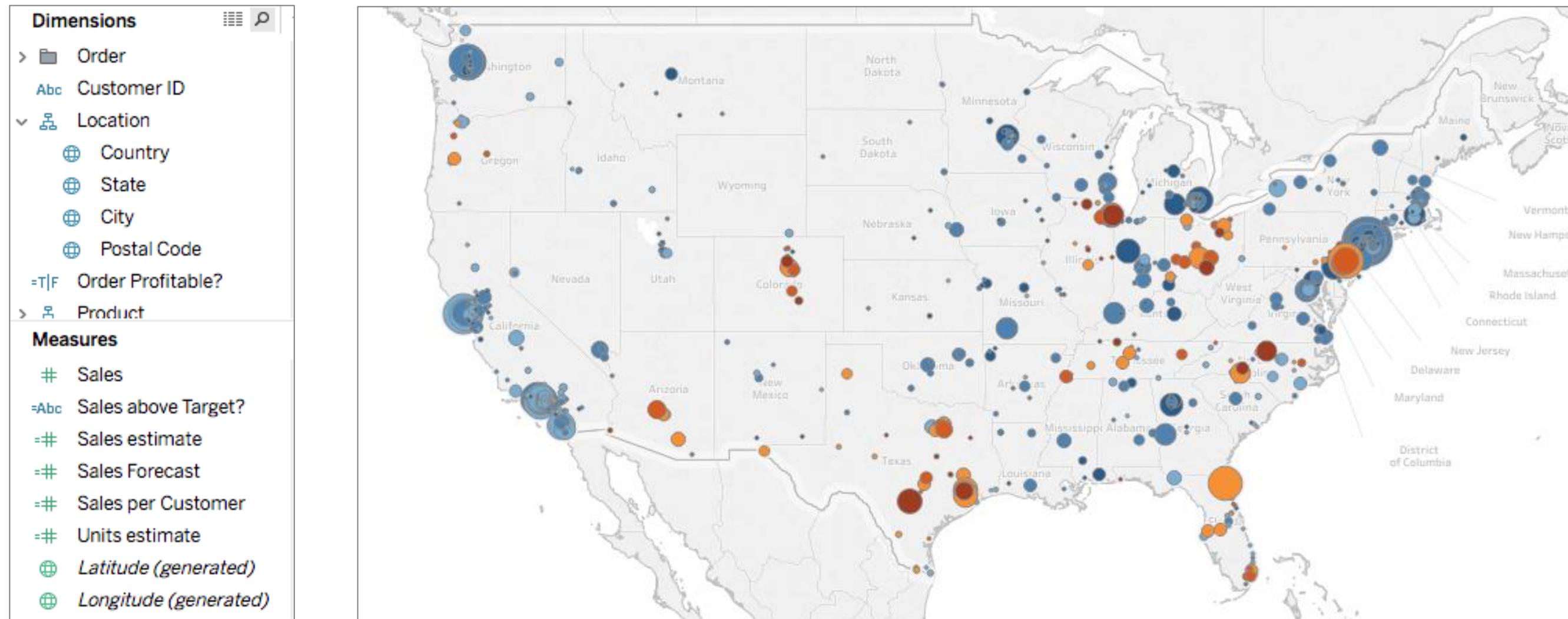
Maps provide more context for the dashboard, making it easier for users to spot trends in the data.



Maps are used to showcase geographical data.

Importance of Maps

In this example, the dots on the map represent sales.



The user may observe that high sales areas exist on both the West and East coasts.

Creating Maps with Tableau

Creating Maps with Tableau

Maps are created by dragging the geographic field(s) into the view and then on the marks shelf.

Marks

Automatic

Color Size Label

Detail Tooltip

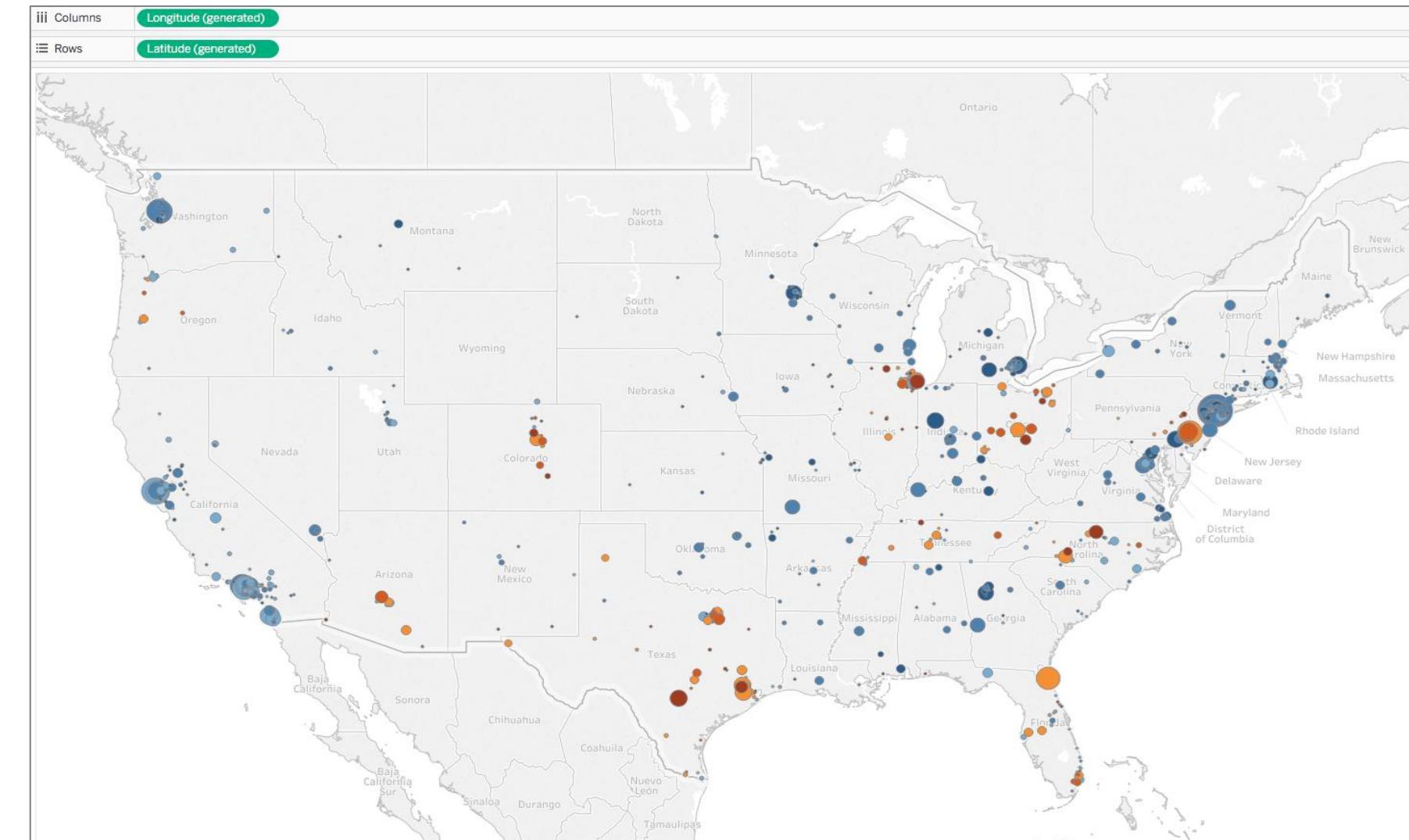
AGG(Profit Ratio)

Postal Code

State

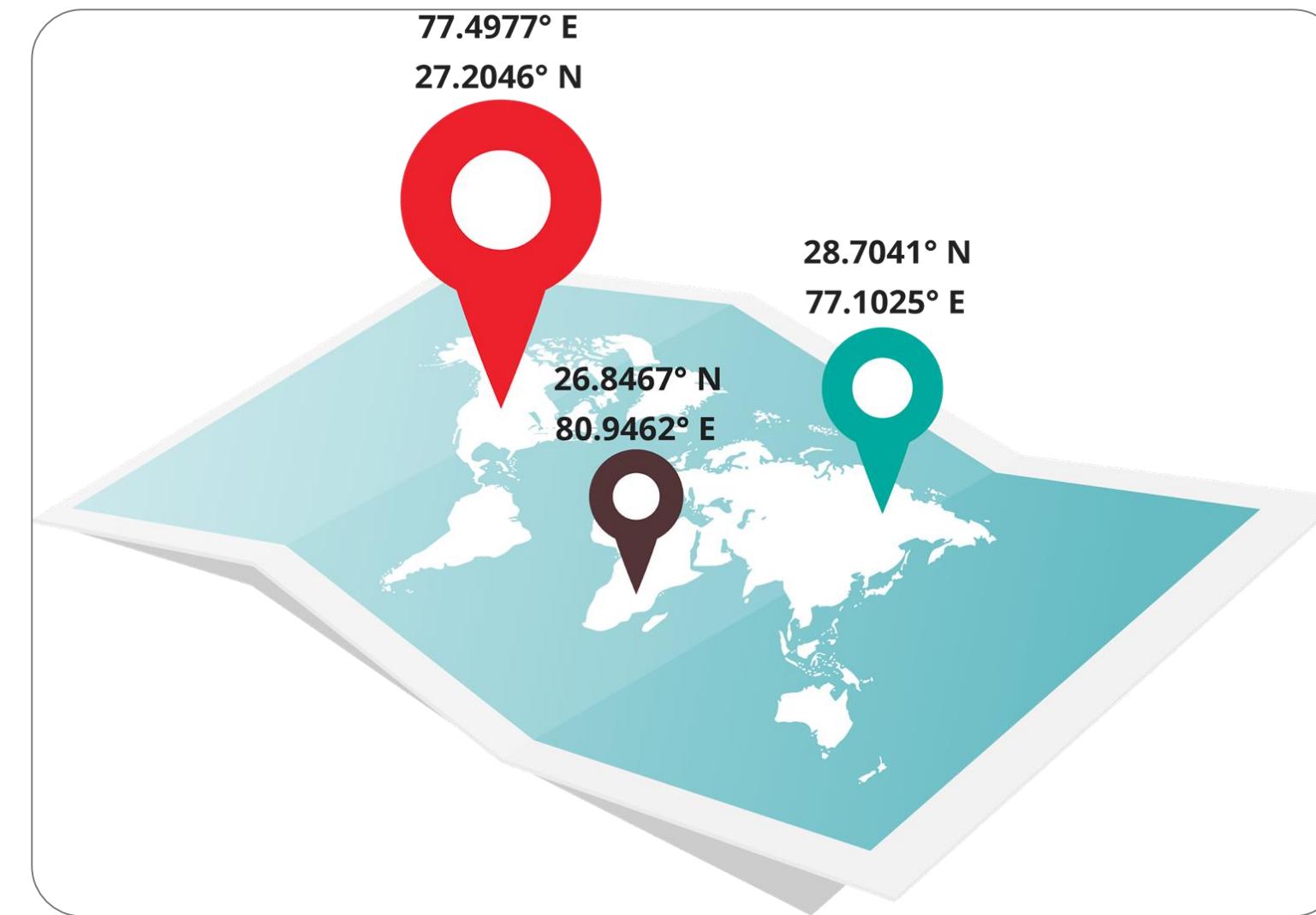
SUM(Sales)

SUM(Profit)



Creating Maps with Tableau

Tableau detects a few geographic fields within the data (country, state, city, and postal code) and produces their latitude and longitude dimensions automatically.



Creating Maps with Tableau

There are two types of maps in Tableau:

Symbol Map

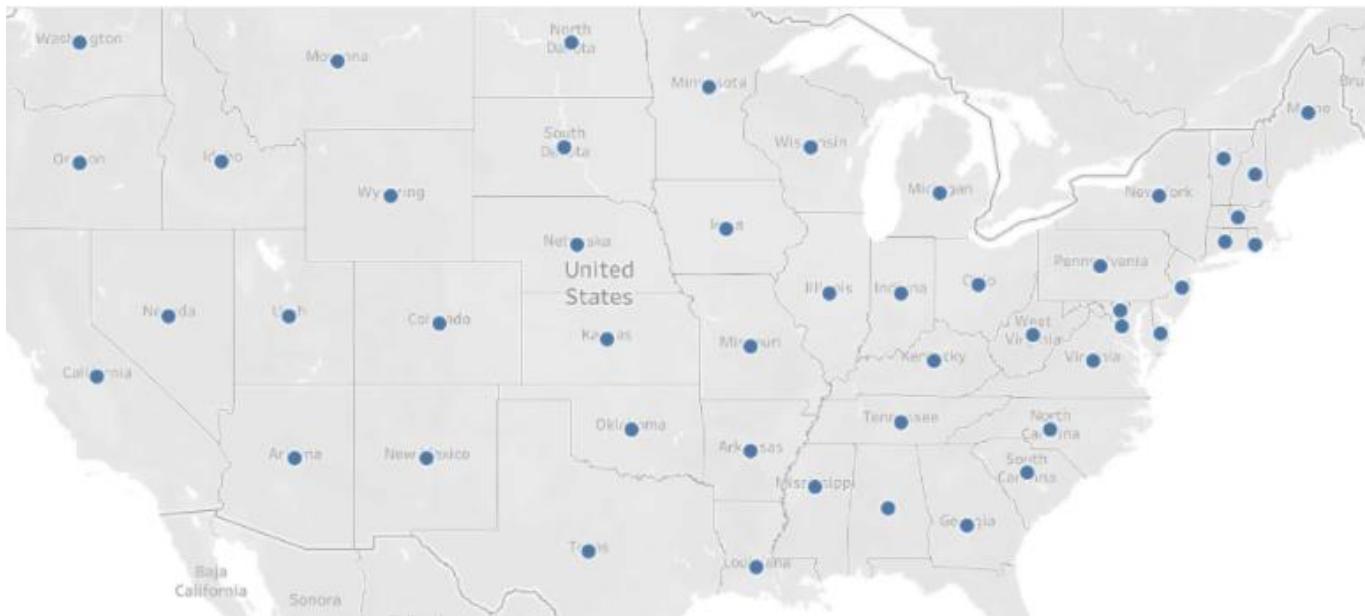
It assigns one symbol to each mark.

Filled Map

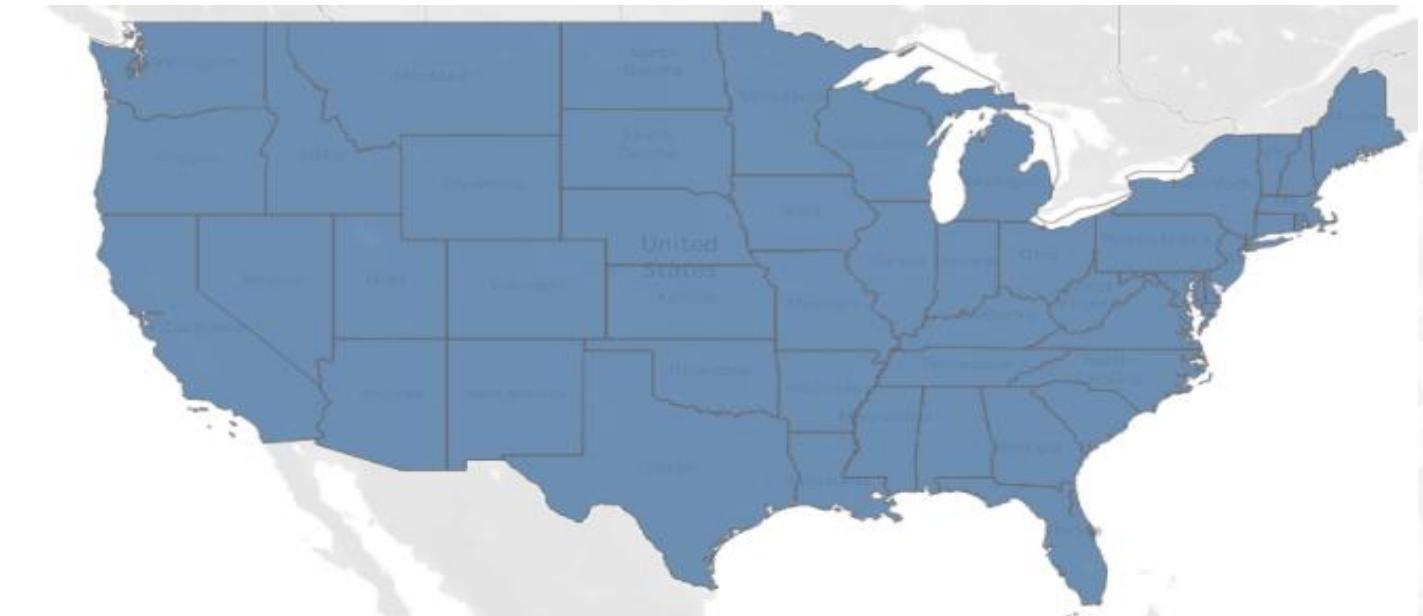
It fills the entire area with color.

Creating Maps with Tableau

An example of symbol and filled maps:



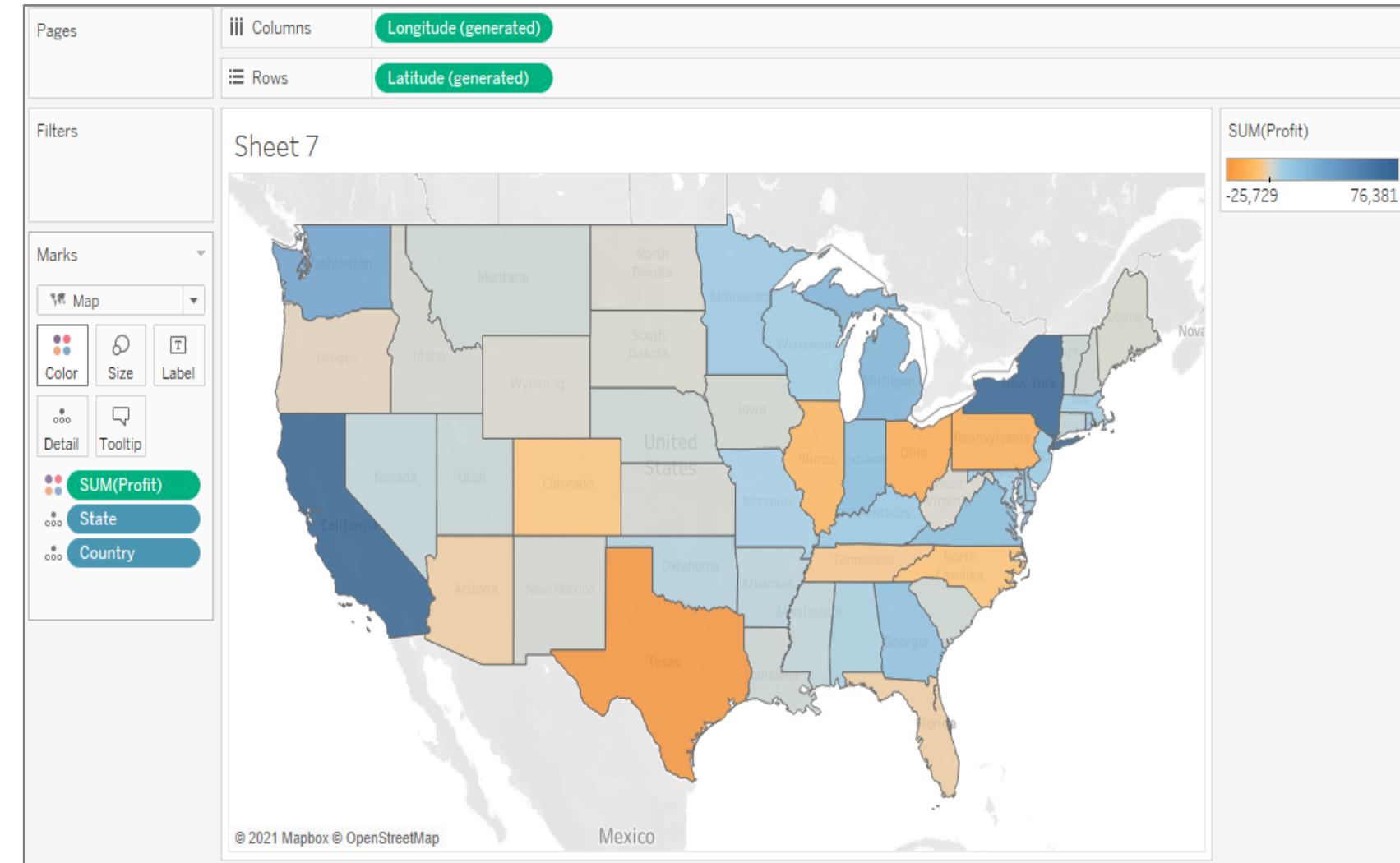
Symbol Map



Filled Map

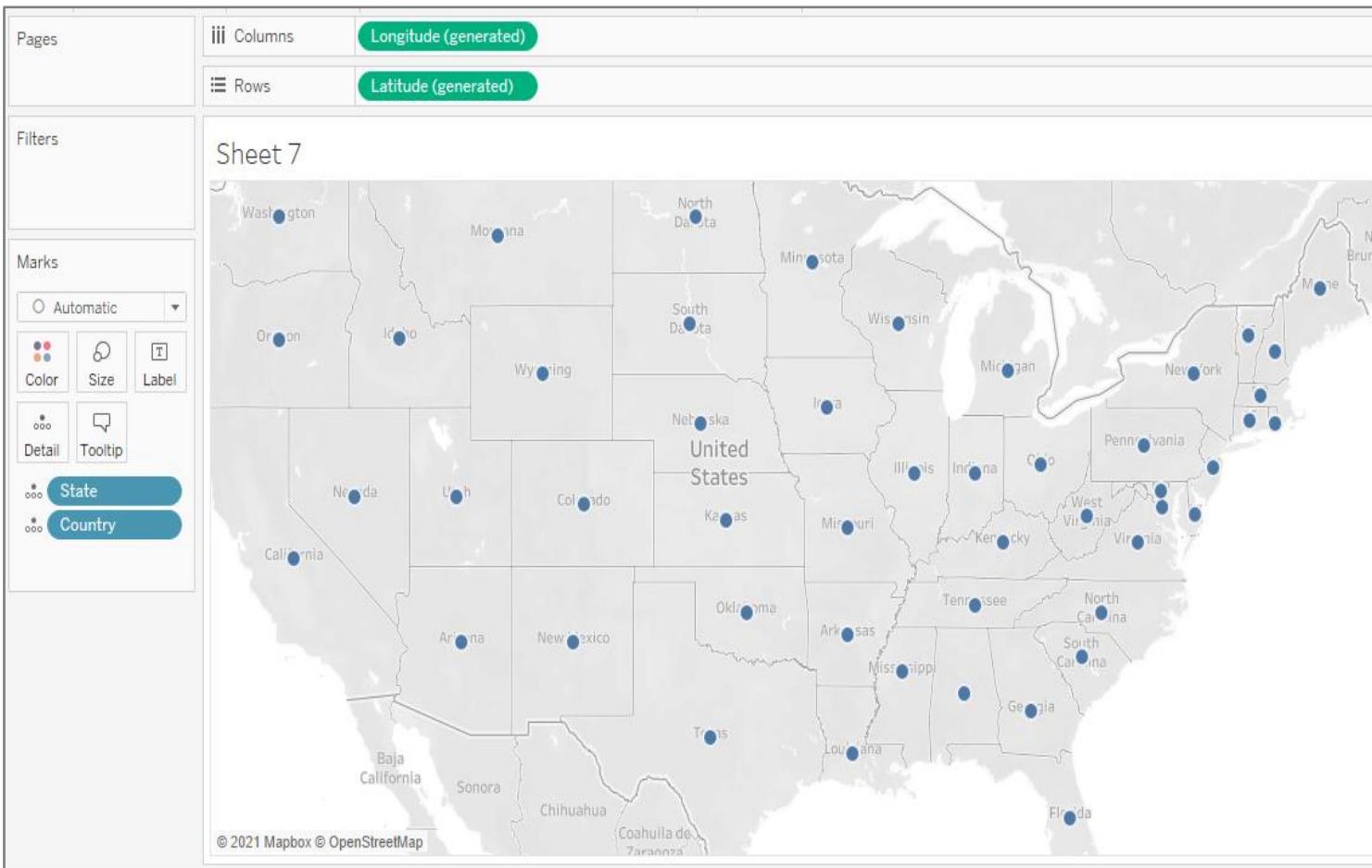
Creating Maps with Tableau

Create a filled map for States based on their profit.



Creating Maps with Tableau

Steps to create a filled map for States based on their profit:

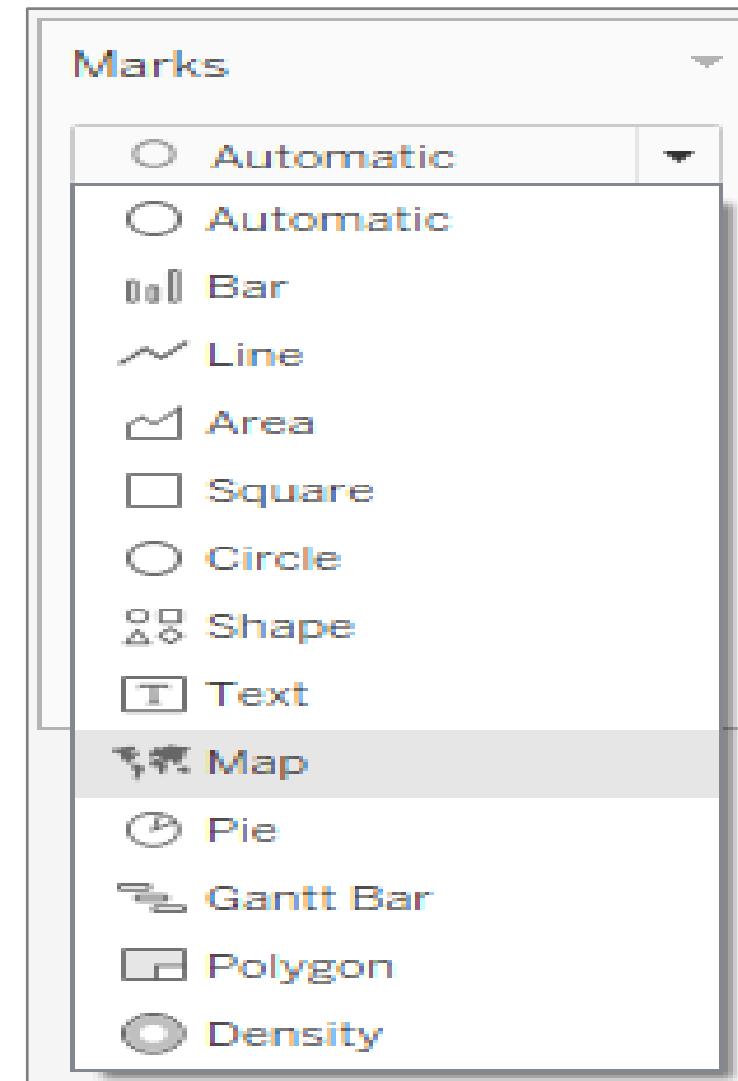


Step 1

Drag **State** to **Detail** in **Marks**, and the **Longitude** and **Latitude** will be added to the **Columns** and **Rows** automatically

Creating Maps with Tableau

Steps to create a filled map for States based on their profit:

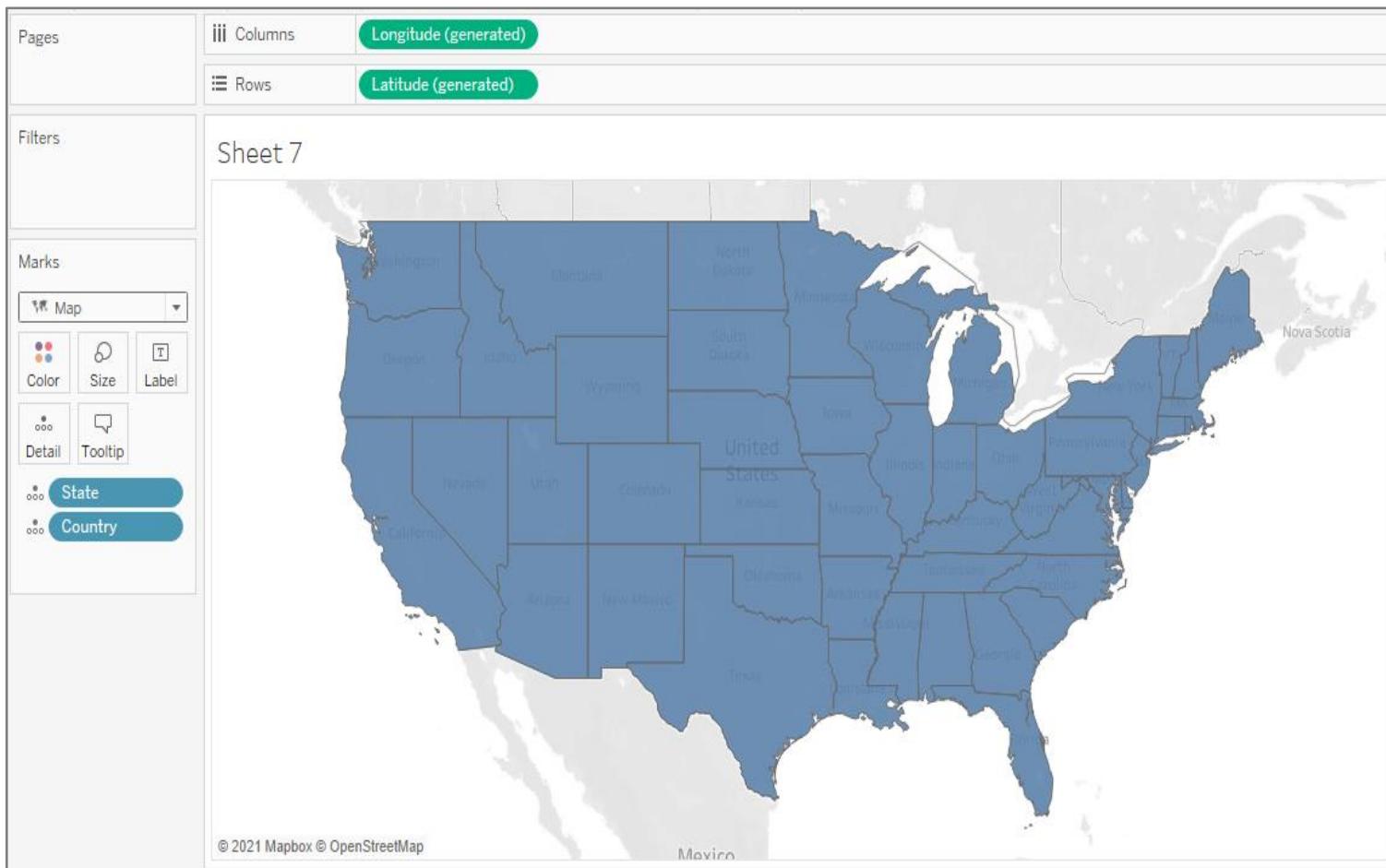


Step 2

Change the type of **Marks** to **Map**

Creating Maps with Tableau

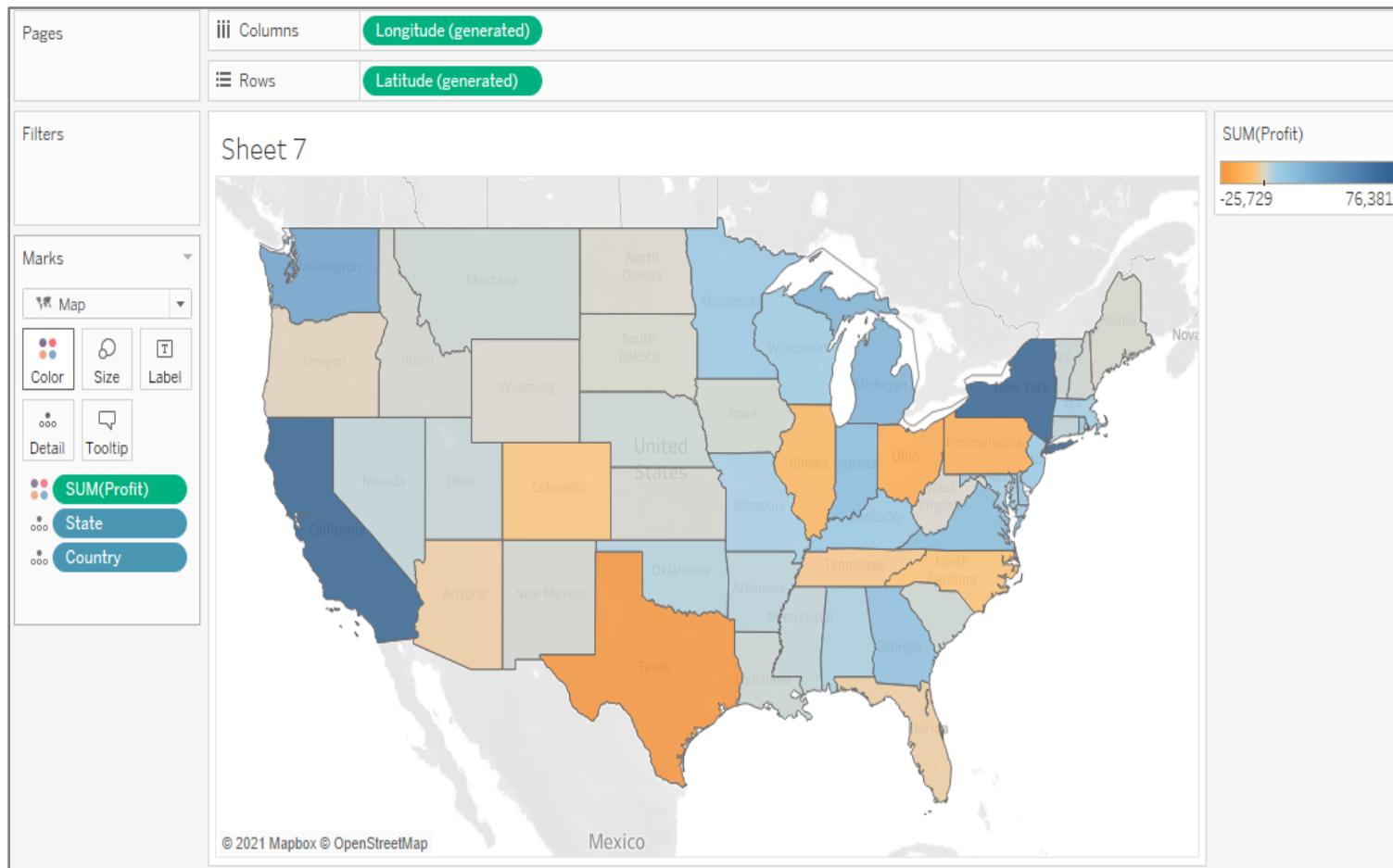
Steps to create a filled map for States based on their profit:



This will create a filled-in map as shown

Creating Maps with Tableau

Steps to create a filled map for States based on their profit:



Step 4

Drag **Profit** to **Color**. It creates the filled-in map colored by the profit

Assisted Practice: Plotting Pie Charts on a Map



Duration: 20 minutes

Problem statement:

Eva Rodger, a sales manager, needs to analyze the sales generated by the states that are not doing as expected. This will help her improve the sales strategies. For this, she needs to create a map visualization with pie charts, which will display the percent to the total contribution of sales of each segment across all regions.

Assisted Practice Guidelines



Steps to follow:

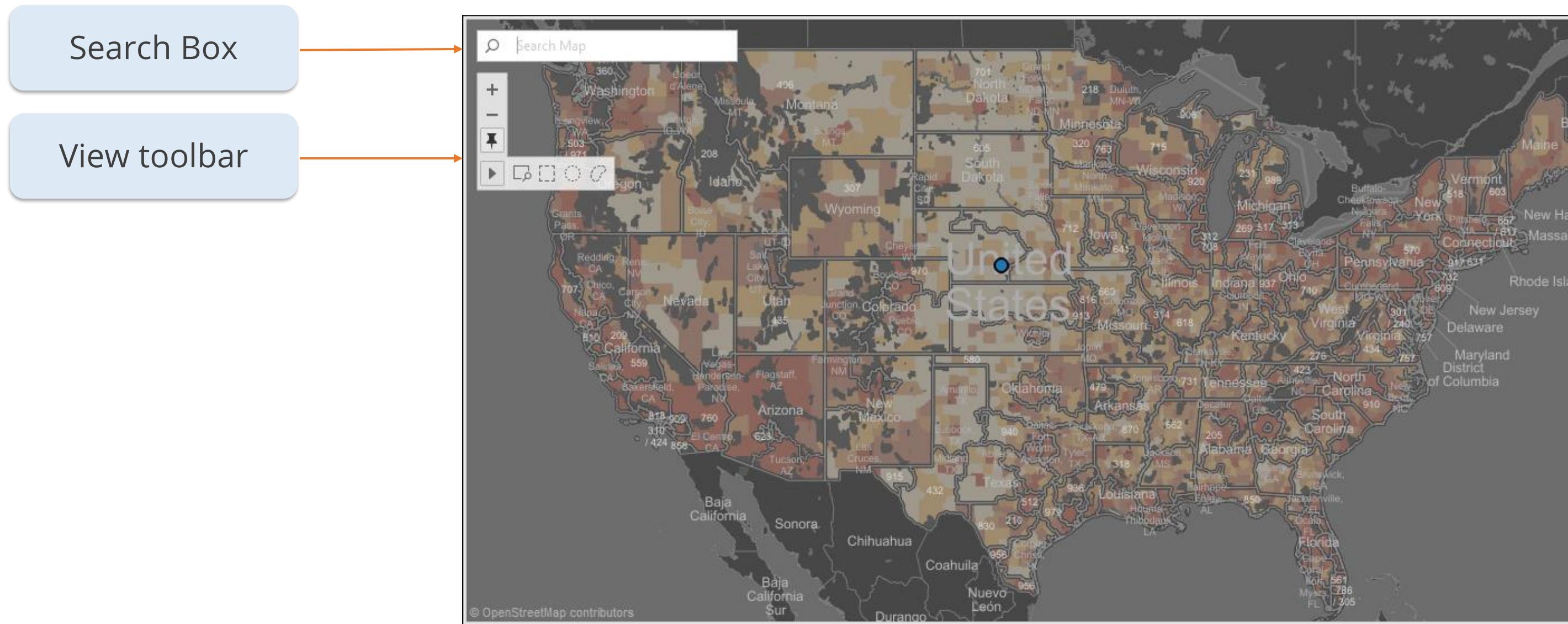
- Step 1: Create a filled map with State dimension and Color it by Region
- Step 2: Create a dual axis map
- Step 3: Change the second map to a symbol map
- Step 4: Size the Marks by Percent contribution of Sales, and Color by Segment
- Step 5: Change the mark type to Pie

ASSISTED PRACTICE

How to Pan, Zoom, and Select in Tableau

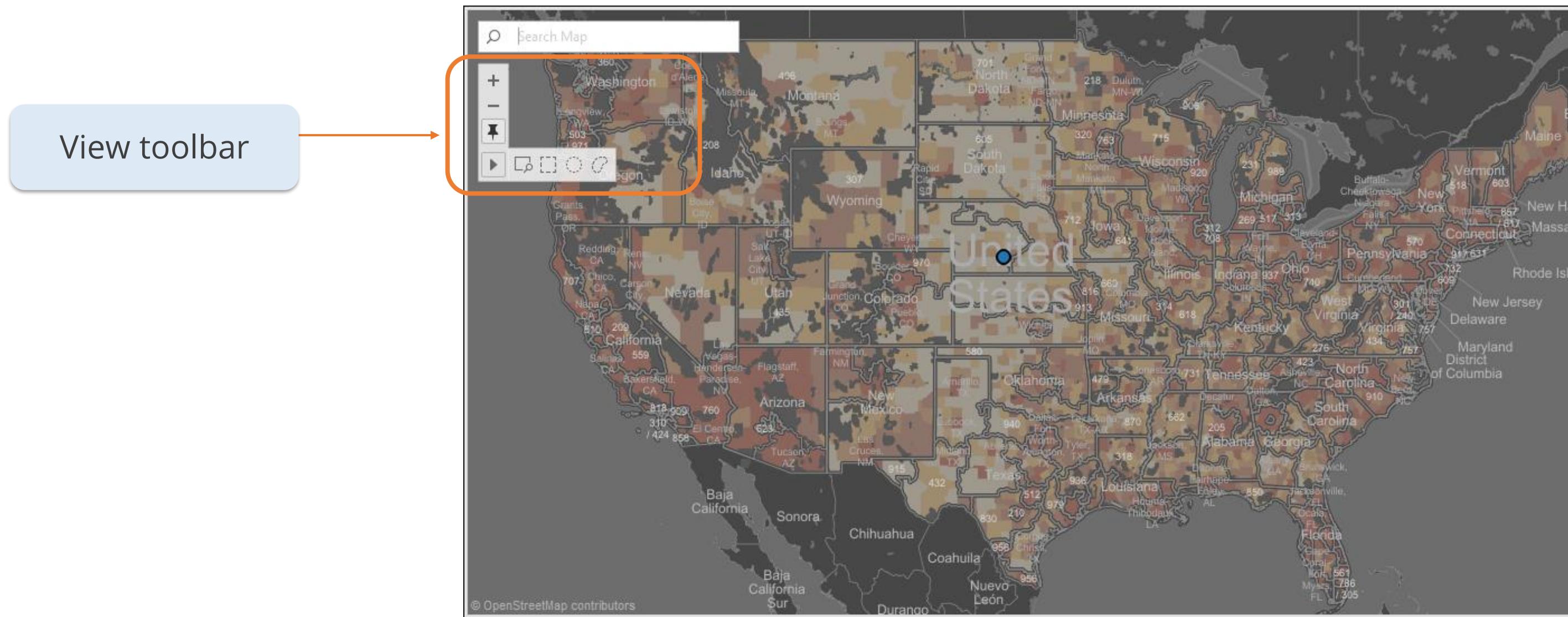
How to Pan, Zoom, and Select in Tableau?

Tableau allows interaction with maps in different ways. In the top left corner of a map, there is a view toolbar and a search box.



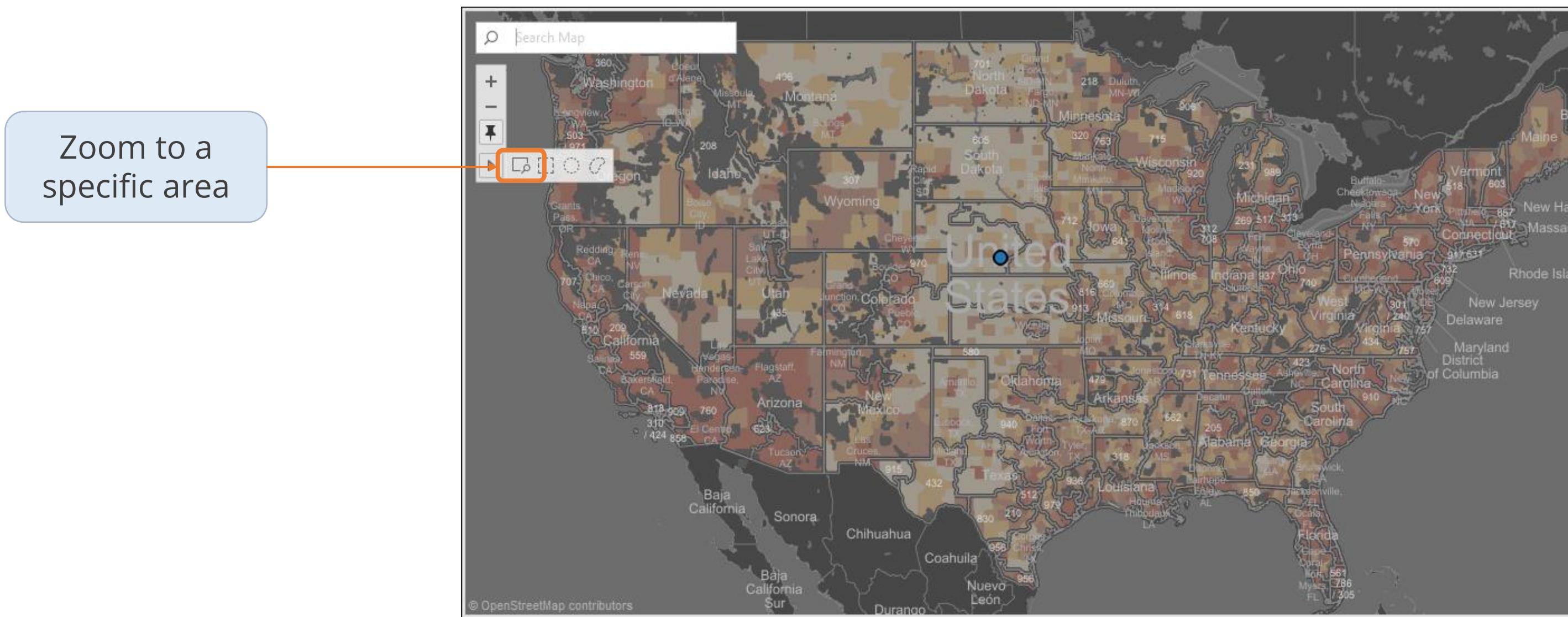
How to Pan, Zoom, and Select in Tableau?

The view toolbar selects marks on a map, pans, and zooms in and out of the map view.



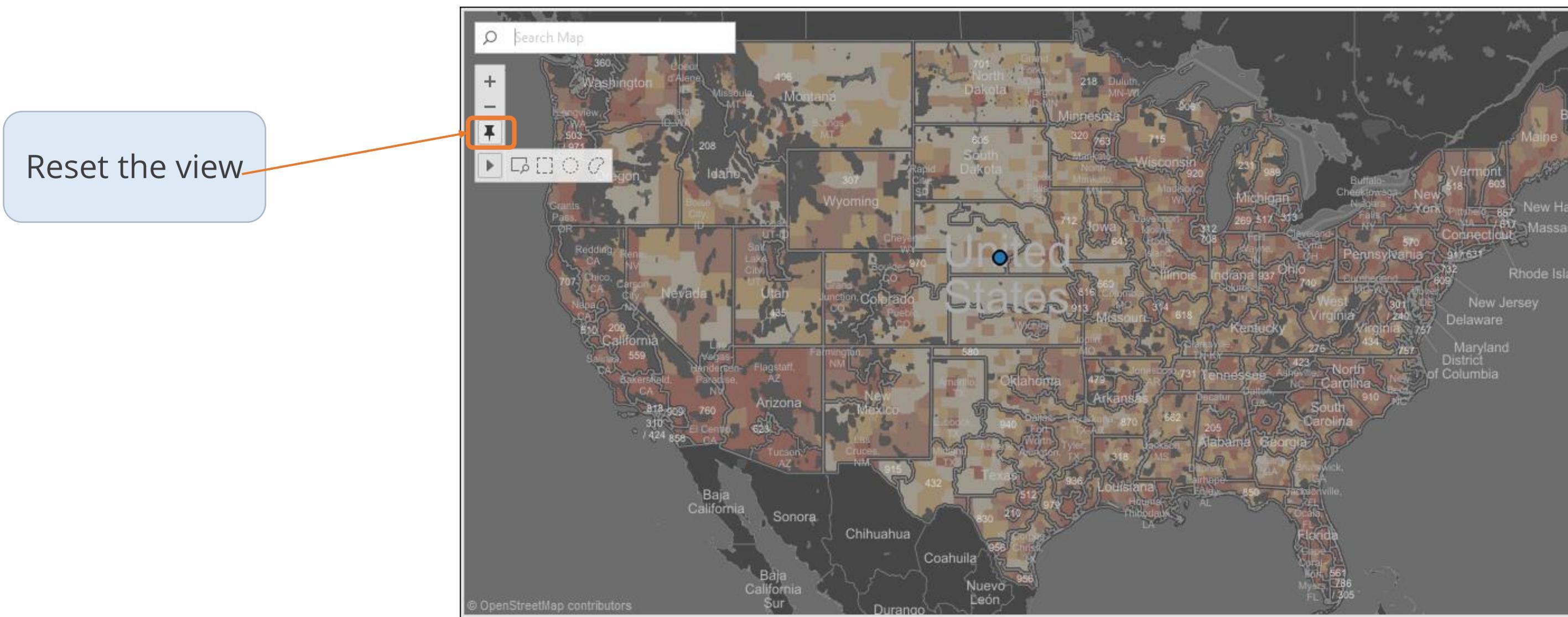
How to Pan, Zoom, and Select in Tableau?

To zoom in to a specific area of the view, select the zoom area option on the view toolbar and then drag to create the zoom area.



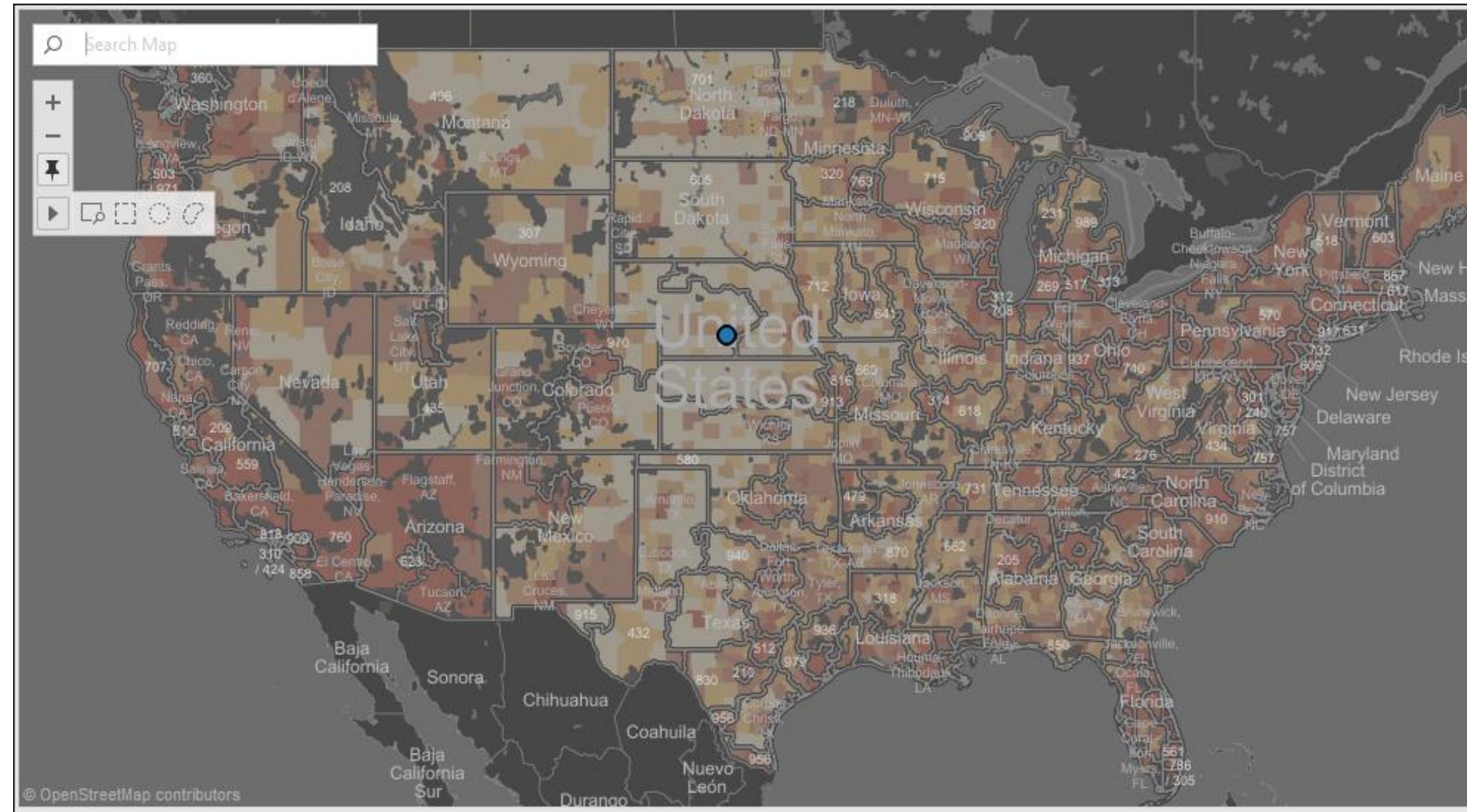
How to Pan, Zoom, and Select in Tableau?

After zooming in or out, the axes are fixed to the zoomed range. Use the reset view button to reset the axes to fit the entire view.



How to Pan, Zoom, and Select in Tableau?

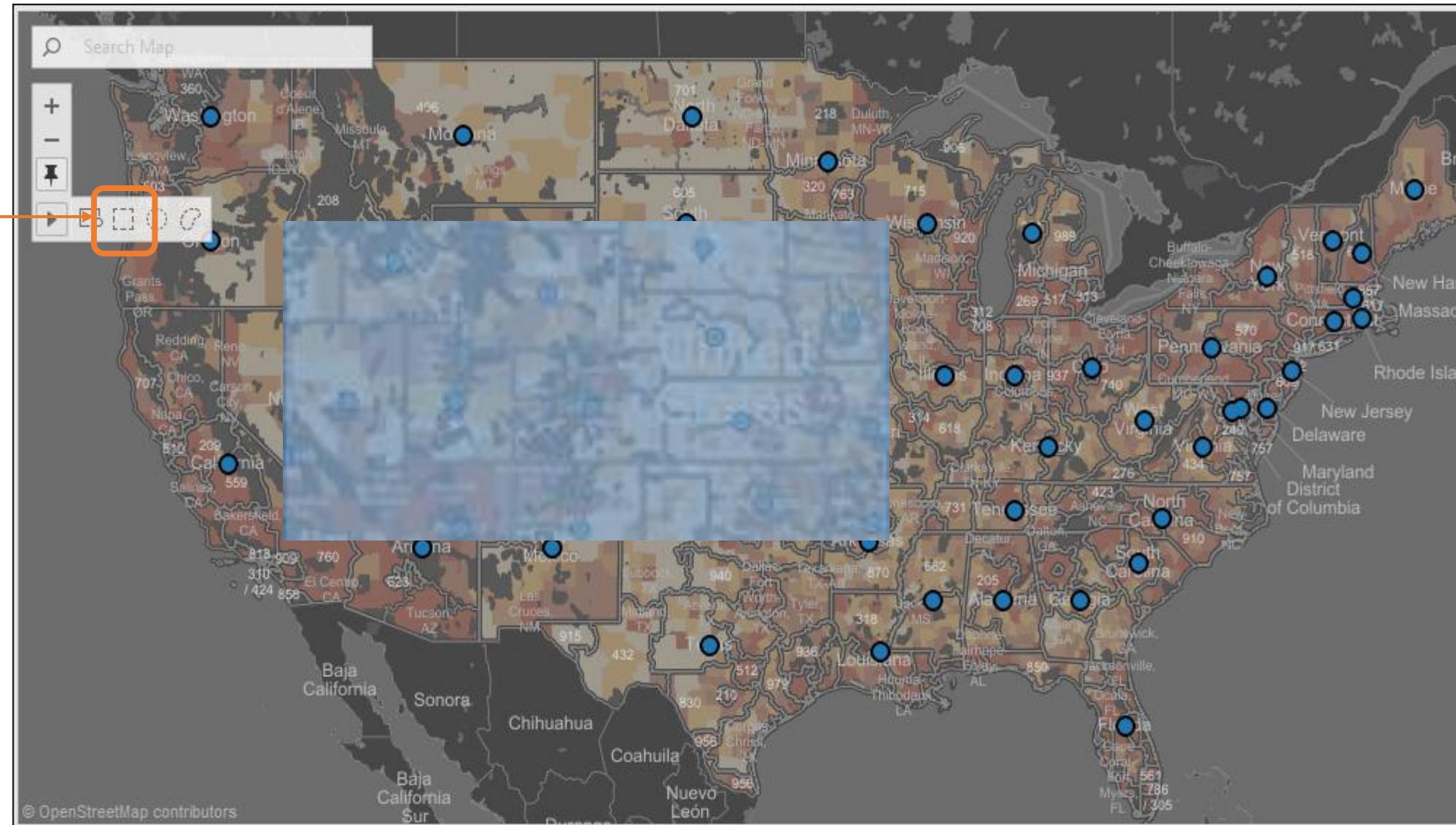
Hold down Shift and then drag across the view to navigate the map within the view.



How to Pan, Zoom, and Select in Tableau?

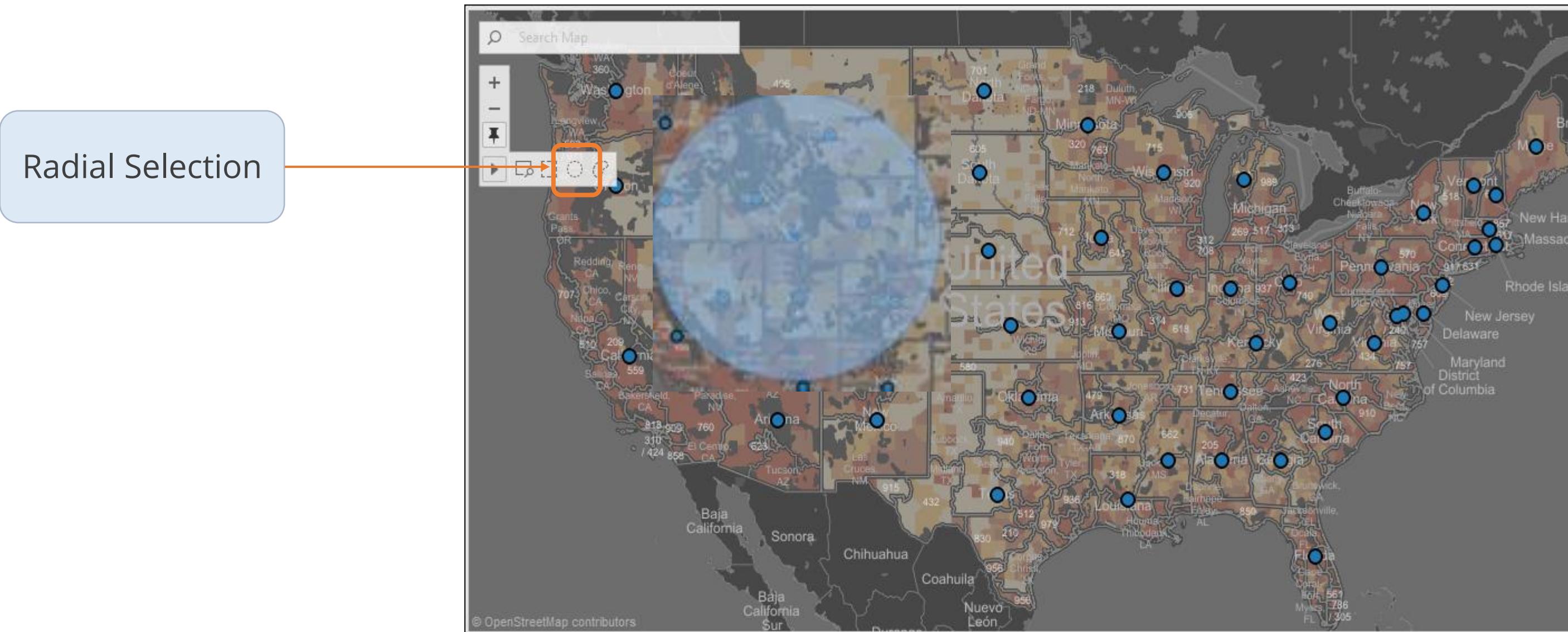
The Rectangular tool selects marks in a rectangular region.

Rectangular Selection



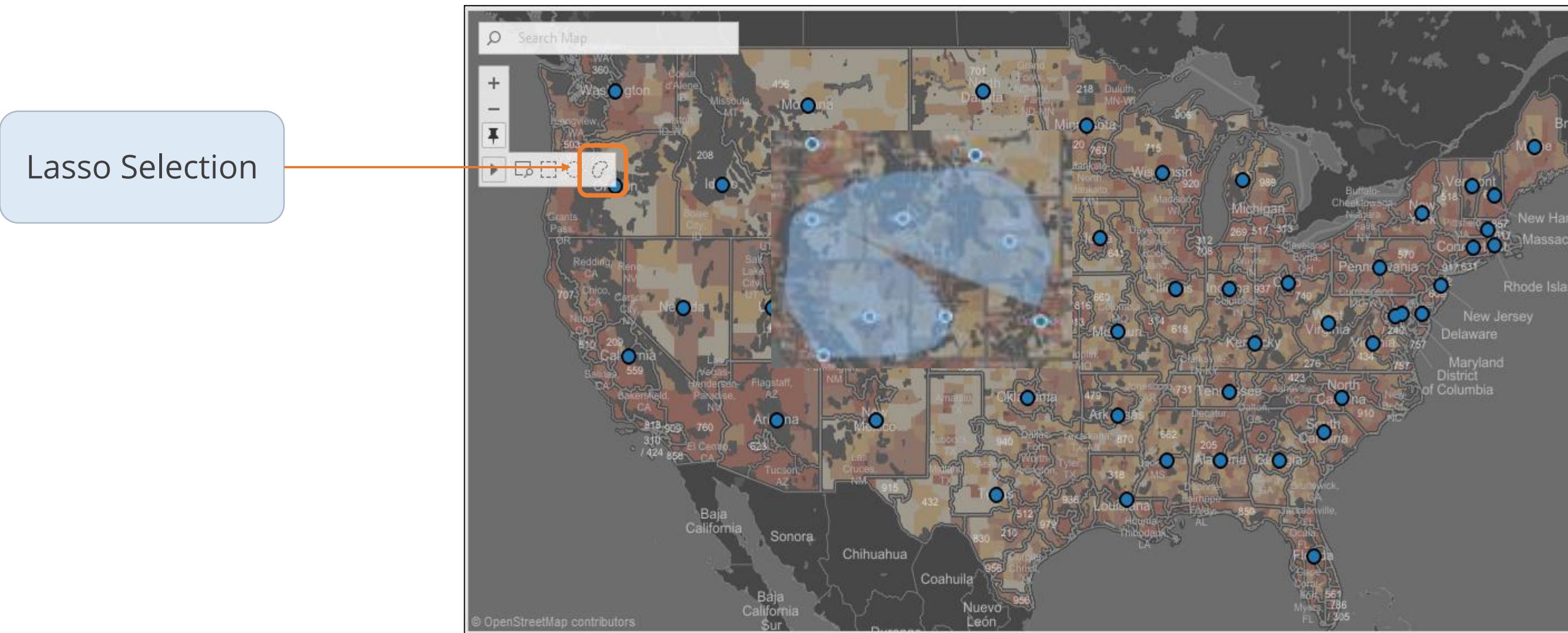
How to Pan, Zoom, and Select in Tableau?

The Radial tool allows users to select marks in a circular region.



How to Pan, Zoom, and Select in Tableau?

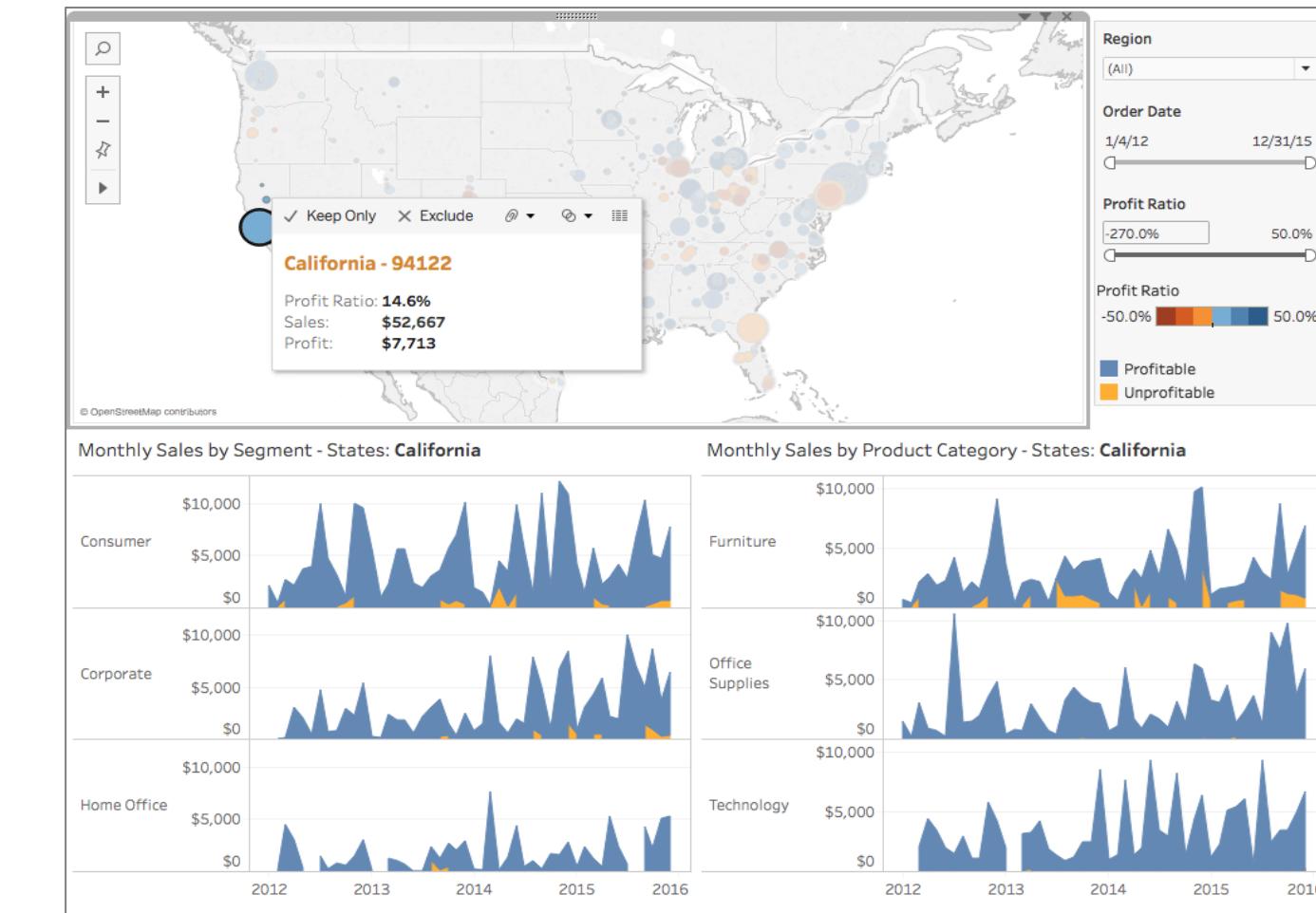
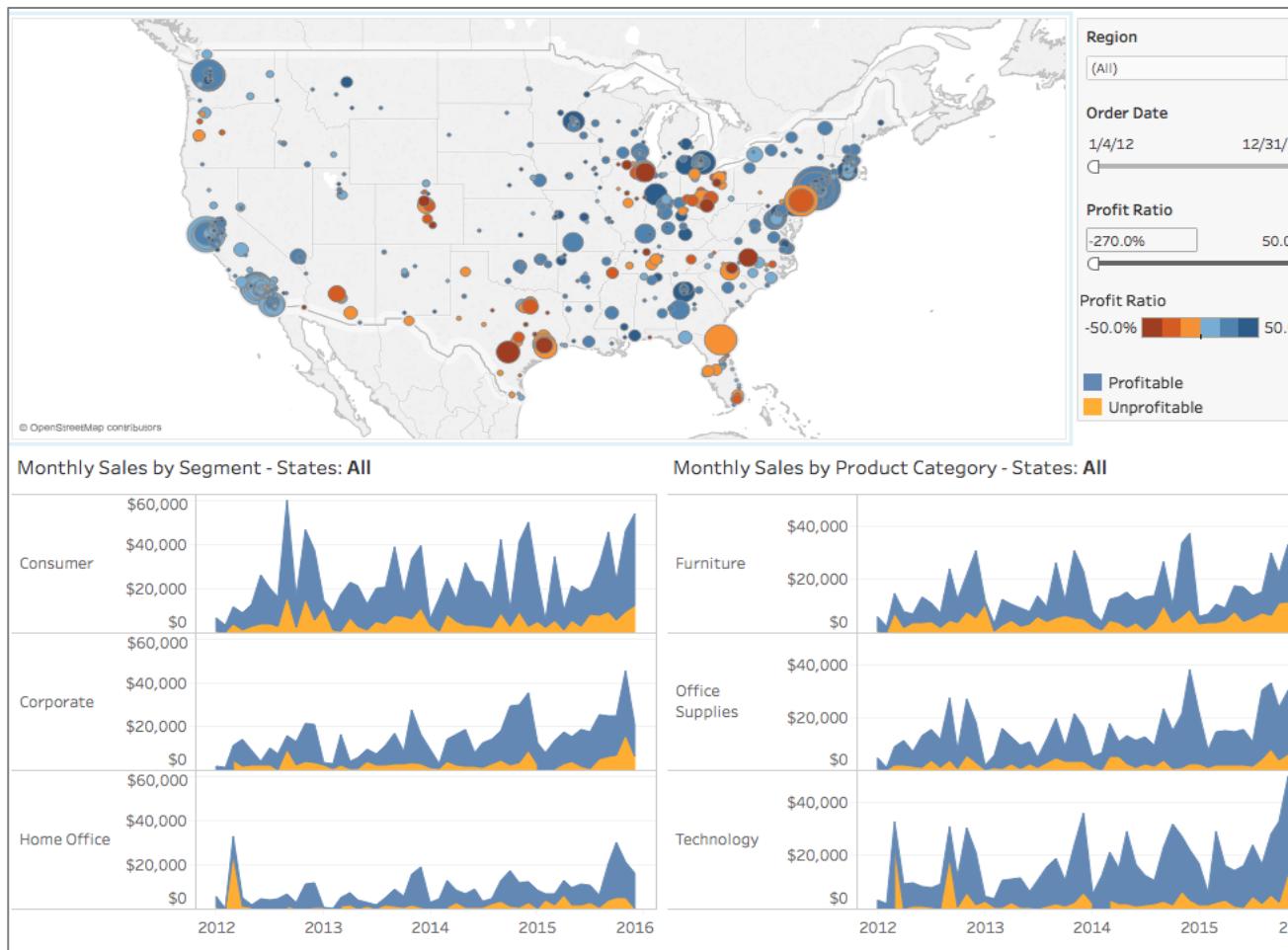
The Lasso tool is used to include specific marks.



Using Maps to Filter Data

Using Maps to Filter Data

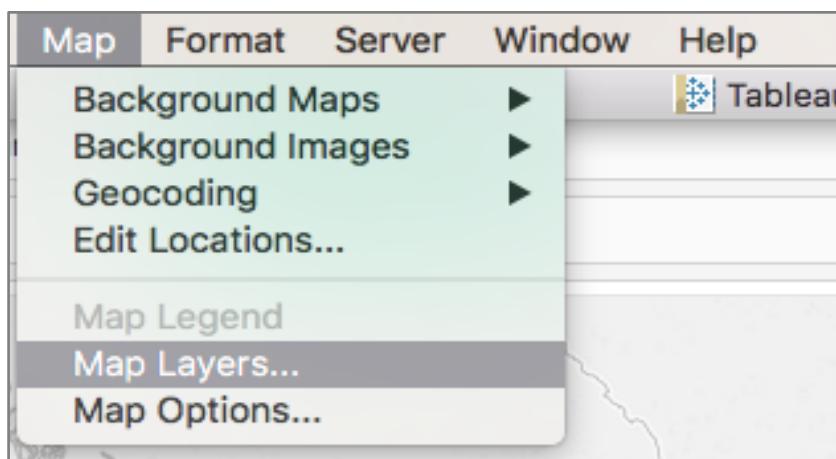
Create actions that filter data in the dashboard to reflect the selected member.



Map Layering

Map Layering

Use the Map Layers pane to change the appearance of the map.



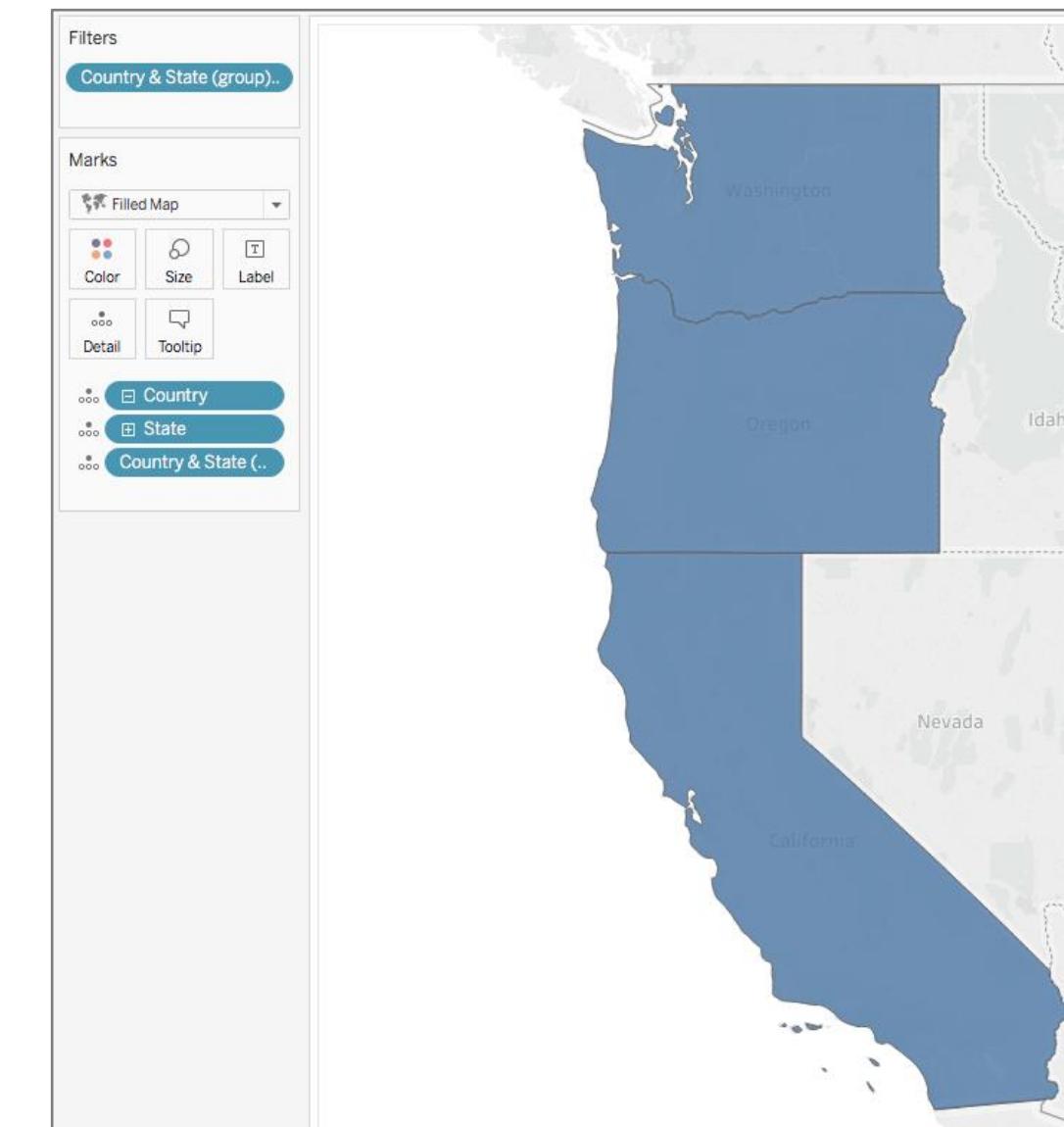
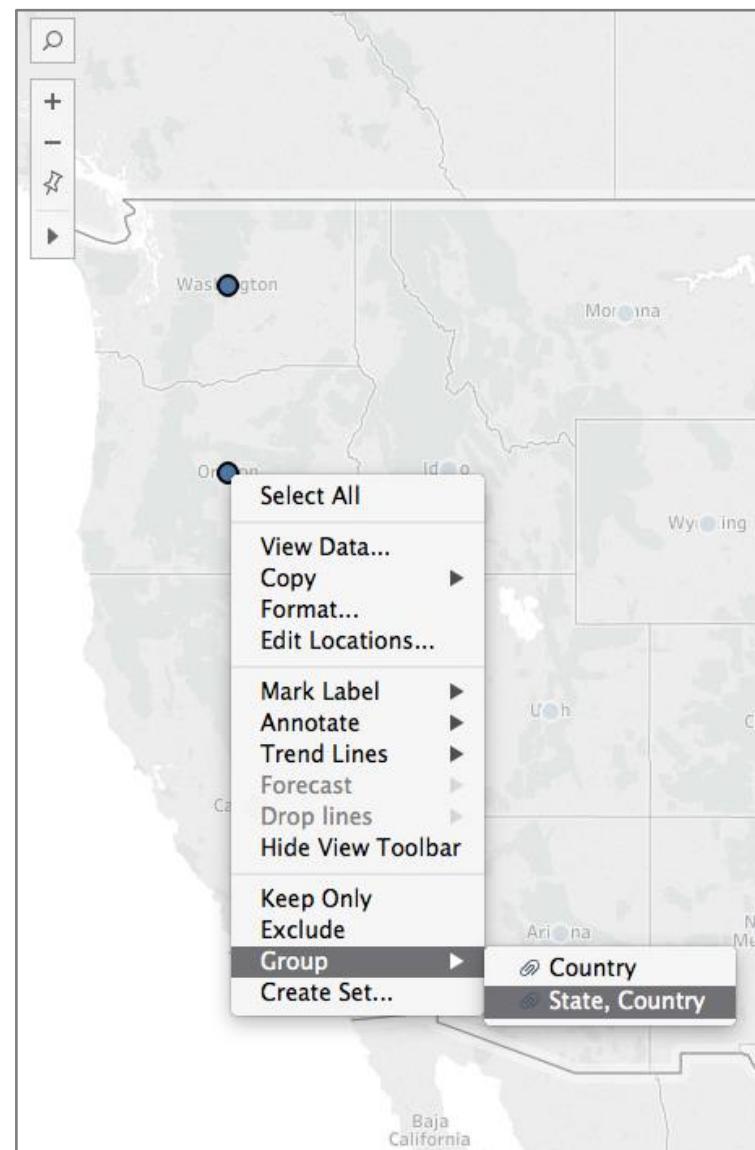
The screenshot shows the 'Map Layers' pane open in the Tableau interface. The pane is divided into three main sections: 'Background', 'Map Layers', and 'Data Layer'.
In the 'Background' section, there is a dropdown menu labeled 'Style' with 'Light' selected, and a slider for 'Washout' set to 20%.
The 'Map Layers' section contains a list of checkboxes for various map features. Some items are checked (e.g., 'Base', 'Coastline', 'Country/Region Borders', 'State/Province Borders', 'State/Province Names'). Other items are unchecked (e.g., 'Land Cover', 'Streets and Highways', 'Country/Region Names', 'County Borders', etc.).
The 'Data Layer' section has a dropdown menu labeled 'Layer' with 'No Data Layer' selected.
Three callout boxes with arrows point from the right side of the slide to specific elements in the 'Map Layers' pane:

- An arrow points to the 'Style' dropdown in the 'Background' section with the text 'Change the map background style'.
- An arrow points to the list of checkboxes in the 'Map Layers' section with the text 'Hide and show map layers, such as land cover or country borders'.
- An arrow points to the 'Layer' dropdown in the 'Data Layer' section with the text 'Add data layers'.

Creating Custom Territories

Creating Custom Territories

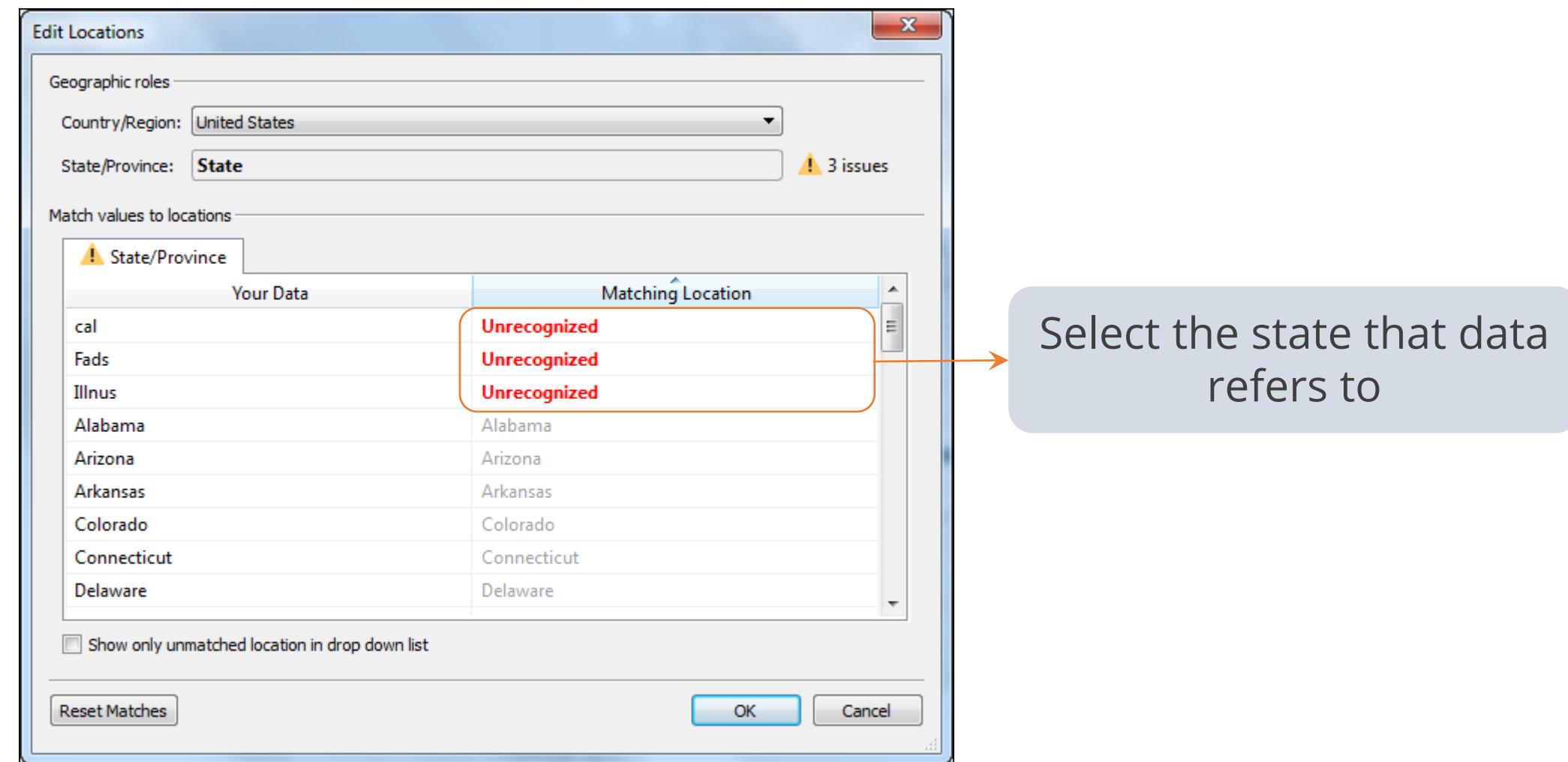
A group is created based on the selection of custom territories either manually or via a calculated field.



Modifying Locations Within Tableau

Modifying Locations Within Tableau

If Tableau fails to recognize the location names automatically, the default location can be set manually.



Geocoding

Geocoding

Geocoding is the process of converting a text-based description of a location, such as an address or a place name, into its geographical coordinates.



Geographical coordinates are created by Tableau itself when a field with geographical data type is present in the dataset.

Geocoding

If Tableau is unable to automatically identify the geographical field, such as Street Name, one must utilize an external CSV file to import the data's geographical coordinates.

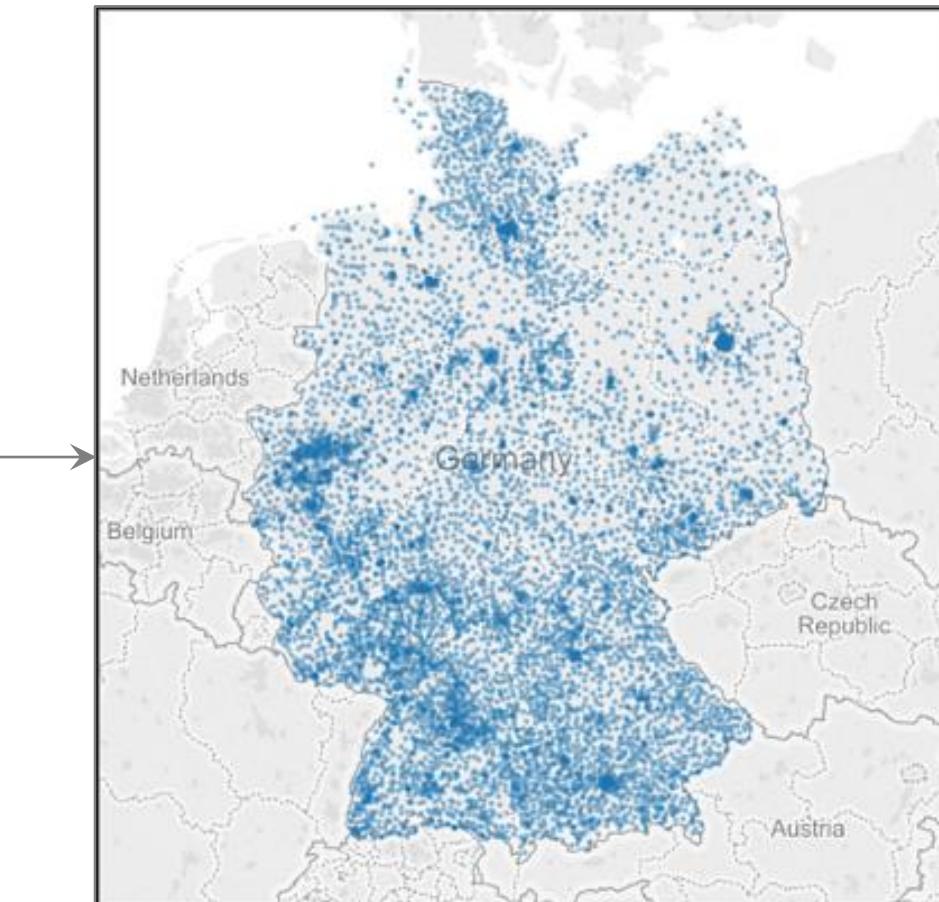


Use custom geocoding option from Map Menu.

Geocoding

In this example, the Excel file is imported to display German postal codes in Tableau.

	A	B	C
1	German Post Code	Latitude	Longitude
2	99998	51.2125	10.5625
3	99996	51.28335	10.575
4	99994	51.24165	10.675
5	99991	51.15	10.55557
6	99988	51.175	10.2917
7	99986	51.14443	10.4389
8	99976	51.2477	10.32917
9	99974	51.2428	10.4501
10	99958	51.09585	10.7583
11	99955	51.17273	10.80151
12	99947	51.14538	10.62537
13	99898	50.8333	10.5833
14	99897	50.8	10.6167
15	99894	50.86305	10.5944
16	99891	50.8854	10.459



Using Background Image

Using Background Image

Background images make the dashboard more visually appealing.



The length and width of the image must be mapped to a set of columns in the dataset.

These fields, mapped X and Y, will then be used in the rows and columns shelves to map the image in a view.

Using Background Image

In this example, a background image of a cricket field is used and annotated.

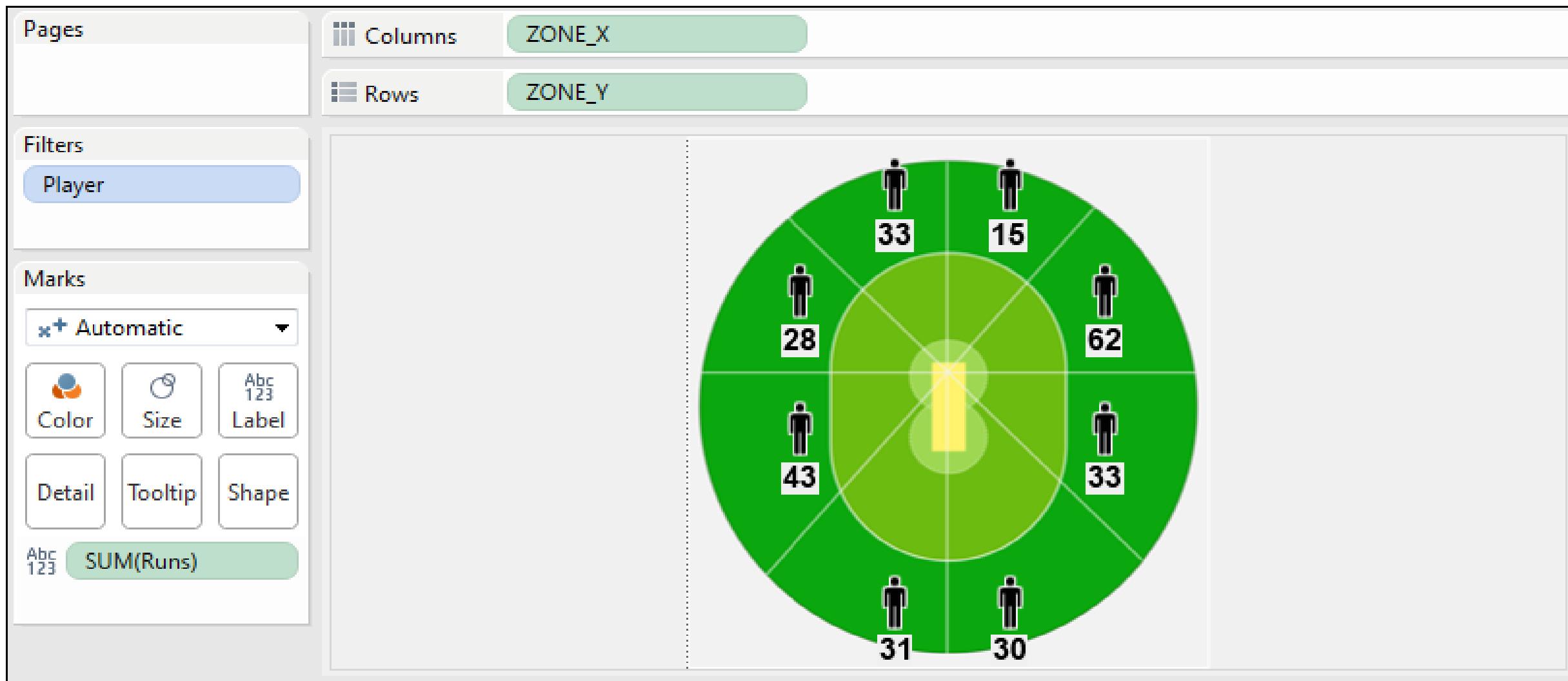
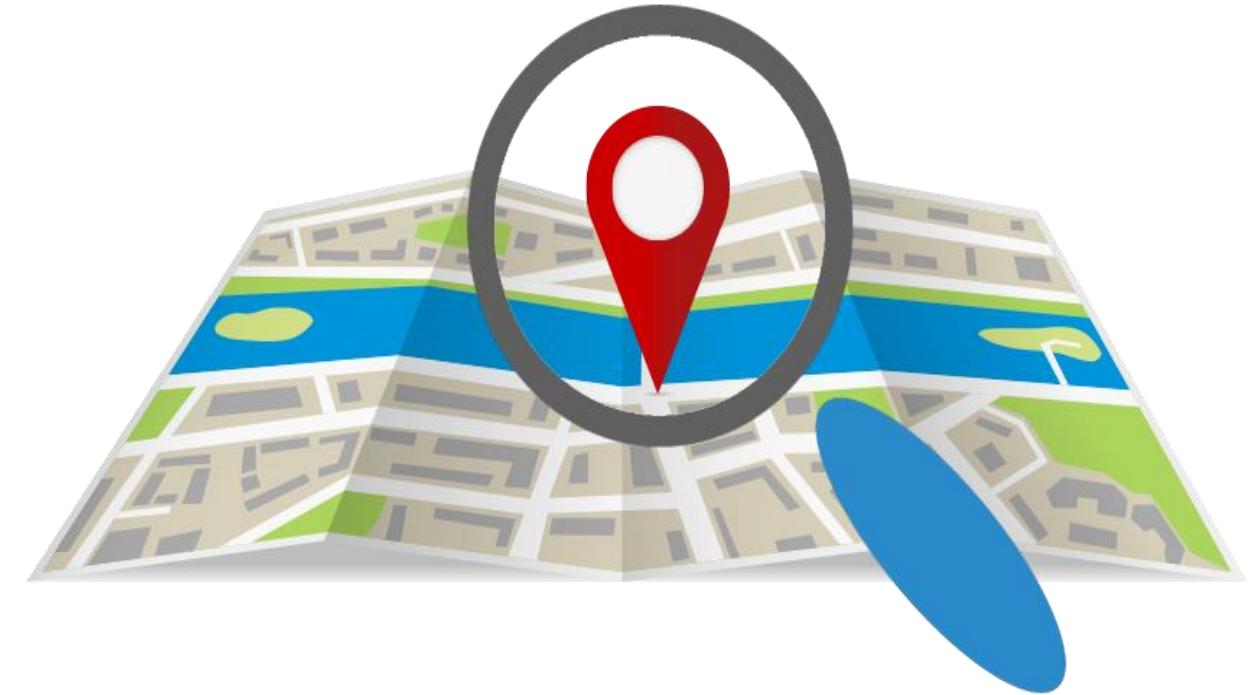


Tableau Map Search

Tableau Map Search

Tableau Map search allows to search for a specific location in map view.



The map search suggests possible locations in a view based on location names in a data source.

Tableau Map Search

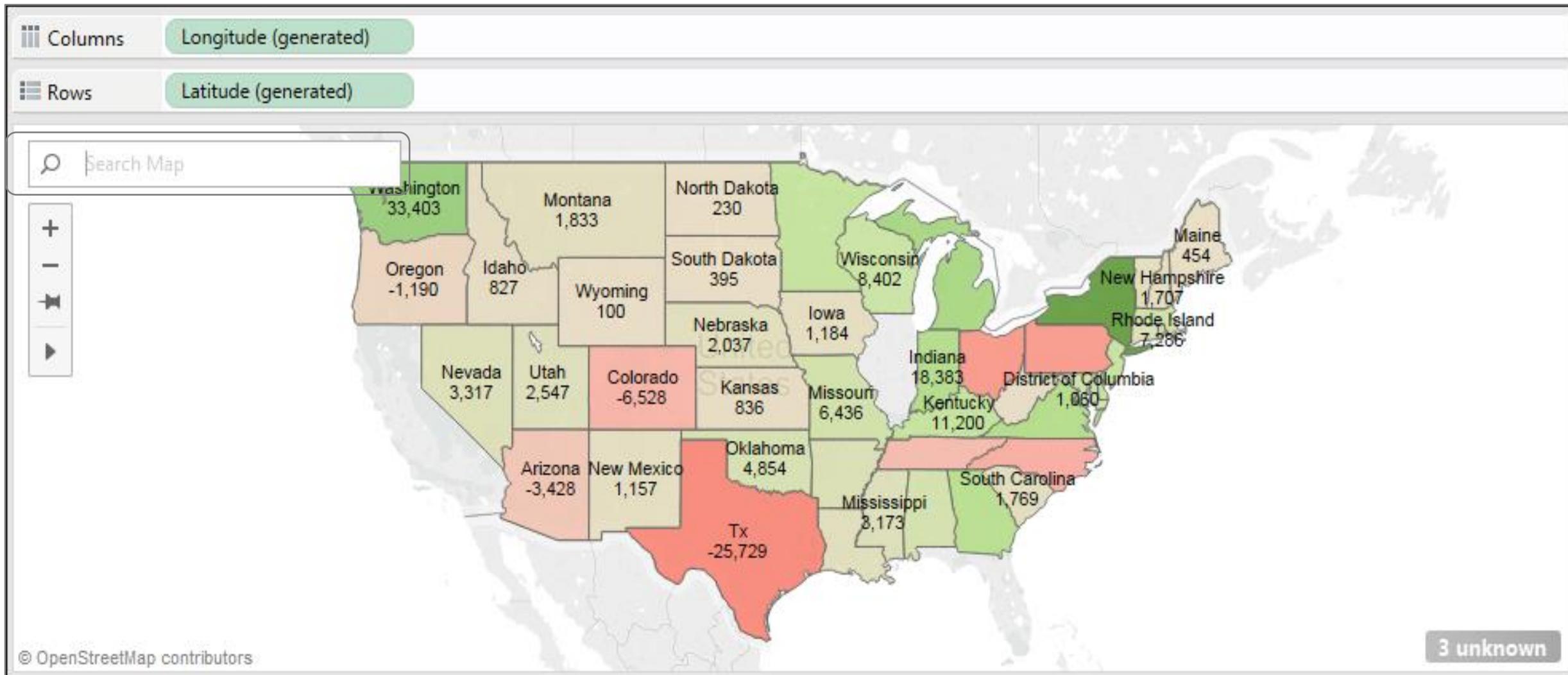
Types of locations that can be found via map search are as follows:



- 01 Postal Code
- 02 Continent
- 03 City
- 04 Country
- 05 State or Province

Tableau Map Search

Location of the map search box is shown in the image below:



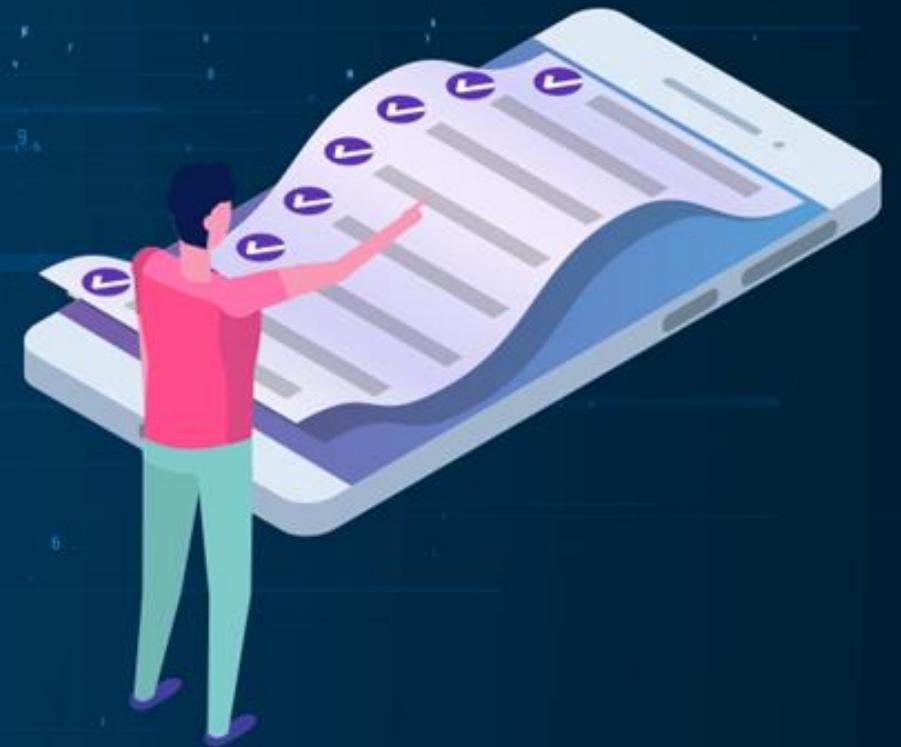
Key Takeaways

- Heat maps are two-dimensional representation of data with the help of colors.
- Bar chart is used to analyze the performance of multiple categories on a single measure.
- Line chart is used in forecasting future values.
- Sparklines are densely populated line charts that help in understanding the anomalies in a data.



Key Takeaways

- Tree map displays hierarchical items in rectangular boxes that represent the tree structure.
- A word cloud displays the frequency of words in a text.
- Tableau allows searching for a specific location in map view.



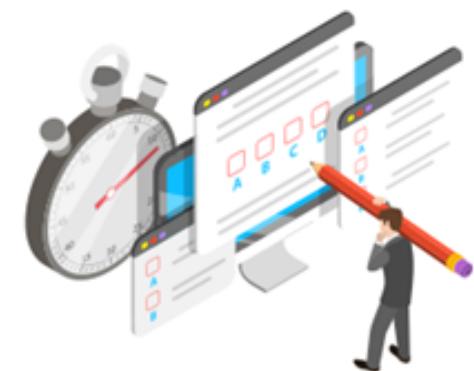


Knowledge Check

**Knowledge
Check**
1

What is the outcome when you drop Category in Columns, Profit in Rows, and Region in Color?

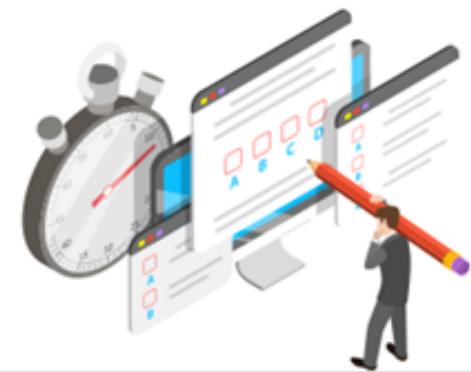
- A. Side by side bar chart
- B. Stacked bar
- C. Tree map
- D. Horizontal bar



**Knowledge
Check**
1

What is the outcome when you drop Category in Columns, Profit in Rows, and Region in Color?

- A. Side by side bar chart
- B. Stacked bar
- C. Tree map
- D. Horizontal bar



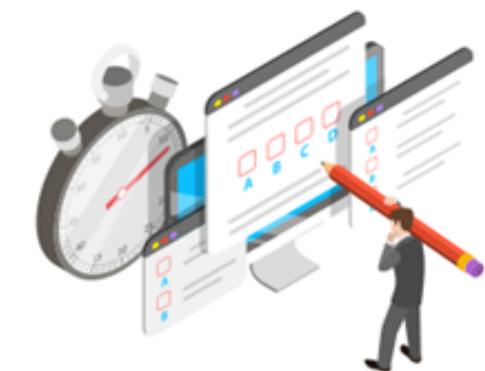
The correct answer is **B**

A stacked bar chart is an outcome when the category is dragged to columns, profit to rows, and region to color.

**Knowledge
Check**
2

Which mark is used to create a Tree Map?

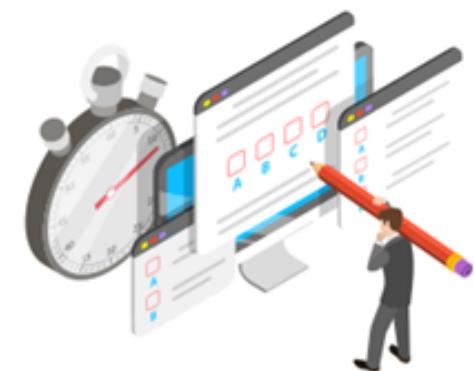
- A. Shapes
- B. Bar
- C. Density
- D. Square



**Knowledge
Check**
2

Which mark is used to create a Tree Map?

- A. Shapes
- B. Bar
- C. Density
- D. Square



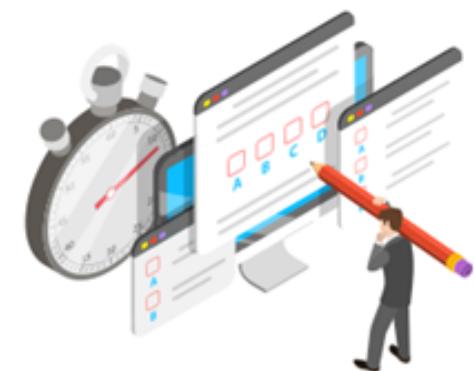
The correct answer is **D**

Square is the mark used to create a Tree Map.

**Knowledge
Check**
3

Which is NOT a step to create a Highlight table?

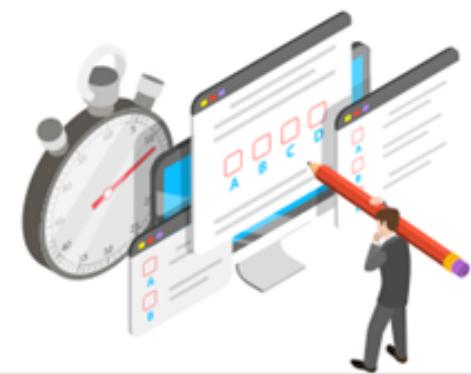
- A. Mark type text
- B. Dimension in color
- C. Measure in text
- D. Dimension in row shelf



**Knowledge
Check
3**

Which is NOT a step to create a Highlight table?

- A. Mark type text
- B. Dimension in color
- C. Measure in text
- D. Dimension in row shelf



The correct answer is **B**

Dimension in color will create a square symbol and will not highlight the entire cell.

**Knowledge
Check**

4

Which of the following is a part of Show Me charts?

- A. Funnel chart
- B. Box plot
- C. Butterfly chart
- D. Pareto Analysis

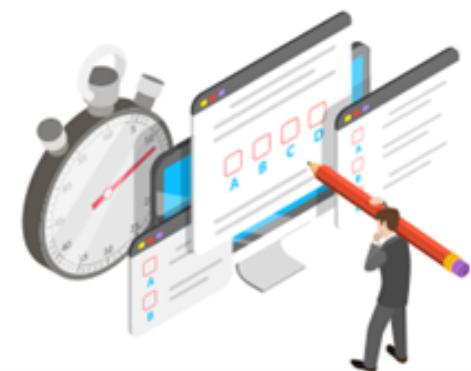


**Knowledge
Check**

4

Which of the following is a part of Show Me charts?

- A. Funnel chart
- B. Box plot
- C. Butterfly chart
- D. Pareto Analysis



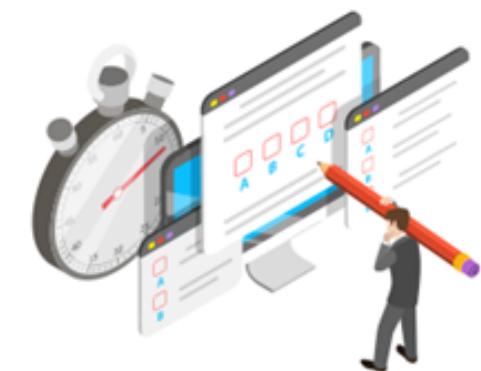
The correct answer is **B**

Box plot is a part of Show Me charts. Other three are custom charts.

**Knowledge
Check**
5

_____ is the process of converting the text-based description of a location into its geographical coordinates.

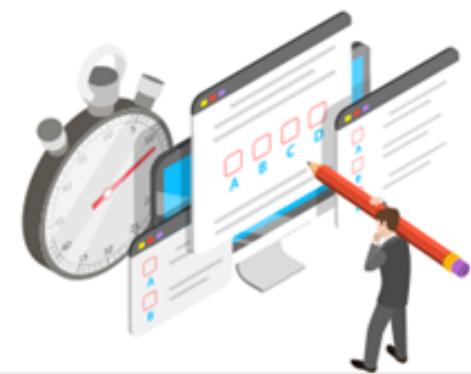
- A. Map layering
- B. Geocoding
- C. Pareto analysis
- D. Sparkline



**Knowledge
Check
5**

_____ is the process of converting the text-based description of a location into its geographical coordinates.

- A. Map layering
- B. Geocoding
- C. Pareto analysis
- D. Sparkline



The correct answer is **B**

Geocoding is the process of converting a text-based description of a location, such as an address or a place name, into its geographical coordinates.

Lesson-End Project



You are the head of sales for a retail products company. The company wants to increase its business across regions. Your task is to examine Customer Statistics, which comprise the number of customers, product sales, product quantity, sales per customer, profit, and profit per customer. He should be able to see customer sales rank, as well as sales and profit by customer, rapidly. The purpose is to compare statistics across different regions. He will organize his sales approach across regions based on these figures.

LESSON-END PROJECT