Lab 01: Get Familiar with Tableau

COMP7507 Visualization and Visual Analytics

Sept. 10, 2024

1. Goal

The goal of this lab session is to get familiar with the interface and basic operations of Tableau.

2. Brief introduction to Tableau

A Tableau [ˈtæbləʊ] is a company of interactive data visualization for bloggers, journalists, researchers, advocates, professors and students to make their storytelling expressive and insightful. It offers five main products: Tableau Desktop, Tableau Server, Tableau Online, Tableau Reader and Tableau Public.

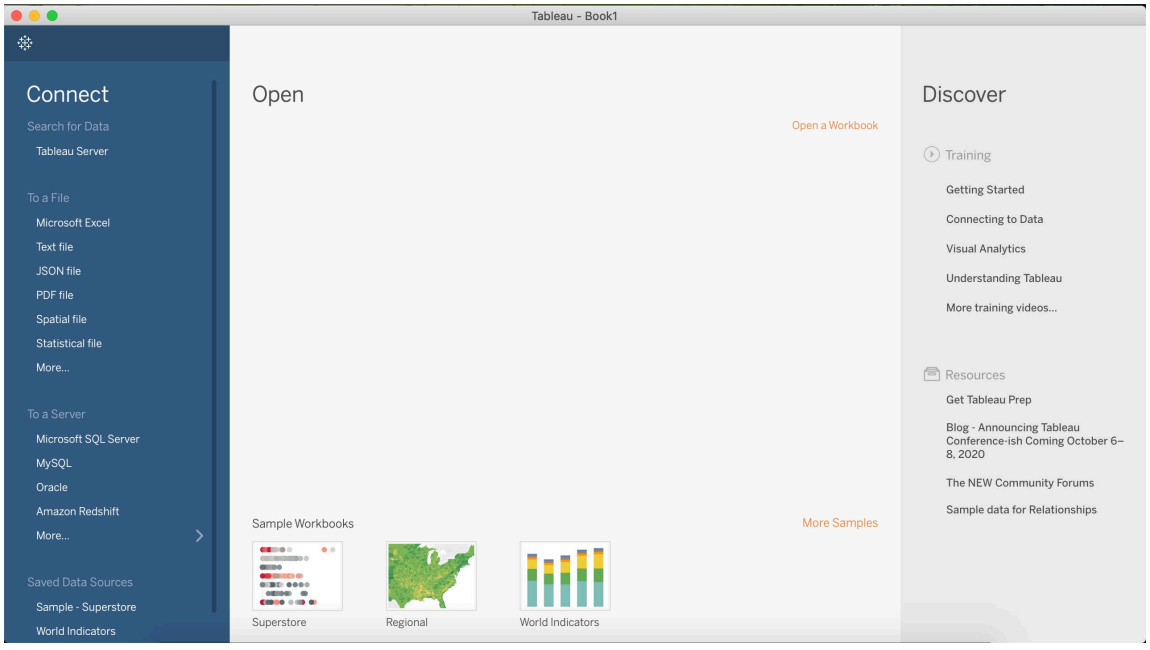
3. Download and Installation

Tableau:
Please refer to Lab 0 - Tableau Installation.

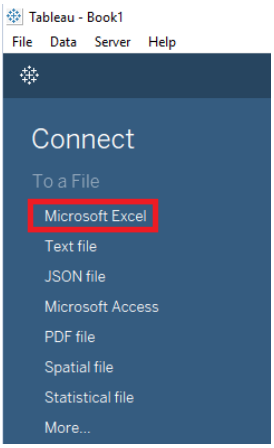
Dataset:
There is one data file for this lab session: Global_Superstore.xls[1]. Please download it from Moodle.

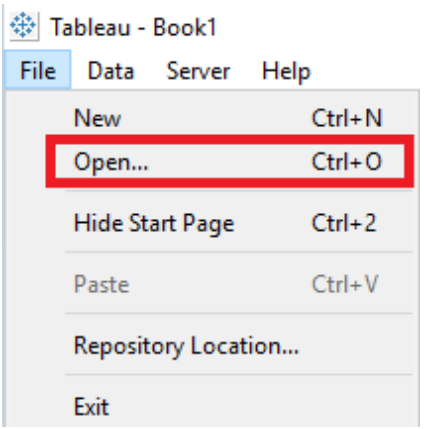
4. Getting started with Tableau

1. Connect to Data



User Interface. Above shows the start screen, where we can connect to new data, connect to saved data sources, or open recently used workbooks. In the Connect pane, we can see a wide variety of data sources Tableau connects to natively, e.g. *excel, text files, relational databases, online data sources* and many others.

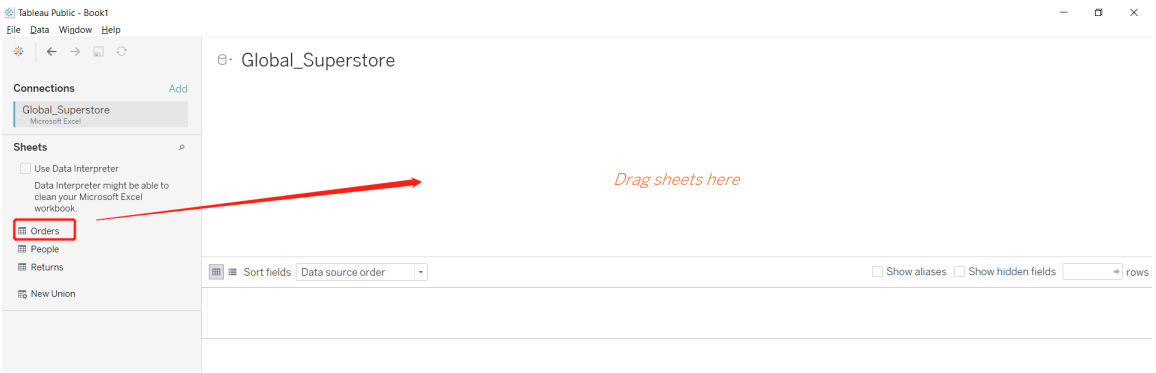




Import Data. In this lab session, we will connect to a global superstore data which is an Excel file. This data set contains transactions of customers purchasing specific products. Click Excel on the Connect pane to load an excel spreadsheet or Click File->Open to load the excel file (Global_Superstore.xls).

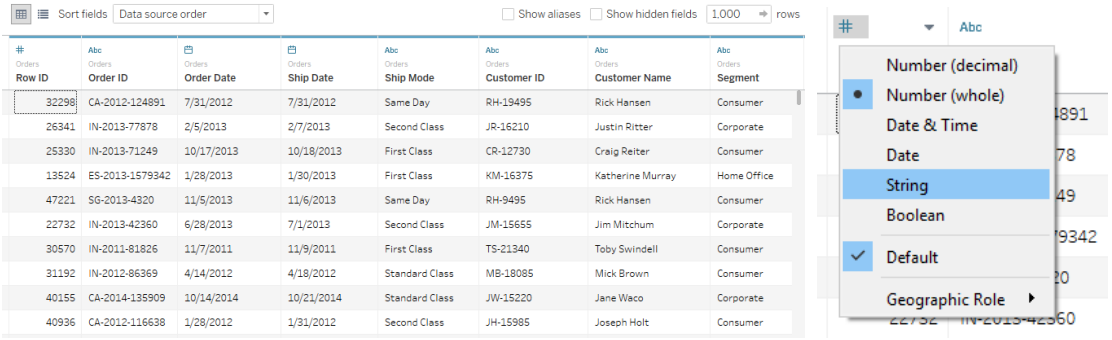
Country	Postal C	Market	Region	Product	Category	Sub-Cate	Product I	Sales	Quantity	Discount	Profit	Shipping	Order Pri
United Sta	10024	US	East	TEC-AC-100	Technology	Accessories	Plantronics	2309.65	7	0	762.1845	933.57	Critical
Australia		APAC	Oceania	FUR-CH-100	Furniture	Chairs	Novimex Exe	3709.395	9	0.1	-288.765	923.63	Critical
Australia		APAC	Oceania	TEC-PH-100	Technology	Phones	Nokia Smart	5175.171	9	0.1	919.971	915.49	Medium
Germany		EU	Central	TEC-PH-100	Technology	Phones	Motorola Sr	2892.51	5	0.1	-96.54	910.16	Medium
Senegal		Africa	Africa	TEC-SHA-10	Technology	Copiers	Sharp Wirel	2832.96	8	0	311.52	903.04	Critical
Australia		APAC	Oceania	TEC-PH-100	Technology	Phones	Samsung Sma	2862.675	5	0.1	763.275	897.35	Critical
New Zealand		APAC	Oceania	FUR-CH-100	Furniture	Chairs	Novimex Exe	1822.08	4	0	564.84	894.77	Critical
New Zealand		APAC	Oceania	FUR-TA-100	Furniture	Tables	Chromcraft	5244.84	6	0	996.48	878.38	High
United Sta	95823	US	West	OFF-BI-100	Office Supp	Binders	Fellowes PE	5083.96	5	0.2	1906.485	867.69	Low
United Sta	28027	US	South	FUR-TA-100	Furniture	Tables	Chromcraft	4297.644	13	0.4	-1862.3124	865.74	Critical
United Sta	22304	US	South	OFF-SU-100	Office Supp	Supplies	Martin Yale	4164.05	5	0	83.281	846.54	High
Afghanistan		APAC	Central Asi	FUR-TA-100	Furniture	Tables	Bevis Confe	4626.15	5	0	647.55	835.57	High
Saudi Arabia		EMEA	EMEA	TEC-CIS-10	Technology	Phones	Cisco Smart	2616.96	4	0	1151.4	832.41	Critical
Brazil		LATAM	South	FUR-CH-100	Furniture	Chairs	Harbour Cre	2221.8	7	0	622.02	810.25	Critical
China		APAC	North Asia	OFF-AP-100	Office Supp	Appliances	KitchenAid	3701.52	12	0	1036.08	804.54	Critical
France		EU	Central	OFF-AP-100	Office Supp	Appliances	Breville Re	1869.588	4	0.1	186.948	801.66	Critical
United Sta	42420	US	South	TEC-AC-100	Technology	Accessories	Logitech di	2249.91	9	0	517.4793	780.70	Critical
Italy		EU	South	OFF-AP-100	Office Supp	Appliances	Hoover Stov	7958.58	14	0	3979.08	778.32	Low
Australia		APAC	Oceania	TEC-CO-100	Technology	Copiers	Brother Fax	2565.594	9	0.1	28.404	766.93	Critical
Tanzania		Africa	Africa	OFF-KIT-10	Office Supp	Appliances	KitchenAid	3409.74	6	0	818.28	763.38	High
Poland		EMEA	EMEA	FUR-HON-10	Furniture	Tables	Hon Compute	1977.72	4	0	276.84	759.47	Critical
United Sta	60610	US	Central	TEC-PH-100	Technology	Phones	Apple iPhor	2735.952	6	0.2	341.994	752.51	High
China		APAC	North Asia	FUR-CH-100	Furniture	Chairs	SAFCO Execu	2754	6	0	358.02	752.47	Critical
United Kingdom		EU	North	OFF-AP-100	Office Supp	Appliances	KitchenAid	5273.7	10	0	1898.4	730.91	High
Mexico		LATAM	North	TEC-PH-100	Technology	Phones	Motorola Sr	1713.84	4	0	445.52	728.97	Critical
El Salvador		LATAM	Central	FUR-TA-100	Furniture	Tables	Hon Compute	2106.496	8	0.2	526.496	728.39	Critical
Taiwan		APAC	North Asia	FUR-TA-100	Furniture	Tables	Lesro Confe	1715.16	2	0	720.36	725.57	Critical

Once the Excel data is loaded, we can choose which sheets or tables we'd like to use. Here, we drag "Orders" out into the canvas. If we would like to add another table, such as "Returns", we could double click or drag it out as well.

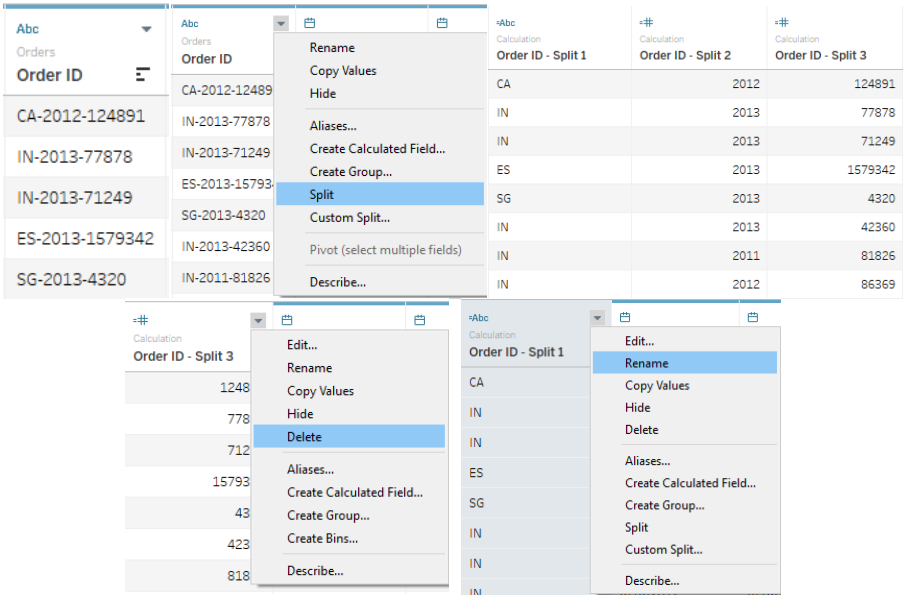


2. Data Preparation

Once the data is imported, we can see a preview of the data. Note that the types of data fields are not the same: Row ID is considered as number; Order Date and Ship Date are considered as date while the ones shown above are considered as string. We can rename columns here or even change data types, such as changing Row ID to a string.

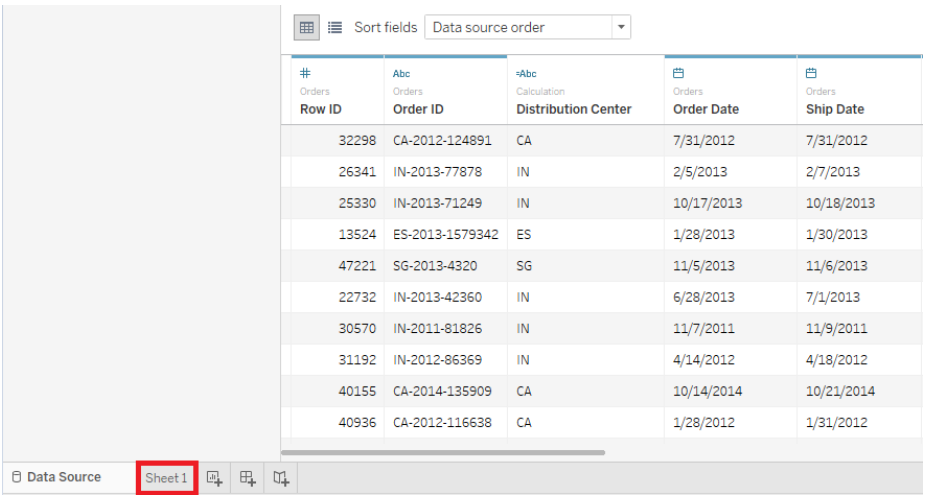


The Order ID field in this dataset has three parts: the distribution center code (e.g. CA), the year (e.g. 2012) and the product ID (e.g. 124891). If we would like to split this field and keep only the distribution center code, it is easy to complete in Tableau. First, click on the drop-down next to the field name and select “Split”. Then we have a column for each of those pieces. We can use drop-down again to delete splits 2 and 3 and just keep the 1st. Let's rename the field as “Distribution Center”.

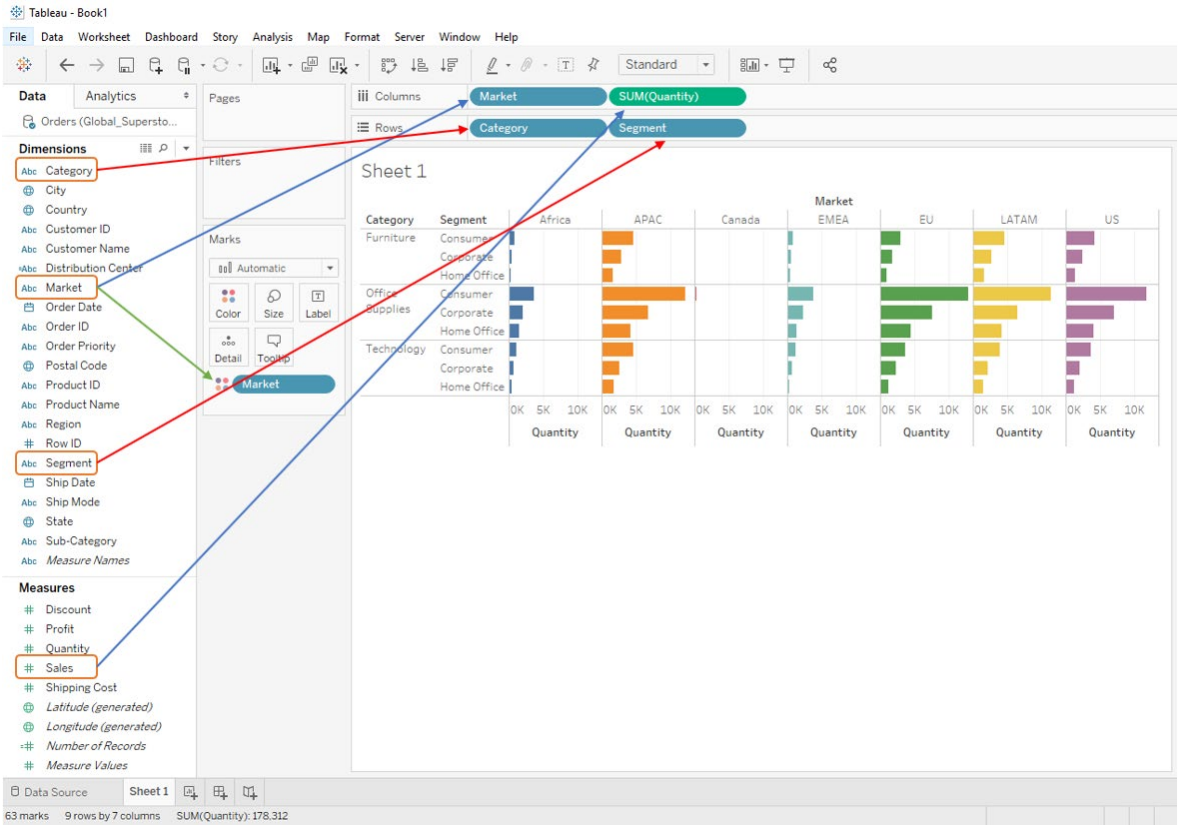


3. Measure Names and Measure Values

We now click on our sheet tab at the bottom line and enter the workspace as shown below.



Now, let’s see how easy it is to start building something. Let’s bring Category to Rows, Quantity to Columns, Segment to Rows, Market to Columns and Market to Color, as well. It’s easy to create visualization (as shown below) of how the sales are looking per category, customer segment and market, in terms of number of items sold. We can also quickly observe that Canada is an emerging market to be developed.



On the left of the data window, we observe that data contains two parts: Measure Names (with blue icons) and Measure Values (with green icons).

Measure Names are categorical fields, in this case, fields such as date, customer, and Category. These are fields that we want to slice and dice our numerical data by. Measure Names are often discrete. Discrete fields create labels in the chart and are color coded blue in the data pane and in the view.

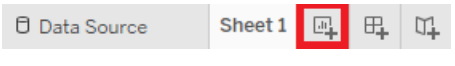
Measures Values, on the other hand, are the metrics. They are the numbers we want to analyze. Measures are often continuous. Continuous fields create axes in the chart and their pills are color coded green.

Abc Order ID
Abc Order Priority
Postal Code
Abc Product ID
Abc Product Name
Abc Region
Row ID
Abc Segment
Ship Date
Abc Ship Mode
State
Abc Sub-Category
Abc *Measure Names*

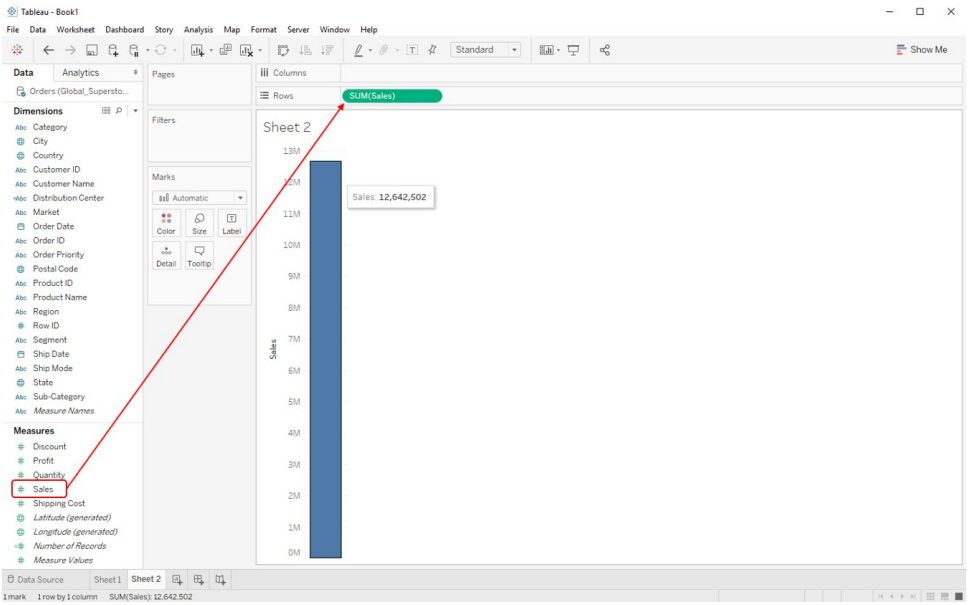
Discount
Profit
Quantity
Sales
Shipping Cost
Latitude (generated)
Longitude (generated)
Orders (Count)
Measure Values

4. Build Views

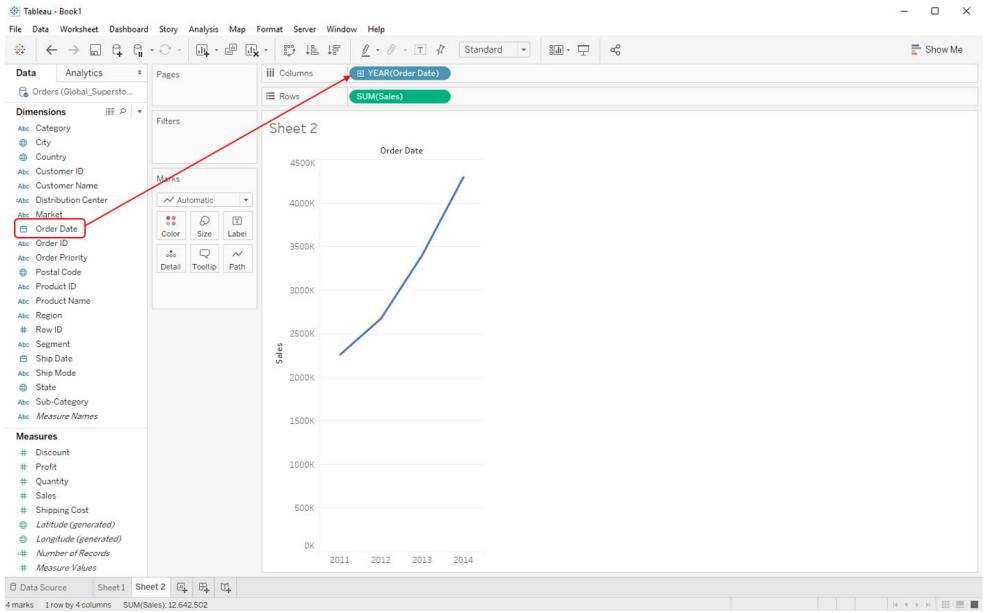
Let's assume we are interested in the total sales number. First, we create a new sheet via clicking the new worksheet icon as shown below.

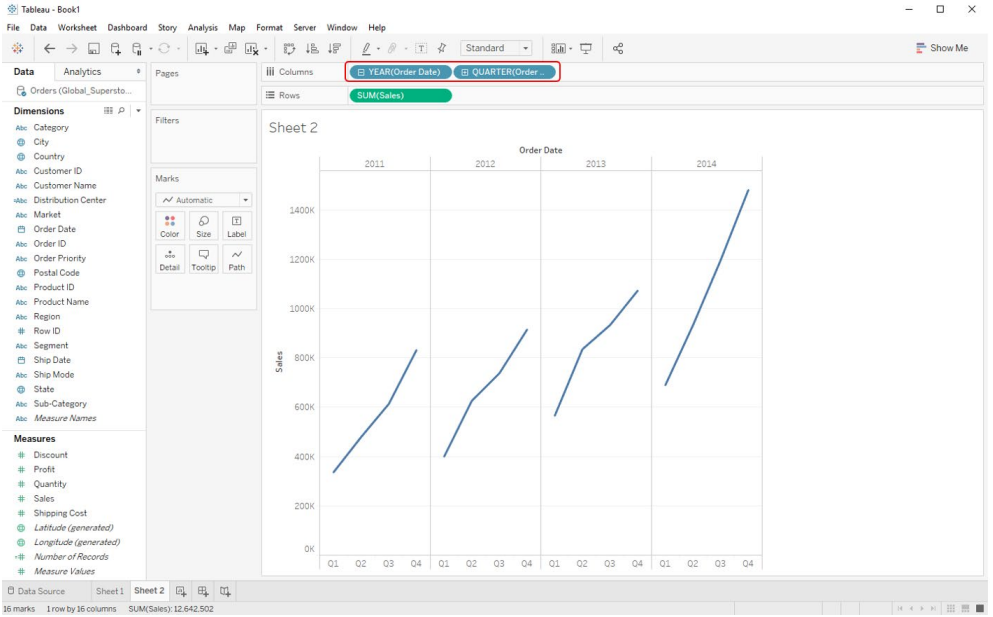


Let's drag Sales to the view. We can see that Tableau queries the database and returns a single result giving us the sum of Sales. It is clearly that this company has done about 12.5 million in sales.

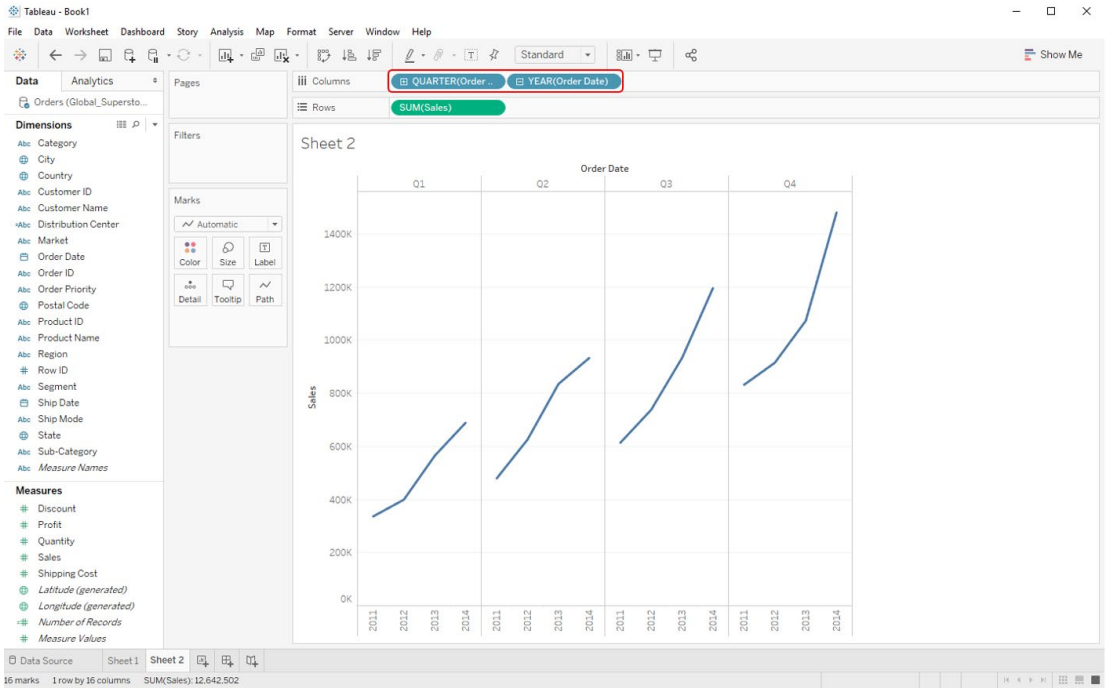


If we want to see this over time, we can drag Order Date to the top of the view. Tableau aggregates our dates at the year level. We can choose to expand this with the plus (+) symbol. Now we see both quarters and years in the view.

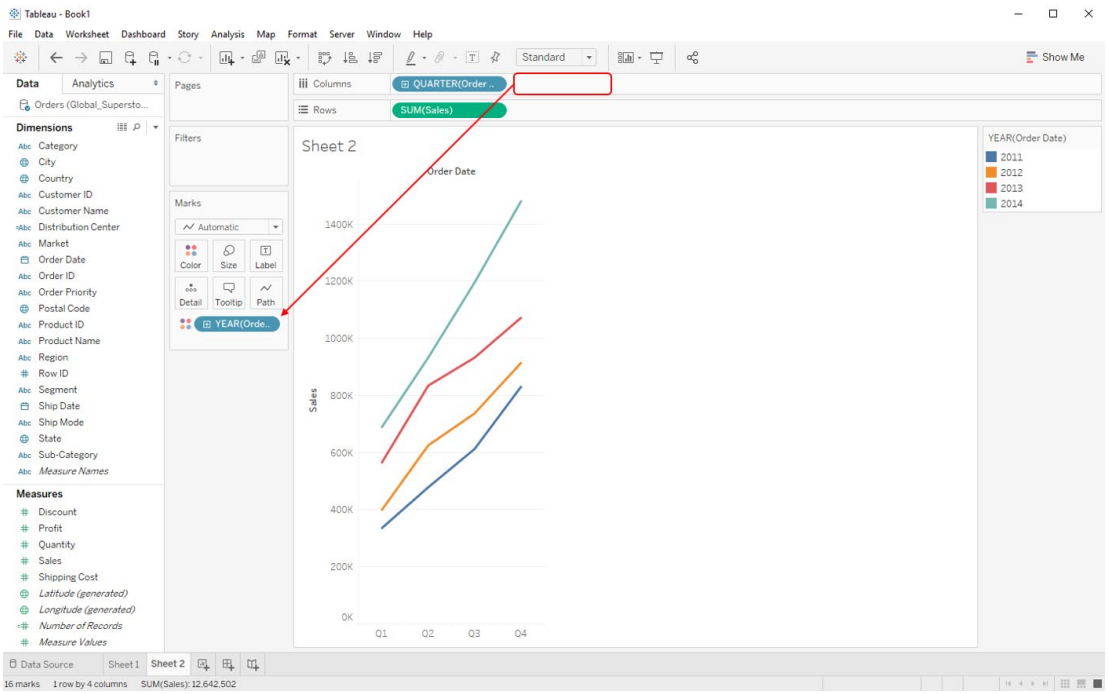




To see how all our quarters are doing over the years, we can easily drag the YEAR item in the Columns and move it behind QUARTER (as shown below). Now we can compare how our growth looks by quarter across the years.



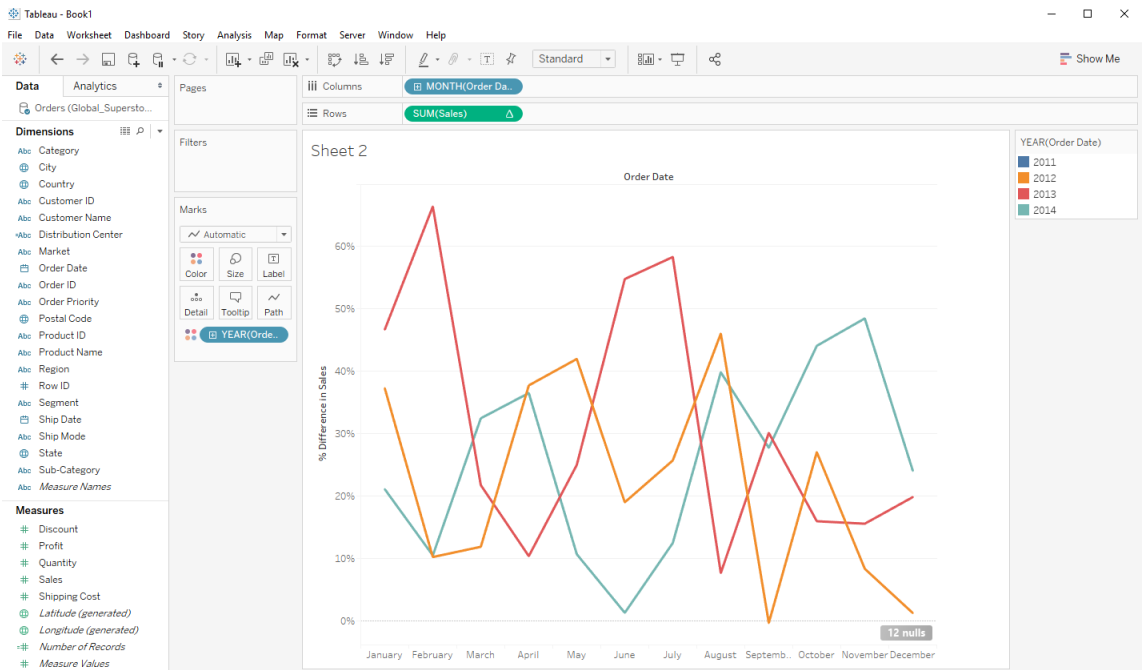
Moving Year to Color shows us all the years on top of each other.



5. Tasks for you

Tableau also provides quick table calculations for the imported data. Here are two simple tasks for you:

(1) Try to visualize the data by months instead of by years.
(2) Try to explore how to use Tableau to calculate "Year over Year Growth" and visualize it as shown below.
(3) Upload the screenshot of the result graph in (2) to Moodle (**before Sept 24, 2024**).



7. References

[1] The data source and this tutorial is adapted from http://www.tableau.com/learn/training
[2] https://onlinehelp.tableau.com/current/guides/get-started-tutorial/en-us/get-started-tutorial-home.htm
[3] https://public.tableau.com/s/resources
[4] https://public.tableau.com/s/resources?qt-overview_resources=1
[5] https://community.tableau.com/docs/DOC-9135