

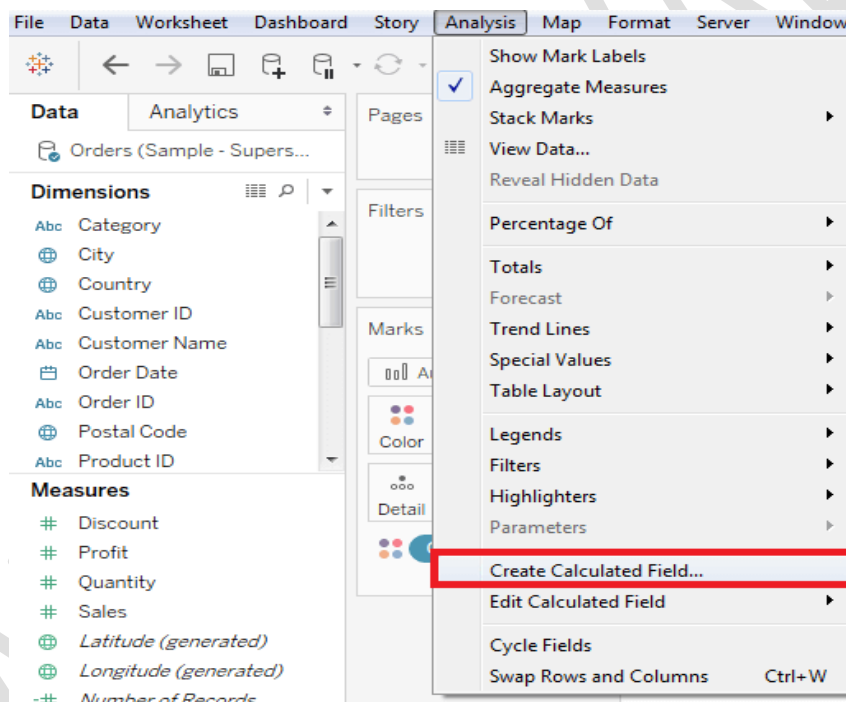
Tableau Module 9 to 13

Calculated Field:

- They help us to create new data from already existing data in our data source when we create a calculated field, we are creating a new field (or column) in our data source, the values of which are determined by a calculation that we control.
- For creating a calculated field, we use VQL or Visual Query Language which is a query language of tableau quite similar to SQL but not same.

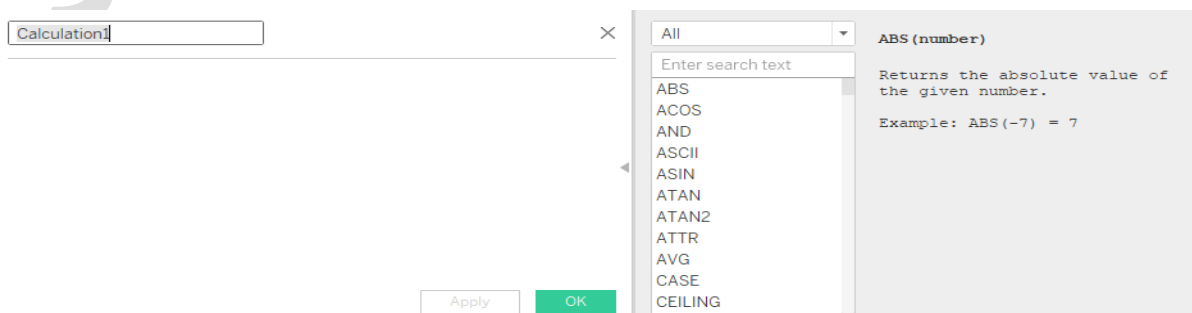
How to Create a Calculated Field

- After connecting to a data source such as **Sample-Superstore**.
- Go to **Analysis** menu.
- And click on **Create Calculated Field** as shown in the below image.

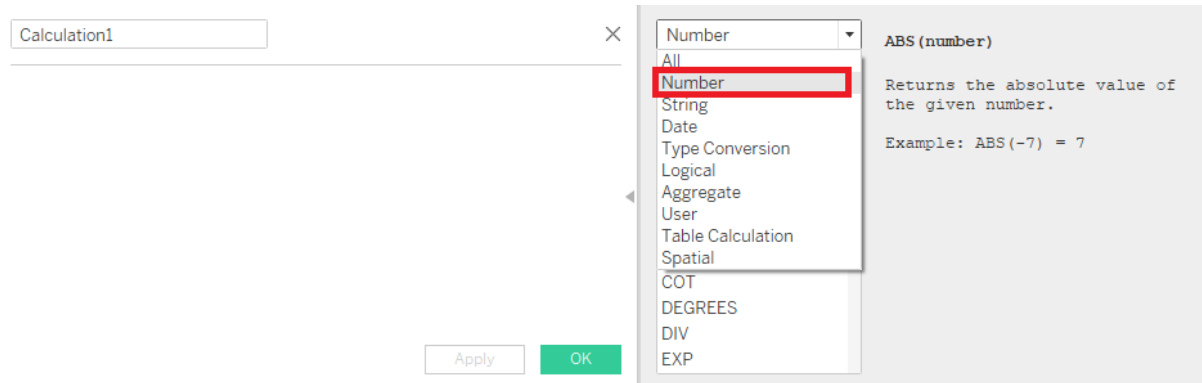


Calculation Editor in Tableau

The above process opens a calculation editor which lists all the functions available in Tableau.

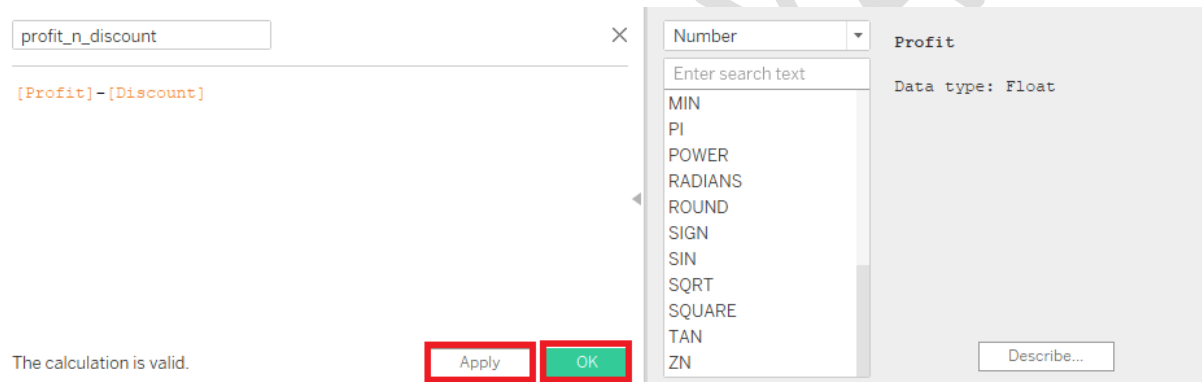


You can change the dropdown value and only see the related functions to numbers.



Create a Formula

to visualize the difference between **Profit** and **Discount** for different shipping mode of the products, create a formula that subtracts the **Discount** from the **Profit**, as shown in the below image, and the name of this field is **profit_n_discount**.



Parameters:

- Parameters are dynamic values that we can change to interact with our charts or affect our calculations. If we need to have something for our visualization that is not exactly in our data. A parameter will allow us to provide a value to pass into tableau.
- They are of two kinds:
 - Parameters with filters.
 - Parameters by sets.

Limitations:

- Parameters cannot make multiple selections in a filter, e.g., with a list of checkboxes, and they do not have the (All) aggregate choice of quick filters.

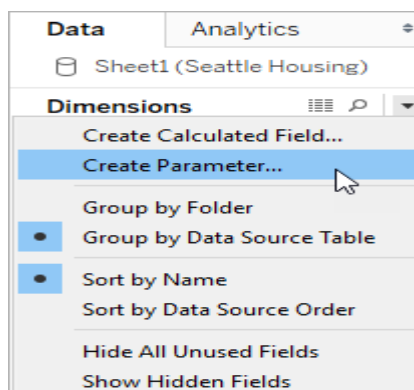
Create Parameters

- A parameter is a global placeholder value such as a number, date, or string that can replace a constant value in a calculation, filter, or reference line.
- For example, you may create a calculated field that returns True if Sales is greater than \$500,000 and otherwise returns False. You can replace the constant value of “500000” in the formula with a parameter. Then, using the parameter control, you can dynamically change the threshold in your calculation.
- You can even create a dynamic parameter that’s set to automatically refresh its current value (to the result of a single-value, view-independent calculation) or list of values (based on a data source column). This will happen each time the workbook is opened and Tableau connects to the data source referenced by the parameter.
- You can make your parameters more dynamic and interactive by using them in Parameter Actions. Parameter actions let your audience change a parameter value through direct interaction with a viz, such as clicking or selecting a mark.

Create a parameter

Follow the instructions below to create a new parameter from the Data pane.

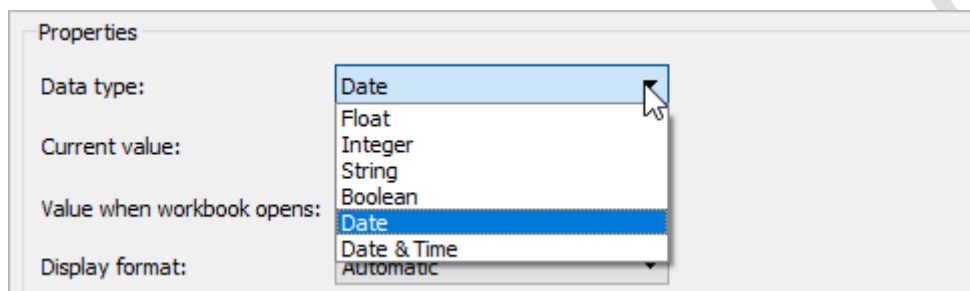
- In the Data pane, click the drop-down arrow in the upper right corner and select **Create Parameter**.



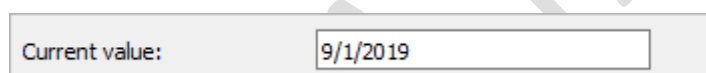
2. In the Create Parameter dialog box, give the field a **Name**.



3. Specify the data type for the values it will accept:



4. Specify a current value. This is the default value for the parameter. In this case, let's leave the field as is because we'll be using the latest data, which we'll configure in the next step.

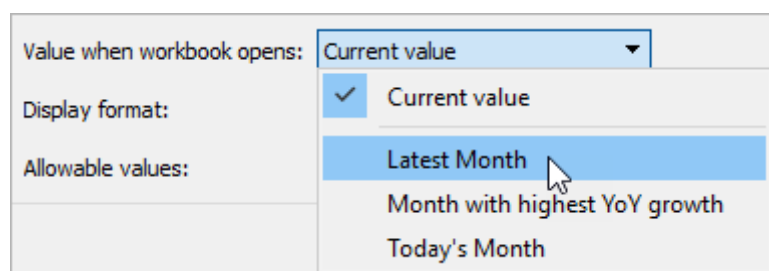


5. Specify a value when the workbook opens. In this case, let's create a dynamic parameter by setting the parameter's default value to the result of a single-value, view-independent calculation.

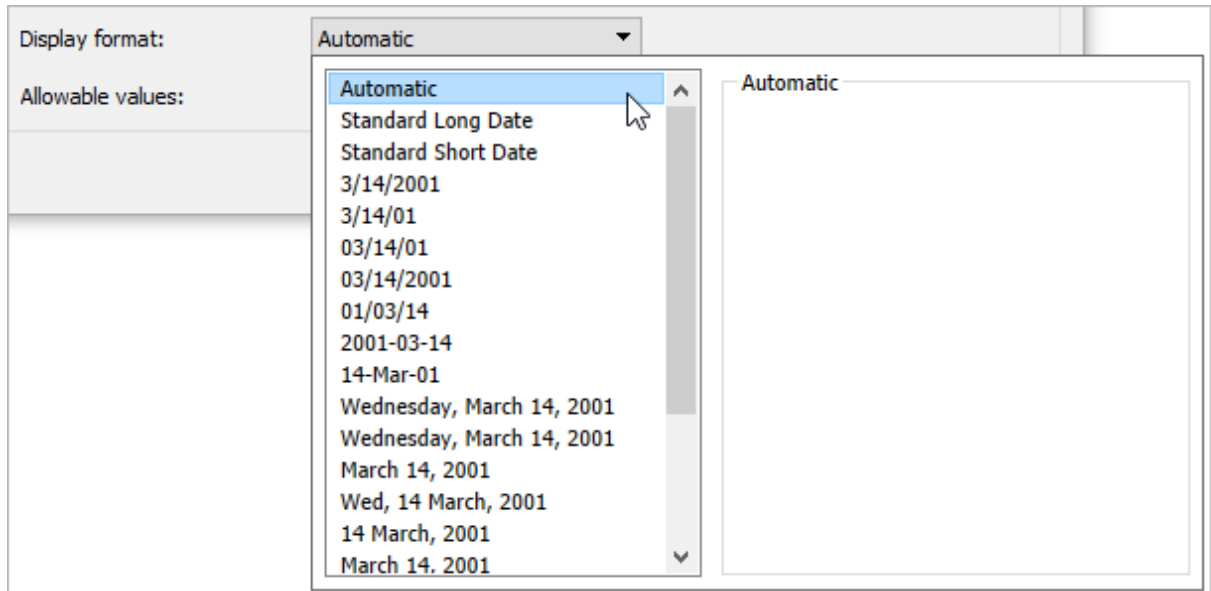
Note: If there is more than one value, the workbook would not be able to choose a default value. The calculation must also be view-independent so that the value won't change as the viz changes. To do this, you can use a FIXED level of detail (LOD) expression that is not dependent on the structure of the viz. All parts of the calculation must be inside the FIXED LOD expression.

Note: If you use a FIXED LOD expression as the default value and are using context filters, the dynamic parameter will not reflect any context filters.

For this dynamic parameter, let's use **Latest Month**. This means that if the connected data source is updated and the workbook is opened, the parameter will automatically update when the workbook is opened.



6. Specify the display format to use in the parameter control (Tableau Desktop only).



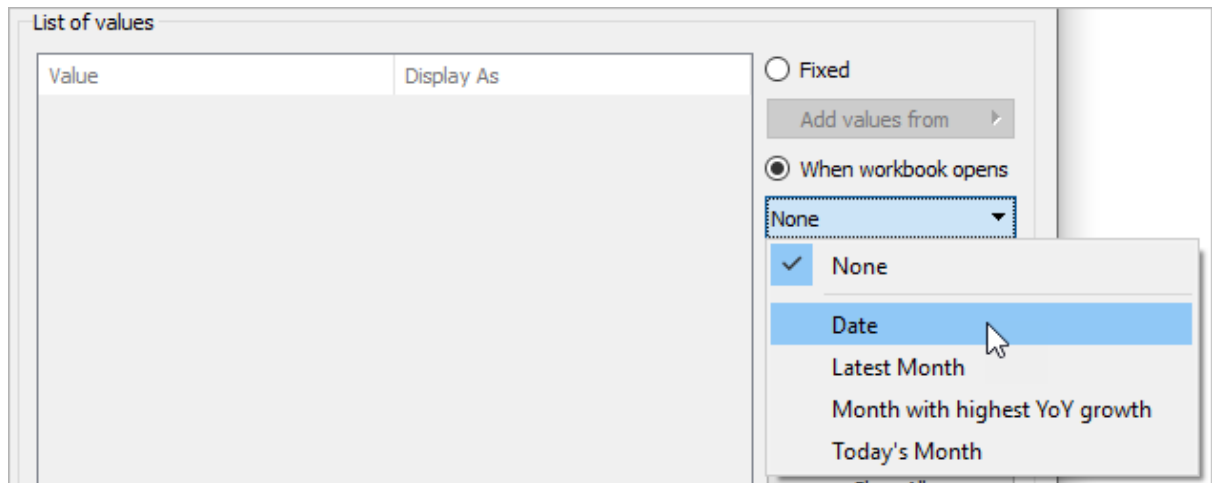
7. Specify how the parameter will accept values. You can select from the following options:
- **All** - The parameter control is a simple text field.
 - **List** - The parameter control provides a list of possible values for you to select from.
 - **Range** - The parameter control lets you select values within a specified range.

The availability of these options is determined by the data type. For example, a string parameter can only accept all values or a list. It does not support a range.

If you select List, you must specify the list of values. Click in the left column to type your list of values, or you can add members of a field by selecting **Add values from**.

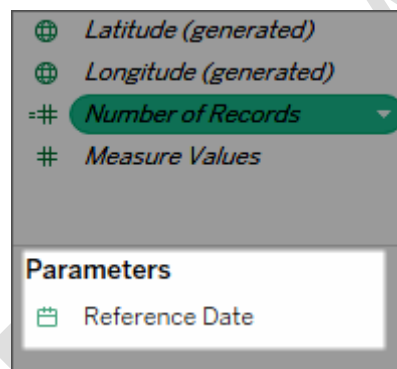
If you select Range, you must specify a minimum, maximum, and step size. For example, you can define a date range between January 1, 2019 and December 31, 2019, with the step size set to 1 month to create a parameter control that lets you select each month in 2019.

In this case, to refresh the parameter's list of values (or domain) whenever the workbook opens, select **List**, and then select **When workbook opens**. Notice that the list of values on the left is grayed out because the workbook is dynamically pulling values from the data source.



8. When finished, click **OK**.

The parameter is now listed in the Parameters section at the bottom of the **Data** pane.



The parameter is also available everywhere else you can use a parameter—for example, on the Top tab in the Filter dialog box, or in the Reference Line dialog box. Parameters are global across the workbook and can be used in any worksheet.

When the parameter value or list of values can't refresh

Below are a few scenarios in which a default parameter value or a refreshable list of parameter values (domain) will not update as expected:

- The default field returns a value whose data is incompatible with the parameter's data type.
- The default field doesn't return a single value (for the parameter's current value).
- The default field returns null.
- The default field is in a data source that's not yet connected.
- The default field is no longer found in the workbook's namespace (i.e. it's been deleted).
- The user cancels the query to the data source while Tableau is attempting to connect.

Edit a parameter

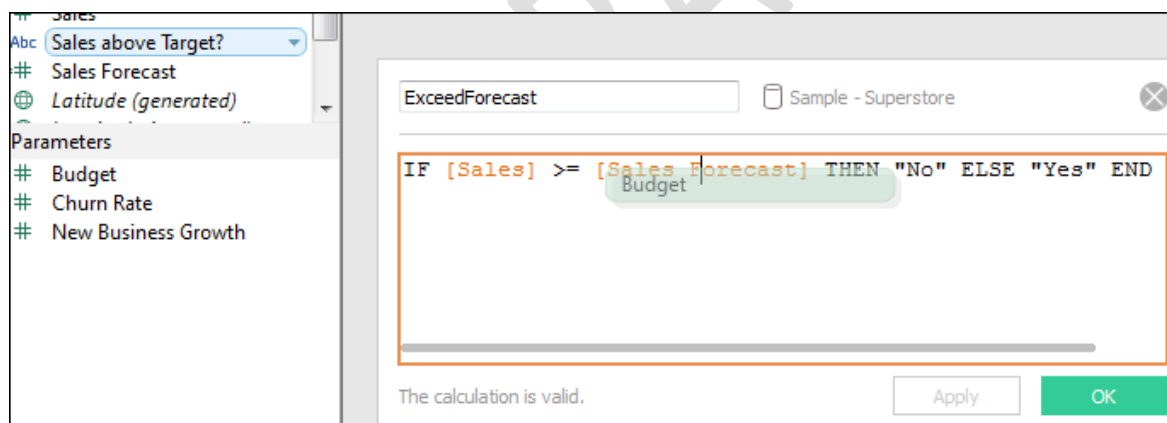
You can edit parameters from the Data pane or the parameter control. Follow the instructions below to edit a parameter:

1. Do one of the following:
 - Right-click (Control-click on a Mac) the parameter in the **Data** pane and select **Edit**.
 - Select **Edit Parameter** on the parameter control card menu.
2. In the Edit Parameter dialog box, make the modifications as necessary.
3. When finished, click **OK**. The parameter is updated along with any calculations that use it.

Use a parameter in a calculation

Parameters give you a way to dynamically modify values in a calculation. Rather than manually editing the calculation (and all dependent calculations), you can use a parameter. Then when you want to change the value, you open the parameter control, change the value, and all of the calculations that use that parameter are updated.

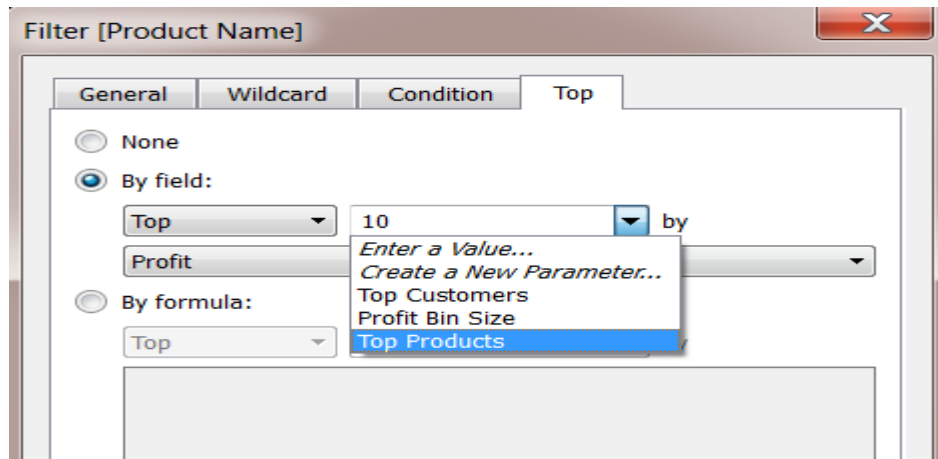
To use a parameter in a calculation, drag the parameter from the Data pane and drop it in the calculation editor, either at a new location in the formula or to replace a part of the current formula:



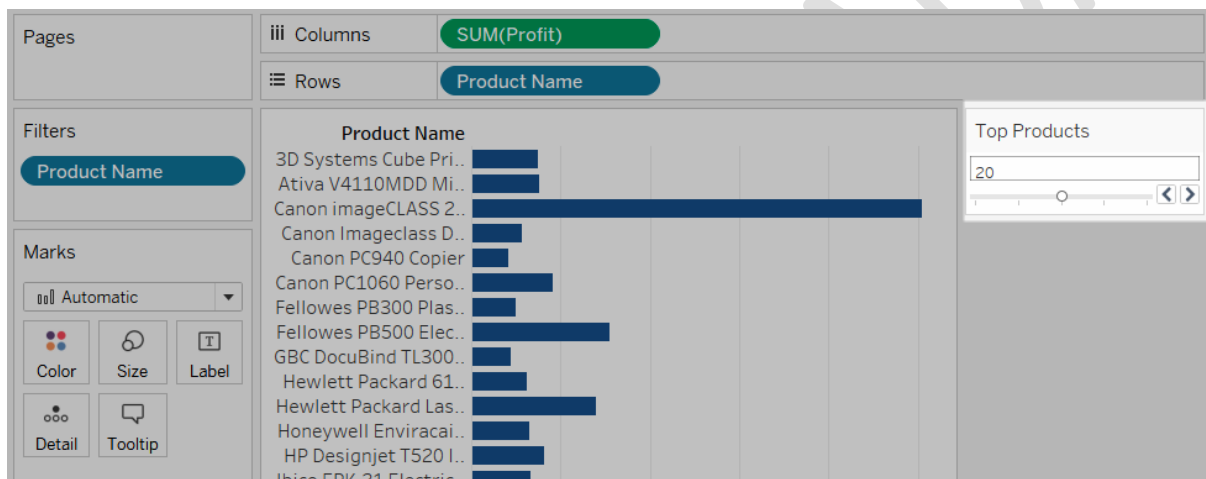
Use a parameter in a filter

Parameters give you a way to dynamically modify values in a Top N filter. Rather than manually setting the number of values you want to show in the filter, you can use a parameter. Then when you want to change the value, you open the parameter control and the filter updates. For example, when creating a filter to show the Top 10 products based on total profit, you may want to use a parameter instead of the fixed "10" value. That way, you can quickly update the filter to show the top 10, 20, or 30 products.

A list of parameters is available in the drop-down lists on the **Top** tab of the Filter dialog box. Select the parameter you want to use in the filter.



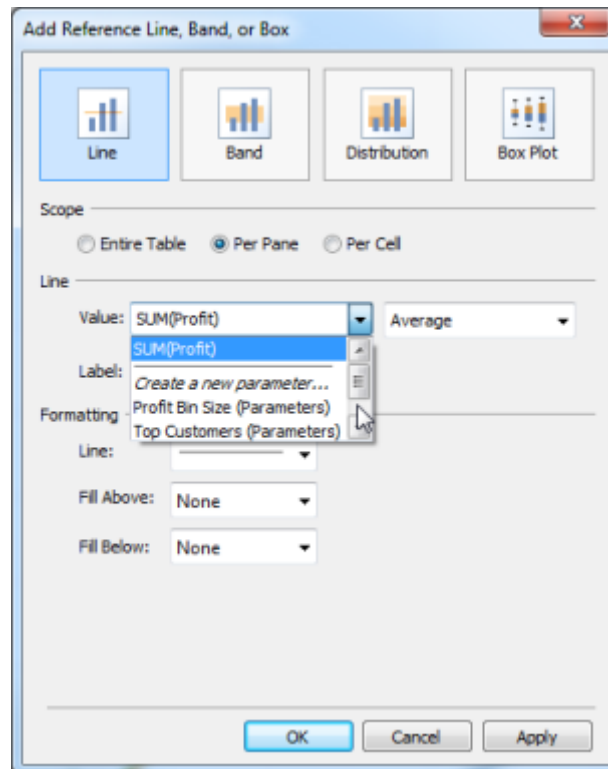
To show the parameter control, right-click the parameter in the **Data** pane and select **Show Parameter**. Use the parameter control to modify the filter to show the top 10 products, 15 products, 20 products, and so on.



Use a parameter in a reference line

Parameters give you a way to dynamically modify a reference line, band, or box. For example, instead of showing a reference line at a fixed location on the axis, you can reference a parameter. Then you can use the parameter control to move the reference line.

A list of parameters is available in the Value drop-down list in the Add Reference Line, Band, or Box dialog box. Select the parameter you want to use.

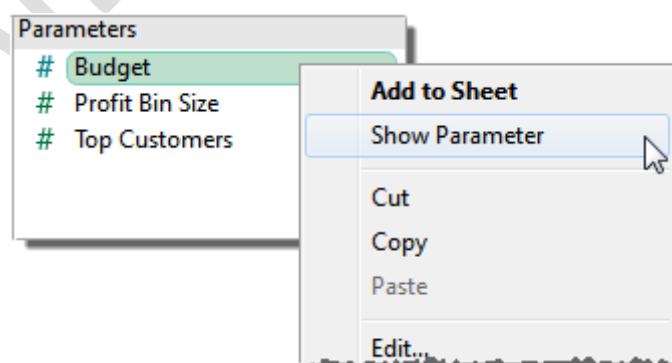


The reference line is drawn at the Current Value specified by the parameter. To open the parameter control, right-click (Control-click on a Mac) the parameter in the **Data** pane and then select **Show Parameter**. Use the parameter control to change where the reference line is drawn.

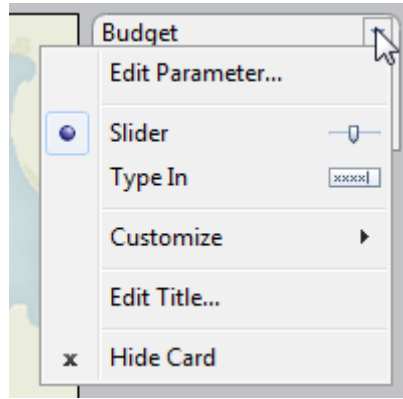
Show a parameter control in the viz

The parameter control is a worksheet card that lets you modify the parameter value. Parameter controls are very similar to filter cards in that they contain controls that modify the view. You can open parameter controls on worksheets and dashboards and they are included when you save to the web or publish to Tableau Server.

To open the parameter control, right-click (Control-click) the parameter in the **Data** pane and select **Show Parameter**.



Like other cards, parameter controls have a menu that you can open using the drop-down arrow in the upper right corner of the card. Use this menu to customize the display of the control. For example, you can show a list of values as radio buttons, a compact list, a slider, or a type in field. The options available on this menu depend on the data type of the parameter as well as whether it accepts all, a list, or a range of values.



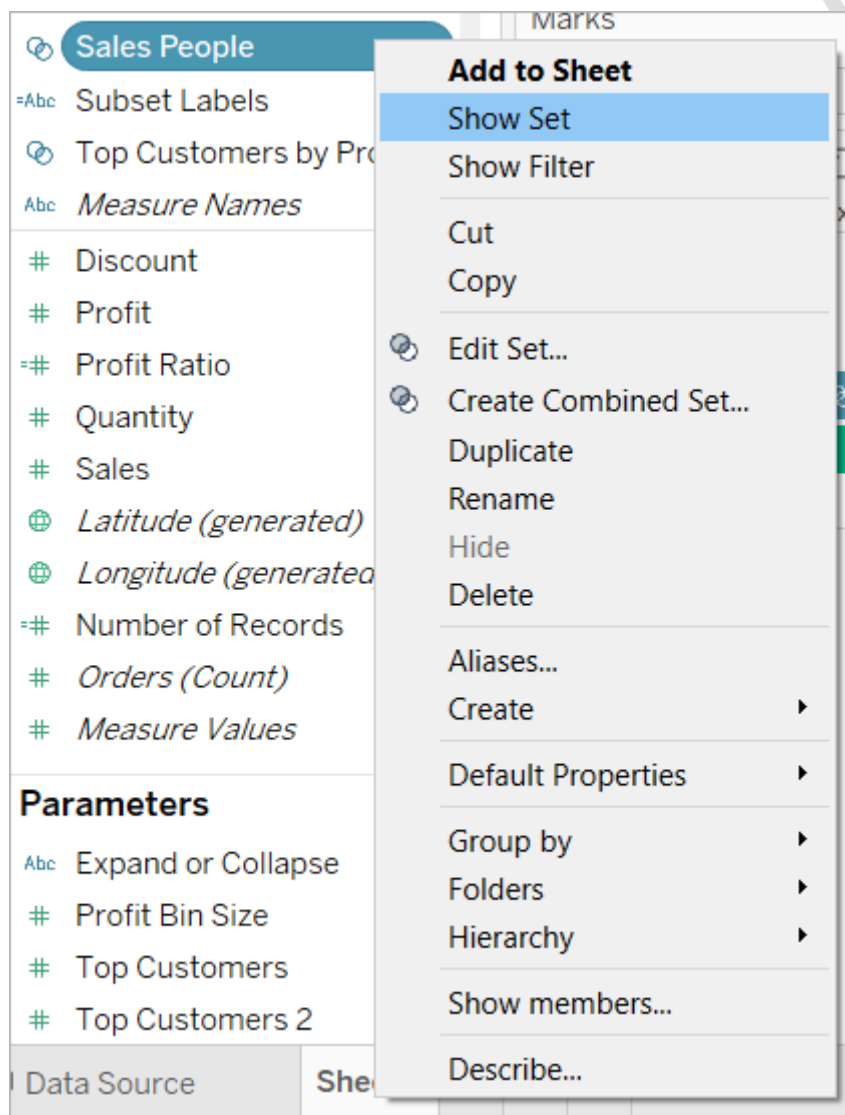
SHALENDRA YADAV

Create Sets

You can use sets to compare and ask questions about a subset of data. Sets are custom fields that define a subset of data based on some conditions.

You can make sets more dynamic and interactive by using them in [Set Actions](#). Set actions let your audience interact directly with a viz or dashboard to control aspects of their analysis. When someone selects marks in the view, set actions can change the values in a set.

In addition to a Set Action, you can also allow users to change the membership of a set by using a filter-like interface known as a Set Control, which makes it easy for you to designate inputs into calculations that drive interactive analysis.



Create a dynamic set

There are two types of sets: dynamic sets and fixed sets. The members of a dynamic set change when the underlying data changes. Dynamic sets can only be based on a single dimension.

To create a dynamic set:

1. In the Data pane, right-click a dimension and select **Create > Set**.
2. In the Create Set dialog box, configure your set. You can configure your set using the following tabs:
 - **General:** Use the General tab to select one or more values that will be considered when computing the set.

You can alternatively select the **Use all** option to always consider all members even when new members are added or removed.

Create Set

Name:

General | Condition | Top

☒ Select from list ☐ Custom value list ☐ Use all

Enter search text

- ☒ "While you Were Out" Message Book, One Form per Page
- ☒ #10 Gummed Flap White Envelopes, 100/Box
- ☒ #10 Self-Seal White Envelopes
- ☒ #10 White Business Envelopes, 4 1/8 x 9 1/2
- ☒ #10- 4 1/8" x 9 1/2" Recycled Envelopes
- ☒ #10- 4 1/8" x 9 1/2" Security-Tint Envelopes
- ☒ #10-4 1/8" x 9 1/2" Premium Diagonal Seam Envelopes
- ☒ #6 3/4 Gummed Flap White Envelopes
- ☒ 1.7 Cubic Foot Compact "Cube" Office Refrigerators
- ☒ 1/4 Fold Party Design Invitations & White Envelopes, 24 8...
- ☒ 12 Colored Short Pencils
- ☒ 12-1/2 Diameter Round Wall Clock

☐ Exclude

Summary

Field: [Product Name]
Selection: Selected 1850 of 1850 values
Wildcard: All
Condition: None
Limit: None

- **Condition:** Use the Condition tab to define rules that determine which members to include in the set.

For example, you might specify a condition that is based on total sales that only includes products with sales over \$100,000.

Create Set

Name: Products with Sales 100K +

General Condition Top

☐ None

☒ By field:

Sales Sum

>= 100,000

Range of Values

Min: Load

Max:

☐ By formula:

Reset OK Cancel

Note: Set conditions work the same as filter conditions. See [Filter Data from Your ViewsLink](#) opens in a new window to learn more.

- **Top:** Use the Top tab to define limits on what members to include in the set.

For example, you might specify a limit that is based on total sales that only includes the top 5 products based on their sales.

Create Set

Name: Products with Sales 100K +

General **Condition** **Top**

☐ None

☒ By field:

Top 5 by


Sales Sum

☐ By formula:



Top 10 by

Reset OK Cancel

3. When finished, click **OK**.

The new set is added to the bottom of the Data pane, under the Sets section. A set icon  indicates the field is a set.

Sets

-  State - High Sales & Profit
 -  Top Customers by Profit
-

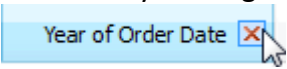

Create a fixed set

The members of a fixed set do not change, even if the underlying data changes. A fixed set can be based on a single dimension or multiple dimensions.

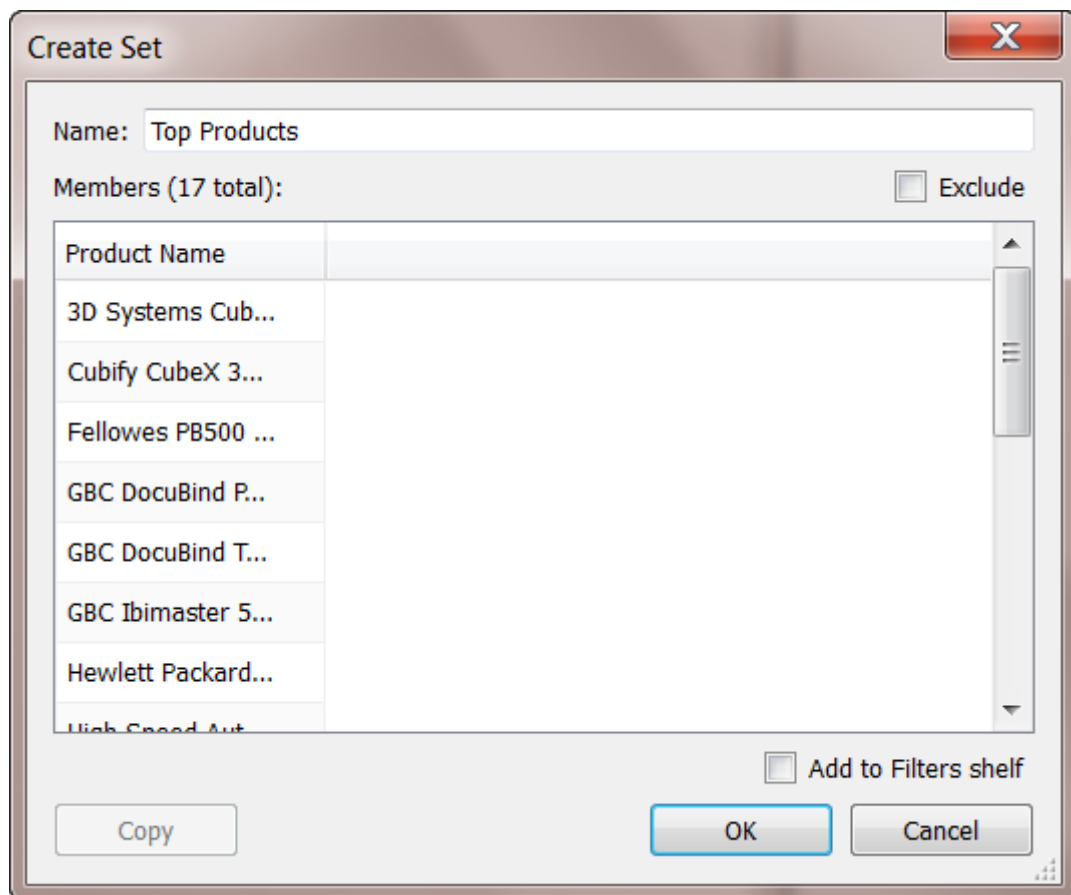
To create a fixed set:

1. In the visualization, select one or more marks (or headers) in the view.
2. Right-click the mark(s) and select **Create Set**.



3. In the Create Set dialog box, type a name for the set.
4. Optionally complete any of the following:
 - By default, the set includes the members listed in the dialog box. You can select the option to **Exclude** these members instead. When you exclude, the set will include all of the members you didn't select.
 - Remove any dimensions that you don't want to be considered by clicking the red "x" icon that appears when you hover over a column heading .
 - Remove any specific rows that you don't want to include in the set by clicking the red "x" icon that appears when you hover over the row .
 - If the marks you selected represent multiple dimensions, each member of the set will be a combination of those dimensions. You can specify the character that separates the dimension values. To do so, for **Separate members by**, enter a character of your choice.



- Select **Add to Filters shelf** to automatically move the set to the Filters shelf once it is created.



5. When finished, click **OK**.

The new set is added to the bottom of the Data pane, under the Sets section. A set icon  indicates the field is a set.

Sets

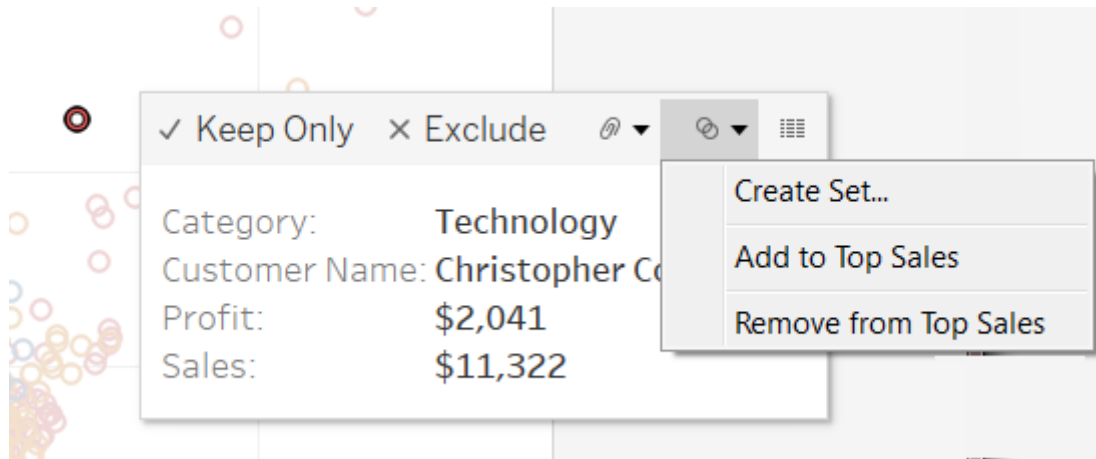
-  State - High Sales & Profit
-  Top Customers by Profit

Add or remove data points from sets

If you created a set using specific data points, you can add more data to or subtract data from the set.

To add or remove data points from a set:

1. In the visualization, select the data points you want to add or remove.
2. In the tooltip that appears, click the Sets drop-down menu icon, and then select **Add to [set name]** or **Remove from [set name]** to add or remove data from a particular set.



Use sets in the visualization

After you create a set, it displays at the bottom of the Data pane in the Sets section. You can drag it into the viz like any other field.

When you drag a set to the viz in Tableau Desktop, you can choose to show the members of the set or aggregate the members into In/Out categories.

In Tableau Server or Tableau Online you can only aggregate the members of the set into In/Out categories.

Show In/Out members in a set

In most cases, when you drag a set to the viz, Tableau displays the set using the In/Out mode. This mode separates the set into two categories:

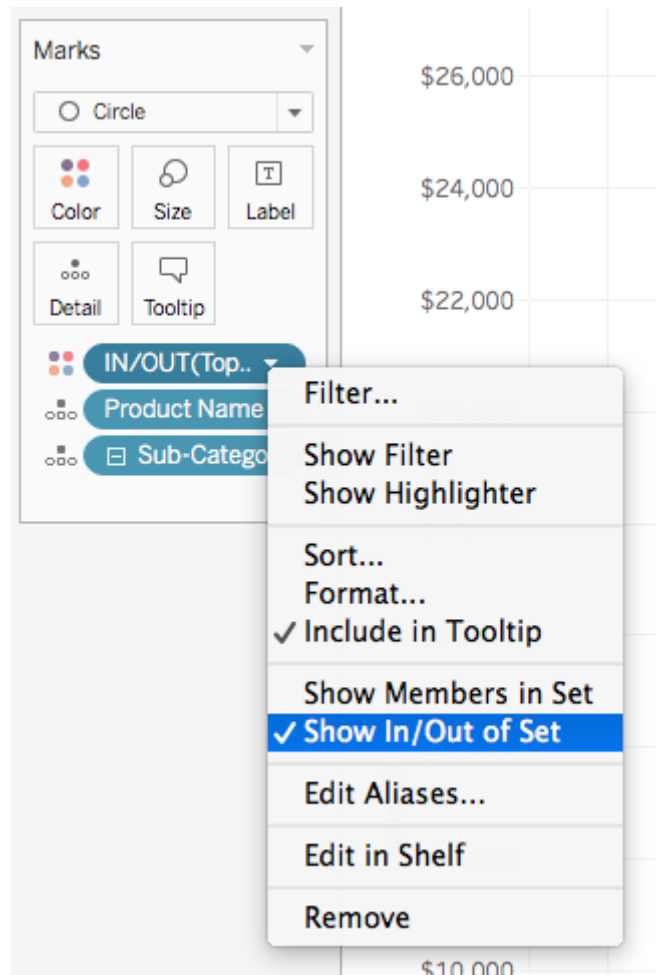
- In - The members in the set.
- Out - The members that aren't part of the set.

For example, in a set defined for the top 25 customers, the top customers would be part of the In category and all other customers would be part of the Out category.

Using the In/Out mode makes it easy to compare the members in the set to everything else.

To show In/Out members in the visualization:

- In Tableau Desktop, right-click the set in the visualization workspace and select **Show In/Out of Set**.



When a set is in In/Out mode, the field on the shelf is prefaced by the text, "IN/OUT", followed by the set name.

Show members in a set

As an alternative to showing the set using In/Out mode, you can list the members in the set. Showing the members in the set automatically adds a filter to the view that includes only the members of the set.

To switch a set to list the individual members:

- In the visualization workspace, right-click the set and select **Show Members in Set**.

Let users change set values

Add a set action

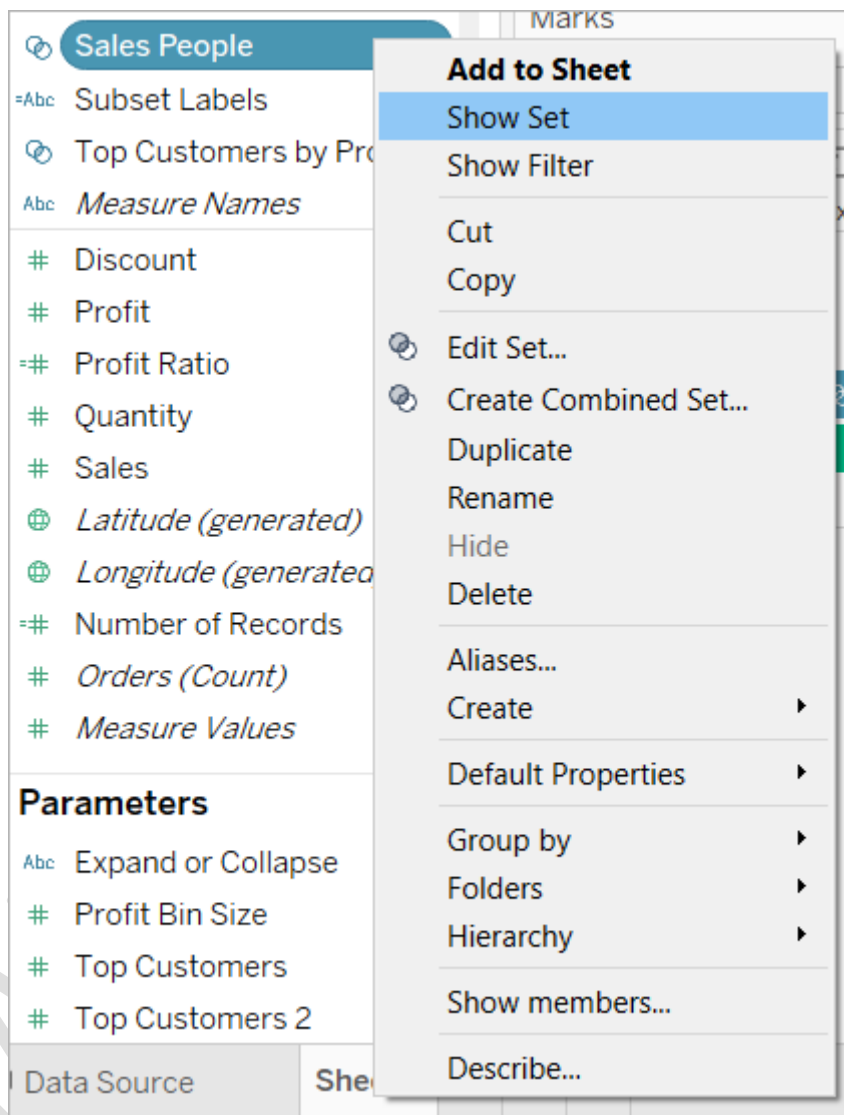
You can use set actions to give your audience more control over their analysis of your visualization.

Set actions take an existing set and update the values contained in that set based on a user's action in the viz. As the author, you can use a set or sets that you have already created to define the scope of the set action.

Show a set control in the view

To give your audience the ability to quickly modify members of a set, you can also display a Set Control. A set control is a worksheet card that is very similar to a parameter control or filter card. You can add set controls to worksheets and dashboards and they are included when you publish to Tableau Server or Tableau Online, or save to the web on Tableau Public.

To display the set control, right-click (Control-click) the set in the Data pane and select **Show Set**.



Like other cards, set controls have a menu that you can open using the drop-down arrow in the upper right corner of the card. Use this menu to customize the display of the control, which supports both single-value and multiple-value selection modes. For example, you can show radio buttons for individual selection, or a drop-down list that supports multiple selections.

Note: You can only display a set control for dynamic sets—not fixed sets. This is by design, as fixed sets aren't meant to change in membership. In addition, if the dynamic set is not in play in the view (that is, if it's not referenced in a calculation or instantiated on the sheet), the context menu item will be disabled, reminding you to add the set to the view.

Combine sets

You can combine two sets to compare the members. When you combine sets you create a new set containing either the combination of all members, just the members that exist in both, or members that exist in one set but not the other.

Combining sets allows you to answer complex questions and compare cohorts of your data. For example, to determine the percentage of customers who purchased both last year and this year, you can combine two sets containing the customers from each year and return only the customers that exist in both sets.

To combine two sets, they must be based on the same dimensions. That is, you can combine a set containing the top customers with another set containing the customers that purchased last year. However, you cannot combine the top customers set with a top products set.

To combine sets:

1. In the Data pane, under Sets, select the two sets you want to combine.
2. Right-click the sets and select **Create Combined Set**.
3. In the Create Set dialog box, do the following
 - Type a name for the new combined set.
 - Verify that the two sets you want to combine are selected in the two drop-down menus.
 - Select one of the following options for how to combine the sets:
 - **All Members in Both Sets** - the combined set will contain all of the members from both sets.
 - **Shared Members in Both Sets** - the combined set will only contain members that exist in both sets.
 - **Except Shared Members** - the combined set will contain all members from the specified set that don't exist in the second set. These options are equivalent to subtracting one set from another. For example, if the first set contains Apples, Oranges, and Pears and the second set contains Pears and Nuts; combining the first set except the shared members would contain just Apples and Oranges. Pears is removed because it exists in the second set.
 - Optionally specify a character that will separate the members if the sets represent multiple dimensions.
4. When finished, click **OK**.

Table Calculations in Tableau

1. Whatever output we are getting in the tableau based on that if we are calculating something then they are known as table related calculations.
2. In simple words, Table calculations are a special type of calculated field that computes on the local data in tableau.
3. These are the calculations which are applied to the values in the entire table.
4. For example: For calculating a running total or running average, we need to apply a single method of calculation to an entire column. Such calculations cannot be performed on some selected rows.

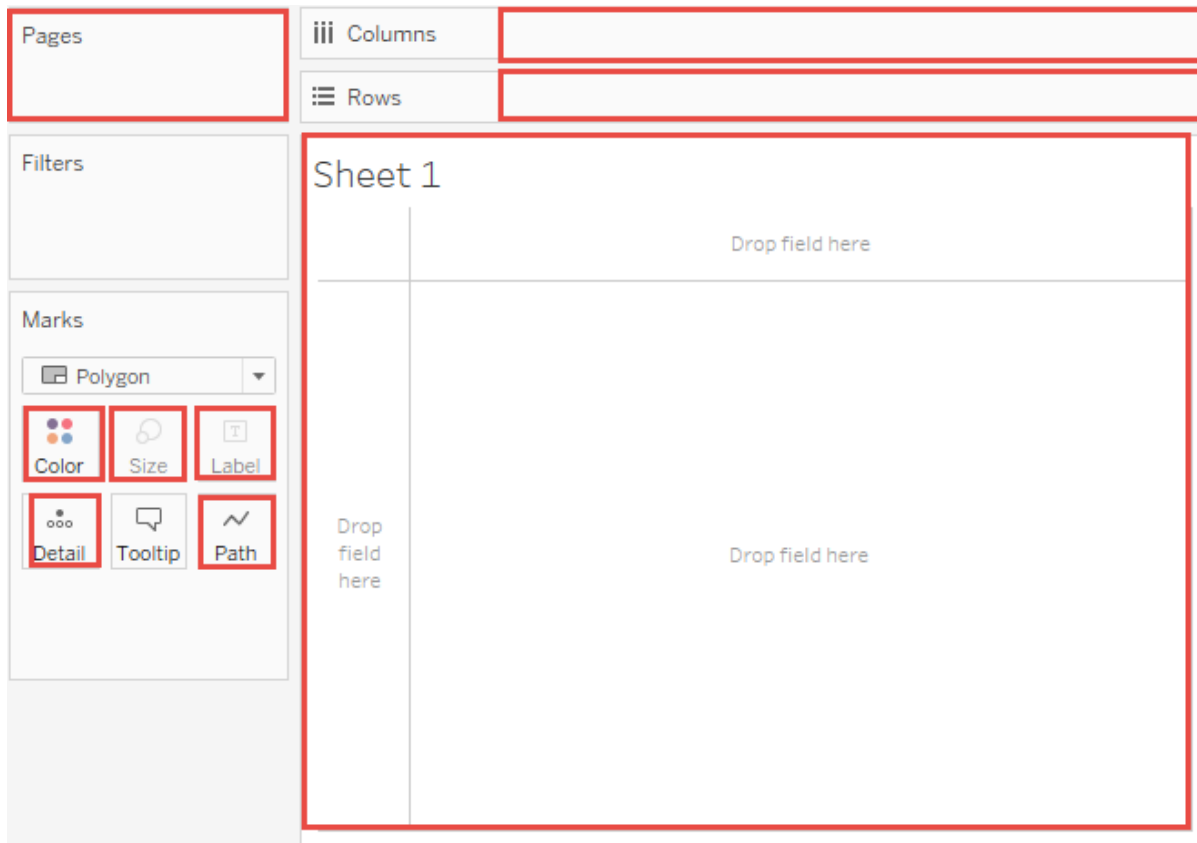
What is a table calculation?

A table calculation is a transformation you apply to the values in a visualization. Table calculations are a special type of calculated field that computes on the local data in Tableau. They are calculated based on what is currently in the visualization and do not consider any measures or dimensions that are filtered out of the visualization.

You can use table calculations for a variety of purposes, including:

- Transforming values to rankings
- Transforming values to show running totals
- Transforming values to show percent of total

For any Tableau visualization, there is a virtual table that is determined by the dimensions in the view. This table is not the same as the tables in your data source. Specifically, the virtual table is determined by the dimensions within the “level of detail,” which means the dimensions on any of the following shelves or cards in a Tableau worksheet:



The basics: addressing and partitioning

When you add a table calculation, you must use all dimensions in the level of detail either for partitioning (scoping) or for addressing (direction).

The dimensions that define how to group the calculation (the scope of data it is performed on) are called **partitioning fields**. The table calculation is performed separately within each partition.

The remaining dimensions, upon which the table calculation is performed, are called **addressing fields**, and determine the direction of the calculation.

Partitioning fields break the view up into multiple sub-views (or sub-tables), and then the table calculation is applied to the marks within each such partition. The direction in which the calculation moves (for example, in calculating a running sum, or computing the difference between values) is determined by the addressing fields. So when you order the fields in the Specific Dimensions section of the Table Calculation dialog box from top to bottom, you are specifying the direction in which the calculation moves through the various marks in the partition.

When you add a table calculation using the Compute Using options, Tableau identifies some dimensions as addressing and others as partitioning automatically, as a result of your selections. But when you use Specific Dimensions, then it's up to you to determine which dimensions are for addressing and which for partitioning.

Table (across)

Computes across the length of the table and restarts after every partition.

For example, in the following table, the calculation is computed across columns (YEAR(Order Date)) for every row (MONTH(Order Date)).

		Order Date			
Quarter of Order..	Month of Order ..	2011	2012	2013	2014
Q1	January	\$4,328	\$368	\$26,111	
	February		\$7,400	\$10,657	-\$2,584
	March		-\$17,224	\$12,719	\$2,723
Q2	April		\$5,900	\$5,053	\$864
	May		\$6,483	\$26,559	-\$11,040
	June		-\$9,798	\$14,633	\$8,829
Q3	July		-\$5,181	\$9,675	\$9,988
	August		\$8,989	-\$3,633	\$28,251
	September		-\$17,181	\$8,312	\$17,581
Q4	October		-\$48	\$25,058	\$21,331
	November		-\$2,656	\$6,220	\$30,134
	December		\$5,374	\$22,318	-\$6,763

Table (down)

Computes down the length of the table and restarts after every partition.

For example, in the following table, the calculation is computed down rows (MONTH(Order Date)) for every column (YEAR(Order Date)).

		Order Date			
Quarter of Order..	Month of Order ..	2011	2012	2013	2014
Q1	January				
	February	-\$9,136	-\$5,963	\$4,325	-\$24,420
	March	\$50,380	\$26,256	\$28,319	\$33,625
Q2	April	-\$27,396	-\$4,272	-\$11,938	-\$13,797
	May	-\$4,547	-\$4,064	\$17,442	\$5,539
	June	\$10,947	-\$5,334	-\$17,261	\$2,609
Q3	July	-\$549	\$3,968	-\$990	\$169
	August	-\$6,037	\$8,133	-\$5,175	\$13,088
	September	\$53,368	\$27,698	\$39,643	\$28,973
Q4	October	-\$50,324	\$33,191	-\$16,445	-\$12,695
	November	\$47,175	\$44,568	\$25,729	\$34,533
	December	-\$9,083	-\$1,053	\$15,045	-\$21,852

Table (across then down)

Computes across the length of the table, and then down the length of the table.

For example, in the following table, the calculation is computed across columns (YEAR(Order Date)), down a row (MONTH(Order Date)), and then across columns again for the entire table.

		Order Date			
Quarter of Orde..	Month of Order ..	2011	2012	2013	2014
Q1	January		\$4,228	\$368	\$26,161
	February	-\$39,893	\$7,400	\$10,657	-\$2,984
	March	\$35,407	\$17,224	\$12,719	\$3,713
Q2	April	-\$25,614	\$5,900	\$5,053	\$864
	May	\$16,464	\$6,483	\$26,559	-\$11,040
	June	-\$11,056	-\$9,798	\$14,633	\$8,829
Q3	July	\$14,312	\$5,181	\$9,675	\$9,938
	August	\$20,519	\$6,989	\$3,633	\$23,611
	September	\$20,261	\$17,101	\$8,312	\$17,611
Q4	October	-\$59,035	-\$48	\$25,058	-\$2,351
	November	\$835	-\$2,656	\$6,220	\$30,134
	December	-\$42,761	\$3,374	\$22,310	-\$6,713

Table (down then across)

Computes down the length of the table, and then across the length of the table.

For example, in the following table, the calculation is computed down rows (MONTH(Order Date)), across a column (YEAR(Order Date)), and then down rows again.

Pages

Filters

Marks

Automatic

Color

Size

Text

Detail

Tooltip

SUM(Sales)

Columns

YEAR(Order Date)

Rows

QUARTER(Order D..)

MONTH(Order Dat..)

Order Date

Quarter of Orde..	Month of Order ..	2011	2012	2013	2014
Q1	January		-\$51,372	-\$56,377	-\$52,534
	February	-\$9,136	-\$5,963	\$4,325	-\$24,420
	March	\$50,880	\$26,256	\$28,319	\$33,625
Q2	April	-\$27,396	-\$4,272	-\$11,938	-\$13,797
	May	-\$4,647	-\$4,064	\$17,442	\$5,539
	June	\$10,947	-\$5,334	-\$17,261	\$2,609
Q3	July	-\$649	\$3,968	\$990	\$169
	August	-\$6,037	\$8,133	-\$5,175	\$13,088
	September	\$53,868	\$27,698	\$39,643	\$28,973
Q4	October	-\$50,324	-\$33,191	-\$15,445	-\$12,695
	November	\$47,175	\$44,568	\$25,729	\$34,533
	December	-\$9,083	-\$1,053	\$15,045	-\$21,852

Pane (down)

Computes down an entire pane.

For example, in the following table, the calculation is computed down rows (MONTH(Order Date)) for a single pane.

Pages

Filters

Marks

Automatic

Color

Size

Detail

Text

Tooltip

SUM(Sales)

Columns

YEAR(Order Date)

Rows

QUARTER(Order D..)

MONTH(Order Dat..)

		Order Date			
Quarter of Orde..	Month of Order ..	2011	2012	2013	2014
Q1	January				
	February	-\$9,136	-\$5,963	\$4,325	-\$24,420
	March	\$50,880	\$26,256	\$28,319	\$33,625
Q2	April				
	May	-\$4,647	-\$4,064	\$17,442	\$5,539
	June	\$10,947	-\$5,334	-\$17,261	\$2,609
Q3	July				
	August	-\$6,037	\$8,133	-\$5,175	\$13,088
	September	\$53,868	\$27,698	\$39,643	\$28,973
Q4	October				
	November	\$47,175	\$44,568	\$25,729	\$34,533
	December	-\$9,083	-\$1,053	\$15,045	-\$21,852

Pane (across then down)

Computes across an entire pane and then down the pane.

For example, in the following table, the calculation is computed across columns (YEAR(Order Date)) for the length of the pane, down a row (MONTH(Order Date)), and then across columns for the length of the pane again.

Pages

Columns: YEAR(Order Date)

Rows: QUARTER(Order D.), MONTH(Order Date)

Filters

Marks: SUM(Sales)

		Order Date			
Quarter of Order..	Month of Order ..	2011	2012	2013	2014
Q1	January		\$4,228	\$368	\$26,161
	February	\$35,833	\$7,488	\$10,657	\$22,511
	March	\$35,407	-\$17,224	\$12,719	\$2,723
Q2	April		\$5,900	\$5,053	\$864
	May	-\$16,464	\$6,483	\$26,559	-\$11,040
	June	-\$11,056	-\$9,798	\$14,633	\$8,829
Q3	July		-\$5,181	\$9,675	\$9,988
	August	-\$20,519	\$8,989	-\$3,633	\$28,251
	September	\$20,261	-\$17,181	\$8,312	\$17,581
Q4	October		-\$48	\$25,058	\$21,331
	November	\$835	-\$2,656	\$6,220	\$30,134
	December	-\$42,781	\$5,374	\$22,318	-\$6,763

Pane (down then across)

Computes down an entire pane and then across the pane.

For example, in the following table, the calculation is computed down rows (MONTH(Order Date)) for the length of the pane, across a column (YEAR(Order Date)), and then down the length of the pane again.

Pages

Filters

Marks

Automatic

Color

Size

Text

Detail

Tooltip

SUM(Sales)

Columns

YEAR(Order Date)

Rows

QUARTER(Order D..)

MONTH(Order Dat..)

		Order Date			
Quarter of Orde..	Month of Order ..	2011	2012	2013	2014
Q1	January		-\$37,517	-\$10,924	-\$0,483
	February	-\$9,136	-\$5,963	\$4,325	-\$24,420
	March	\$50,380	\$26,286	\$28,829	\$33,625
Q2	April		-\$400	\$14,451	\$682
	May	-\$4,647	-\$4,064	\$17,442	\$5,539
	June	\$10,947	-\$5,334	-\$17,261	\$2,609
Q3	July		-\$53,012	-\$26,155	-\$24,480
	August	-\$6,037	\$8,133	-\$5,175	\$13,088
	September	\$53,868	\$27,698	\$39,643	\$28,973
Q4	October		-\$38,141	-\$18,456	-\$19,444
	November	\$47,175	\$44,568	\$25,729	\$34,533
	December	-\$9,083	-\$1,053	\$15,045	-\$21,852

Cell

Computes within a single cell.

Pages

Filters

Marks

T Automatic

Color

Size

T

Text

Detail

Tooltip

T SUM(Sales) ▲

Columns

YEAR(Order Date)

Rows

QUARTER(Order D..)

MONTH(Order Dat..)

		Order Date			
Quarter of Orde..	Month of Order ..	2011	2012	2013	2014
Q1	January	\$0	\$0	\$0	\$0
	February	\$0	\$0	\$0	\$0
	March	\$0	\$0	\$0	\$0
Q2	April	\$0	\$0	\$0	\$0
	May	\$0	\$0	\$0	\$0
	June	\$0	\$0	\$0	\$0
Q3	July	\$0	\$0	\$0	\$0
	August	\$0	\$0	\$0	\$0
	September	\$0	\$0	\$0	\$0
Q4	October	\$0	\$0	\$0	\$0
	November	\$0	\$0	\$0	\$0
	December	\$0	\$0	\$0	\$0

Specific Dimensions

Computes only within the dimensions you specify.

For example, in the following visualization the dimensions, Month of Order Date and Quarter of Order Date, are the addressing fields (since they are selected), and Year of Order Date is the partitioning field (since it is not selected). So the calculation transforms the difference from each month across all quarters within a year. The calculation starts over for every year.

Note that if all dimensions are selected, then the entire table is in scope.

Tableau interface showing a table calculation 'Difference in Sales' with 'Specific Dimensions' selected. The table displays sales data by quarter, month, and year (2011-2014). The 'Specific Dimensions' dialog box is open, showing 'Year of Order Date' as the partitioning field and 'Month of Order Date' and 'Quarter of Order Date' as addressing fields.

Quarter of ...	Month of O..	2011	2012	2013	2014
Q1	January	-\$9,136	-\$5,963	\$4,325	-\$24,420
	February	\$50,880	\$26,256	\$28,319	\$33,625
	March	-\$27,396	-\$4,272	-\$11,938	-\$13,797
Q2	April	-\$4,647	-\$4,064	\$17,442	\$5,539
	May	\$10,947	-\$5,334	-\$17,261	\$2,609
	June	-\$6,649	\$3,968	-\$990	\$169
Q3	July	-\$6,037	\$8,133	-\$5,175	\$13,088
	August	\$53,868	\$27,698	\$39,643	\$28,973
	September	-\$50,324	-\$33,191	-\$16,445	-\$12,695
Q4	October	\$47,175	\$44,568	\$25,729	\$34,533
	November	-\$9,083	-\$1,053	\$15,045	-\$21,852
	December				

At the level

The **At the level** option is only available when you select **Specific Dimensions** in the Table Calculations dialog box, and when more than one dimension is selected in the field immediately below the **Compute Using** options—that is, when more than one dimension is defined as an addressing field.

This option is not available when you're defining a table calculation with **Compute Using**, because those values establish partitions by position. But with **Specific Dimensions**, because the visual structure and the table calculation are not necessarily aligned, the **At the level** option is available to let you fine-tune your calculation.

Use this setting to set a break (that is, restart of the calculation) in the view, based on a particular dimension. How is this different from just using that dimension for partitioning? In fact, it is partitioning, but it's partitioning by position rather than by value, which is how partitioning is defined with the **Compute Using** options.

The choices available from the At the level drop-down list in the example above are:

Deepest	Specifies that the calculation should be performed at the level of finest granularity. This is the default option.
Quarter of Order Date	Specifies that the calculation should be performed at the quarter level.
Month of Order Date	Specifies that the calculation should be performed at the month level.

Create a table calculation

To learn how to create a table calculation, follow along with the steps in the example below.

Step 1: Build the visualization

1. Open Tableau and connect to the **Sample-Superstore** saved data source.
2. Navigate to a new worksheet.
3. From the **Data** pane, under Dimensions, drag **Order Date** to the **Rows** shelf.

The dimension updates to YEAR(Order Date).

4. On the Rows shelf, right-click **YEAR(Order Date)** and select **Quarter**.
5. On the Rows shelf, click the + icon on **QUARTER(Order Date)**.

MONTH(Order Date) is added to the shelf.

6. From the **Data** pane, under Dimensions, drag **Order Date** to the **Columns** shelf.

The dimension updates to YEAR(Order Date) again.

7. From the **Data** pane, under Measures, drag **Sales** to **Text** on the Marks card.

The updates to look like this:

Pages

Filters

Marks

Columns

Rows

Order Date

Quarter of ..

Month of O..

2011

2012

2013

2014

Q1

January

February

March

Q2

April

May

June

Q3

July

August

September

Q4

October

November

December

YEAR(Order Date)

QUARTER(Order D..)

MONTH(Order Dat..)

Automatic

Color

Size

Text

Detail

Tooltip

SUM(Sales)

Quarter of ..	Month of O..	2011	2012	2013	2014
Q1	January	\$13,946	\$18,174	\$18,542	\$44,703
	February	\$4,811	\$12,211	\$22,868	\$20,284
	March	\$55,691	\$38,467	\$51,186	\$53,909
Q2	April	\$28,295	\$34,195	\$39,249	\$40,112
	May	\$23,648	\$30,132	\$56,691	\$45,651
	June	\$34,595	\$24,797	\$39,430	\$48,260
Q3	July	\$33,946	\$28,765	\$38,441	\$48,428
	August	\$27,909	\$36,898	\$33,266	\$61,516
	September	\$81,777	\$64,596	\$72,908	\$90,489
Q4	October	\$31,453	\$31,405	\$56,463	\$77,794
	November	\$78,629	\$75,973	\$82,192	\$112,326
	December	\$69,546	\$74,920	\$97,237	\$90,475

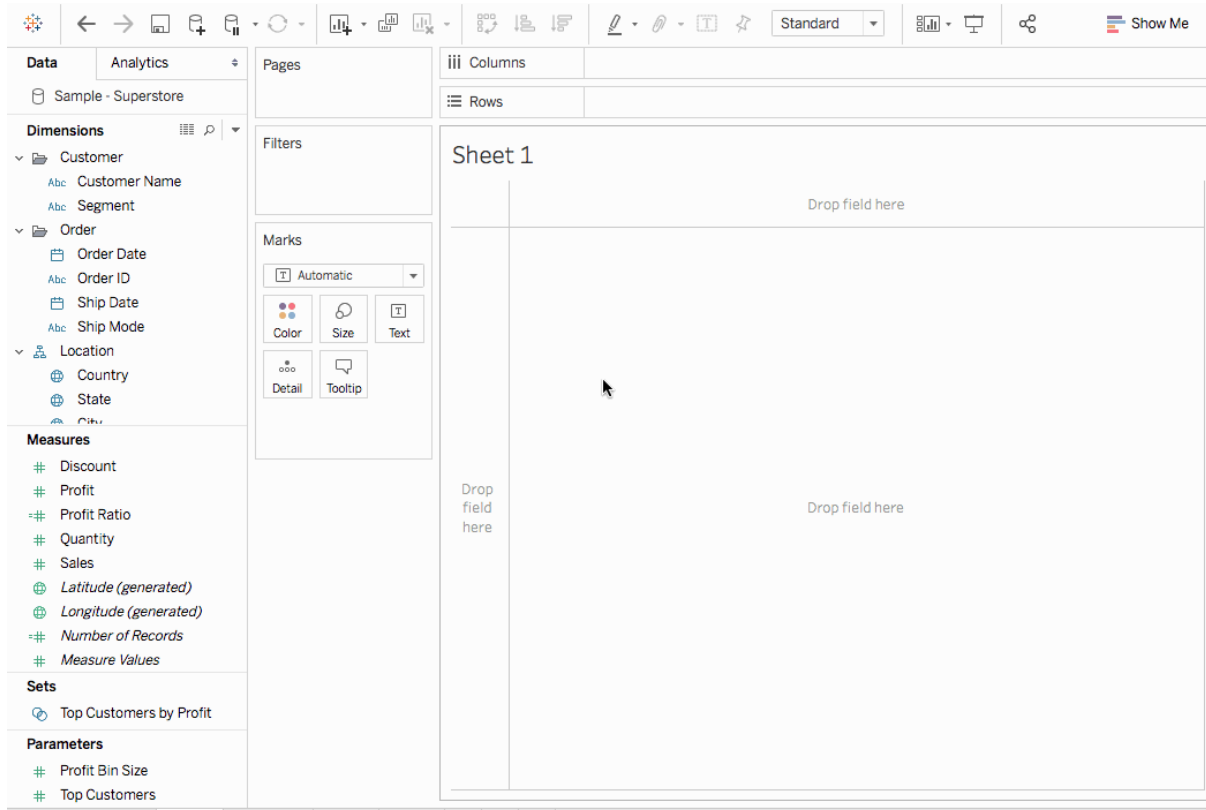
Step 2: Add the table calculation

- On the Marks card, right-click SUM(Sales) and select **Add Table Calculation**.
- In the Table Calculation dialog box that opens, do the following:
 - For **Calculation Type**: select **Difference From**.
 - For **Compute Using**, select **Table (across)**.

Note that as you select how to compute the calculation, the visualization updates with visual indicators to guide you.

- When finished, click the X in the top corner of the Table Calculation dialog box to exit it.

The calculation is applied to the values in the visualization.



Edit a table calculation

To edit a table calculation:

1. Right-click the measure in the view with the table calculation applied to it and select **Edit Table Calculation**.
2. In the Table Calculation dialog box that appears, make your changes.
3. When finished, click the X in the top corner of the Table Calculation dialog box to exit it.

Remove a table calculation

To remove a table calculation:

- Right-click the measure in the view with the table calculation applied to it and select **Clear Table Calculation**.

The table calculation is removed from the measure and the visualization updates with the original values.

Data Blending & Calculation

1. Data Blending is somewhat similar to joins where we take data from various sources and combine them together to form a graph.
2. It is basically an advanced version of SQL joins.
3. Diff Between Joins & Data Blend:
Data joins use any of the four joins available: Left, right, inner, outer whereas Data Blending basically stimulates a traditional Left Join only.
4. Limitations of Data Blending:
 - a. Sorting by field is unavailable for data blending measures.
 - b. Null Values appear after blending the data sources.
 - c. Reduces the speed of execution in large datasets.

Create Interactive Dashboards

1. Interactive Dashboard:

An interactive dashboard is a data management tool that tracks, analyses, monitors, and visually displays key business metrics while allowing users to interact with data, enabling them to make well-informed, data-driven, and healthy business decisions.

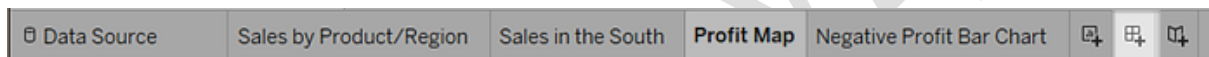
2. There are three common types of dashboards:

- Strategic
- Tactical
- Operational

Set up your dashboard

You want to emphasize that certain items sold in certain places are doing poorly. Your bar graph view of profit and your map view demonstrate this point nicely.

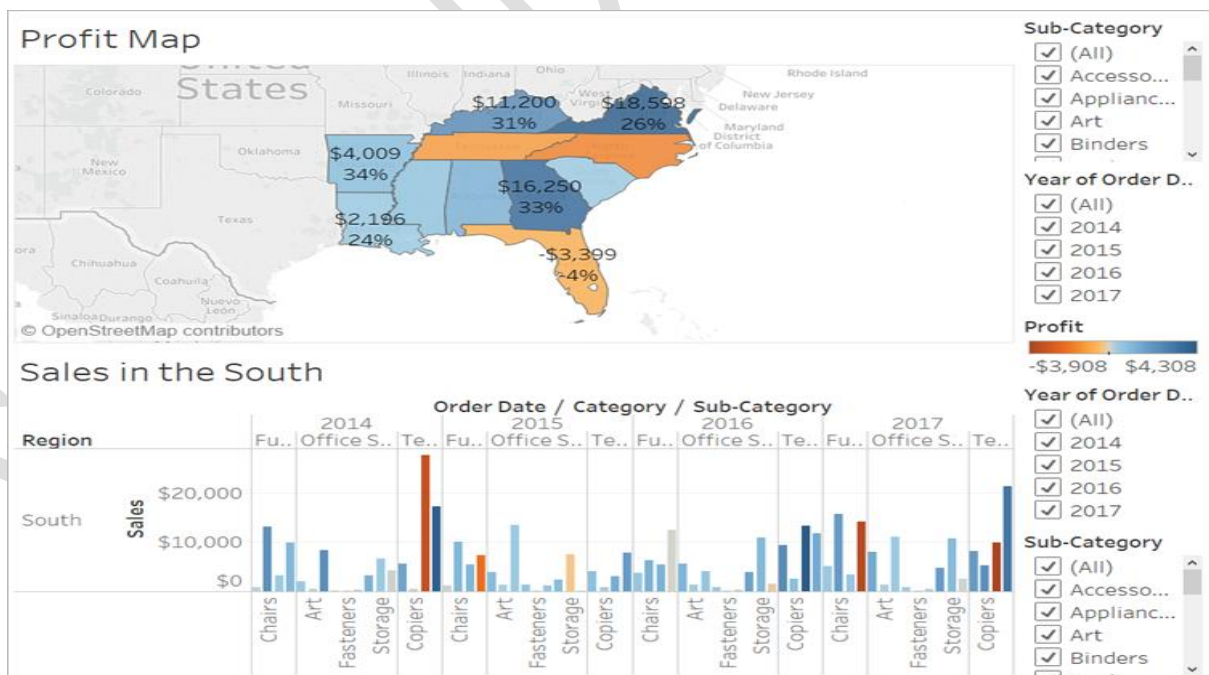
1. Click the **New dashboard** button.



2. From the Dashboard pane on the left, drag **Sales in the South** to your empty dashboard.

3. Drag **Profit Map** to your dashboard, and drop it on top of the Sales in the South view.

Your view will update to look like this:



Now you can see both views at once. Nice!

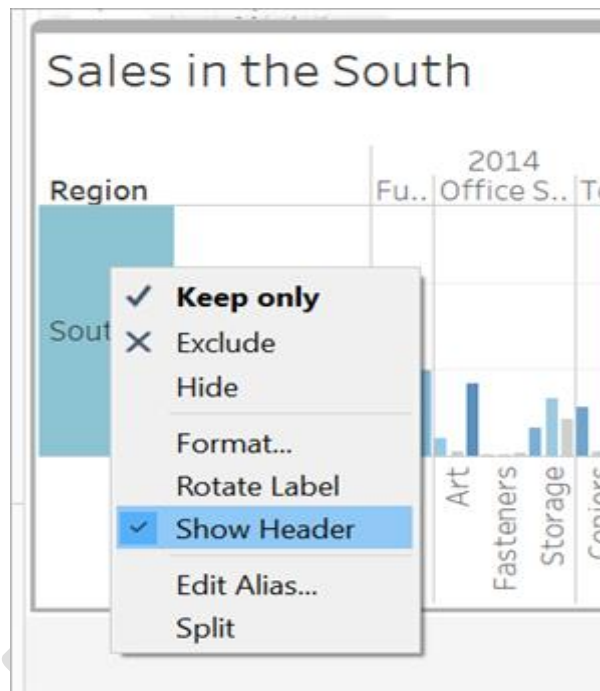
Sadly, the bar chart is a bit squished, which isn't helping your boss understand your data.

Arrange your dashboard

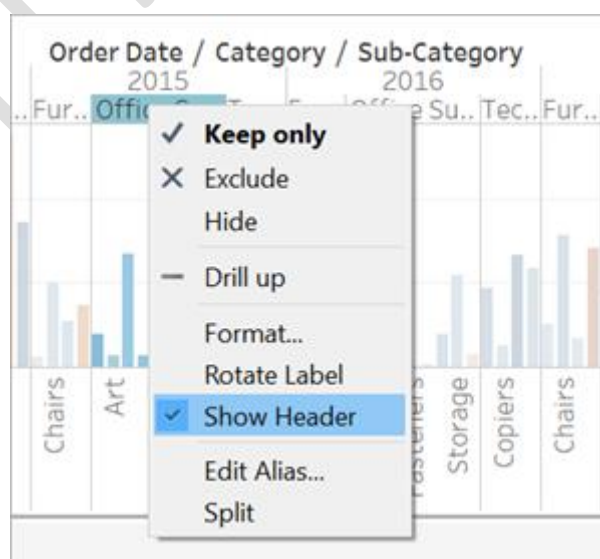
It's not easy to see details for each item in Sub-Category from your Sales in the South bar chart. Plus, because we have the map in view, we probably don't need the South region column in Sales in the South, either.

Resolving these issues will give you more room to communicate the information you need.

1. On Sales in the South, right-click in the column area under the **Region** column header, and clear **Show header**.




2. Repeat this process for the **Category** row header.



You've now hidden unnecessary columns and rows from your dashboard while preserving the breakdown of your data. Ah, the beauty of white space. (But, you could probably freshen things up even more.)

3. Right-click the **Profit Map** title and select **Hide Title**.

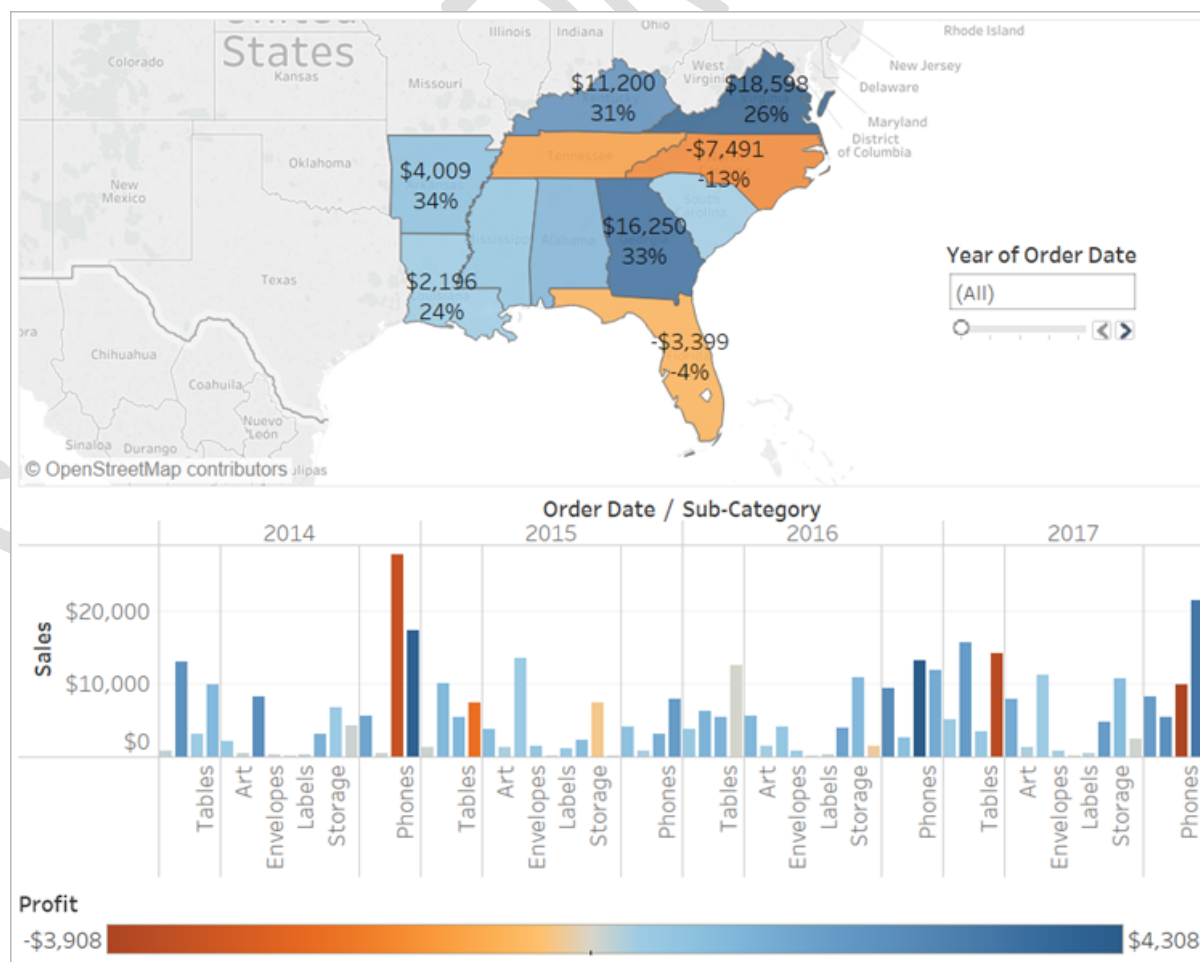
The title Profit Map is hidden from the dashboard and more space is created.

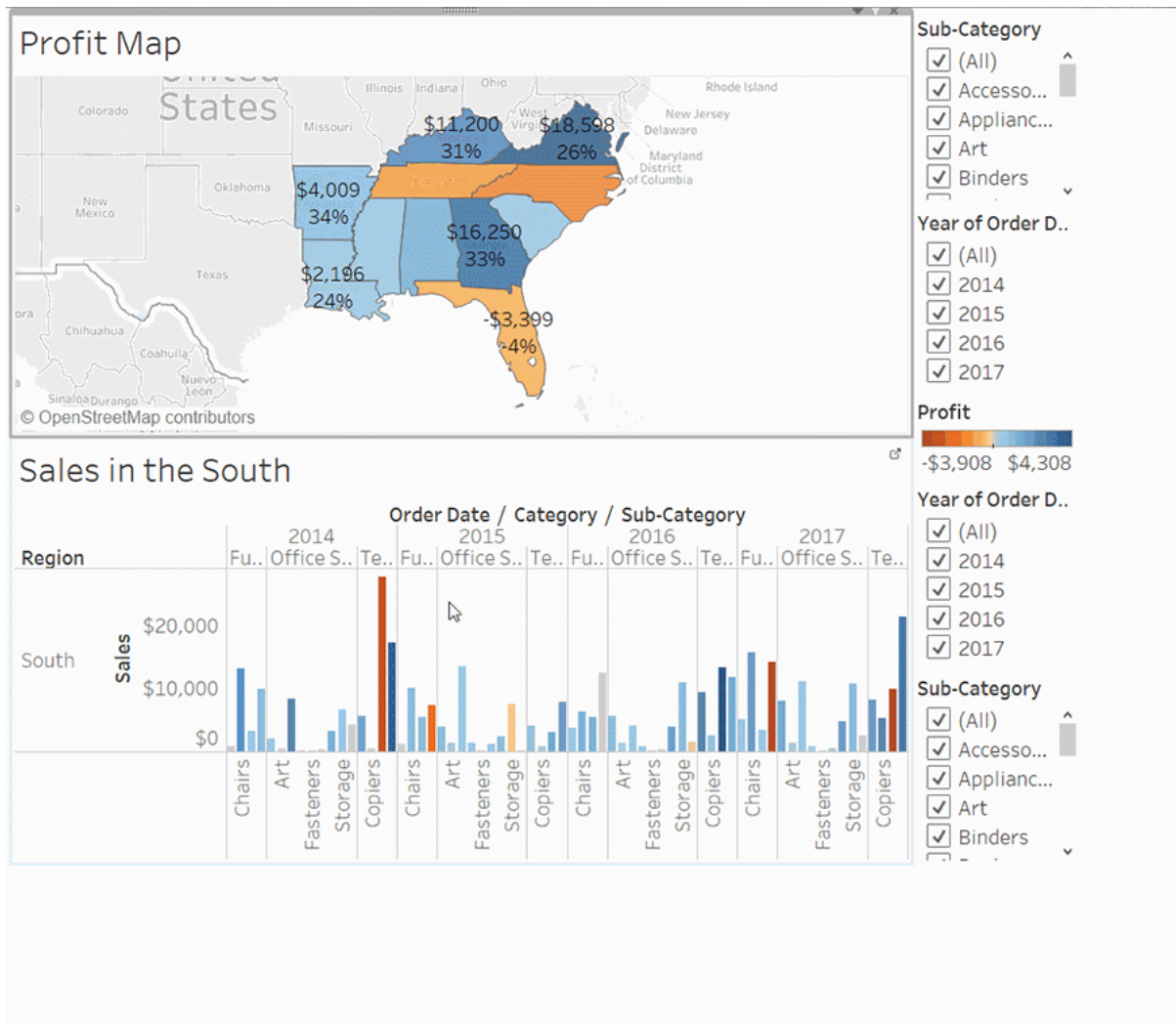
4. Repeat this step for the **Sales in the South** view title.
5. Select the first **Sub-Category** filter card on the right side of your view, and at the top of the card, click the **Remove** icon .
6. Repeat this step for the second **Sub-Category** filter card and one of the **Year of Order Date** filter cards.
7. Click on the **Profit color legend** and drag it from the right to below Sales in the South.
8. Finally, select the remaining **Year of Order Date** filter, click its drop-down arrow, and then select **Floating**. Move it to the white space in the map view. In this example, it is placed just off the East Coast, in the Atlantic Ocean.

Try selecting different years on the Year of Order Date filter. Ooh, your data is quickly filtered to show that state performance varies year by year. That's nice, but it could be made even easier to compare.

9. Click the drop-down arrow at the top of the **Year of Order Date** filter, and select **Single Value (Slider)**.


Your view updates to look like this:





Add interactivity

Wouldn't it be great if you could view which sub-categories are profitable in specific states?

1. Select **Profit Map** in the dashboard, and click the **Use as filter** icon  in the upper right-hand corner.
2. Select a state within the map.

The Sales in the South bar chart automatically updates to show just the sub-category sales in the selected state. You can quickly see which sub-categories are profitable.

3. Click outside of the U.S. to clear your selection.

You also want viewers to be able to see the change in profits based on the order date.

4. Select the **Year of Order Date** filter, click its drop-down arrow, and select **Apply to Worksheets > Selected Worksheets**.
5. In the Apply Filter to Worksheets dialog box, select **All in dashboard**, and then click **OK**.

This option tells Tableau to apply the filter to all worksheets in the dashboard that use this same data source.

Publish & share Dashboards

1. Tableau content can be published to tableau server or tableau Online.
2. An once published these tableau dashboards or workbooks ca be distributed to the end users via various options mentioned below.

All of these options have different capabilities, security models and requiremntnts.

3. Six Options for shareing Tableau workbooks & dashboards are:

1. Tableau server / Tableau Online
2. Tableau Mobile
3. Tableau Desktop
4. Tableau Reader
5. PDF
6. Image

Simple Steps to Publish a Workbook

When you want to share a workbook with your colleagues, you can publish it to Tableau Server or Tableau Online with a few simple clicks. There, other people can view it, interact with it, and even edit it if their server permissions allow.

Before you publish your workbook, make sure you know the following:

- The name of the server and how you sign in to it. If your organization uses Tableau Online, you can click the Quick Connect link.
- Any publishing guidelines your Tableau administrator might have, such as the name of the project you should publish to.

Publish your workbook

1. With the workbook open in Tableau Desktop, click the **Share** button in the toolbar.

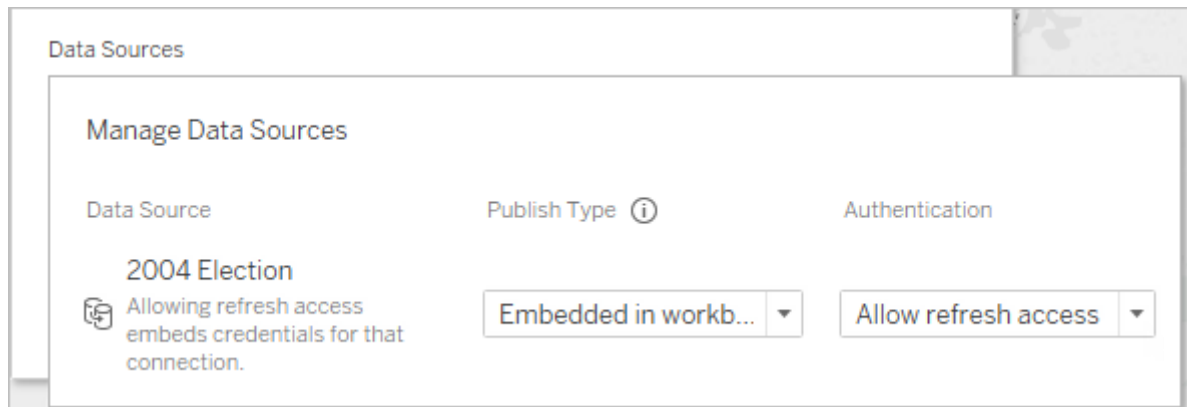


If you aren't already signed in to Tableau Server or Tableau Online, do so now. If you don't have a site yet, you can create one on Tableau Online.

2. In the Publish Workbook dialog box, select the project to publish to.

3. Name the workbook according to whether you're creating a new one or publishing over an existing one.
4. Under Data Sources, select **Edit**. For **Authentication**, select **Allow refresh access** or **Embed password**.

For some data connections, only one authentication option appears. If **None** shows, leave it set to that.



4. Click **Publish**.

Tableau Online – Use & Account Creation

1. For sharing the tableau content to end users it needs to be published before sharing.

For publishing tableau contents like Dashboards / workbooks we use Tableau server or Tableau Online.

2. Six steps for creating Tableau Online Account are :

1. Navigate to: <https://www.tableau.com>
2. Hover cursor on Products.
3. Click on Tableau Online.
4. Click on “LOG IN TO TABLEAU ONLINE”
5. Click on Sign Up to create your account and click on: “Try it for Free”.
6. Enter details to create your account.
7. Click on “Request free trial”.
8. You have successfully created your Tableau online account.

Sign In to Tableau Online

You can sign in to Tableau Online from a Tableau *client*. Examples of clients include a web browser, Tableau Desktop, Tableau Bridge, and Tableau Mobile. You can sign in to your site directly, or from a Tableau view embedded in a web page.

Sign-in options and steps

Depending on how your site administrator set up your Tableau Online site, you will use one of the following ways to sign in (these are also referred to as *authentication* types):

- **Single sign-on**

Single sign-on means that your administrator has set up the Tableau Online site so that you can use the same user name and password (*credentials*) you use for other applications in your company.

When you use single sign-on, your credentials are managed outside of Tableau Online by a third-party *identity provider*. When you enter your credentials to sign in to Tableau Online, it's the identity provider that lets Tableau Online know you are an approved user.

- **TableauID**

TableauID credentials are made up of an email address and password that you use for accessing your Tableau Online site. These credentials also give you access to other content on the Tableau website, such as on-demand training videos and white papers.

How to know which type of credentials your site uses

If your site administrator has set up the site to use TableauID, you will receive an email invitation to the site. When you click the link in the email, you can create your password. That email address and password become your TableauID.

If the site is set up for single sign-on credentials, generally your site administrator will notify you, and you use the same user name and password you do for signing in to other programs in your organization.

If you are not sure how the site is set up or which credentials to use, check with your Tableau Online site administrator.

To sign in (includes Tableau Online URL)

1. Do one of the following, depending on where you're signing in:

When signing in from:	Do this:
A web browser	Enter the Tableau Online URL into the address bar: https://online.tableau.com
Tableau Desktop, to publish or access content	Select Server > Sign In , and enter the Tableau Online URL: http://online.tableau.com
Tableau Desktop, to sign in to Tableau Bridge	Select Server > Start Tableau Bridge Client .
Tableau Mobile app	Tap Sign In , and then tap Connect to Tableau Online .

2. On the Tableau Online sign-in page, do one of the following:

- If your site is set up to use single sign-on, enter your user name.

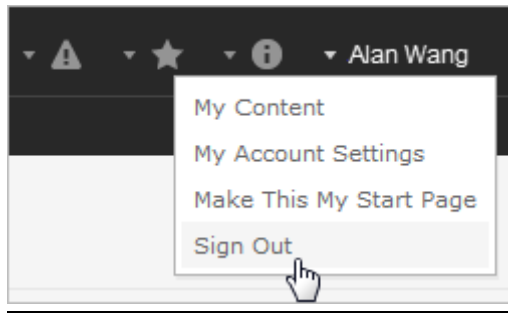
You are directed to the sign-in form for the identity provider. Enter your user name again and your password. The third party will authenticate you and direct you back to Tableau Online.

- If your site is set up to use TableauID authentication, enter the user name (email address) and password you use for Tableau Online.

If your administrator has added you to multiple Tableau Online sites, you are prompted to select a site.

To sign out

To sign out, select your display name in the upper-right corner of any page, and then select **Sign Out**.



If your site uses single sign-on, and you do not see a Sign Out link, close the browser tab or window. The Sign Out link does not appear if your site and the identity provider that manages your company's user information are not configured to support single log-out.

Remembering your sign-in credentials

If you want Tableau Online to remember your user name, select the **Remember me** check box when you sign in. The next time you sign in, Tableau enters your user name. You still need to type your password.

Connected clients

Your site administrator has the option to allow direct sign-in from approved Tableau clients. For examples of clients, see this topic's introduction.

After you sign in successfully from a recognized client, Tableau stores your credentials in a secure token that remembers your connection with Tableau Online. When this token is in place, you can access your Tableau Online site directly, without having to sign in.

Clearing saved sign-ins

- If you want to disconnect from your site, you can explicitly sign out from the connected client. For example, in Tableau Desktop, select **Server > Sign Out**.
- To remove all existing server connections from Tableau Desktop, select **Help > Settings and performance > Clear saved server sign-ins**.