Data Visualization and Analytics with Tableau

PART 2: Data Types

7 main data types

Data Type	Icon
Text (string) values	
Date Values	
Date & Time Values	
Numerical Values	
Boolean Values	
Geographic Values	
Cluster Group	

PART 2: Categorize Fields

Dimensions

- Qualitative, such as Gender, Category, Eye colour.
- Dimensions are usually discrete.

vs

Measures

- Quantitative, such as sales value, height, growth rate etc.
- Measures are usually continuous.

Discrete

- Individually distinct, such as Toyota is distinct from Mazda.
- In Tableau, colour coded blue, comes into the view as label, and create panes.

vs

Continuous

- Continuous means forming an unbroken, continuous whole.
- In Tableau, colour coded green, comes into view as an axis.

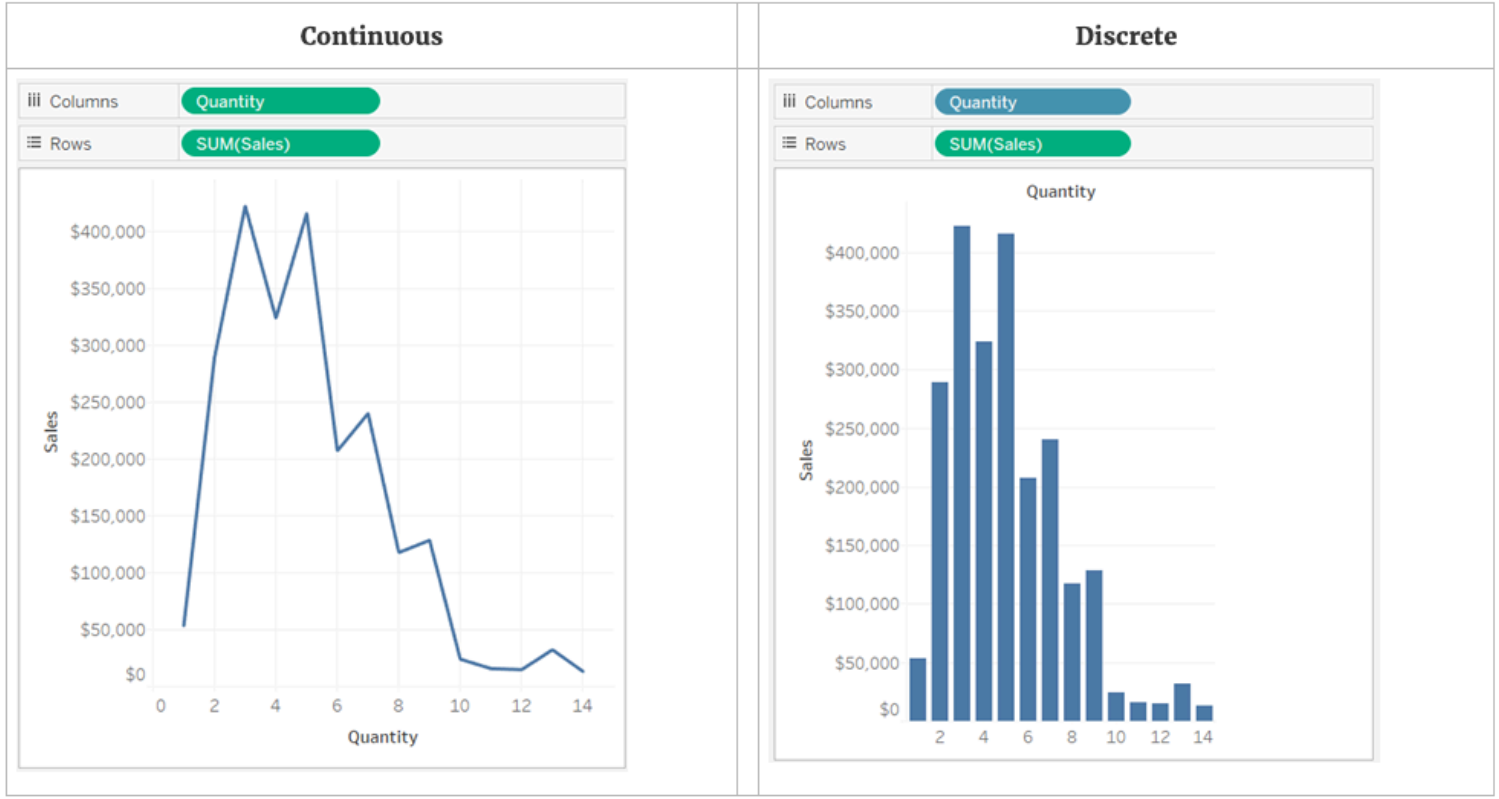
PART 2: Categorize Fields

Discrete Dimensions Product Name

Continuous Dimensions YEAR(Order Date)

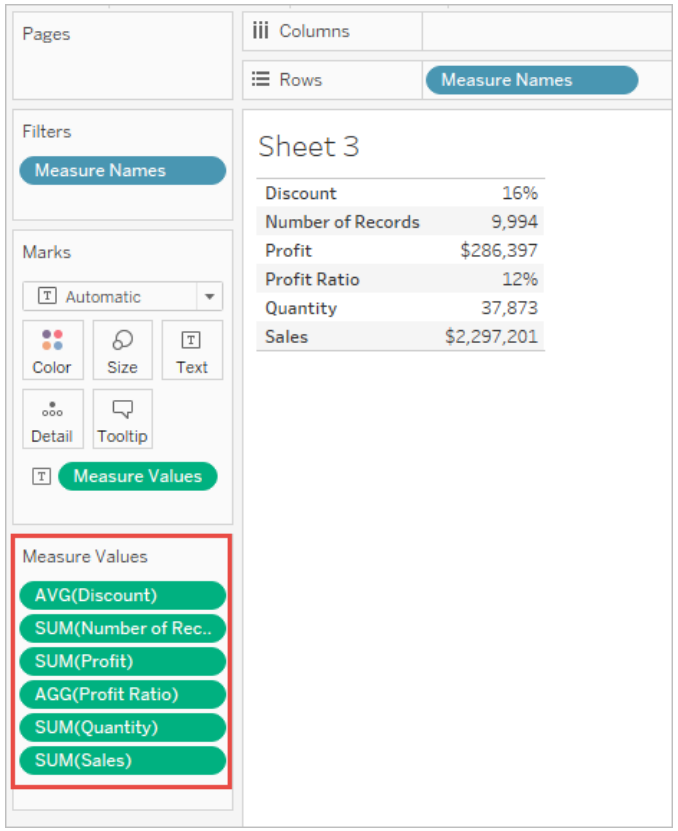
Discrete Measures SUM(Profit)

Continuous Measures SUM(Profit)



PART 2: Measure Names & Values

Measure names & values are placeholders that try to squeeze multiple things in same place.



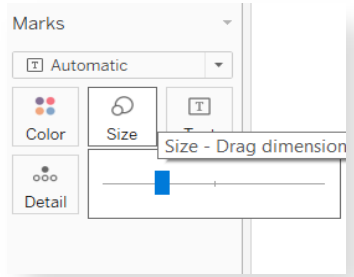
Measure Names

- Always appears at the bottom of the Dimensions area in the Data pane
- Contains the names of all measures in your data, collected into a single field with discrete values

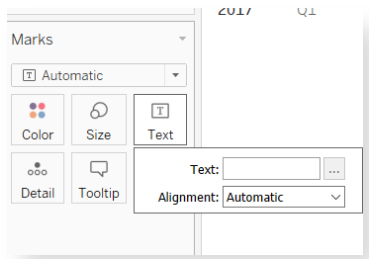
Measure Values

- Appears at the bottom of the Measures area in the Data panel
- Contains all the measures in your data, collected into a single field with continuous values.
- Drag individual measure fields out of the measure values card to remove them from view

PART 2: 6 Marks



Size: Adjusts sizes of shapes in the diagrams



Text: Displays text or labels based on variable

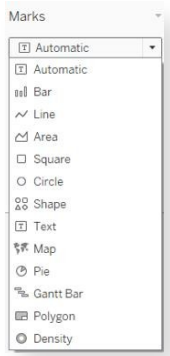
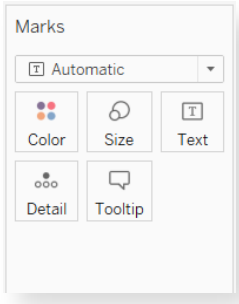
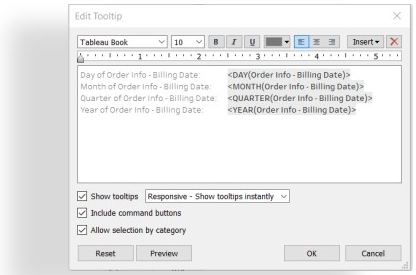


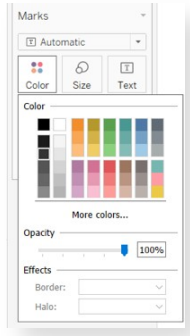
Chart Type: The dropdown menu allows users to select the chart type to view the data.



Details: Extra information add on from text



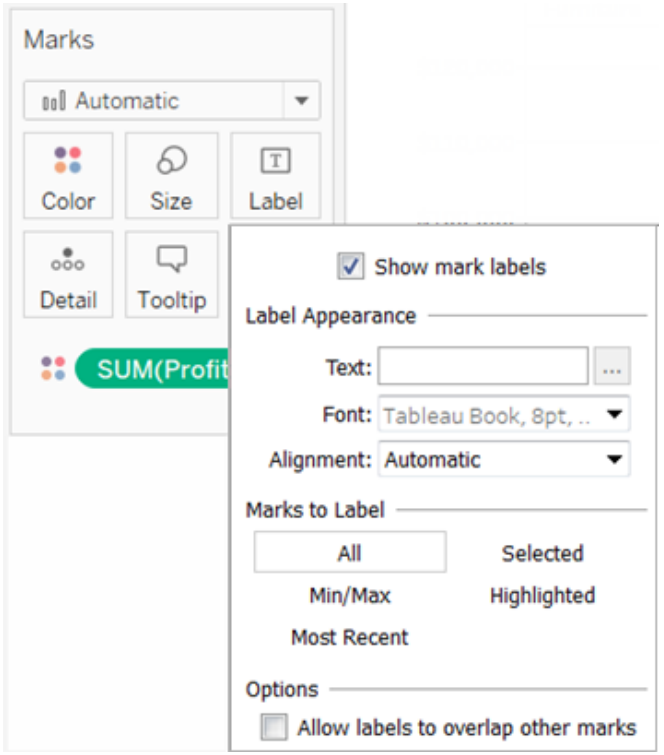
Tooltip: Displays information upon hover.



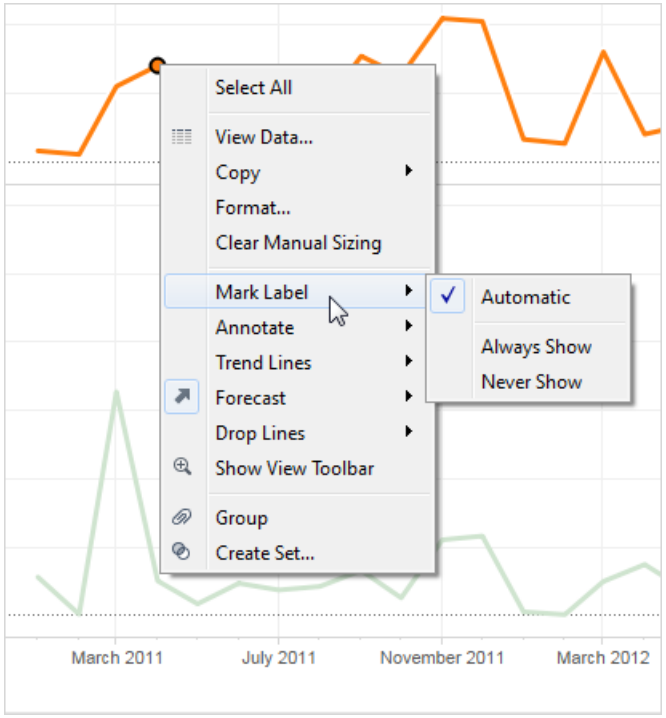
Color: Customize the chart or tables according to categories that are displayed by different colors.

PART 2: Control Appearance of Marks

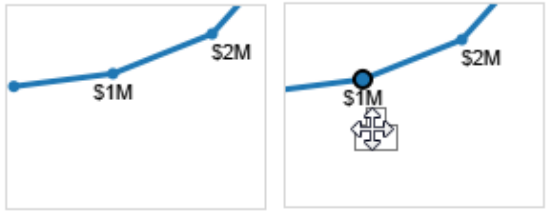
Show/Hide Mark Labels



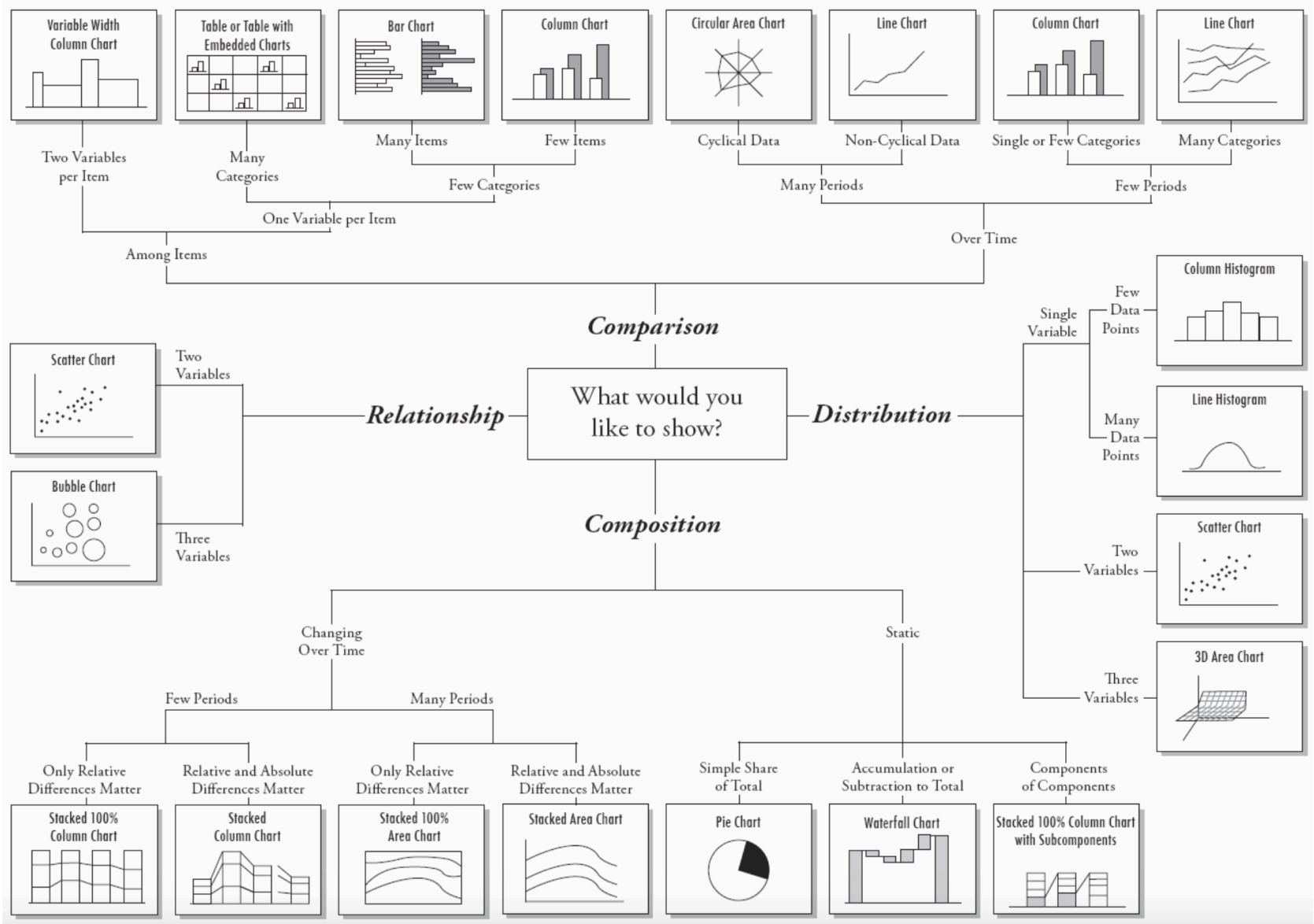
Show/Hide Individual Labels



Move mark Labels



PART 2: Tableau Charts



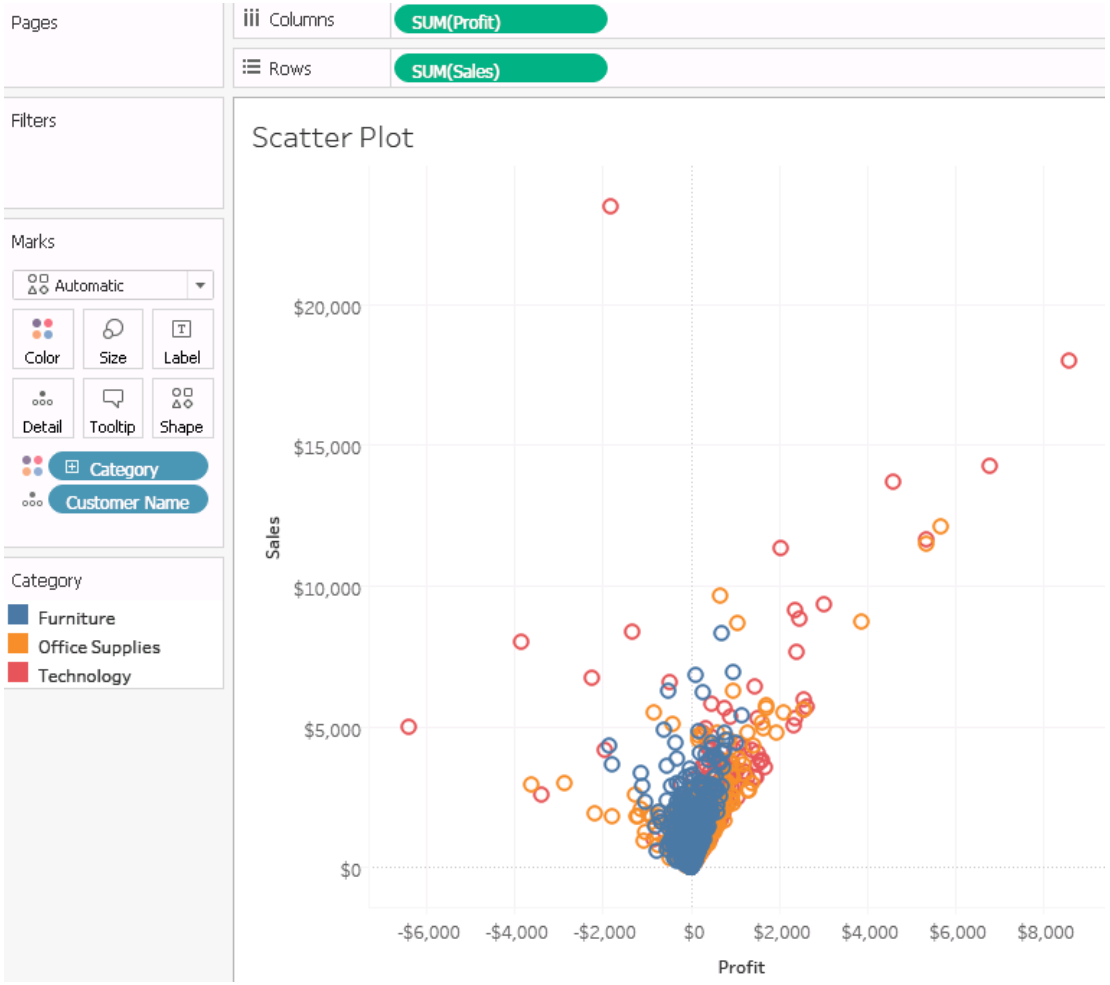
PART 2: Scatter Plots

Scatter plots help to visualize relationships between numerical variables. Example: To build a scatterplot.

Steps

1. Drag “**Profit**” to Columns and “**Sales**” to Rows.
2. Drag “**Customer Name**” to Detail in Marks card.
3. Select the area of concentrated points by click and hold and drag across the area.
4. Right click the points and click Keep only.
5. The scatterplot in the previous chart should be like the display on the right.

Note: A scatter plot is already created when step 2 is done, but since the objective is to display a more depictive example of a scatterplot, hence the additional steps helps to zoom in to the concentrate area of points to display a much clearer scatterplot.



PART 2: Bar Chart

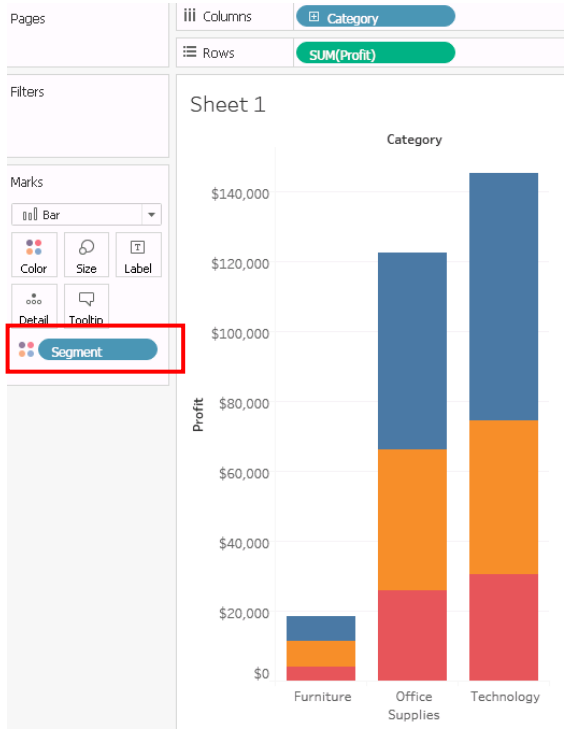
Use bar charts to compare data across categories.

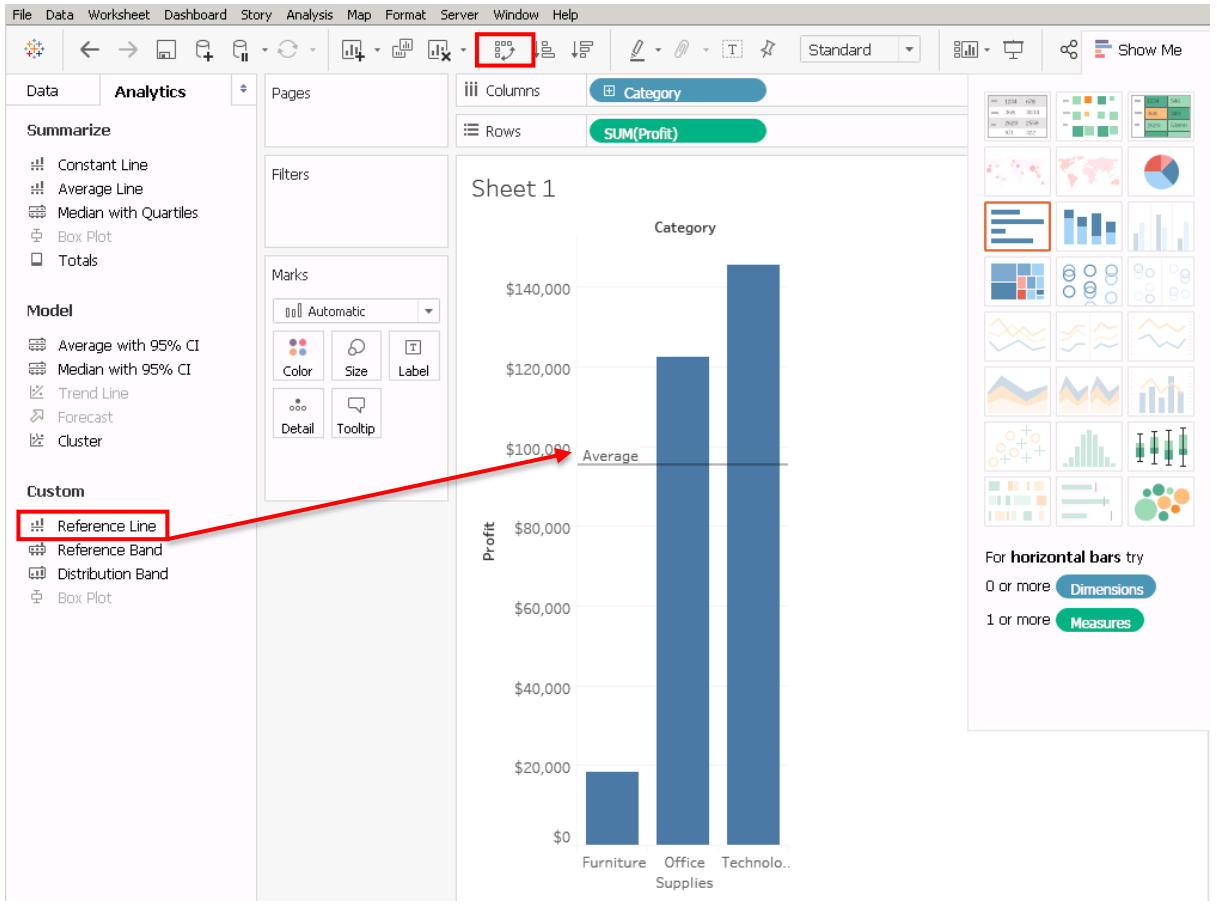
Steps

1. Drag a dimension "**Profit**" to Rows and measure "**Category**" to Columns, or vice versa. You can use "**Show Me**".
2. You can add additional fields to shelf.

➢ Add **Reference Line** to benchmark against a reference, such as average

➢ Drag a dimension to the Columns shelf to create multiple overlapped bars



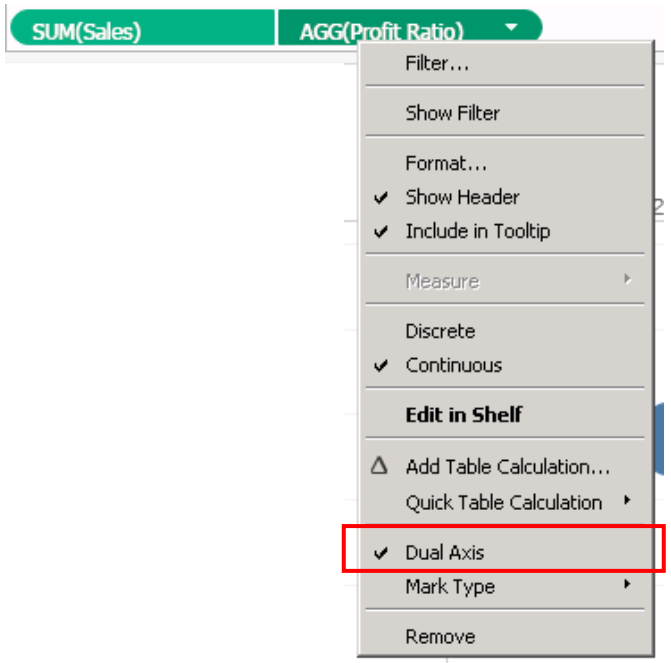


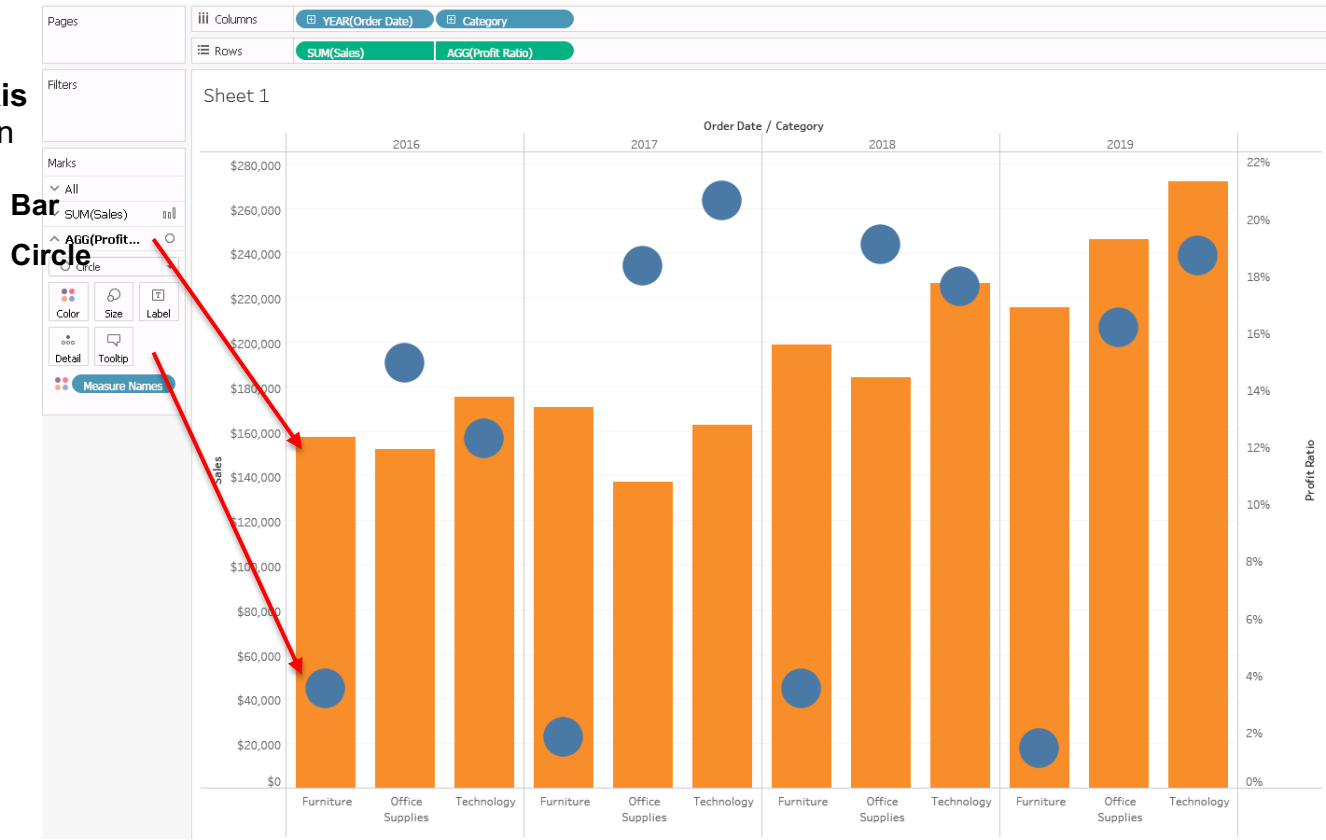
PART 2: Bar Chart with Dual Axis

Display a measure with bars on one axis and another measure as lines on the second axis.

Steps

1. Drag **Sales** and **Profit Ratio** to the Rows shelf
2. Right-click the second measure on the Rows shelf, and select **Dual Axis**
3. On the Marks card labeled All, set the mark type to Bar in the dropdown menu



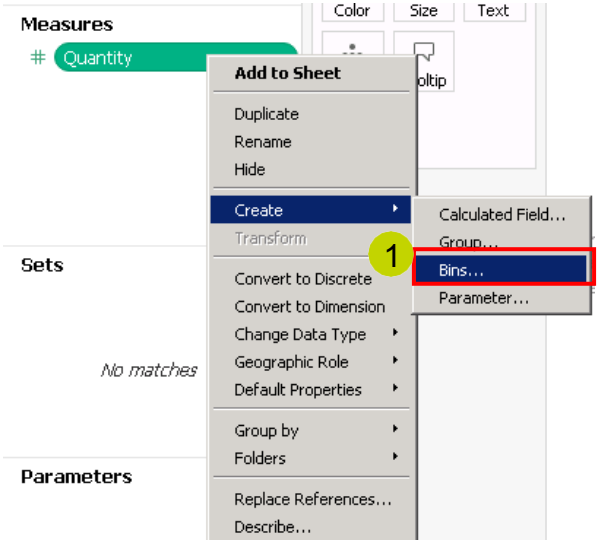


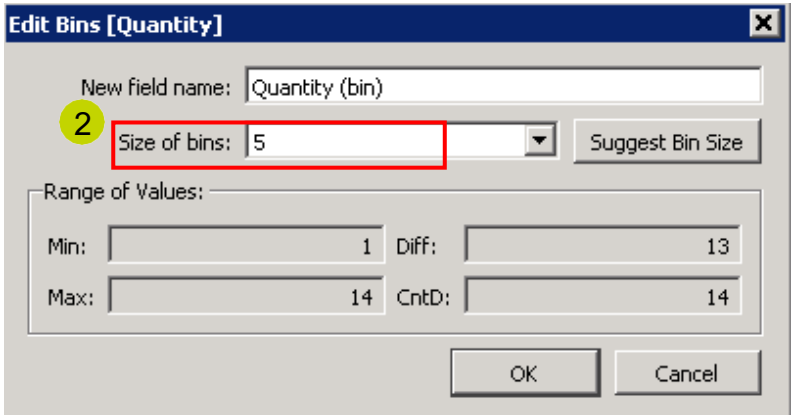
PART 2: Histogram

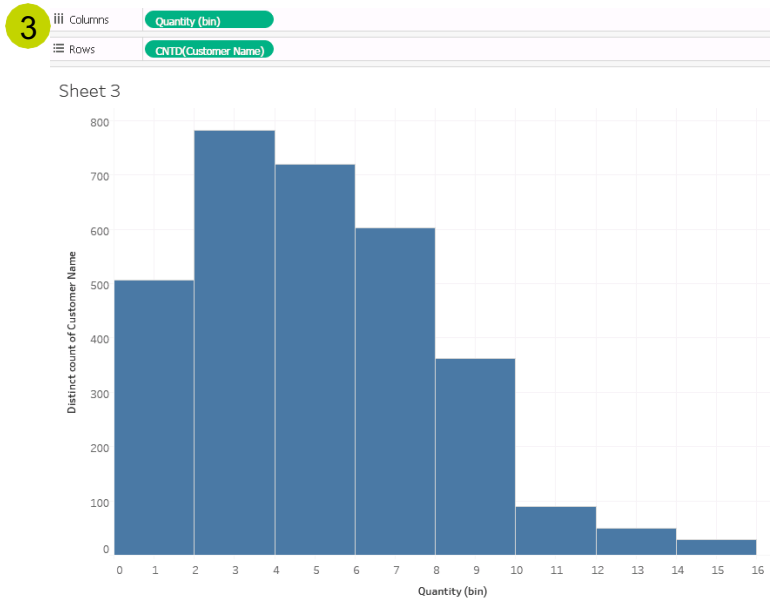
A histogram looks like a bar chart but groups values for a continuous measure into ranges, or bins.

Steps

1. Right click a measure “**Quantity**” to create **Bins:** Quantity (bin).
2. Define bins name, size of bins
3. Drag the bin to the columns, and the aggregation CNT(Customer Name), i.e. distinct count of customer names to the rows.
4. [Optional] Drag **Segment** to **Color Mark**





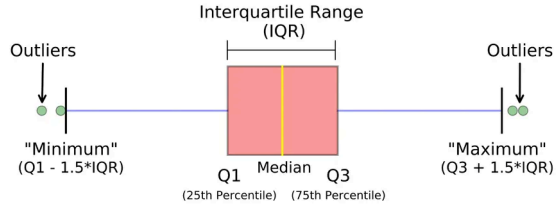


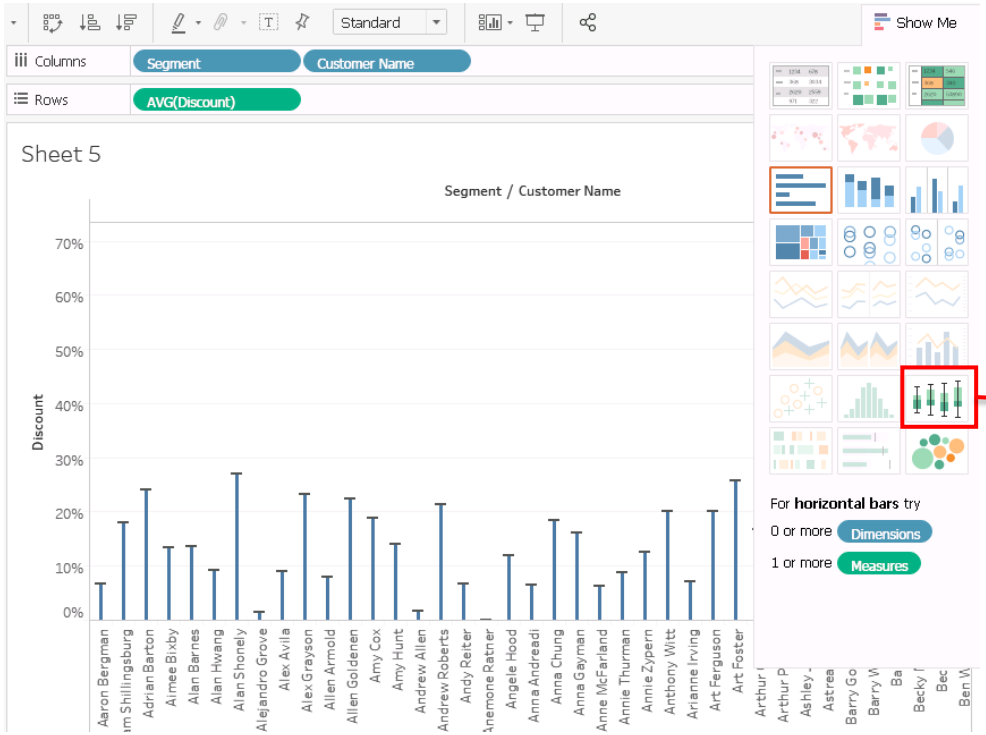
PART 2: Boxplot

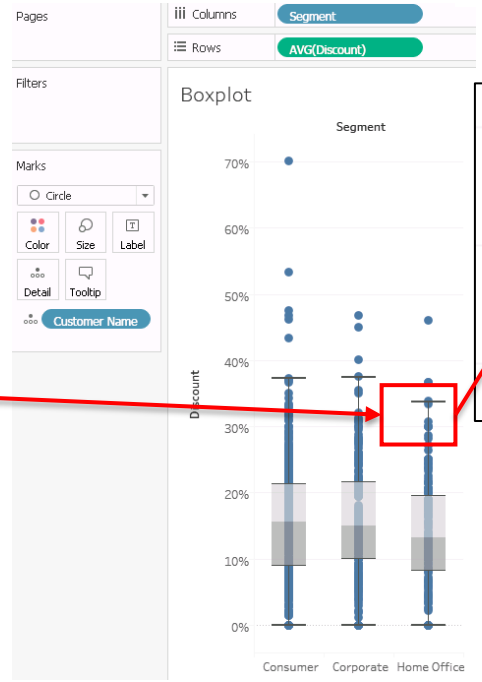
A box plot, also known as box-and-whisker plot, to show the distribution of values along an axis.

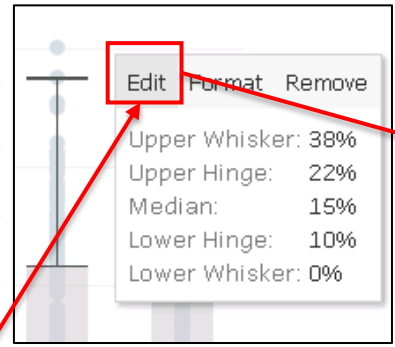
Steps

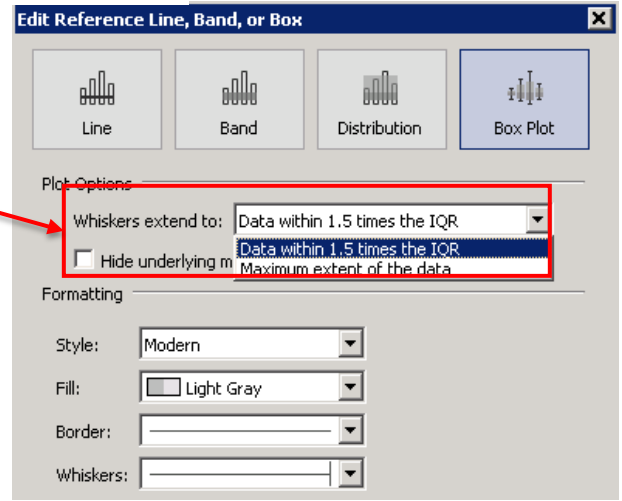
1. Drag the “**Customer Name**” dimension to Columns and drop it to the right of “**Segment**”.
2. Drag measure “**Discount**” to the Rows
3. Click **Show Me** in the toolbar, then select the box plot chart type.











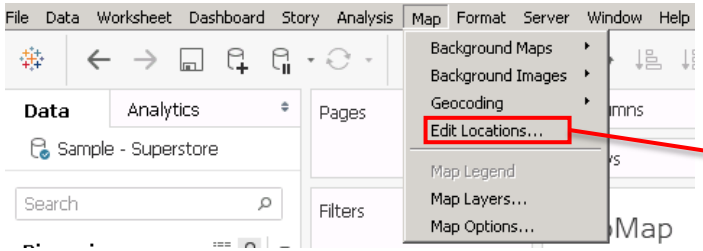
PART 2: Geographical Map

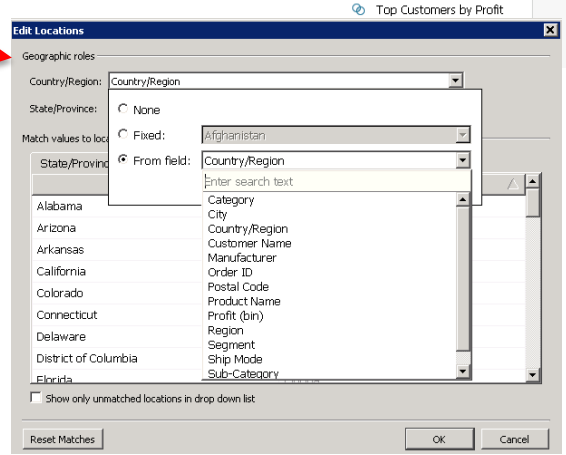
Maps help to analyze and visualize data geographically. To build a simple map, your data source must contain location data (location names, or latitude and longitude coordinates)

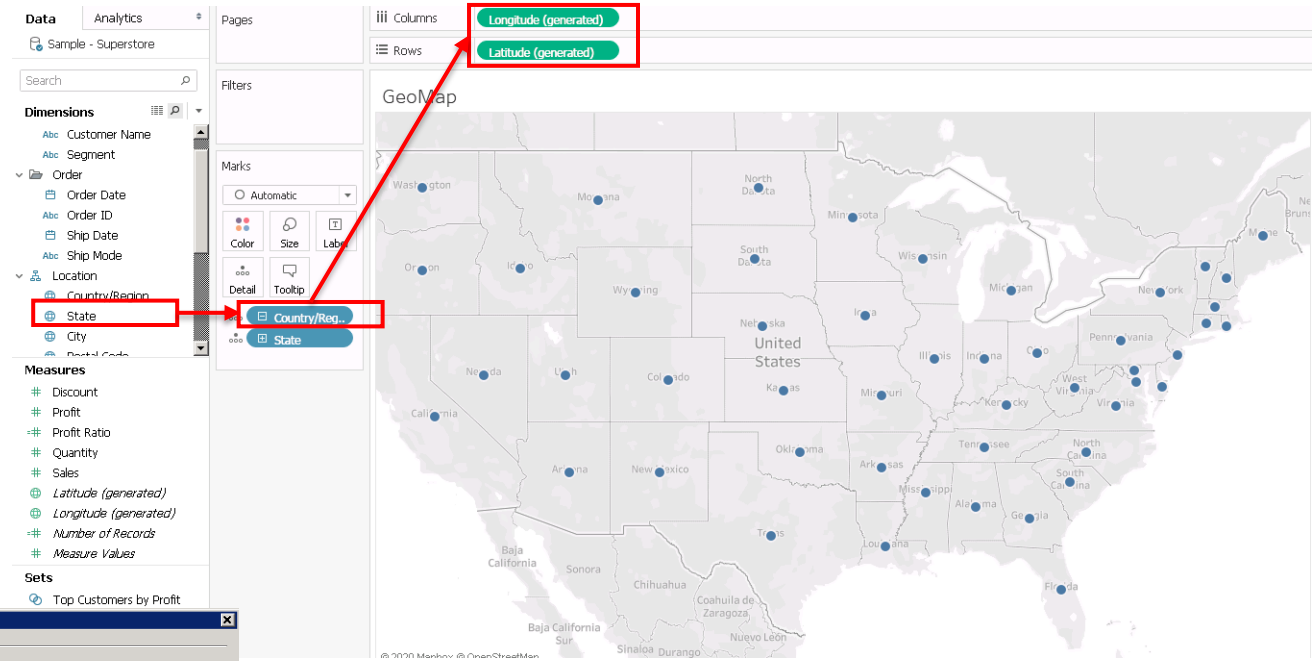
Steps

1. Locate a dimension under Data pane that is considered a geographical dimension, such as State/Region/City/Country etc.
2. Double click on it.
3. A simple map will be generated with the Longitude and Latitude generated automatically from the location data

Note: Location on tableau automatic inferred may not be accurate, you need to edit the location configurations sometime.







PART 2: Waterfall Chart

Waterfall chart helps understand how positive and negative values of dimension members contributes to a total.

Steps

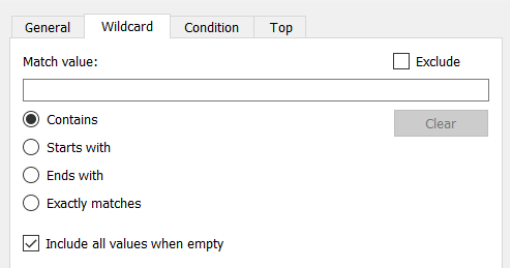
1. Drag dimension "**Sub-Category**" to the Columns, measure "**Profit"** to the Rows.
2. Add a table calculation to the "**Profit"** measure so that it calculates a '**Running total**' on 'Table (Across)'.
3. Change the mark type to '**Gantt Bar**' mark type.
4. Create a **Negative Profit** calculated field.
5. Drag Negative Profit field to size mark to create the waterfall effect.
6. [Optional] Colored the Gantt bars by Profit by dragging the Profit measure to the Color Marks Card. (Red is negative, blue positive etc.)

PART 2: Analyze View – Filtering

Filters can be applied in a worksheet to restrict the number of records present in a dataset.

Wildcard

Example: When filtering on email addresses, users might want to only include emails from a specific domain, hence defining is in a wildcard filter that ends with "@gmail.com" to only include Google emails.

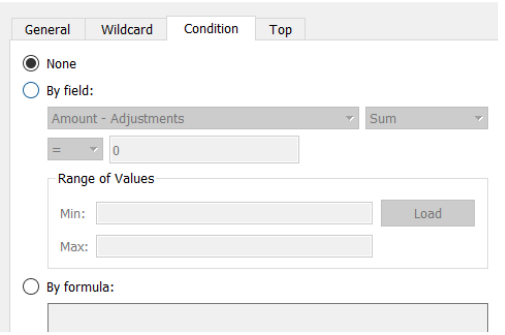


Condition

Example: in a view showing the average Unit Price for a collection of products, users may want to only show the Products that have an average unit price that is greater than or equal to $25, hence can have built-in controls to write a condition or users can write a custom formula.

Two methods to define:

- **By field** – define a continuous field and range to filter
- **By formula** – determine the exact formula

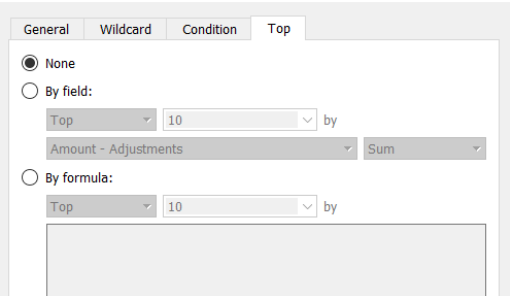


Top

Example: in a view that shows the average time to shop for a collection of products, users can decide to only who the top 15 products by Sales, rather than having to define a specific range for sales.

Two methods to define:

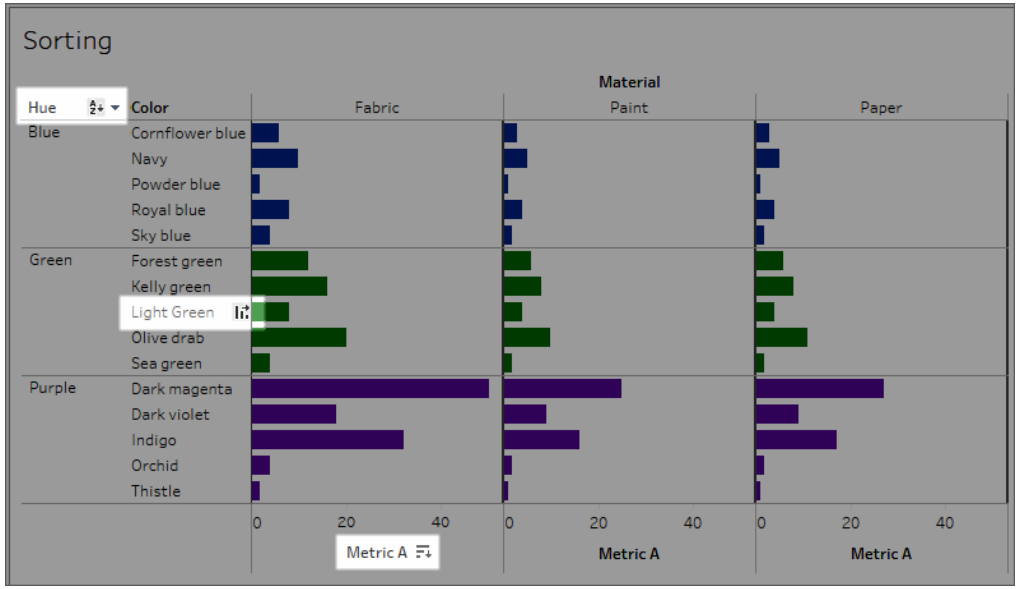
- **By field** – define a continuous field to rank
- **By formula** – determine the exact formula to rank



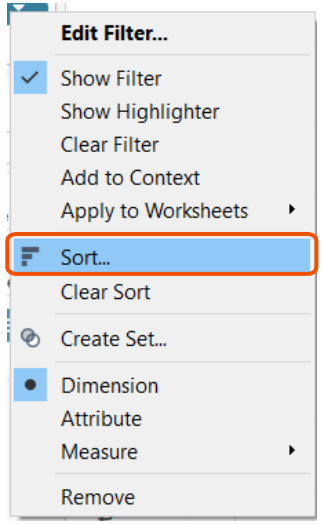
PART 2: Analyze View – Sorting

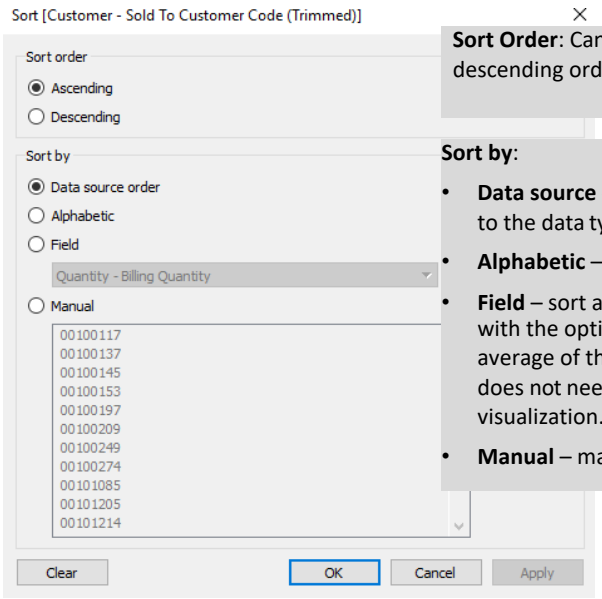
Many ways to sort a visualization with single click sort button.
One click sorts ascending, two clicks sort descending, and three clicks clear the sort.

Quick Sort



Detail Sort





Sort Order: Can be sorted by ascending or descending order

Sort by:

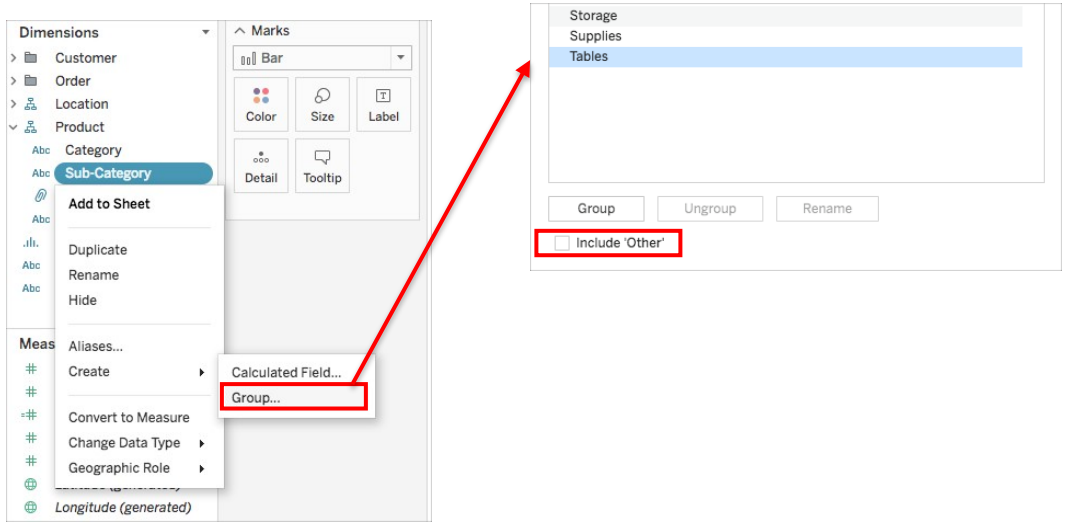
- **Data source order** - sorted according to the data type
- **Alphabetic** – applies only to text data
- **Field** – sort according to another variable, with the option of according to sum or average of the variable, in which the field does not need to be used in the visualization.
- **Manual** – manual sorting of all the values

PART 2: Analyze View – Grouping

A group combines related members in a field. There are useful for both correcting data errors as well as answering “what if” type questions.

Step:

1. In the data pane, right-click a field and select **Create** > **Group**
2. In the Create Group dialog box, select several members that you want to group, and then click **Group**
3. The selected members are combined into a single group. A default name is created using the combined member names



PART 2: Analyze View – Hierarchy

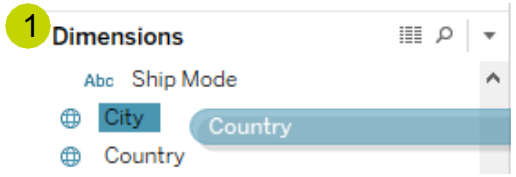
Field hierarchy allows several dimensions to be grouped, so these fields can be easily drilled-down in the visualization.

Step:

1. In the Data pane, drag a field and drop it directly on top of another field.
2. When prompted, enter a name for the hierarchy and click OK.
3. Drag any additional fields into the hierarchy. You can also re-order fields in the hierarchy by dragging them to a new position.
4. By dragging the hierarchy, you can perform the drill-down easily by clicking on the boxed + icon on the pill.

Note:
Dates in **Tableau** automatically fit into a standard **date hierarchy**.
Year – Quarter – Month – Week – Day is the default. All **dates** naturally fit into that **hierarchy**.

1



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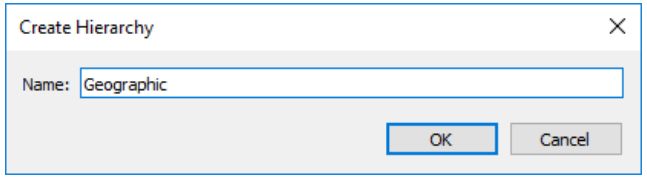

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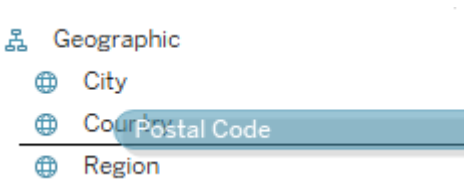

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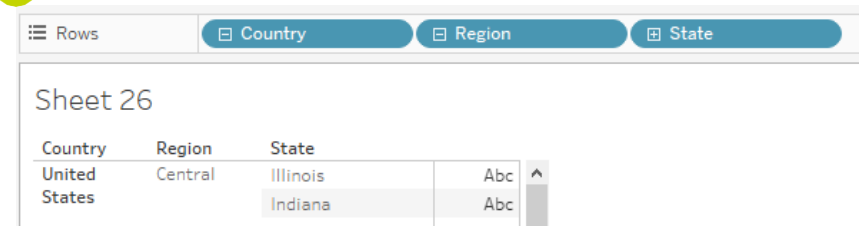


PART 2: Analyze View – Set

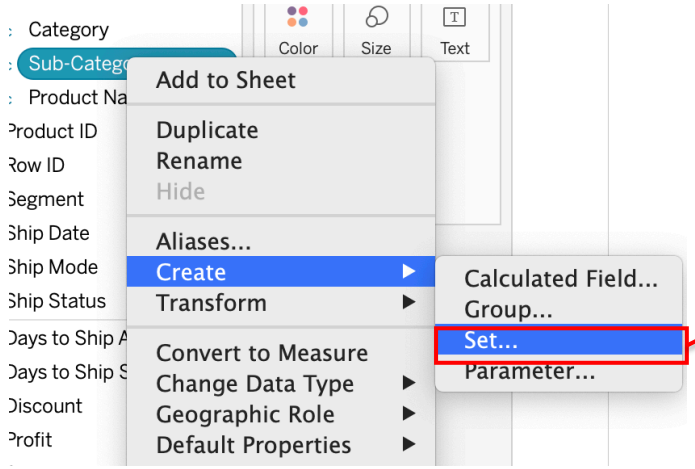
Sets are custom fields that define a subset of data based on some conditions.
Set actions allow us to interact directly with dashboard.

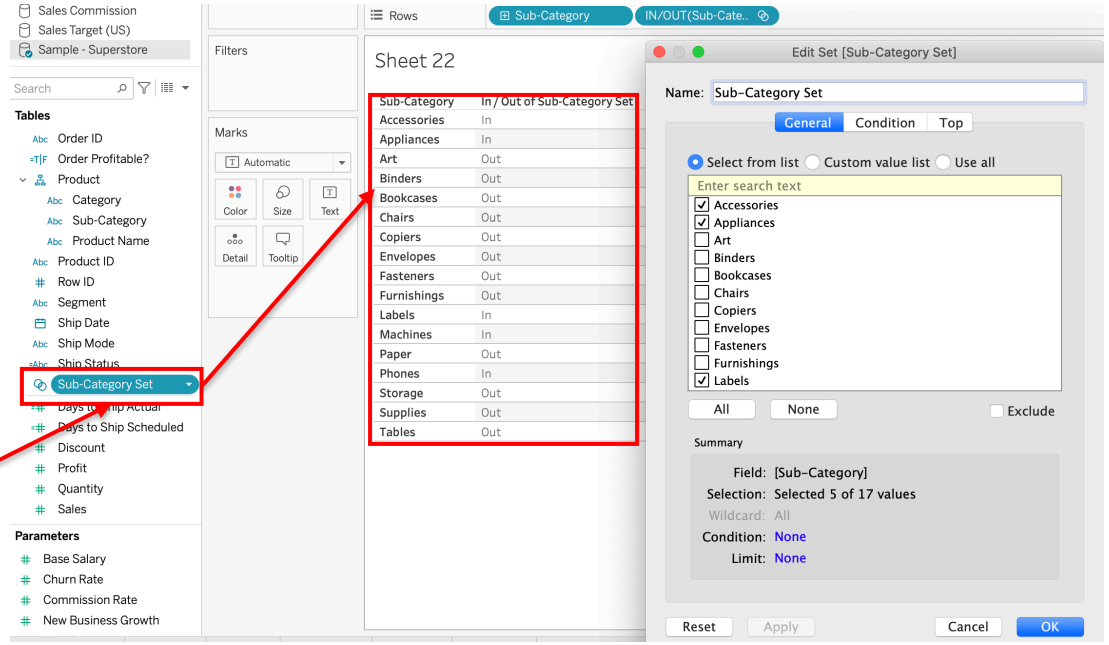
Step:

1. In the data pane, right-click a field and select **Create** > **Set**
2. In the Create Set dialog box, select several members that you want to include or exclude, and then click ok.
3. The selected members are combined into a set. A set icon indicates the field is a set.

Note:

In – The members in the set. Out – the members aren't in the set.





PART 2: Analyze View – Alias

Create aliases (alternative names) for members in a dimension so that their labels appear differently in the view. Aliases can be created for the members of discrete dimensions only, cannot be used for continuous dimensions, dates or measures.

Steps:

1. In the Data pane, right-click a dimension and select **Aliases**
2. In the Edit Aliases dialog box, under Value (Alias), select a member and enter a new name.
3. To submit your changes, click OK. The new alias names appear as labels.