1. Basics:

1. What is the difference between Discrete and Continuous Data?

BASIS FOR COMPARISON	DISCRETE DATA	CONTINUOUS DATA
Meaning	Discrete data is one that has clear spaces between values.	Continuous data is one that falls on a continuous sequence.
Nature	Countable	Measurable
Values	It can take only distinct or separate values.	It can take any value in some interval.
Graphical Representation	Bar Graph	Histogram
Tabulation is known as	Ungrouped frequency distribution.	Grouped frequency distribution.
Classification	Mutually Inclusive	Mutually Exclusive
Function graph	Shows isolated points	Shows connected points
Example	Days of the week	Market price of a product

2. What is the criteria for data to land into dimensions and measures?

Dimensions:- contain qualitative values (such as names, dates, or geographical data). You can use dimensions to categorize, segment, and reveal the details in your data. Dimensions affect the level of detail in the view.

Measures:- contain numeric, quantitative values that you can measure. Measures can be aggregated. When you drag a measure into the view, Tableau applies an aggregation to that measure (by default)

3. What is Metadata, where is it present in the workbook?

At the core of Tableau is data - your data. Your data can come in different formats and structures, categorized at varying levels of detail, and can have relationships with other data.

This is the kind of metadata that you can expect to surface from the Metadata API using GraphQL.
To successfully create effective GraphQL queries, you need to understand how Tableau interprets and interacts with content and assets. Understanding this can inform the most efficient way for you to access metadata at the level of detail that you need.
Because the Metadata API uses GraphQL, this section describes the fundamental objects that are available to you to use in a GraphQL query.

4. What happens when you aggregate or disaggregate the Data?

Aggregate:- functions perform a calculation on a set of values and return a single value.

For example, if you have 3,000 sales transactions from 50 products in your data source, you might want to view the sum of sales for each product, so that you can decide which products have the highest revenue.

Disaggregating:- means that Tableau will display a separate mark for every data value in every row of your data source. Disaggregating your data can be useful for analyzing measures that you may want to use both independently and dependently in the view.

For example**,** you may be analyzing the results from a product satisfaction survey with the Age of participants along one axis. You can aggregate the **Age** field to determine the average age of participants or disaggregate the data to determine at what age participants were most satisfied with the product.

5. You are working on a dataset, the client adds in more data to the dataset. What happens to the Visualization that you had created? Give the explanation for both Live and Extracted data.

Live Data:- Whatever changes they will have done in dataset that will be directly available to the tableau. Live connections offer the convenience of real-time updates, with any changes in the data source reflected in Tableau.

Extracted Data:- Whatever changes they will have done in dataset those change will not be reflected immediately. extract will need to be refreshed to receive updates from the original data source, whether it is a local file or an on-premise database.

6. What are the file extensions in Tableau and how each one is different?

Workbooks (.twb) – Tableau workbook files have the .twb file extension. Workbooks hold one or more worksheets, plus zero or more dashboards and stories. **When we work with live connection the we have to go with .twb file extension**

Bookmarks (.tbm) – Tableau bookmark files have the .tbm file extension. Bookmarks contain a single worksheet and are an easy way to quickly share your work.

Packaged Workbooks (.twbx) – Tableau packaged workbooks have the .twbx file extension. A packaged workbook is a single zip file that contains a workbook along with any supporting local file data and background images. This format is the best way to package your work for sharing with others who don't have access to the original data. **When we work with extract connection the we have to go with .twbx file extension**

Extract (.hyper or .tde) – Depending on the version the extract was created in, Tableau extract files can have either the .hyper or .tde file extension. Extract files are a local copy of a subset or entire data set that you can use to share data with others, when you need to work offline, and improve performance.

Data Source (.tds) – Tableau data source files have the .tds file extension. Data source files are shortcuts for quickly connecting to the original data that you use often. Data source files do not contain the actual data but rather the information necessary to connect to the actual data as well as any modifications you've made on top of the actual data such as changing default properties, creating calculated fields, adding groups, and so on.

Packaged Data Source (.tdsx) – Tableau packaged data source files have the .tdsx file extension. A packaged data source is a zip file that contains the data source file (.tds) described above as well as any local file data such as extract files (.hyper or .tde), text files, Excel files, Access files, and local cube files. Use this format to create a single file that you can then share with others who may not have access to the original data stored locally on your computer.

2. Text Table, Highlight Tables, Heat Maps, Tree Map:

1. Create a text table for the Avg (Sales) for each subcategory using Sample Superstore? List which Sub Category is got Avg (Sale) more than $1000? - **Sample Superstore**
2. Create a Heat Table for the order date and Region against the Sub Category based in Count of Sales with two colours diverging that is distinguished by Sum of Profit - **Sample Superstore**
3. Create a Highlight table for the States for the Order Date Year whose highlighting is done based on Sum of profits - **Sample Superstore**
4. Which customer is having maximum of sales in the year 2012? - **Global Superstore**
5. How much is profit share less in Pennsylvania when compared to New York? - **Sample Superstore**
6. Check for the pane wise percentages of sales with Category, Sub- Category and quarter wise order date, also check for the Row wise grand totals and Column wise grand totals. - **Sample Superstore**

3. Filled Maps, Symbol Maps:

1. Use Global Superstore. Check Which Western Country in EMEA region has least profit percentage.
2. Use **"Sample Superstore. Xls",** which state shares boarders only profit for tables
3. Use **"Sample Superstore. Xls",** which state has no data for Profits for Office Supplies

4. Bar Charts, Stacked, Side by Side:

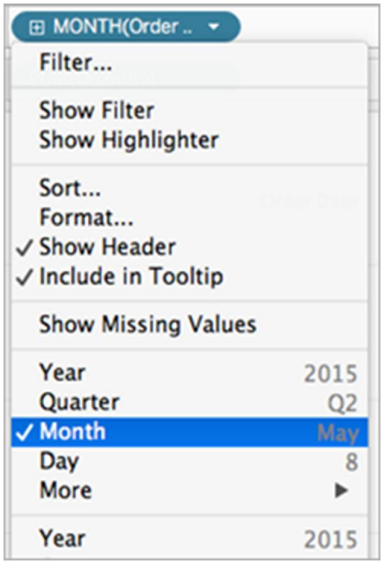
1. Which Customer name & Year is having all the Product Categories sum of profit less than over-all Average profit? - **Sample Superstore**
2. What is the Maximum of Life Expectancy Female for the region Africa & year 2012? - **World Indicators**
3. What is the share of the top 20 customers based on the sales amount compared to the customers based on profit amounts - **Sample Superstore**

5. Line Graphs, Dual Line, dual axis:

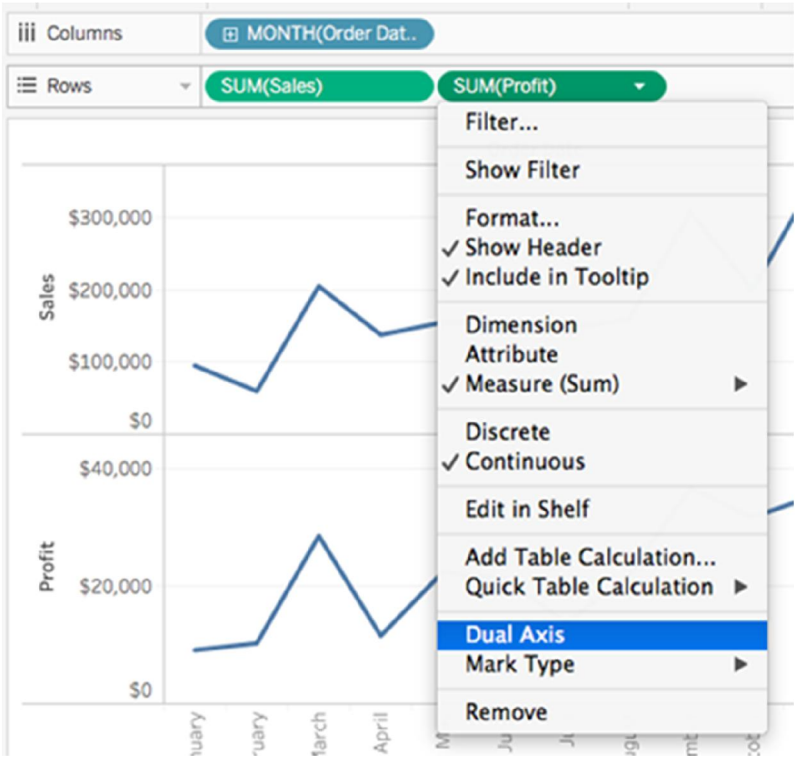
1. How can you show two different graphs in one view? - **Global Superstore**

To create a combination chart, follow the steps below:

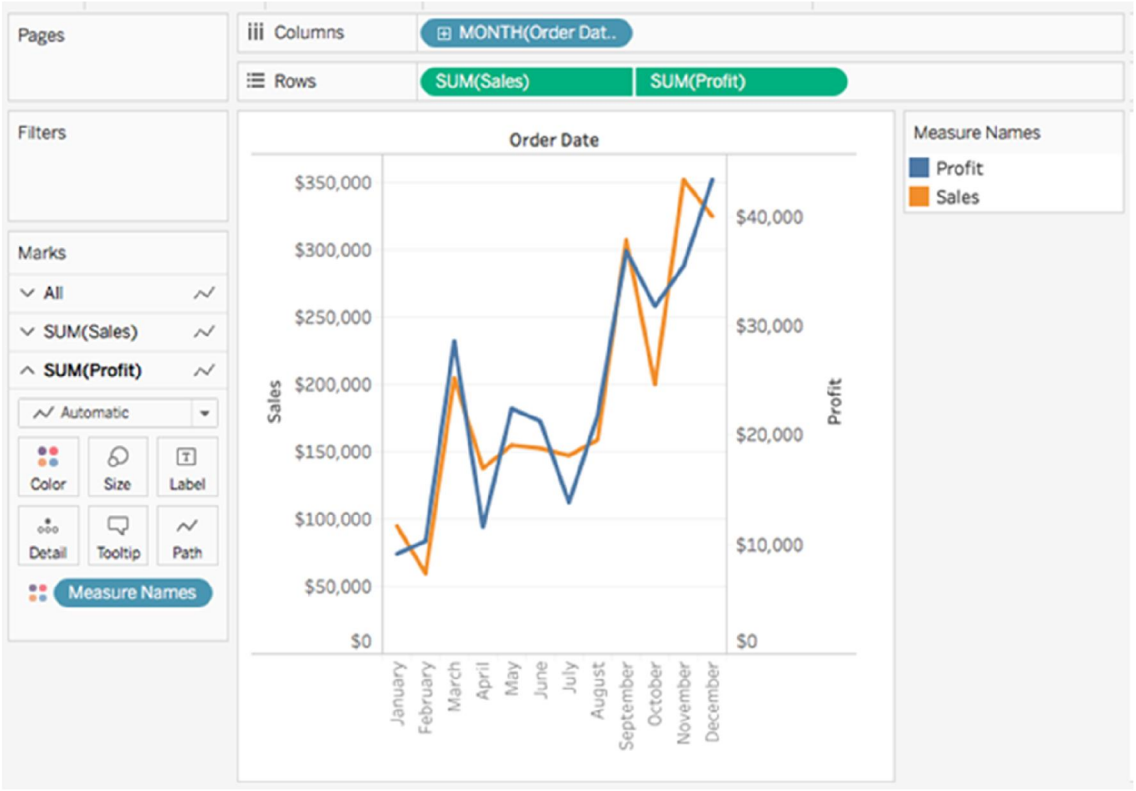
1. Open Tableau Desktop and connect to the **Sample - Superstore** data source.
2. Navigate to a new worksheet.
3. From the **Data** pane, drag **Order Date** to the **Columns** shelf.
4. On the Columns shelf, right-click **YEAR(Order Date)** and select **Month**.



5. From the **Data** pane, drag **Sales** to the **Rows** shelf.
6. From the **Data** pane, drag **Profit** to the **Rows** shelf and place it to the right of SUM(Sales).
7. On the Rows shelf, right-click **SUM(Profit)** and select **Dual-Axis**.

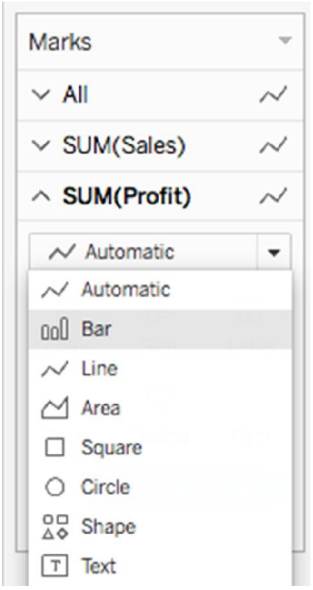


The view updates. Measure Names is added to Color on the Marks card to differentiate the lines.

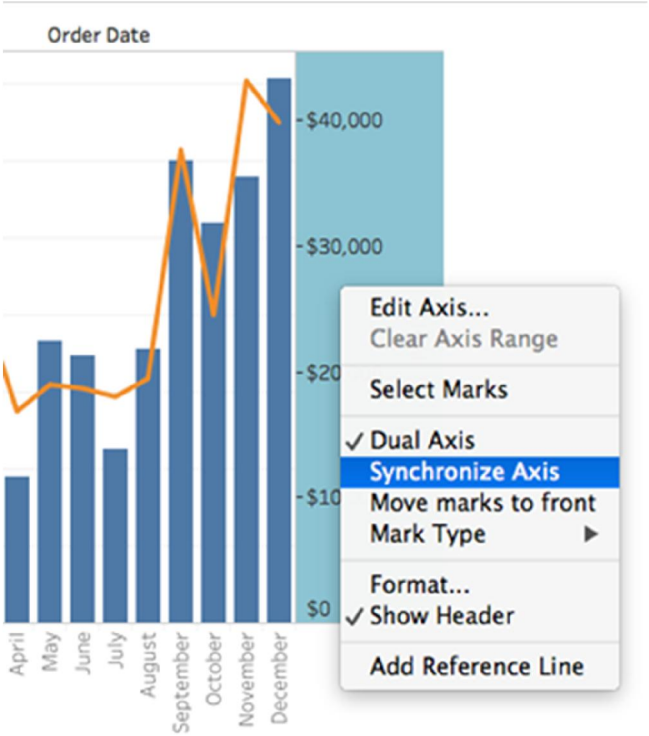


Note: Some marks can be hidden behind others. To move the marks forward or backward, right-click one of the axes in the visualization and select Move Marks to Back or Move Marks to Front.

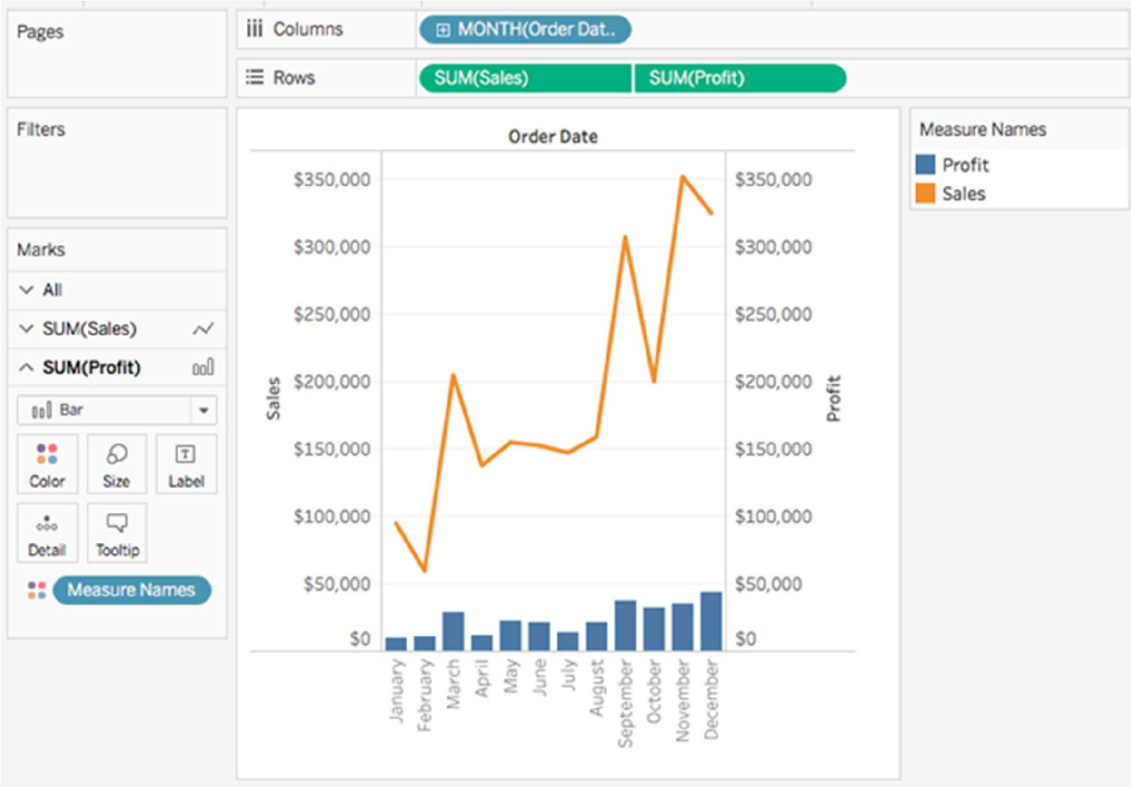
8. On the SUM(Profit) Marks card, click the Mark Type drop-down and select **Bar**.



9. In the visualization, right-click the **Profit** axis and select **Synchronize Axis**.



The view updates to look like this:



2. Which Region is having Sum of Energy Usage>1000000 and sum of Population 65+>10? - **World Indicators**

6. Trendlines, Cluster, scatter Plot, boxplot, Word Cloud (Packed Bubbles), Histogram:

1. Draw a trend line for profit as a linear function of sales only for product technology? - **Sample Superstore**
2. Create a histogram showing the number of Sales using Sales Bins of $1000. Which bins have profit ratios of more than 25%? - **Global Superstore**
3. Using "**Sample Superstore"**, use order sheet create a histogram showing the number of orders using sales bins of $1000.
4. Using **"Global Superstore**", use the orders sheet, build a scatter plot showing the sum of sales on the x-axis and sum of profits on the y axis for all products (Product name). What is the equation for linear regression for products in Technology?
5. Use **"World Indicators".** Take Health Exp% GDP, Health Exp/Capita, Life Expectancy Male, Female. What are the variables that are considered to create the clusters by default?

7. Calculate Fields, Quick table calculations, LOD:

1. How do you create a profit ratio using the Calculated fields?

Step 1: Create the calculated field

In a worksheet in Tableau, select **Analysis** > **Create Calculated Field**.

In the Calculation Editor that opens, give the calculated field a name.

In this example, the calculated field is called Profit Ratio.

Step 2: Enter a formula

In the Calculation Editor, enter a formula.

This example uses the following formula:

```
SUM([Profit])/SUM([Sales])
```

Formulas use a combination of functions, fields, and operators.

When finished, click **OK**.

The new calculated field is added to the Data pane. If the new field computes quantitative data, it is added to Measures. If it computes qualitative data, it is added to Dimensions.

You are now ready to use the calculated field in the view.

2. Global Superstore data set; Region wise year wise sales are ranked. What is the rank of some country when compared to last year?
3. What percent of total profits do the top 10 customers by Sales represent? - **Sample Superstore**
4. Find the customer with the lowest overall profit. What is his/her profit ratio? - **Sample Superstore**
5. Ranking States based on Sales what is the rank of state which has sales crossed $20000. - **Sample Superstore**
6. What is the percent of orders which took more than 7 days on an average to deliver.
7. Use **"World Indicators".** Without using table calculations what is the proper syntax to build a calculated field which will display overall total GDP on this view?

8. Filters:

1. What are the different types of filters and give their working order?

Types of Filters:

The filters can be applied in a worksheet to restrict the number of records present in a dataset. Various types of filters are used in Tableau Desktop based on different purposes. The different types of filters used in Tableau are given below. The name of filter types are sorted based on the order of execution in Tableau.

1. Extract Filters
2. Data Source Filters
3. Context Filters
4. Dimension Filters
5. Measure Filters

Extract Filters:

Extract filters are used to filter the extracted data from data source. This filter is utilized only if the user extracts the data from data source.

Once the text file is connected to Tableau, you can see the live and extract option in the top right corner of data source tab. Live Connection directly connects to a data source. Extract connection extracts the data from data source and creates a local copy in Tableau repository. The procedure for creating an extracting filter is given as follows.

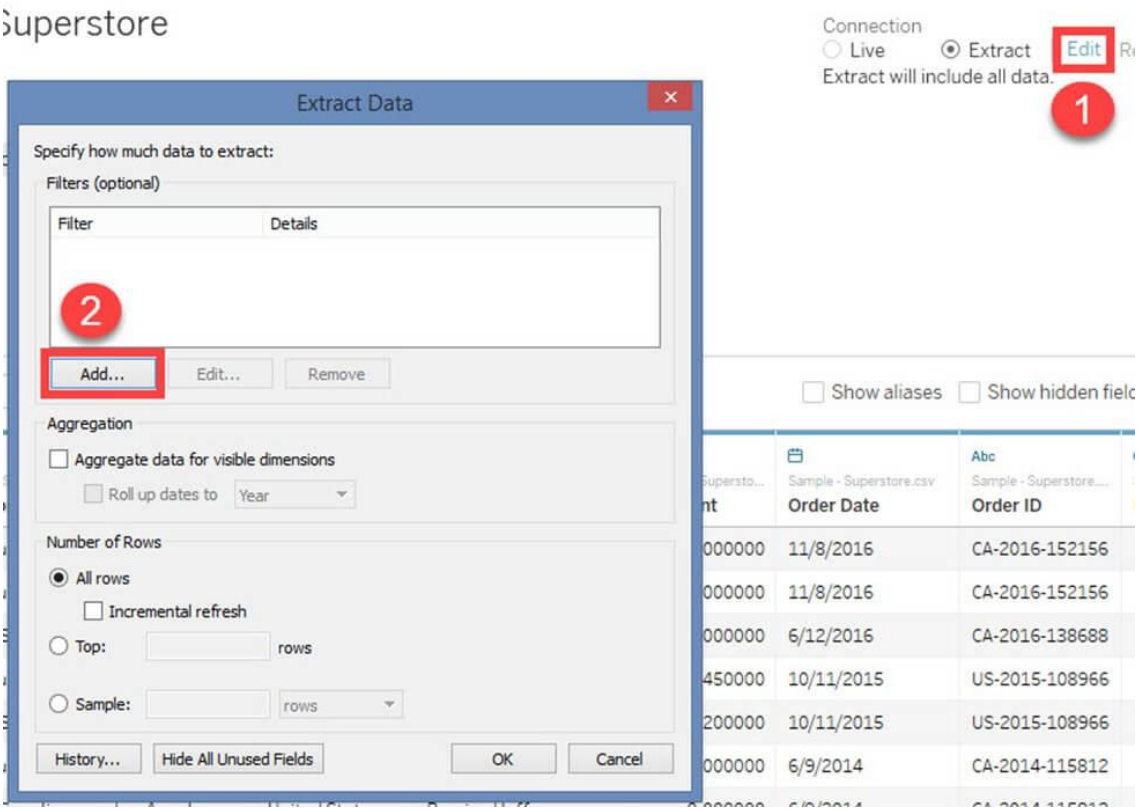
Step 1) After connecting the text file into Tableau,

- Click on “Extract” radio button as shown in the figure.

This will create a local copy in Tableau repository.

Step 2) Next**,**

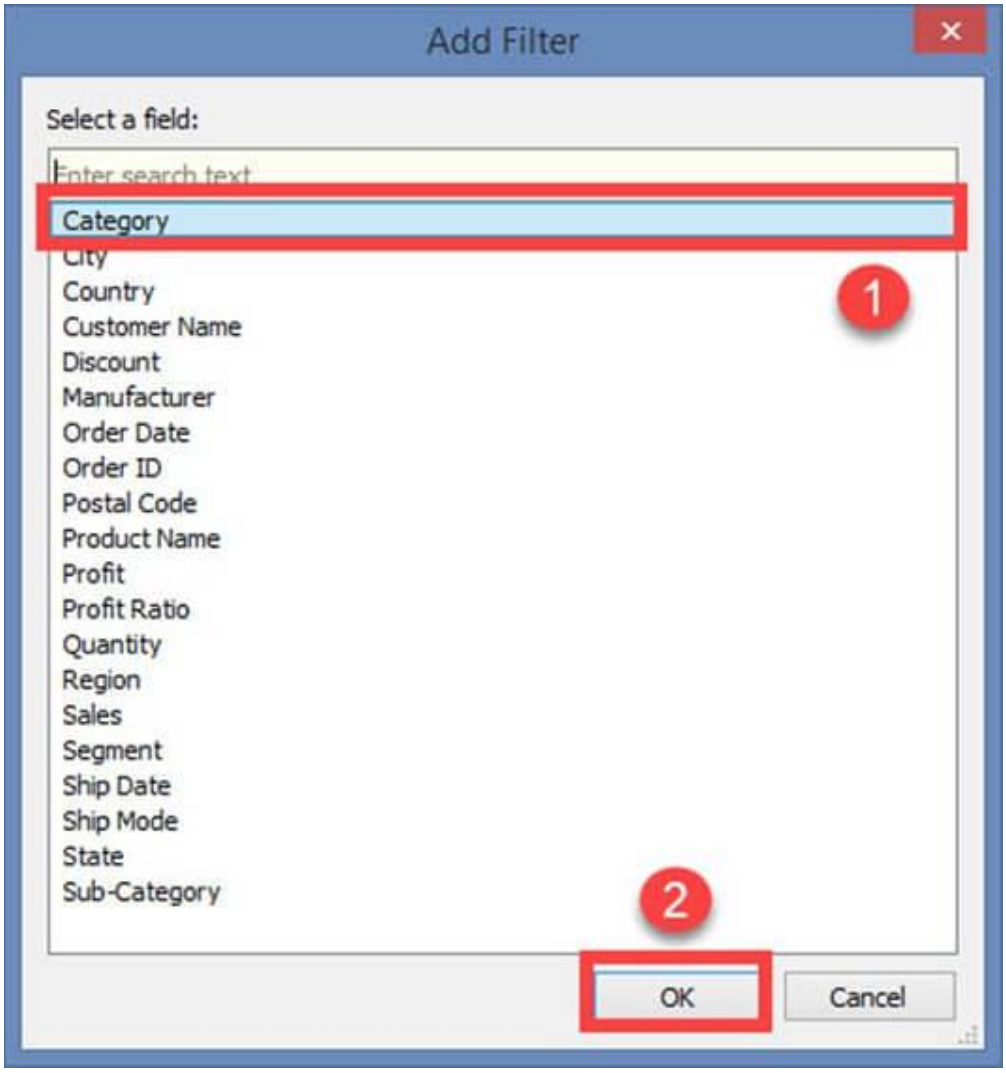
1. Click on the ‘Edit’ option placed near to Extract button.
2. It opens “Extract data” window. Click on ‘Add’ option present in the Window.



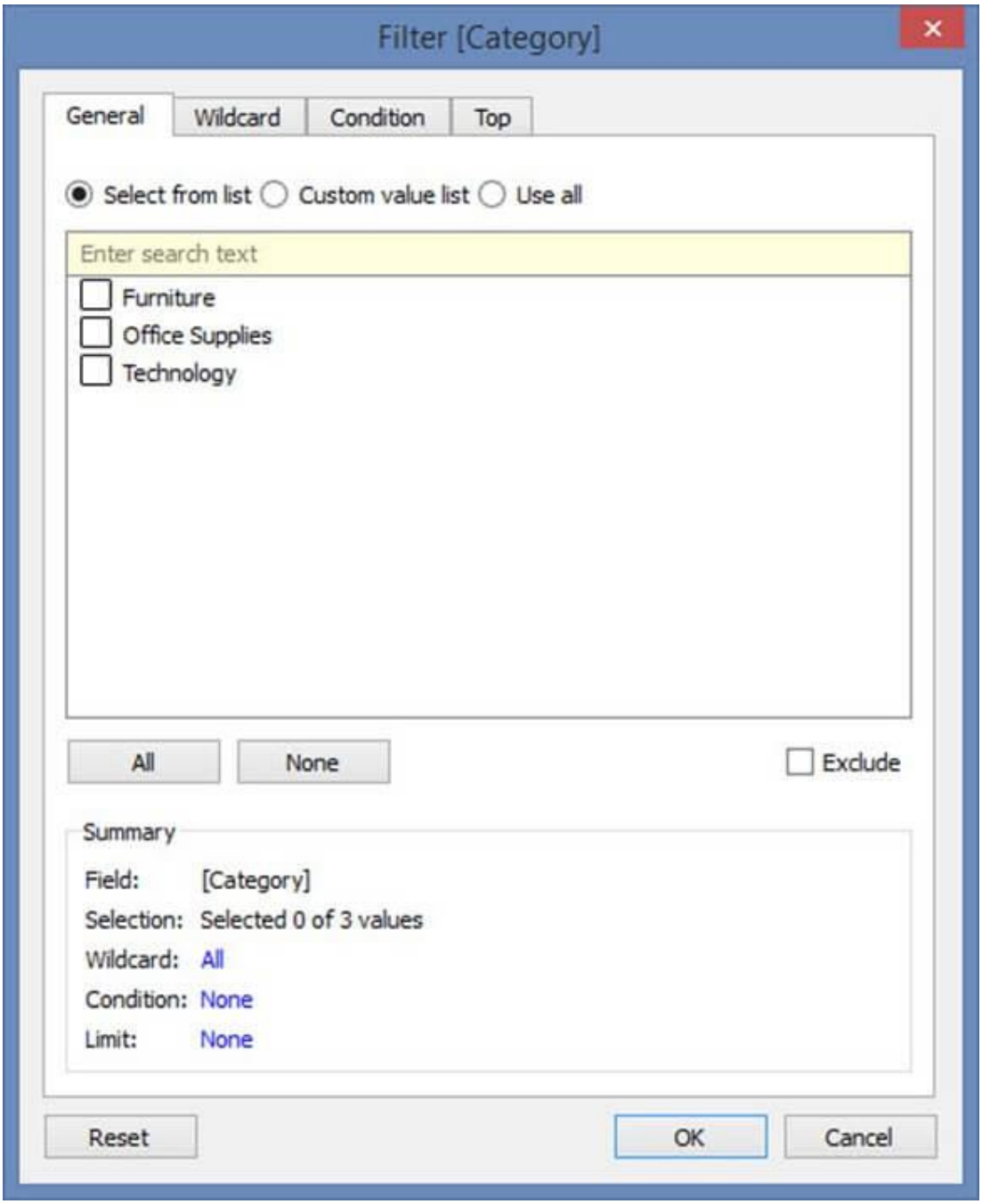
Step 3) "Add Filter" Window is open to select the filter conditions.

You can choose any of the fields and add as extract filter. In this example, we have selected'Category' as extract filter.

1. Select 'Category' from the list
2. Click on 'OK.'



Once you click on OK button, it opens a filter window.



The filter window has multiple options to filter 'Category' based on various use case. All the use cases and its filter conditions are explained below.

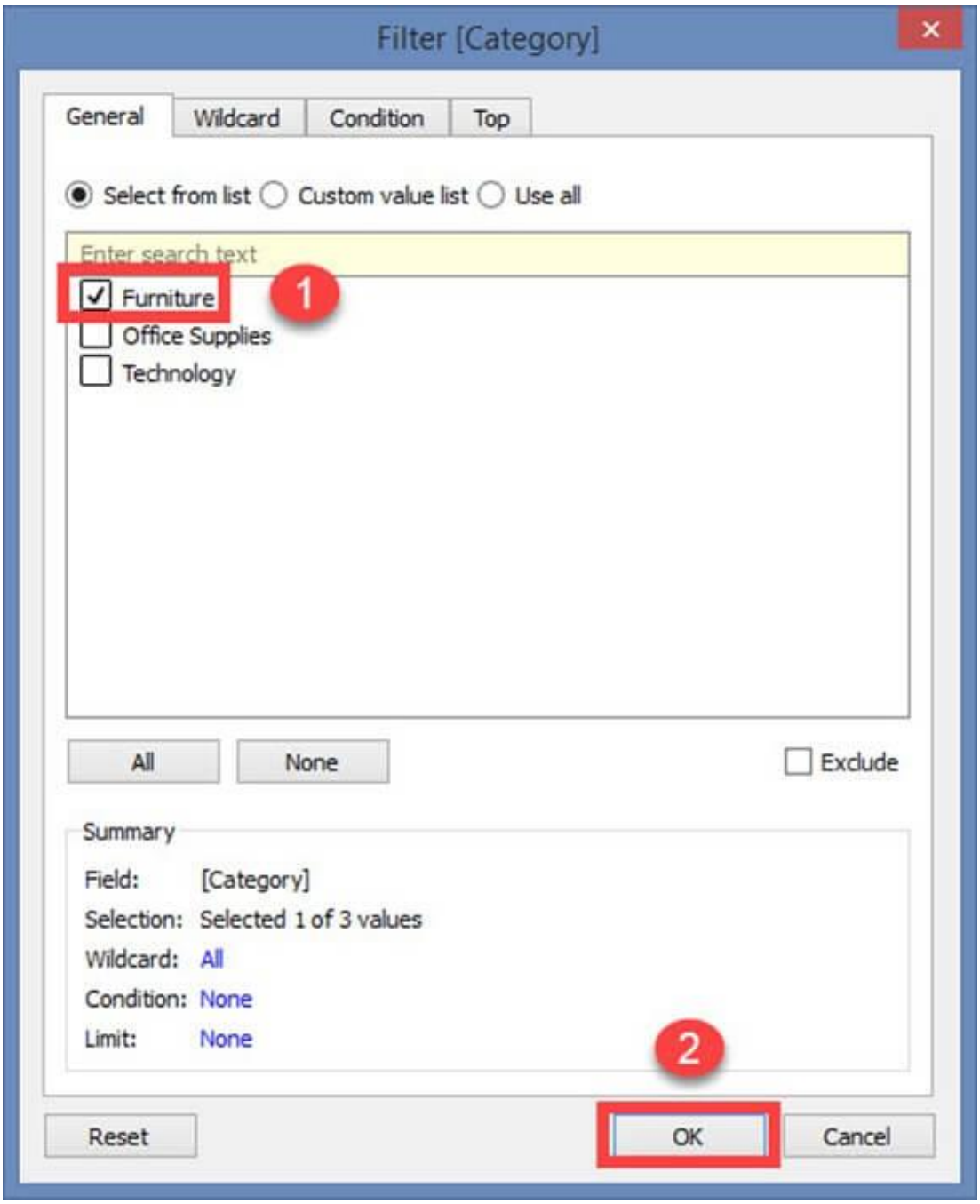
Filter condition in Tableau

Use Case 1: Select from List

By default, filter window opens the "Select from List" option. You can include or exclude the members present in the field using this option.

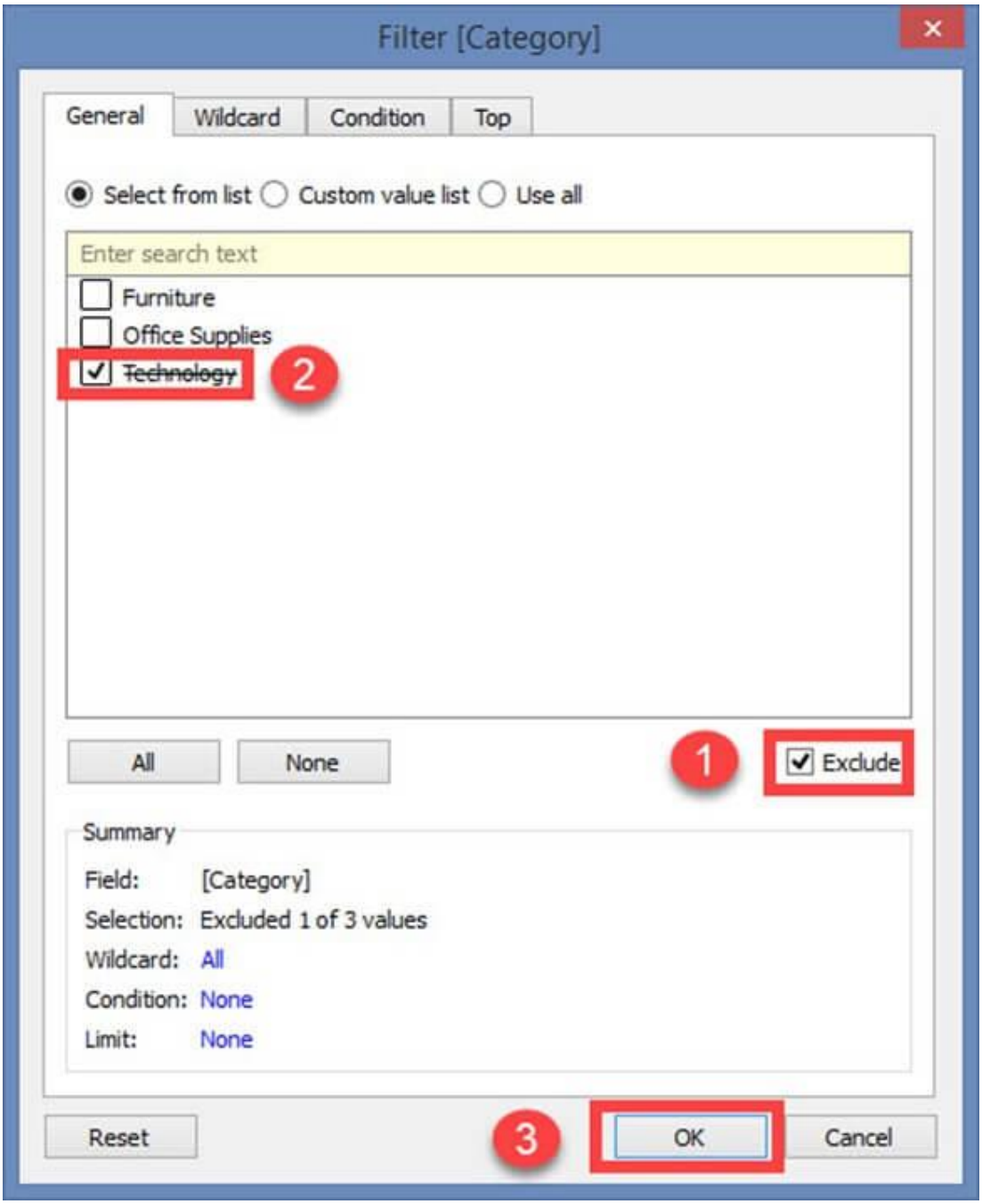
To include you can

1. Select the members
2. Click on OK.



To exclude the selected members,

1. Click on exclude checkbox
2. Select the members to exclude
3. Click on OK.



There are two more option in the “Select from List”.

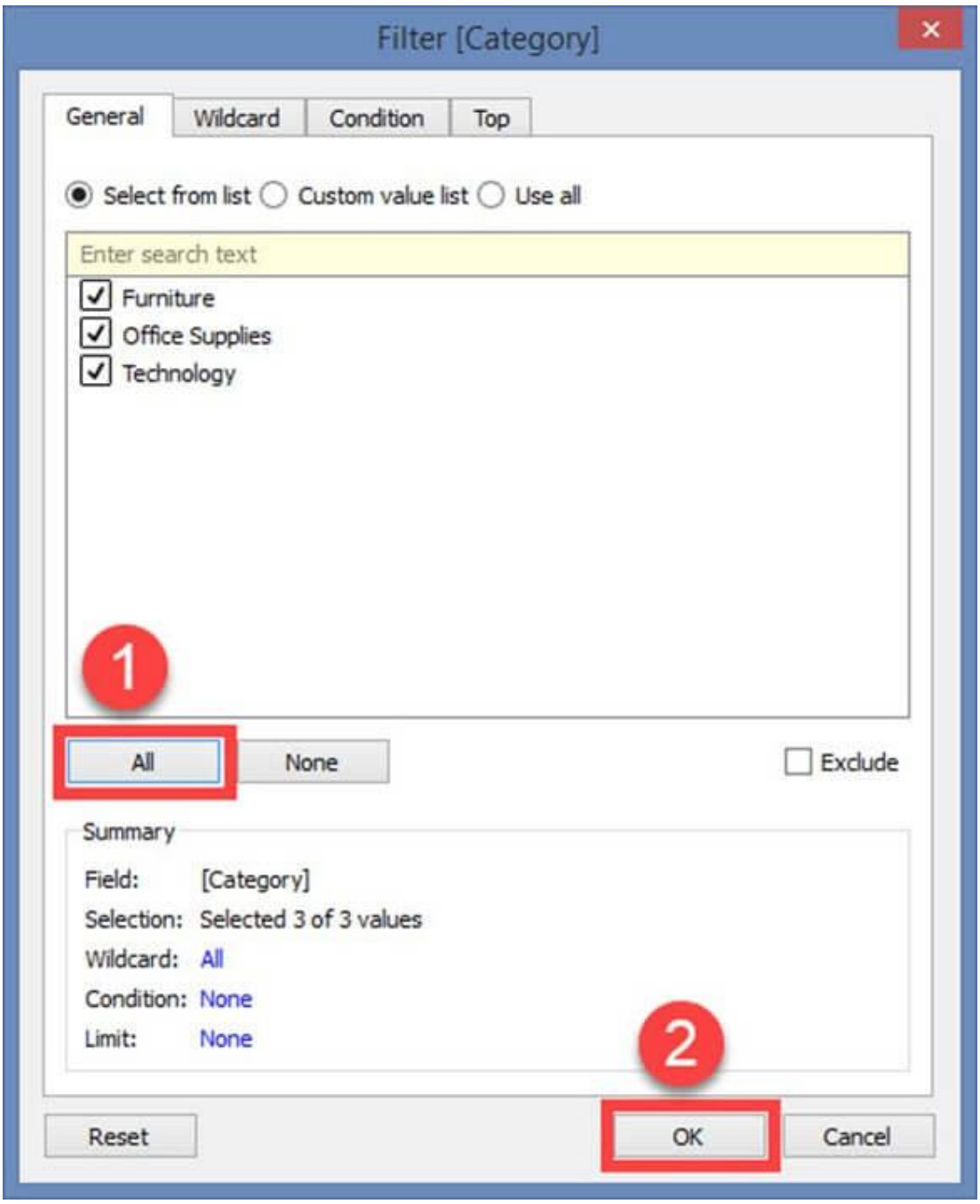
1. All
2. None

All:

This option includes or excludes all members present in the field. In this example, all members are included by clicking on “All” option.

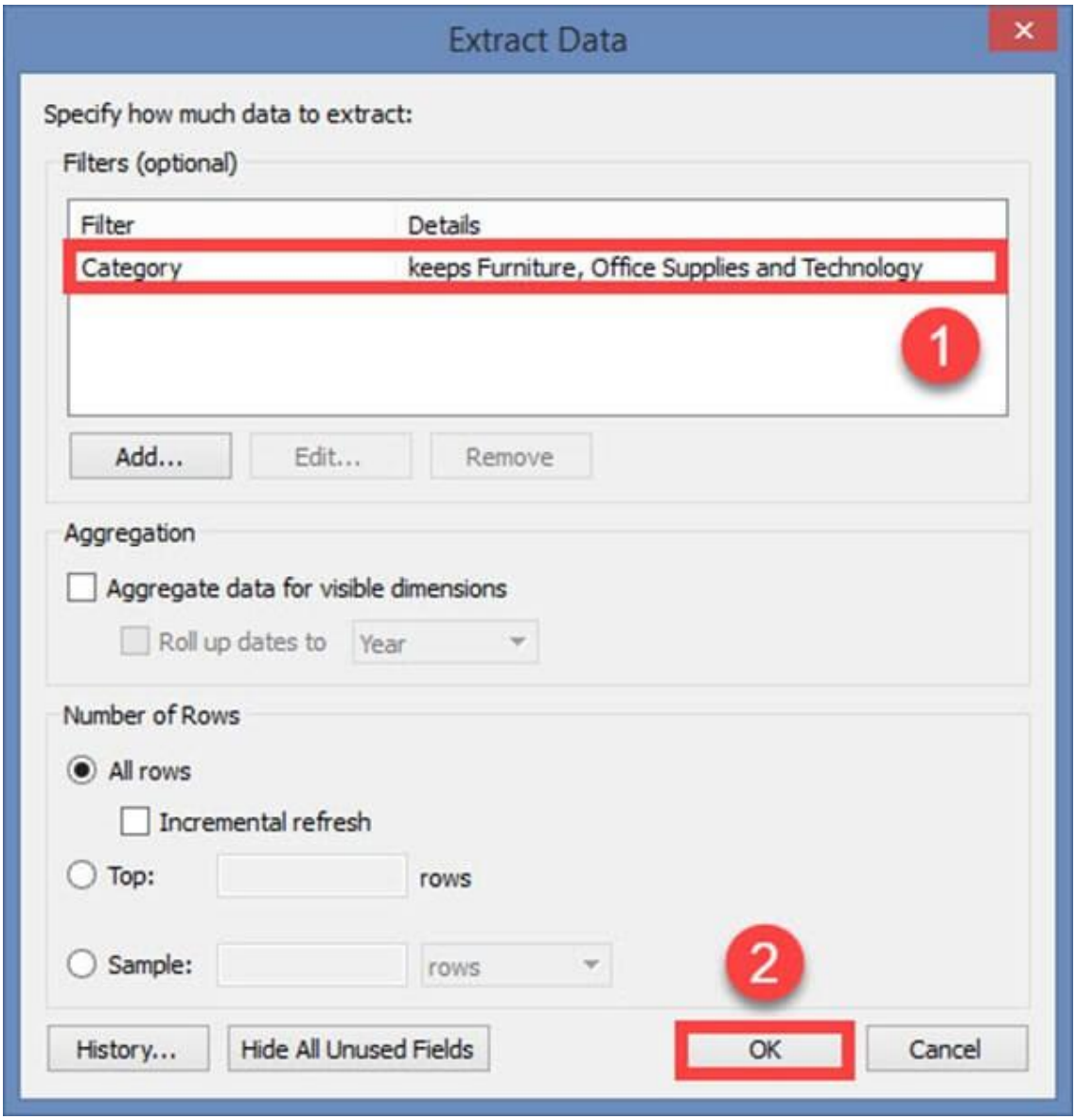
Step 1)

1. Select ‘All’ option.
2. Click on OK

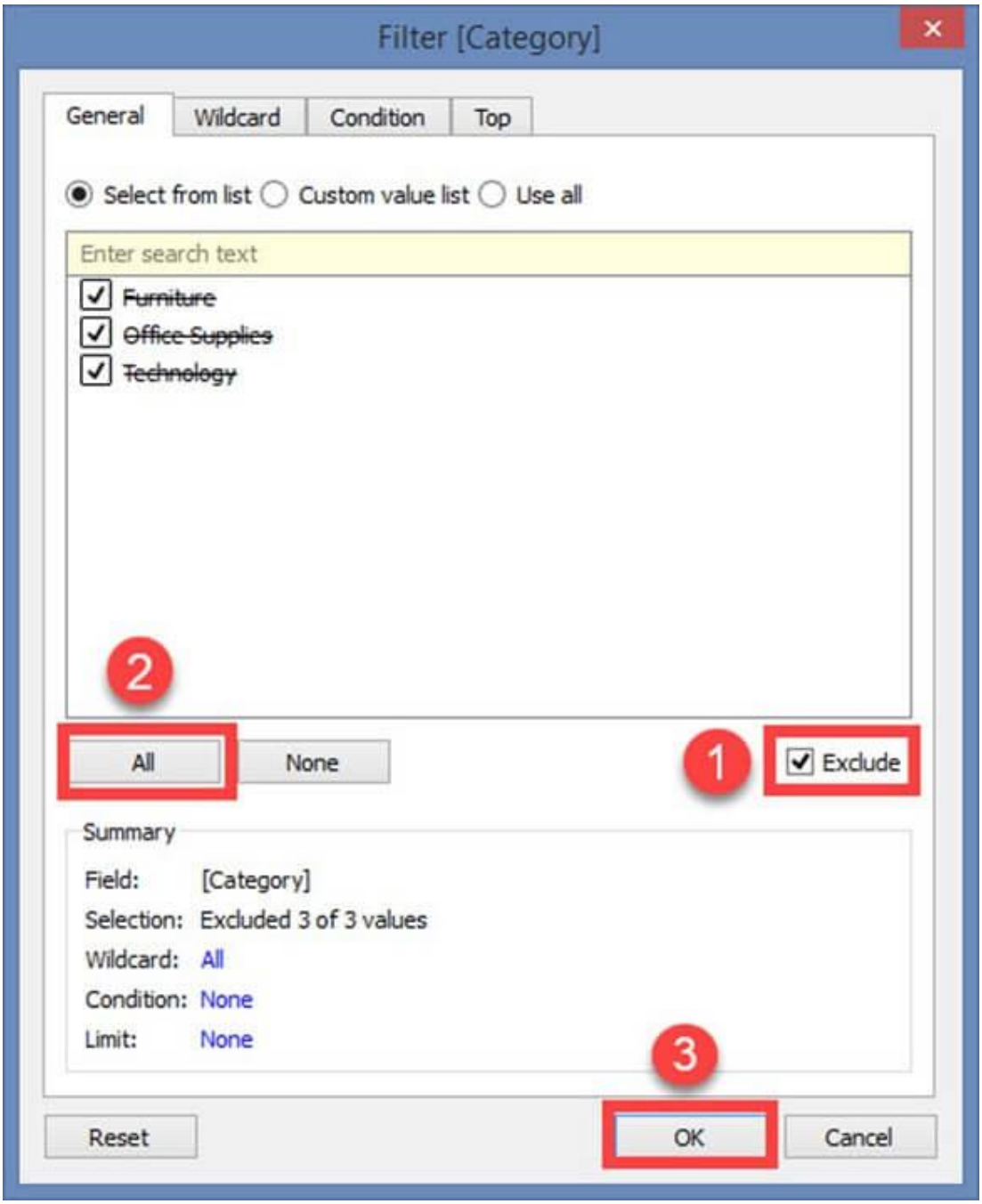


Step 2) Next**,**

1. It shows extract data filter. The filter condition is also added in the extract filter window.
2. Click on OK to add the extract filter.



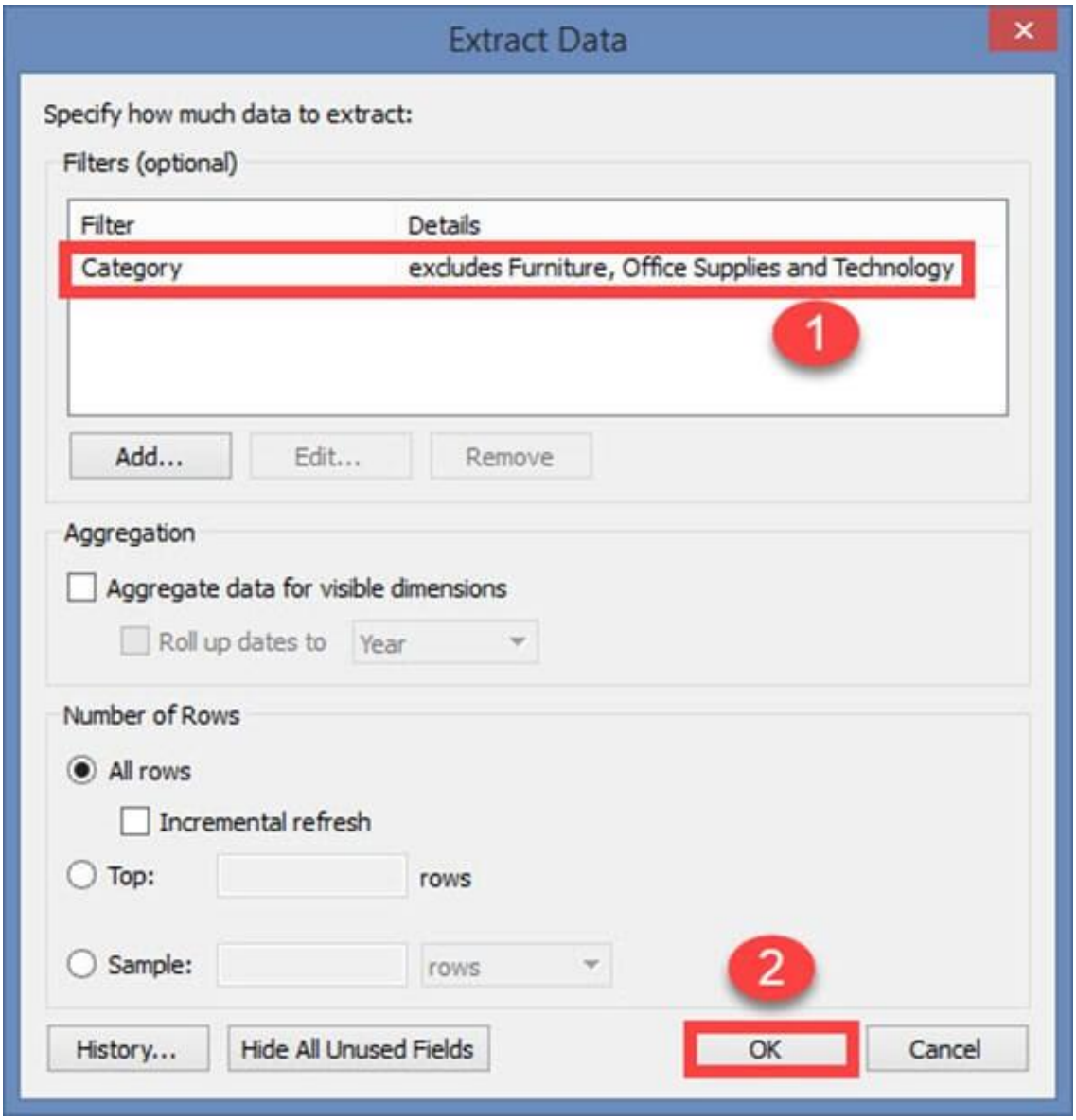
To exclude all the members in the list, first, click on 'Exclude' button. Then select 'All' option and click on OK. This procedure adds the filter in extract data filter window.



None:

If you want clear all the selection made in the filter window and start a new selection, you can use this 'none'option. None option clears all the selection made in the filter window. Once it is cleared you can select the new members.

1. Click on the 'None' option. Select the new members to be added as filter.
2. Click on OK to add the extract filter.

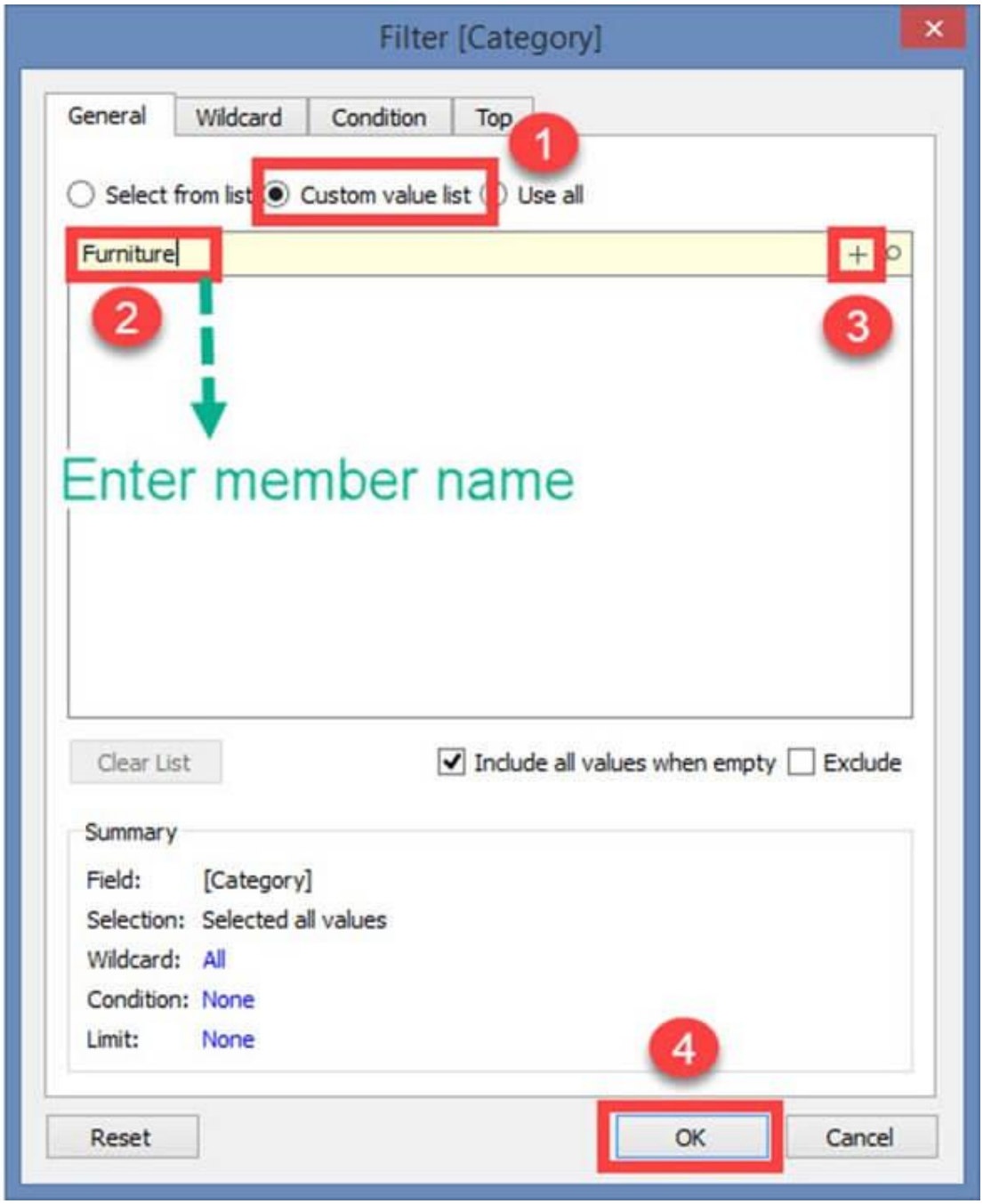


Use Case 2: Custom Value List

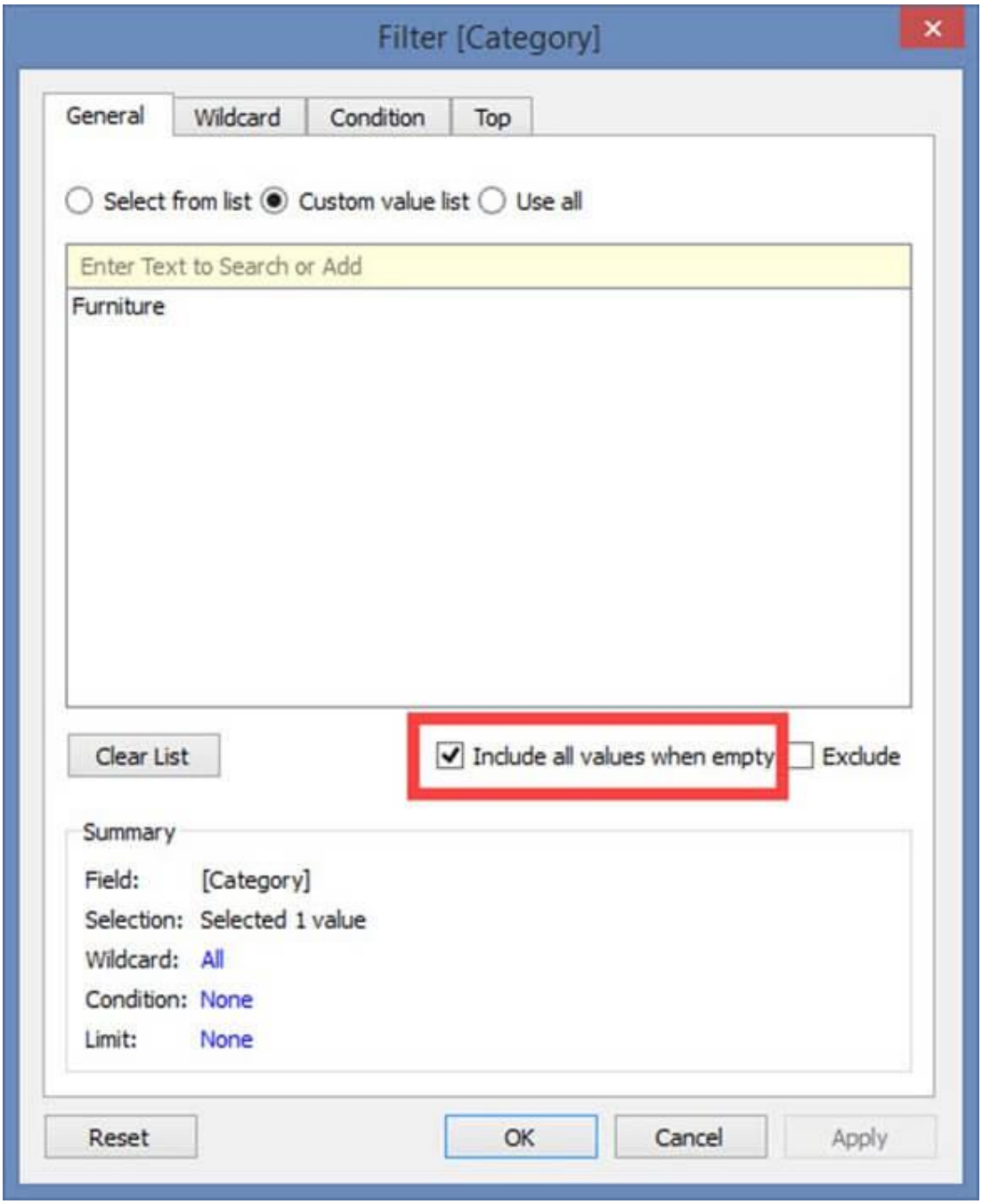
A custom value list allows the user to type the member name and filter the field accordingly. A custom value list can be created by following the given procedure.

Step 1) In the Filter Screen

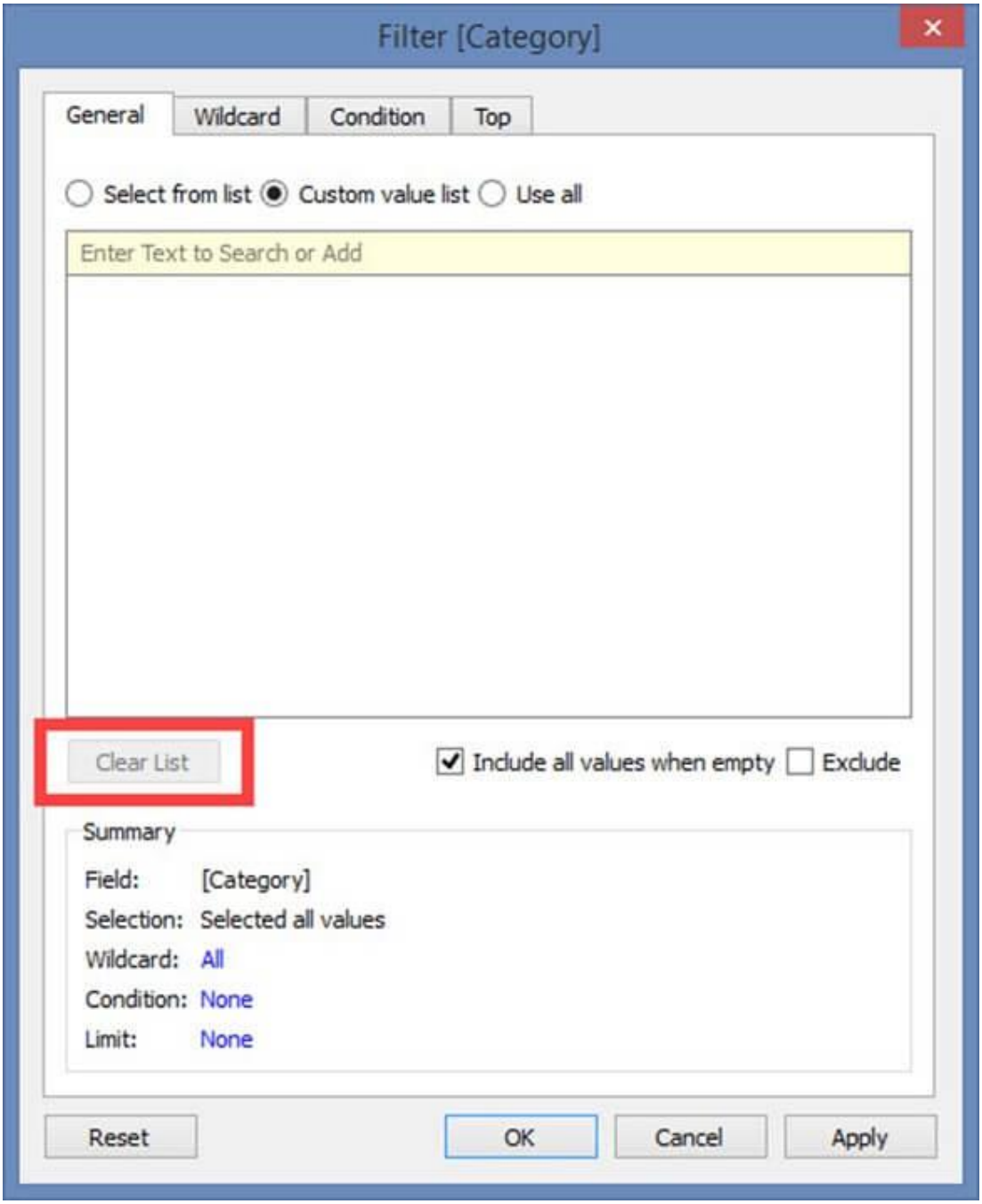
1. Click on “Custom value list” radio button.
2. Type the member name.
3. Click on ‘+’ symbol to add the name in the list.
4. You can add multiple members in the list and click on OK



There is an option in the window “Include all values when empty.” It can be selected to include all values present in the field when the selected member has no data.

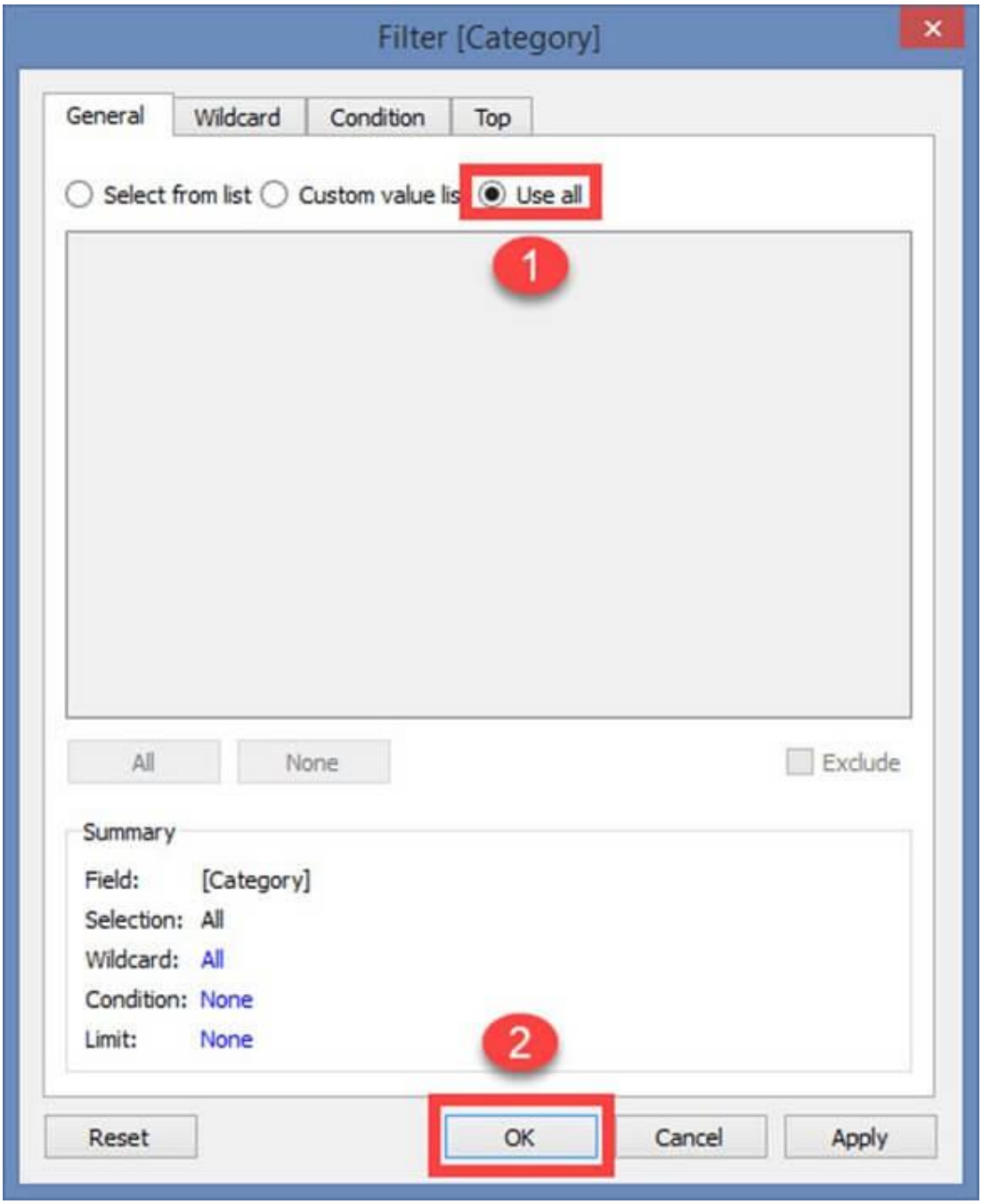


Clear List option clears the customs value list.



Use Case 3: Use all

This option selects all the members present in the field.



Use case 4: Wildcard

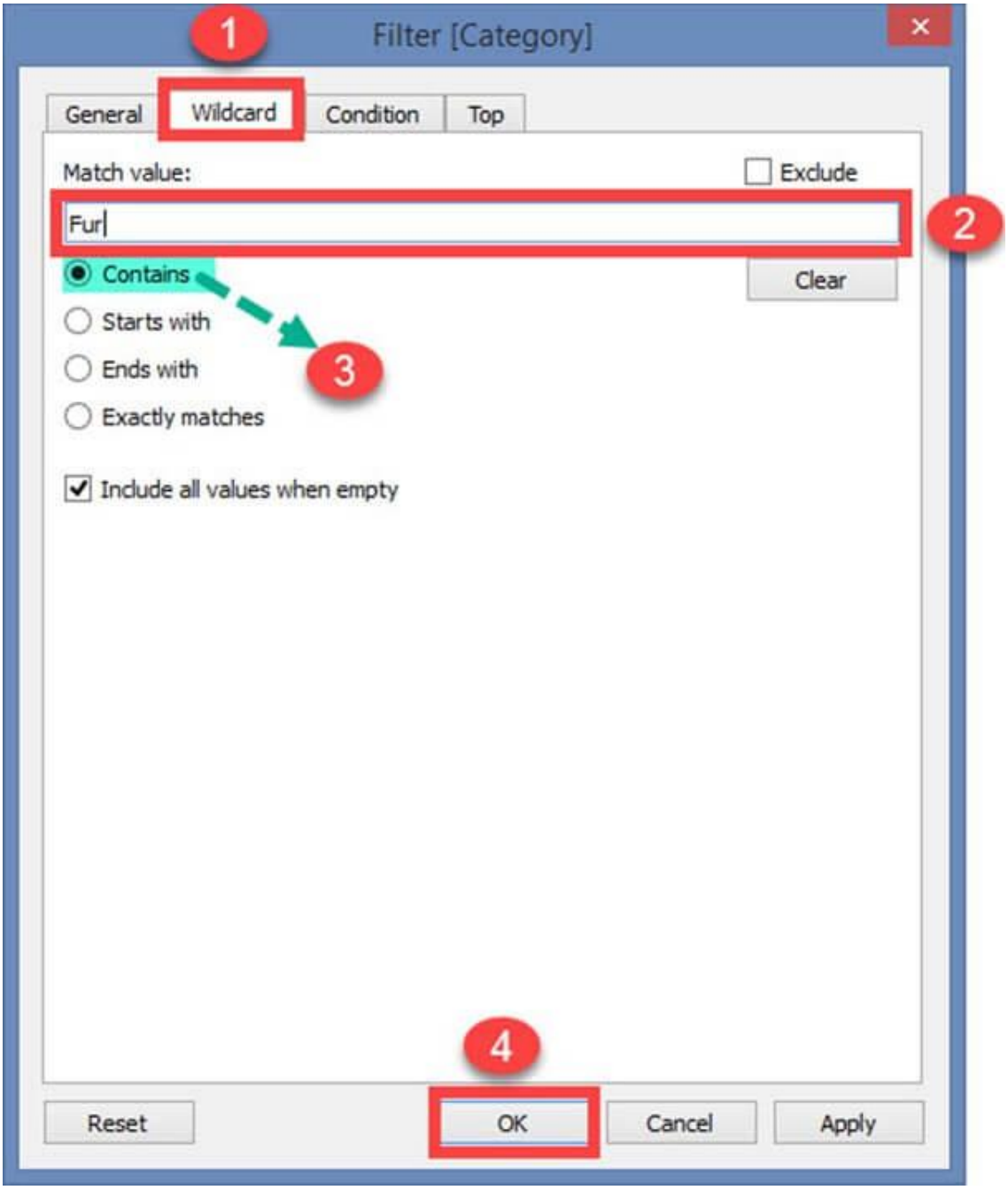
Wildcard option is used to filter the fields based on given wildcard match. Users can type the character and filter the field based on the match. The different types of matches are given as follows.

Contains	Select the members if the member name contains typed characters.
Starts with	Select the members if the member name starts with typed characters.

Ends with	Select the members if the member name ends with typed characters.
Exactly matches	Select the members if the member name exactly matches with typed characters.

Step 1)

1. Select the “Wildcard” tab.
2. Type the characters to match.
3. Select the type of match. In this example “Contains” match type is selected.
4. Click on OK.

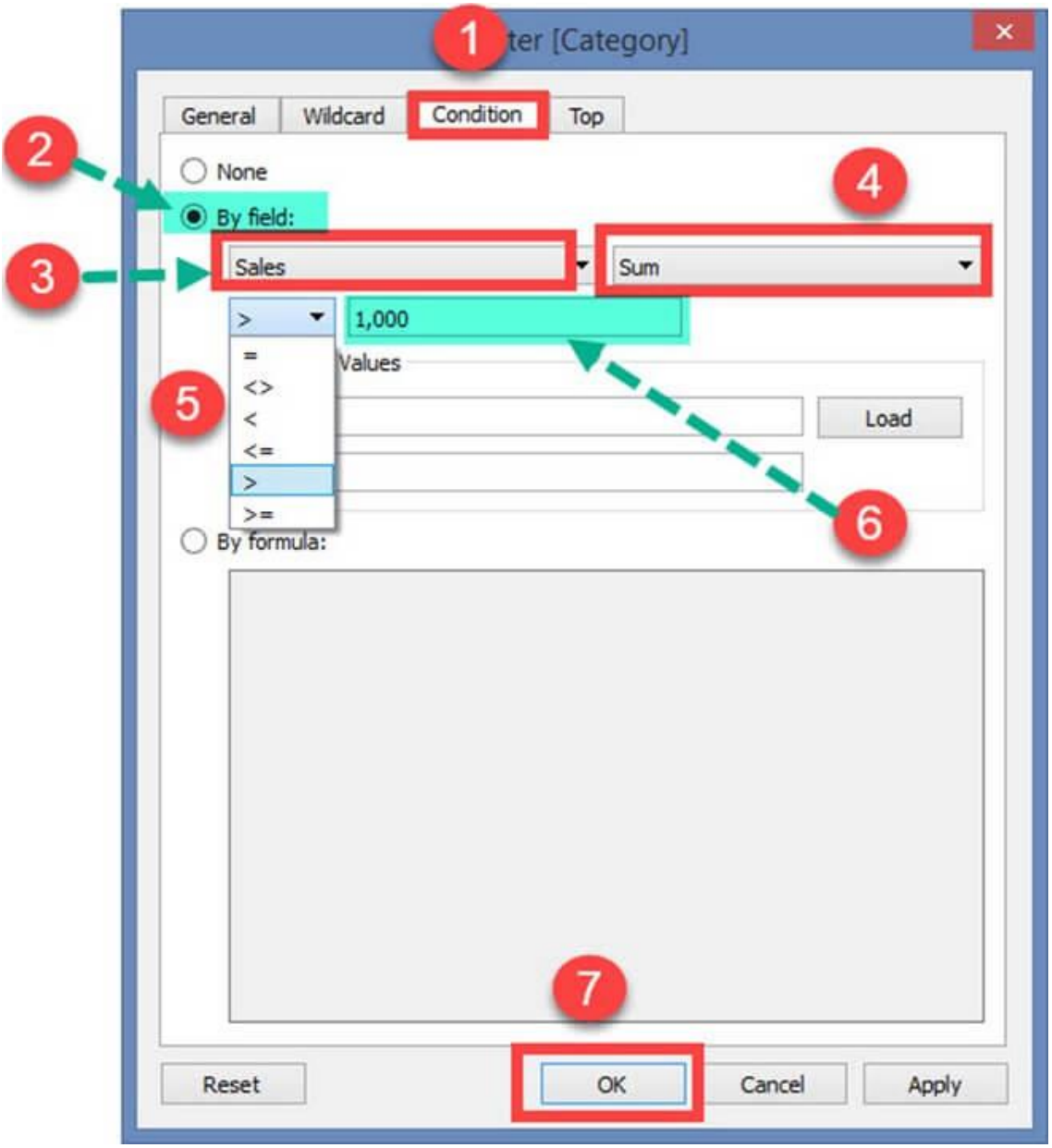


Use Case 5: Filter on Condition

This option is used to filter the data set by giving several conditions. Filer condition based on field is given below.

By Field:

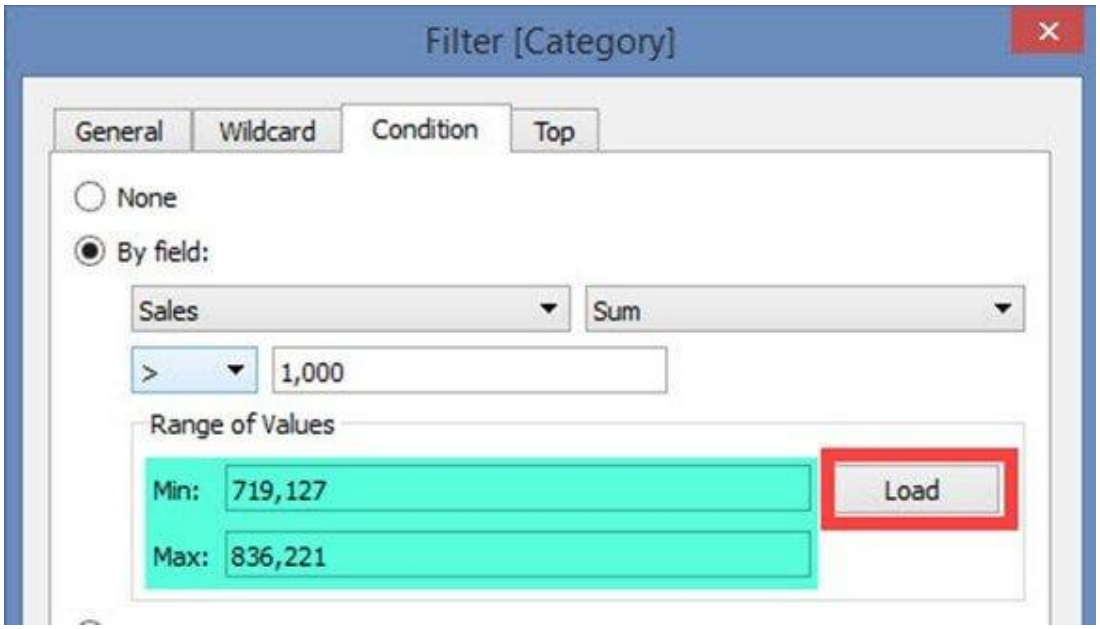
1. Select the 'Condition' tab in Filter Window.
2. Click on radio button 'By field.'
3. Select the name of the field to be filtered from the drop-down list.
4. Select the aggregation type like Sum, average and median from the drop-down list.
5. Choose the operator from the drop-down.
6. Enter the value to filter the selected field.
7. Click on OK.



In the above example, the dataset is filtered to see the data where the sum of sales is greater than 1000.

The range of Values:

This option shows the minimum and maximum value of the selected field by clicking on 'Load' button. It can be used to refer the values.

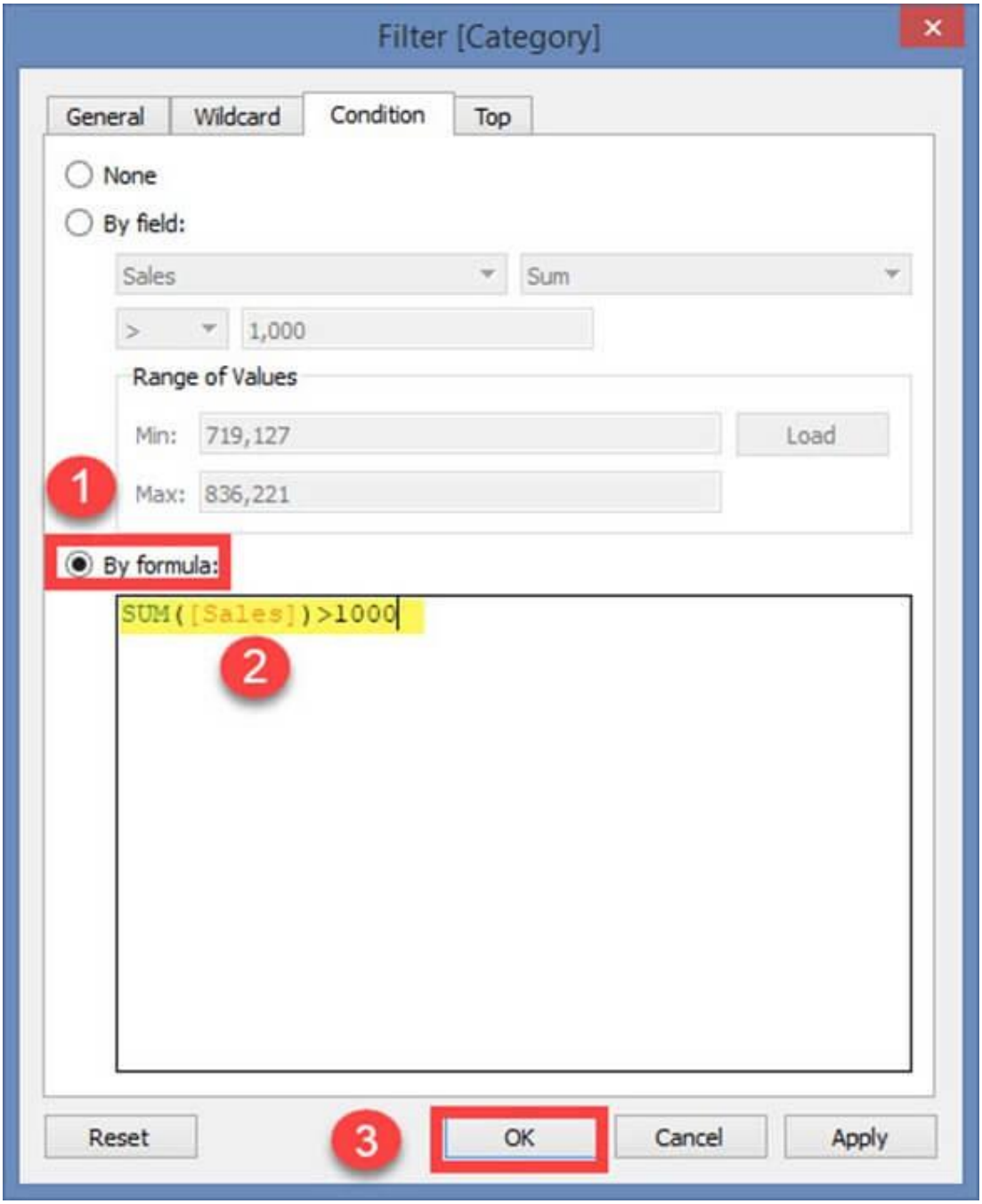


Filter Condition by Formula:

You can write a formula to filter the dataset using this option. The procedure is explained below.

Steps:

1. Click on radio button 'By formula.'
2. Enter the formula in the box as shown in the figure.
3. Click on Ok.



In the above example, the written formula filters the data where sum of sales is greater than 1000.

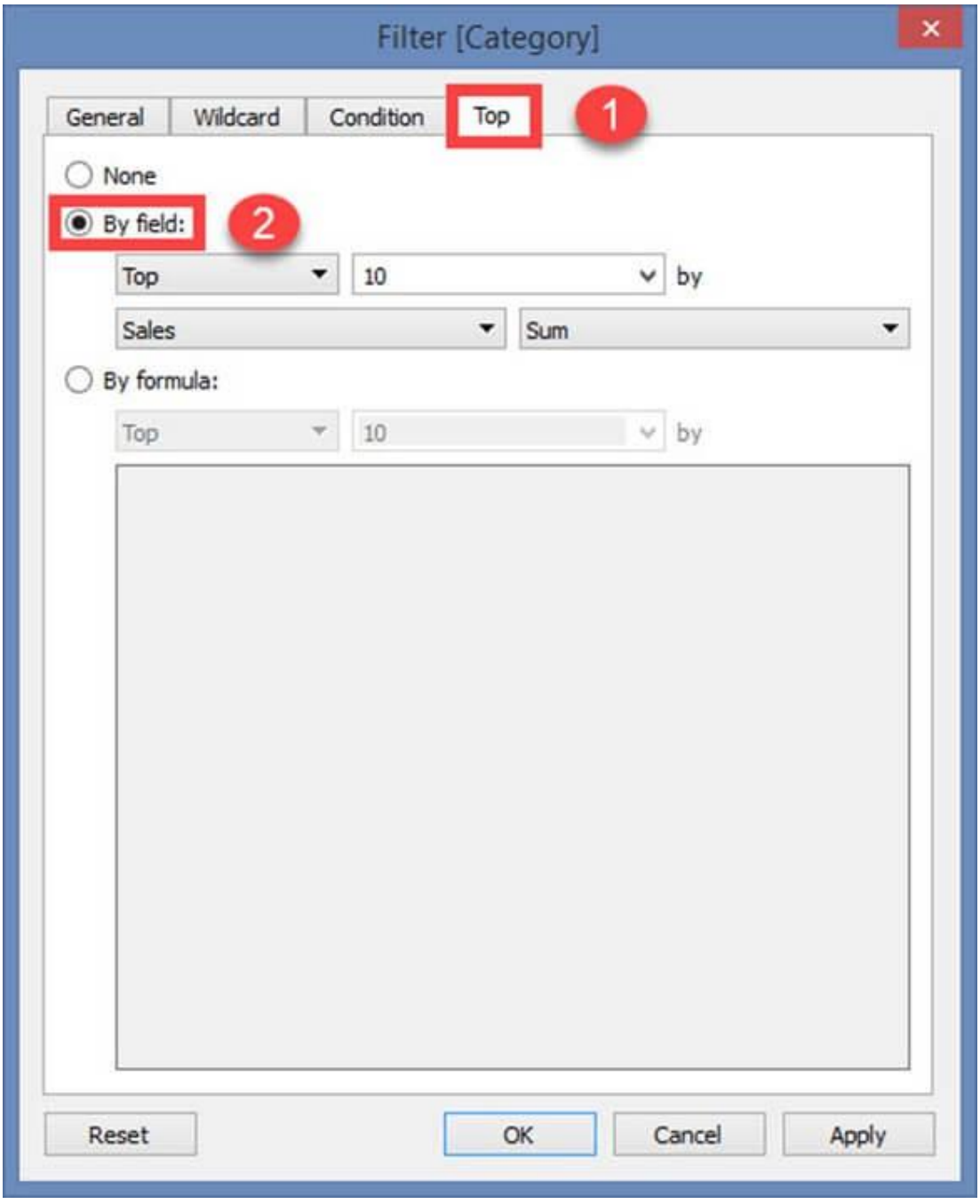
Use Case 6: Top or bottom filters

This option is used to select top or bottom ‘n’ number of records.

By Field:

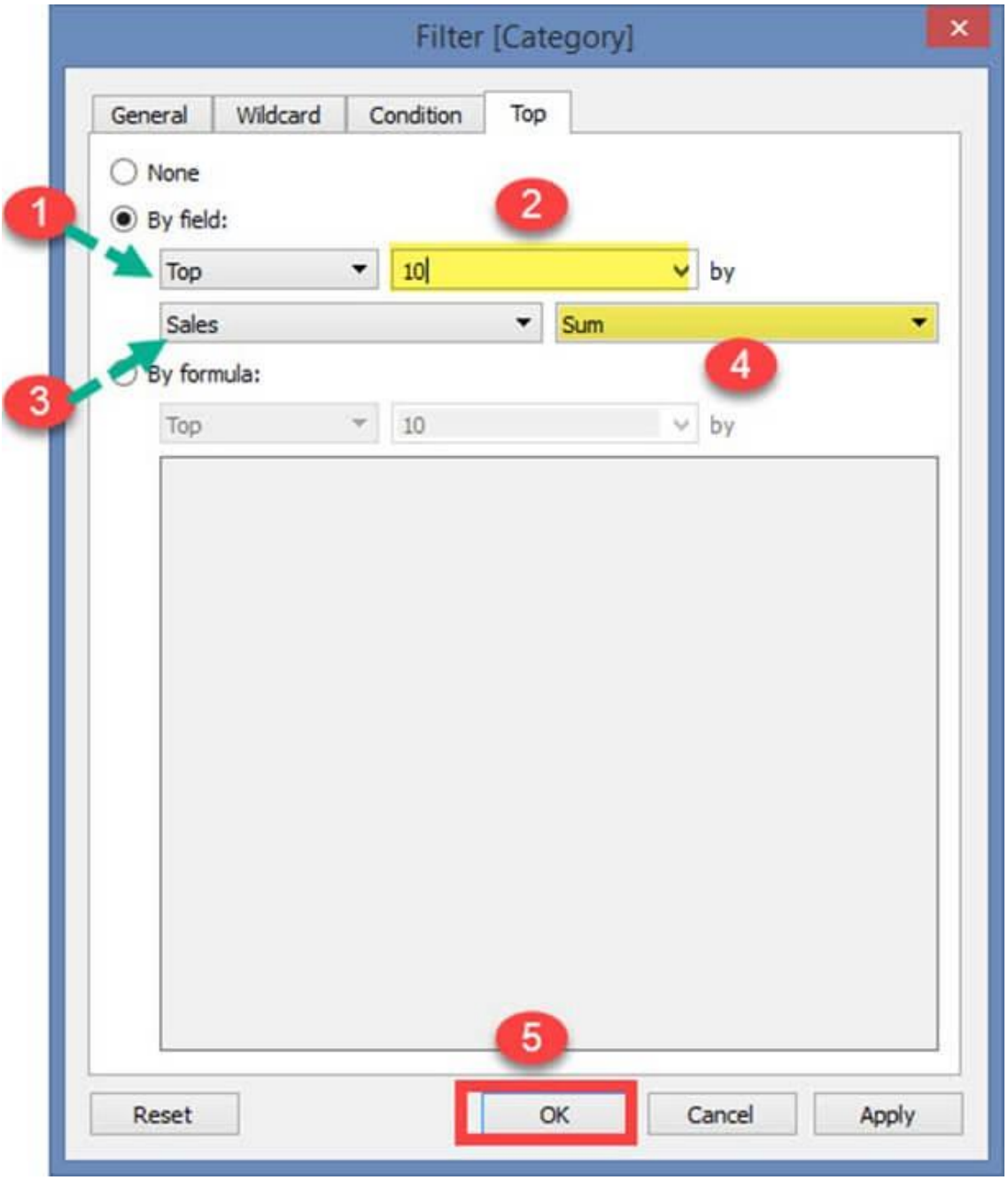
Step 1)

1. Select ‘Top’ tab from the filter window.
2. Click on radio button ‘By field’.



Step 2)

1. Select ‘Top’ or ‘Bottom’.
2. Choose the number of records.
3. Select the field.
4. Choose the aggregation type.
5. Click on Ok.



In the above example, the filter restricts the data set to show top 10 records based on the sum of sales.

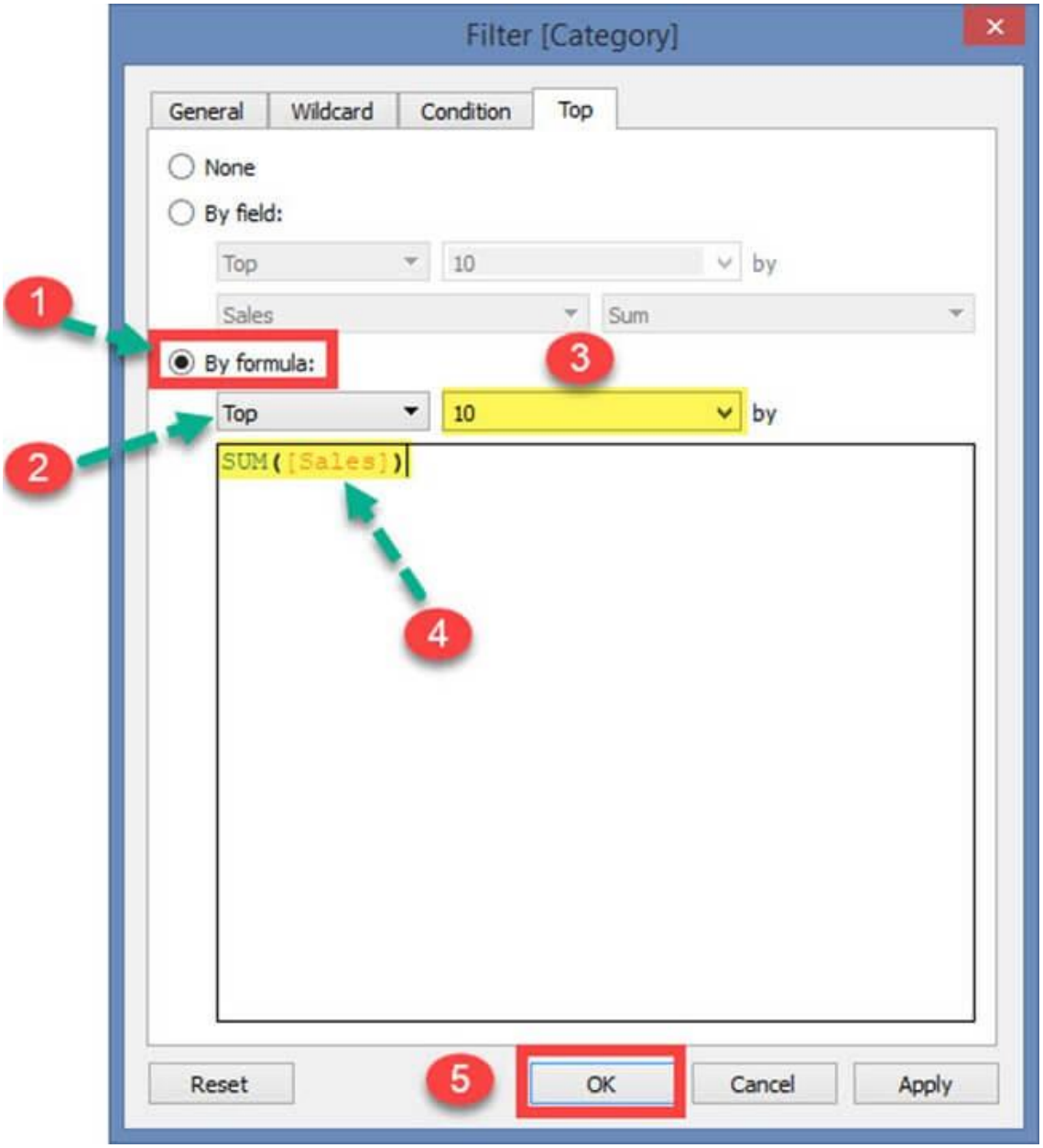
By Formula:

The top or bottom condition can also be given through formula.

Steps:

1. Click on the radio button ‘By Formula’.
2. Select ‘Top’ or ‘Bottom’.

3. Choose the number of records.
4. Enter the formula.
5. Click on OK.

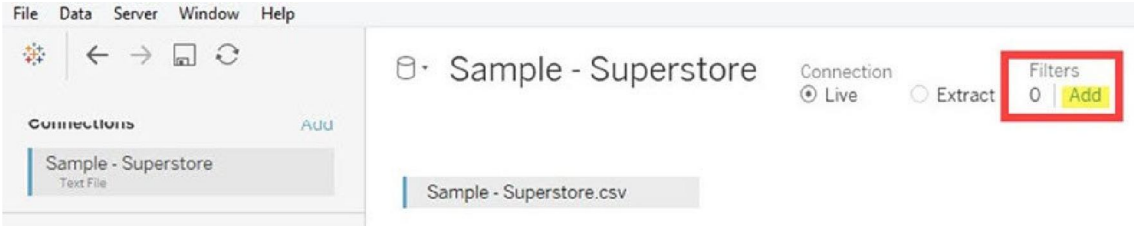


In the above example, the formula was written to show top 10 records based on the sum of sales.

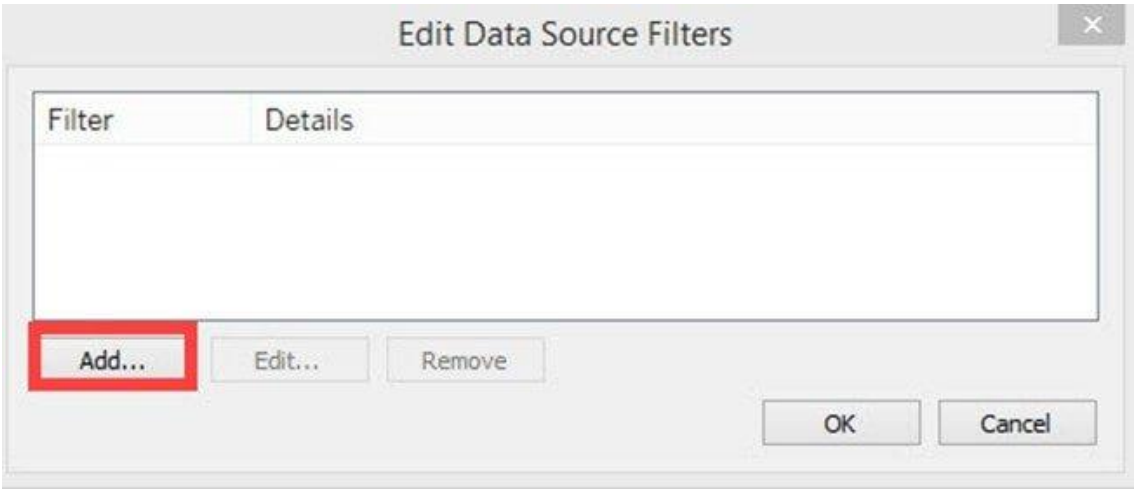
Data Source Filter:

A data source filter is used to filter the data in data source level. It can restrict the records present in the data set. This filter is similar to extract filter on securing the data. But data source filter and extract filter is not linked to each other. **Data source filter works on both live and extracts connection**. The procedure to select data source filter is given as follows.

Step 1) Click on the 'Add' button placed on the top right corner of the data source tab.



Step 2) It opens the 'Edit Data Source Filters' Window. Click on 'Add' Option present in the window.



After clicking on 'add' button, follow the remaining steps from the topic 'Extract Filters' -> Step 3.

Context Filter:

A Context filter is an independent filter that can create a separate dataset out of the original data set and compute the selections made in the worksheet. One or more categorical filter that separates the dataset into major parts can be used as a context filter. All other filters used in the worksheet works based on the selection of context filter. The functions of context filters can be explained through an excel sheet.

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Category	City	Country	Customer Name	Discount	Order Date	Order ID	Postal Code	Manufacturer	Profit	Quantity	Region	Sales
2	Furniture	Henderson	United States	Claire Gute	0%	11/8/2016	CA-2016-152156	42420	Bush	$42	2	South	$262
3	Furniture	Henderson	United States	Claire Gute	0%	11/8/2016	CA-2016-152156	42420	Hon	$220	3	South	$732
4	Office Supplies	Los Angeles	United States	Darrin Van Huff	0%	6/12/2016	CA-2016-138688	90036	Universal	$7	2	West	$15
5	Furniture	Fort Lauderdale	United States	Sean O'Donnell	45%	10/11/2015	US-2015-108966	33311	Bretford	($383)	5	South	$958
6	Office Supplies	Fort Lauderdale	United States	Sean O'Donnell	20%	10/11/2015	US-2015-108966	33311	Eldon	$3	2	South	$22
7	Furniture	Los Angeles	United States	Brosina Hoffman	0%	6/9/2014	CA-2014-115812	90032	Eldon	$14	7	West	$49
8	Office Supplies	Los Angeles	United States	Brosina Hoffman	0%	6/9/2014	CA-2014-115812	90032	Newell	$2	4	West	$7
9	Technology	Los Angeles	United States	Brosina Hoffman	20%	6/9/2014	CA-2014-115812	90032	Mitel	$91	6	West	$907
10	Office Supplies	Los Angeles	United States	Brosina Hoffman	20%	6/9/2014	CA-2014-115812	90032	DXL	$6	3	West	$19
11	Office Supplies	Los Angeles	United States	Brosina Hoffman	0%	6/9/2014	CA-2014-115812	90032	Belkin	$34	5	West	$115
12	Furniture	Los Angeles	United States	Brosina Hoffman	20%	6/9/2014	CA-2014-115812	90032	Chromcraft	$85	9	West	$1,706
13	Technology	Los Angeles	United States	Brosina Hoffman	20%	6/9/2014	CA-2014-115812	90032	Other	$68	4	West	$911
14	Office Supplies	Concord	United States	Andrew Allen	20%	4/15/2017	CA-2017-114412	28027	Xerox	$5	3	South	$16
15	Office Supplies	Seattle	United States	Irene Maddox	20%	12/5/2016	CA-2016-161389	98103	Fellowes	$133	3	West	$408
16	Office Supplies	Fort Worth	United States	Harold Pawlan	80%	11/22/2015	US-2015-118983	76106	Holmes	($124)	5	Central	$69
17	Office Supplies	Fort Worth	United States	Harold Pawlan	80%	11/22/2015	US-2015-118983	76106	Storex	($4)	3	Central	$3
18	Office Supplies	Madison	United States	Pete Kriz	0%	11/11/2014	CA-2014-105893	53711	Other	$13	6	Central	$666
19	Office Supplies	West Jordan	United States	Alejandro Grove	0%	5/13/2014	CA-2014-167164	84084	Fellowes	$10	2	West	$56
20	Office Supplies	San Francisco	United States	Zuschuss Donatelli	0%	8/27/2014	CA-2014-143336	94109	Newell	$2	2	West	$9
21	Technology	San Francisco	United States	Zuschuss Donatelli	20%	8/27/2014	CA-2014-143336	94109	Cisco	$16	3	West	$213
22	Office Supplies	San Francisco	United States	Zuschuss Donatelli	20%	8/27/2014	CA-2014-143336	94109	Wilson Jones	$7	4	West	$23
23	Office Supplies	Fremont	United States	Ken Black	0%	12/9/2016	CA-2016-137330	68025	Newell	$5	7	Central	$19
24	Office Supplies	Fremont	United States	Ken Black	0%	12/9/2016	CA-2016-137330	68025	Acco	$16	7	Central	$60

The figure shows a sample dataset. From the dataset, it is identified that 'Category' can be used as context filter as it can divide the dataset into major parts. Once the filter is applied to the dataset, the following data can be obtained.

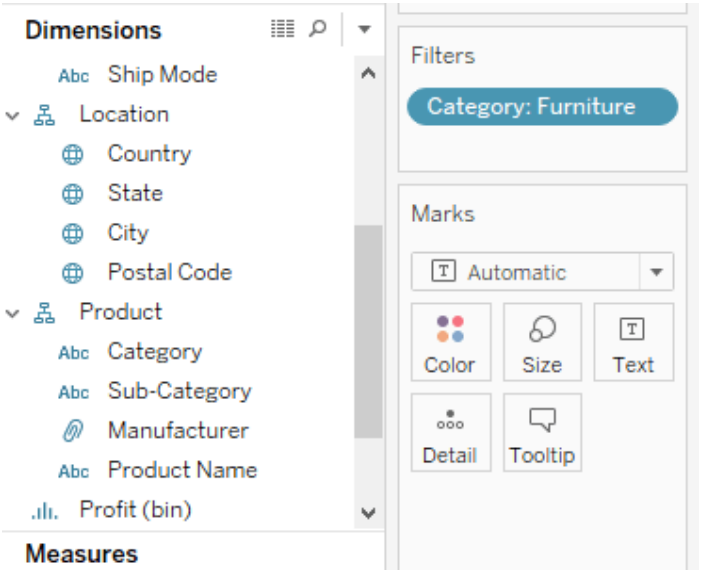
A	B	C	D	E	F	G	H	I	J	K	L	M
Category	City	Country	Customer Name	Discount	Order Date	Order ID	Postal Code	Manufacturer	Profit	Quantity	Region	Sales
Furniture	Henderson	United States	Claire Gute	0%	11/8/2016	CA-2016-152156	42420	Bush	$42	2	South	$262
Furniture	Henderson	United States	Claire Gute	0%	11/8/2016	CA-2016-152156	42420	Hon	$220	3	South	$732
Furniture	Fort Lauderdale	United States	Sean O'Donnell	45%	10/11/2015	US-2015-108966	33311	Bretford	($383)	5	South	$958
Furniture	Los Angeles	United States	Brosina Hoffman	0%	6/9/2014	CA-2014-115812	90032	Eldon	$14	7	West	$49
Furniture	Los Angeles	United States	Brosina Hoffman	20%	6/9/2014	CA-2014-115812	90032	Chromcraft	$85	9	West	$1,706

When the category "Furniture" is selected, the data available in the particular category is shown in the figure. Other filters that can be applied in the sheet will be dependent on the category filter. This is the basic function of using context filter. Tableau creates a temporary dataset in repository engine based on the context filter selection. Once context filter is selected, all other selections and filters depend on the selection of specific context filter. The temporary table or data set that is created on selecting context filter loads whenever the context filter is changed.

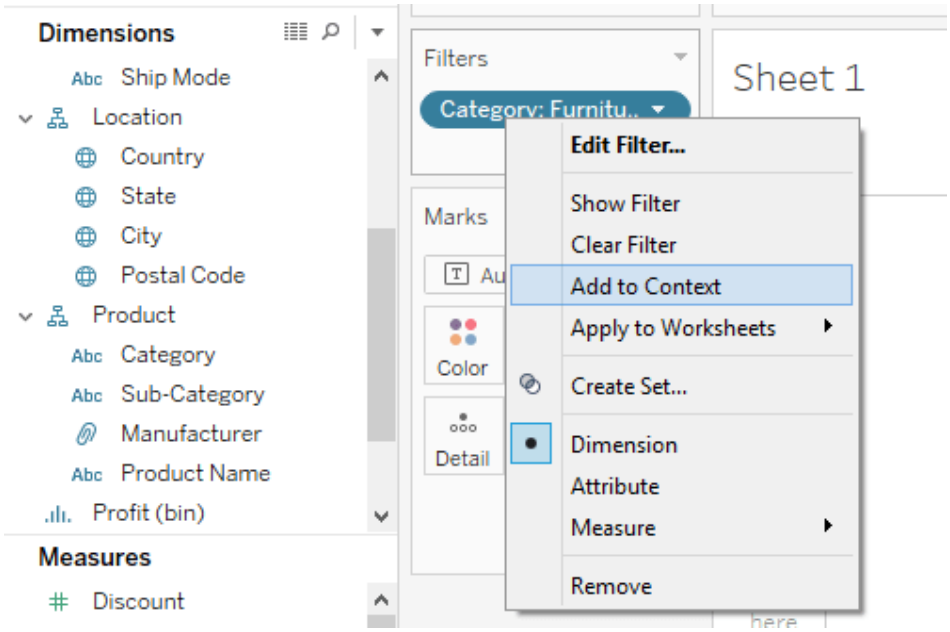
Apply Context Filters in Worksheet:

Any dimension can be added as context filter by following the steps given below:

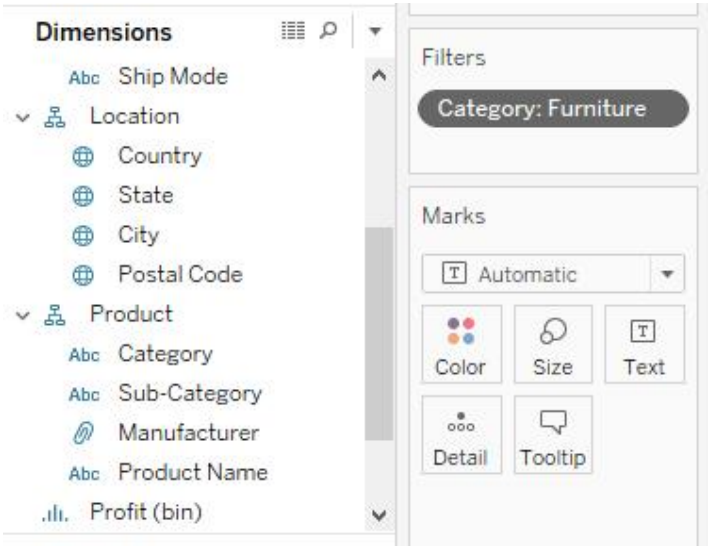
Step 1) The dimension to be added as context filter needs to be added in filter section box as given in the image.



Step 2) Right click on the dimension added in the filter section and select "Add to Context" option.

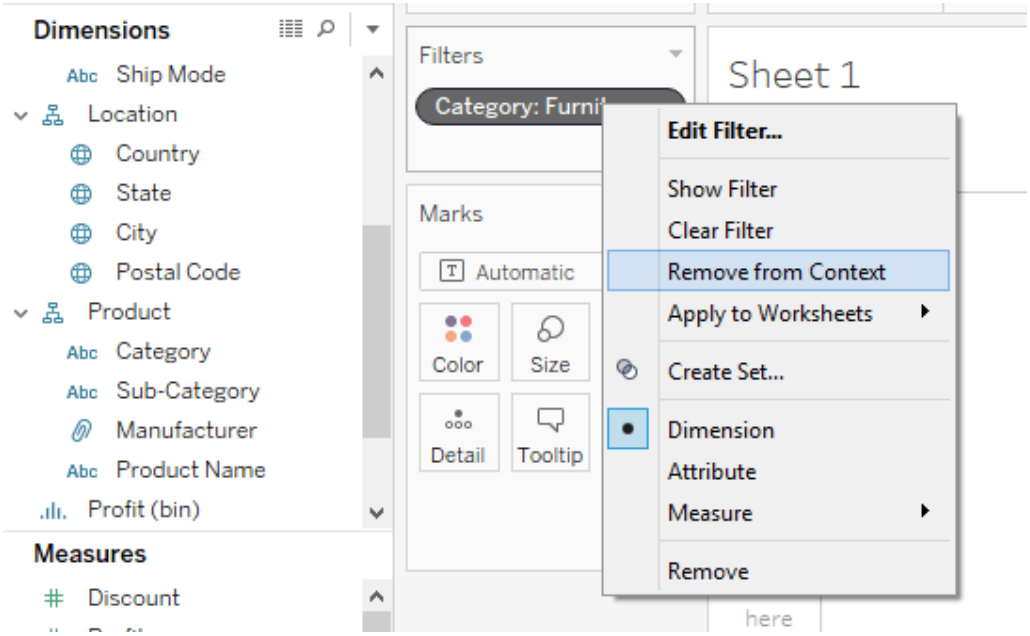


Step 3) Once the filter is selected as a context filter, the color of dimension box changes to grey color. This grey color box is an indication of context filter.



Removing Context Filter:

Any context filter can be changed back to normal filter by selecting the “Remove from Context” option which is available when right-clicking on the dimension. The color of dimension box will also change back to blue color as an indication.



Advantages of Using Context Filters:

Improve Performance:

When context filter is used in large data sources, it can improve the performance as it creates a temporary dataset part based on the context filter selection. The performance can be effectively improved through the selection of major categorical context filters.

Dependent Filter Conditions:

Context filters can be used to create dependent filter conditions based on the business requirement. When the data source size is large, context filter can be selected on the major category, and other relevant filters can be executed.

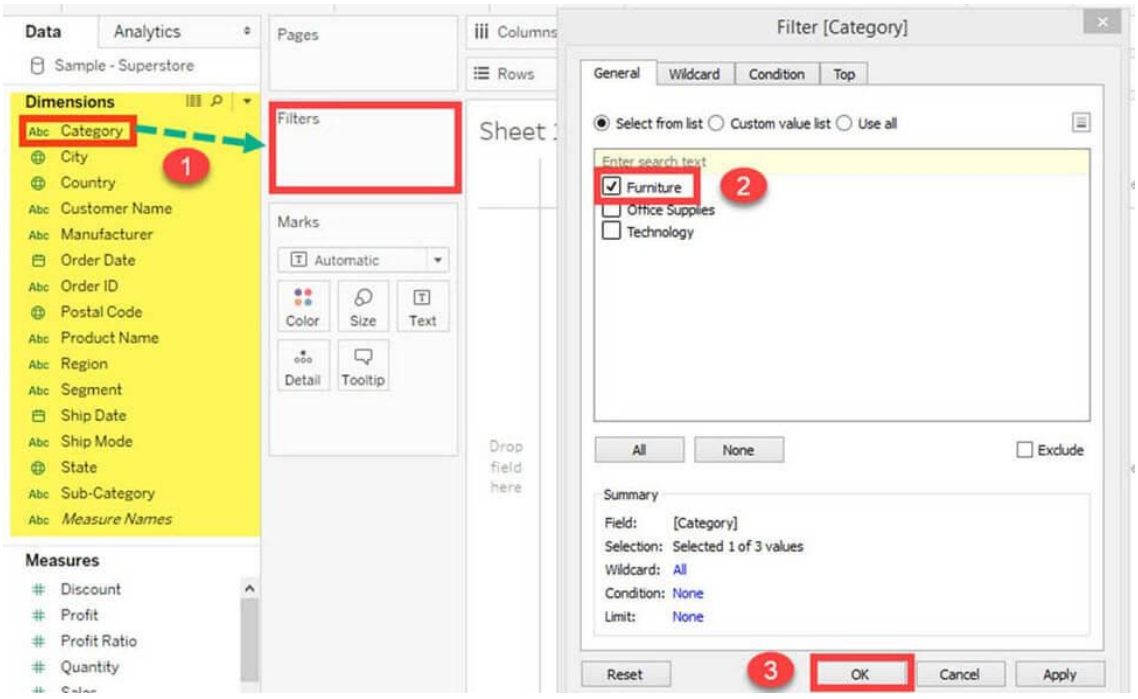
Dimension Filters:

When a dimension is used to filter the data in a worksheet, it is called as Dimension filter. It is a non-aggregated filter where a dimension, group, sets and bin can be added. A dimension filter can be applied through the top or bottom conditions, wildcard match and formula.

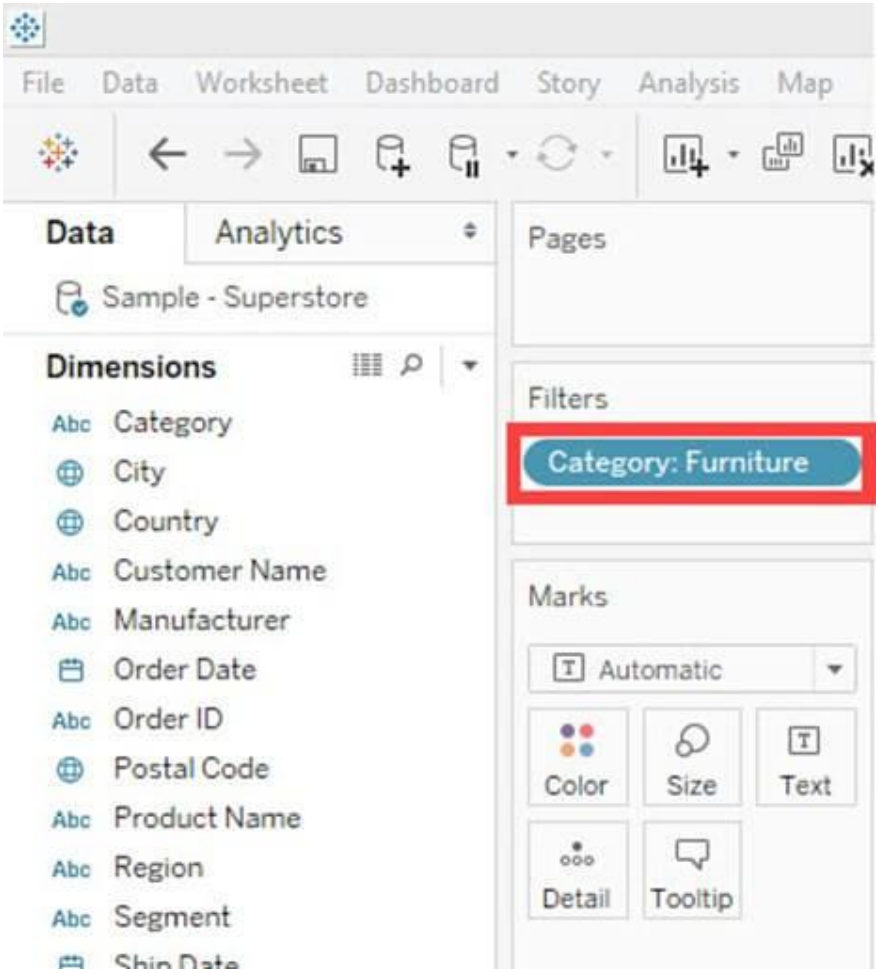
The members present in a dimension can be included or excluded from the list using this filter. Dimension filter can be shown in a sheet or dashboard to change the filter condition dynamically. The process for adding a dimension as the filter is given as follows.

Step 1) Go to a worksheet as given in above topics and follow the steps.

1. Select a dimension from the dimension list. In this example 'Category' is chosen from the dimension list. Drag the dimension into 'Filters' box.
2. It opens the 'Filter' Window. Select the member from the list.
3. Click on OK.



The above procedure filters data set to show the records only for category 'Furniture.'

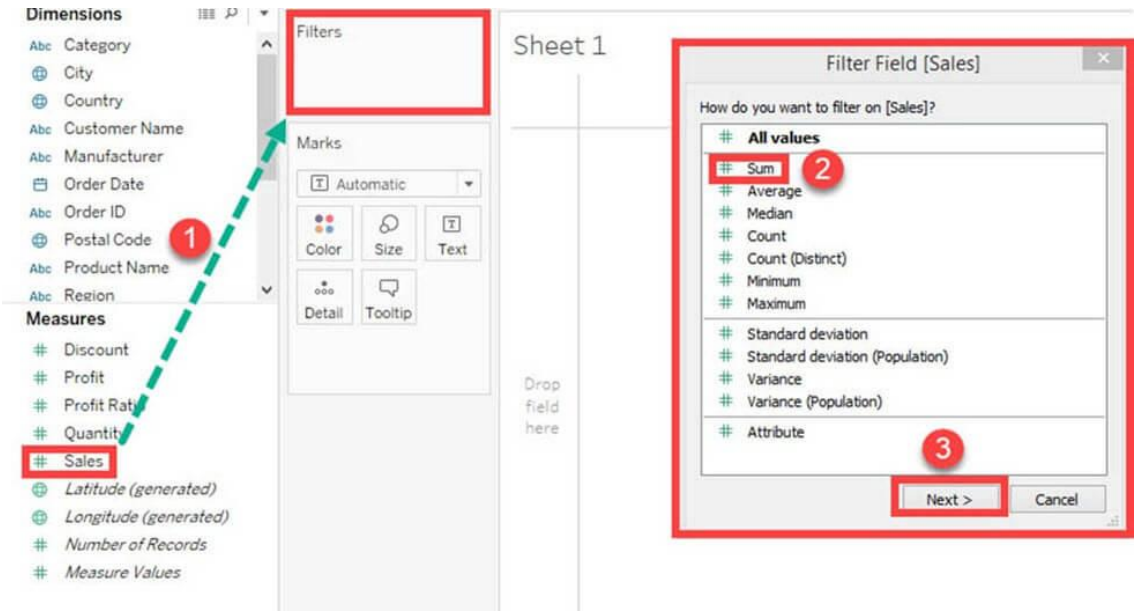


Measure Filter:

A measure filter can filter the data based on the values present in a measure. The aggregated measure values can be used in measure filter to modify the data. A measure filter can be applied in a worksheet by following the procedure.

Step 1) Go to a Worksheet

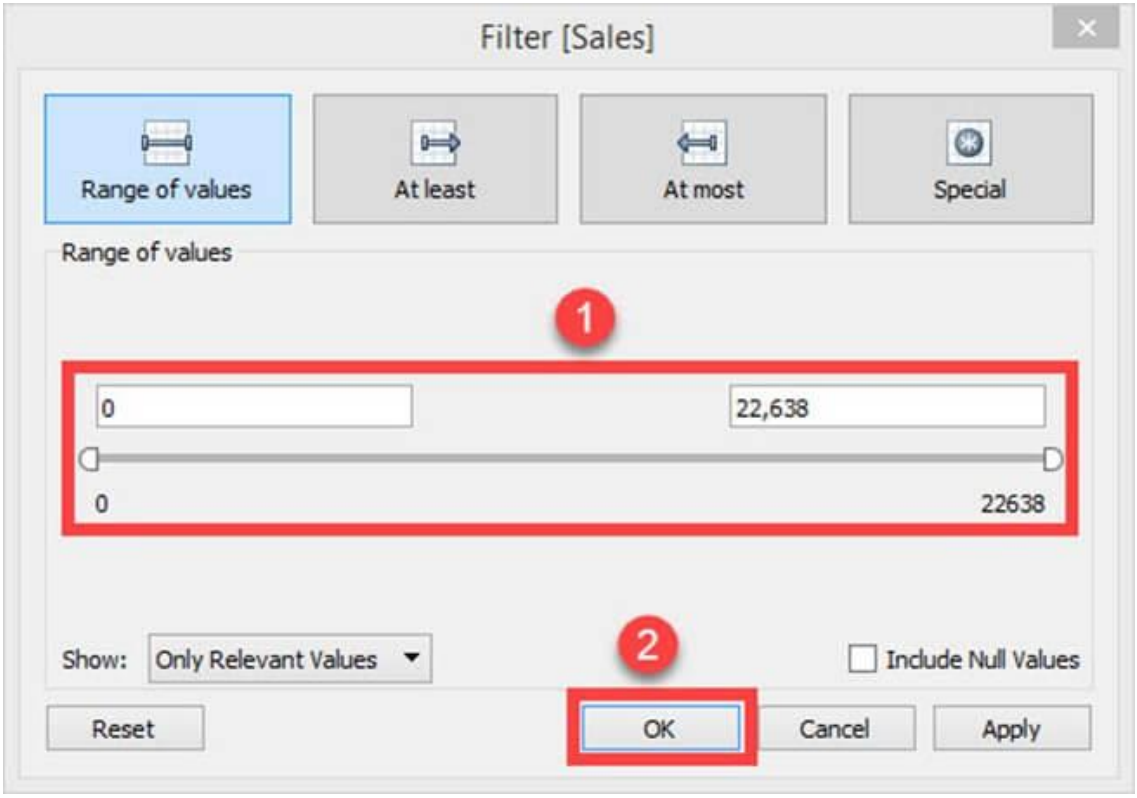
1. Select a measure present in the Measures tab. In this example, 'Sales' is selected. Drag the measure into 'Filter' box.
2. It opens a 'Filter field' window. Select any of the aggregation from the list. In this example, Sum is taken as aggregation type.
3. Click on 'Next' button.



Step 2) It opens a window where you need to select the range of values. The other types of options present in the window are given as follows.

Range of values	Minimum and maximum range of measure value can be given and filtered.
At least	A minimum value of a measure is given to filter the data.
At most	A maximum value of a measure is given to filter the data.
Special	An option to select null or non-null values and filter the data.

1. Select the range of values. You can modify the upper and lower limit for the range of values.
2. Click on OK.



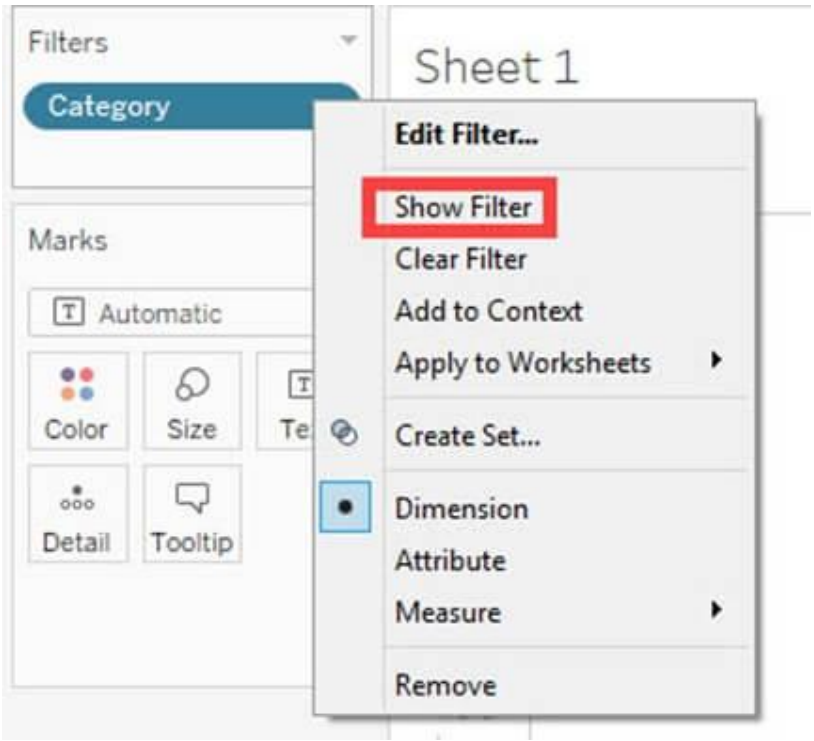
The above example filters the data set based on the sum of sales value between 0 and 22638.

Custom or Quick Filter:

Filters can be customized based on the user selection. The filters can customize worksheets and dashboards to modify the data dynamically. The procedure to customize the filter is given as follows.

Step 1) Add the 'Category 'filter as shown in the topic Dimension filter.

1. Right-click on the filter added.
2. Select 'Show Filter' option.



Step 2) It shows the 'Category' filter box in the right side of the worksheet. By default, the filter shows the multi-value list as shown in the figure.

Step 3) You can select or unselect members present in the filter and modify the data.

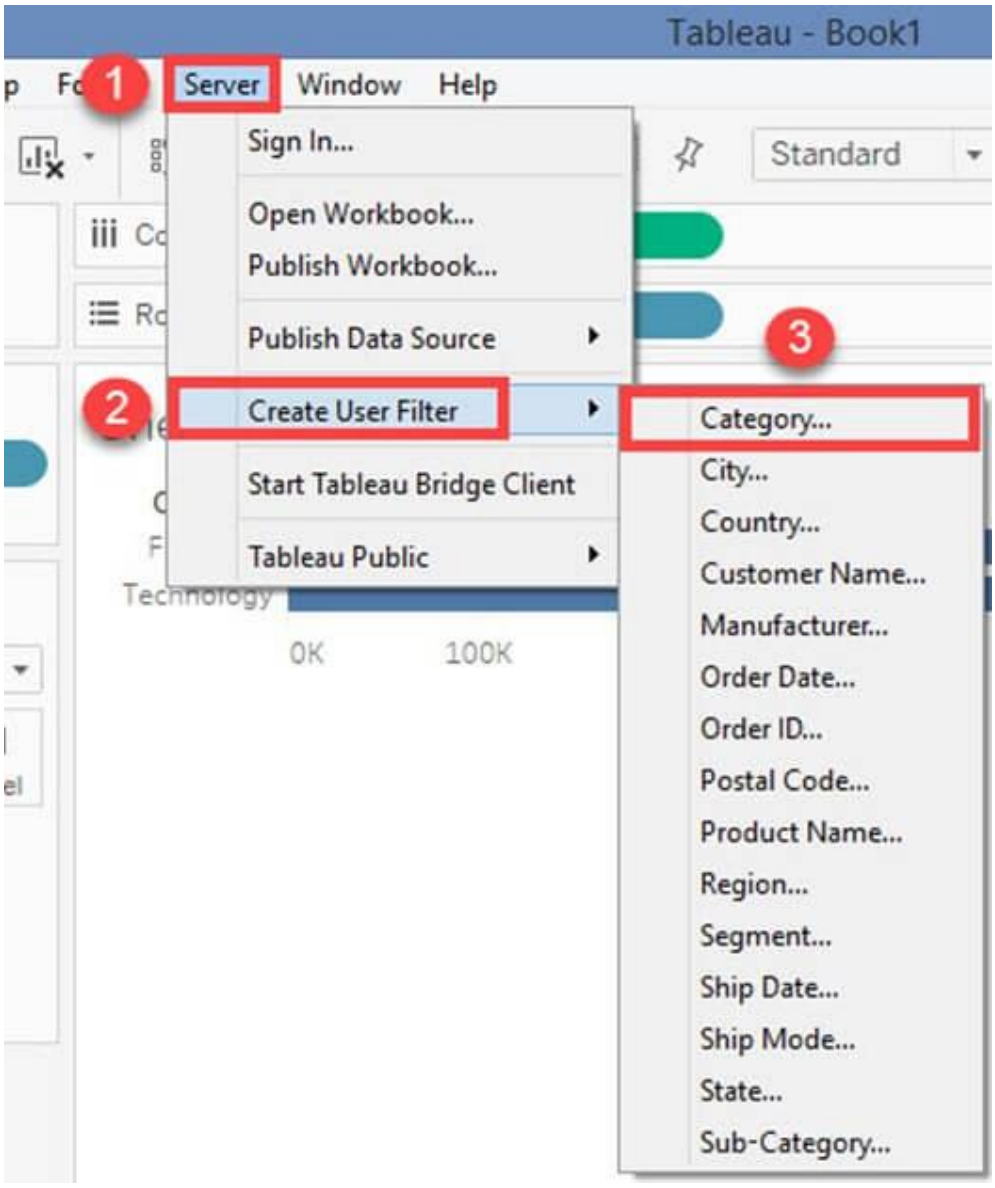
User Filter:

User filter secure the row level data present in a dataset. It can be used when publishing the workbook on a server. Different filter conditions can be applied for different users. For example,

assume there are three departments in a firm namely Furniture, Office Supplies, and Technology. By using the user filter, we can allow the users to show only the data relevant to their department. i.e., Users from 'Furniture' department can only see the data from category 'Furniture'. This can assure the security of row level data. The procedure to apply the user filter is given as follows.

Step 1)

1. Click on the Server option present in the Menu bar.
2. Hover over the 'Create User Filter' option.
3. Select the field to create user filter. In this example, the category is selected as user filter.



Step 2)

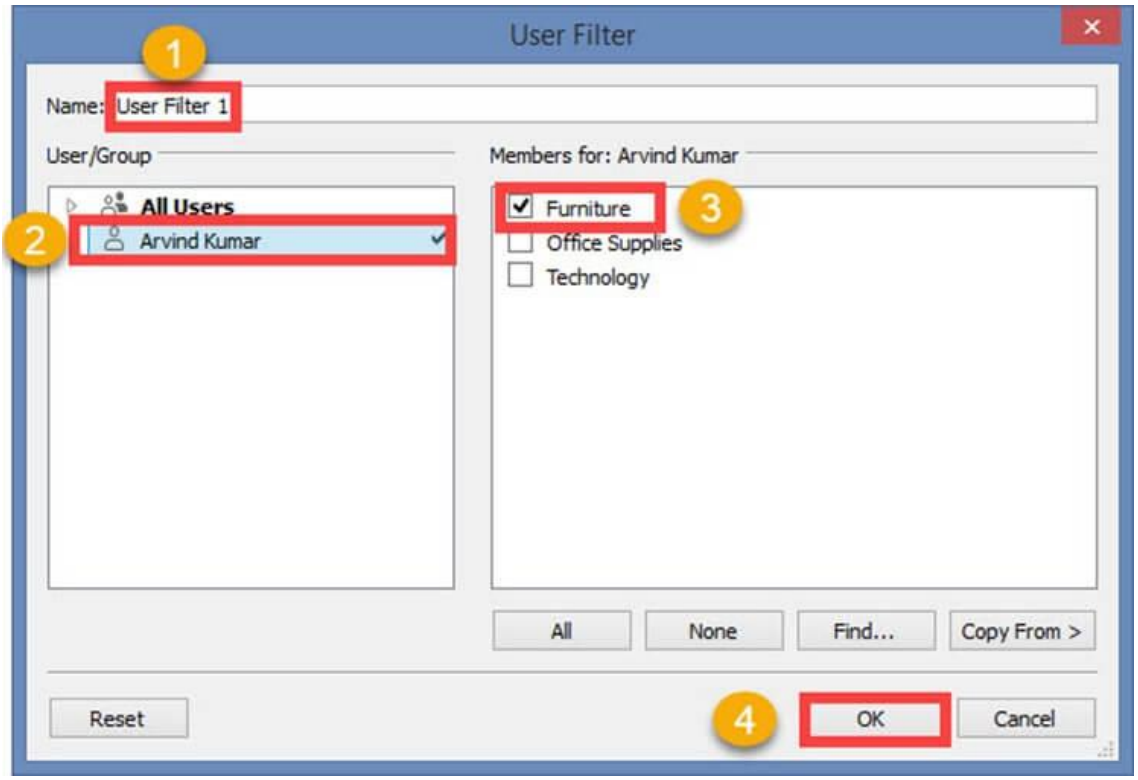
1. It opens a 'Tableau Server Sign in' window.
2. Click on 'Tableau Online' option present in the window.

Step 3)

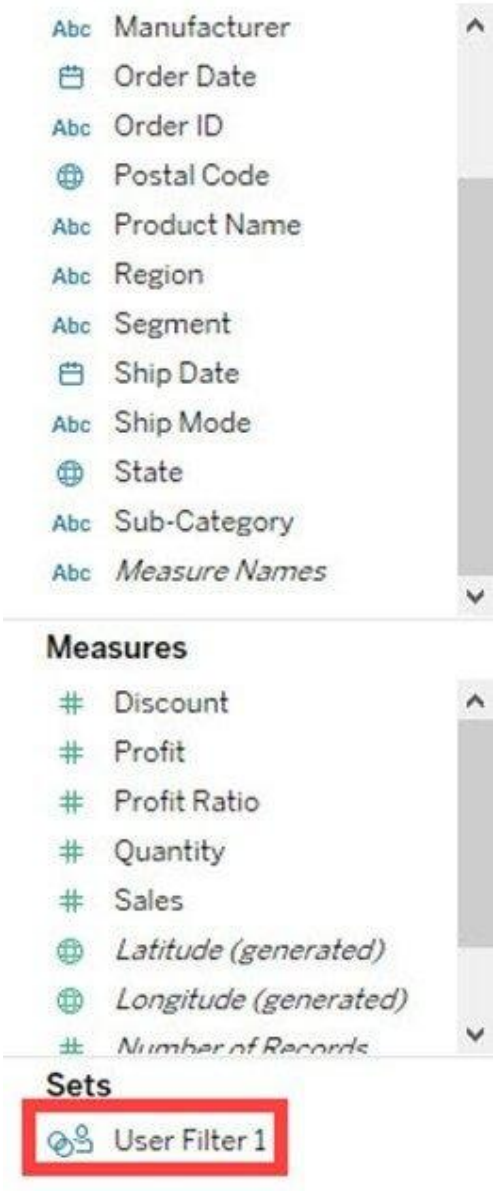
1. It opens a Tableau Online Sign in Window. Enter your registered email id and password.
2. Click on Sign In option.

Step 4) It opens a 'User Filter' window. Follow the below steps to add user filter.

1. Enter a name for the user filter.
2. Select a user form the user's list.
3. Check in the required members need to show for the selected member.
4. Click on OK.



It creates a user filter in Tableau. You can view the user filter under sets pane as shown below.



When the workbook is published in the server, only the filtered data is shown to the user. User filter can be created for multiple users to secure the data.

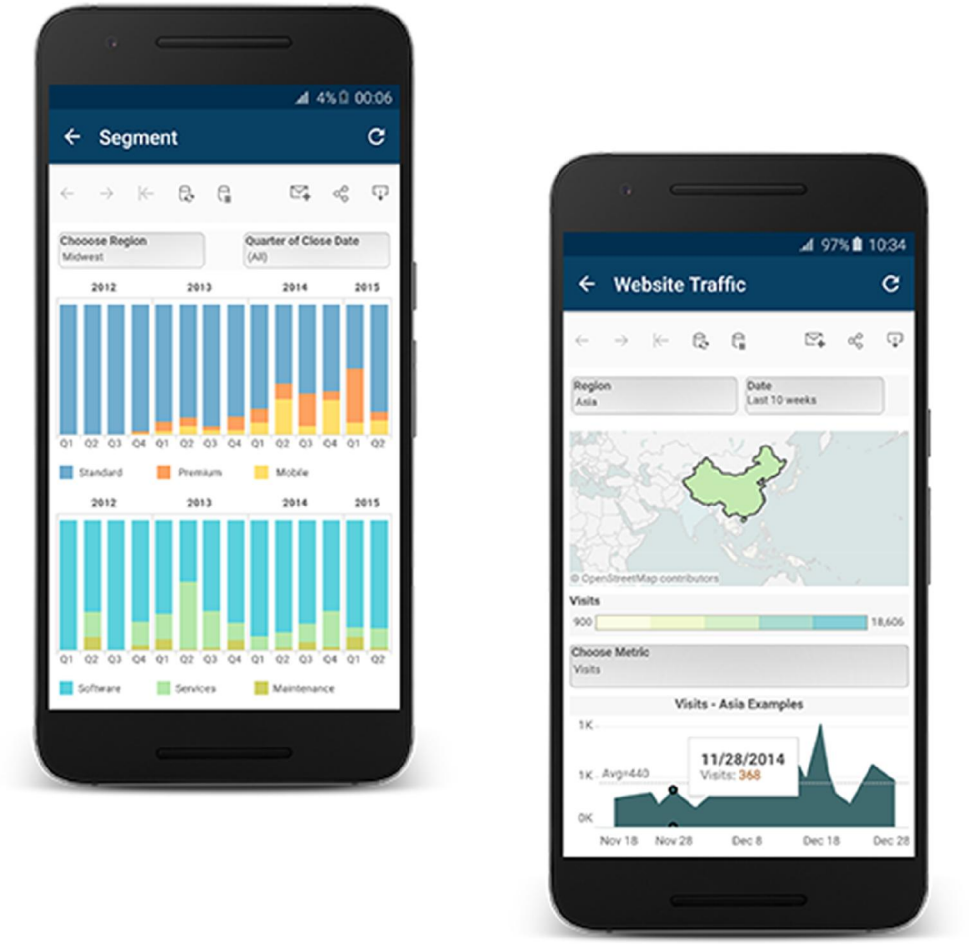
2. Create a list of Top 10 Products based on Profits whose sale value is more than $5000? - **Global Superstore**
3. Create a Chart with Customer Name and Profit and check for the Sale Value for top 15 Customers? - **Global Superstore**
4. Apply filter to all the worksheet, filter by year 2011, then find the sum(sales) for the highest subcategory.- **Global Superstore**
5. What is the name of 375th top most customer by sum of profits - **Sample Superstore**

9. Dashboards & story:

1. What are the different device type preview that Dashboards can use?

Create Dashboard Layouts for Different Device Types

Dashboards can include layouts for different types of devices that span a wide range of screen sizes. When you publish these layouts to Tableau Server or Tableau Online, people viewing your dashboard experience a design optimized for their phone, tablet, or desktop. As the author, you only have to create a single dashboard and deliver a single URL.



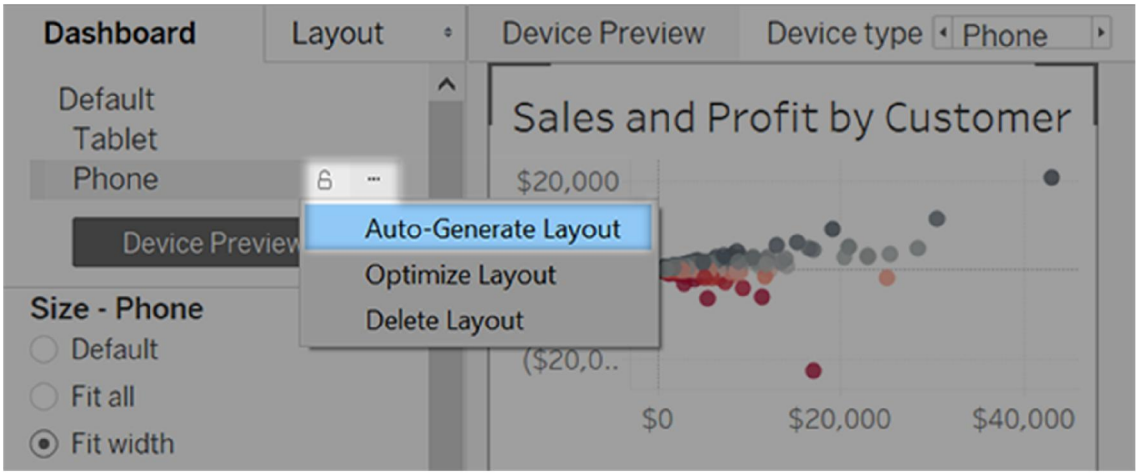
How the Default dashboard relates to device layouts

Device layouts appear on the Dashboard tab, under Default. Initially, each device layout contains every item in the Default dashboard and derives its size and layout from Default as well.

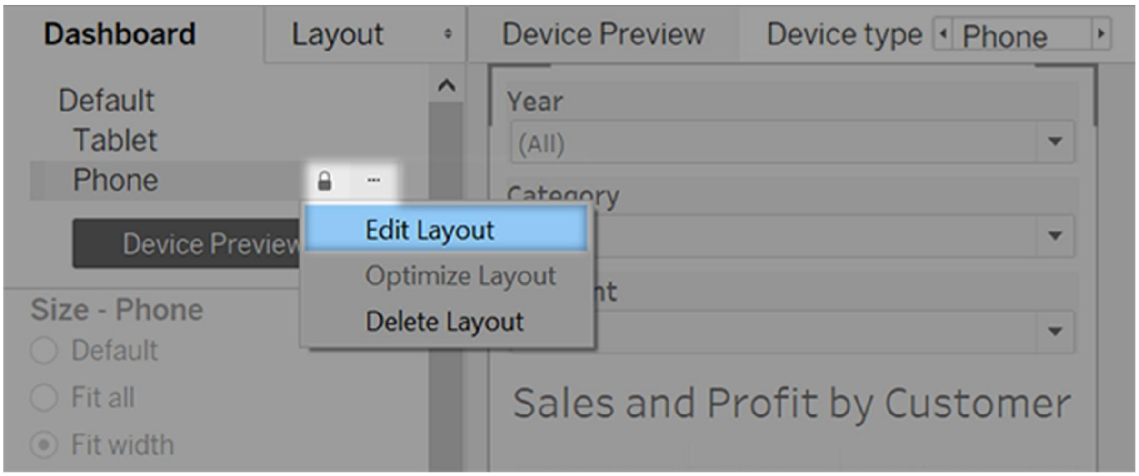
Think of the Default dashboard as the parent, and the device layouts (desktop, tablet, and phone) as its children. Any view, filter, action, legend or parameter that you want to add to a device layout must first exist in the Default dashboard.

Phone layouts and the Default dashboard

To save time with a unique Phone layout option that automatically reflects changes to the Default dashboard, either click the open lock icon , or choose **Auto-Generate Layout** from the pop-up menu.

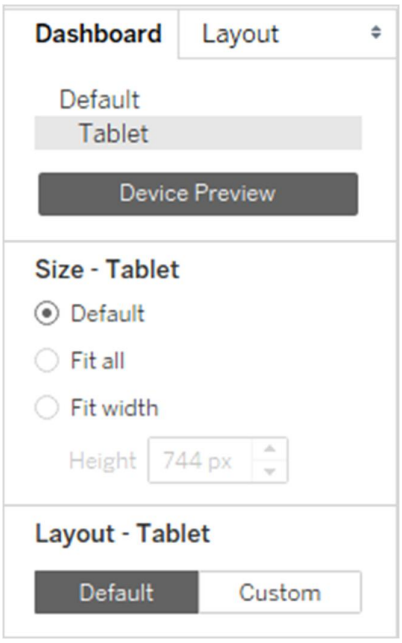


If you instead click the closed lock icon or choose **Edit Layout** from the menu, the Phone layout becomes fully independent, so you'll need to manually add and arrange items to reflect changes to the Default dashboard.



Desktop and Tablet layouts and the Default dashboard

Unlike Phone layouts, you need to manually add Desktop and Tablet layouts to a dashboard. Desktop and Tablet layouts are always fully independent from the Default dashboard, so each device layout can contain a unique arrangement of objects.



Automatically add phone layouts

Two options let you automatically add phone layouts:

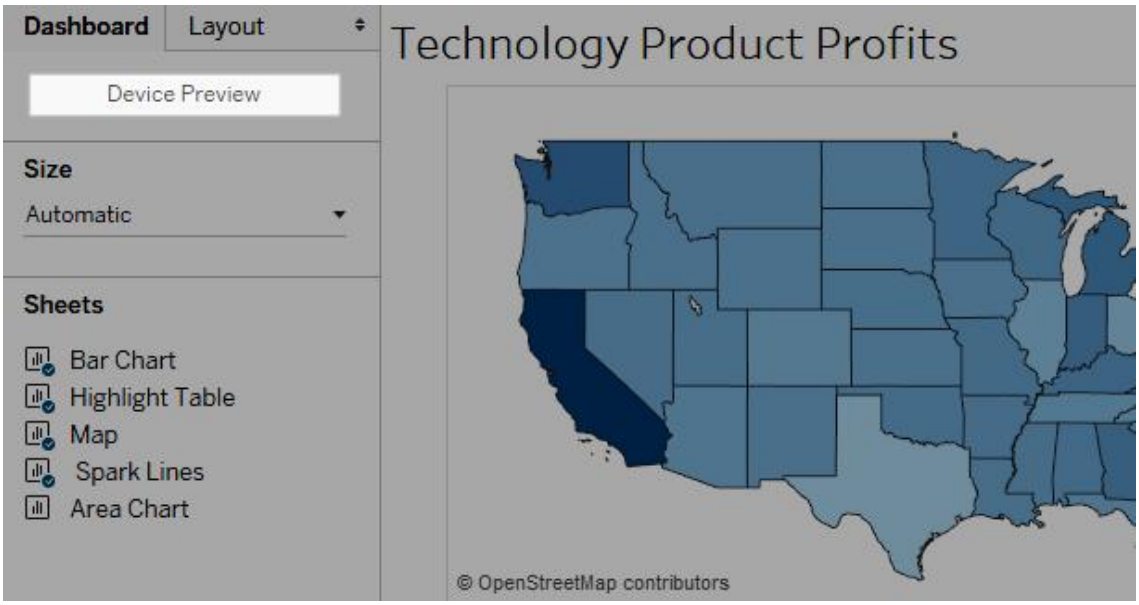
- To create phone layouts whenever you open old dashboards that lack them, choose **Dashboard** > **Add Phone Layouts to Existing Dashboards**

- To create phone layouts whenever you create a new dashboard, choose **Dashboard** > **Add Phone Layouts to New Dashboards**. (This option is on by default.)

Preview and manually add device layouts

1. Open a dashboard.

2. On the **Dashboard** tab on the left, click **Device Preview**.



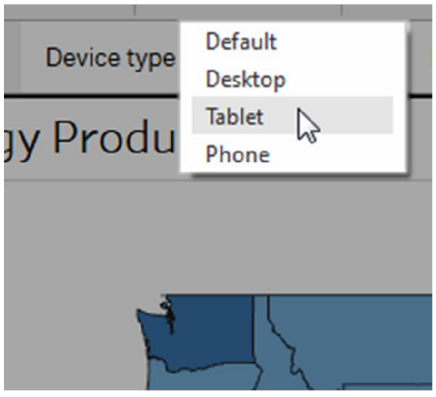
In device preview mode, these options appear above the dashboard:

3. Take a moment to click through the **Device types** and **Models** and explore the different screen sizes. Then set these options:

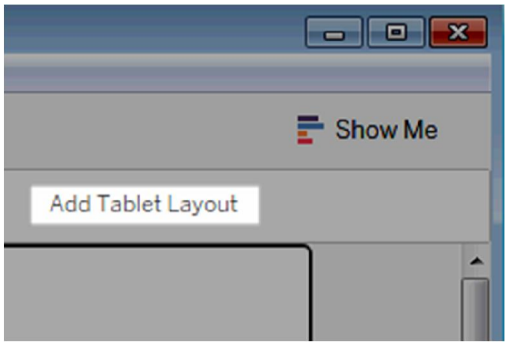
    - To see how the dashboard will look in landscape vs. portrait mode, click . Usually, landscape is optimal for tablets and portrait is best for phones.

    - Select **Tableau Mobile app** to see how the dashboard will look with the app instead of the browser. This option is available for iOS or Android devices and shrinks the dashboard slightly, leaving space for the app controls.

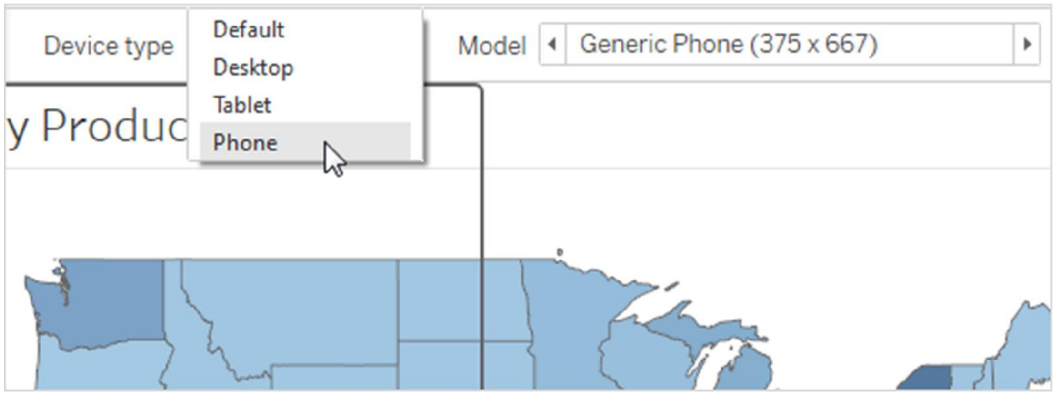
4. Choose a **Device type**, such as **Tablet**.



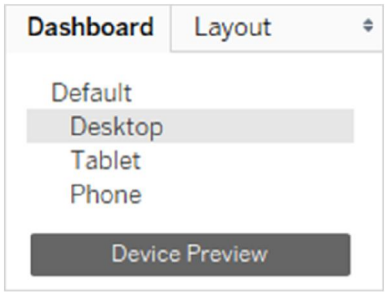
5. In the upper-right corner, click the **Add Layout** button for the device type you selected (for example, **Add Tablet Layout**).



6. Add an additional layout by selecting a new **Device type** and clicking **Add Layout**.



Creating a layout for each device type gives you the most control over your users' experience as they view your dashboard from different devices. After you publish a dashboard with all three layouts, users won't see the default dashboard layout; instead, they'll always see the appropriate device-specific layout.

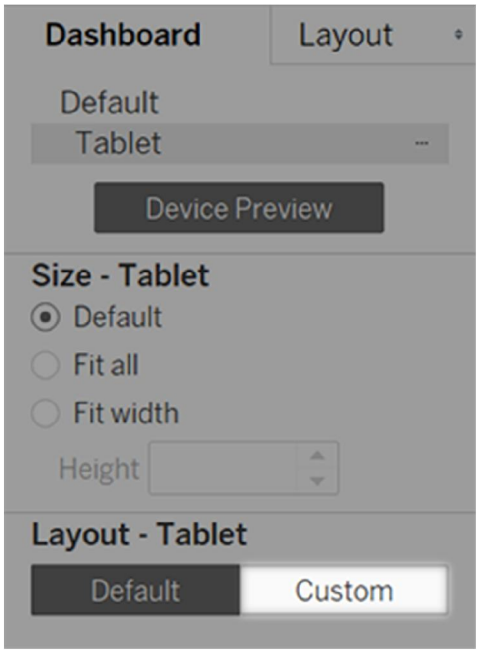


Note: If you make changes to a view, double-check related devices layouts to ensure that they look as you expect.

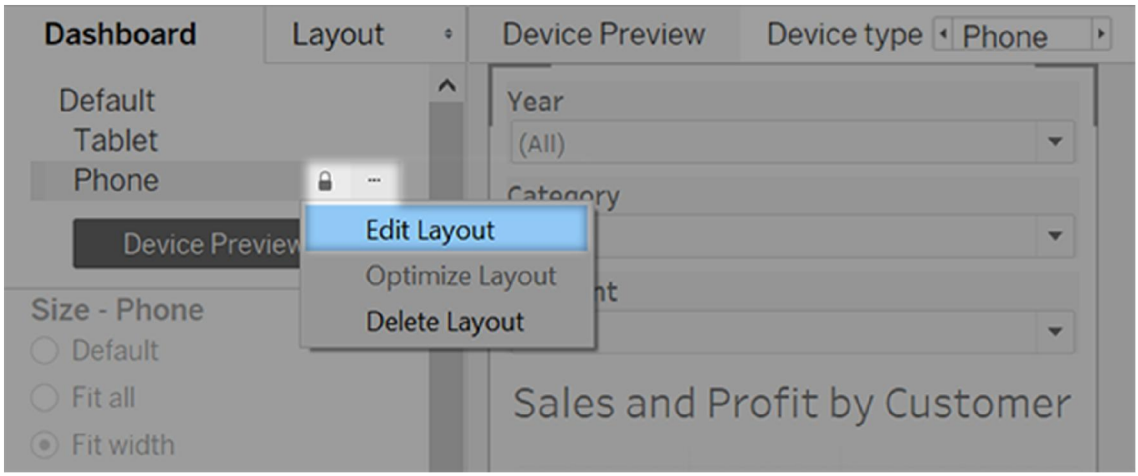
Customize a device layout

After you've added a device layout to your dashboard, you can start rearranging objects to create the look you want.

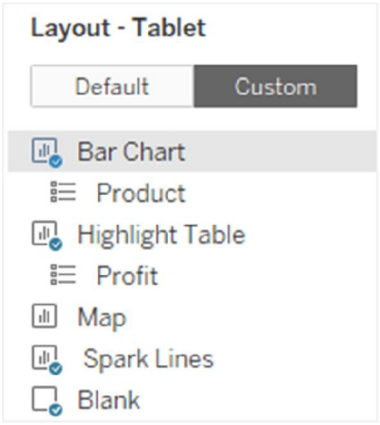
1. For Desktop and Tablet layouts, click **Custom**:



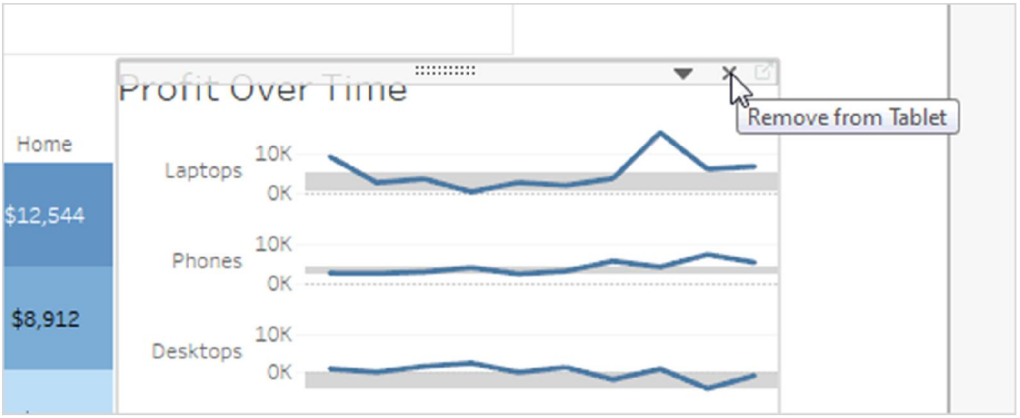
For Phone layouts, either click the lock icon, or choose **Edit Layout** from the pop-up menu:



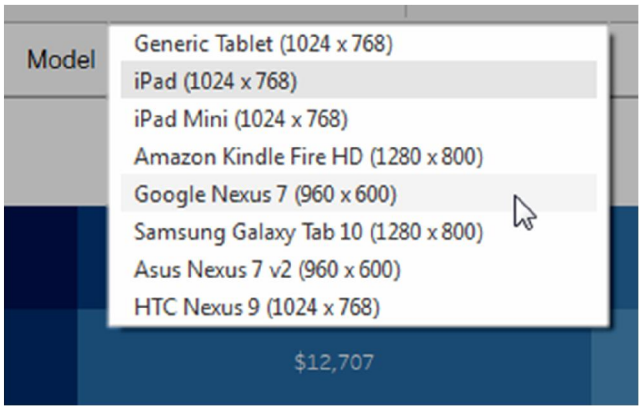
2. Anything you can add to your layout is listed on the left, under **Layout**. If an item has a blue check mark, it means that it's part of the device layout that you're currently working on.



3. If you remove an item, it's only removed from the current device layout. It still exists on the default dashboard and can be added to the device layout again.

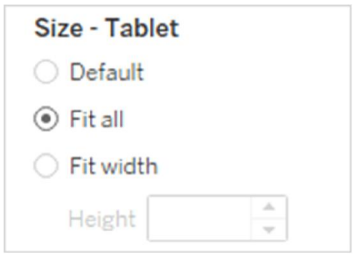


4. Click through the **Device model** options to see how the layout will appear on different models.



Ultimately, it's the size of the web browser that loads the dashboard that determines which layout appears on the device.

5. At left, explore the options under **Size**.



Default: The height and width of the device layout mimics whatever the default dashboard is using. For example, if you're creating a tablet layout and the default dashboard is set to a fixed size of Desktop Browser (1000 x 800), setting Size to Default for the tablet layout will make it use 1000 x 800 as well.

Fit all: All items are automatically resized to fit the device frame size. The device frame size is determined by the Device type, Model, and orientation (portrait or landscape) settings.

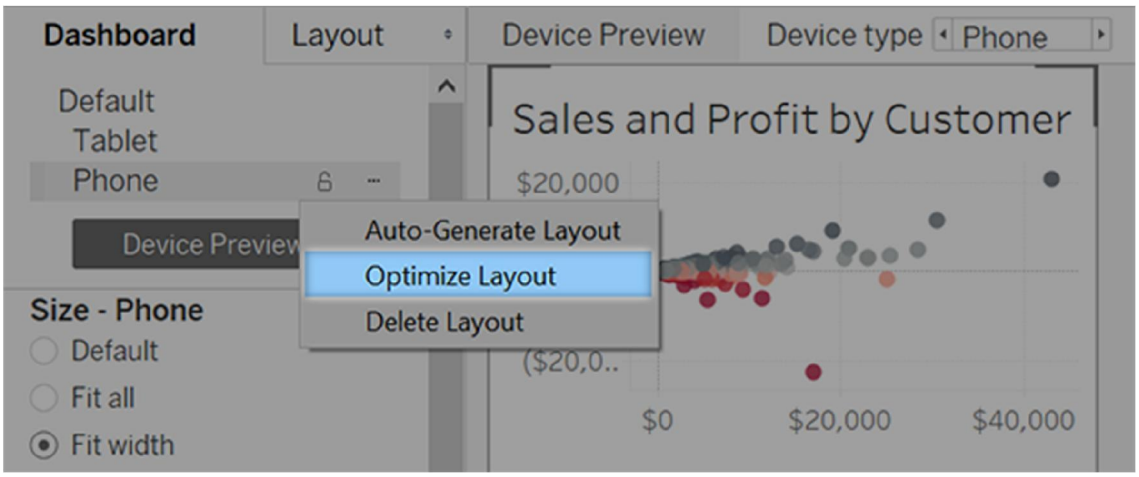
Fit width (recommended for phones): Items are automatically resized to fit the width of the device frame, but the height is fixed. This is a great option for phone layouts and vertical scrolling.

Optimize for phones

The small screens of mobile phones benefit from further optimization. Try these techniques.

Optimize manual phone layouts

If you've chosen to edit a phone layout yourself, you can quickly optimize the placement of filters, remove white space, and more. On the **Dashboard** tab, click the pop-up menu to the right of **Phone**, and select **Optimize Layout**.



Be aware that this command only rearranges items currently in the phone layout. If you want to continuously update the phone layout to reflect all changes to the default dashboard, select **Auto-Generate Layout**.

2. Create a dashboard using World Indicators showing the all the Actions that can be performed in Tableau.

10. Time Series:

1. Use Order date and drill down the information for Quarter and Month level separately and show the line Chart in a Continuous Form- **Global Superstore**

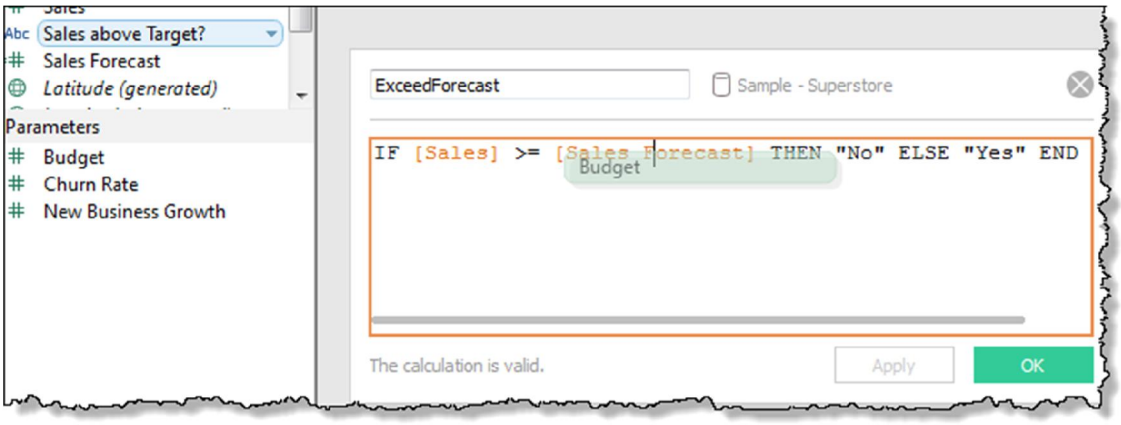
11. Sets, Parameters, Groups:

1. Parameters can be used in?

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.

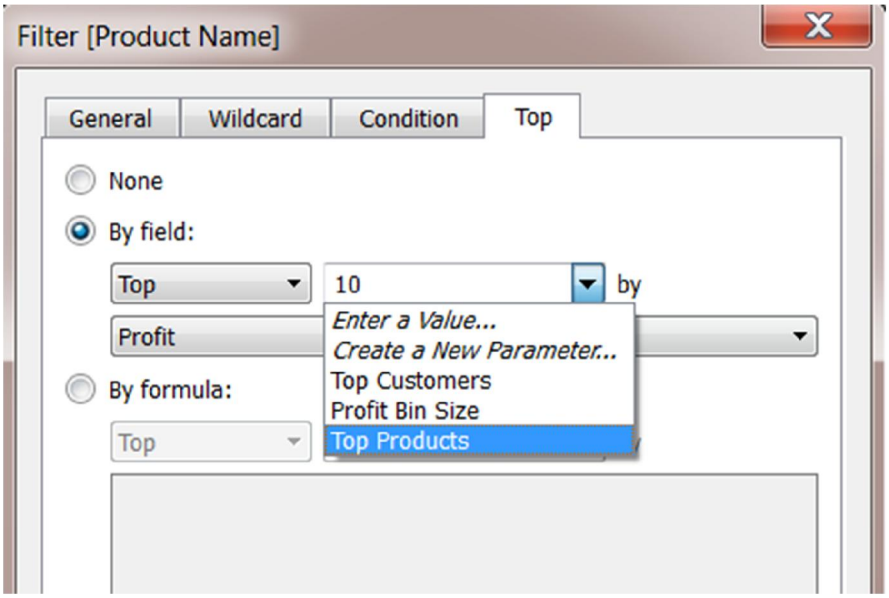
To use a parameter in a calculation, drag the parameter from the Data pane and drop it in the calculation editor, either at a new location in the formula or to replace a part of the current formula:



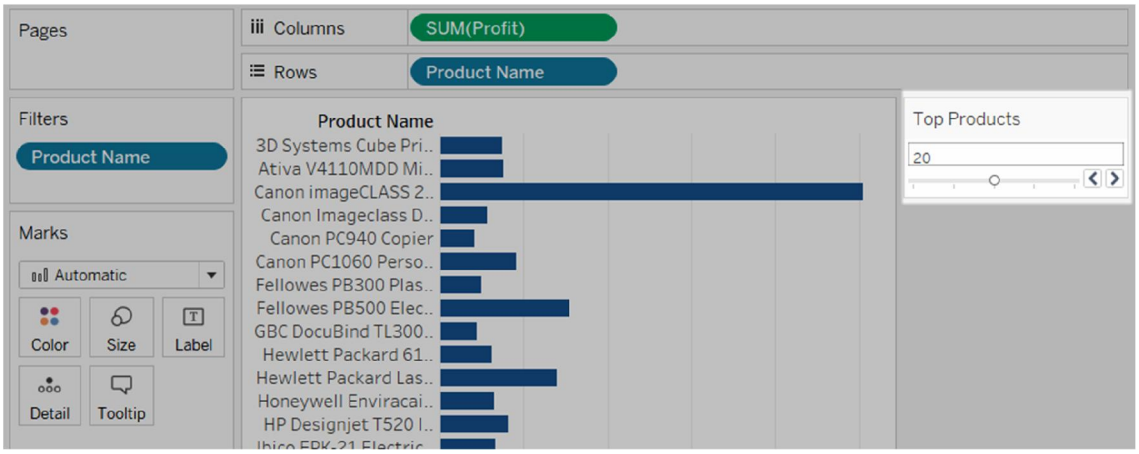
Use a parameter in a filter

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.



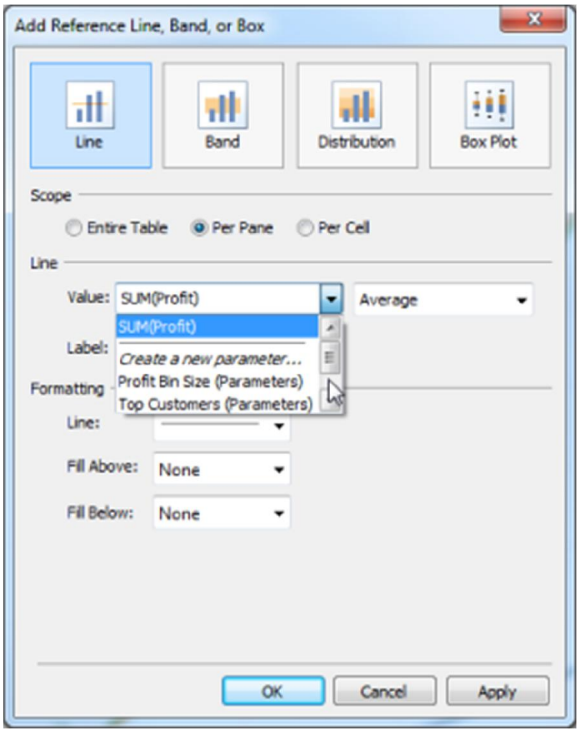
To show the parameter control, right-click the parameter in the **Data** pane and select **Show Parameter**. Use the parameter control to modify the filter to show the top 10 products, 15 products, 20 products, and so on.



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.



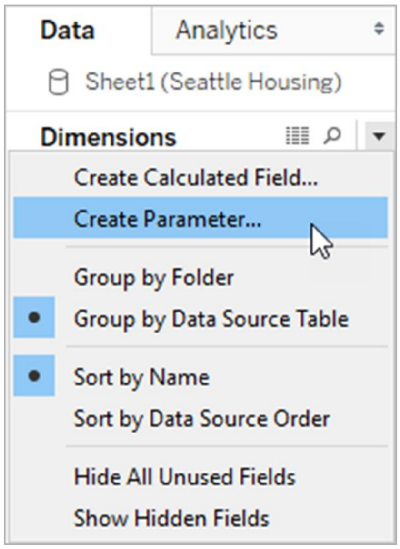
The reference line is drawn at the Current Value specified by the parameter. To open the parameter control, right-click (Control-click on a Mac) the parameter in the **Data** pane and then select **Show Parameter**. Use the parameter control to change where the reference line is drawn.

2. What are the different ways to create a Parameter?

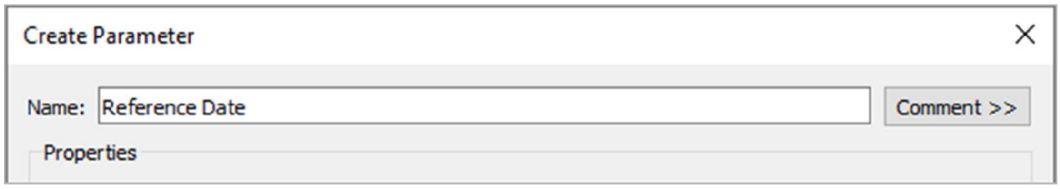
Create a parameter

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

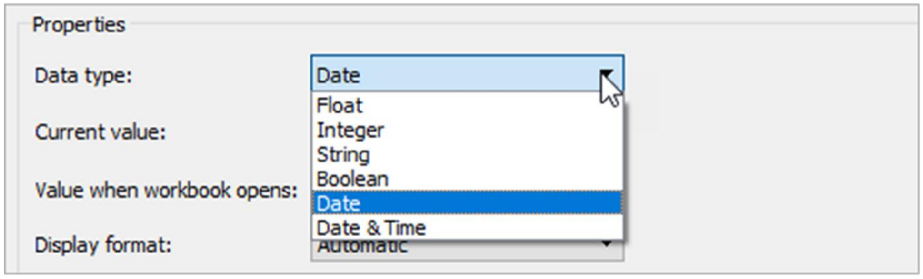
1. In the Data pane, click the drop-down arrow in the upper right corner and select **Create Parameter**.



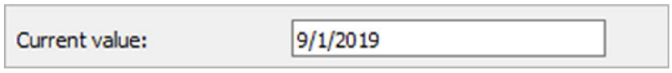
2. In the Create Parameter dialog box, give the field a **Name**.



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.

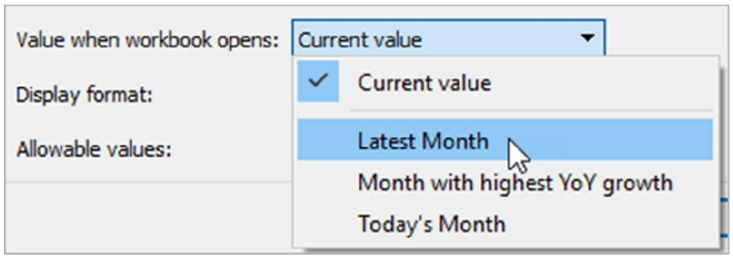


5. Specify a value when the workbook opens. In this case, let's create a dynamic parameter by setting the parameter's default value to the result of a single-value, view-independent calculation.

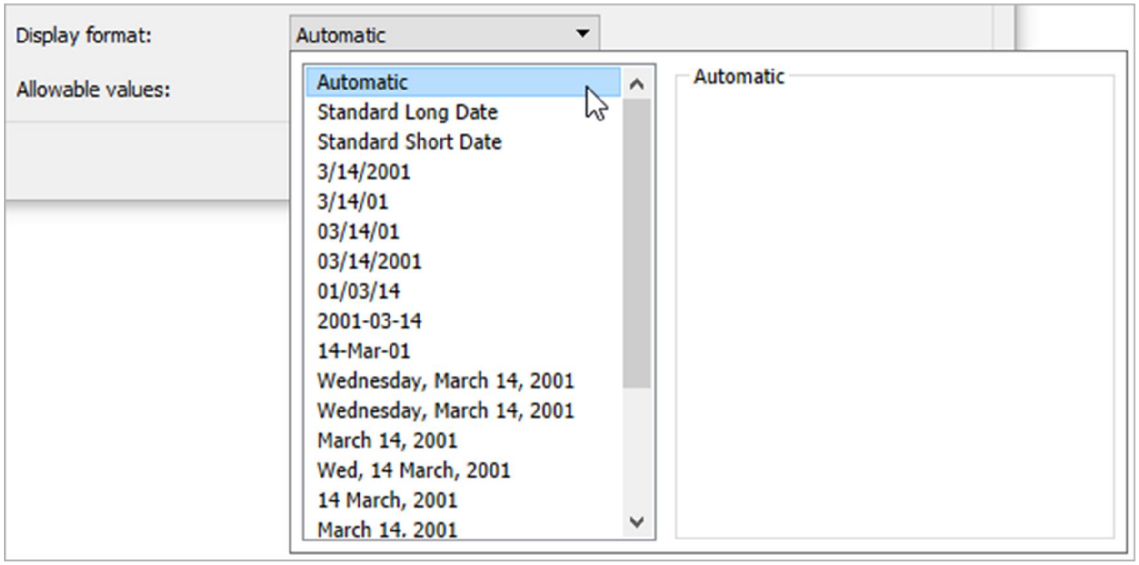
Note: If there is more than one value, the workbook would not be able to choose a default value. The calculation must also be view-independent so that the value won't change as the viz changes. To do this, you can use a FIXED level of detail (LOD) expression that is not dependent on the structure of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

LOD expression. 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).

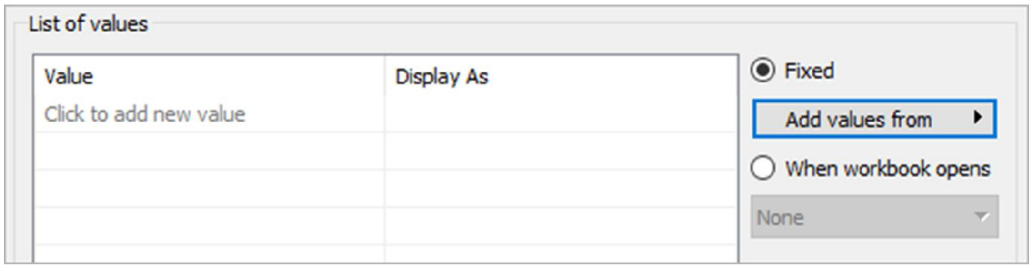


7. Specify how the parameter will accept values. You can select from the following options:

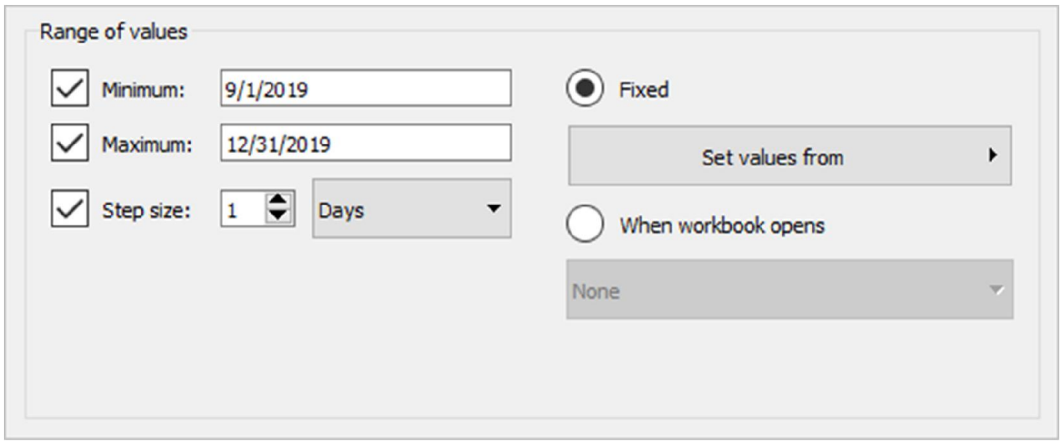
    - **All** - The parameter control is a simple text field.
    - **List** - The parameter control provides a list of possible values for you to select from.
    - **Range** - The parameter control lets you select values within a specified range.

    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.

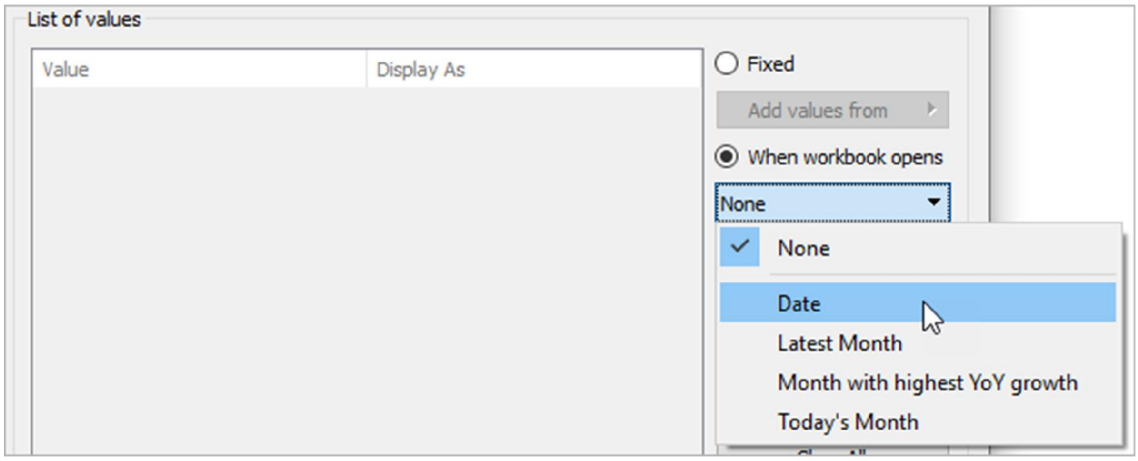
    If you select List, you must specify the list of values. Click in the left column to type your list of values, or you can add members of a field by selecting **Add values from**.



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.

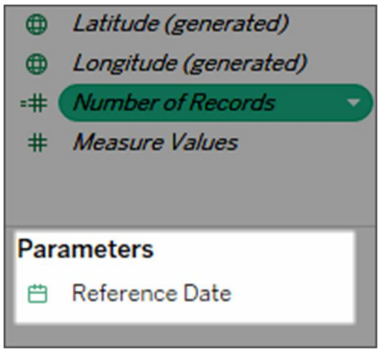


In this case, to refresh the parameter's list of values (or domain) whenever the workbook opens, select **List**, and then select **When workbook opens**. Notice that the list of values on the left is grayed out because the workbook is dynamically pulling values from the data source.



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.

Note: On Desktop, these queries are initially evaluated when the workbook is opened and Tableau connects to the fields' data sources for the first time. You can also evaluate the queries by refreshing the data source. To do this, press F5, or open the data source's context menu and select **Refresh**. On Server and Online, you can refresh the data source by clicking the Data Source Refresh button in the toolbar. In this case, however, remember that the value returned depends on the server's cache policies.

If the default fields fail to return values, the parameter will behave as follows:

- The current value will keep the latest valid value.
- The list of values will be empty because Tableau doesn't serialize the values returned from the query in the workbook.

The current value must be in the list of values for it to be assigned to the parameter. If the list of values is empty, the parameter will get assigned a fallback value according to the data type (1 for integer, 1.0 for float, "" for string, and the current date for date and datetime).

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.

To delete a parameter, right-click it in the Data pane and select **Delete**. Any calculated fields that use the deleted parameter will become invalid.

12. Forecast:

1. You are provided with the dataset for the past 10yrs. How can you forecast the data for next 4 years, Quarter wise.
2. Use **"Sample Superstore".** What is the Sales Forecast Estimate for the month of September 2018?

13. Pie Chart:

1. Create a Pie Chart using regions and sum of sales, sort the pie in ascending order, increase the size in the view and label them with Count of Quantity and Sum of Profits- **Sample superstore**