

Introduction to Data Visualization with Tableau

First steps



Hands-on schedule

01 First steps

02 Common charts and dashboards

03 Transform the **data**

06 Further opportunities

05 Useful **visualisations**

04 Interactions



Agenda

1 First steps

- Tableau tools
- User interface
- Load data from different sources
- Our first chart

2 Creating basic charts

- Create some basic charts (pl. bar, line, scatter plot)
- Add filters
- Calculate totals
- How to format your chart

First steps



Tableau tools

Tableau tools



Tableau Desktop



Tableau Prep



Tableau Server



Tableau Online

Tableau Desktop User Interface

Tableau Desktop interface

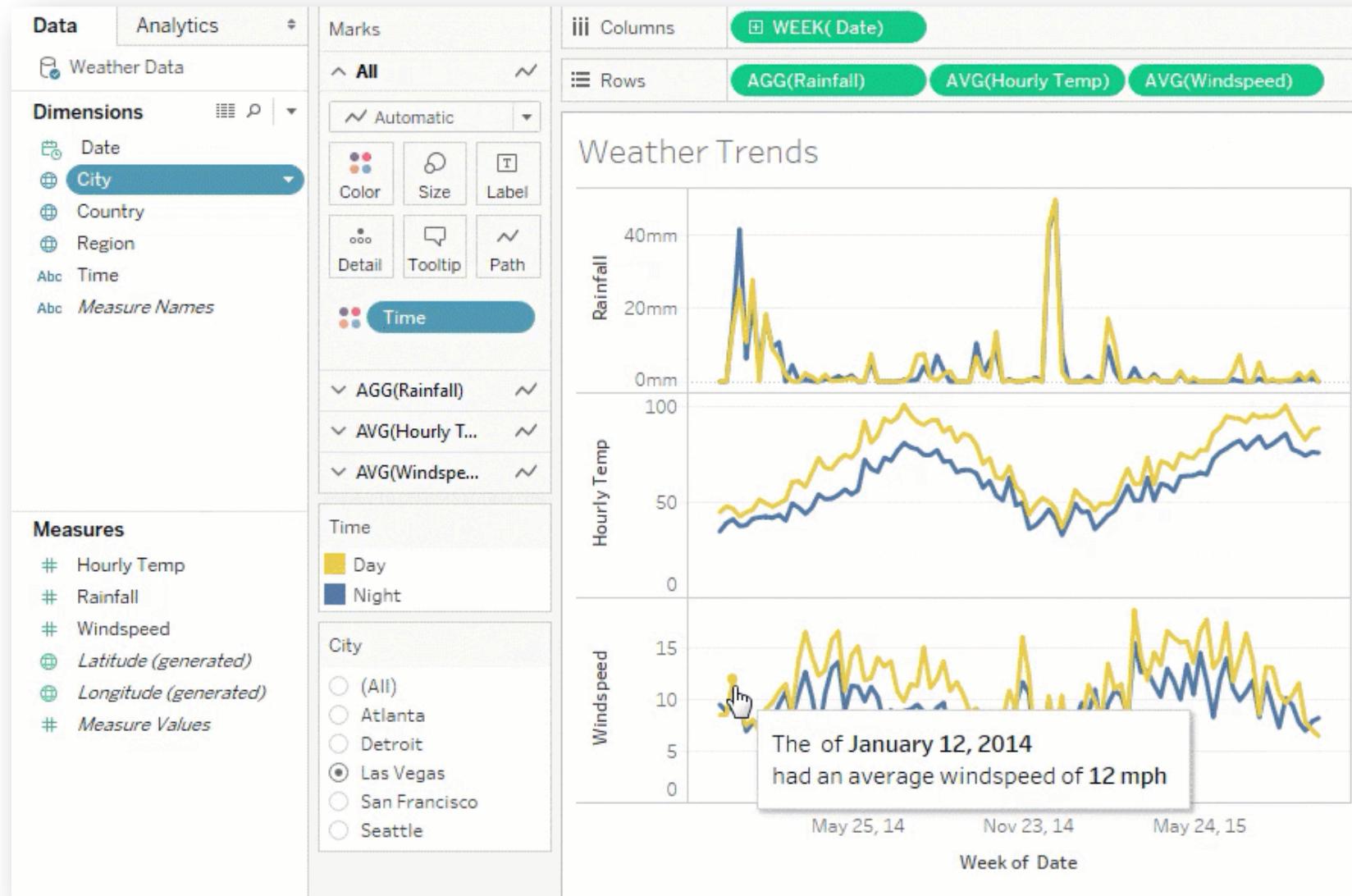


Tableau user interface

- Sheet
 - Single chart
- Dashboard
 - One display with multiple visualizations and interactions that help to discover and analyze the underlying information in the data
- Story
 - Presentation like layout with multiple slides where you can record single charts or dashboards

Tableau user interface

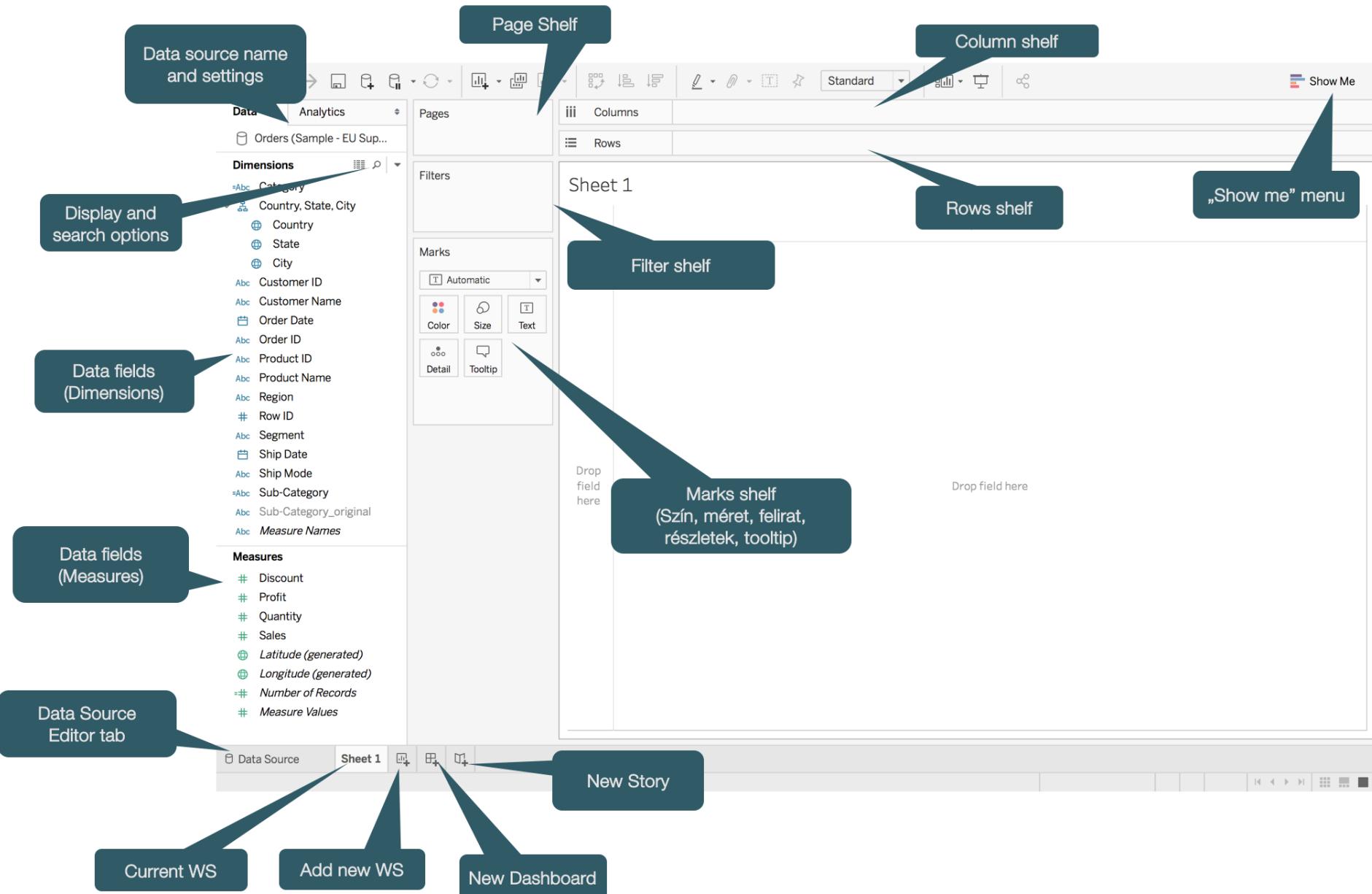


Tableau user interface

Useful shortcuts

Description	Windows shortcut	Mac shortcut
New worksheet	Ctrl+M	Command+T
Switch in and out of Presentation Mode	F7 , Ctrl+H	Option+Return
Refresh data source	F5	Command+R
Show Me!	Ctrl+1 , Ctrl+Shift+1	Command+1
Open the Drop Field menu	Right-click+drag to shelf	Option+drag to shelf
Copy a field in the view and place it on another shelf or card	Ctrl+drag	Command+drag
Undo	Ctrl+Z	Command+Z
Redo	Ctrl+Y	Command+Shift+Z

Check all: <https://help.tableau.com/current/pro/desktop/en-us/shortcut.htm>

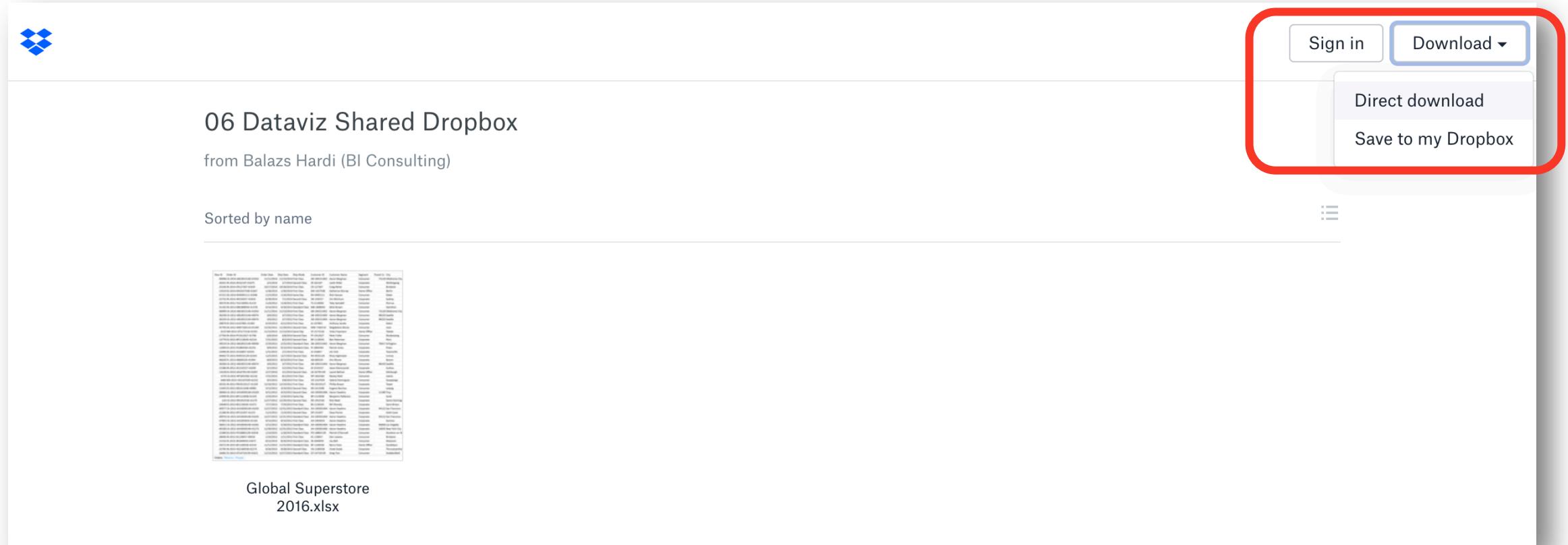
Load data from different sources

Connect to data

bit.ly/CEUDV

Download the excel file

Connect to data



06 Dataviz Shared Dropbox
from Balazs Hardi (BI Consulting)

Sorted by name

Global Superstore
2016.xlsx

Sign in Download ▾

Direct download

Save to my Dropbox

Download the excel file

Connect to data

Row ID	Order ID	Order Date	Ship Date	Ship Mode	Customer ID	Customer Name	Segment	Postal Co	City	J1 State
40098	CA-2014-AB10015140-41954	11/11/2014	11/13/2014	First Class	AB-100151402	Aaron Bergman	Consumer	73120	Oklahoma City	Oklahoma
26341	IN-2014-JR162107-41675	2/5/2014	2/7/2014	Second Class	JR-162107	Justin Ritter	Corporate		Wollongong	New South Wales
25330	IN-2014-CR127307-41929	10/17/2014	10/18/2014	First Class	CR-127307	Craig Reiter	Consumer		Brisbane	Queensland
13524	ES-2014-KM1637548-41667	1/28/2014	1/30/2014	First Class	KM-1637548	Katherine Murray	Home Office		Berlin	Germany
47221	SG-2014-RH9495111-41948	11/5/2014	11/6/2014	Same Day	RH-9495111	Rick Hansen	Consumer		Dakar	Senegal
22732	IN-2014-JM156557-41818	6/28/2014	7/1/2014	Second Class	JM-156557	Jim Mitchum	Corporate		Sydney	Victoria
30570	IN-2012-TS2134092-41219	11/6/2012	11/8/2012	First Class	TS-2134092	Toby Swindell	Consumer		Porirua	Wellington
31192	IN-2013-MB1808592-41378	4/14/2013	4/18/2013	Standard Class	MB-1808592	Mick Brown	Consumer		Hamilton	Waikato
40099	CA-2014-AB10015140-41954	11/11/2014	11/13/2014	First Class	AB-100151402	Aaron Bergman	Consumer	73120	Oklahoma City	Oklahoma
36258	CA-2012-AB10015140-40974	3/6/2012	3/7/2012	First Class	AB-100151404	Aaron Bergman	Consumer	98103	Seattle	Washington
36259	CA-2012-AB10015140-40974	3/6/2012	3/7/2012	First Class	AB-100151404	Aaron Bergman	Consumer	98103	Seattle	Washington
28879	ID-2013-AJ107801-41383	4/19/2013	4/22/2013	First Class	AJ-107801	Anthony Jacobs	Corporate		Kabul	Afghanistan
45794	SA-2012-MM7260110-41269	12/26/2012	12/28/2012	Second Class	MM-7260110	Magdelene Morse	Consumer		Jizan	Jizan
4132	MX-2013-VF2171518-41591	11/13/2013	11/13/2013	Same Day	VF-2171518	Vicky Freymann	Home Office		Toledo	Parana
27704	IN-2014-PF1912027-41796	6/6/2014	6/8/2014	Second Class	PF-1912027	Peter Fuller	Consumer		Mudanjiang	Heilongjiang
13779	ES-2015-BP1118545-42216	7/31/2015	8/3/2015	Second Class	BP-1118545	Ben Peterman	Corporate		Paris	Ile-de-France
39519	CA-2012-AB10015140-40958	2/19/2012	2/25/2012	Standard Class	AB-100151402	Aaron Bergman	Consumer	76017	Arlington	Texas
12069	ES-2015-PJ1883564-42255	9/8/2015	9/14/2015	Standard Class	PJ-1883564	Patrick Jones	Corporate		Prato	Tuscany
22096	IN-2015-JS156857-42035	1/31/2015	2/1/2015	First Class	JS-156857	Jim Sink	Corporate		Townsville	Queensland
49463	TZ-2015-RH9555129-42343	12/5/2015	12/7/2015	Second Class	RH-9555129	Ritsa Hightower	Consumer		Uvinza	Kigoma
46630	PL-2013-AB600103-41494	8/8/2013	8/10/2013	First Class	AB-600103	Ann Blume	Corporate		Bytom	Silesia
36260	CA-2012-AB10015140-40974	3/6/2012	3/7/2012	First Class	AB-100151404	Aaron Bergman	Consumer	98103	Seattle	Washington
21586	IN-2012-JK1532527-41030	5/1/2012	5/2/2012	First Class	JK-1532527	Jason Klamczynski	Corporate		Suzhou	Anhui
13528	ES-2014-LB16795139-41697	2/27/2014	3/1/2014	Second Class	LB-16795139	Laurel Beltran	Home Office		Edinburgh	Scotland
1570	US-2015-NP1832582-42216	7/31/2015	8/1/2015	First Class	NP-1832582	Naresj Patel	Consumer		Juárez	Chihuahua
3484	MX-2015-VD2167039-42252	9/5/2015	9/8/2015	First Class	VD-2167039	Valerie Dominguez	Consumer		Soyapango	San Salvador

Download the excel file

Connect to data

The screenshot shows the Tableau Connect interface. On the left, there's a sidebar with various connection options. A red circle highlights the 'Text file' option under the 'To a File' section. The main area lists many data sources, including MySQL, Hive, SharePoint Lists, and various databases and cloud services.

Search

Alibaba AnalyticDB for MySQL	Hortonworks Hadoop Hive	SharePoint Lists
Alibaba Data Lake Analytics	Impala	Snowflake
Alibaba MaxCompute	Intuit QuickBooks Online	Spark SQL
Amazon Athena	Kognitio	Teradata
Amazon Aurora for MySQL	Kyvos	Vertica
Amazon EMR Hadoop Hive	LinkedIn Sales Navigator	Web Data Connector
Amazon Redshift	MapR Hadoop Hive	
Anaplan	MariaDB	Other Databases (JDBC)
Apache Drill	Marketo	Other Databases (ODBC)
Aster Database	MemSQL	
Azure SQL Data Warehouse	Microsoft SQL Server	
Box	MongoDB BI Connector	
Cloudera Hadoop	MySQL	
Databricks	OData	
Denodo	OneDrive	
Dropbox	Oracle	
Exasol	Oracle Eloqua	
Firebird 3	Pivotal Greenplum Database	
Google Ads	PostgreSQL	
Google Analytics	Presto	
Google BigQuery	Qubole Presto	
Google Cloud SQL	Salesforce	
Google Drive	SAP HANA	
Google Sheets	ServiceNow ITSM	

Find the **Global Superstore 2016.xlsx** file

Connect to data

The screenshot shows the Power BI Data Source view. On the left, the 'Connections' pane lists 'Global Superstore 2016' (Microsoft Excel). The 'Sheets' pane shows 'Orders', 'People', and 'Returns'. A 'New Union' section is also present. The main area displays the 'Orders' sheet from 'Global Superstore 2016'. The top navigation bar includes 'Connection' (Live or Extract), 'Filters' (0 | Add), and a back/forward button. Below the table are filtering and sorting options: 'Sort fields' (Data source order), 'Show aliases' (unchecked), 'Show hidden fields' (unchecked), and '1 000' rows. The table has columns: Row ID, Order ID, Order Date, Ship Date, Ship Mode, Customer ID, Customer Name, Segment, and Po. The data shows various orders with details like Order ID CA-2014-AB1001514..., Order Date 2014.11.11, and Customer Name Aaron Bergman.

#	Orders Row ID	Orders Order ID	Orders Order Date	Orders Ship Date	Orders Ship Mode	Orders Customer ID	Orders Customer Name	Orders Segment	Orders Po
40098	CA-2014-AB1001514...	2014.11.11.	2014.11.13.	First Class	AB-100151402	Aaron Bergman	Consumer		
26341	IN-2014-JR162107-4...	2014.02.05.	2014.02.07.	Second Class	JR-162107	Justin Ritter	Corporate		
25330	IN-2014-CR127307-4...	2014.10.17.	2014.10.18.	First Class	CR-127307	Craig Reiter	Consumer		
13524	ES-2014-KM1637548...	2014.01.28.	2014.01.30.	First Class	KM-1637548	Katherine Murray	Home Office		
47221	SG-2014-RH9495111...	2014.11.05.	2014.11.06.	Same Day	RH-9495111	Rick Hansen	Consumer		
22732	IN-2014-JM156557-4...	2014.06.28.	2014.07.01.	Second Class	JM-156557	Jim Mitchum	Corporate		
30570	IN-2012-TS2134092...	2012.11.06.	2012.11.08.	First Class	TS-2134092	Toby Swindell	Consumer		
31192	IN-2013-MB1808592...	2013.04.14.	2013.04.18.	Standard Class	MB-1808592	Mick Brown	Consumer		
40099	CA-2014-AB1001514...	2014.11.11.	2014.11.13.	First Class	AB-100151402	Aaron Bergman	Consumer		
36258	CA-2012-AB1001514...	2012.03.06.	2012.03.07.	First Class	AB-100151404	Aaron Bergman	Consumer		
36259	CA-2012-AB1001514...	2012.03.06.	2012.03.07.	First Class	AB-100151404	Aaron Bergman	Consumer		

Drag the **Orders** sheet to the editor pane.

Connect to data

The screenshot shows a data visualization interface with a sidebar on the left containing 'People' and 'Returns' buttons, and a main area titled 'New Union'. The main area features a data grid with the following columns:

#	Abc	Orders Order Date	Orders Ship Date	Abc Orders Ship Mode	Abc Orders Customer ID	Abc Orders Customer Name	Abc Orders Segment
0015140-41954	Number (decimal)	2014.11.11.	2014.11.13.	First Class	AB-100151402	Aaron Bergman	Consumer
02107-41675	✓ Number (whole)	2014.02.05.	2014.02.07.	Second Class	JR-162107	Justin Ritter	Corporate
027307-41929	Date & Time	2014.10.17.	2014.10.18.	First Class	CR-127307	Craig Reiter	Consumer
637548-41667	Date	2014.01.28.	2014.01.30.	First Class	KM-1637548	Katherine Murray	Home Office
495111-41948	String	2014.11.05.	2014.11.06.	Same Day	RH-9495111	Rick Hansen	Consumer
22732	Boolean	IN-2014-JM156557-41818	2014.06.28.	Second Class	JM-156557	Jim Mitchum	Corporate
30570	Geographic Role ►	IN-2012-TS2134092-41219	2012.11.06.	First Class	TS-2134092	Toby Swindell	Consumer
31192		IN-2013-MB1808592-41378	2013.04.14.	Standard Class	MB-1808592	Mick Brown	Consumer
40099		CA-2014-AB10015140-41954	2014.11.11.	First Class	AB-100151402	Aaron Bergman	Consumer
36258		CA-2012-AB10015140-40974	2012.03.06.	First Class	AB-100151404	Aaron Bergman	Consumer
36259		CA-2012-AB10015140-40974	2012.03.06.	First Class	AB-100151404	Aaron Bergman	Consumer

At the top of the grid, there is a dropdown menu with options: 'Sort fields' (selected), 'Data source order', 'Show aliases', 'Show hidden fields', '1 000 rows', and a 'Rows' input field. Below the grid, there are buttons for 'Data Source', 'Sheet 1', and various data manipulation icons. At the bottom right, there are navigation arrows and a grid icon.

You can modify your data here. Like changing the data type...

Connect to data

The screenshot shows a data visualization interface with a sidebar on the left containing 'People' and 'Returns' sections, and a main area titled 'New Union'. A context menu is open over a row in a table, with 'Hide' selected. The table has columns for 'Field Name', 'Table', and 'Remote Field Name'. The rows show fields from the 'Orders' table: Row ID, Order ID, Order Date, Ship Date, Ship Mode, Customer ID, Customer Name, Segment, Postal Code, City, State, Country, and Region.

Field Name	Table	Remote Field Name
Row ID	Orders	Row ID
Order ID	Orders	Order ID
Order Date	Orders	Order Date
Ship Date	Orders	Ship Date
Ship Mode	Orders	Ship Mode
Customer ID	Orders	Customer ID
Customer Name	Orders	Customer Name
Segment	Orders	Segment
Postal Code	Orders	Postal Code
City	Orders	City
State	Orders	State
Country	Orders	Country
Region	Orders	Region

or hiding unnecessary columns...

Connect to data

The screenshot shows a Microsoft Excel interface with a data model ribbon. A context menu is open over a cell labeled 'New Union'. The menu includes options like 'Orders', 'People', 'Returns', and 'New Union'. A sub-menu for 'New Union' is also visible, containing 'Orders', 'State', 'Oklahoma', 'New South Wales', 'Queensland', 'Berlin', 'Dakar', 'New South Wales', 'Australia', 'Oceania', 'Asia Pacific', 'TEC-PH-5842', 'Technology', 'Phones', 'Samsung Smart Pho...', 'Wellington', 'New Zealand', 'Oceania', 'Asia Pacific', 'FUR-CH-5378', 'Furniture', 'Chairs', 'Novimex Executive L...', 'Waikato', 'New Zealand', 'Oceania', 'Asia Pacific', 'FUR-TA-3764', 'Furniture', 'Tables', 'Chromcraft Conferen...', 'Oklahoma', 'United States', 'Central US', 'USCA', 'FUR-BO-5957', 'Furniture', 'Bookcases', 'Sauder Facets Collec...', 'Washington', 'United States', 'Western US', 'USCA', 'FUR-CH-4421', 'Furniture', 'Chairs', 'Global Push Button ...', 'Washington', 'United States', 'Western US', 'USCA', 'OFF-AR-5309', 'Office Supplies', 'Art', 'Newell 330'. A 'Edit Aliases [Market]' dialog box is open, showing a table with columns 'Member', 'Has Alias', and 'Value (Alias)'. The table contains rows for Africa, Asia Pacific, Europe, LATAM, and USCA. The 'USCA' row has its 'Value (Alias)' field set to 'North Amer'. Buttons for 'OK', 'Cancel', and 'Clear Aliases' are visible.

Member	Has Alias	Value (Alias)
Africa		Africa
Asia Pacific		Asia Pacific
Europe		Europe
LATAM	*	South America
USCA	*	North Amer

or adding Aliases to data values.

Our first chart

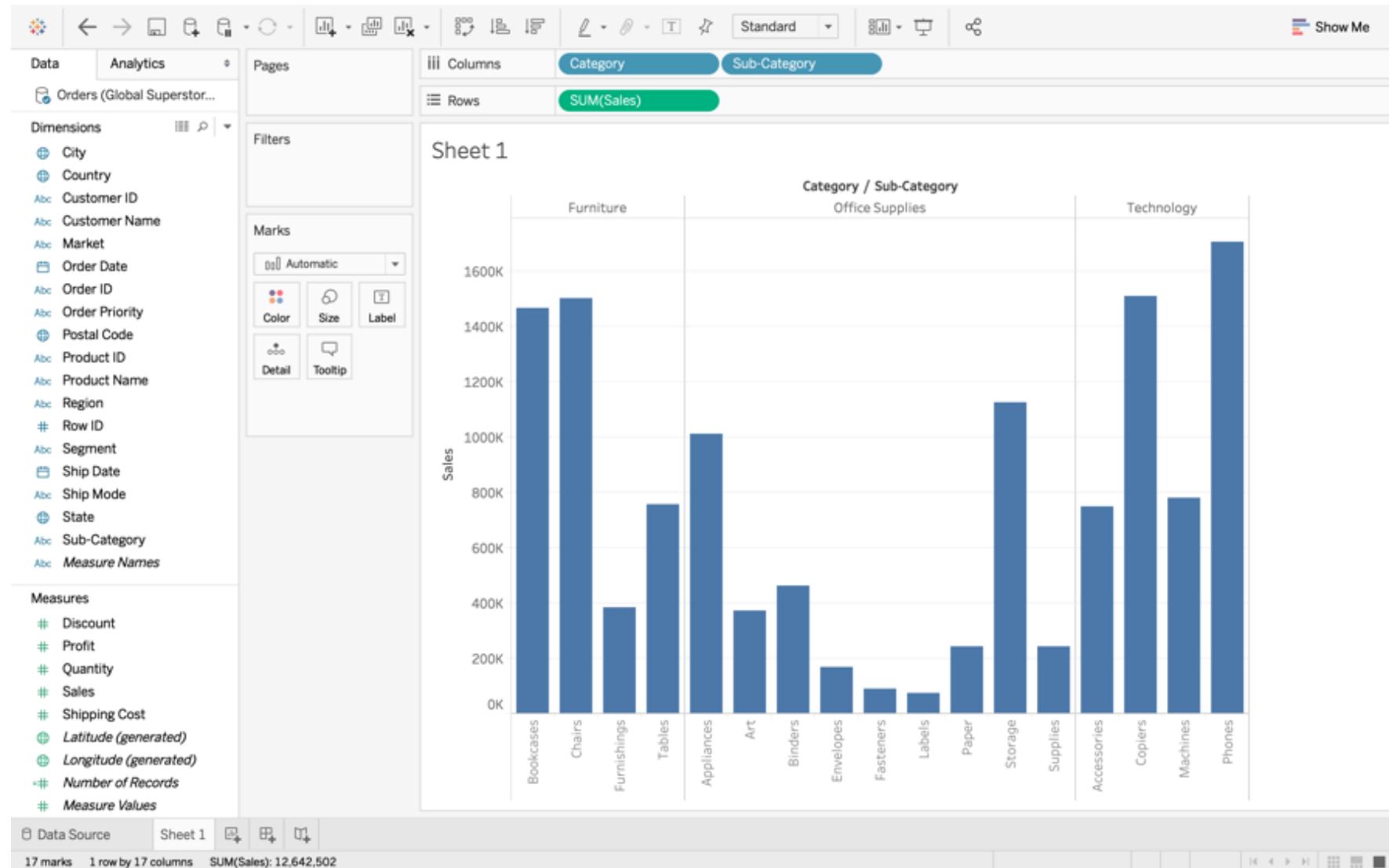
Our first chart

01. Lets create our first chart...

- Products are grouped into categories and sub-categories. I'd like to get an overview about how product categories sell and if they produce profit or loss.

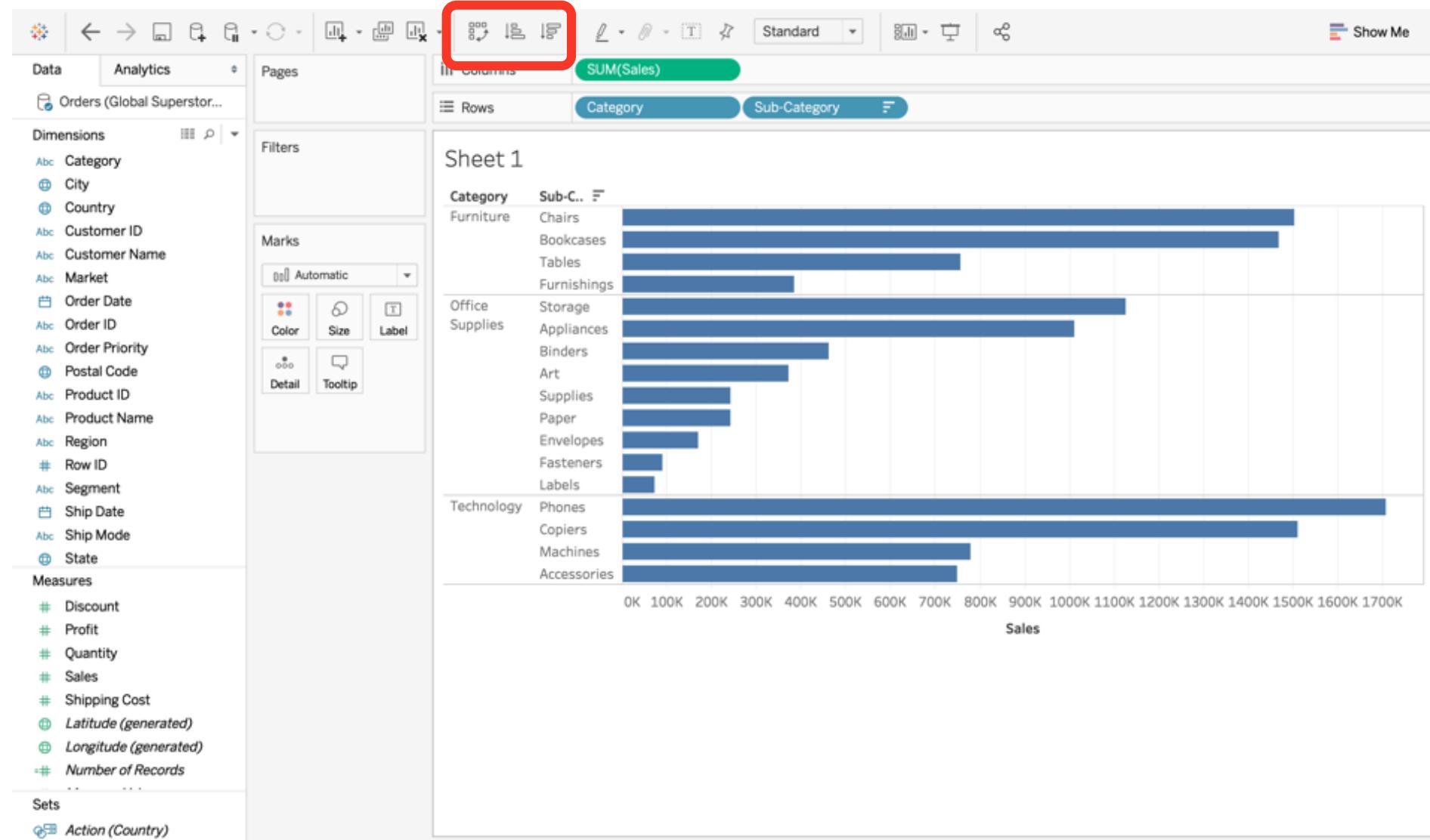
Category	Sub-Category
Furniture	Chairs
	Bookcases
	Tables
	Furnishings
Office Supplies	Storage
	Appliances
	Binders
	Art
Paper	Supplies
	Envelopes
	Fasteners
	Labels
Technology	Phones
	Copiers
	Machines
	Accessories

Our first chart



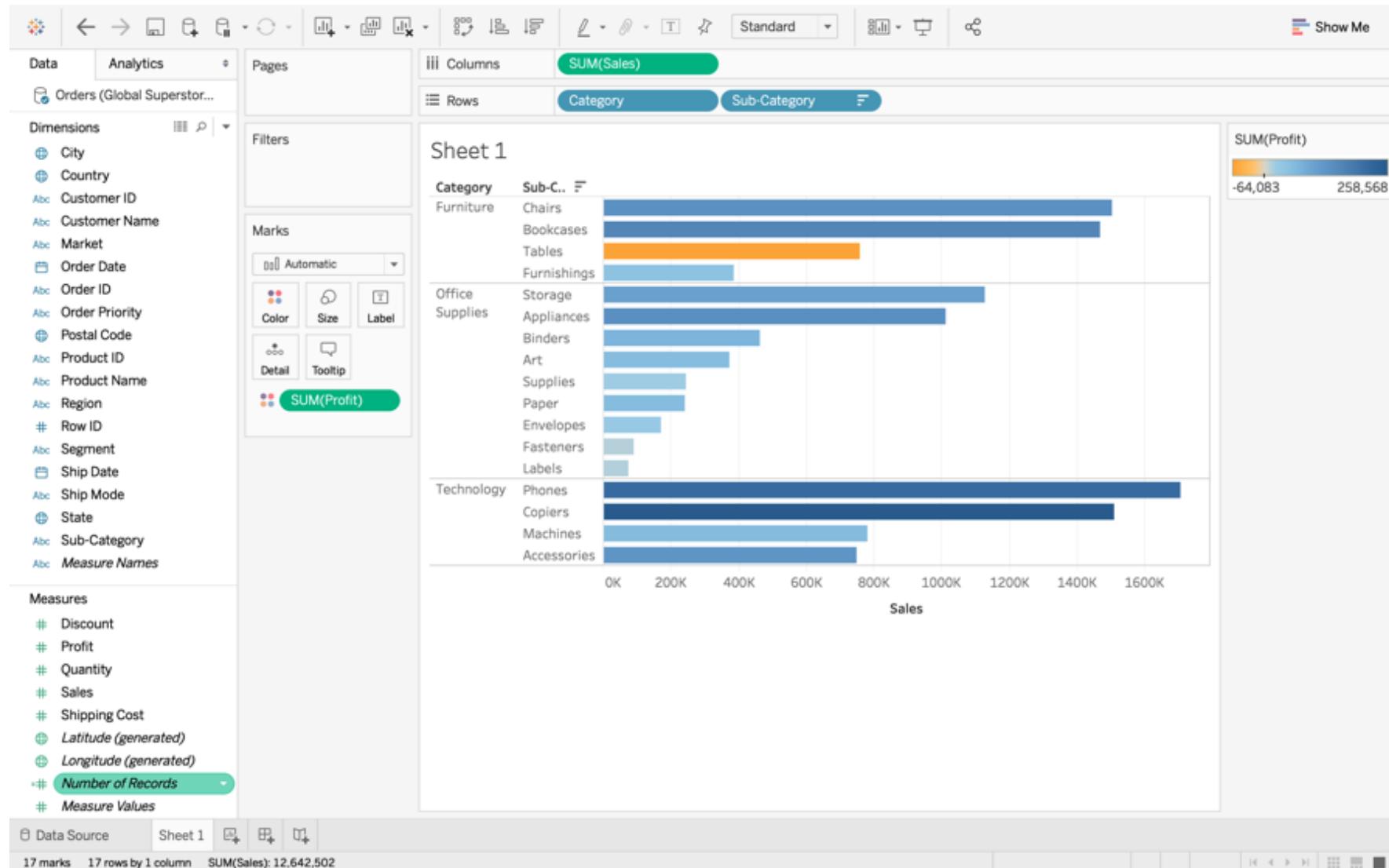
Double click on Sales, Category, Sub-Category

Our first chart



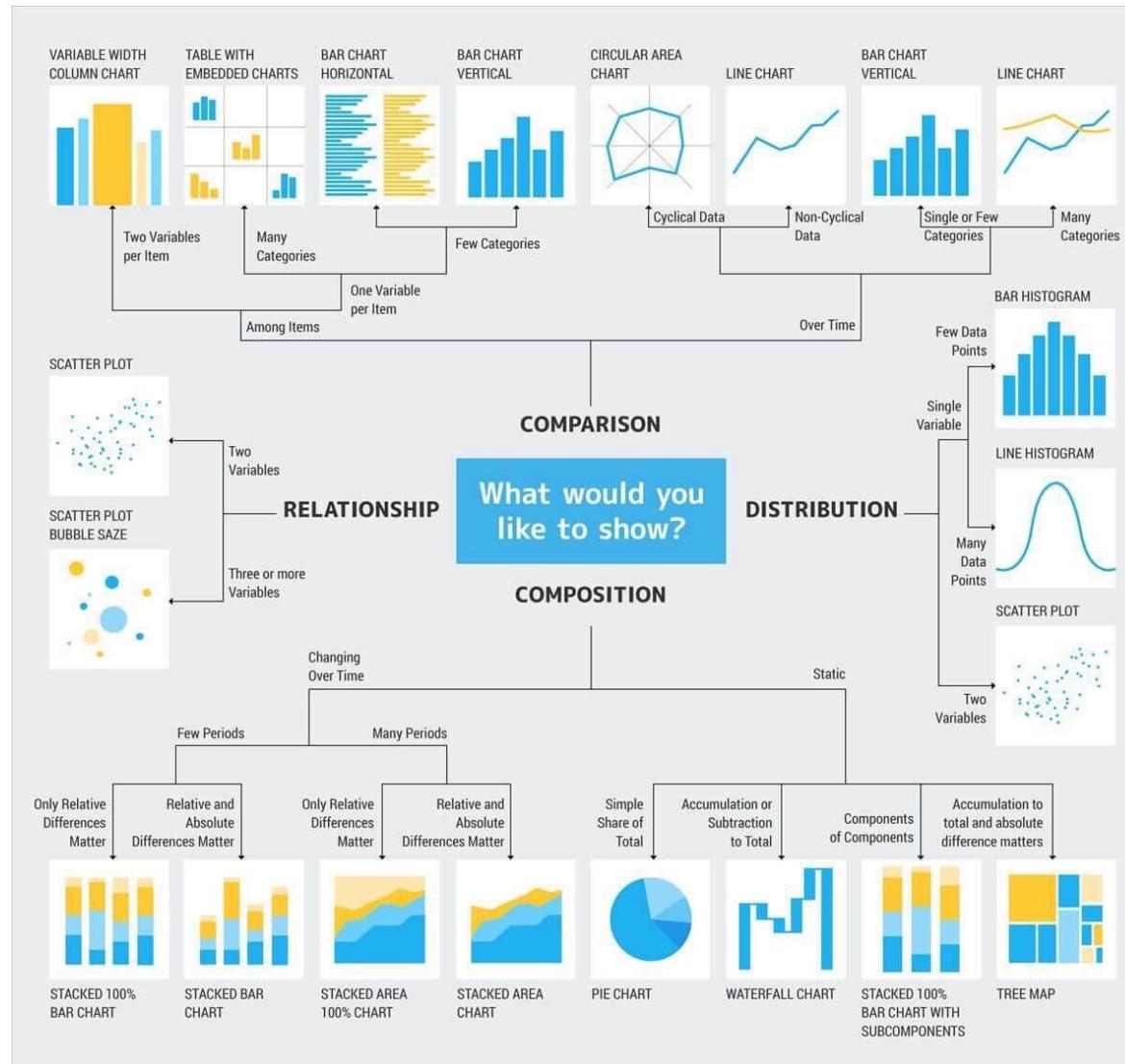
Swap rows and columns and Sort descending

Our first chart



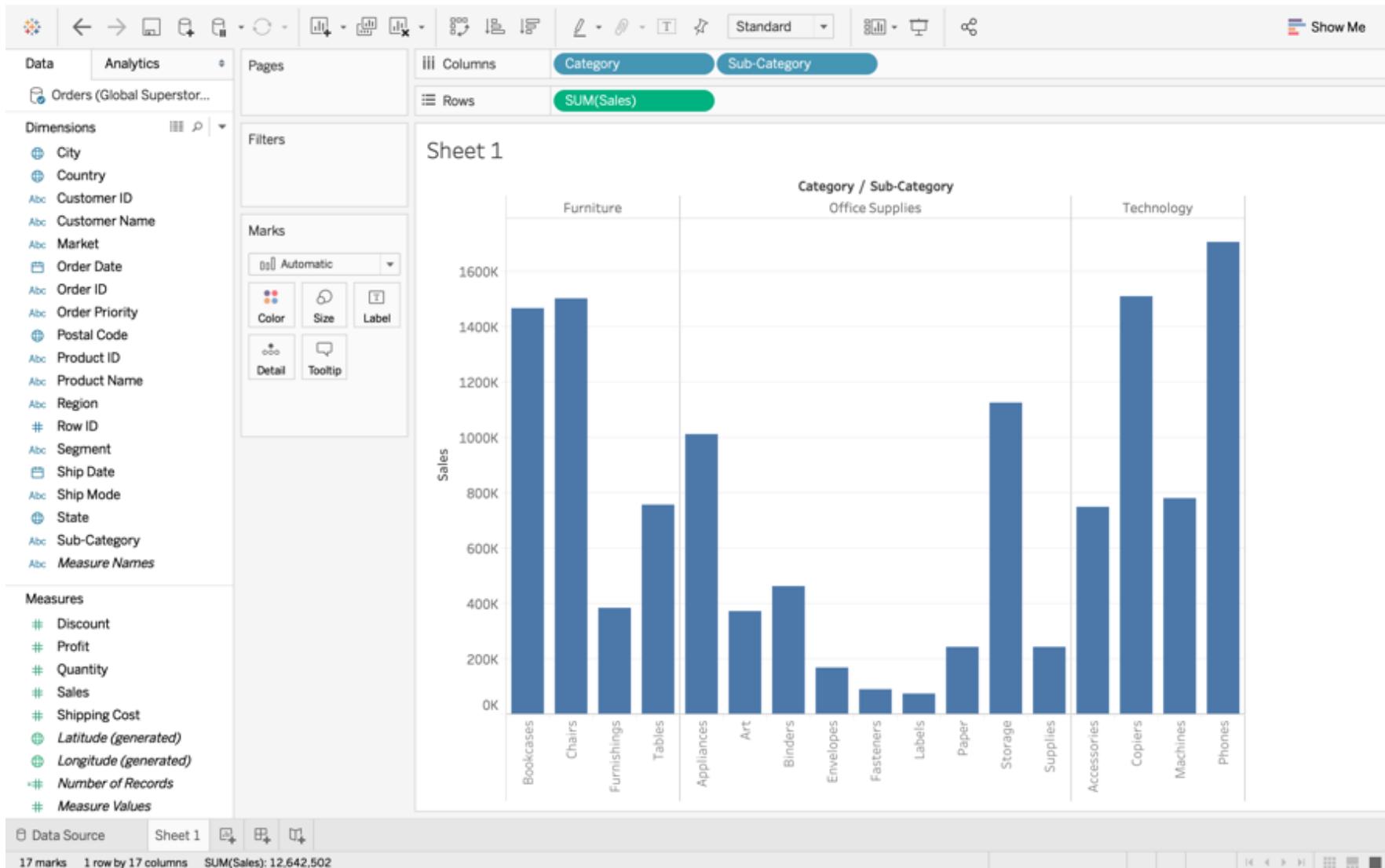
Drag Profit over the bar chart to see what sub-categories perform well

How to choose the chart type?



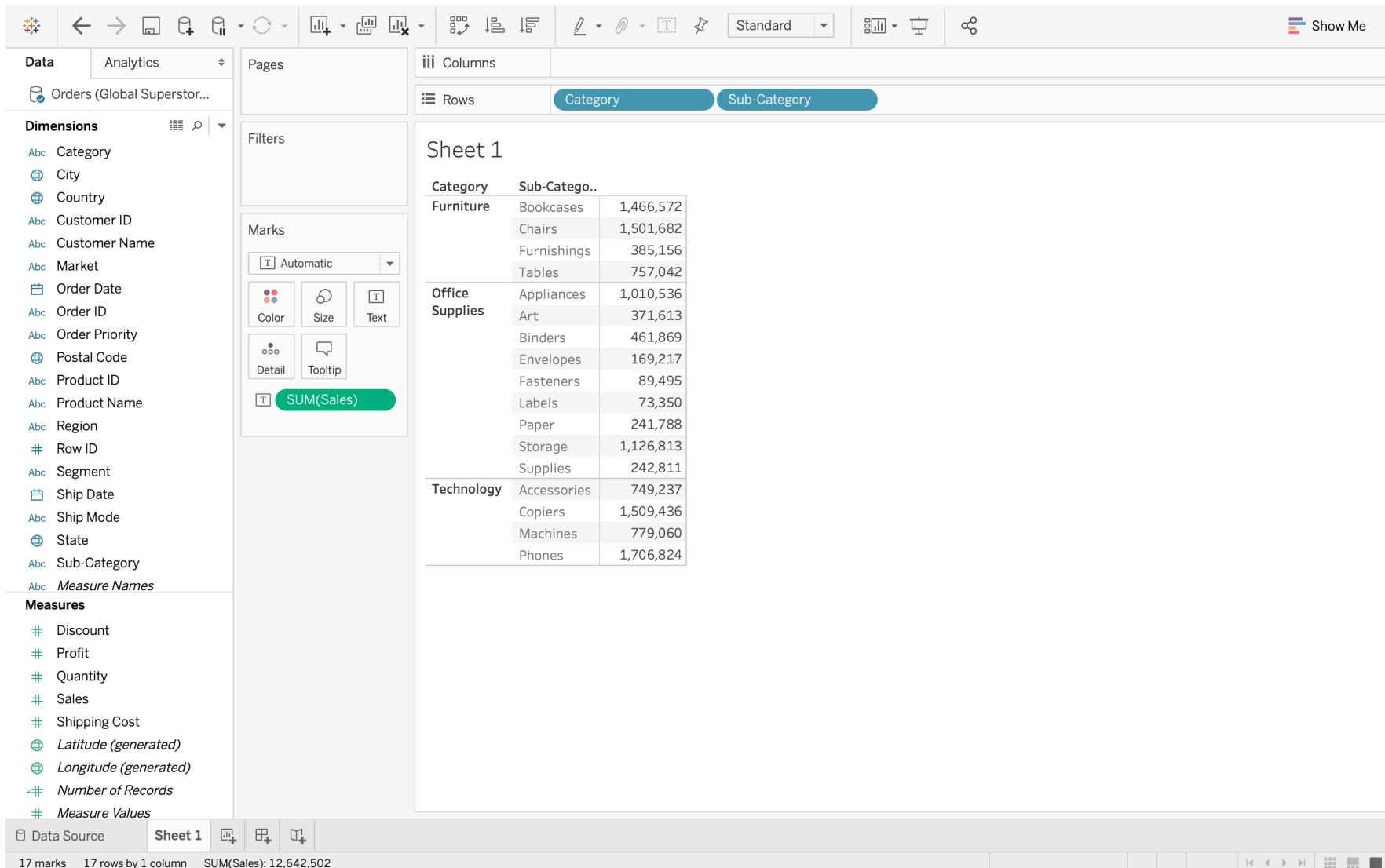
Dr. Andrew Abela - Choosing the right chart type

Second chart



New sheet – repeat the first steps
Double click on **Sales, Category, Sub-Category**

Second chart

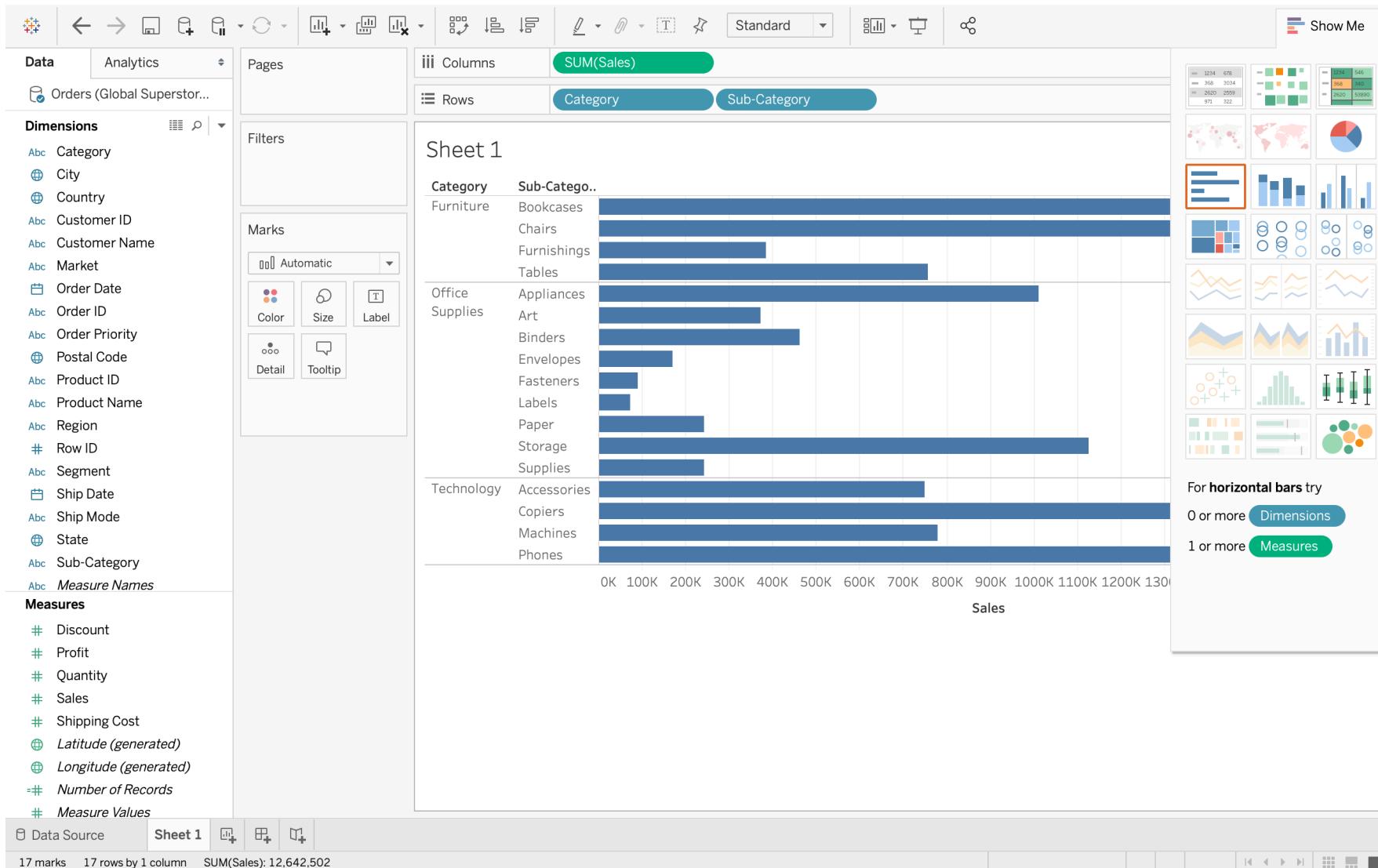


Use **Ctrl+Z** to go back to the empty sheet and select the same three columns but in a different order.
Dubble click: **Category, Sub-Category, Sales**

Second chart

- The built in automation shows the best visualization for the selected data.
- The result is not final, you can modify it or change to a different chart type easily.

Second chart



Select the bar chart from the **Show Me** menu

Lessons learned

- Sheet editor layout
- Creating a bar chart
- Quick buttons
 - Swap rows and columns
 - Sort data
- Built-in Tableau automation
- You can undo/redo every action

Creating basic charts

Create some basic charts

Line chart

Create a trendline

02. I'm interested in seasonality. On the next chart I want to check how sales numbers change during the months of the year. I want to compare the last year to the previous one (I don't need earlier data) .

Trendline

The screenshot shows the Tableau Data Prep interface. The top navigation bar includes icons for file operations, search, and various toolbars. Below the toolbar, the interface is divided into several sections:

- Data:** Shows the connection name "Orders (Global Superstor...)".
- Analytics:** A dropdown menu.
- Pages:** An empty section.
- Columns:** A list of columns:
 - YEAR(Order Date) (highlighted with a red box)
 - Order Date
 - 2012
 - 2013
 - 2014
 - 2015
 - Abc
- Rows:** An empty section.

Dimensions: A list of dimensions:

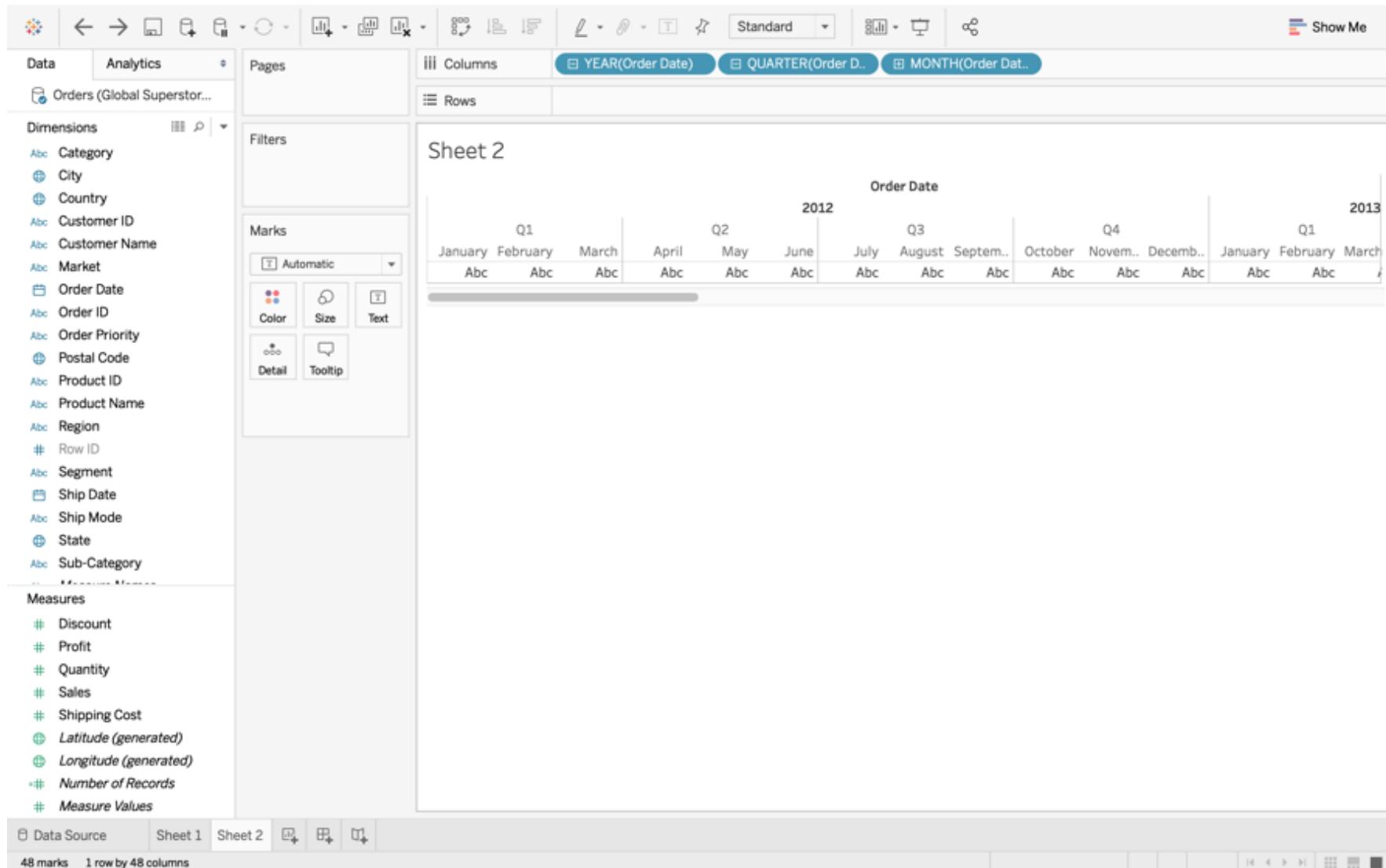
- Category
- City
- Country
- Customer ID
- Customer Name
- Market
- Order Date
- Order ID
- Order Priority
- Postal Code
- Product ID
- Product Name
- Region
- Row ID
- Segment
- Ship Date
- Ship Mode
- State
- Sub-Category

Marks: A panel with options for Automatic, Color, Size, Text, Detail, and Tooltip.

Sheet 2: A preview area showing a table with columns for Order Date (2012, 2013, 2014, 2015) and a single row labeled "Abc".

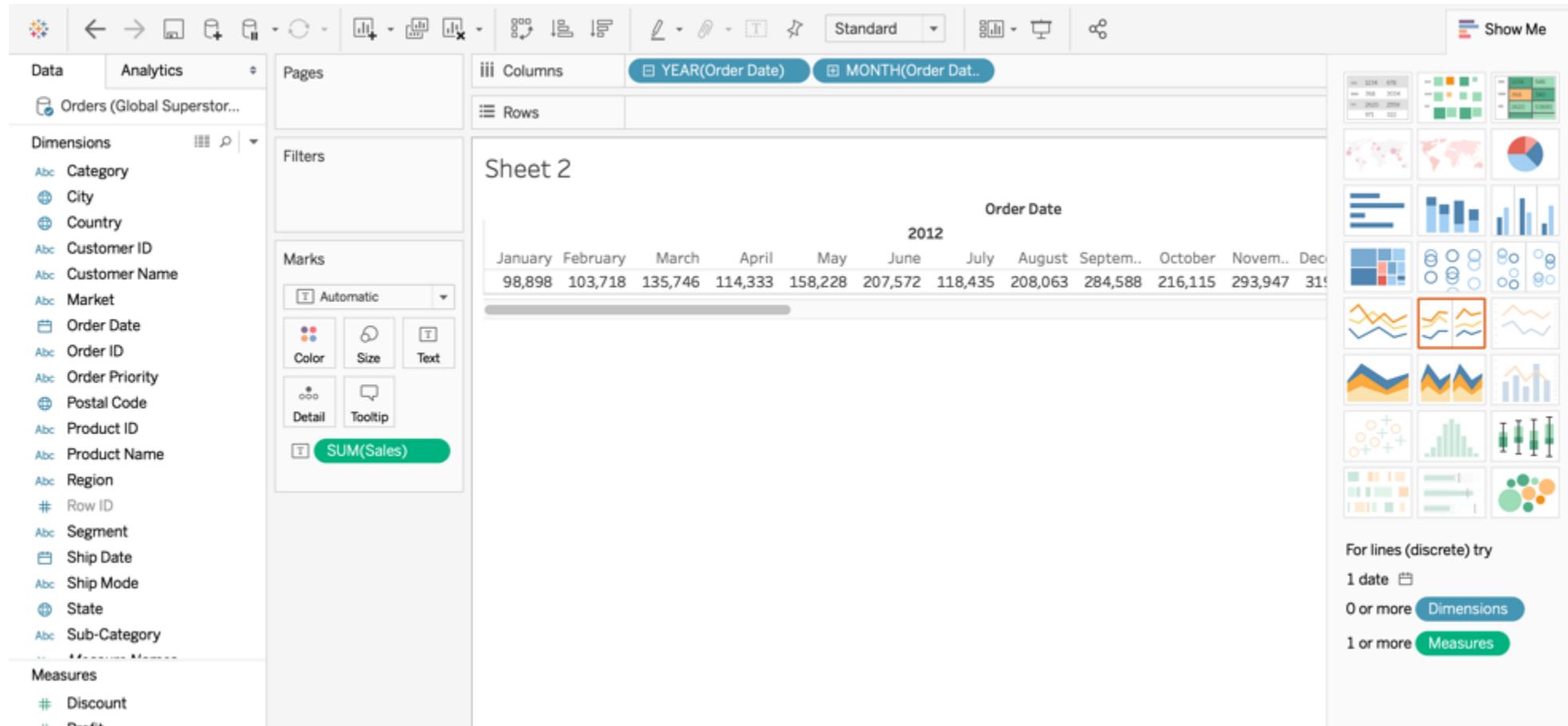
Double click on Order Date and unfold it with the + button

Trendline



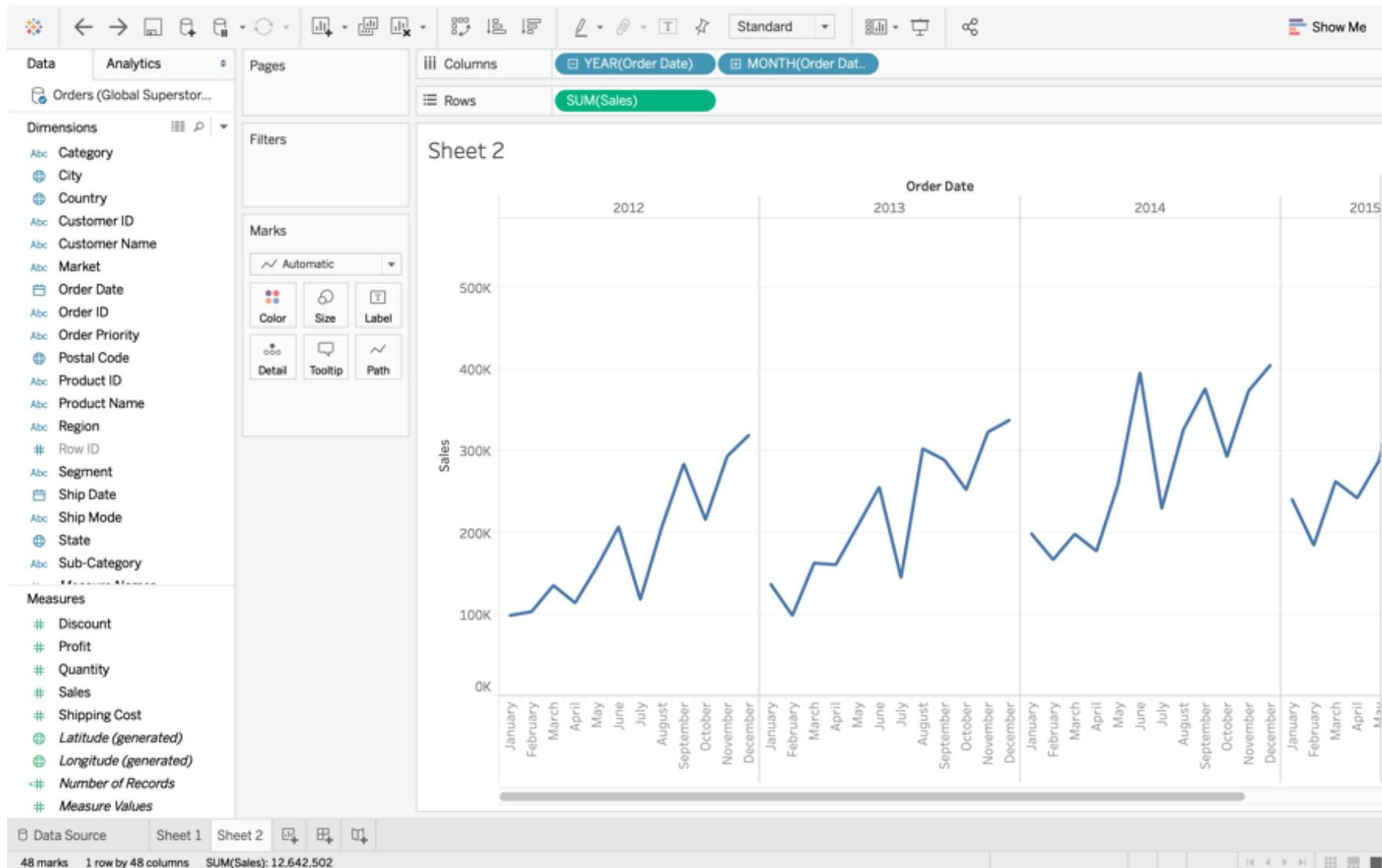
Drill down to **MONTH**. You can delete **QUARTER** by just dragging and dropping it out

Trendline



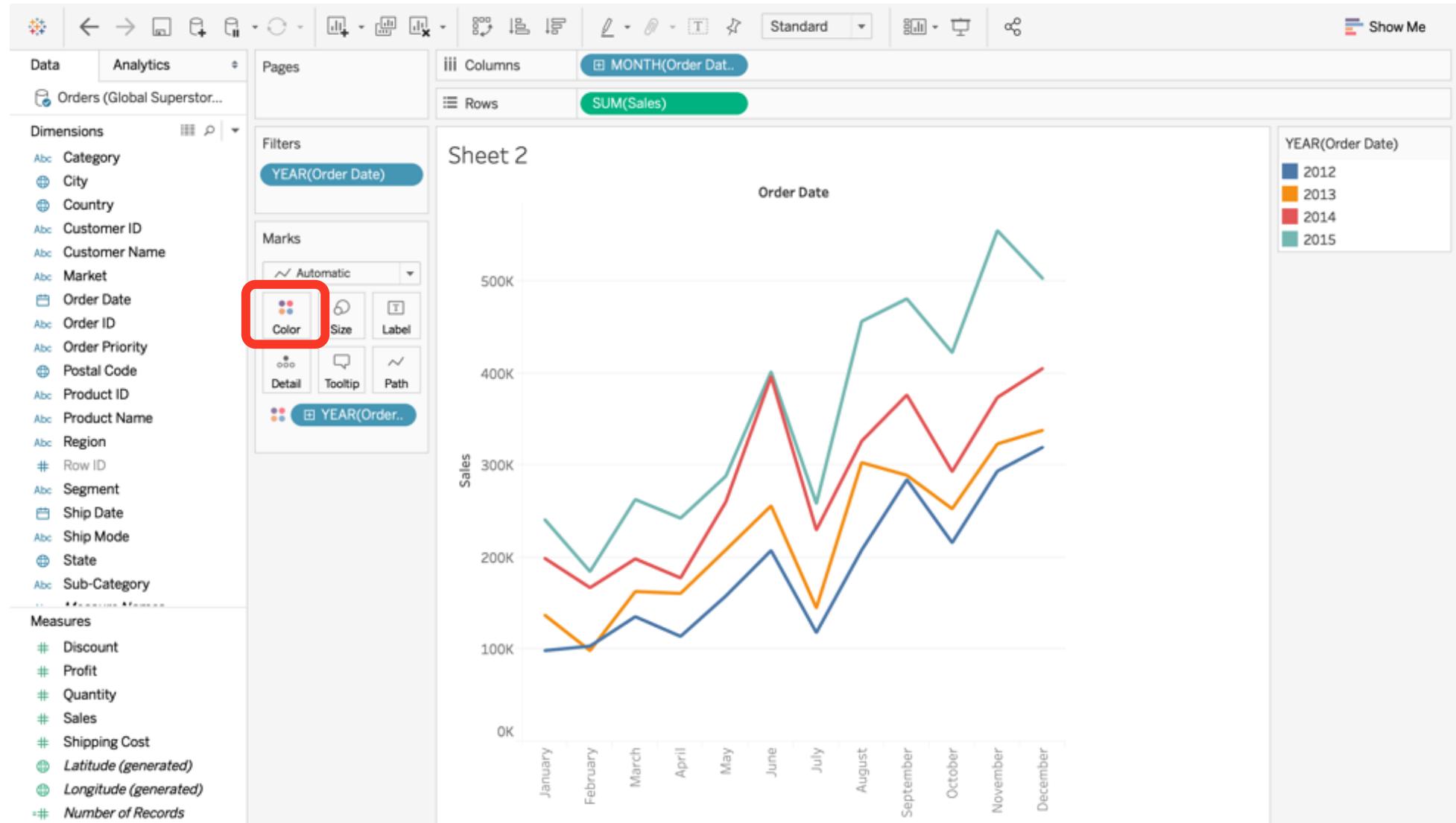
Double click on **Sales**, then change the diagram type to discrete lines from the **Show Me** menu. The recommended chart type is highlighted with an orange border.

Trendline



Years are divided into columns

Trendline



Let's show them on the same chart with different colors. Drag YEAR from the Columns pane to the Color Mark

Trendline

The image shows two sequential filter dialog boxes. The first dialog, titled "Filter Field [Order Date]", lists various date filtering options like "Relative Date", "Range of Dates", and "Years". The "Years" option is selected and highlighted in blue. The second dialog, titled "Filter [Year of Order Date]", shows a list of years from 2012 to 2015. The years 2014 and 2015 are checked, indicating they are selected for filtering. A red dotted arrow points from the first dialog to the second.

Filter Field [Order Date]

How do you want to filter on [Order Date]?

- Relative Date
- Range of Dates
- Years
- Quarters
- Months
- Days
- Week numbers
- Weekdays
- Month / Year
- Month / Day / Year
- Individual Dates

- Count
- Count (Distinct)
- Minimum
- Maximum

- Attribute

Cancel Next >

Filter [Year of Order Date]

General Condition Top

Select from list Custom value list Use all

Enter search text

- 2012
- 2013
- 2014
- 2015

All None Exclude

Summary

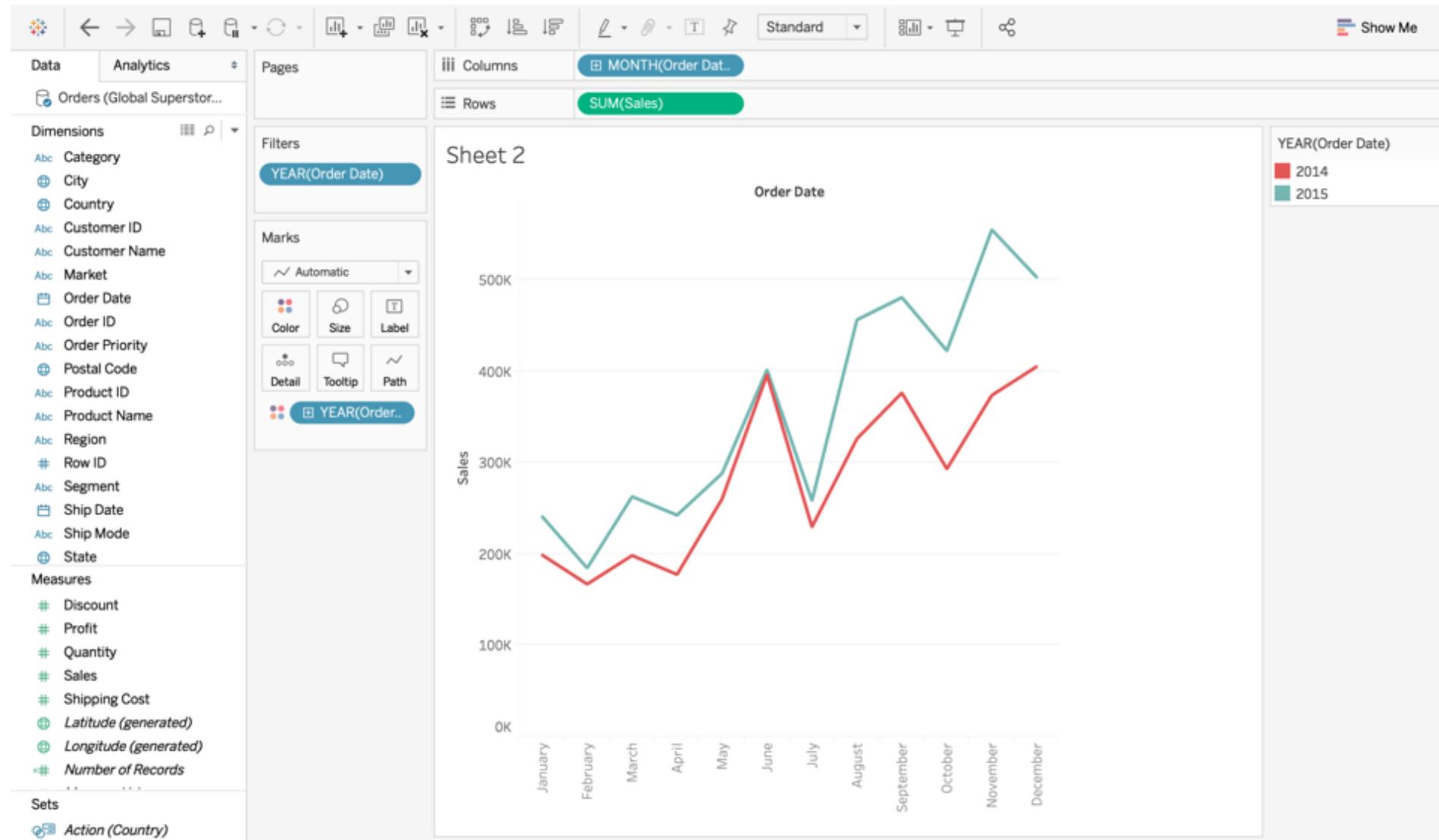
Field: [Year of Order Date]
Selection: Selected 2 of 4 values
Wildcard: All
Condition: None
Limit: None

Filter to latest date value when workbook is opened

Reset Apply Cancel OK

Filter to the last two years by dragging Order date over the **Filter** pane. Select Years and the 2014, 2015 values.

Trendline



Lessons learned

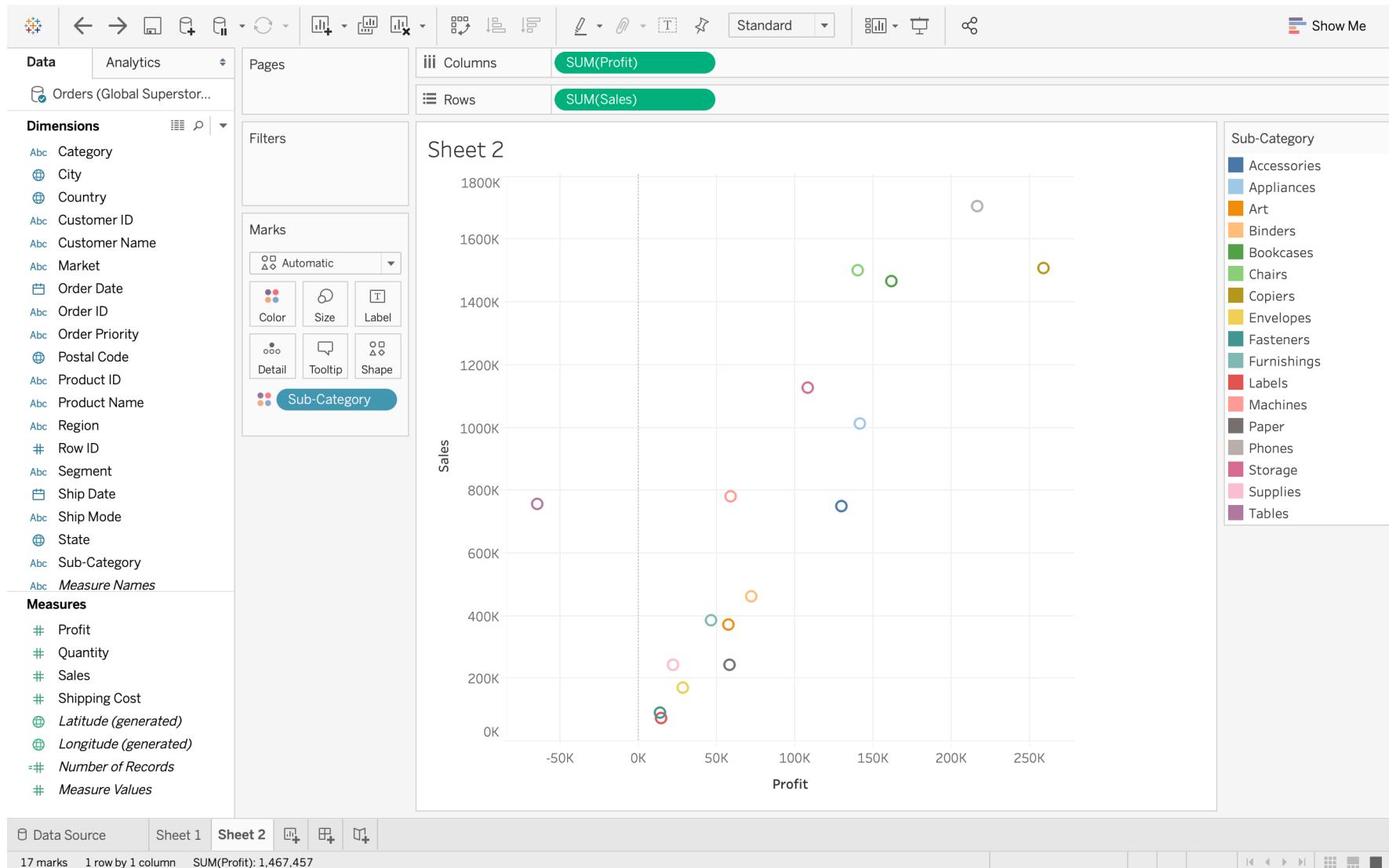
- Selecting the chart type from Show Me menu
- Creating a line chart
- Drill down in date parts
- Drag columns to the Filter pane

Scatter plot

Scatter plot

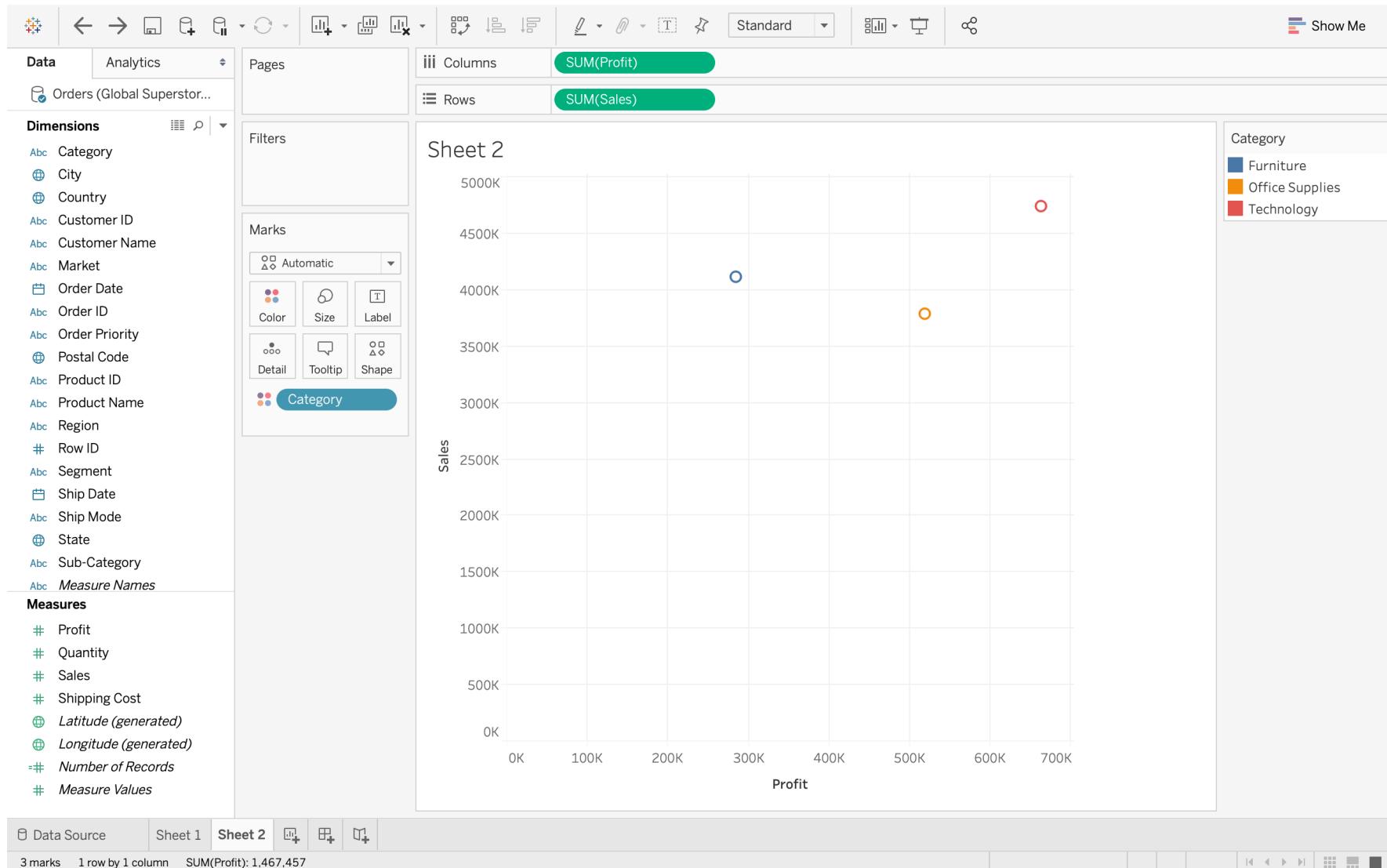
03. It would be nice to compare the product sub-categories. Let's show the **correlation** between **Sales** and **Profit**?

Scatter plot



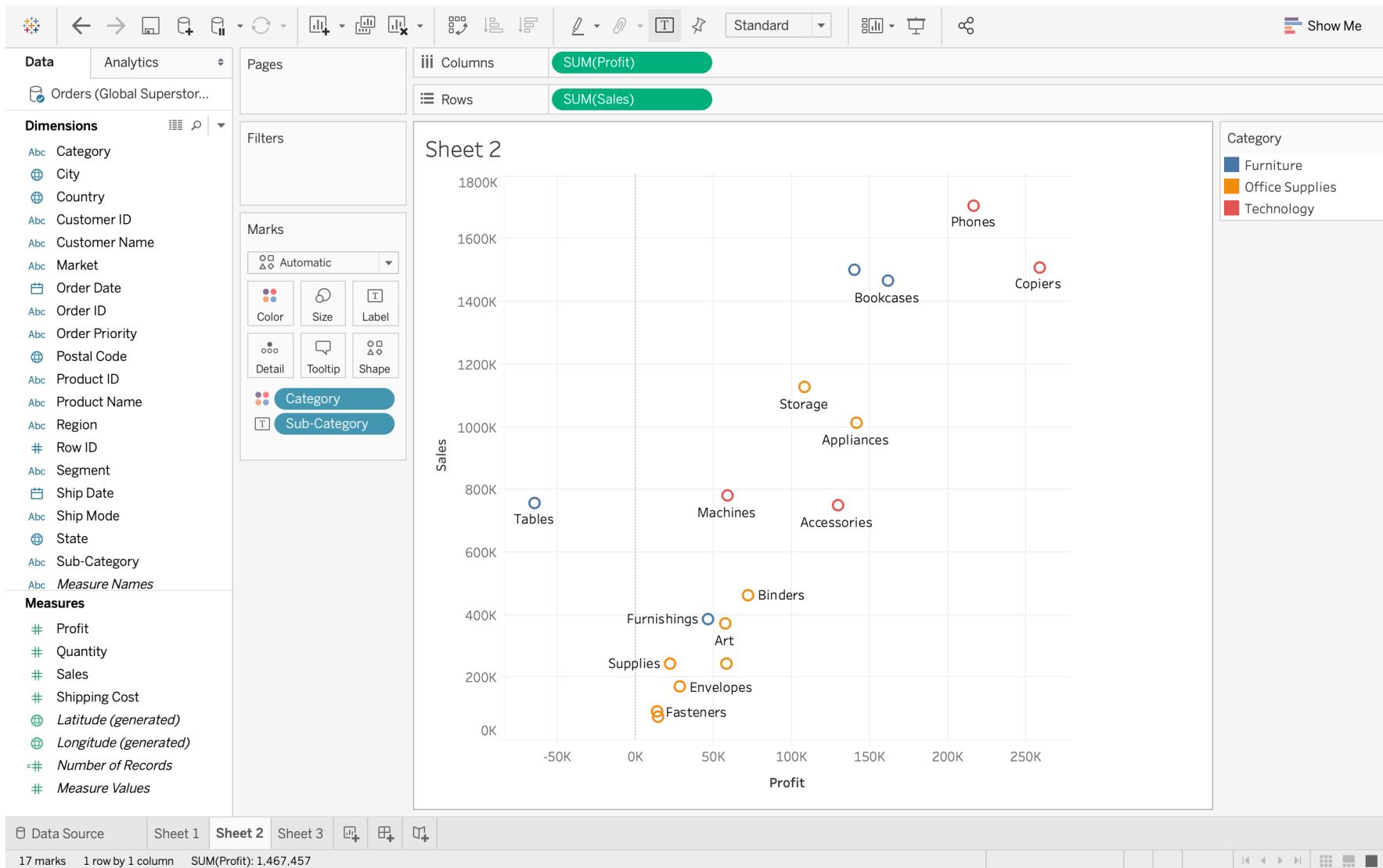
Double click on Sales, Profit and Sub-Category

Scatter plot



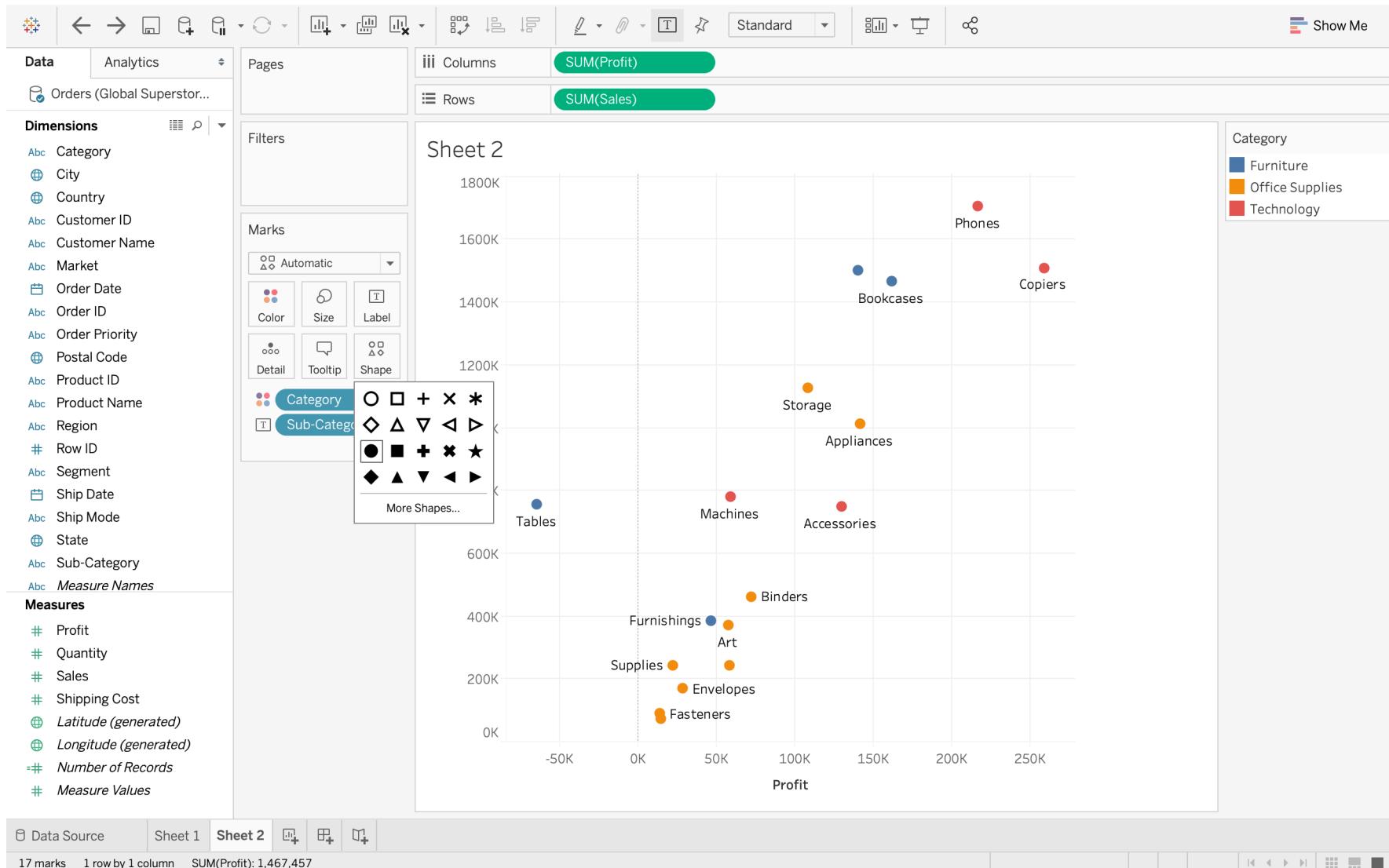
Color by **Category**. Sub-Category will be replaced on the color mark.

Scatter plot



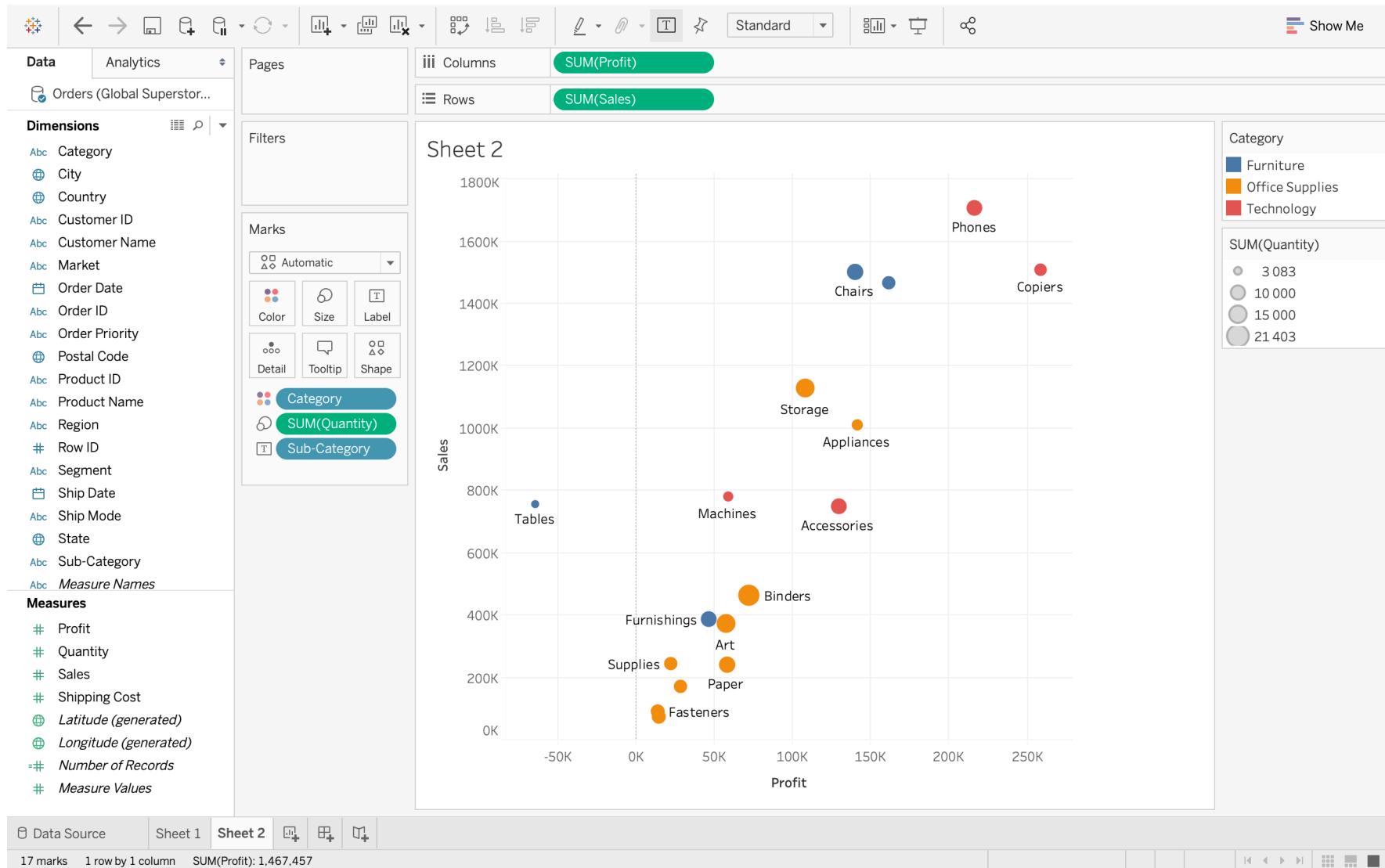
Drag Sub-Category back again to the **Label** mark

Scatter plot



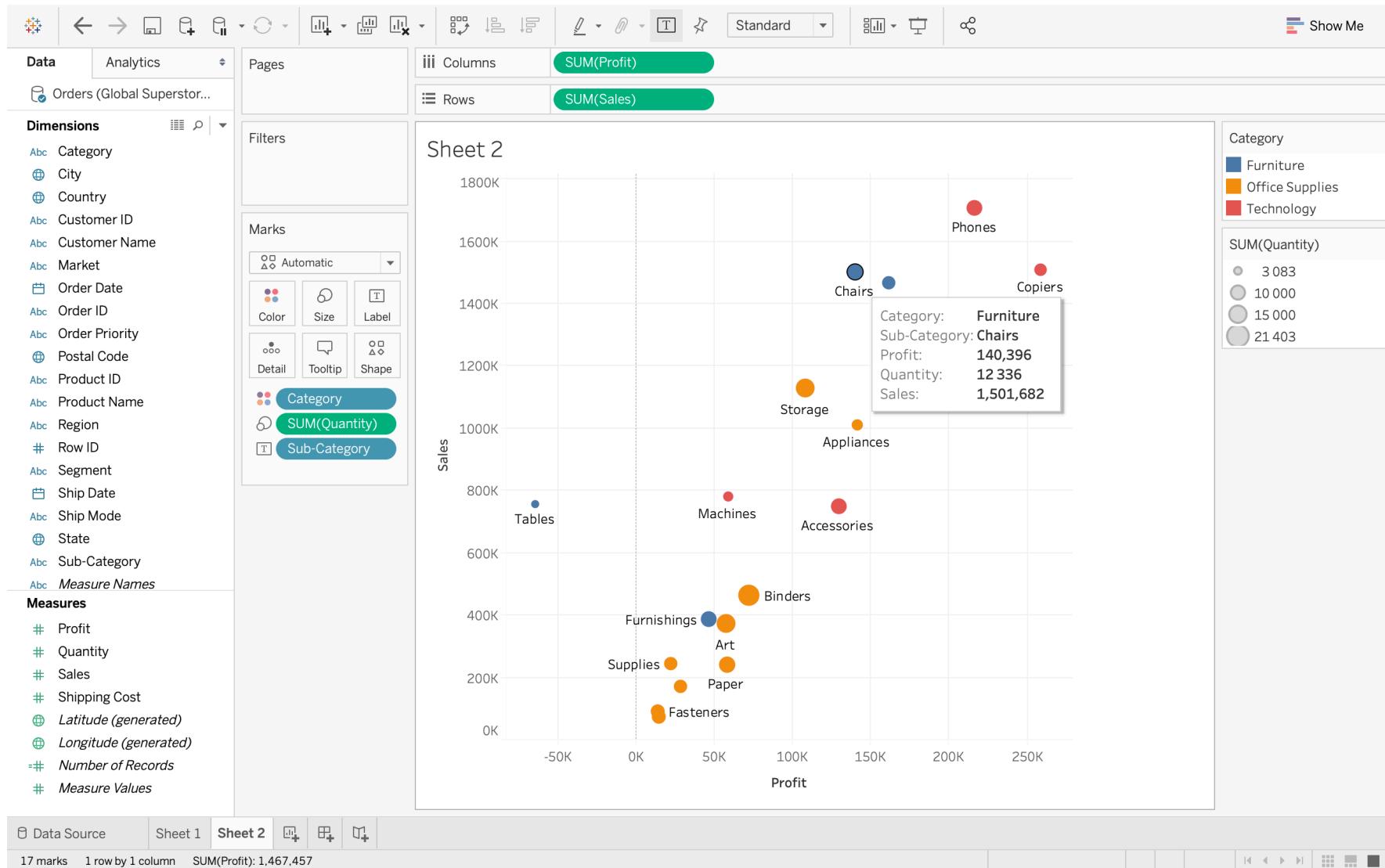
Change the Shape

Scatter plot



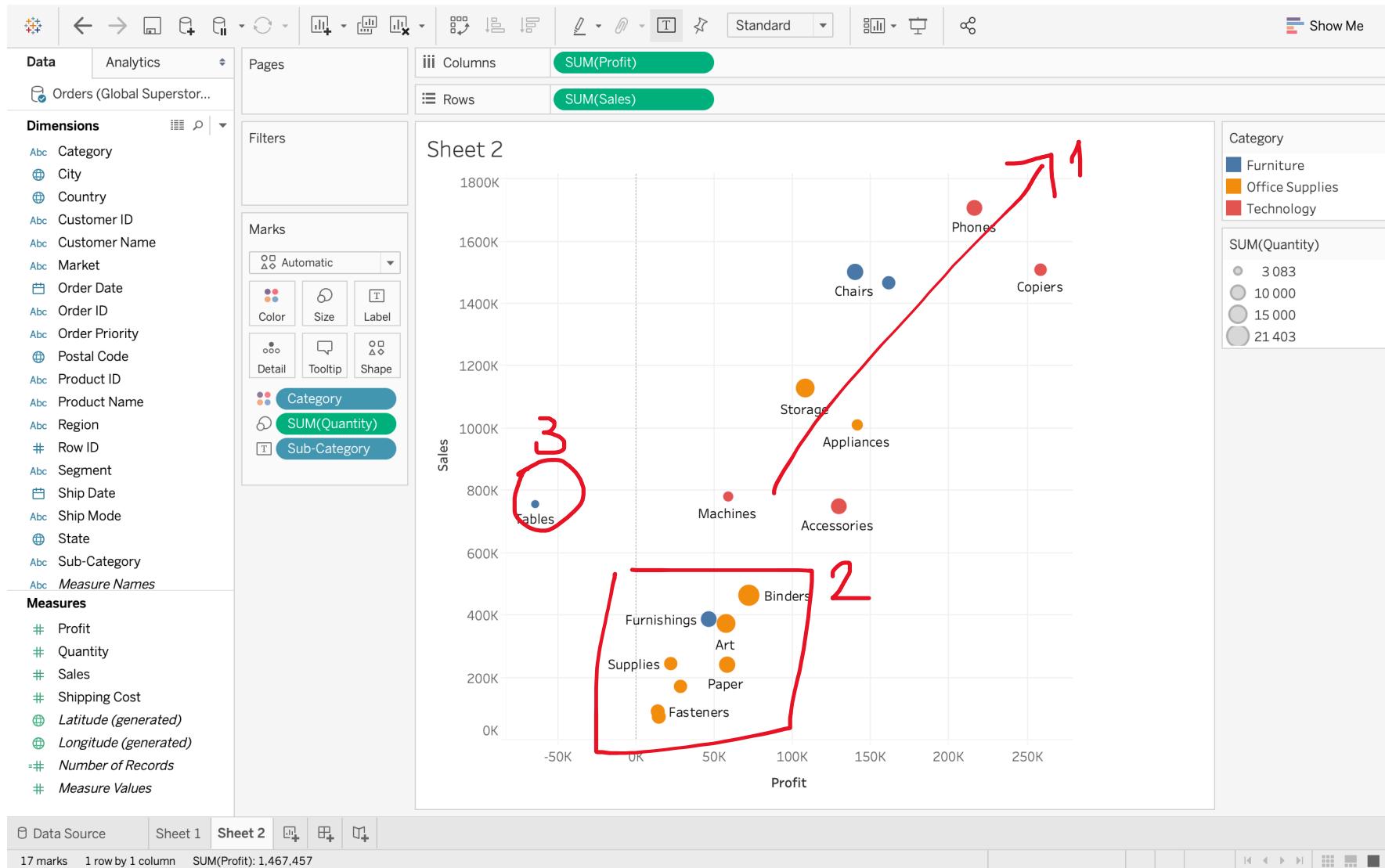
Size can be controlled by another column. Drag **Quantity** to the **Size** mark.

Scatter plot



Tooltip show every data automatically. Hover your cursor over a mark to see it.

Scatter plot



Scatter plots are great to see three things: 1. trends 2. clusters 3. outliers

Mit tanultunk?

- Creating a scatter plot
- Set the color, label, size and shape
- What's on the tooltip

Text table (data table)

Data table

04. Next I'd like to see the sales numbers but not by product categories but **Regions** and **Segments**.

Data table

The screenshot shows the Tableau Data Table interface. The top navigation bar includes icons for Home, Back, Forward, Refresh, and various data source and visualization options. The main workspace is divided into several sections:

- Dimensions:** A list of dimensions including Category, City, Country, Customer ID, Customer Name, Market, Order Date, Order ID, Order Priority, Postal Code, Product ID, Product Name, Region, Row ID, Segment, Ship Date, Ship Mode, State, Sub-Category, and Measure Names.
- Marks:** Options for Automatic, Color, Size, Text, Detail, and Tooltip, with SUM(Sales) selected.
- Pages:** Shows 'Sheet 2' as the active page.
- Columns:** Set to 'Segment'.
- Rows:** Set to 'Market' and 'Region'.
- Sheet 2 Content:** A data table titled 'Segment' showing sales data by Market, Region, and Segment. The columns are Market, Region, Consum., Corpora., and Home Office. The data is grouped by Market (Africa, Asia Pacific, Europe, LATAM, USCA) and Region (Central Africa, Eastern Africa, North Africa, Southern Africa, Western Africa, Central Asia, Eastern Asia, Oceania, Southeastern Asia, Southern Asia, Western Asia, Eastern Europe, Northern Europe, Southern Europe, Western Europe, Caribbean, Central America, South America, Canada, Central US, Eastern US, Southern US, Western US).
- Bottom Navigation:** Includes tabs for Data Source, Sheet 1, and Sheet 2, along with other standard navigation and zoom controls.

At the bottom of the interface, status information indicates there are 69 marks, 23 rows by 3 columns, and a total sum of Sales: 12,642,502.

Market	Region	Consum.	Corpora.	Home Office
Africa	Central Africa	94,099	24,892	24,639
	Eastern Africa	67,490	33,618	26,748
	North Africa	119,254	62,051	51,912
	Southern Africa	44,933	36,767	23,492
	Western Africa	97,992	47,611	28,276
Asia Pacific	Central Asia	12,911	3,012	3,389
	Eastern Asia	407,539	271,682	175,839
	Oceania	579,550	322,827	197,807
	Southeastern Asia	460,753	254,352	169,319
	Southern Asia	431,073	269,288	166,212
	Western Asia	164,640	93,979	58,488
Europe	Eastern Europe	152,420	94,426	63,187
	Northern Europe	327,134	202,075	107,570
	Southern Europe	302,128	216,200	90,267
	Western Europe	915,067	521,206	295,656
LATAM	Caribbean	162,349	104,538	57,394
	Central America	637,867	374,221	211,013
	South America	333,631	166,494	117,099
USCA	Canada	35,719	19,314	11,895
	Central US	252,031	157,996	91,213
	Eastern US	350,908	200,409	127,464
	Southern US	195,581	121,886	74,255
	Western US	362,881	225,855	136,722

Market, Region, Segment, Sales

Data table

The screenshot shows the Tableau Data Table interface. The top navigation bar includes icons for Data, Analytics, Pages, Columns, Rows, Standard, and Show Me. The left sidebar lists dimensions and measures. Dimensions include Category, City, Country, Customer ID, Customer Name, Market, Order Date, Order ID, Order Priority, Postal Code, Product ID, Product Name, Region, Row ID, Segment, Ship Date, Ship Mode, State, Sub-Category, and Measure Names. Measures include Discount, Profit, Quantity, Sales, Shipping Cost, Latitude (generated), Longitude (generated), Number of Records, and Measure Values. The main area displays a data grid titled "Sheet 2" with columns: Market, Region, Consumer, Corporate, and Home Office. The data is grouped by Market (Africa, Asia Pacific, Europe, LATAM, USCA) and Region (various sub-regions). The "Segment" and "Market" buttons are highlighted in blue.

Market	Region	Segment		
		Consumer	Corporate	Home Office
Africa	Central Africa	94,099	24,892	24,639
	Eastern Africa	67,490	33,618	26,748
	North Africa	119,254	62,051	51,912
	Southern Africa	44,933	36,767	23,492
	Western Africa	97,992	47,611	28,276
Asia Pacific	Central Asia	12,911	3,012	3,389
	Eastern Asia	407,539	271,682	175,839
	Oceania	579,550	322,827	197,807
	Southeastern Asia	460,753	254,352	169,319
	Southern Asia	431,073	269,288	166,212
	Western Asia	164,640	93,979	58,488
Europe	Eastern Europe	152,420	94,426	63,187
	Northern Europe	327,134	202,075	107,570
	Southern Europe	302,128	216,200	90,267
	Western Europe	915,067	521,206	295,656
LATAM	Caribbean	162,349	104,538	57,394
	Central America	637,867	374,221	211,013
	South America	333,631	166,494	117,099
USCA	Canada	35,719	19,314	11,895
	Central US	252,031	157,996	91,213
	Eastern US	350,908	200,409	127,464
	Southern US	195,581	121,886	74,255
	Western US	362,881	225,855	136,722

You can change the size of the chart with **Ctrl+arrows** or manually with your cursor.

Data table

The screenshot shows the Tableau Data Table interface. The top navigation bar includes icons for Data, Analytics, Pages, Columns, Rows, Standard, and Show Me. The left sidebar contains sections for Dimensions (e.g., Category, City, Country, Customer ID, etc.) and Measures (e.g., Discount, Profit, Quantity, Sales, etc.). The main area displays a data table titled "Sheet 2" with three columns of headers: Consumer, Corporate, and Home Office. The table is organized by Market (Africa, Asia Pacific, Europe, LATAM, USCA) and Region. The data includes fields for Discount, Profit, and Sales.

Market	Region	Consumer			Corporate			Home Office		
		Discount	Profit	Sales	Discount	Profit	Sales	Discount	Profit	Sales
Africa	Central Africa	0	23,838	94,099	0	5,839	24,892	0	5,706	24,639
	Eastern Africa	36	12,967	67,490	24	5,399	33,618	25	3,534	26,748
	North Africa	0	27,922	119,254	0	16,823	62,051	0	13,092	51,912
	Southern Africa	0	10,805	44,933	0	7,857	36,767	0	5,496	23,492
	Western Africa	335	-27,761	97,992	191	-15,231	47,611	108	-7,416	28,276
Asia Pacific	Central Asia	53	-4,957	12,911	25	-1,848	3,012	13	-477	3,389
	Eastern Asia	59	81,212	407,539	27	51,060	271,682	29	34,830	175,839
	Oceania	290	62,205	579,550	156	34,659	322,827	88	23,225	197,807
	Southeastern Asia	436	10,235	460,753	255	3,707	254,352	160	3,910	169,319
	Southern Asia	63	84,128	431,073	48	49,723	269,288	27	25,485	166,212
	Western Asia	429	-21,585	164,640	271	-18,961	93,979	162	-13,376	58,488
Europe	Eastern Europe	0	36,780	152,420	0	25,176	94,426	0	15,129	63,187
	Northern Europe	177	42,423	327,134	104	28,904	202,075	51	12,597	107,570
	Southern Europe	104	34,258	302,128	68	23,129	216,200	31	12,723	90,267
	Western Europe	293	112,339	915,067	148	70,081	521,206	91	36,014	295,656
LATAM	Caribbean	111	19,868	162,349	65	9,189	104,538	53	5,514	57,394
	Central America	306	85,687	637,867	192	43,009	374,221	119	30,286	211,013
	South America	296	15,077	333,631	156	5,678	166,494	98	7,335	117,099
USCA	Canada	0	9,678	35,719	0	5,036	19,314	0	3,103	11,895
	Central US	305	8,564	252,031	161	18,704	157,996	91	12,438	91,213
	Eastern US	217	41,191	350,908	127	23,623	200,409	71	26,709	127,464
	Southern US	119	26,914	195,581	80	15,215	121,886	39	4,621	74,255
	Western US	180	57,451	362,881	109	34,437	225,855	61	16,530	136,722

Bottom status bar: Data Source, Sheet 1, Sheet 2, 207 marks, 23 rows by 9 columns, SUM of Measure Values: 14,117,289.

Add a couple of measures with double click (Profit, Discount)

Data table

The screenshot shows the Tableau Data Table view. The interface includes a top toolbar with various icons, a left sidebar for Dimensions and Measures, and a main area for Pages, Columns, and Rows. The data is presented in a grid format with three columns of headers: Segment, Measure Names, and Region. The rows are labeled Market, Consumer, Corporate, and Home Office. The data is categorized by Market (Africa, Europe, Latin America, USCA) and Region (Central Africa, Eastern Africa, North Africa, Southern Africa; Central America, South America; Canada, Central US, Eastern US, Southern US, Western US). The grid contains numerical values for Discount, Sales, and Profit. A context menu is open over the data, specifically over the 'Text' mark, showing options for Alignment (Horizontal and Vertical), Direction (Automatic or Wrap), and Wrap (Off or On). The bottom of the screen shows the status bar with '207 marks 23 rows by 9 columns SUM of Measure Values: 14,117,289'.

Market	Region	Consumer			Corporate			Home Office			
		Discount	Sales	Profit	Discount	Sales	Profit	Discount	Sales	Profit	
Africa	Central Africa	0	94,099	23,838	0	24,892	5,839	0	24,639	5,706	
	Eastern Africa	36	67,490	12,967	24	33,618	5,399	25	26,748	3,534	
	North Africa	0	119,254	27,922	0	62,051	16,823	0	51,912	13,092	
	Southern Africa	0	44,933	10,805	0	36,767	7,857	0	23,492	5,496	
		335	97,992	-27,761	191	47,611	-15,231	108	28,276	-7,416	
		Text: <Measure Values ...>	53	12,911	-4,957	25	3,012	-1,848	13	3,389	-477
		Alignment: Automatic	59	407,539	81,212	27	271,682	51,060	29	175,839	34,830
		Horizontal: Automatic	90	579,550	62,205	156	322,827	34,659	88	197,807	23,225
		Horizontal: Automatic	136	460,753	10,235	255	254,352	3,707	160	169,319	3,910
		Vertical: Automatic	63	431,073	84,128	48	269,288	49,723	27	166,212	25,485
		Vertical: Automatic	129	164,640	-21,585	271	93,979	-18,961	162	58,488	-13,376
Europe	Central Europe	0	152,420	36,780	0	94,426	25,176	0	63,187	15,129	
	Eastern Europe	77	327,134	42,423	104	202,075	28,904	51	107,570	12,597	
	North Europe	104	302,128	34,258	68	216,200	23,129	31	90,267	12,723	
	South Europe	293	915,067	112,339	148	521,206	70,081	91	295,656	36,014	
	Western Europe	111	162,349	19,868	65	104,538	9,189	53	57,394	5,514	
Latin America	Central America	306	637,867	85,687	192	374,221	43,009	119	211,013	30,286	
	South America	296	333,631	15,077	156	166,494	5,678	98	117,099	7,335	
	USCA	Canada	0	35,719	9,678	0	19,314	5,036	0	11,895	3,103
		Central US	305	252,031	8,564	161	157,996	18,704	91	91,213	12,438
		Eastern US	217	350,908	41,191	127	200,409	23,623	71	127,464	26,709
Southern US		119	195,581	26,914	80	121,886	15,215	39	74,255	4,621	
Western US		180	362,881	57,451	109	225,855	34,437	61	136,722	16,530	

Selected Measures are shown with two technical columns. **Measure Names** drive the headers on the chart. Values are controlled by **Measure Values**. You can format the data under the **Text** mark.

Measure Names

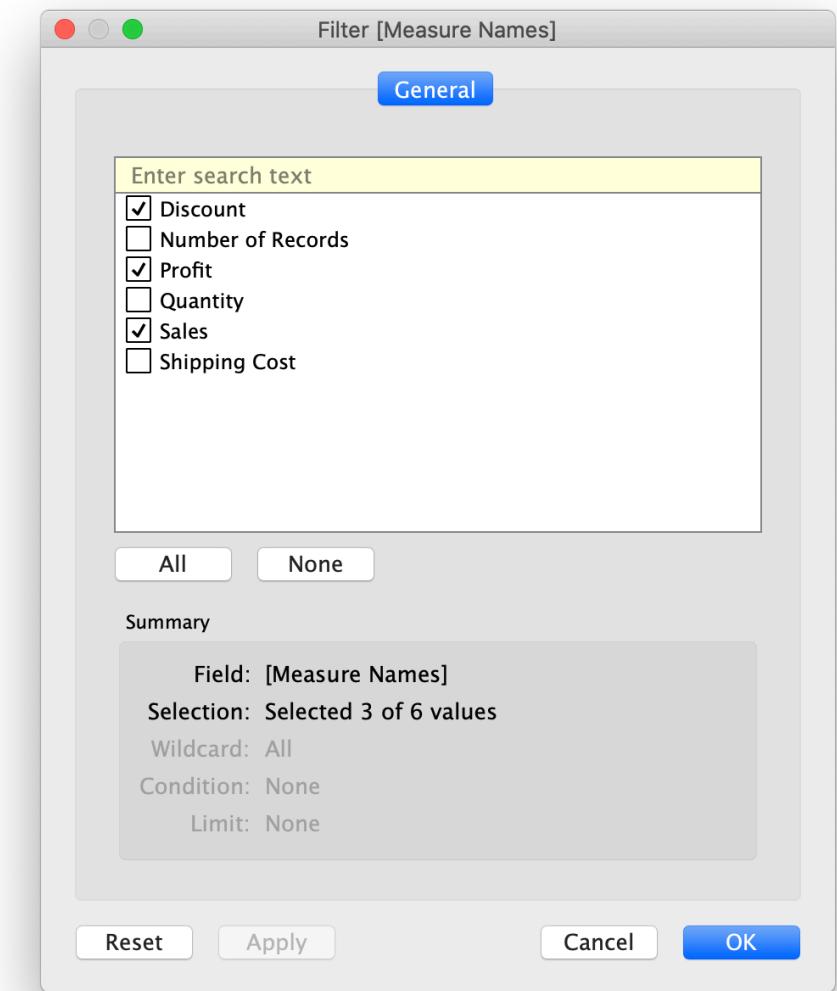
- Technical column
 - Values are the names of all the measures in the data set

What are measures?

- Numerical data that we aggregate and calculate with.

What are dimensions?

- Usually text (sometimes date or numerical) columns that describe and group measures.



Discrete and continuous columns

- Green and blue pills show whether the data is discrete or continuous.

Market

Blue: discrete columns. They are shown as header labels, data values are distinct (Category, Segment, Country...)

SUM(Sales)

Green: continuous columns. Only numerical data can be continuous. They are shown on an axis where they can get every value between the two endpoints of the axis.

Lessons learned?

- Creating data tables
- Two technical columns: Measure Names and Measure Values
- Blue (discrete) and green (continuous) columns

Totals

Totals

05. The head of the controlling department at our company liked our bar chart and asks for a report with the exact numbers in a data table. She asks for more details with segments.

Totals

The screenshot shows the Tableau Data Prep interface. On the left, there's a sidebar with sections for Dimensions (e.g., Category, City, Country, Customer ID, etc.) and Measures (e.g., Discount, Profit, Quantity, Sales, etc.). The main area has a 'Segments' section at the top, followed by a table titled 'Sheet 2 (2)'.

Sheet 2 (2)

Category	Sub-Catego..	Consumer		Corporate		Home Office	
		Sales	Profit	Sales	Profit	Sales	Profit
Furniture	Bookcases	765,111	79,222	457,327	54,677	244,134	28,025
	Chairs	778,363	72,672	448,520	45,370	274,800	22,354
	Furnishings	202,921	26,469	112,786	13,200	69,449	7,176
	Tables	381,727	-24,730	245,794	-29,520	129,521	-9,833
Office Supplies	Appliances	510,021	65,568	317,390	52,185	183,124	23,810
	Art	200,463	33,042	103,525	14,265	67,624	10,523
	Binders	253,739	40,220	128,508	18,572	79,622	13,641
	Envelopes	87,627	14,977	50,982	9,236	30,609	4,637
	Fasteners	44,998	6,821	28,327	4,586	16,170	2,437
	Labels	38,698	7,664	21,184	4,519	13,468	2,806
	Paper	118,776	27,624	71,156	17,180	51,856	13,308
Technology	Storage	575,433	47,644	339,943	38,573	211,437	22,200
	Supplies	123,031	9,603	81,463	8,471	38,317	4,486
	Accessories	382,163	60,273	231,024	45,534	136,050	23,820
	Copiers	757,081	124,216	462,774	83,622	289,581	50,730
	Machines	382,373	28,372	229,908	15,504	166,779	14,991
	Phones	905,422	129,585	494,086	45,235	307,316	41,897

At the bottom, there are tabs for 'Data Source', 'Sheet 1', 'Sheet 2', and 'Sheet 2 (2)'. The status bar shows '102 marks 17 rows by 6 columns SUM of Measure Values: 14,109,959'.

Dubble click on **Category**, **Sub-Category** and **Sales**. Add **Segment**.

Totals

The screenshot shows the Tableau desktop interface. The top navigation bar includes icons for file operations, data connections, and various filters. The main workspace is divided into several panes:

- Analytics pane (top left):** Contains sections for Summarize, Model, and Custom. The "Summarize" section has a red box around the "Analytics" tab, and another red box highlights the "Totals" option under "Add Totals".
- Text table view (center):** Displays a data grid titled "Text table". The columns are labeled "Subtotals", "Column Grand Totals", and "Row Grand Totals". The data rows represent different categories and sub-categories from the "Office Supplies" and "Technology" departments.
- Bottom status bar:** Shows "Data Source", "Bar chart", "Line chart", "Text table", and other visualization options. It also displays "102 marks", "17 rows by 6 columns", and "SUM of Measure Values: 14,109,959". The bottom right corner shows the user's name, "Balazs Hardi".

Switch to the **Analytics** pane and drag **Totals** over the chart. Select Row / Column / Subtotals.

Totals

The screenshot shows the Tableau Data Prep interface with the following configuration:

- Dimensions:** City, Country, Customer ID, Customer Name, Market, Order Date, Order ID, Order Priority, Postal Code, Product ID, Product Name, Region, Row ID, Segment, Ship Date, Ship Mode, State, Sub-Category, Measure Names.
- Measures:** Discount, Profit, Quantity, Sales, Shipping Cost, Latitude (generated), Longitude (generated), Number of Records, Measure Values.
- Text table:** The main view displays a data grid with three columns of headers: Category, Sub-Catego.., and Measure Names. The data is grouped by Segment (Consumer, Corporate, Home Office) and further categorized by Category (Furniture, Office Supplies, Technology). The grid includes sub-totals for each category and a Grand Total at the bottom.
- Marks:** Automatic, Color, Size, Text, Detail, Tooltip.
- Filters:** Measure Names.
- Pages:** Standard.

Category	Sub-Catego..	Consumer		Corporate		Home Office	
		Profit	Sales	Profit	Sales	Profit	Sales
Furniture	Bookcases	79,222	765,111	54,677	457,327	28,025	244,134
	Chairs	72,672	778,363	45,370	448,520	22,354	274,800
	Furnishings	26,469	202,921	13,200	112,786	7,176	69,449
	Tables	-24,730	381,727	-29,520	245,794	-9,833	129,521
	Total	153,633	2,128,121	83,727	1,264,427	47,722	717,904
Office Supplies	Appliances	65,568	510,021	52,185	317,390	23,810	183,124
	Art	33,042	200,463	14,265	103,525	10,523	67,624
	Binders	40,220	253,739	18,572	128,508	13,641	79,622
	Envelopes	14,977	87,627	9,236	50,982	4,637	30,609
	Fasteners	6,821	44,998	4,586	28,327	2,437	16,170
	Labels	7,664	38,698	4,519	21,184	2,806	13,468
	Paper	27,624	118,776	17,180	71,156	13,308	51,856
	Storage	47,644	575,433	38,573	339,943	22,200	211,437
	Supplies	9,603	123,031	8,471	81,463	4,486	38,317
	Total	253,161	1,952,788	167,586	1,142,480	97,849	692,225
Technology	Accessories	60,273	382,163	45,534	231,024	23,820	136,050
	Copiers	124,216	757,081	83,622	462,774	50,730	289,581
	Machines	28,372	382,373	15,504	229,908	14,991	166,779
	Phones	129,585	905,422	45,235	494,086	41,897	307,316
	Total	342,445	2,427,040	189,895	1,417,791	131,438	899,726
Grand Total	749,240	6,507,949	441,208	3,824,698	277,009	2,309,855	

Totals

The screenshot shows a Tableau desktop interface with a data visualization titled "Sheet 2 (2)". The visualization is a crosstab with "Category" and "Sub-Catego.." on the rows, and "Segment" (Consumer, Corporate, Home Office) on the columns. The data includes various products like Furniture, Office Supplies, and Accessories, with columns for Avg. Sales and Profit.

A context menu is open over the "Sales" measure in the "Corporate" column. The menu options include:

- Sum
- Average** (selected)
- Median
- Count
- Count (Distinct)
- Minimum
- Maximum
- Percentile
- Std. Dev
- Std. Dev (Pop.)
- Variance
- Variance (Pop.)

The menu also includes options for "Measure (Average)" (with a checkmark), "Edit in Shelf", "Add Table Calculation...", "Quick Table Calculation", "Total using (Automatic)", and "Remove".

At the bottom of the screen, there are tabs for "Data Source", "Sheet 1", "Sheet 2", and "Sheet 2 (2)". The status bar at the bottom indicates "168 marks 21 rows by 8 columns SUM of Measure Values: 1,483,336".

You can change the aggregation rule. Change **Sales** from Sum to Average from the column's menu.
 Totals are calculated from the whole data set.

Totals

The screenshot shows the Tableau interface with the Analysis menu open. The 'Totals' option is selected, which then triggers a context menu over a data table. This context menu includes options like 'Show Row Grand Totals', 'Show Column Grand Totals', 'Row Totals to Left', 'Column Totals to Top', 'Add All Subtotals', 'Remove All Subtotals', and 'Total All Using'. The 'Total All Using' option is currently highlighted. The data table below shows sales and profit data for different categories.

	Home Office		Grand Total	
	Sales	Profit	Sales	Profit
Furniture	244,134	28,025	1,466,572	161,924
Office Supplies	274,800	22,354	1,501,682	140,396
Technology	69,449	7,176	385,156	46,845
	129,521	-9,833	757,042	-64,083
	717,042	722	4,110,452	285,083
	Automatic	\$10	1,010,536	141,563
	Sum	\$23	371,613	57,830
	Average	\$41	461,869	72,433
	Minimum	\$37	169,217	28,849
	Maximum	\$37	89,495	13,844
	564	21,184	4,519	13,468
	524	71,156	17,180	51,856
	544	339,943	38,573	211,437
	Supplies	123,031	9,603	81,463
	Total	1,952,788	253,161	1,142,480
				167,586
				692,225
				97,849
				3,787,493
				518,596
	Accessories	382,163	60,273	231,024
	Copiers	757,081	124,216	462,774
	Machines	382,373	28,372	229,908
	Phones	905,422	129,585	494,086
	Total	2,427,040	342,445	1,417,791
				189,895
				899,726
				131,438
				4,744,557
	Grand Total	6,507,949	749,240	3,824,698
				441,208
				2,309,855
				277,009
				12,642,502
				1,467,457

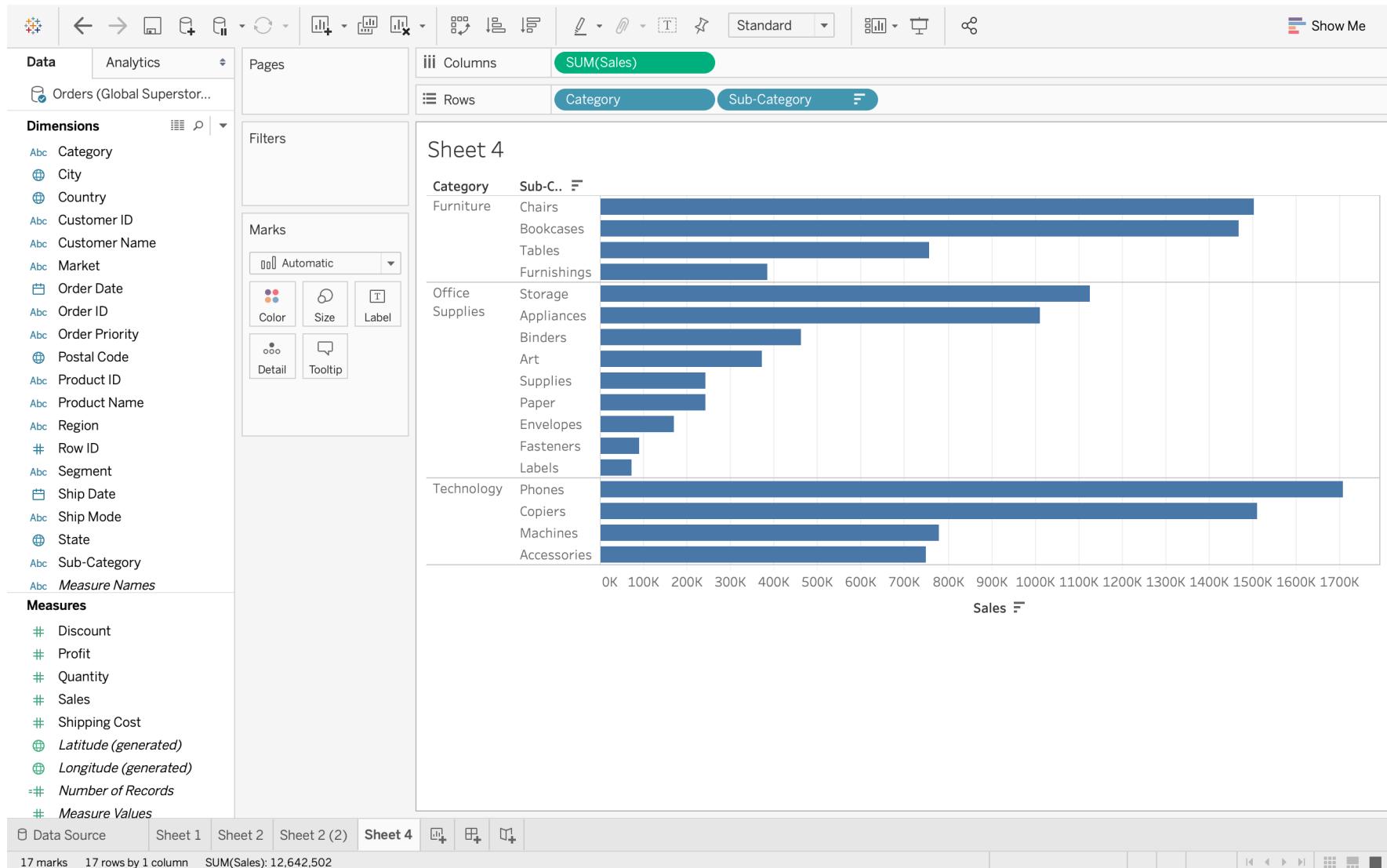
There's a way to leave the aggregation rule in the table as it is and change the aggregation of the Total values. Select **Analysis** from the top menu. Totals will be calculated from the data table.

Lessons Learned

- Adding Totals
- Changing aggregation rules for data columns
- Changing aggregation rules for the Total values

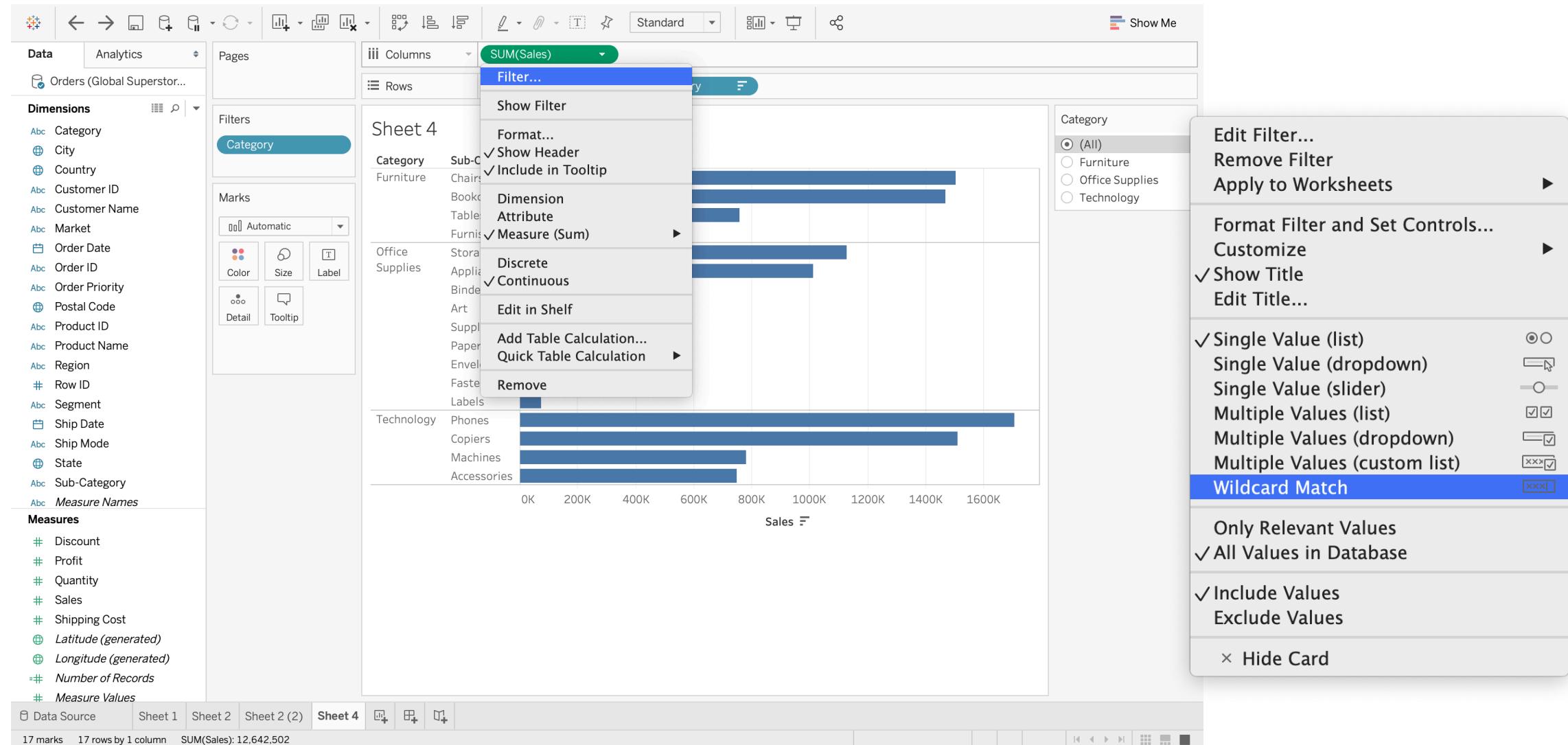
Using filters

Filter types



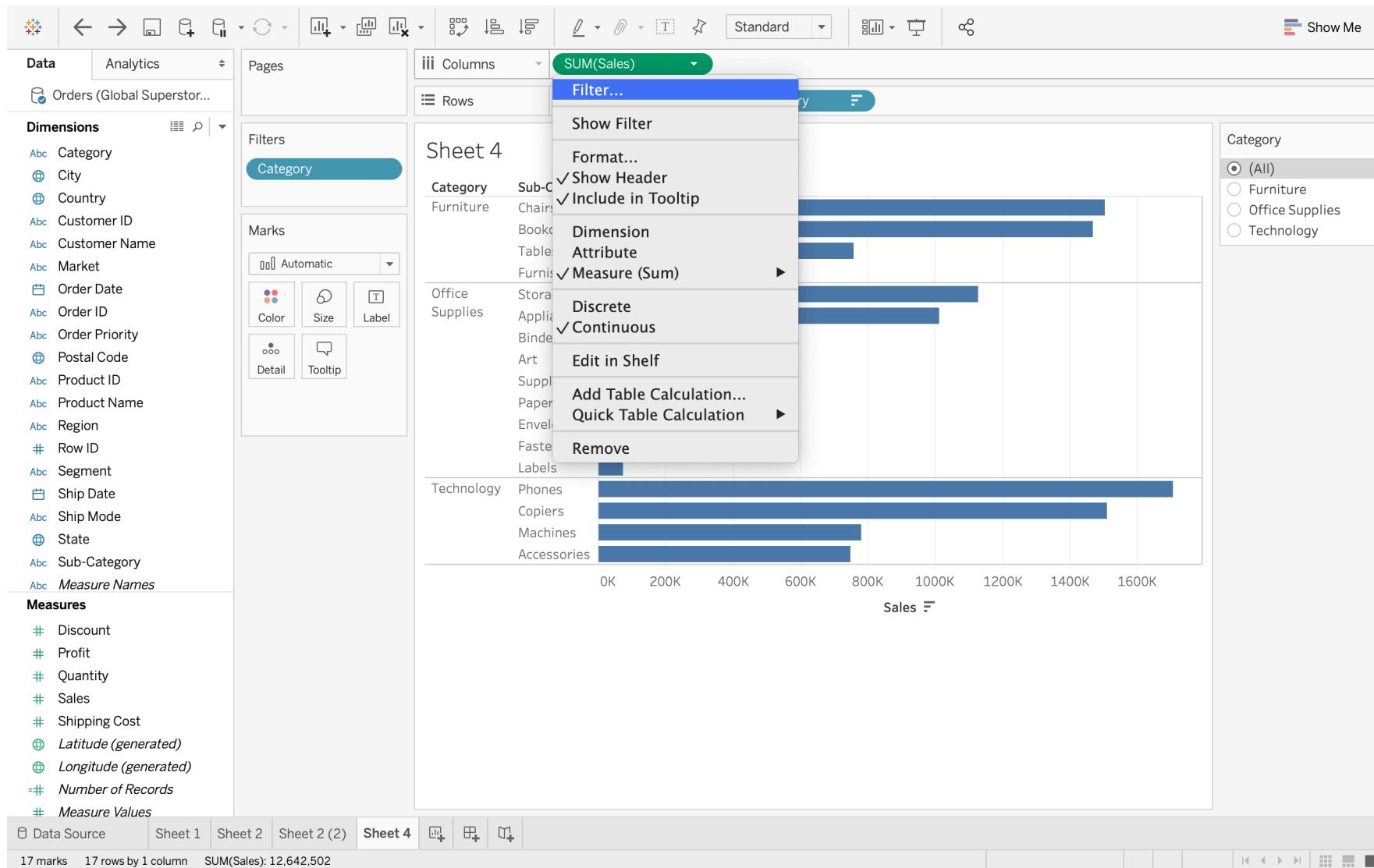
Sales, Category, Sub-category bar chart. Swap rows and columns

Discrete filter



Category right click » Filter
Right click again » Show Filter

Continuous filter



Sales right click » Filter

Continuous filter

The screenshot shows a Tableau desktop interface with a bar chart titled "Sheet 4". The chart displays sales data by category. A context menu is open over the chart, specifically over a bar representing the "Storage" category.

Context Menu Options:

- Edit Filter...
- Remove Filter
- Apply to Worksheets ►
- Format Filter and Set Controls...
- Customize ►
- ✓ Show Title
- Edit Title...

Filter [Sales] Dialog:

The "Range of values" tab is selected. The current range is set from 489 212 to 1 305 949. The "At Most" slider is highlighted with a blue selection bar, indicating it is the active filter type.

Slider Range: 489 212 to 1 305 949

Show: Only Relevant Values Include Null Values

Buttons: Reset, Apply, Cancel, OK

Dimensions:

- Category
- City
- Country
- Customer ID
- Customer Name
- Market
- Order Date
- Order ID
- Order Priority
- Postal Code
- Product ID
- Product Name
- Region
- Row ID
- Segment
- Ship Date
- Ship Mode
- State
- Sub-Category
- Measure Names

Measures:

- Discount
- Profit
- Quantity
- Sales
- Shipping Cost
- Latitude (generated)
- Longitude (generated)
- Number of Records
- Measure Values

Bottom Navigation:

- Data Source
- Sheet 1
- Sheet 2
- Sheet 2 (2)
- Sheet 4
- Standard
- Show Me

Bottom Status Bar:

- 5 marks
- 5 rows by 1 column
- SUM(Sales): 4,422,688

Lessons learned

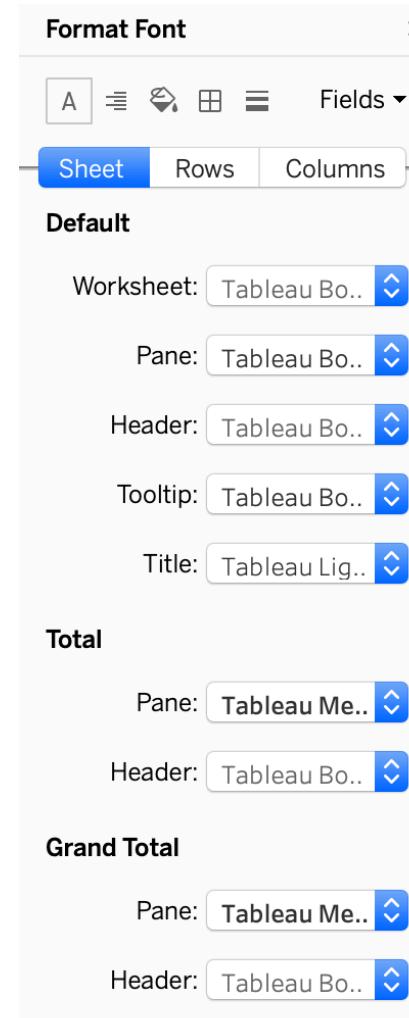
- Using filters on a sheet
 - Background filters
 - Interactive filter
- Presentation view
- Discrete and continuous filter types

Formatting options

Format panel

Formatting options:

- Font
- Alignment
- Shading
- Borders
- Lines



The **Format** panel will be visible on the left when select any mark on the chart with a right click and click on **Format** from the menu.

Next lesson

Create a dashboard

- common charts
- dashboard layout
- formatting a dashboard
- dashboard filters

Thank you