NANYANG THE INNOVATIVE POLYTECHNIC School of Information Technology

# LAB 2: VISUALISING TIME SERIES DATA

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## Learning Outcome

At the end of this session, learners will be able to:

- Describe the basic patterns and techniques in visualizing time series data
- Show summary and detail time series data together
- Compare time series data in multiple shelves
- Format the dates
- Create and view the most recent data by create calculated fields

## Data Preparation

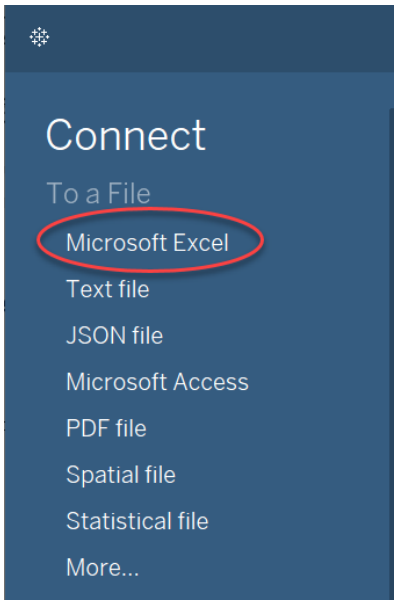
Create a Tableau workbook that connect to the **Sample - Superstore Subset (Excel)** data source.

We are going to use this data source for all the tasks of this lab.

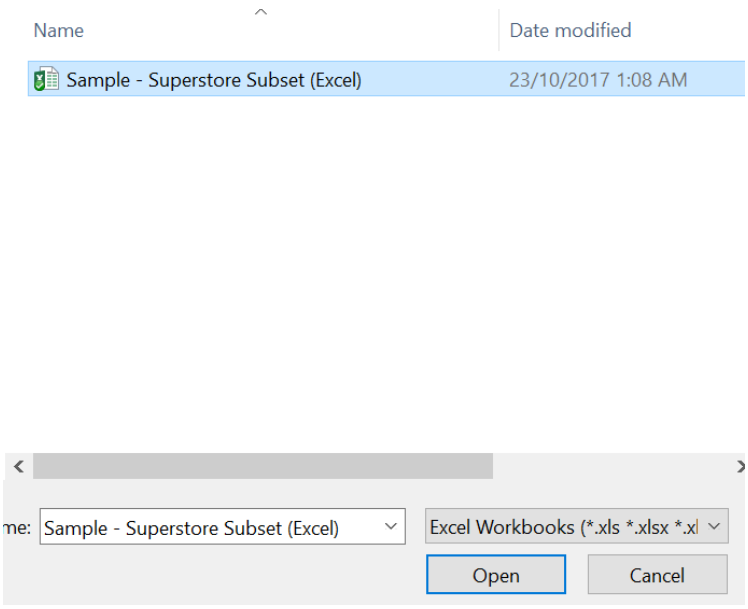
Step 1. Launch Tableau. Under Connect To a File, select **Microsoft Excel**.

Step 2. From the file open window, select the **Sample - Superstore Subset (Excel)** excel file.

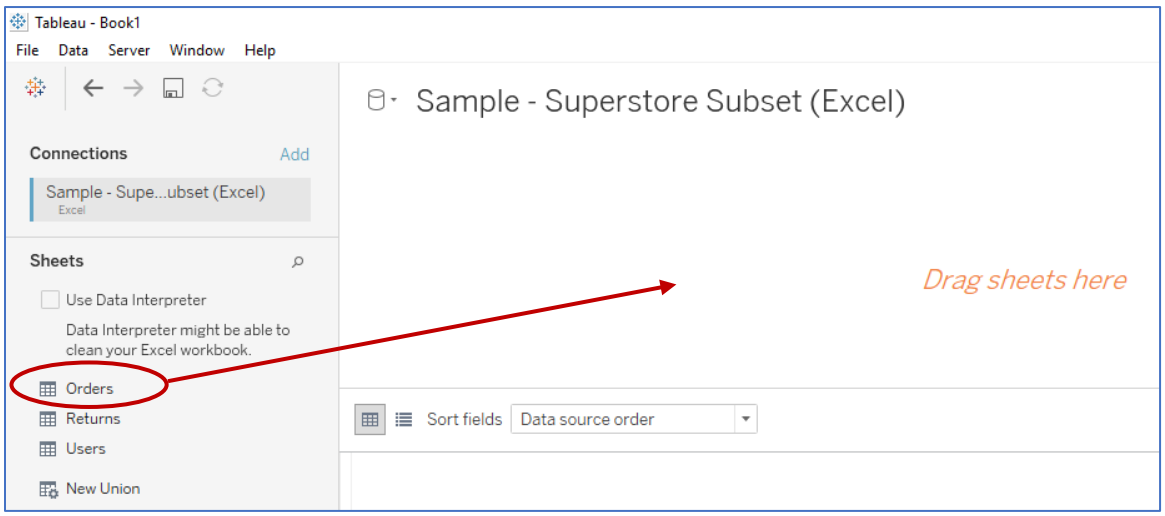
**Step 1**




**Step 2**



Step 3: Drag **Orders** to the *canvas*.




## Task 1: View Analyzing Time Series Video

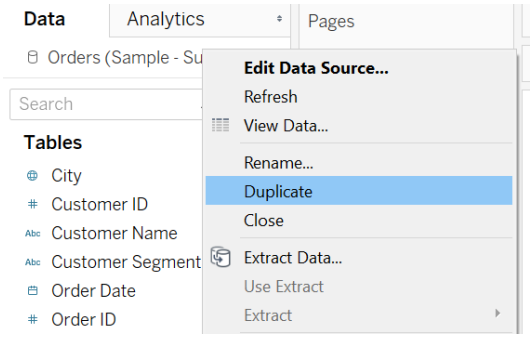
View this "Analyzing Time Series" video (6 mins).

# Task 2: Create a View that shows Summary and Detail together

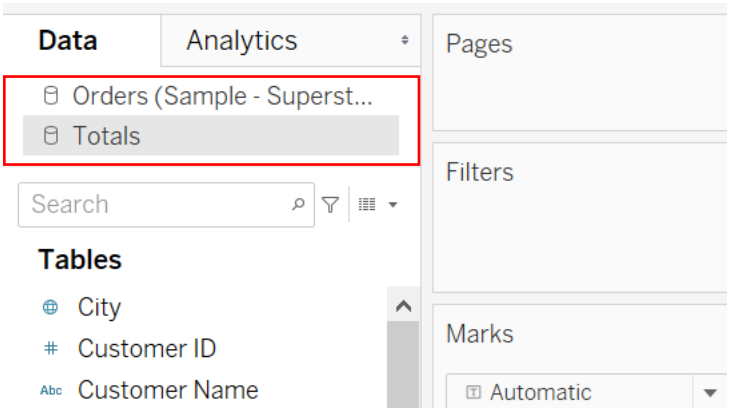
## Duplicate the 2nd data source named Totals

1. Click **Sheet1** tab at the left bottom corner to open the chart designer. Rename it as **Task 1**.

2. Right click the **Orders (Sample - Superstore Subset (Excel))** data source in the Data menu and select **Duplicate**.




3. Rename the copied data source to **Totals**. Your workbook should contain the following TWO (2) data sources:



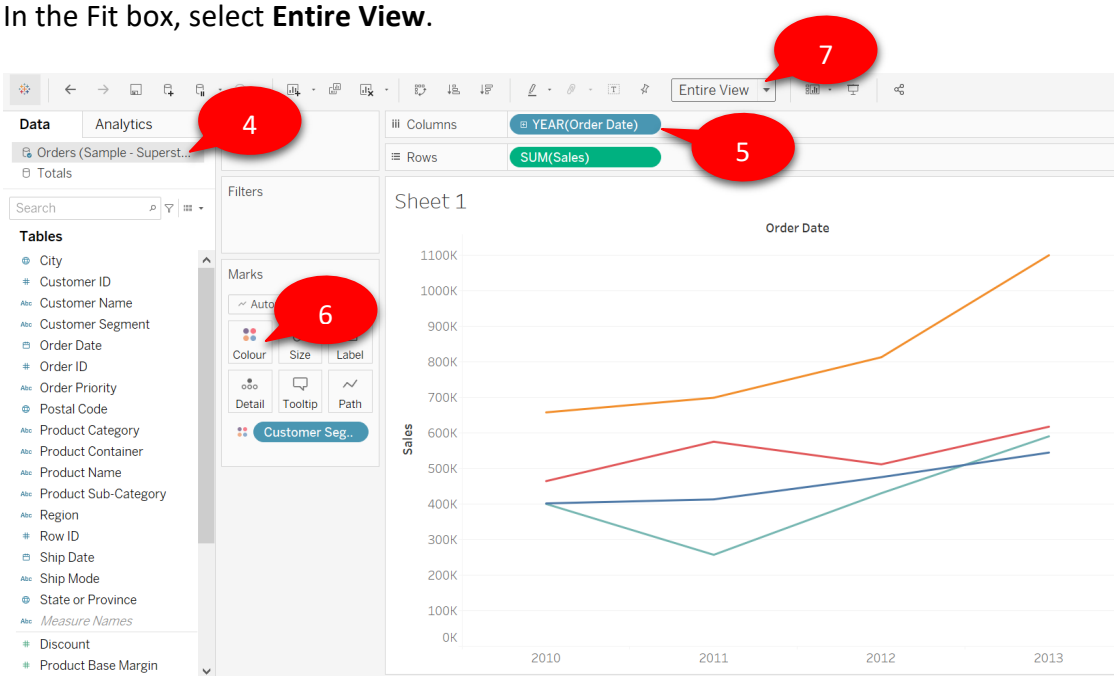

## Create the 1st sales line chart

4. In the Data window, select **Orders (Sample - Superstore Subset (Excel))** data source.

5. Drag **Order Date** to the **Columns** shelf. Drag **Sales** to the **Rows** shelf.

6. Drag the **Customer Segment** to the **Colour** Marks card.

7. In the Fit box, select **Entire View**.




## Create the 2nd summary line chart

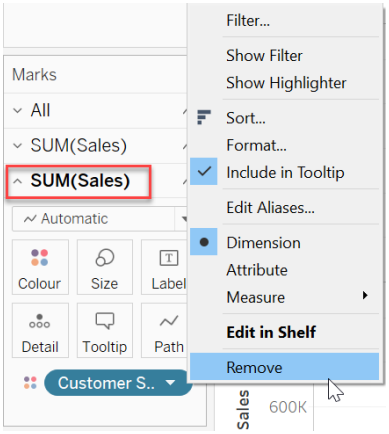
8. In the Data window, select the **Totals** data source.

9. Drag the **Sales** field to the **Rows** shelf.

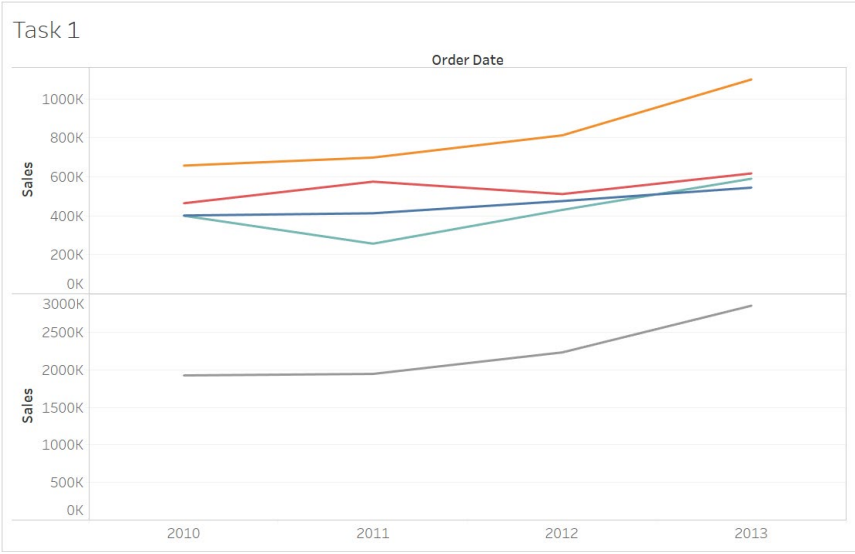
10. Two identical graphs now appear, one above the other. The top one is for Superstore and the bottom one is for Totals.

11. On the Marks card, click the second **SUM(Sales)** field.

12. In the Details area, right click **Customer Segment**, and select **Remove**.

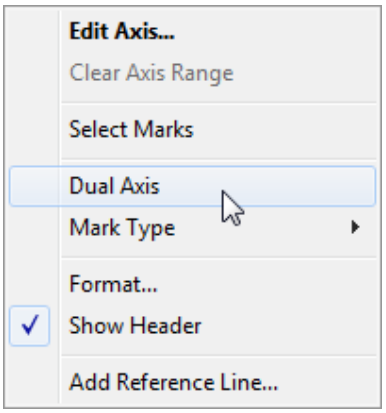



13. The coloured lines for the customer segments disappear from the bottom graph, and only a gray line for **Totals** is displayed.



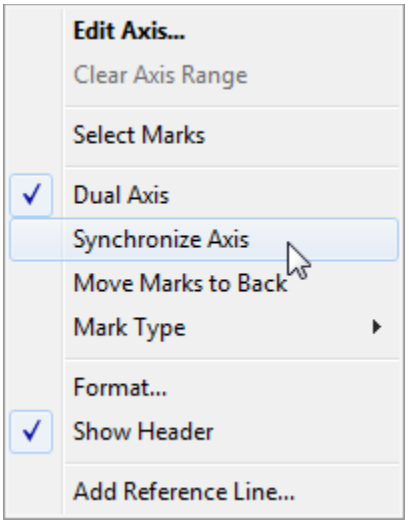

## Combine the two line charts and synchronize the axis

14. Right click the Y axis of the **Totals** charts and select **Dual Axis**.




15. The Superstore and Totals graphs combine, with axes on both sides of the graph. But the axes have different scales.

16. Right click the axis on the right side of the graph and select **Synchronize Axis**.

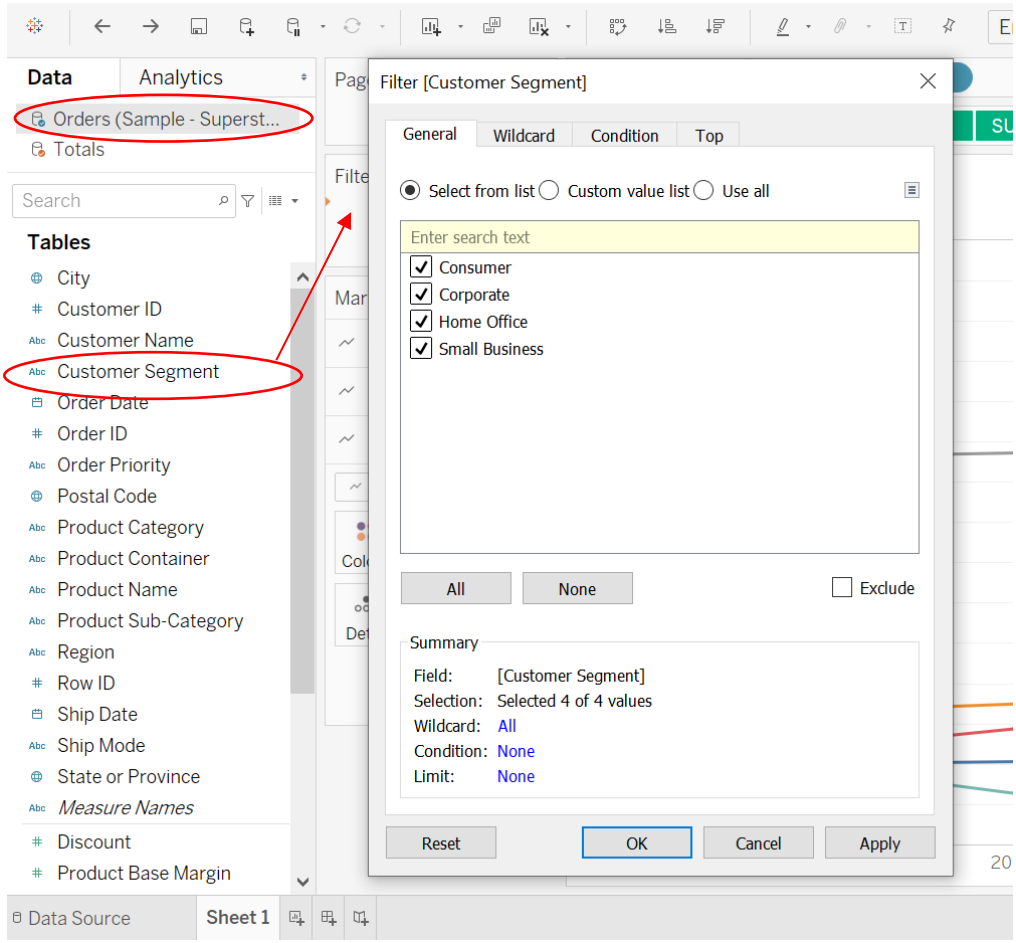



17. The scale on the right axis synchronizes with the left axis.

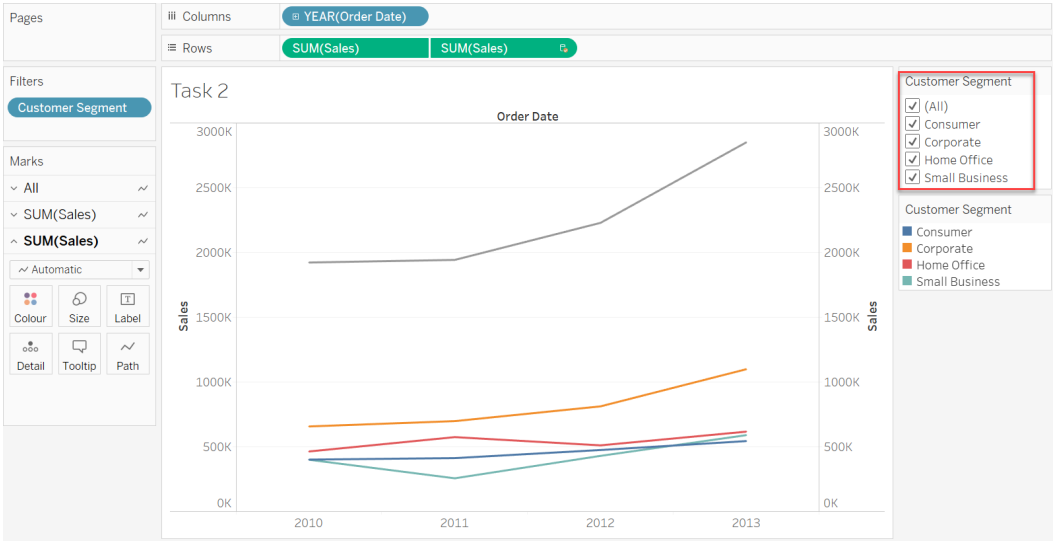
## Add the filter for customer sectors

18. In the Data window, select the **Orders (Sample - Superstore Subset (Excel))** data source.

19. Drag **Customer Segment** and drop into the Filters pane. In the Filters dialog window, select **All** from the list, then click **OK**.

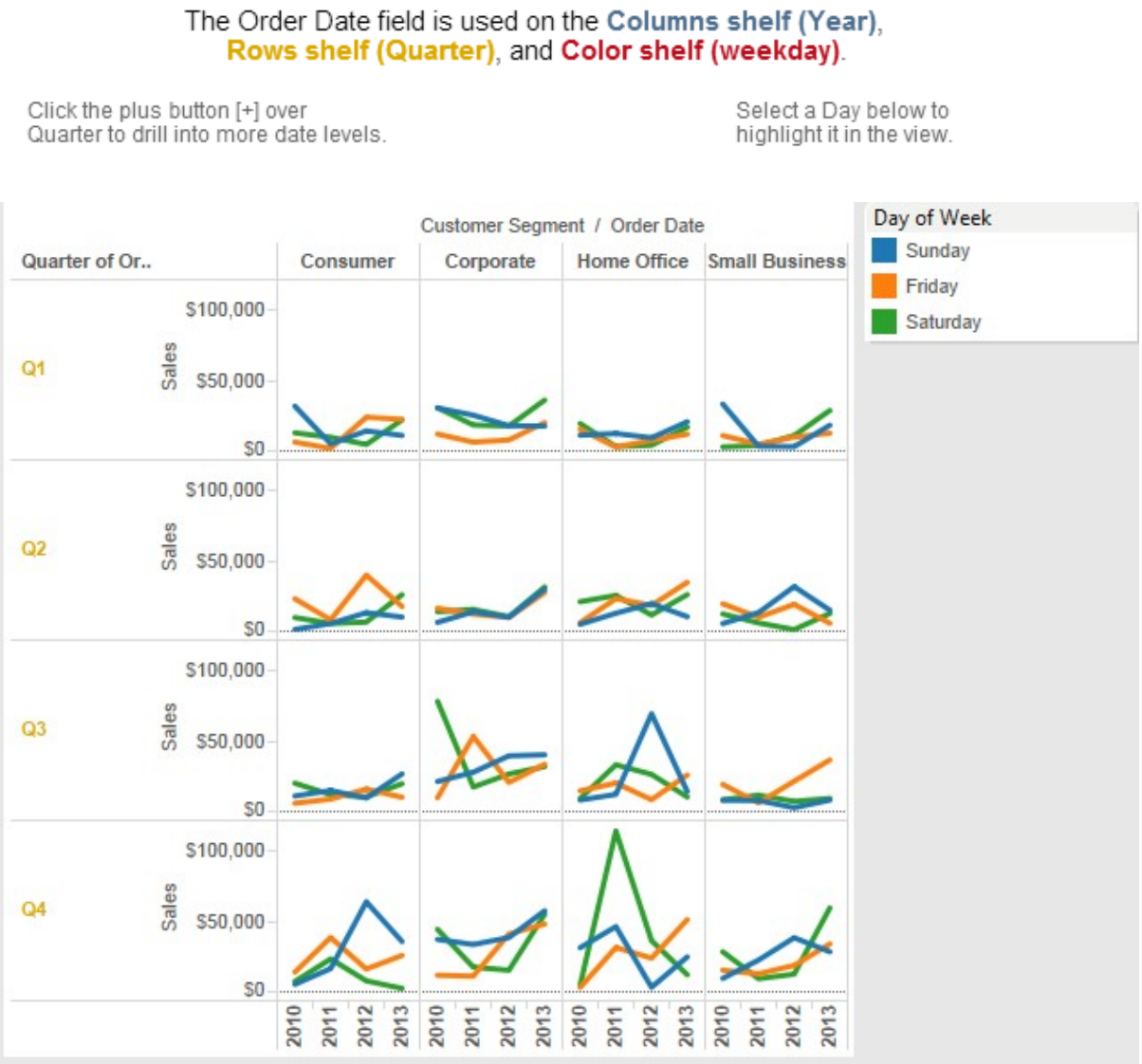



20. In the Filters pane, right click "**Customer Segment**" and select **Show Filter**. You can select All to see the total and the four customer segments or select an individual segment from the Quick Filter pane at the right.


Pages
Columns
YEAR(Order Date)
Rows
SUM(Sales)
SUM(Sales)
Filters
Customer Segment
Marks
All
SUM(Sales)
SUM(Sales)
Automatic
Colour
Size
Label
Detail
Tooltip
Path
Task 2
Order Date
3000K
2500K
2000K
1500K
1000K
500K
0K
Sales
2010
2011
2012
2013
Customer Segment
(All)
Consumer
Corporate
Home Office
Small Business
Customer Segment
Consumer
Corporate
Home Office
Small Business

# Task 3: Create a View That Uses Dates on Multiple Shelves

The view below contains a single date field effectively shown as three independent attributes of a visual table. In this case the Order Date field is used on the Column (year) shelf, Rows (quarter) shelf, and the Colours (weekday) shelf. Without separating and pivoting the date by different levels of detail, could you have noticed that total Sunday sales in the consumer division skyrocketed from 2011 to 2012? Could you have discovered that this happened only in Q4? Could you have seen that the effect was restricted to Sundays? The date field must be visually pivoted in order to find such insights. Tableau makes pivoting dates and using them on multiple shelves easy.



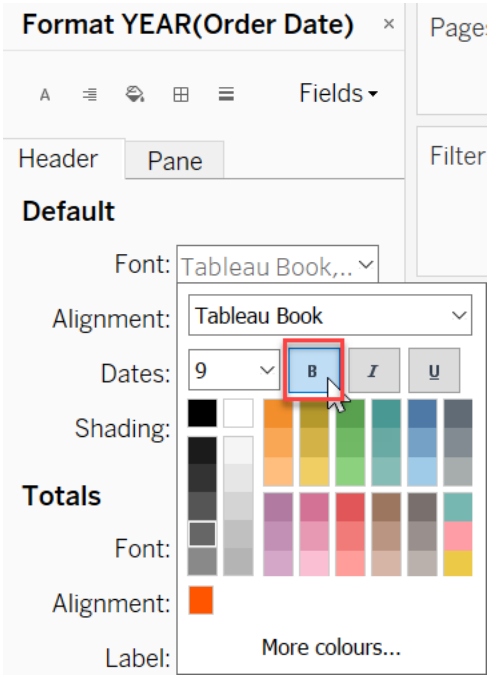
## 3.1 Shows years as columns

1. In the same workbook, open a new worksheet and name it **Task 3**. Make sure that you select the data source **Orders (Sample - Superstore Subset (Excel))**.

2. Drag the **Customer Segment** and **Order Date** fields to the **Columns** shelf.

3. Drag **Sales** to the **Rows** shelf.

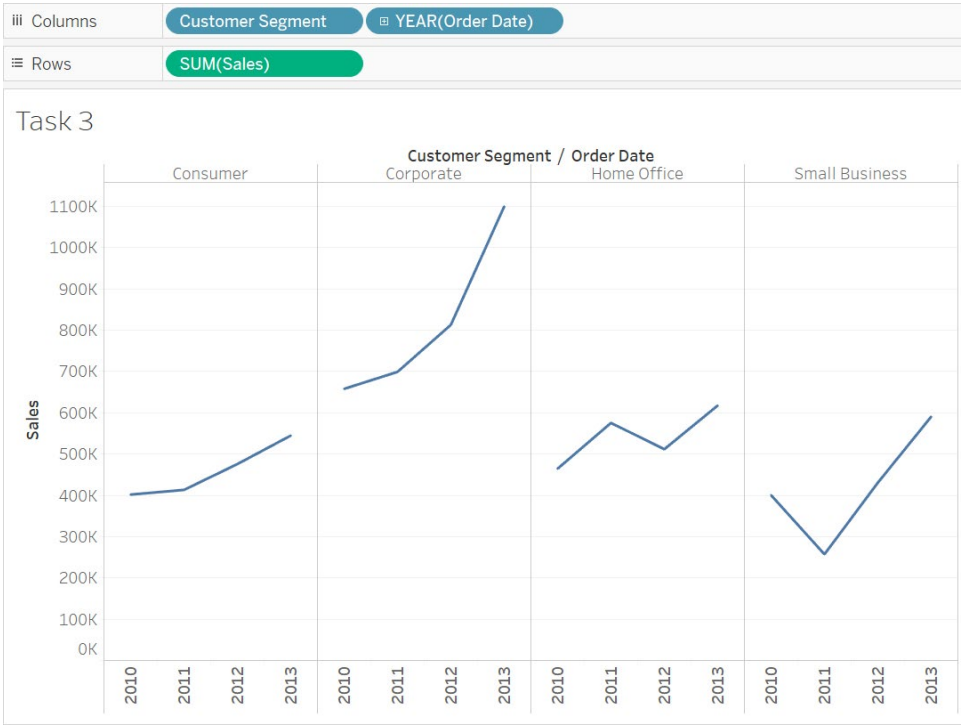
    a. Right click the years on the X axis, select **Format**.
    b. On the Header tab, under Default, in the Font drop-down menu, click the bold button to apply bolding.




4. Click the Close Pane button in the upper-right corner of the Format window to close.

5. Right click the years on the X axis, select **Rotate Label**.

6. The view with years as columns looks like this.




## 3.2 Show quarters as rows

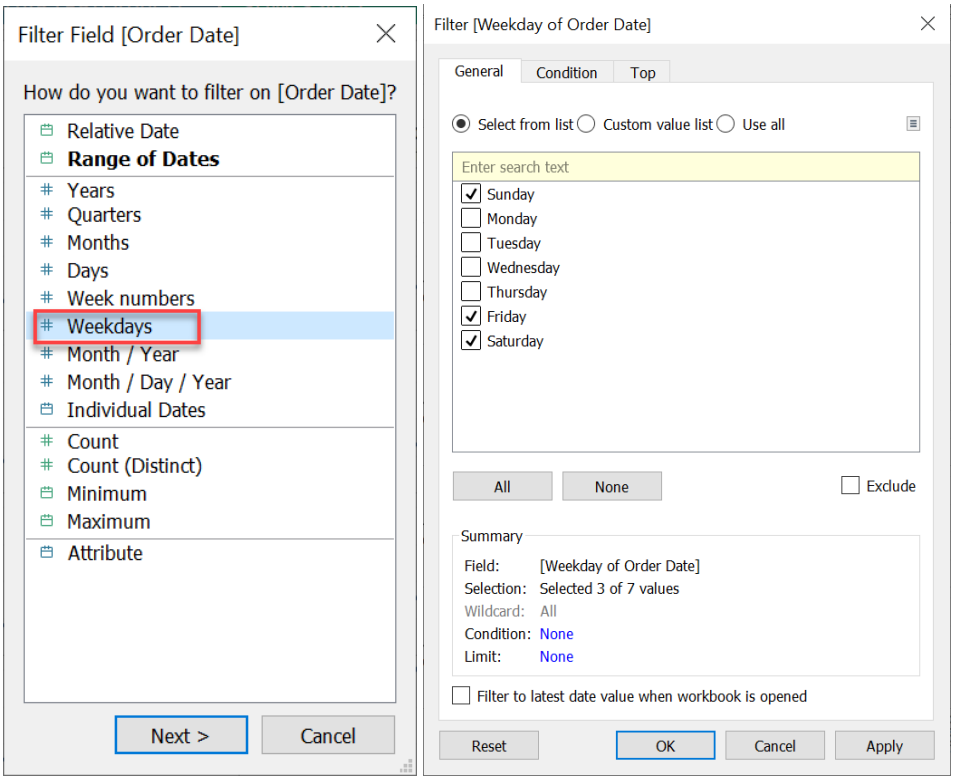
1. On the **Columns** shelf, click the plus sign on **YEAR(Order Date)**.

2. From the **Columns** shelf, drag **QUARTER(Order Date)** to the **Rows** shelf. The view with quarters as rows looks like this.


## 3.3 Use colour to distinguish different days.

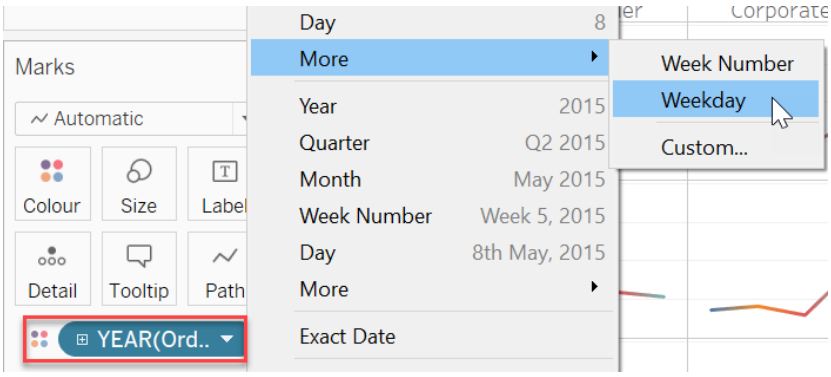
1. Drag the **Order Date** field to the **Filters** shelf.

2. In the Filter Field dialog box, do the following tasks:
   a. Select **Week days**, and then click **Next**.
   b. Select **Sunday**, **Friday**, and **Saturday**.
   c. When finished, click **OK**.

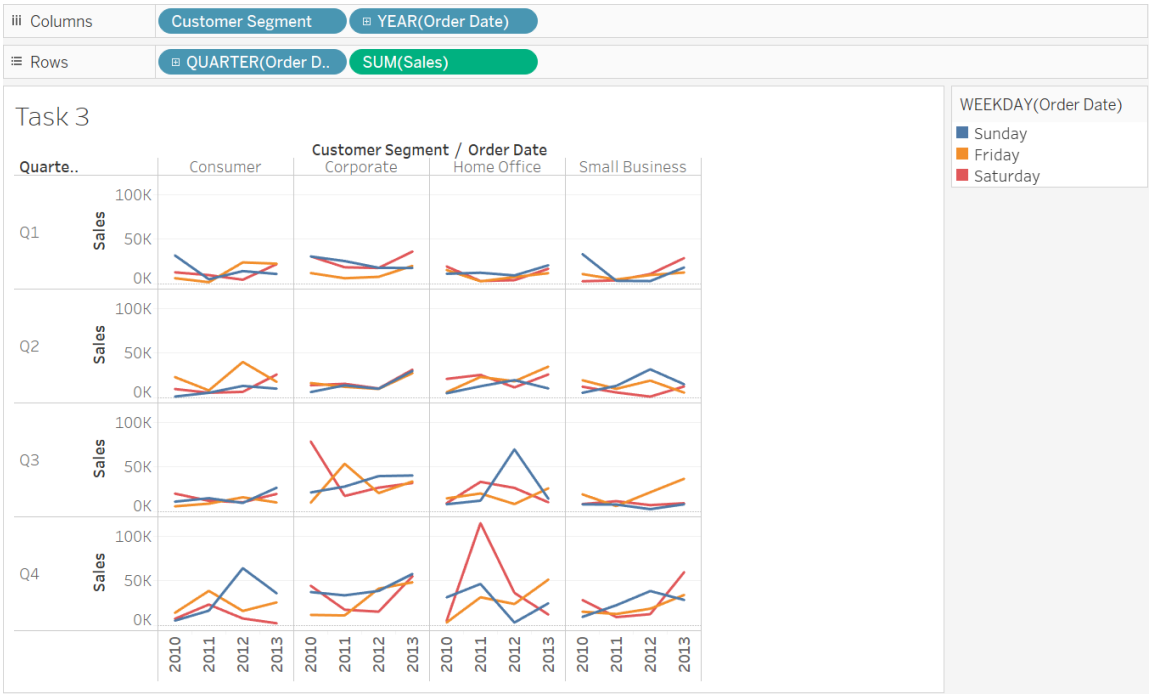


3. Drag the **Order Date** field to **Colour**.

4. Right click **YEAR(Order Date)** in the **Marks** card and select **More → Weekday**.



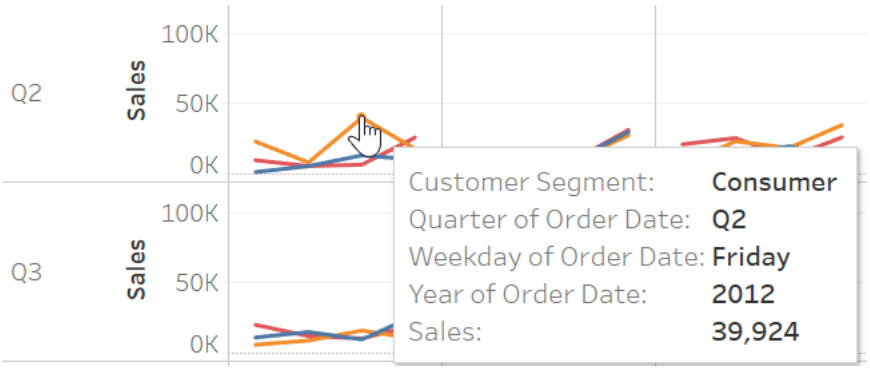

5. The final view provides information about weekend sales across all consumer segments for a four-year period.




## 3.4 See data for a specific day

1. You can click any point on any line to see the year, quarter, weekday, customer segment, and sales figure.

2. In the **Consumer** box for **Q2**, point to the peak on the Friday line to see the Sales number.




## Task 4: Create a View with Month Abbreviations

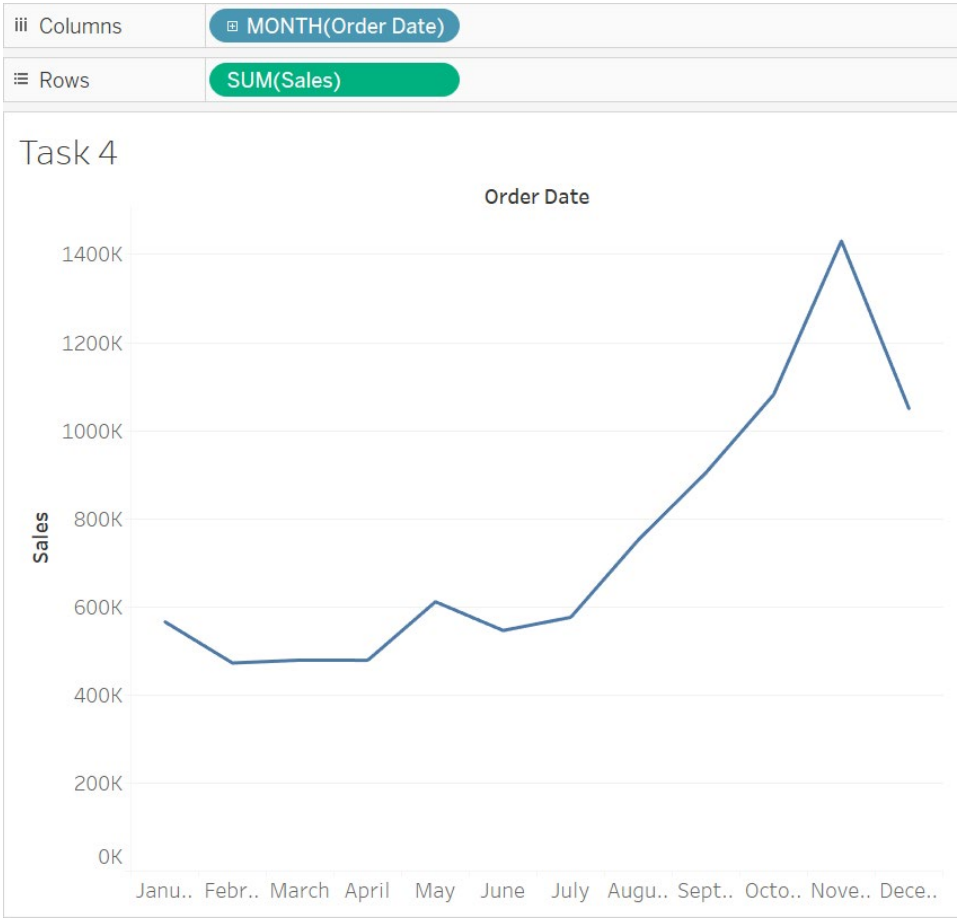
When drilling down to the month level of a date field, by default Tableau will use the full month names such as January, February, and March. This can sometimes take up more space on a view than you want.

This article will show you how to display month abbreviations using both three-letters (for example, Jan, Feb, Mar, etc.) and one-letter (for example, J, F, M, and etc.).

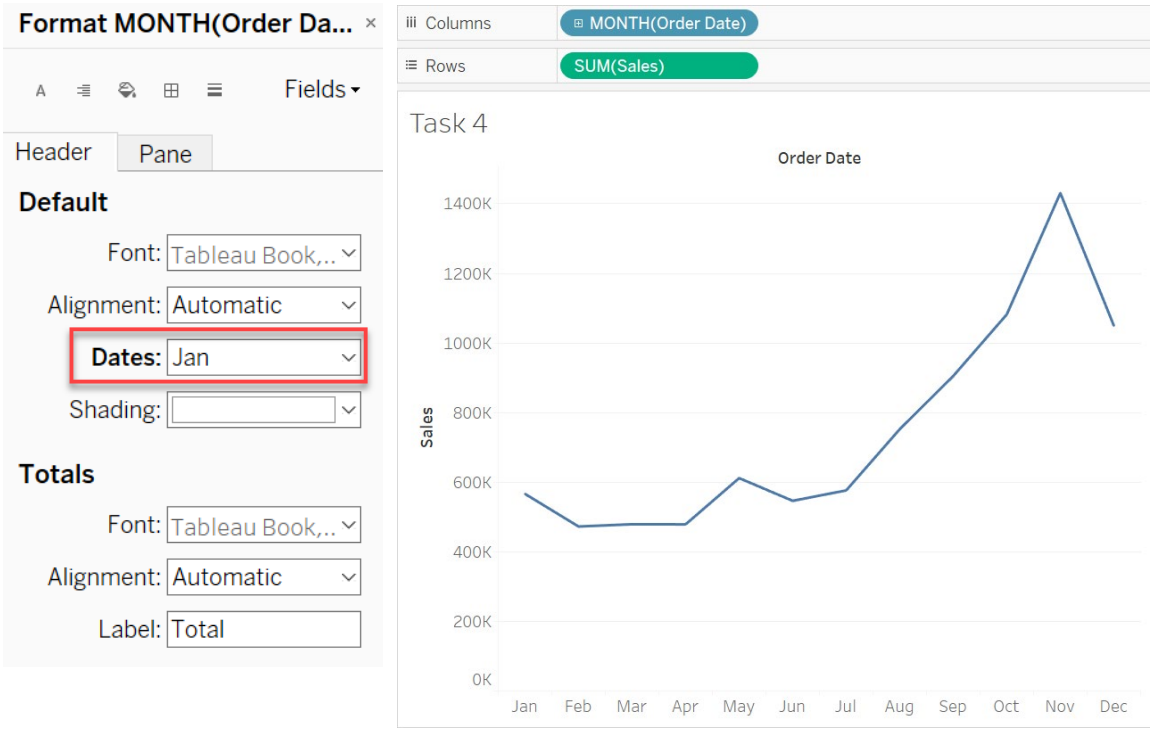
1. Create a new worksheet named **Task 4**. Connect to your data source. This example uses the **Sample - Superstore Subset (Excel)** data source.

2. Drag the **Order Date** field to the **Columns** shelf, and right click the **YEAR(Order Date)** field, and select **Month**.

3. Drag the **Sales** field to the **Rows** shelf.




4. Right click the **MONTH(Order Date)** field, and click **Format**.
5. In the Format window, next to **Dates**, select **Abbreviation** to display the month name with three letters, or select First Letter to display the month name with one letter.


Format MONTH(Order Da...
Fields
Header
Pane
Default
Font: Tableau Book,...
Alignment: Automatic
Dates: Jan
Shading:
Totals
Font: Tableau Book,...
Alignment: Automatic
Label: Total
Columns
MONTH(Order Date)
Rows
SUM(Sales)
Task 4
Order Date
Sales
1400K
1200K
1000K
800K
600K
400K
200K
0K
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

# Task 5: Create a View with Five of the Most Recent Days' Data

In this task, we shall create a view of data from the five most recent calendar days. This is a powerful way to view data that does change regularly. In this example, you can use the five most recent days of orders from the Sample - Superstore data source.

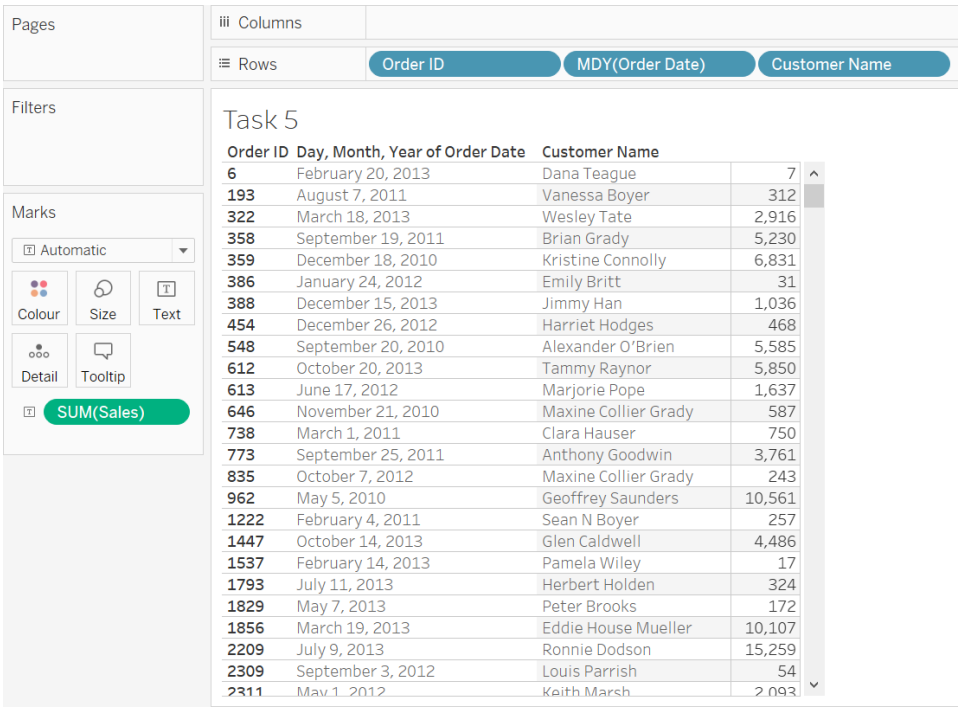
## 5.1 Set up the initial view

1. Create a new worksheet named **Task 5**. Connect to your data source. This example uses the **Sample - Superstore Subset (Excel)** data source.

2. Drag the **Order ID**, **Order Date**, and **Customer Name** fields to the **Rows** shelf.

3. On the **Rows** shelf, click the down button of **YEAR(Order Date)** and select **More → Custom → Detail** drop-down list → **Month / Day / Year.**

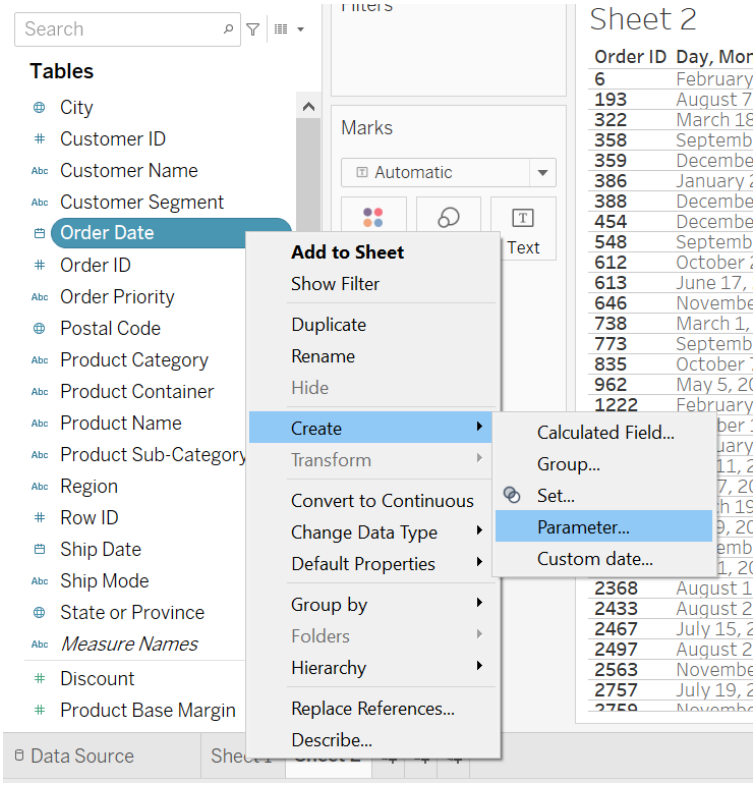
4. Drag **Sales** to **Text**.



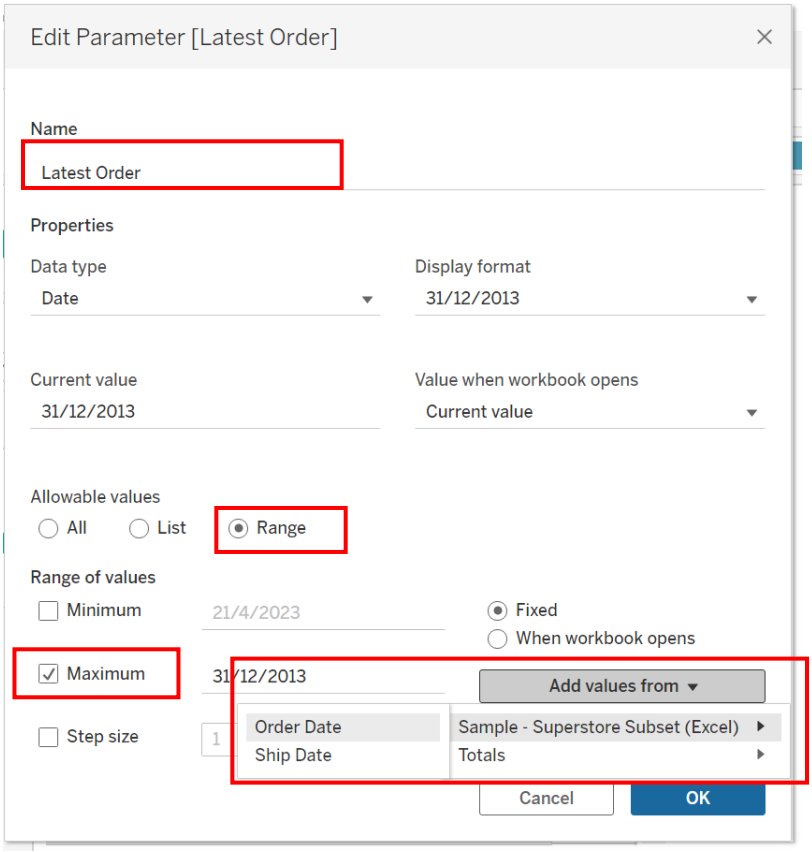

| Order ID | Day, Month, Year of Order Date | Customer Name | |
|---|---|---|---|
| 6 | February 20, 2013 | Dana Teague | 7 |
| 193 | August 7, 2011 | Vanessa Boyer | 312 |
| 322 | March 18, 2013 | Wesley Tate | 2,916 |
| 358 | September 19, 2011 | Brian Grady | 5,230 |
| 359 | December 18, 2010 | Kristine Connolly | 6,831 |
| 386 | January 24, 2012 | Emily Britt | 31 |
| 388 | December 15, 2013 | Jimmy Han | 1,036 |
| 454 | December 26, 2012 | Harriet Hodges | 468 |
| 548 | September 20, 2010 | Alexander O'Brien | 5,585 |
| 612 | October 20, 2013 | Tammy Raynor | 5,850 |
| 613 | June 17, 2012 | Marjorie Pope | 1,637 |
| 646 | November 21, 2010 | Maxine Collier Grady | 587 |
| 738 | March 1, 2011 | Clara Hauser | 750 |
| 773 | September 25, 2011 | Anthony Goodwin | 3,761 |
| 835 | October 7, 2012 | Maxine Collier Grady | 243 |
| 962 | May 5, 2010 | Geoffrey Saunders | 10,561 |
| 1222 | February 4, 2011 | Sean N Boyer | 257 |
| 1447 | October 14, 2013 | Glen Caldwell | 4,486 |
| 1537 | February 14, 2013 | Pamela Wiley | 17 |
| 1793 | July 11, 2013 | Herbert Holden | 324 |
| 1829 | May 7, 2013 | Peter Brooks | 172 |
| 1856 | March 19, 2013 | Eddie House Mueller | 10,107 |
| 2209 | July 9, 2013 | Ronnie Dodson | 15,259 |
| 2309 | September 3, 2012 | Louis Parrish | 54 |
| 2311 | May 1, 2012 | Keith Marsh | 2,093 |

## 5.2 Find the most recent order

1. Right click on **Order Date**. Select **Create → Parameter**.




2. In the **Name** text box, type the name **Latest Order**.
   a. Select **Range** for Allowable values.
   b. Check on **Maximum** value only and copy the maximum value to the current value.
   c. Click on **Add from Field,** select **Order Date** from the **Sample - Superstore Subset (Excel)** data source.



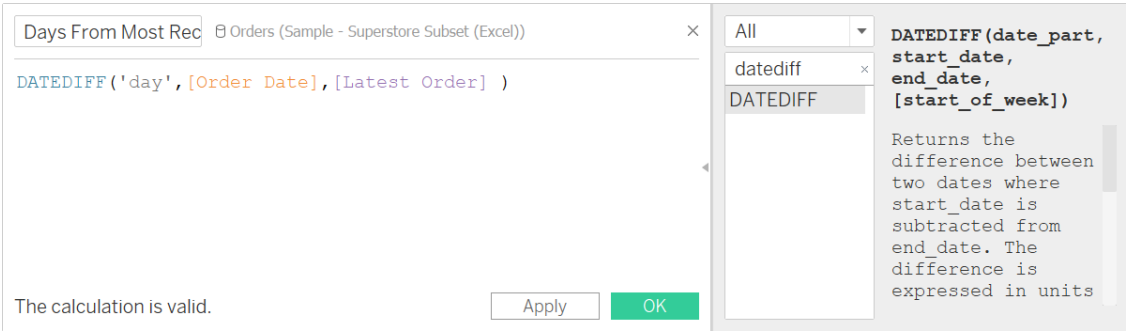

## 5.3 Calculate the difference

To determine how many days it is from the [Order Date] to the most recent order date or [Latest Order], create another calculated field that uses the DATEDIFF function.

1. Select **Analysis** → **Create Calculated Field**.

2. In the **Calculated Field** dialog box, make the following selections to create this formula: **DATEDIFF('day',[Order Date],[Latest Order] )**

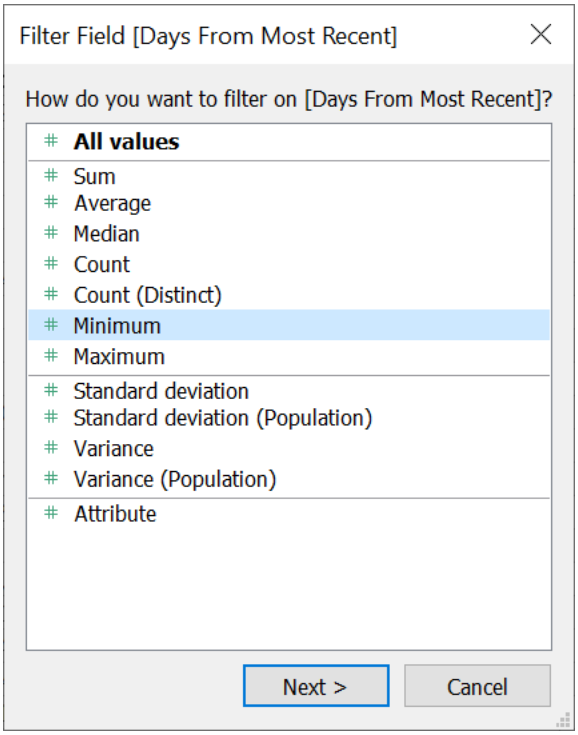
   In the **Name** field, type the name **Days From Most Recent**.
   a. Press the Tab key to move the cursor to the **Formula** text box.
   b. Double-click **DATEDIFF**.
   c. Inside the parentheses, type **'day',** and then in the **Fields** list, drag in **Order Date**.
   d. Type a comma, and then in the **Fields** list, drag in **Latest Order**.
   e. When finished, click **OK**.



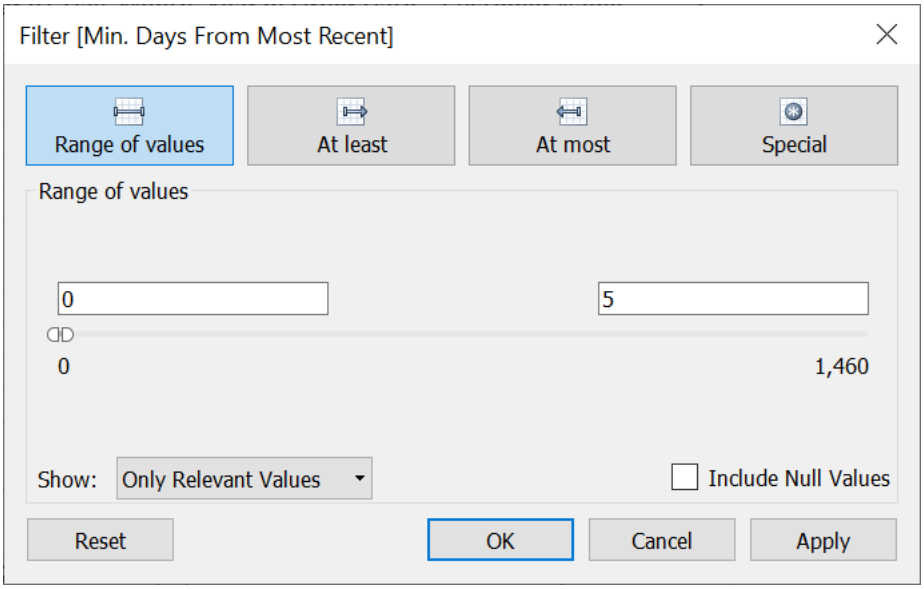

## 5.4 Filter your results

1. Drag the **Days From Most Recent** field to the **Filters** shelf.

2. In the **Filter Field** dialog box, select **Minimum**, and then click **Next**.



3. In the **Filter** dialog box, under **Range of Values**, in the text box on the right, type **5**, and then click **OK**. The view changes to show only activity from the five most recent days.




4. On the **Filters** shelf, click the down arrow at the right side of **MIN(Days From Most Recent)** field and select **Show Filter** to create a Quick Filter that you can use anytime to investigate your most recent order activity.