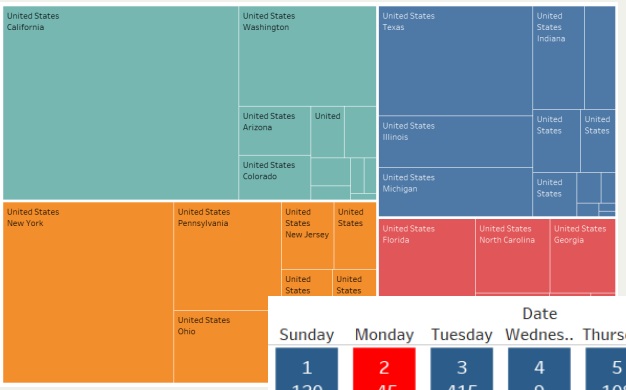
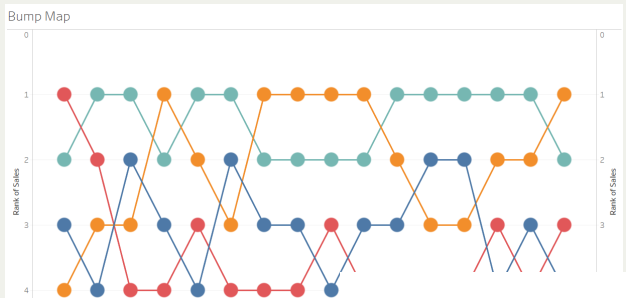
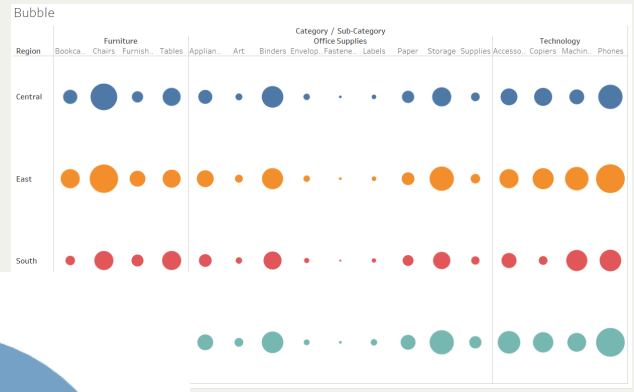
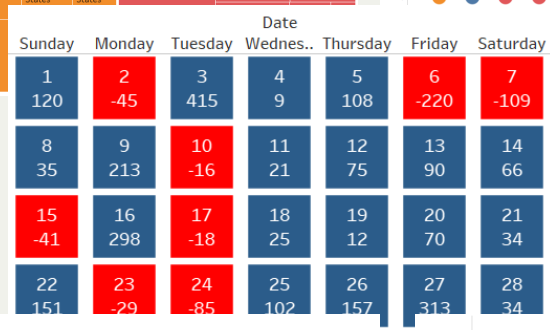
Visualization with Tableau

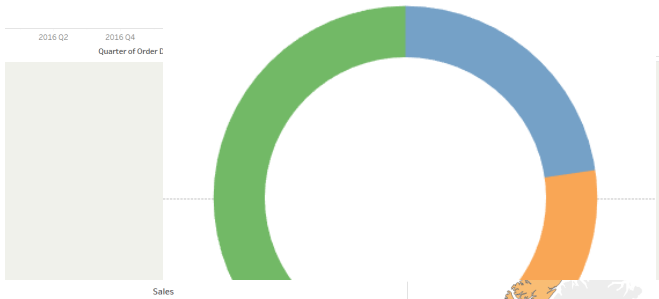
What we are going to create...

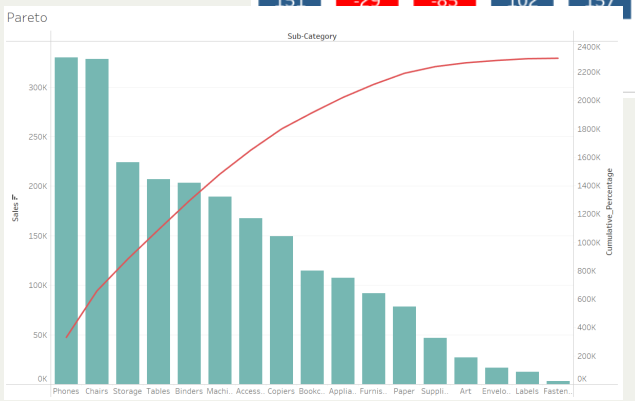


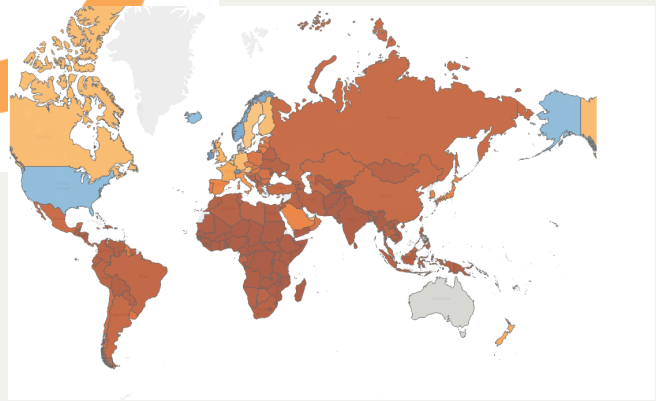












Importing Data

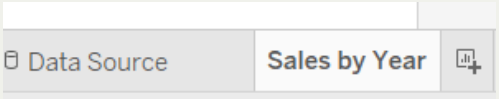
Download “Superstore Data” from course website or here.

You can choose a spreadsheet as your data, e.g., “Orders.”

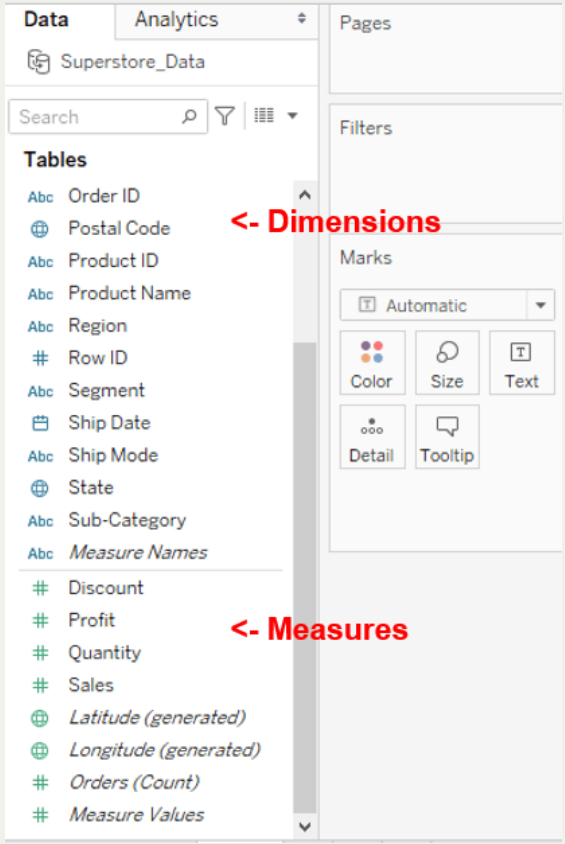
Once the dataset is available, check the data types first.

Creating a Worksheet

Let’s create a new worksheet by clicking on “Sheet 1”! You can customize the name for your worksheet.



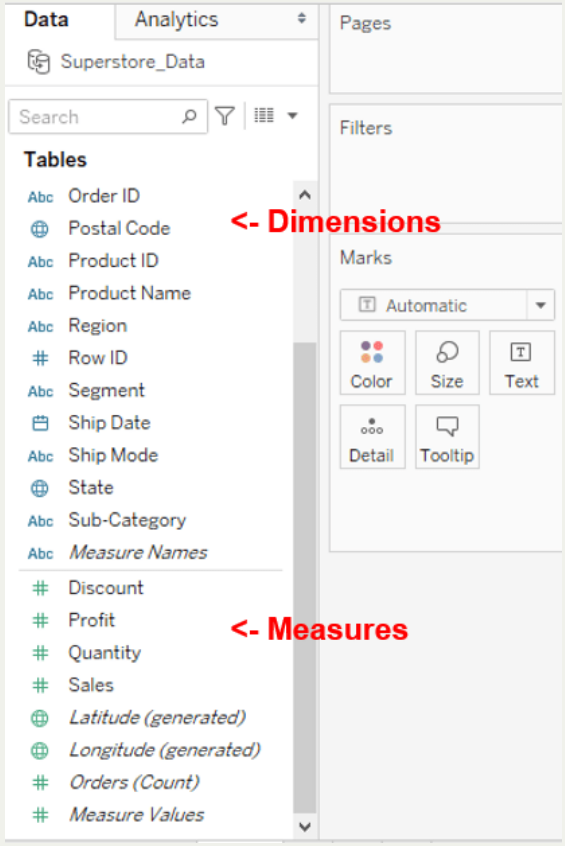
Dimensions vs. Measures



There are two types of variables available, dimensions vs. measures.

What are the differences between dimensions and measures?

Dimensions vs. Measures



There are two types of variables available, dimensions vs. measures.

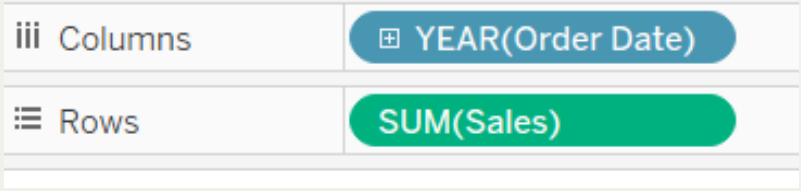
Measures are variables that can be used for calculation whereas dimensions are used to partition the measures.

Basics

Lines

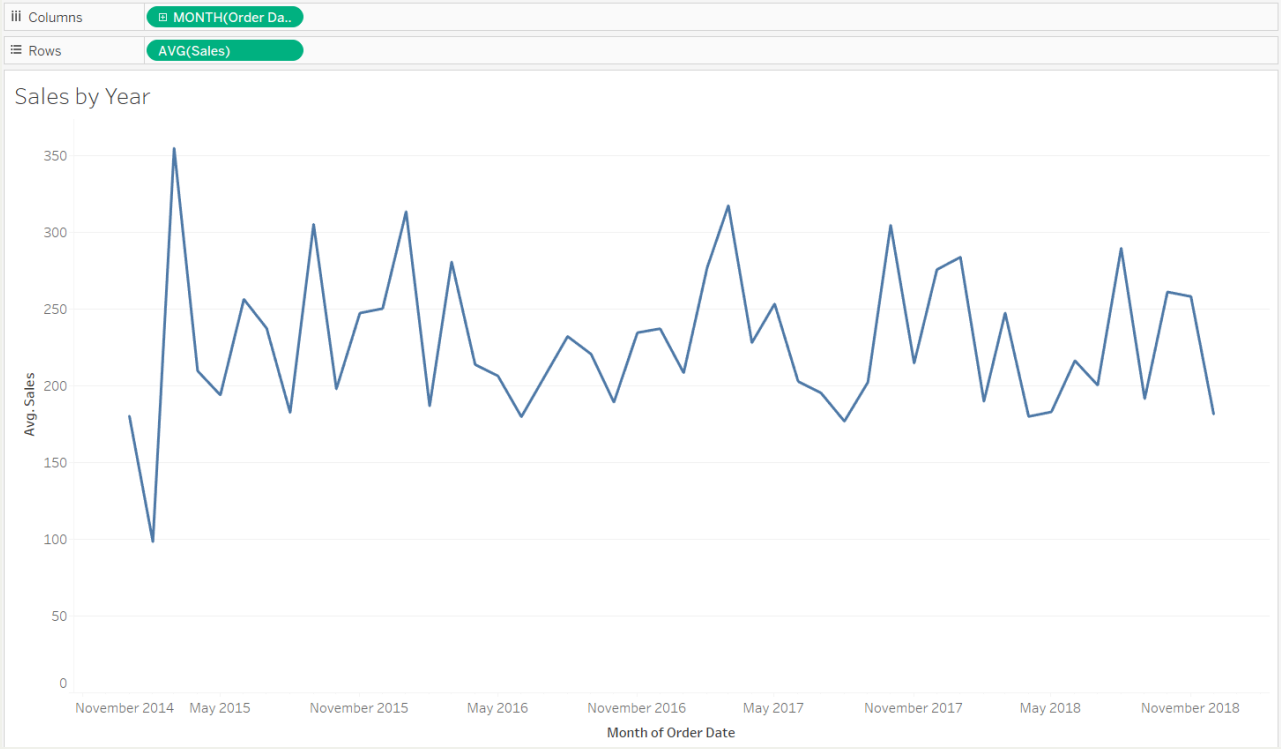
Draw Order Date to Columns and Sales to Rows.

You get your first Tableau visualization now!



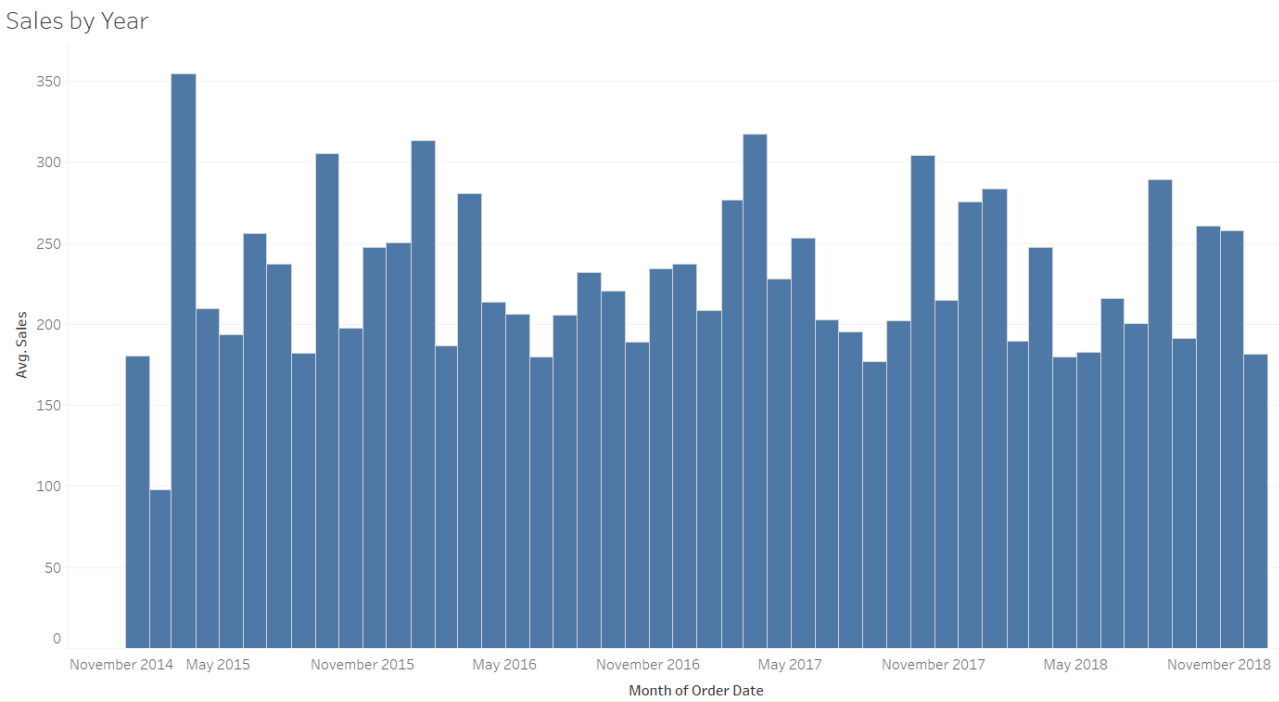
Lines

Change Order Data from Year to Month-Year and Sales from Sum to Average.



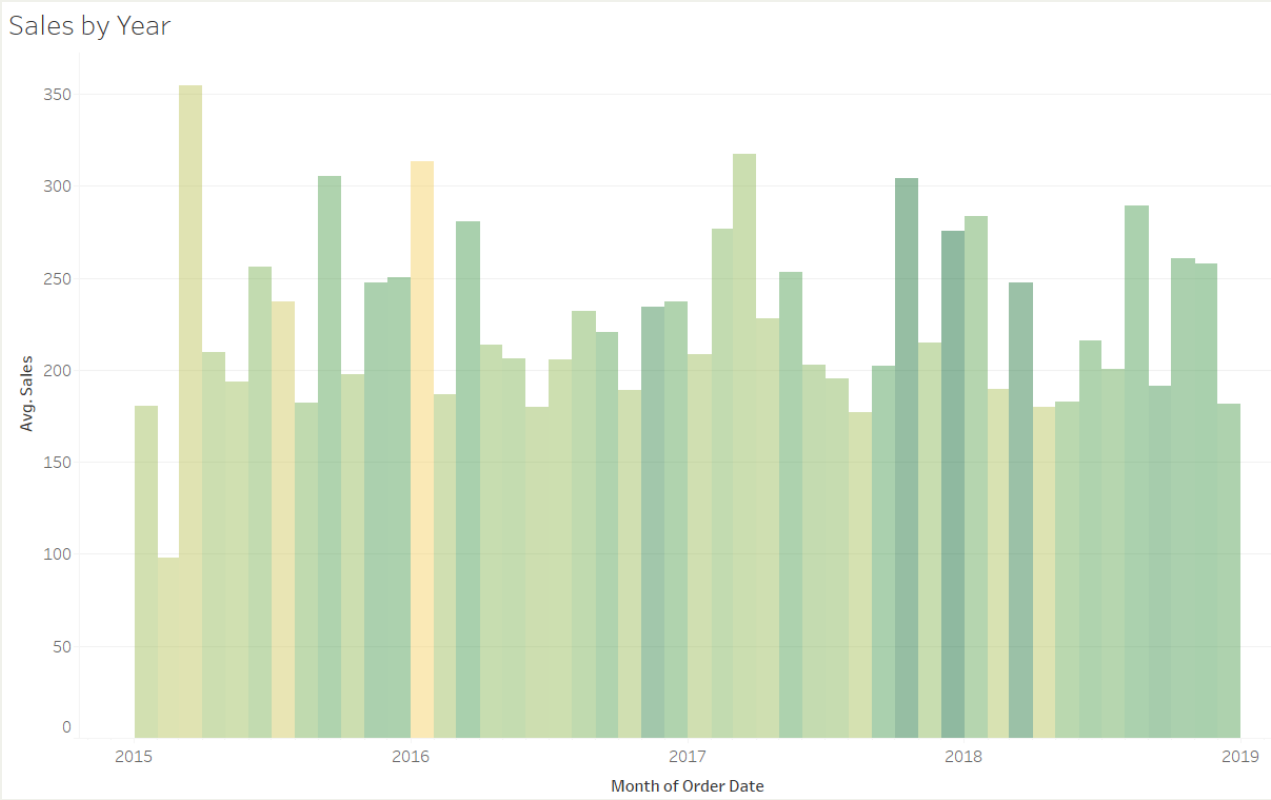
Bars

If you don't like lines, try bars! Click the dropdown menu on Marks and select Bars. See what will happen!



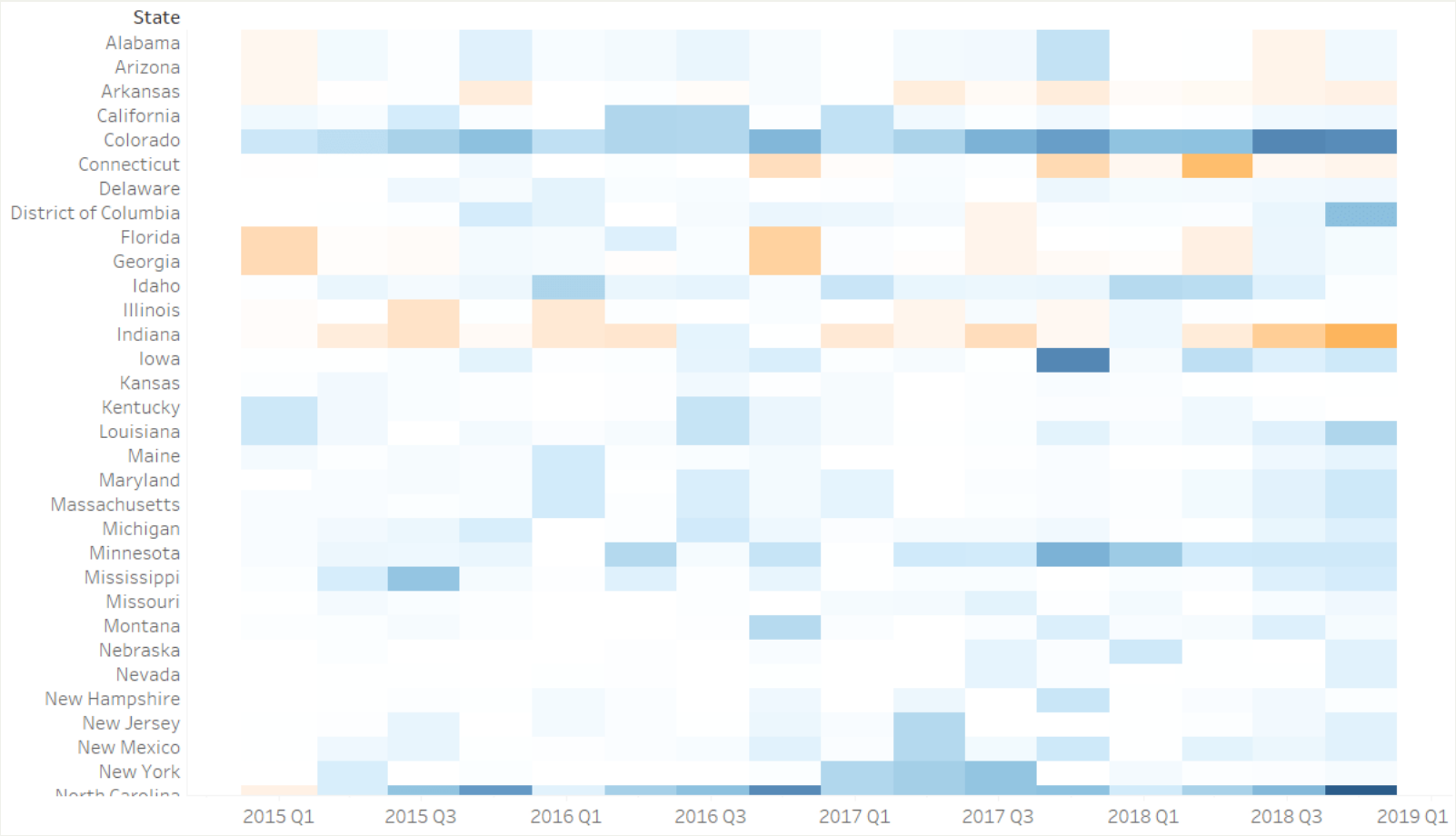
Colors

Add colors to your bars! Drag Profit to Color, and you can customize the color scheme by clicking on Color.



Heat Map

We are creating the following heatmap!



Heatmap

Create a new worksheet called “Heatmap.”

Drag Order Date to Columns and specify Quarter Year.

Drag State to Rows.

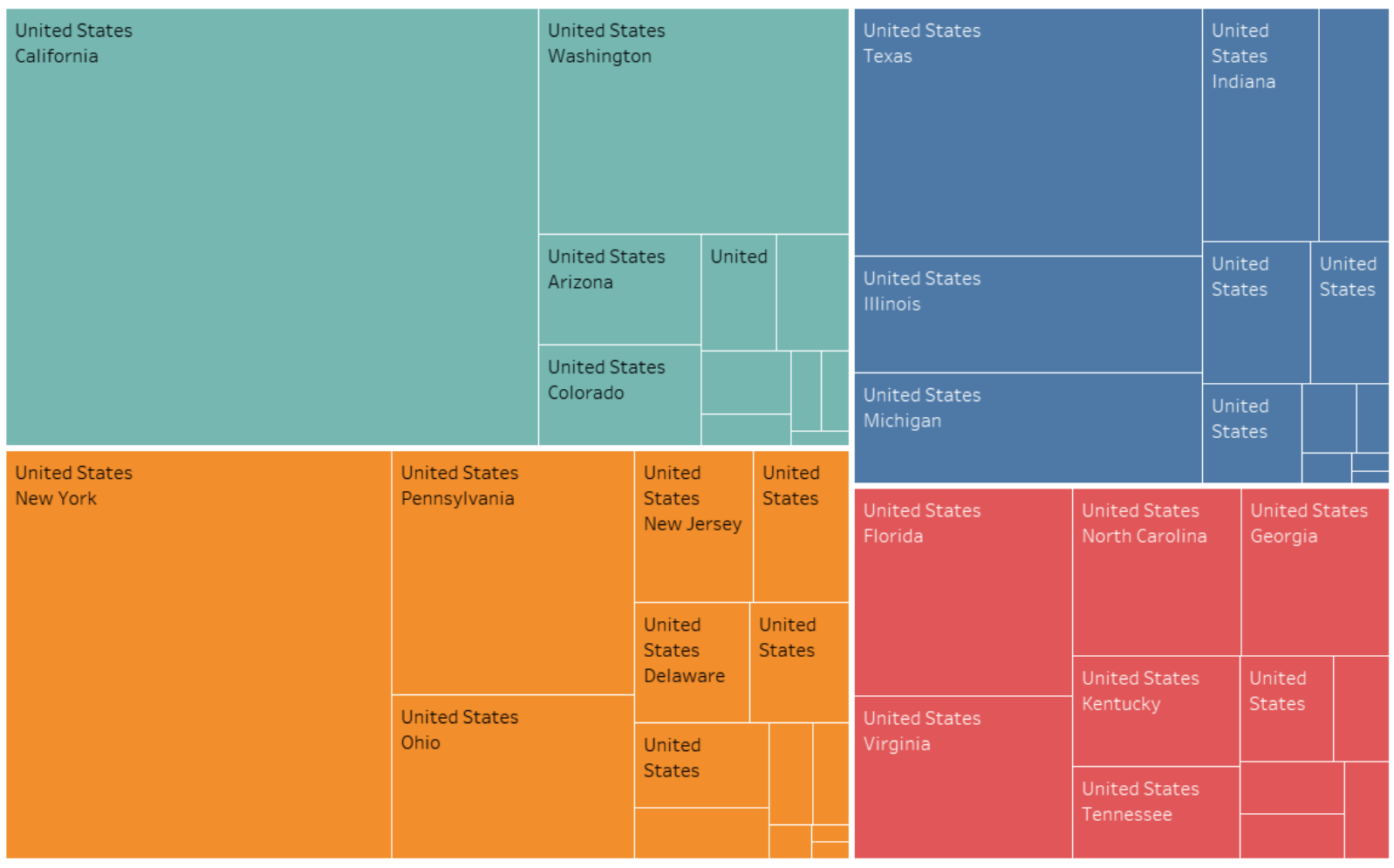
Click the dropdown menu on Marks and select Square.

Drag Profit to Color.

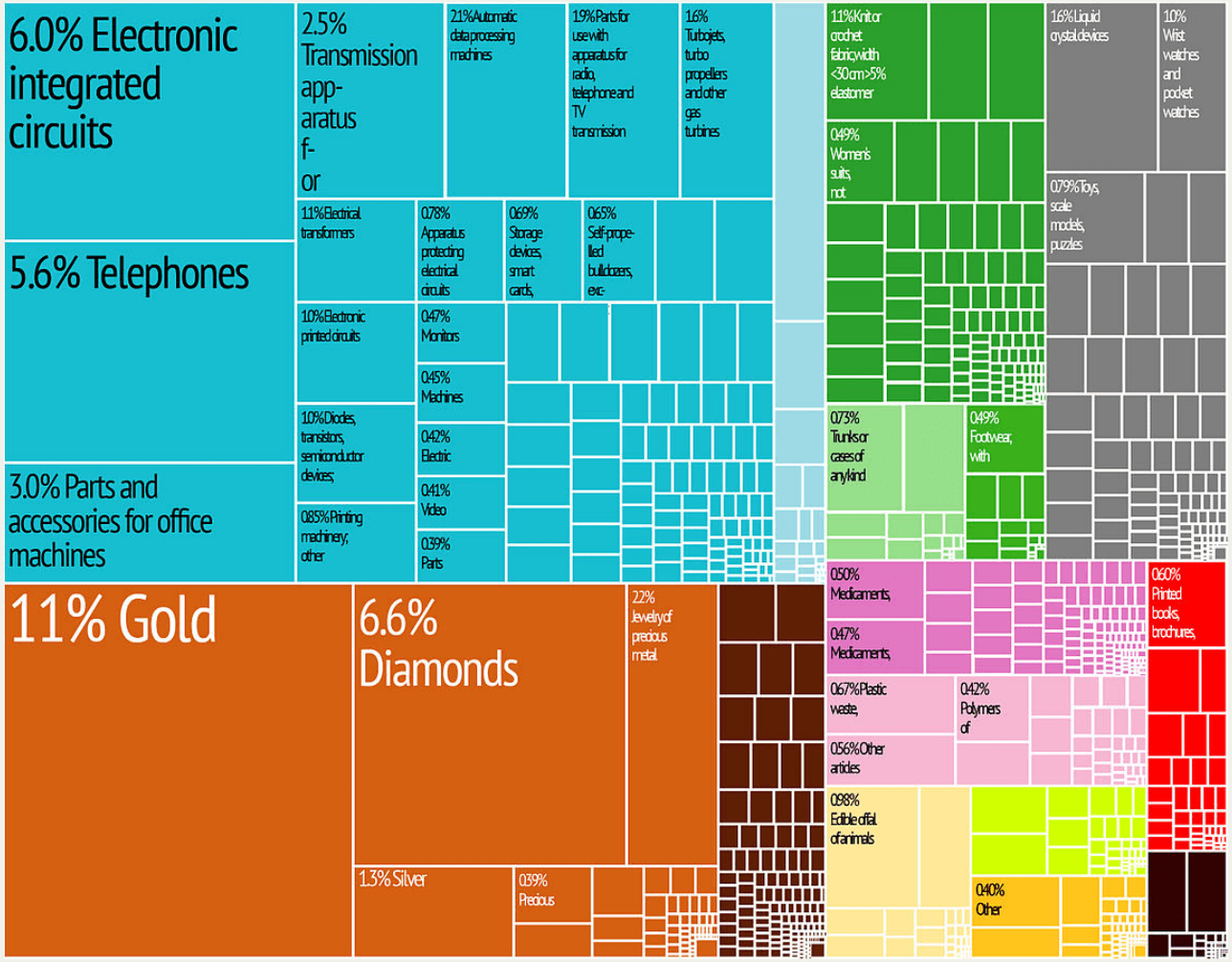
Click on Size and Color to customize your square size and your color.

Treemap

We are creating a treemap!



This is a Hong Kong export treemap, found on Wikipedia. How is it created?



Treemap

Start with a new worksheet “treemap.”

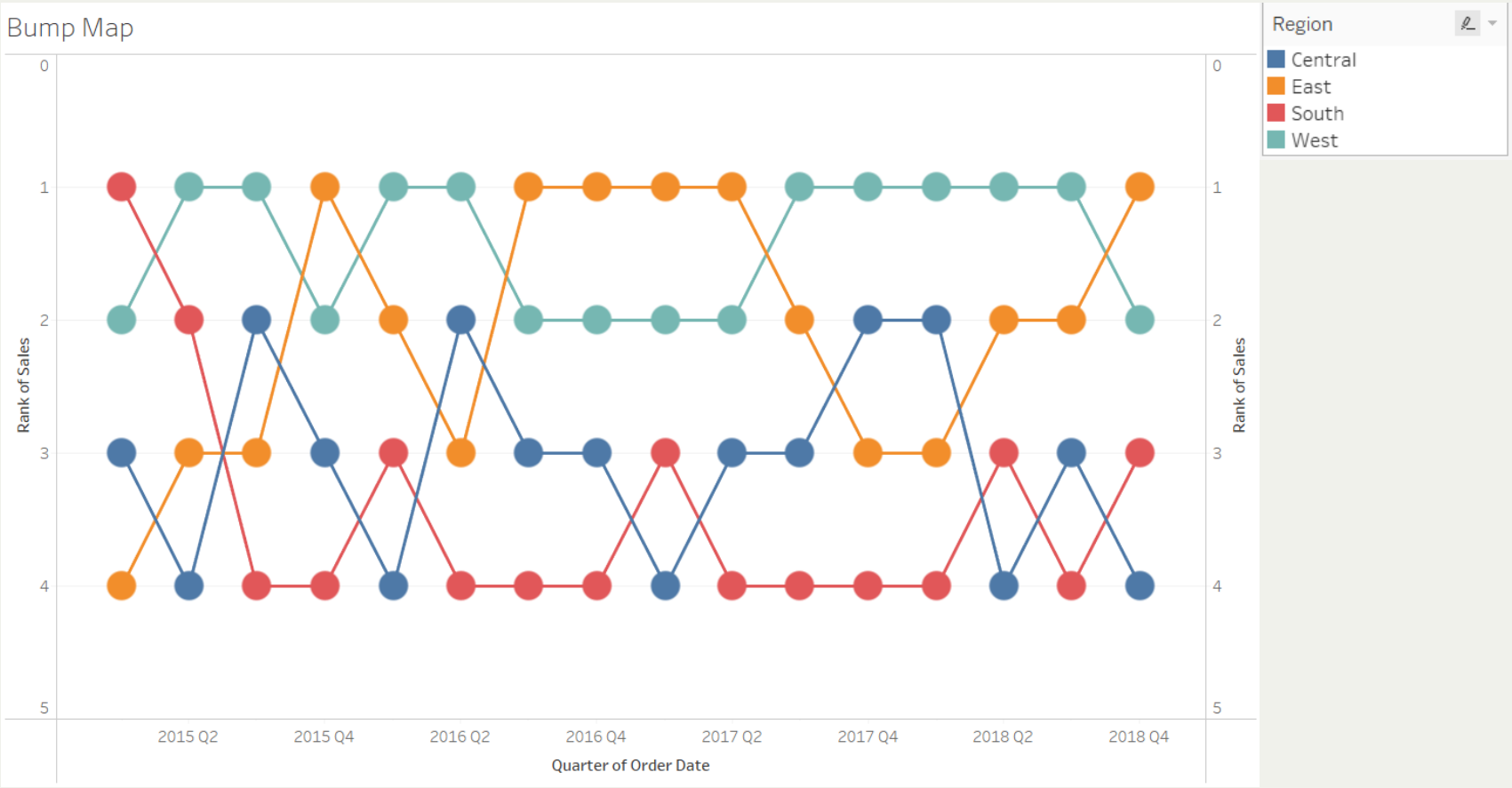
Drag Country, State, Sales all to your Columns.

On the right-hand side, click Show Me, and select the treemap icon:

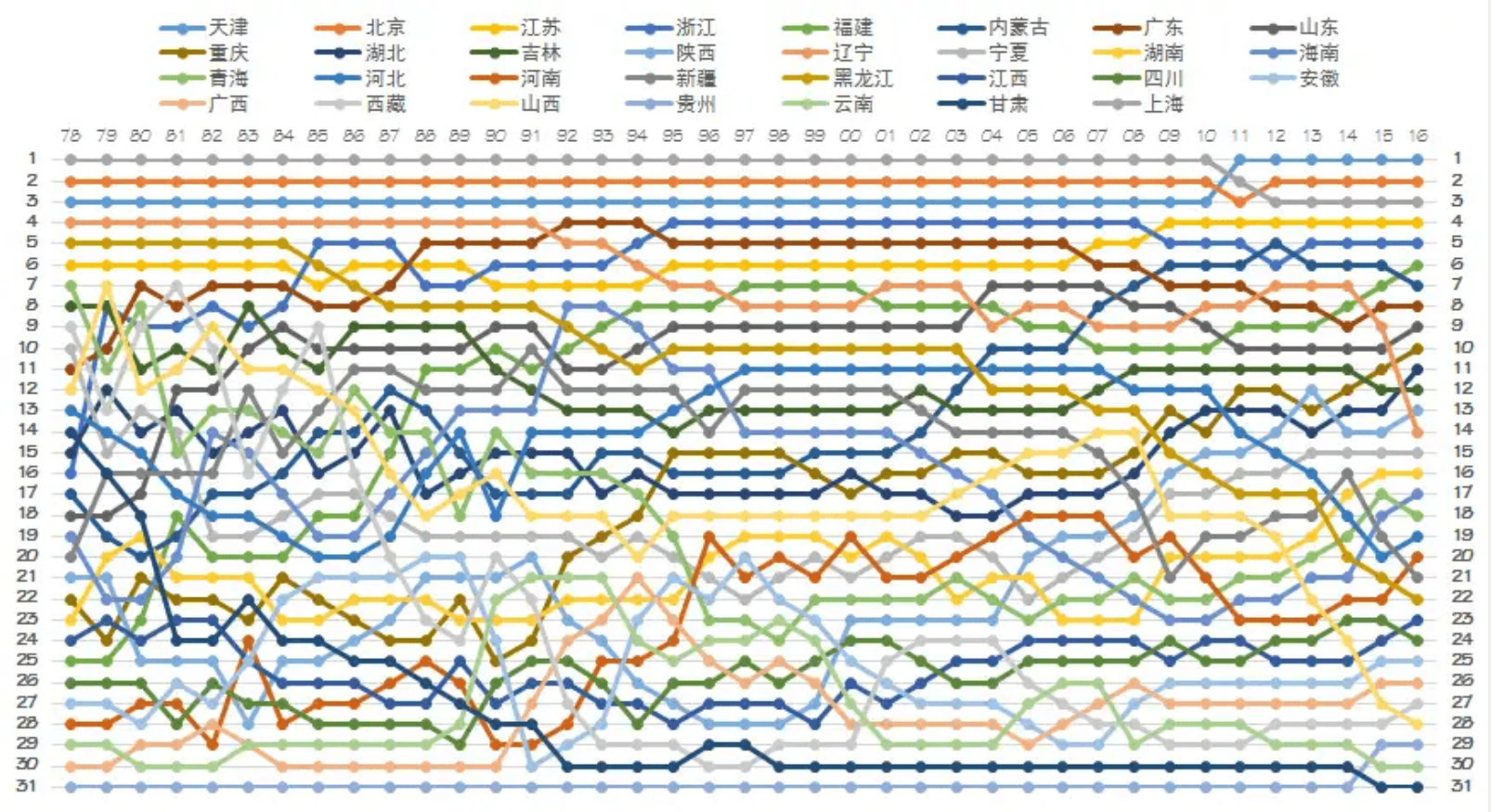
Drag Region to Color, and you are done!

Bump Map

This is a Bump Map



Bump maps are used in a lot of places... This is a rank of Chinese provinces by GDP per capita.



Bump Map

Start with a new worksheet (e.g., “Bump Map”).

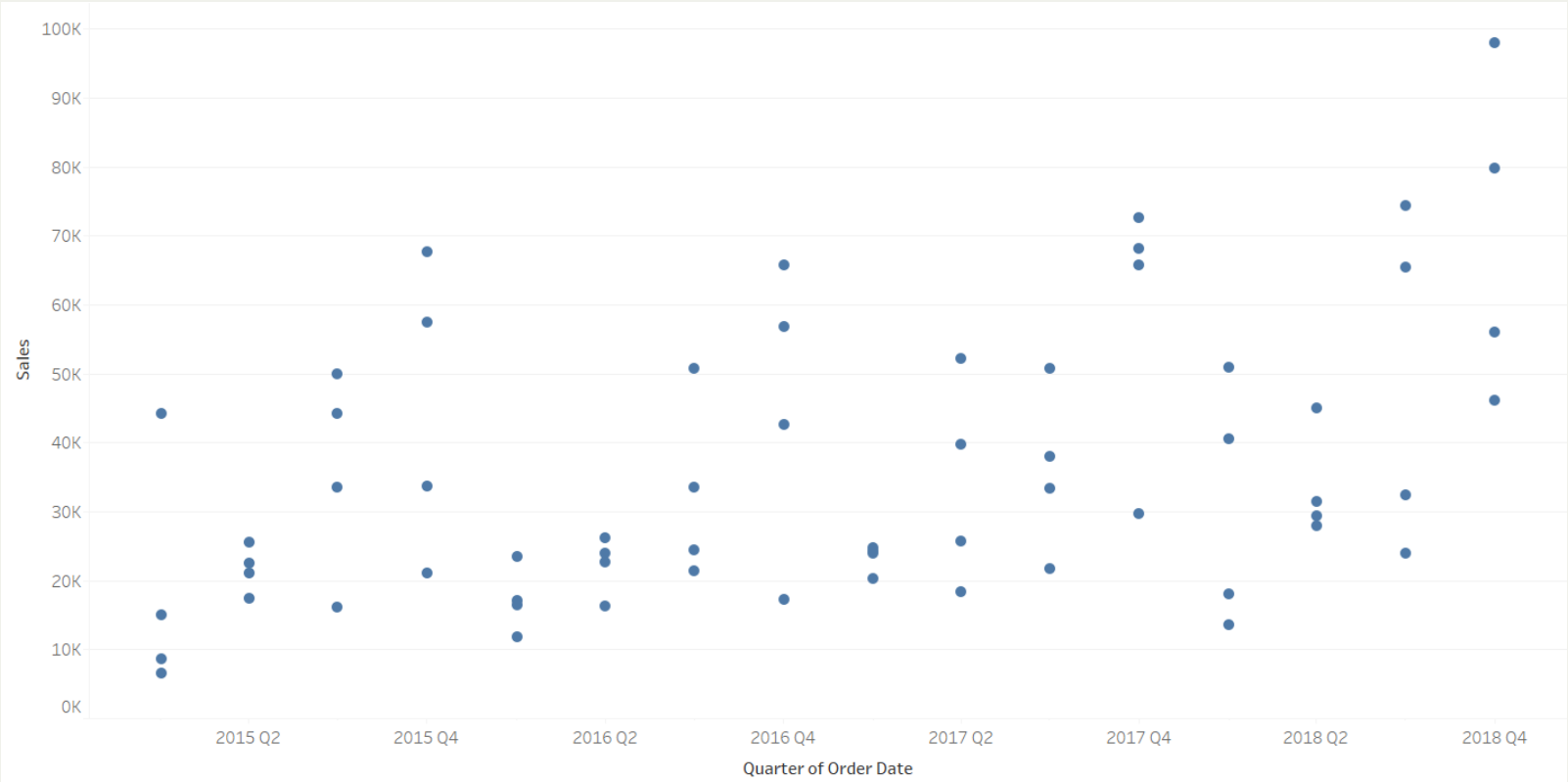
Order Date to Columns and Sales to Rows.

Change Order Date format from Year to Quarter Year.

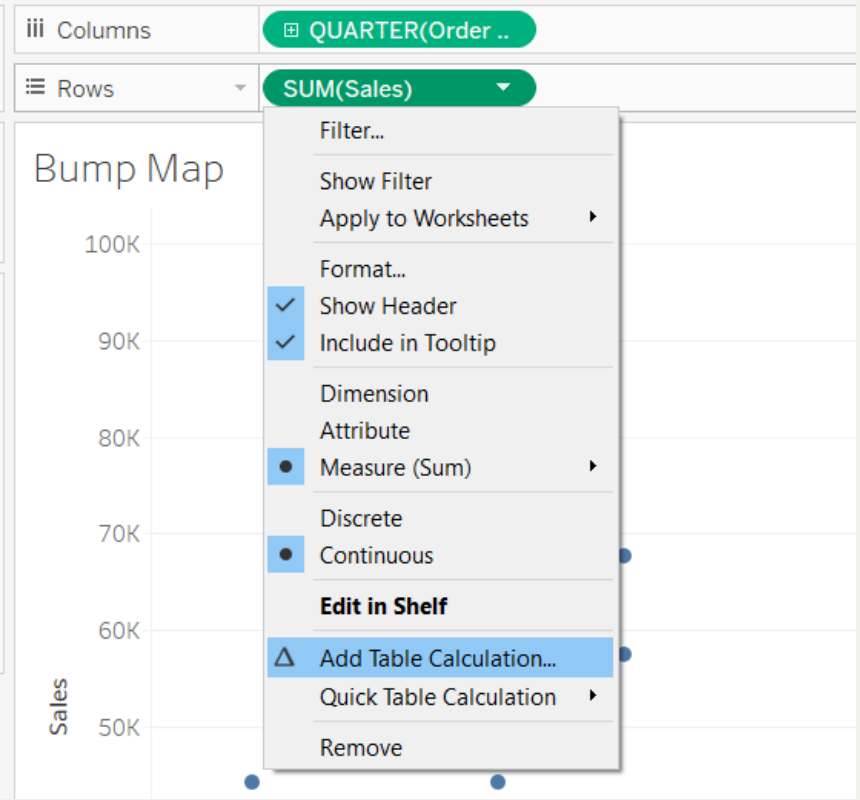
Region to Detail under Marks.

Change Marks from Automatic to Circle.

Bump Map

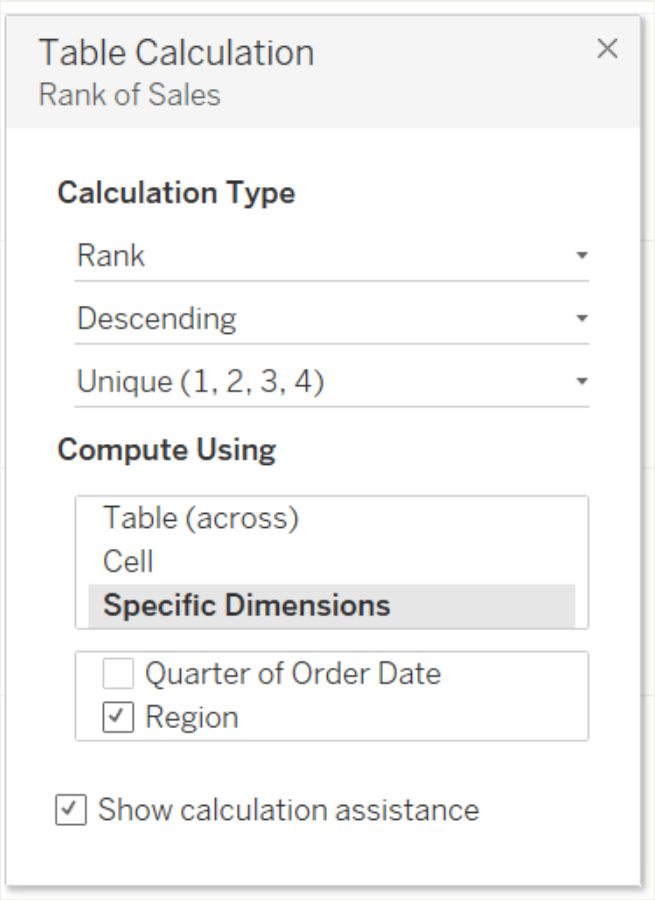

100K
90K
80K
70K
60K
50K
40K
30K
20K
10K
0K
Sales
2015 Q2
2015 Q4
2016 Q2
2016 Q4
2017 Q2
2017 Q4
2018 Q2
2018 Q4
Quarter of Order Date

Bump Map



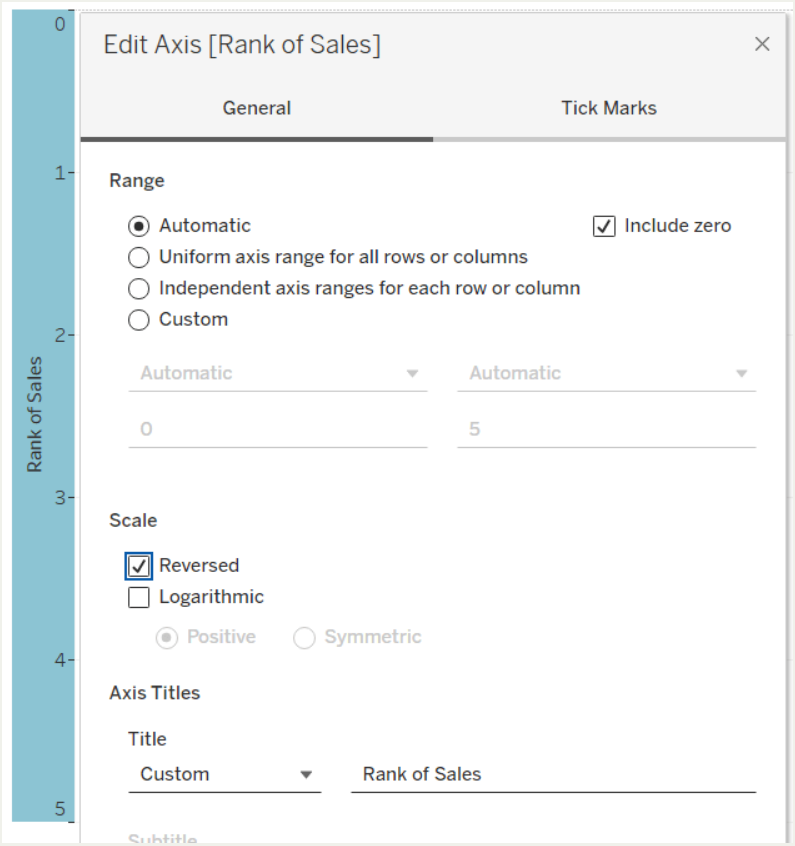
Right click the triangle next to Sales, and select Add Table Calculation.

Bump Map



Specify your Table Calculation according to this figure. Here, we rank the sales of each region.

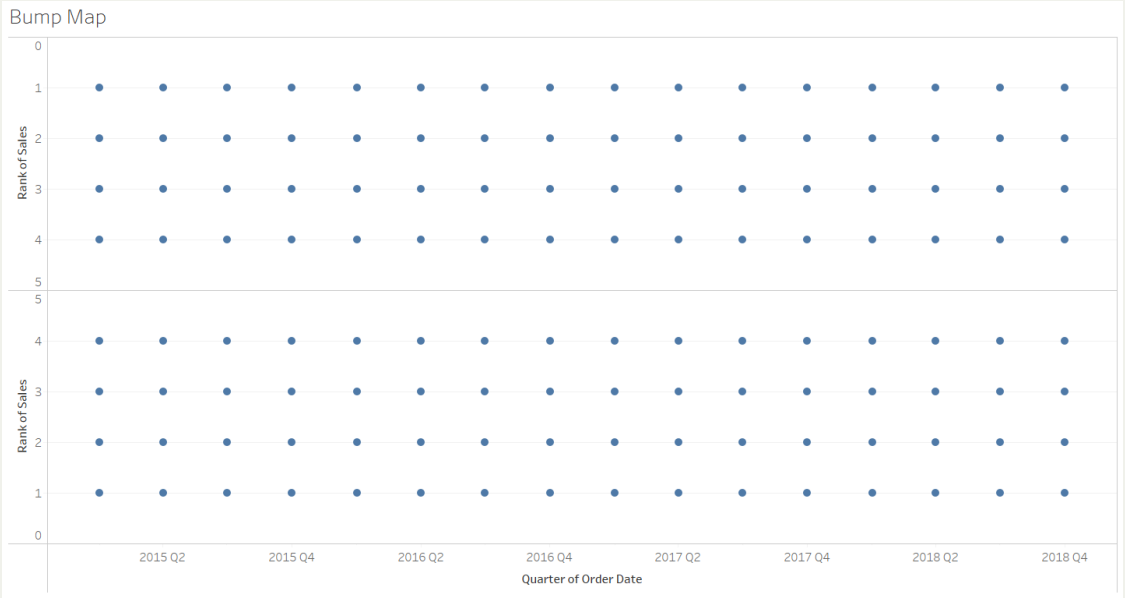
Bump Map



Right-click your y-axis, choose edit axis, and select reserved scale. Now, we are ranking from the first to the last.

Bump Map

Press Control (Windows) or Command (Mac) on your keyboard, drag Sales on Rows to Rows again to replicate this variable again. You will reach the following figure.



Bump Map

Click the small triangle next to the second Sales on Rows, and select Dual Axis. By doing so, you merge the two figures into one single figure.

Right-click your y-axis and click Synchronize Axis, you will get the two y-axes identical.

Bump Map

Under Marks, change the format your second figure from Circle to Line.

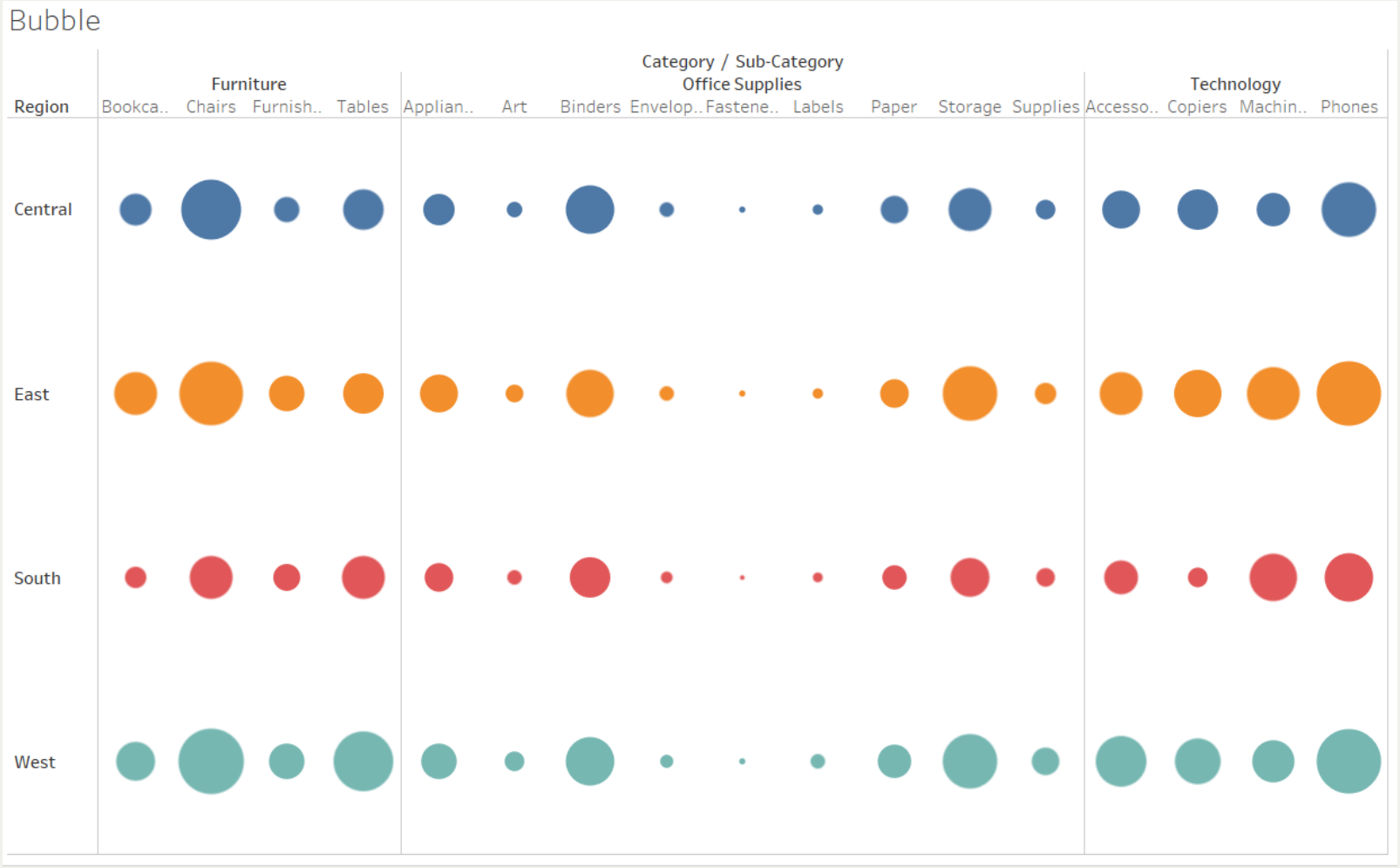
Drag Region to Color under Marks for both figures.

Adjust the size of the your circles to make it look best.

Finally, you are down with your bump map!

Bubble Matrix

This is a bubble matrix.



Bubble Matrix

Start with a new worksheet.

Region to Rows; Category and Subcategory to Columns.

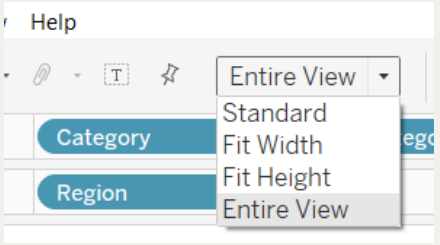
Set the table format to Circle.

Sales to Size (of the circles).

Region to Color (of the circles).

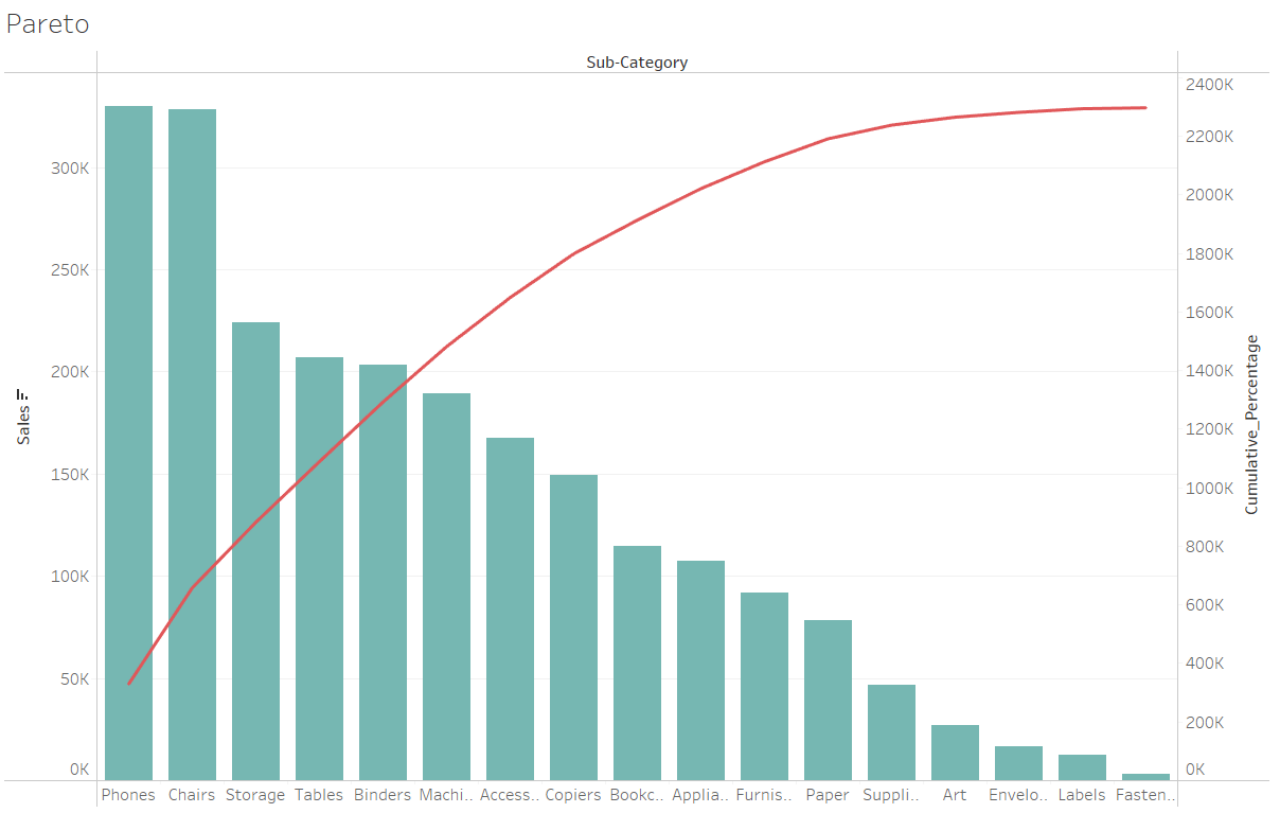
Adjust the size and transparency of your bubbles.

You may also set the table to Entire View to make it looks nicer.



Pareto Chart

This is a Pareto Chart



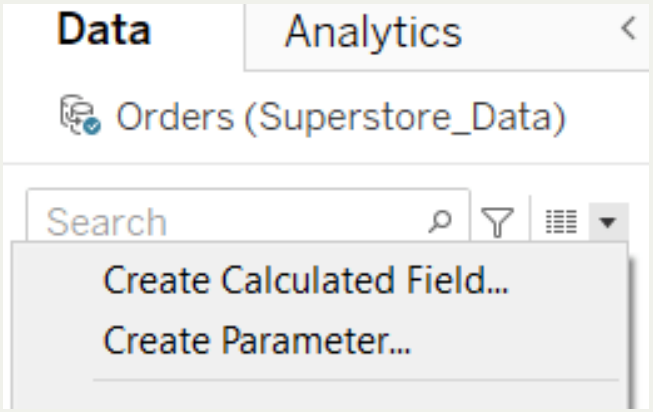
Pareto Chart

Start with a new worksheet.

Subcategory to Columns and Sales to Rows.

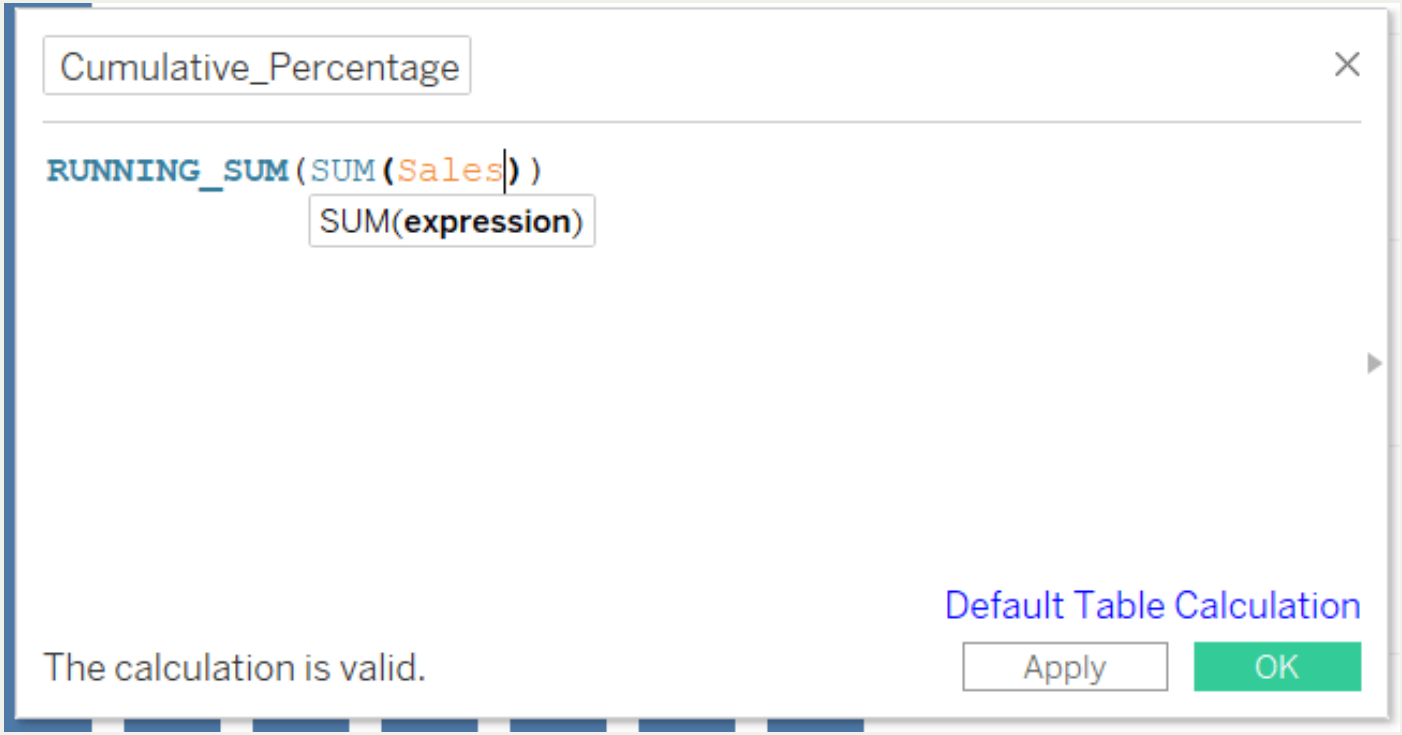
Rank the bars based on sales by clicking on this: 

Click here to create calculated field:



Pareto Chart

Create the following new variable:



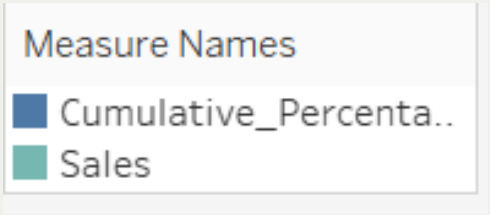
Pareto Chart

Draw the new variable Cumulative_Percentage to Rows.

Choose "Dual Axis" as we illustrated previously.

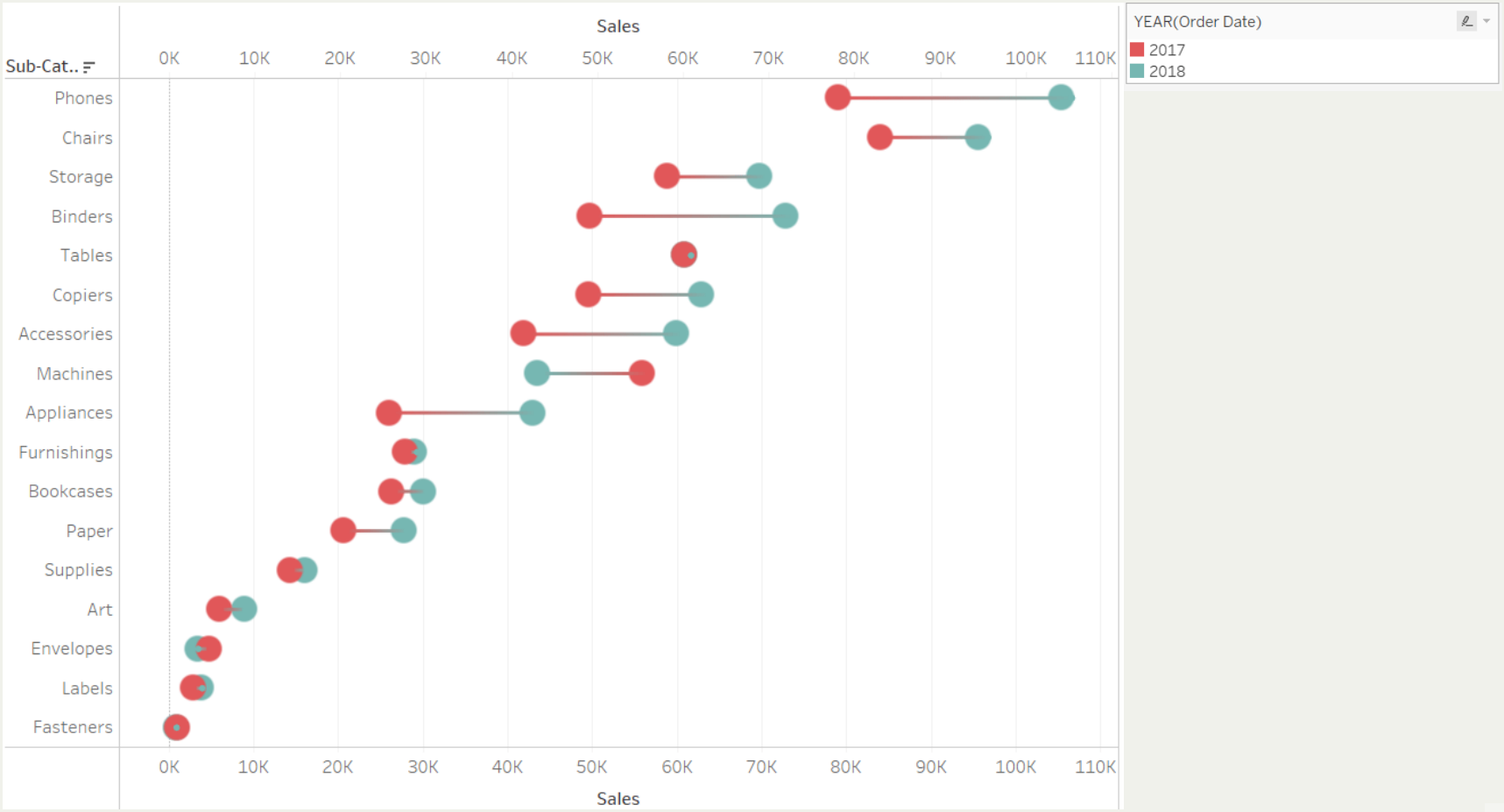
Set the format of the first figure to be Bar, and the second figure to be Line.

You can adjust the width of the bars and the line. If you want to edit the colors of the bars and line, double-click the buttons here:

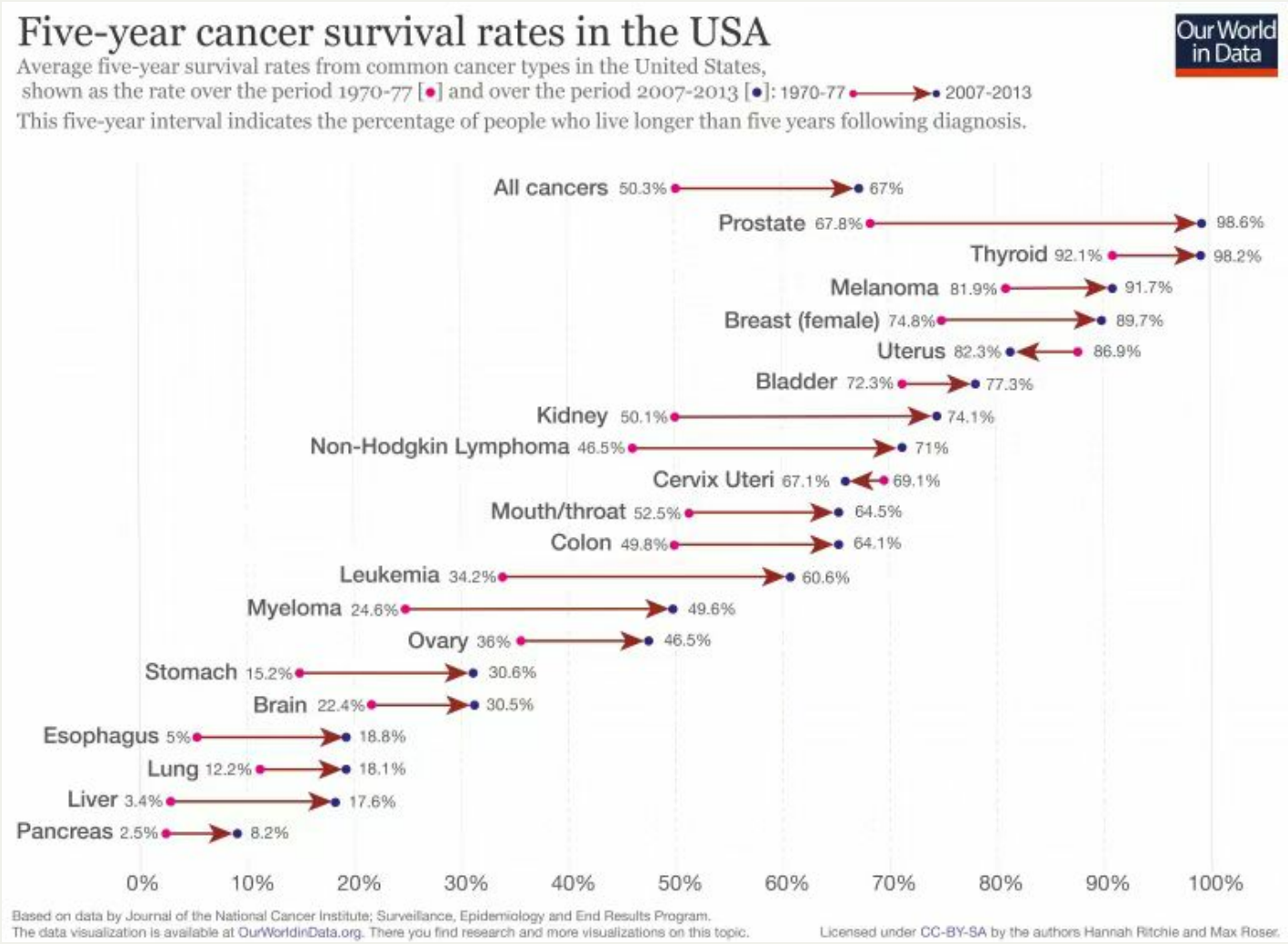


Dumbbell Chart

This is a dumbbell chart showing how sales change from 2017 to 2018.



This type of chart is used everywhere...



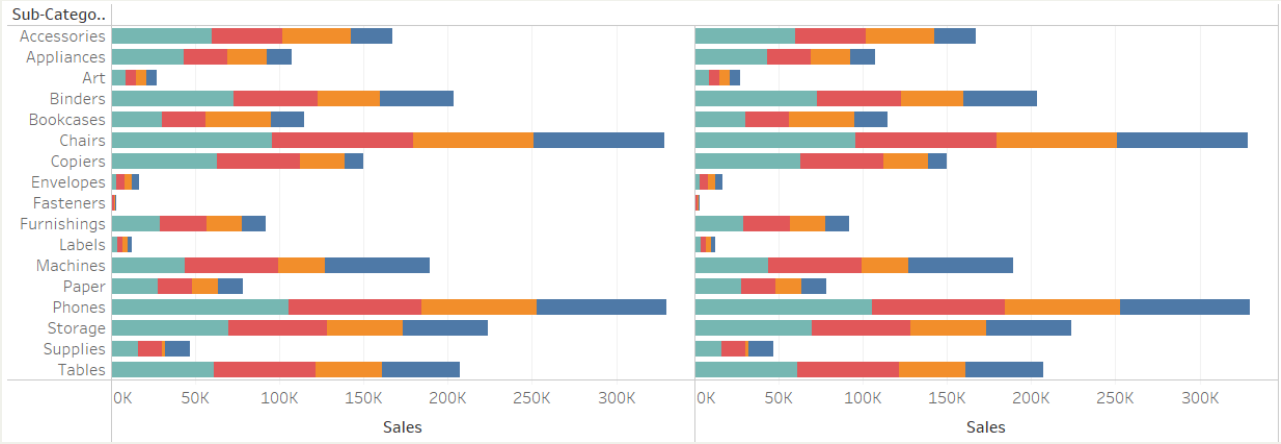
Dumbbell Chart

Start with a new worksheet.

Subcategory to Rows; Sales to Columns.

Order Date (Year) to Color.

Press Control/Command tab and drag Sales to Columns to replicate it.

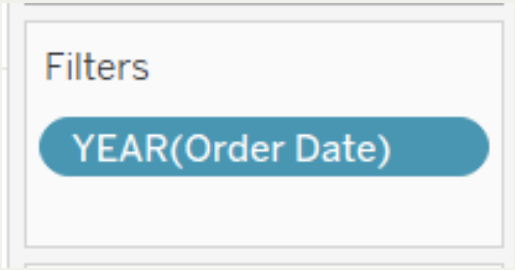


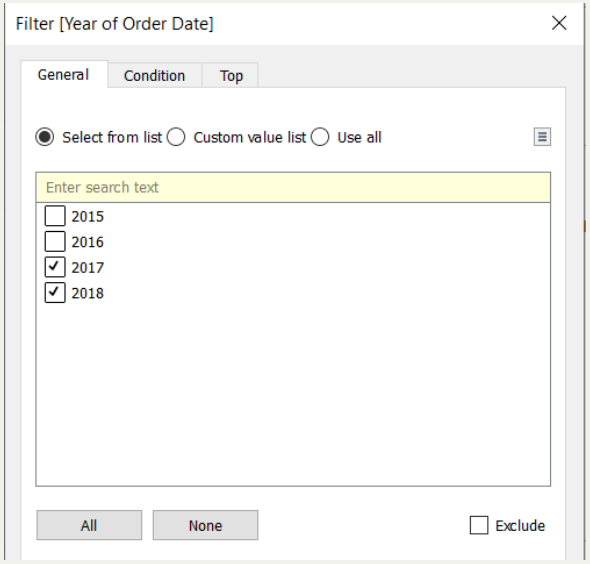
Dumbbell Chart

Choose Dual Axis for the second Sales; now, you merge the two figures into one single figure.

Right click on your x-axis to Synchronize Axis.

Drag Order Date to Filters and only check 2017 and 2018.



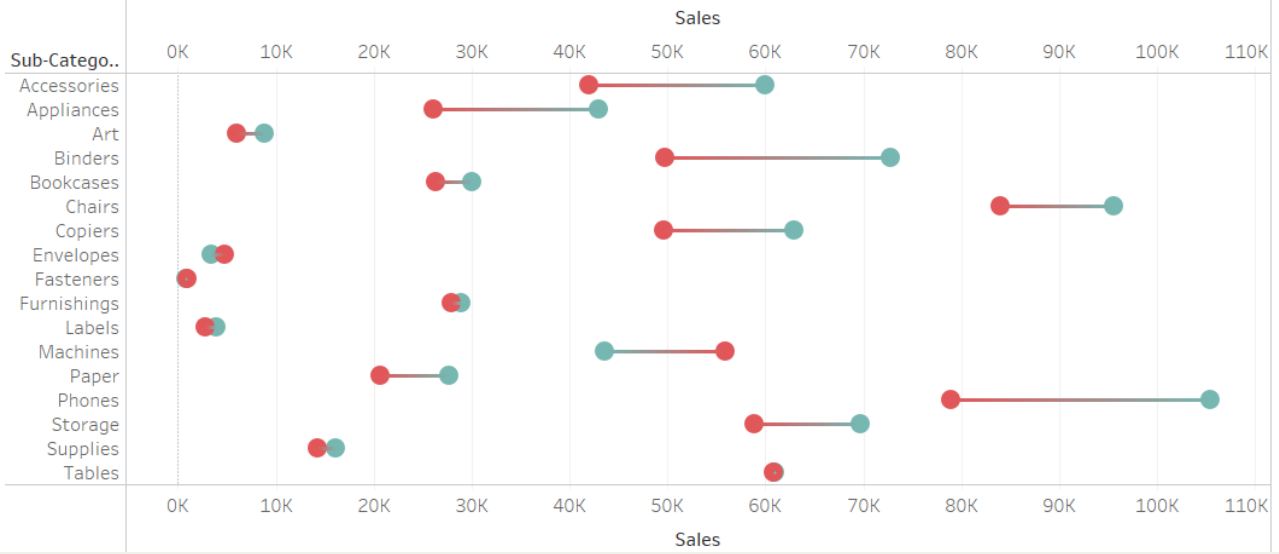


Dumbbell Chart

Choose the format of the second chart to Line.

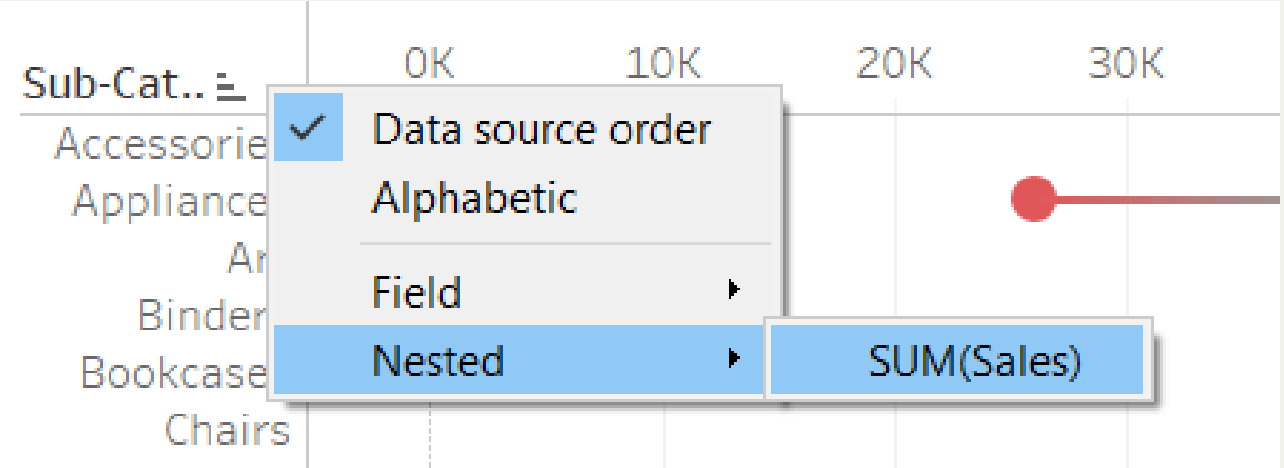
Drag Order Date (the first "Year") to Path. Note that the default format is Quarter so you need to change it to Year.

Adjust the size of circles in the first chart.



Dumbbell Chart

Now, the items in y-axis are listed in alphabetical order. If you prefer to list the items based on sales, click on the button in your y-axis, select Nested, SUM(Sales) as illustrated in the following figure. You are done!



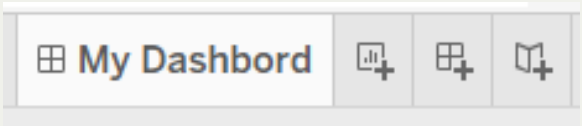
Dashboard

Dashboard

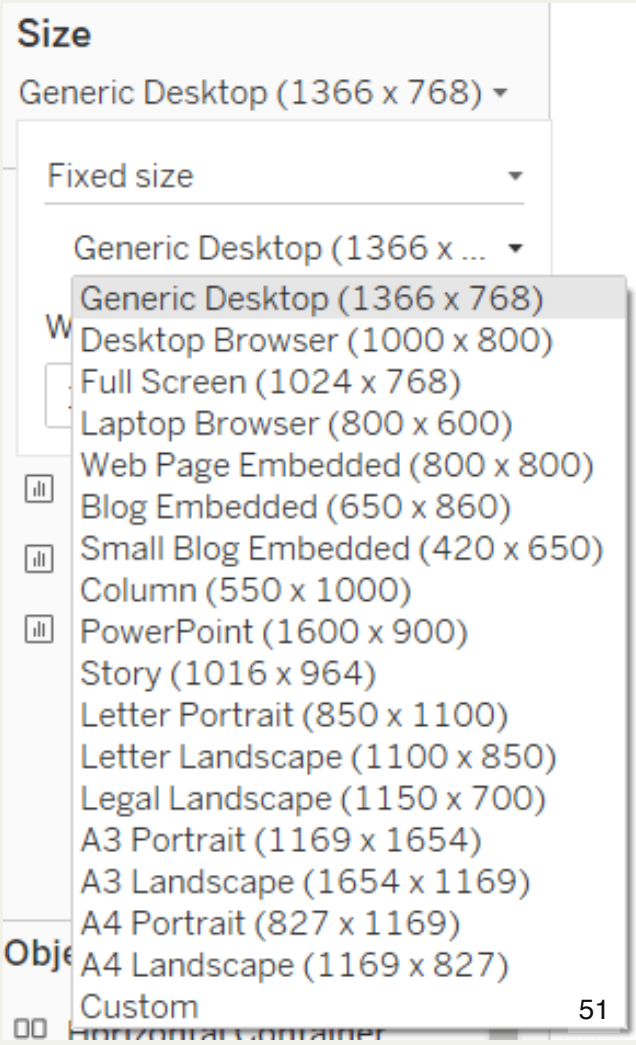
Now, you already have a number of worksheets, and we can organize them (or some of them) in a dashboard, which is more convenient for visualization!

Dashboard

Create a dashboard by clicking on the dashboard button at the bottom of your Tableau, and name your dashboard.



Then, customize the size of your dashboard here:

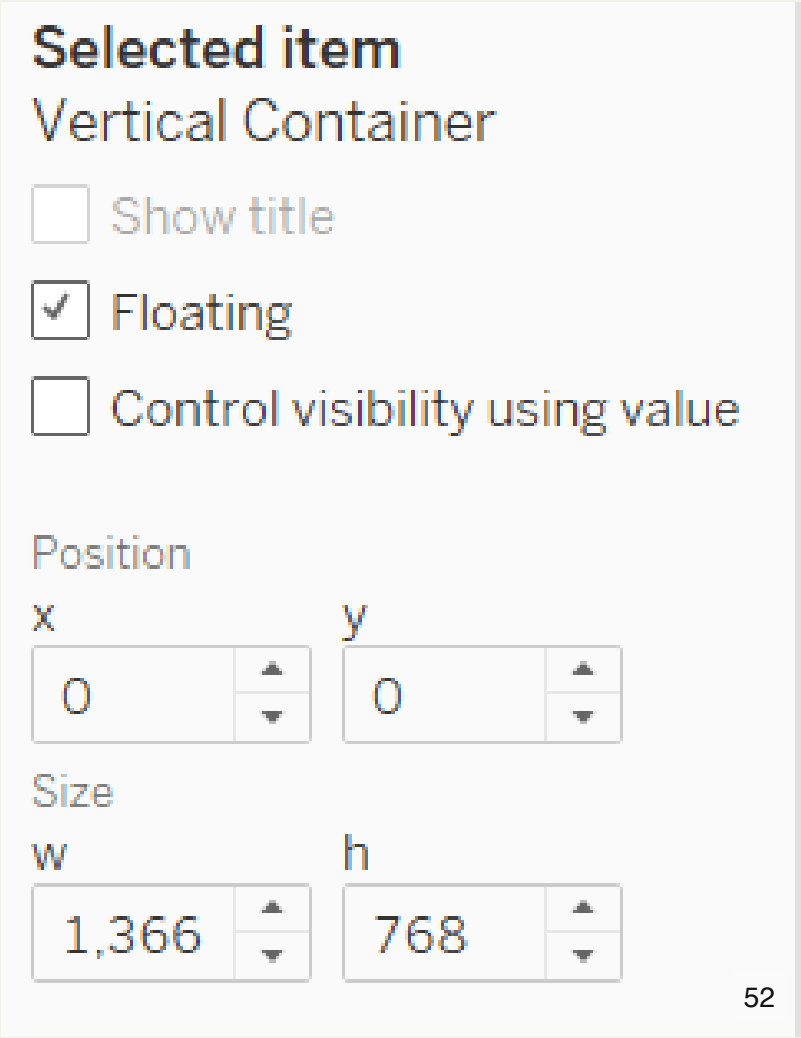


Dashboard

Press Shift on your keyboard and drag a Vertical Container to your dashboard.

Click the Layout tab and set the position of the vertical container to be fill your dashboard. Make sure Floating is checked.

In my case, I set my container location to be the followings:



Dashboard

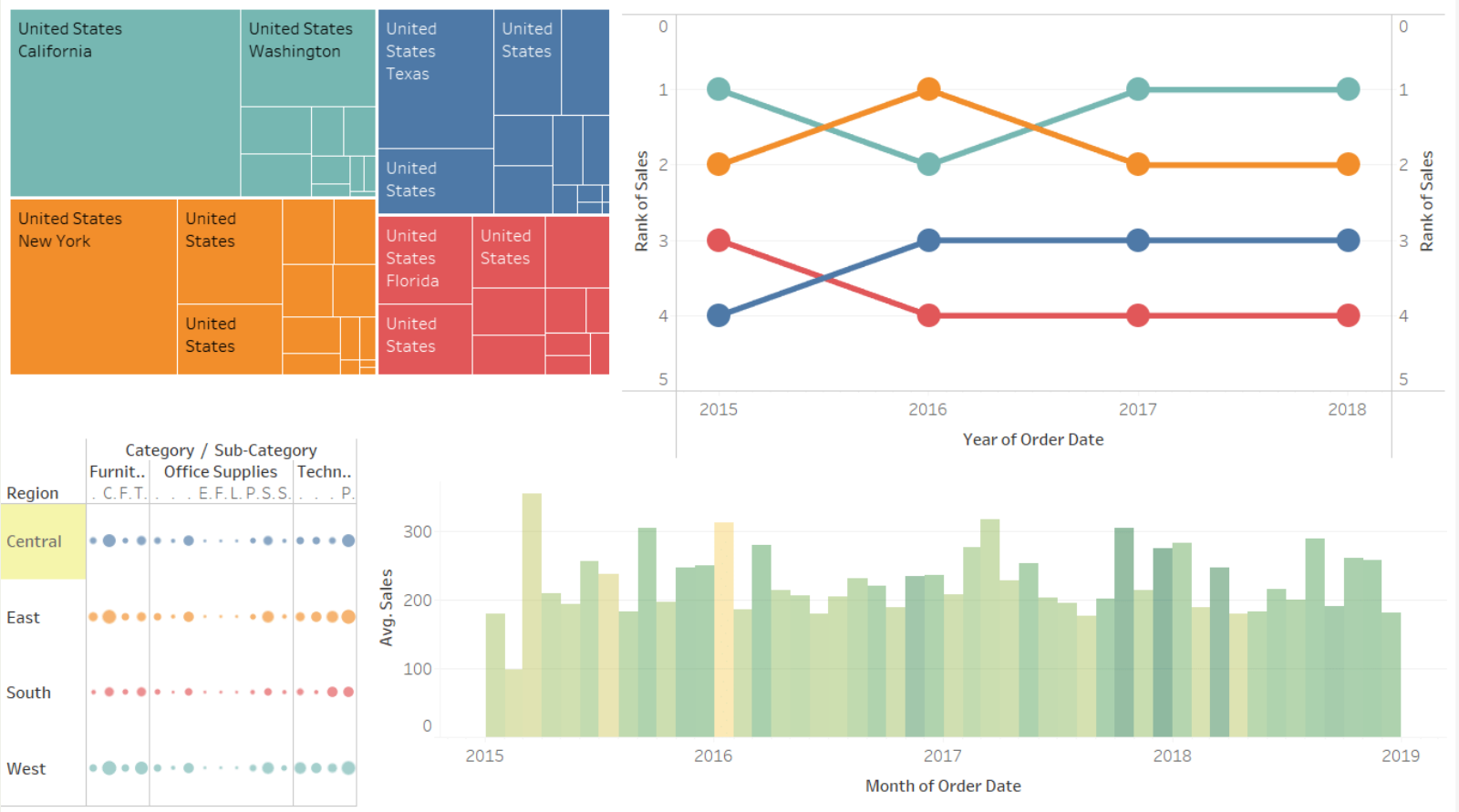
You can Shift + drag your worksheet to the dashboard.

If necessary, you can click the X on the top right of a container to delete it, or go to layout to change the position of the container.

For more details, watch this YouTube Video.

Try to create your own visualization!

My Dashboard



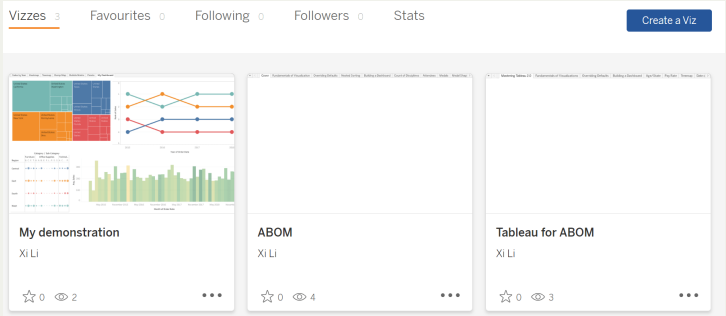
Saving your Tableau

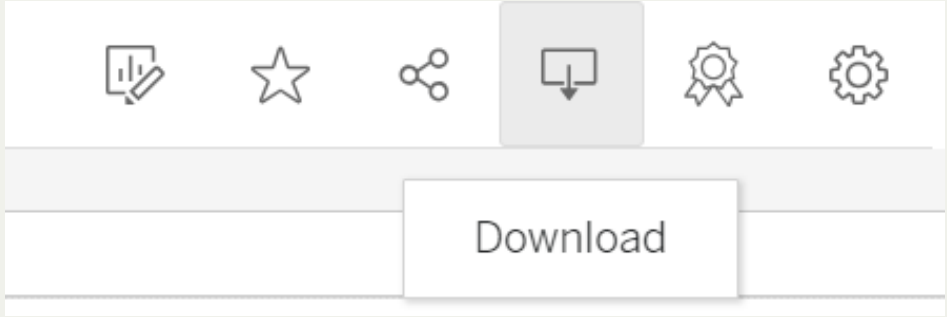
Saving your Tableau

You can only save your Tableau visualization online.

Log in with your Tableau public account.

When you want to access the file, log in to your Tableau public and you can download it by clicking on your file name:





Map

Map

Download map data from course website or here.

Import your data to Tableau; check the variables first.

Start with a new worksheet.

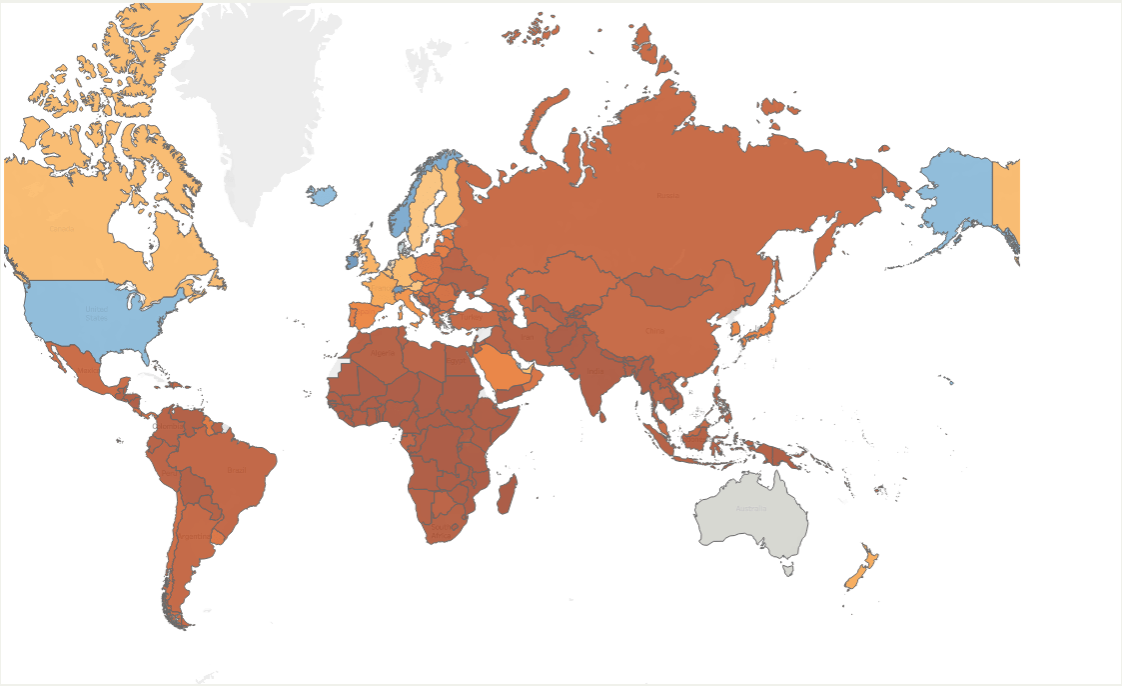
Drag Country to the drop field, you will get the following visualization:

Map

Under Marks, change Automatic to Map.

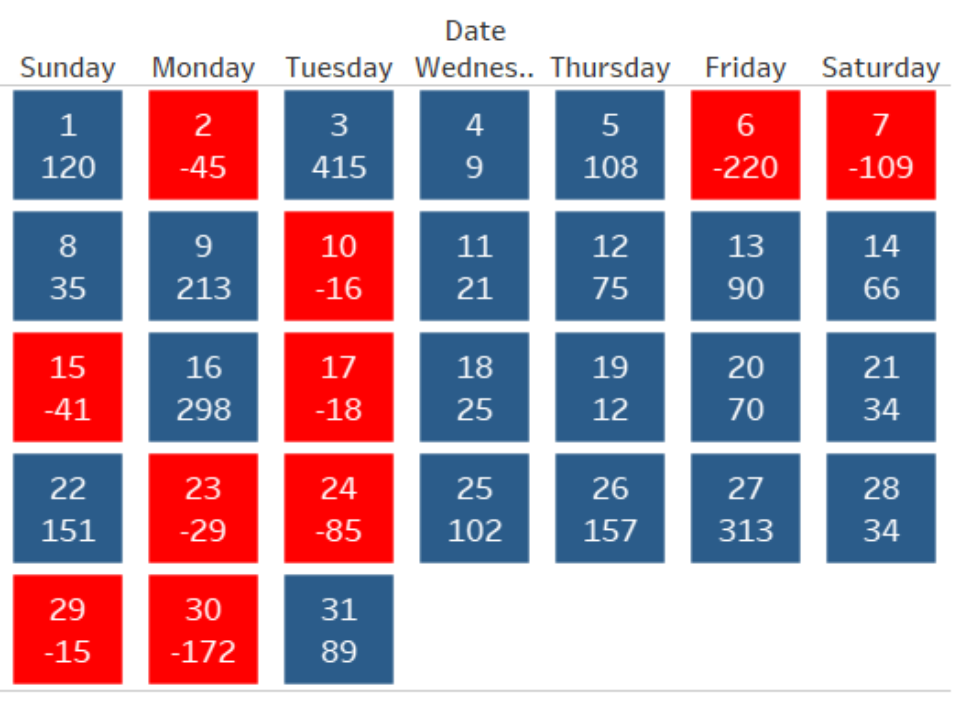
Drag GDP per capita to Color.

Edit your colors if necessary. You get the following figure:



Calendar Chart

This is a calendar chart. It shows your monthly earning from your stock investment. Blue colors denote profit gain whereas red colors denote profit loss.



Calendar Chart

Download calendar data from course website or here.

Import your data to Tableau; check the variables first.

Start with a new worksheet.

Date to Columns, and set its format to be More (Weekday).

Date to Rows, and set its format to be More (Week Number).

Date to Text, and set its format to be (the first) Day.

Adjust the size of your table.

Calendar Chart

Profit to Text.

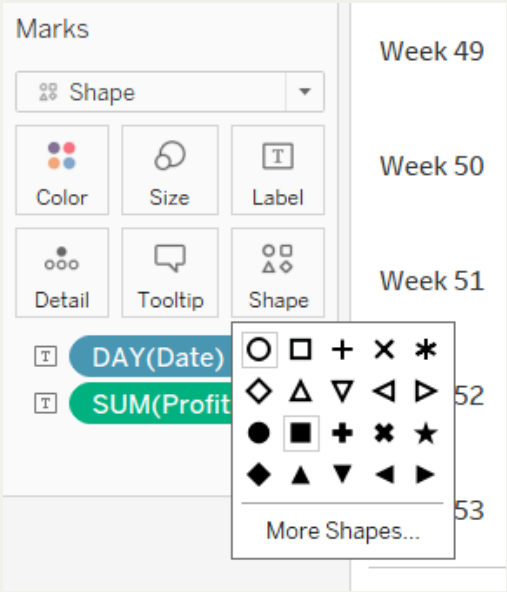
Click on Text, change Alignment to Center. Adjust the size and font of the text if necessary.

Calendar

Week of ..	Date Sunday	Monday	Tuesday	Wednes..	Thursday	Friday	Saturday
Week 49	1 120	2 -45	3 415	4 9	5 108	6 -220	7 -109
Week 50	8 35	9 213	10 -16	11 21	12 75	13 90	14 66
Week 51	15 -41	16 298	17 -18	18 25	19 12	20 70	21 34
Week 52	22 151	23 -29	24 -85	25 102	26 157	27 313	28 34
Week 53	29 -15	30 -172	31 89				

Calendar Chart

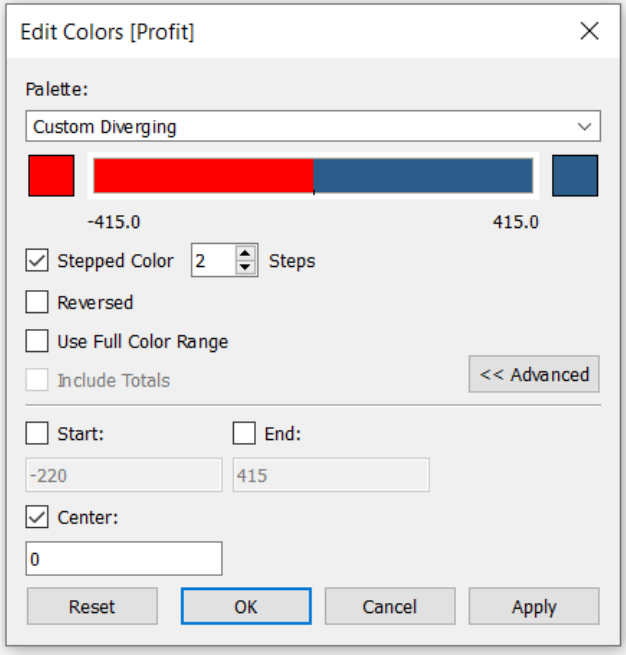
Under Marks, choose Shape. Then click on Shape and select solid square (see figure below).



Calendar Chart

Profit to Color.

Edit your colors to only show 2 step colors, click Advanced and edit the color range to make color center to be 0. Edit your two colors if necessary (see figure below).



Calendar Chart

Right click on Week 49 and uncheck show header.

Adjust the size of your box; you are done!

Donut Chart

Donut Chart

Download car sales data from course website or here.

Import your data to Tableau; check the variables first.

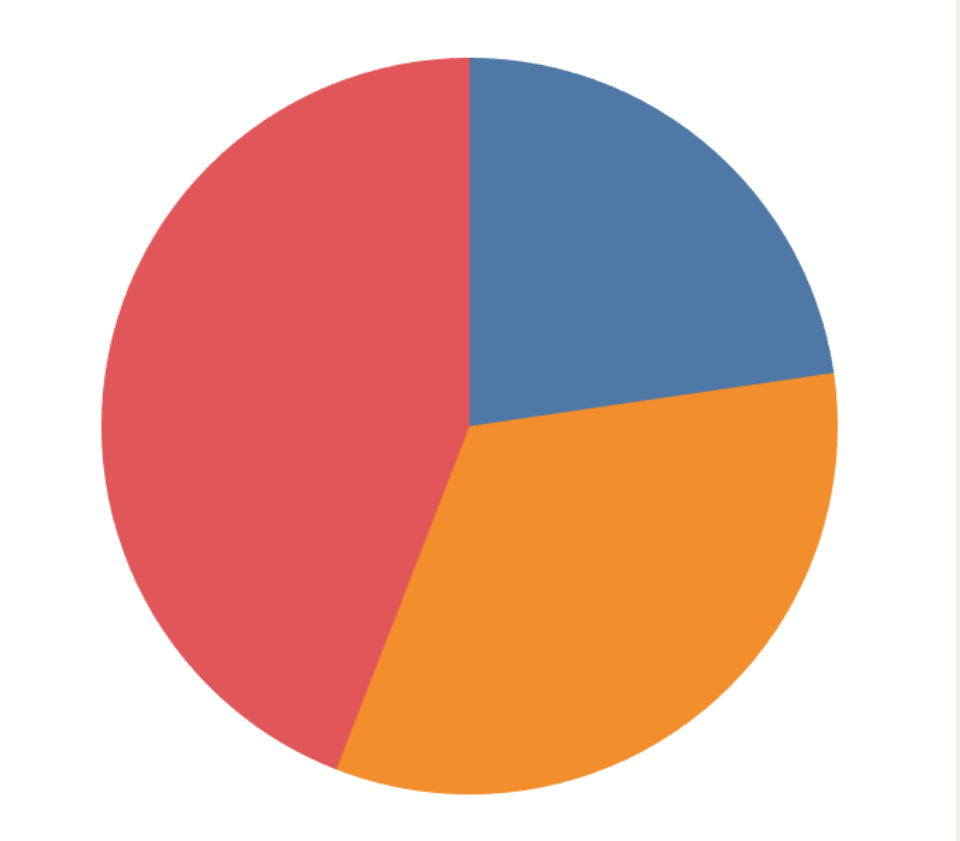
Start with a new worksheet.

Under Marks, Choose Pie.

Brand to Color, and Sales to Angle.

Choose Entire View and Adjust Chart Size.

Donut Chart



Donut Chart

Manually type “0” in Rows.

Again, manually type “0” in Rows.

You will get two charts, up and down.

Choose Dual Axis and Synchronize Axis.

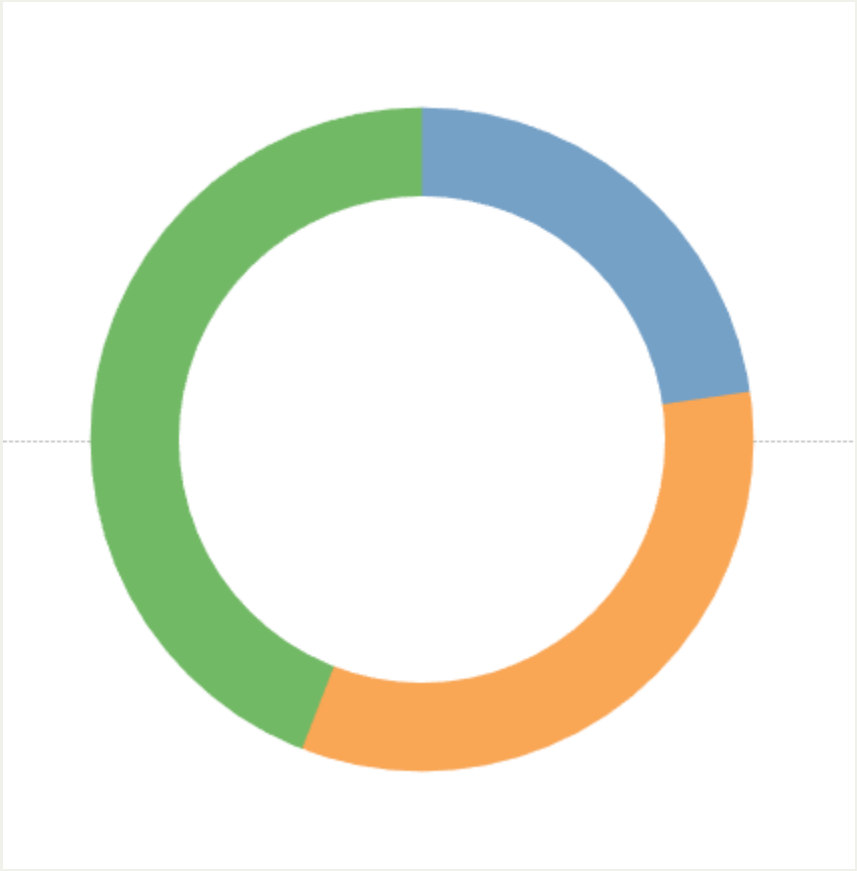
Remove the Color of the second Pie Chart.

Change the Color of the second Pie Chart to White.

Adjust the Size of the second Pie Chart.

Adjust the Size of the first Pie Chart.

Donut Chart



Scatter Plot

Scatter Plot

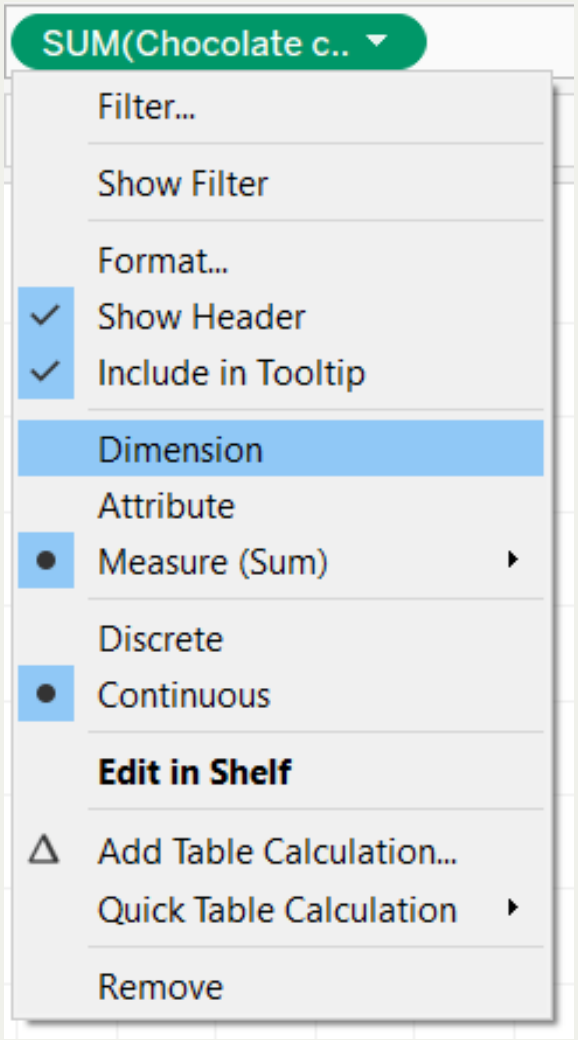
Download chocolate data from course website or here.

Import your data to Tableau; check the variables first.

Start with a new worksheet.

Chocolate Consumption to Columns, Nobel Laureate to Rows.

Change both variables from Measure to Dimension (see right figure).



Scatter Plot

Under Marks, select the format to be Circle.

Drag Nobel Laureate to Size.

Drag Region to Color.

Drag Country to Detail.

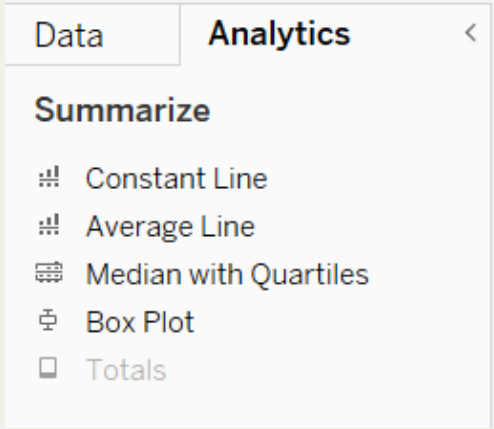
Adjust the size of circles if necessary.

Regression Line

Next, let us add a regression line to the figure!

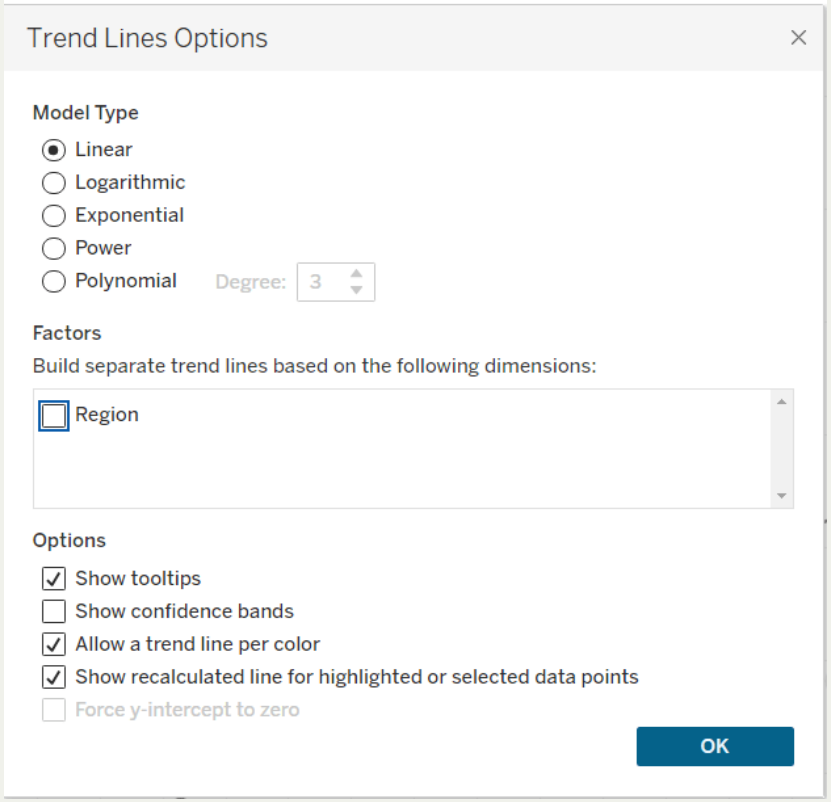
Select the Analytics Panel as shown in the right figure.

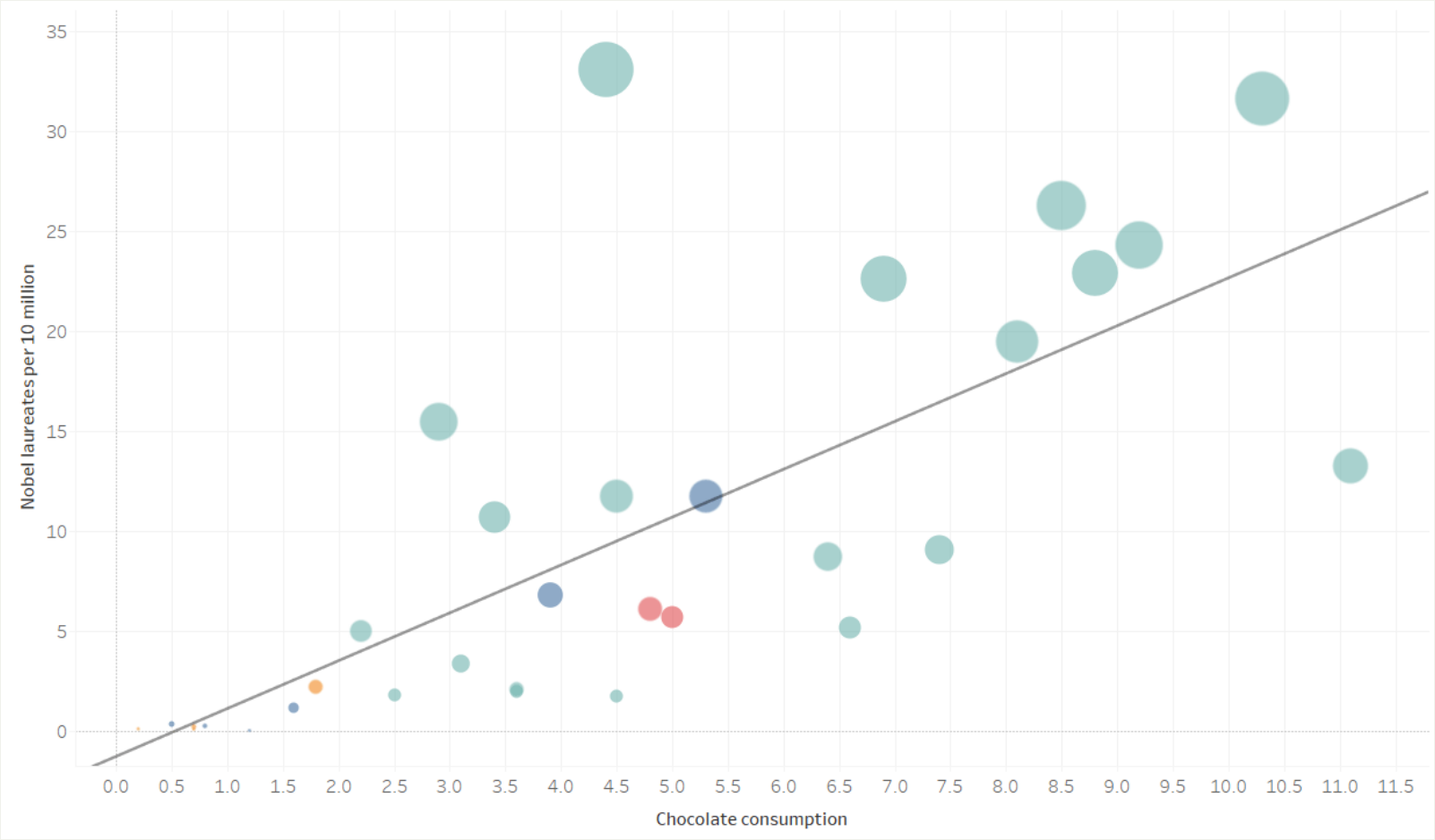
Drag Trend Line to the drop field, and select Linear. Now, you have 4 regression lines for the 4 continents.



Regression Line

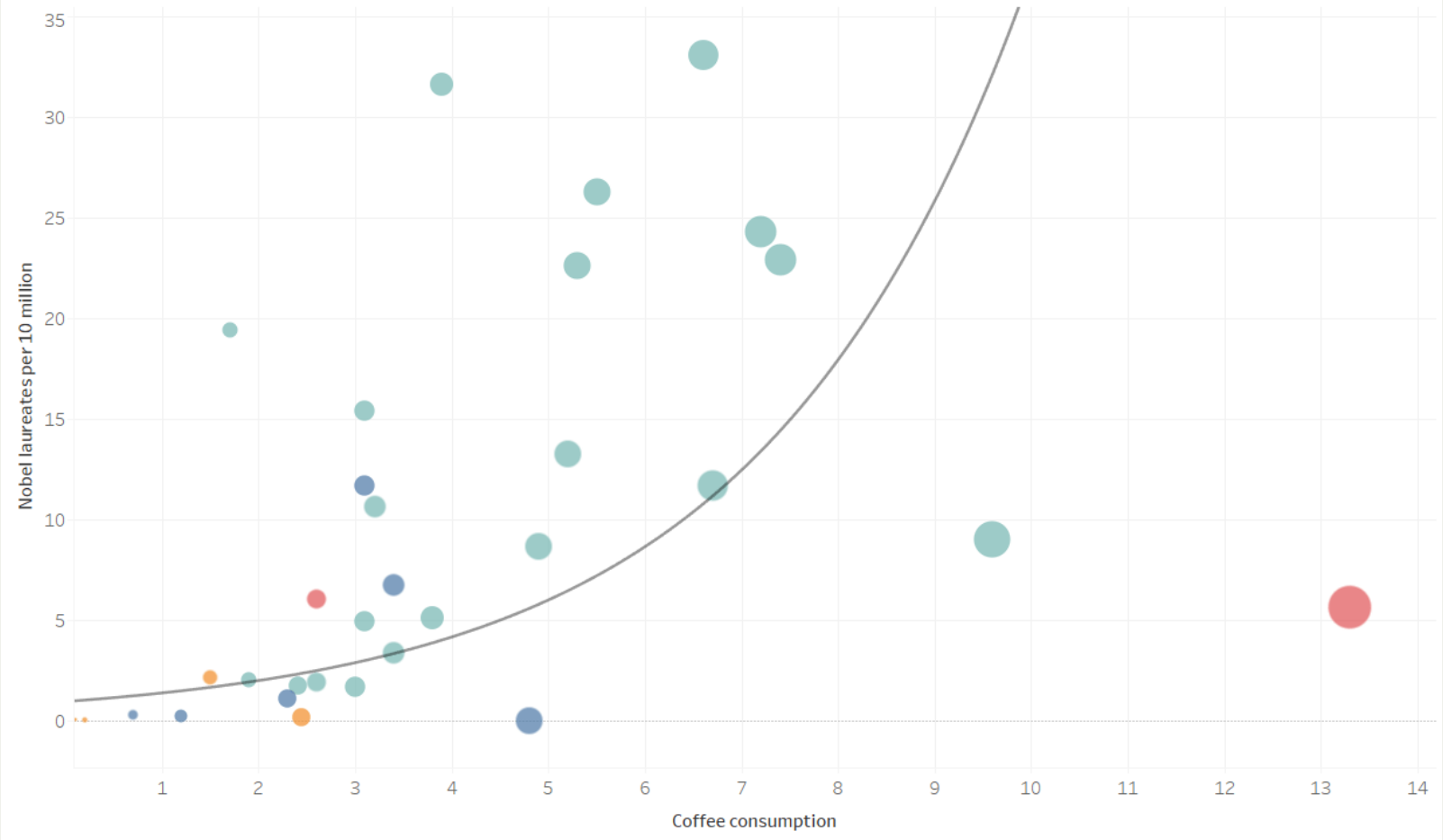
Click one of the lines, choose Edit, and uncheck Region.





$$y = -1.30 + 2.39 \times x, \;\; p < 0.0001$$

Exercise: Show the relationship between coffee consumption and Nobel laureates



Thank you!