

# Tableau

## (Business Intelligence)

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By Eng. Mohammed Marwan Shahin

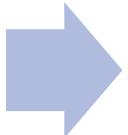


# Outlines

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## Day1 :

- Tableau Introduction/ installation
- Data import/Cleaning/ Relationship



## Day2:

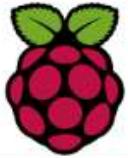
- Tableau desktop (visualization) overview
- Creating Charts
- Using Calculated Fields



## Day3:

- Creating dashboard / Story
- Tableau Online/ publishing/ permissions/ adding users/ Scheduled refresh/

# Training Outcome



## Operation Dashboard

Data Details Edit View: Original Watch Share

Text Table Worksheet Export to PDF

Quantity Spotlight: High, Low, mid range

Country: Australia, Canada, France, Germany, United Kingdom, United States

Return Quantity: 1,828

ScatterPlot: Product Cost vs Product Price

Product Price	Product Cost
500	500
1000	800
1500	1000
2000	1200
2500	1400
3000	1600
3500	1800

logical functions

Subcategory: Tires and Tubes, Bottles and Cages, Road Bikes, Helmets, Mountain Bikes, Gears

Subcategory	Order Quantity
Tires and Tubes	30K
Bottles and Cages	15K
Road Bikes	8K
Helmets	6K
Mountain Bikes	5K
Gears	4K

map



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Return Per Region

Region	Percentage
United States	35%
Australia	22%
Canada	13%
United Kingdom	11%
Germany	9%
France	10%

WIKIPEDIA The Free Encyclopedia

Main page Contents Current events Random article

United States

From Wikipedia, the free encyclopedia

Several terms redirect here. For other uses, see America (disambiguation), US (disambiguation), USA (disambiguation), The United States of America



# Data Visualization

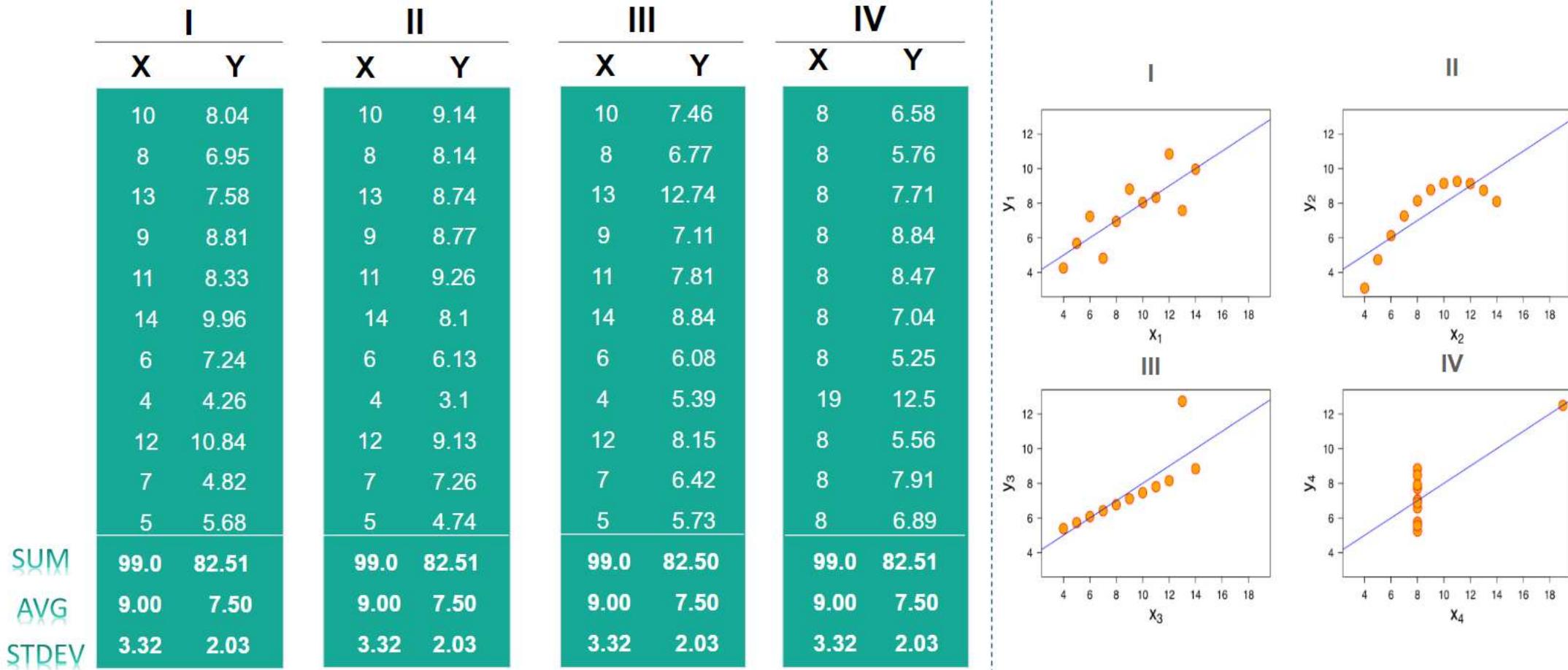
# Why Data Visualization ?

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- Visualization allows visual access to huge amounts of data in easily digestible visuals
- Well designed data graphics are usually the simplest and at the same time, the most powerful



# Power Of Data Visualization



# What Is Data Visualization?

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- Representation of data (*from one or many sources*) in a pictorial or graphical format
- Enables decision makers to observe analytics presented visually, in order to identify and understand the trends and patterns in data
- Data Visualization narrates a complete story that is easier to comprehend



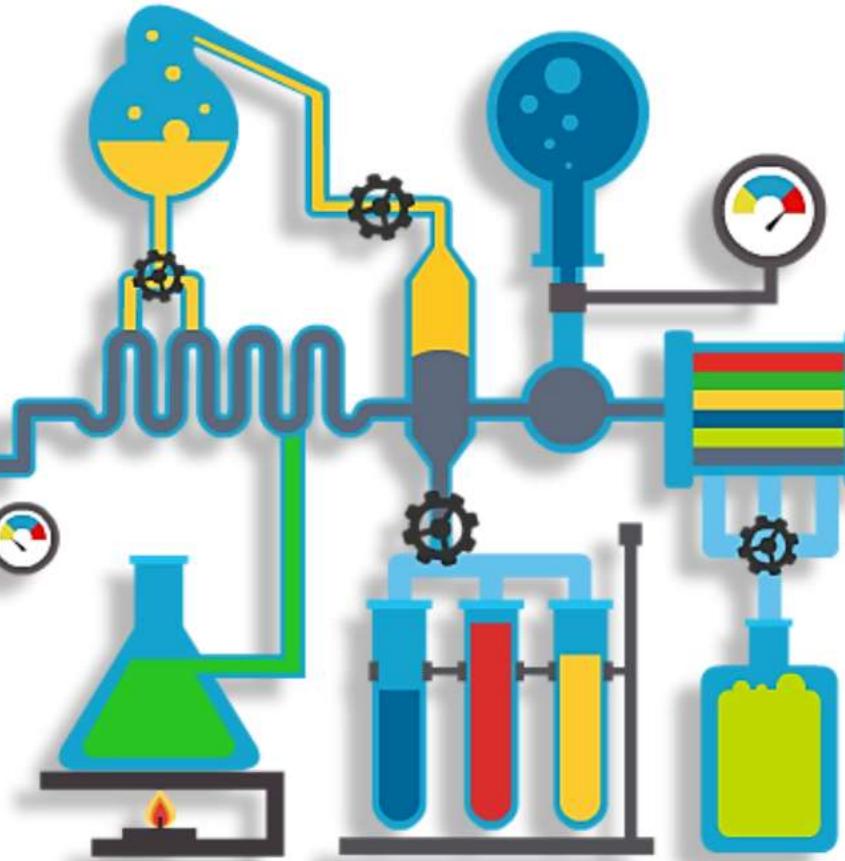
Relevant and recognizable visuals with proper scale narrating a complete story

# How To Achieve Data Visualization ?

Integrate Different Data Sets

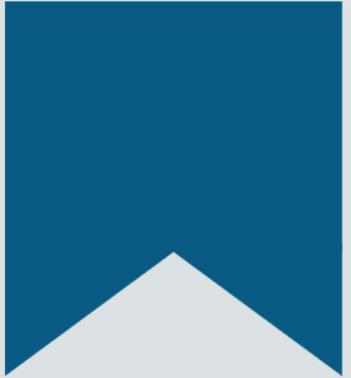


Analyze



Visualize



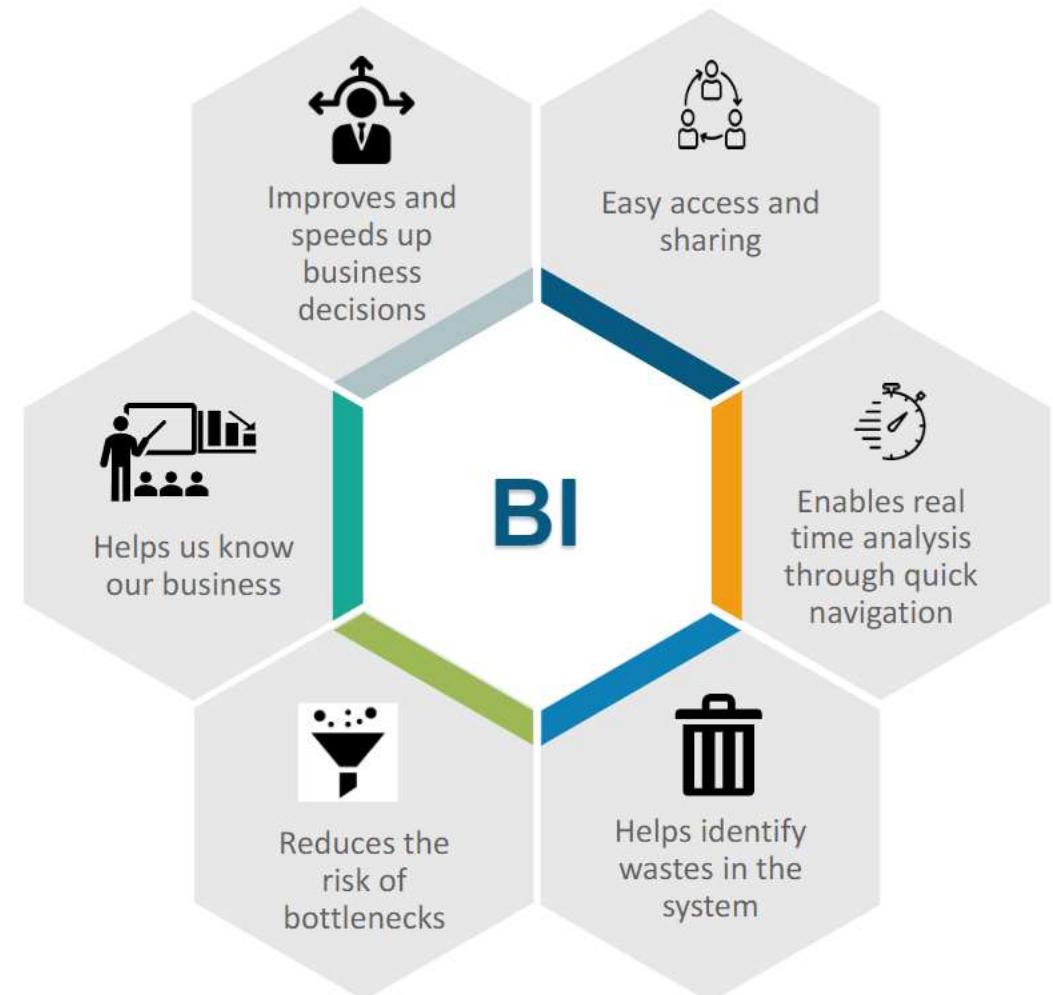


# Business Intelligence Tools

# Why Business Intelligence (BI)?

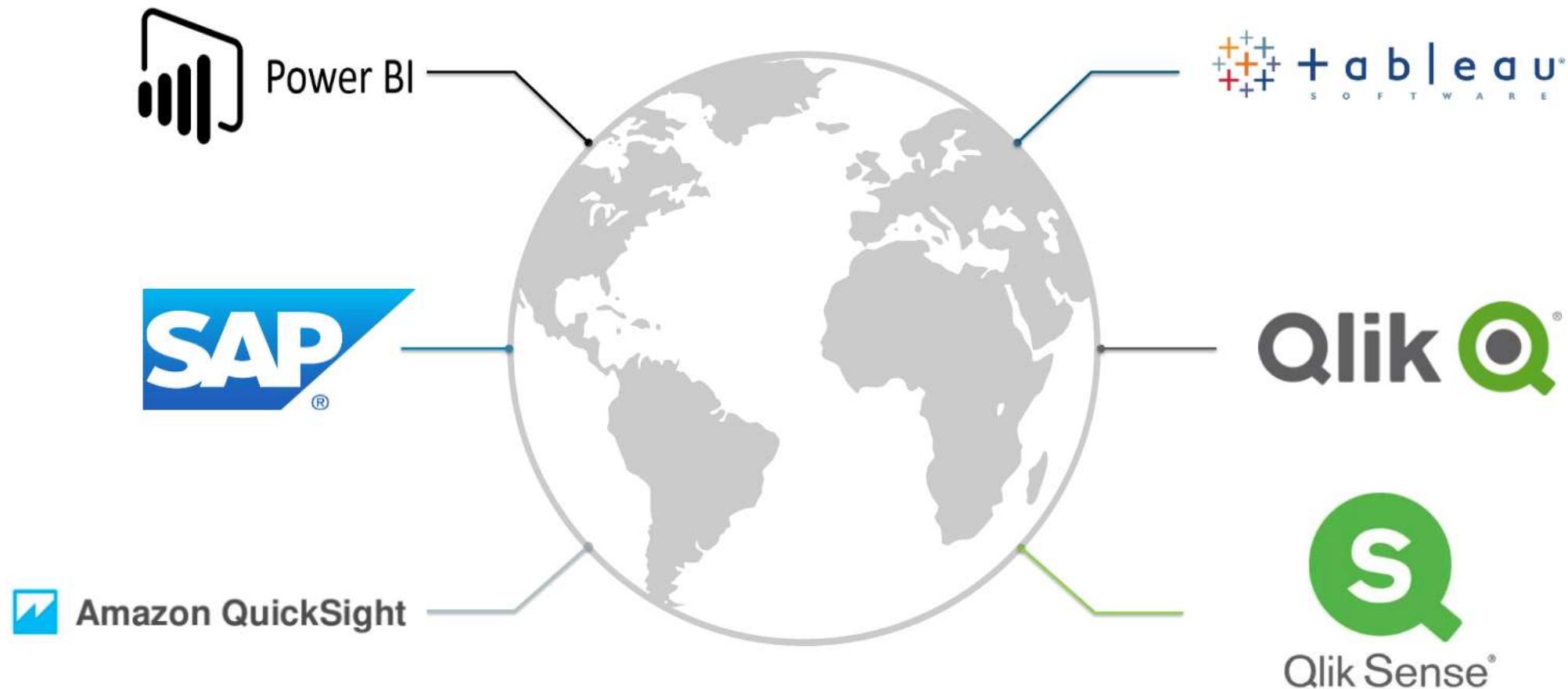
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- Transforms the business data into information or knowledge
- Delivers reliable and relevant information, thereby enabling users to take effective fact-based decisions



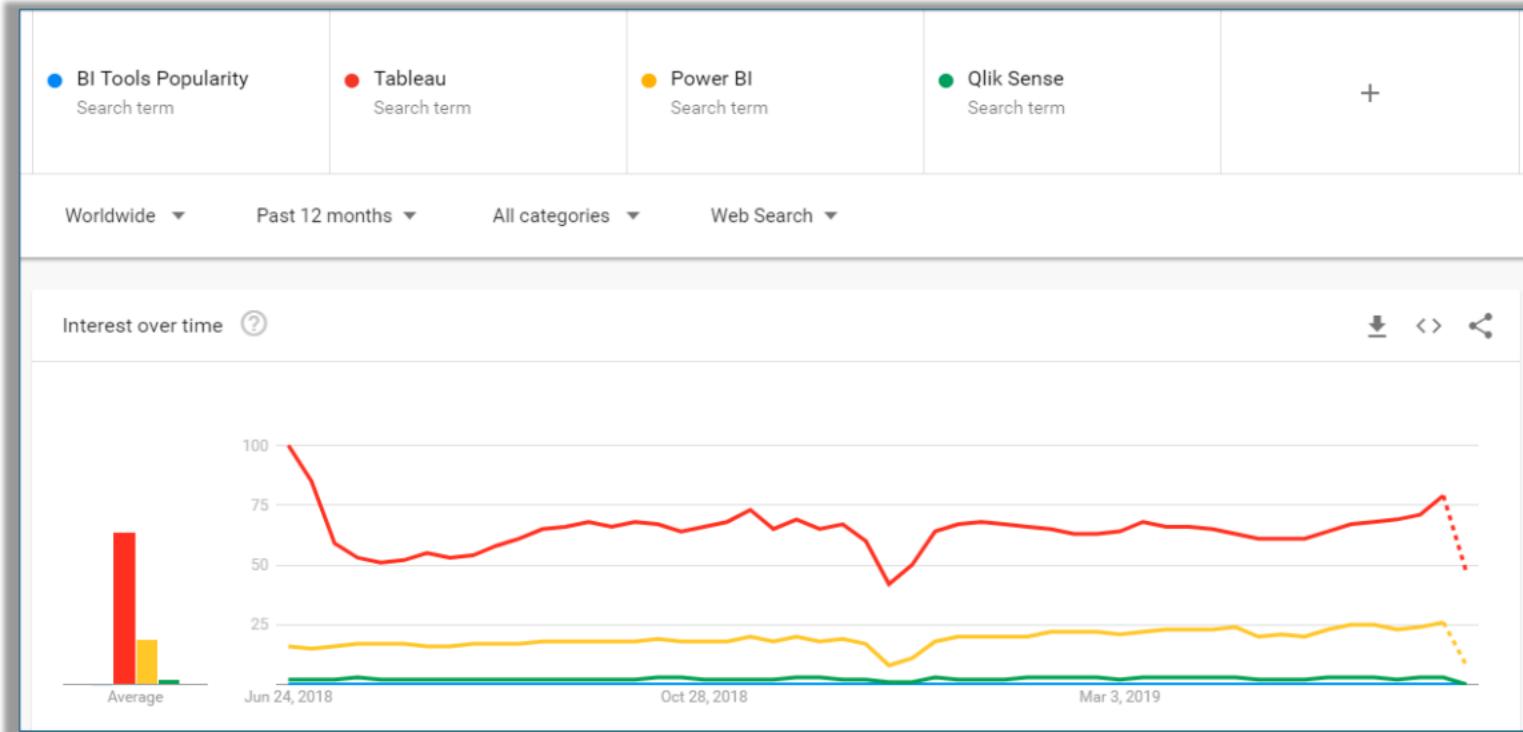
# Popular Business Intelligence (BI) Tools

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# Popularity: Tableau Vs Power BI Vs Qlik Sense

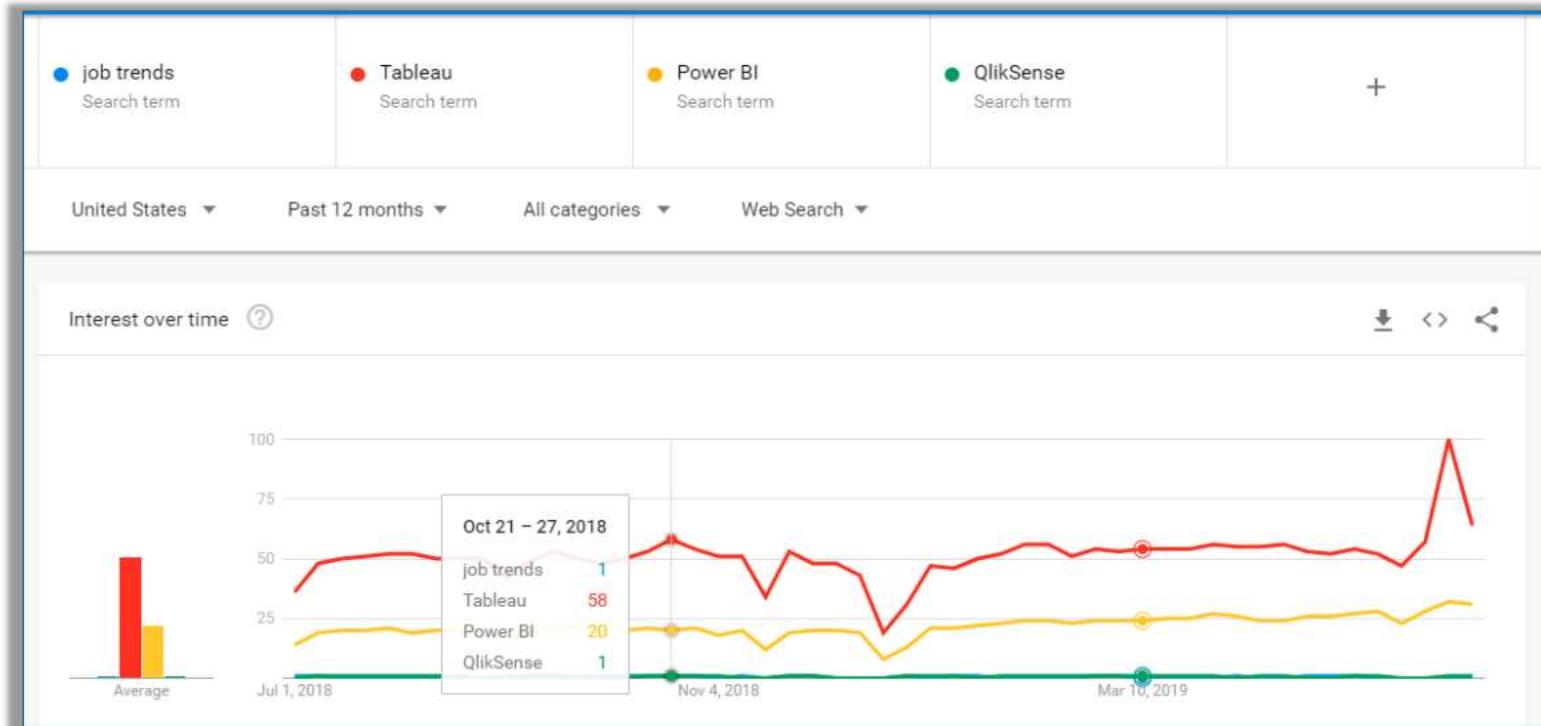
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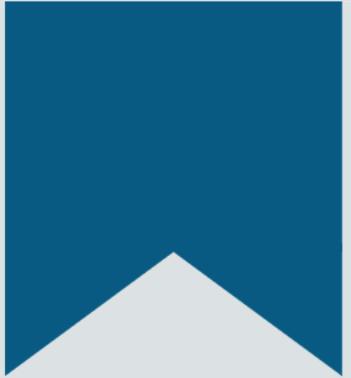
Google Trends: Tableau Vs Power BI Vs Qlik Sense

# Job Trends: Tableau Vs Power BI Vs Qlik Sense

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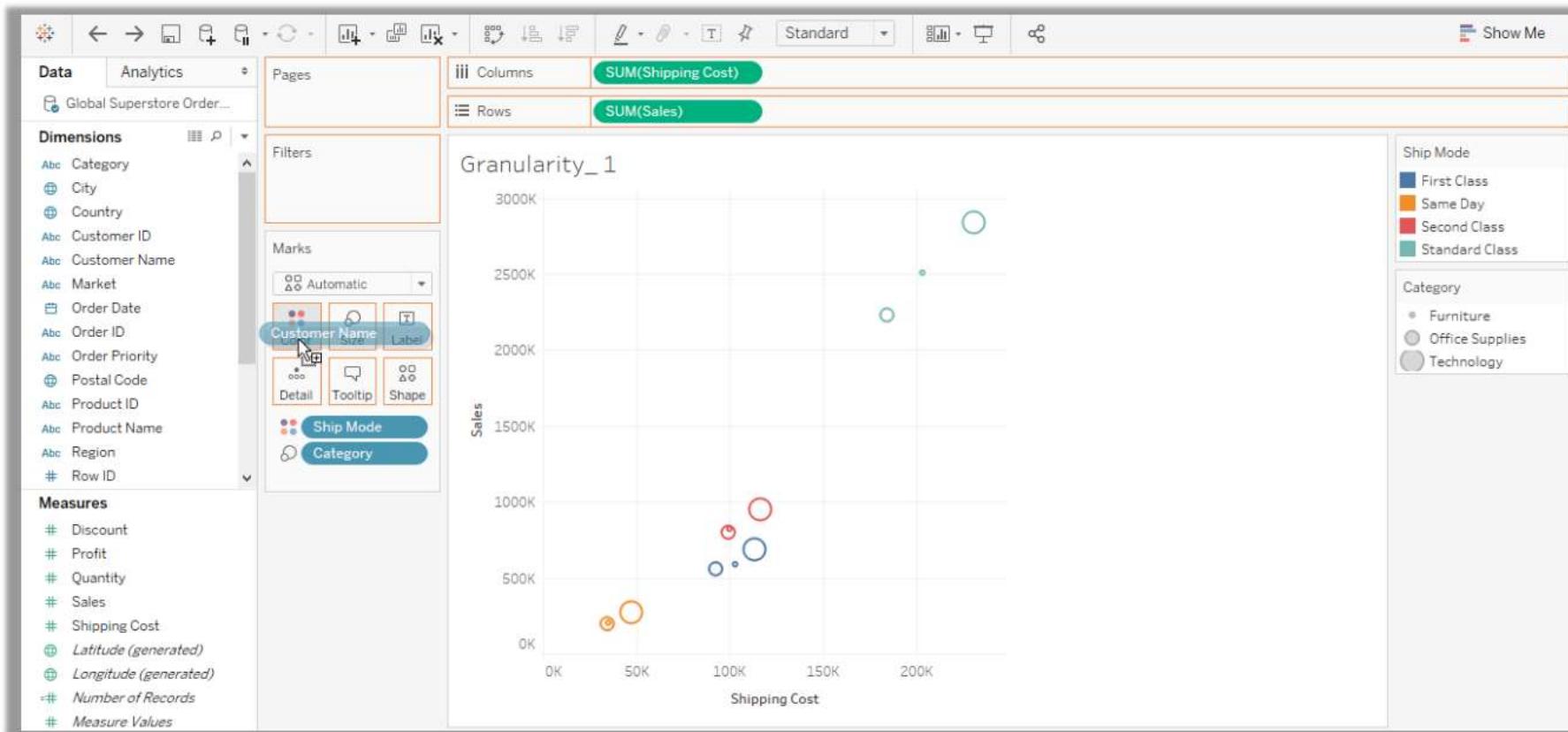
Google Trends: Tableau Vs Power BI Vs Qlik Sense



# Introduction To Tableau

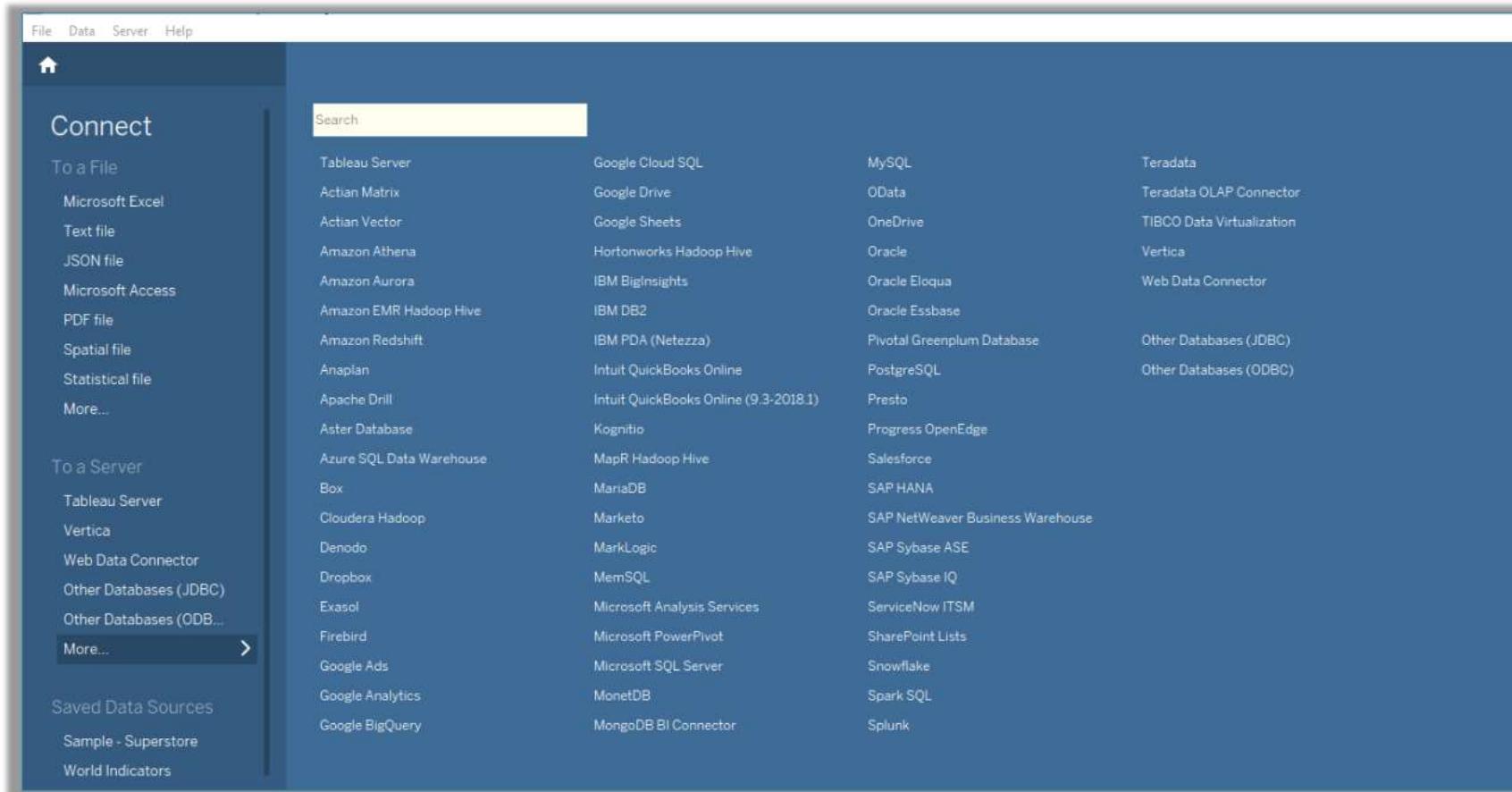
# Why Tableau?

- User Friendly - Create complex data visualization in an intuitive, drag and drop manner



# Why Tableau?

- Easily connects to different data sources, be it Databases, Spreadsheets, Cloud data or Big data



# Why Tableau?

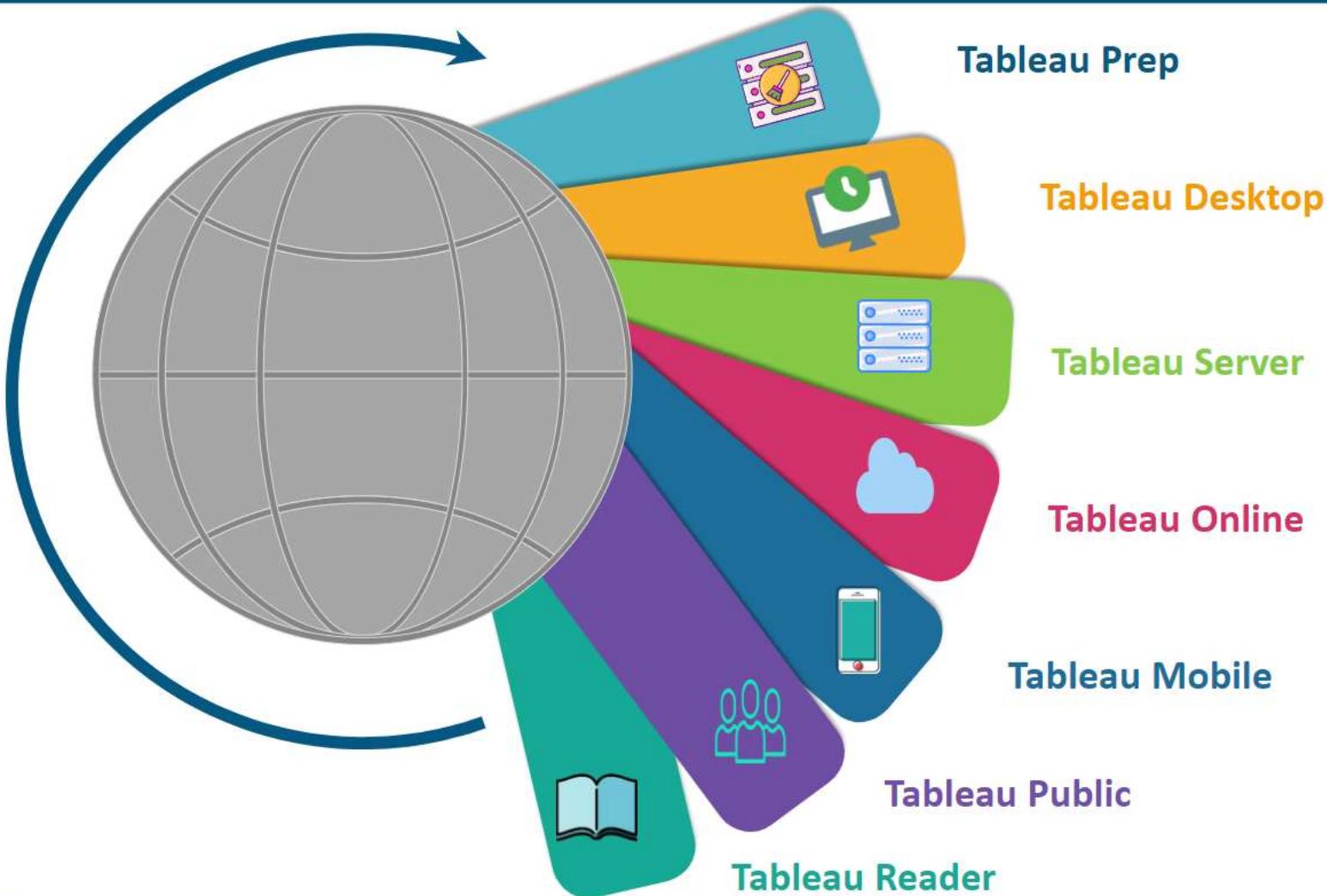
- Live Analysis - Allows to connect and perform analysis on live data

The screenshot shows the Tableau Data Source interface. On the left, the 'Connections' pane displays a single connection named 'global\_superstore\_2016' from 'Microsoft Excel'. Below it, the 'Sheets' pane lists 'Orders', 'People', 'Returns', and 'New Union'. A tooltip indicates that 'Data Interpreter might be able to clean your Microsoft Excel workbook.' The main area shows a preview of the 'Orders' sheet with columns: Row ID, Order ID, Order Date, Ship Date, Ship Mode, Customer ID, Customer Name, Segment, and Postal Co. The 'Ship Date' column is currently sorted in descending order. At the top right, there are tabs for 'Connection' (with 'Live' selected), 'Extract', and 'Filters'. A note says 'Connect directly to your data. The speed of your data source will determine performance.' The bottom right shows a row limit of 1,000 rows.

#	Abc Orders	Orders	Abc Orders	Abc Orders	Abc Orders	Abc Orders	Abc Orders	Abc Orders
Row ID	Order ID	Order Date	Ship Date	Ship Mode	Customer ID	Customer Name	Segment	Postal Co
40098	CA-2014-AB1001514...	11-11-2014	13-11-2014	First Class	AB-100151402	Aaron Bergman	Consumer	na
26341	IN-2014-JR162107-41...	05-02-2014	07-02-2014	Second Class	JR-162107	Justin Ritter	Corporate	na
25330	IN-2014-CR127307-4...	17-10-2014	18-10-2014	First Class	CR-127307	Craig Reiter	Consumer	na
13524	ES-2014-KM1637548...	28-01-2014	30-01-2014	First Class	KM-1637548	Katherine Murray	Home Office	na
47221	SG-2014-RH9495111...	05-11-2014	06-11-2014	Same Day	RH-9495111	Rick Hansen	Consumer	na
22732	IN-2014-JM156557-4...	28-06-2014	01-07-2014	Second Class	JM-156557	Jim Mitchum	Corporate	na
30570	IN-2012-TS2134092-4...	06-11-2012	08-11-2012	First Class	TS-2134092	Toby Swindell	Consumer	na
31192	IN-2013-MB1808592-...	14-04-2013	18-04-2013	Standard Class	MB-1808592	Mick Brown	Consumer	na

# Tableau Products

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# Tableau Products (Contd...)

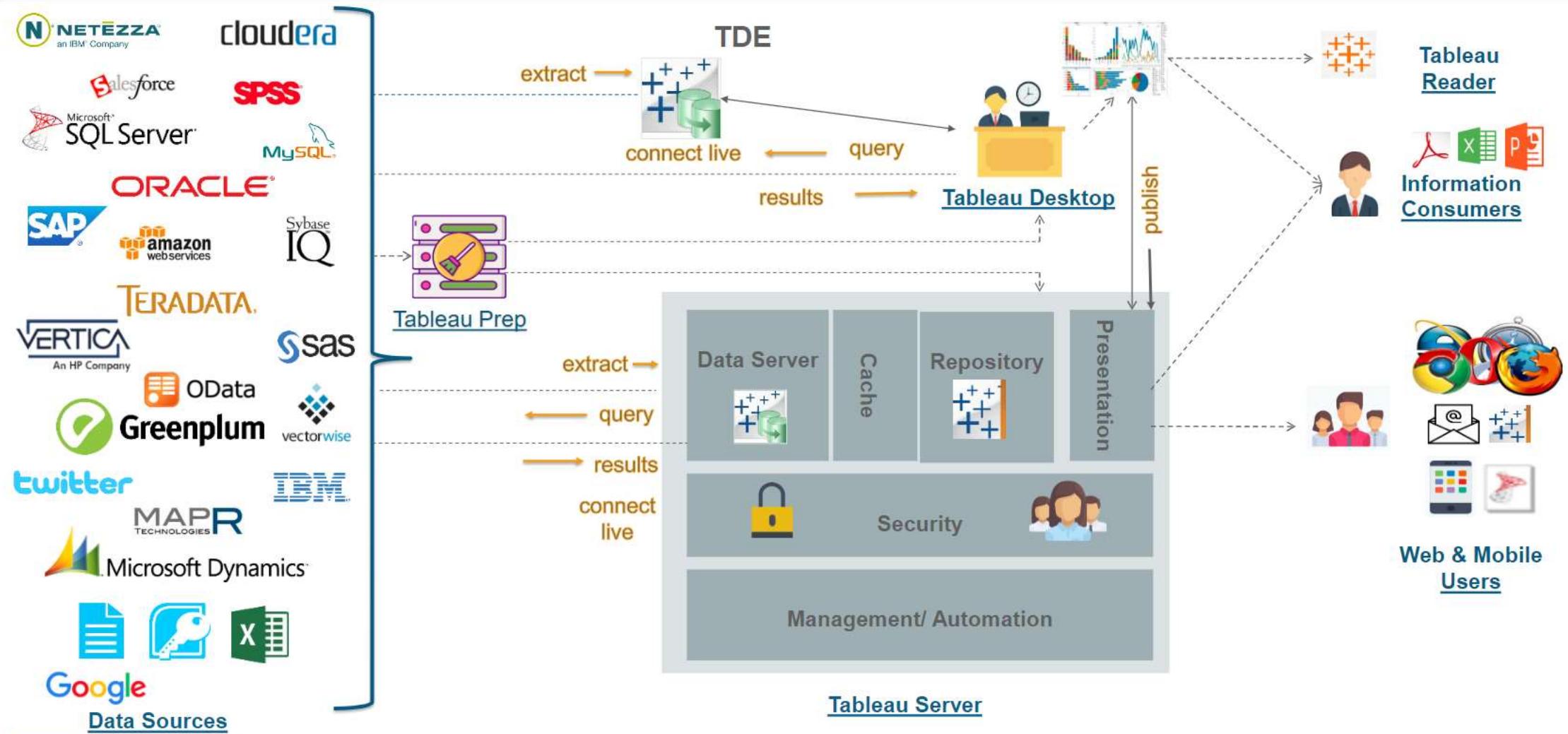
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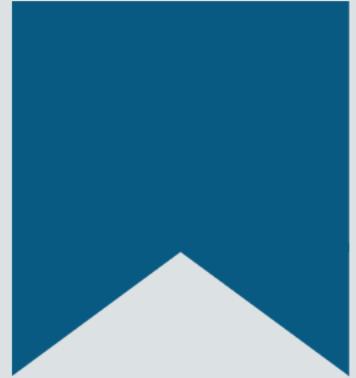
Tableau Products	Description
Tableau Prep	Data preparation tool that helps combine, shape and clean the data for analysis
Tableau Desktop	Authoring and publishing tool that is used to create shared views on Tableau Server
Tableau Server	Business Analytics platform wherein we publish, store and schedule automatic refreshes on the web
Tableau Online	Analytics platform fully hosted in cloud version of SaaS
Tableau Mobile	Tableau Mobile is a free app available on both Android and IOS environment. You can use it to explore and share views published to Tableau Server or Tableau Online
Tableau Public	Free product from Tableau, allowing visualization enthusiast to play with data with some restrictions
Tableau Reader	Free application that lets anyone view and interact with Tableau packaged workbooks



# Tableau Architecture

# Tableau Architecture





# Data Preparation Using Tableau Prep

# Why Tableau Prep?

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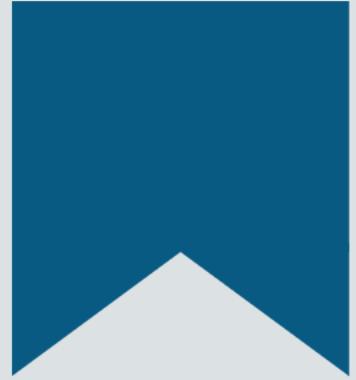


Prepares data at a faster pace for analysis

Helps transform and shape data

Visually combines, instantly reshapes and quickly cleans the data  
from multiple sources

Get faster insights into the data and make better business decisions



# Installation Guide: Tableau Prep Builder

**Step 1:** Follow this link <https://www.tableau.com/support/releases/prep/2019.2.2>

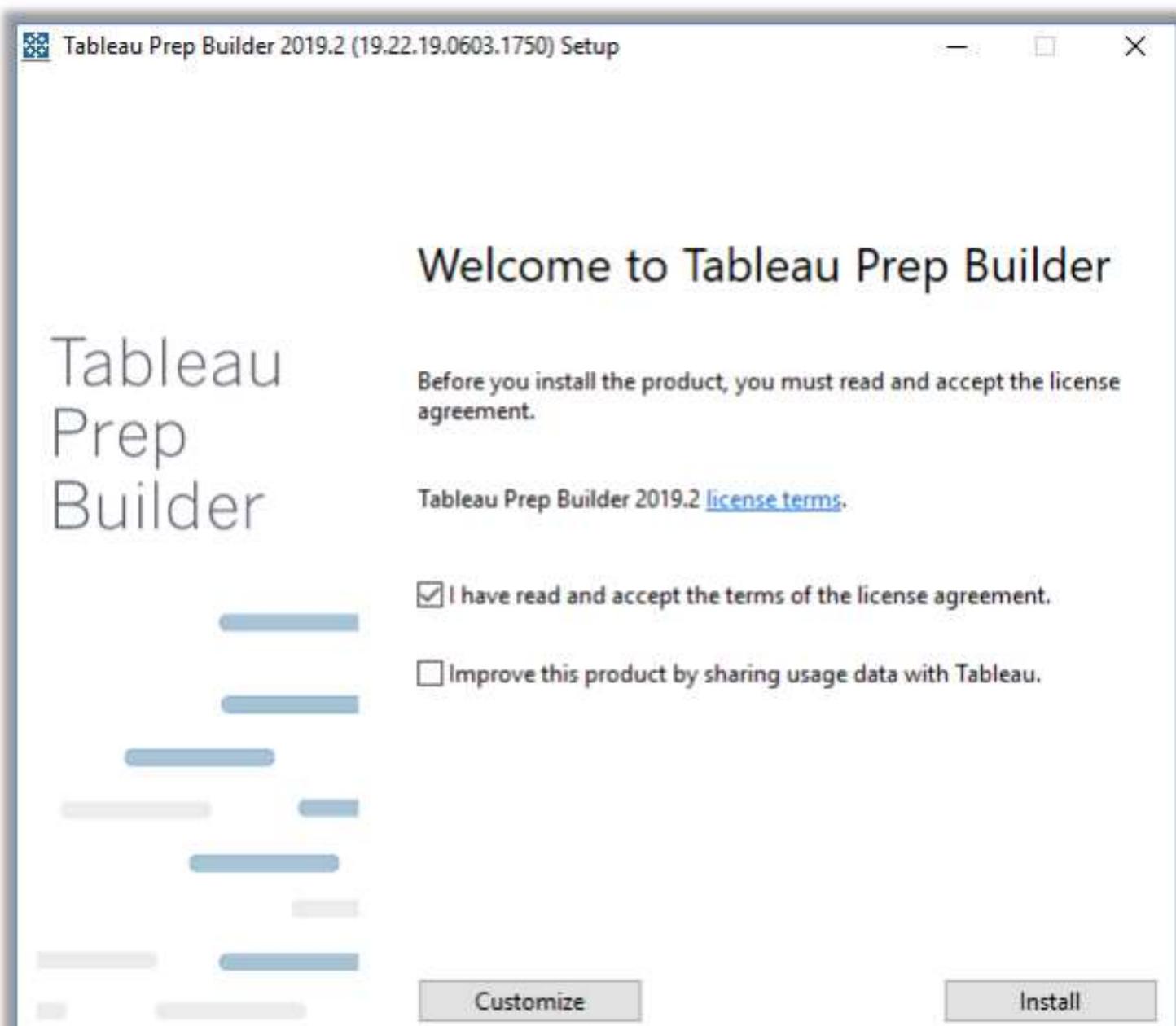
in order to install the Tableau Prep Builder 2019.2.

The screenshot shows the Tableau Prep Builder 2019.2.2 download page. At the top, it displays the title "Tableau Prep Builder 2019.2.2" and a prominent orange "DOWNLOAD PREP 2019.2.2" button. Below this, there are three sections: "Build number" (19.22.19.0603.1750), "Release date" (Tuesday, June 4, 2019), and "Product support" (with a "READ MORE" link). The main content area is titled "Download Files" and lists two options: "Windows" (TableauPrep-2019-2-2.exe, 665 MB) and "Mac" (TableauPrep-2019-2-2.dmg, 876 MB). The Windows link is currently selected, indicated by a green underline.

**Step 2:** Click on the “Save” button in order to save the .exe file.



**Step 3:** Select the acceptance checkbox and click on the “Install” button to begin with the installation process.



# Tableau Prep Builder

Tableau Prep Builder 2019.2  
(19.22.19.0603.1750)

Progress



Installing:

Tableau Prep Builder 2019.2 (19.22.19.0603.1750)



Cancel

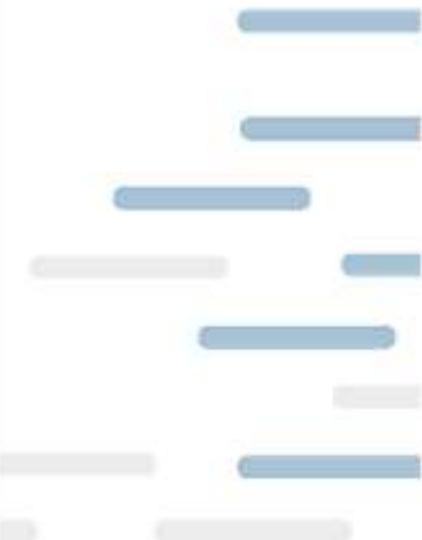


Tableau Prep Builder 2019.2 (19.22.19.0603.1750) Setup

Tableau  
Prep  
Builder

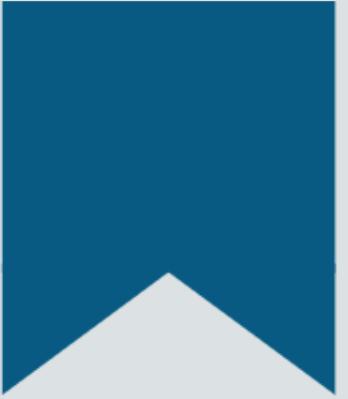
Tableau Prep Builder 2019.2  
(19.22.19.0603.1750)

Setup Successful



Restart

Close



# Features Of Tableau Desktop

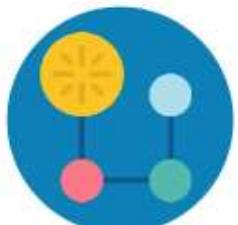
# Features Of Tableau Desktop

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1

Great  
Visualization



2

Faster Insights



3

Connect to more  
Data



4

Answer deeper  
Questions



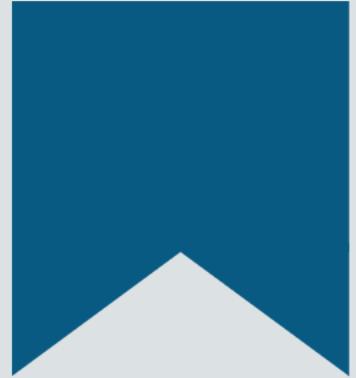
5

Put your data  
on Map



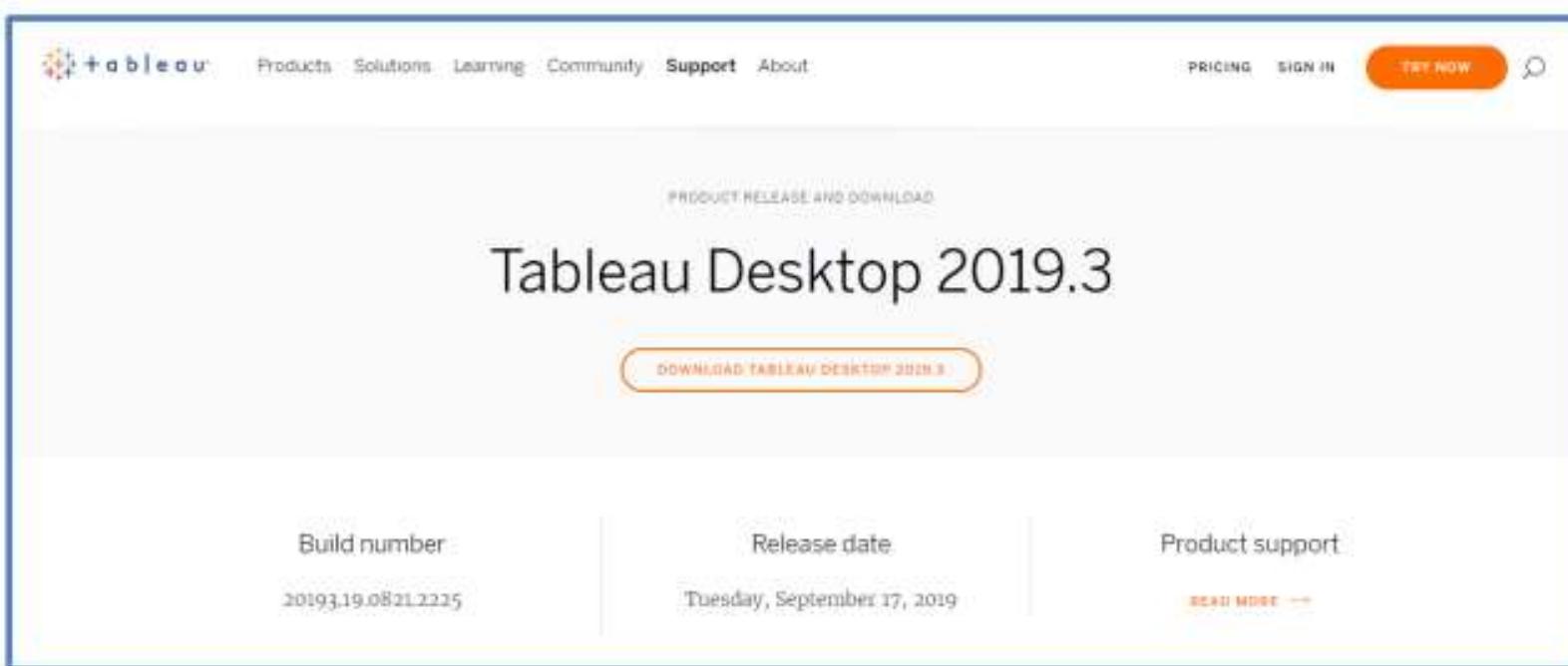
6

Share and collaborate  
securely



# Installation Guide: Tableau Desktop

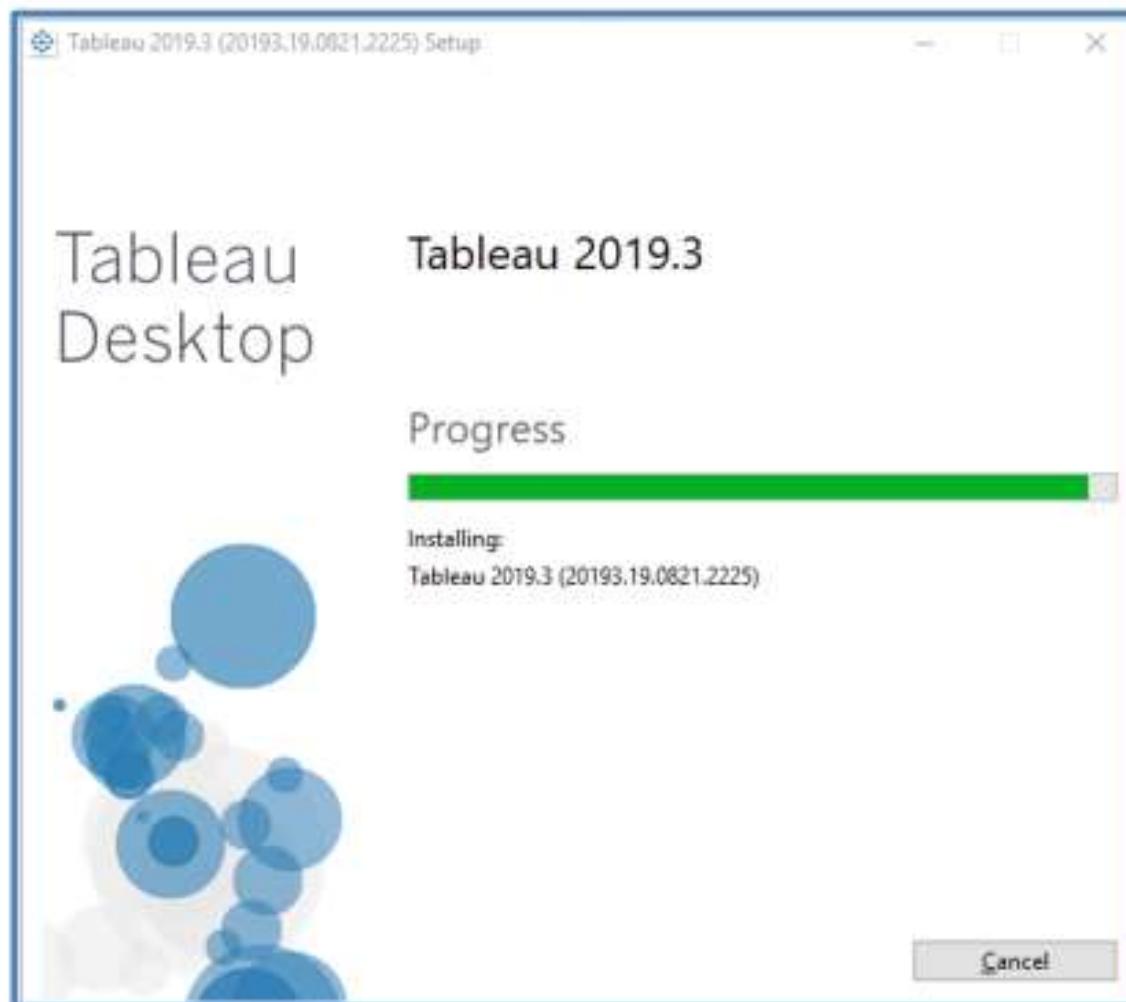
**Step 1:** Follow this link <https://www.tableau.com/support/releases/desktop/2019.3> in order to install Tableau Desktop.



**Step 2:** Click on the downloaded Tableau Desktop setup icon, check the acceptance box and click on the "Install" button to begin with the installation process.



## Module 2- Data Connect With Tableau Desktop

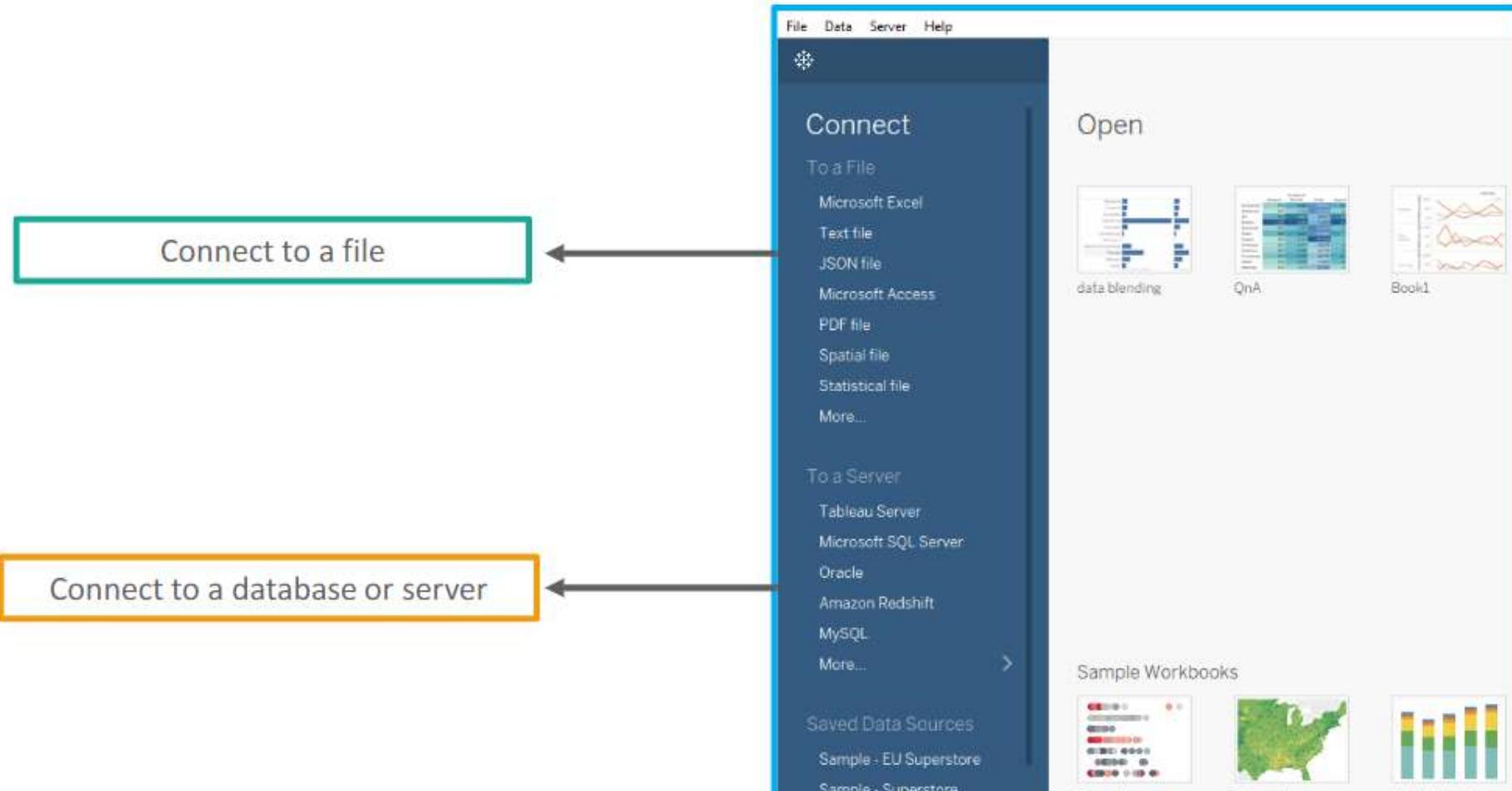


**Step 3:** Once the installation is done, click on the Tableau icon present on your desktop to start using Tableau Desktop.



# Data Connection

# Connect To Data From File, Server Or Database

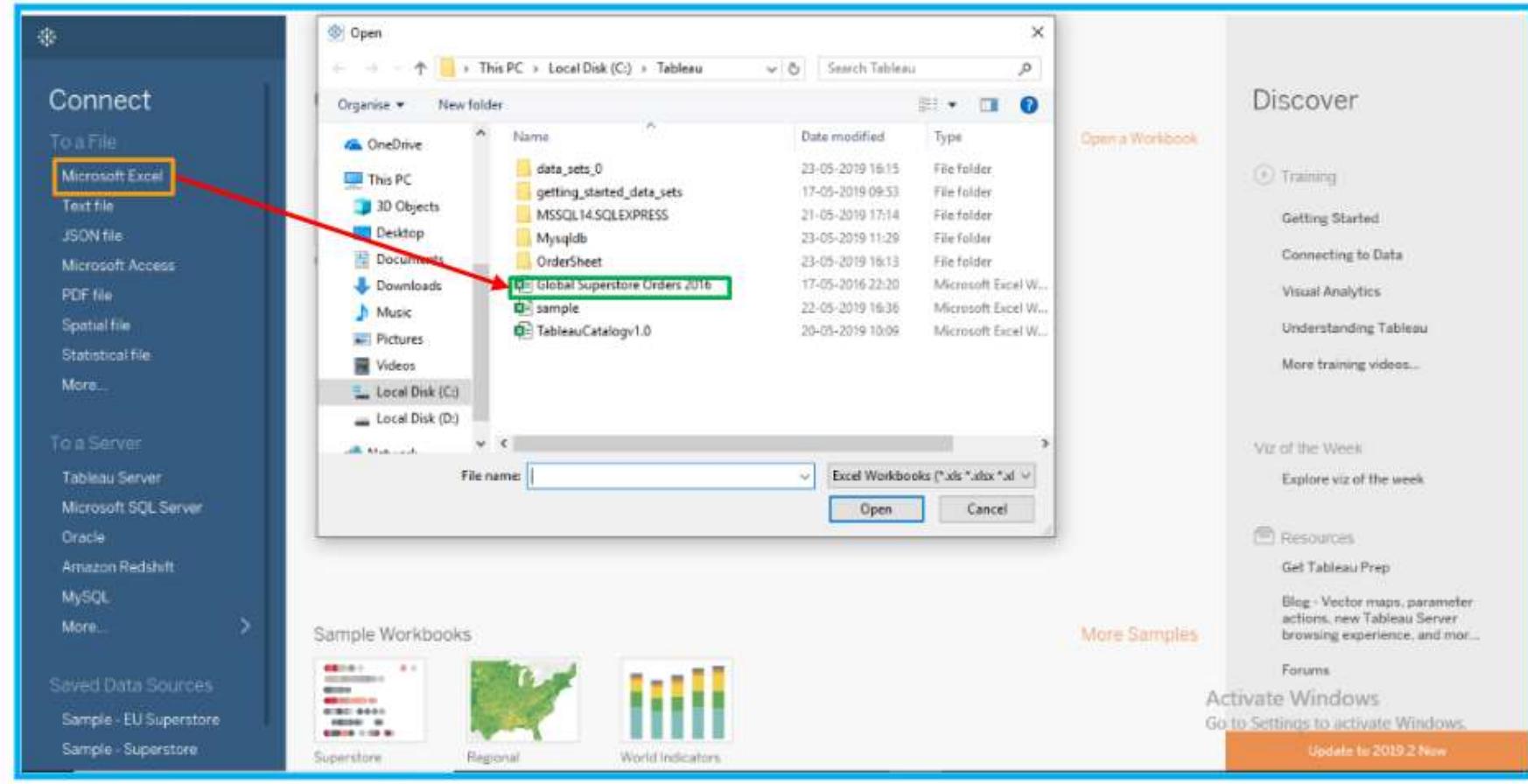


## Connect with Files

### 1 Connect with Files

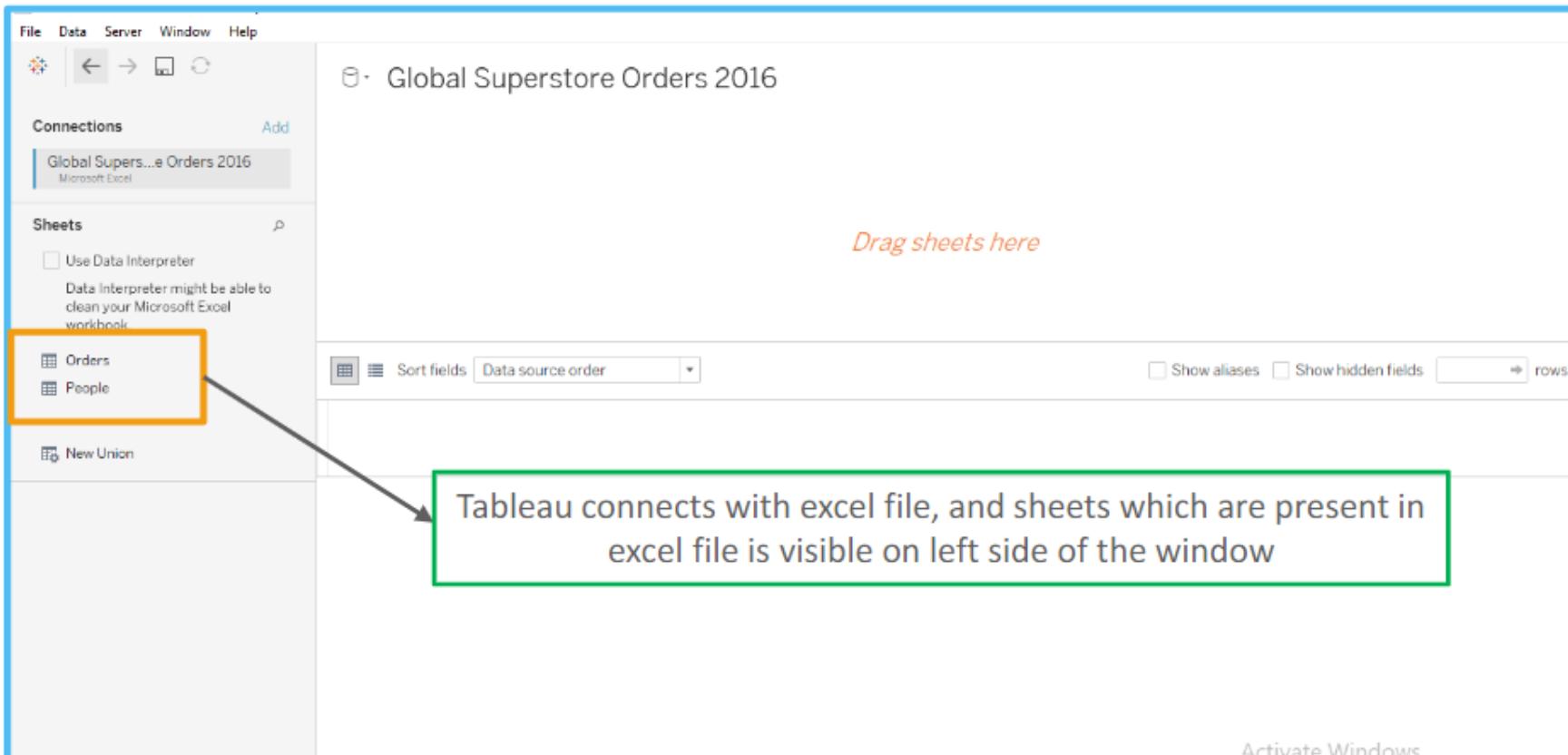
### 2 Connect with server or database

- Click on “Microsoft Excel”
- Select the dataset and click on “Open”



# Connect To A File

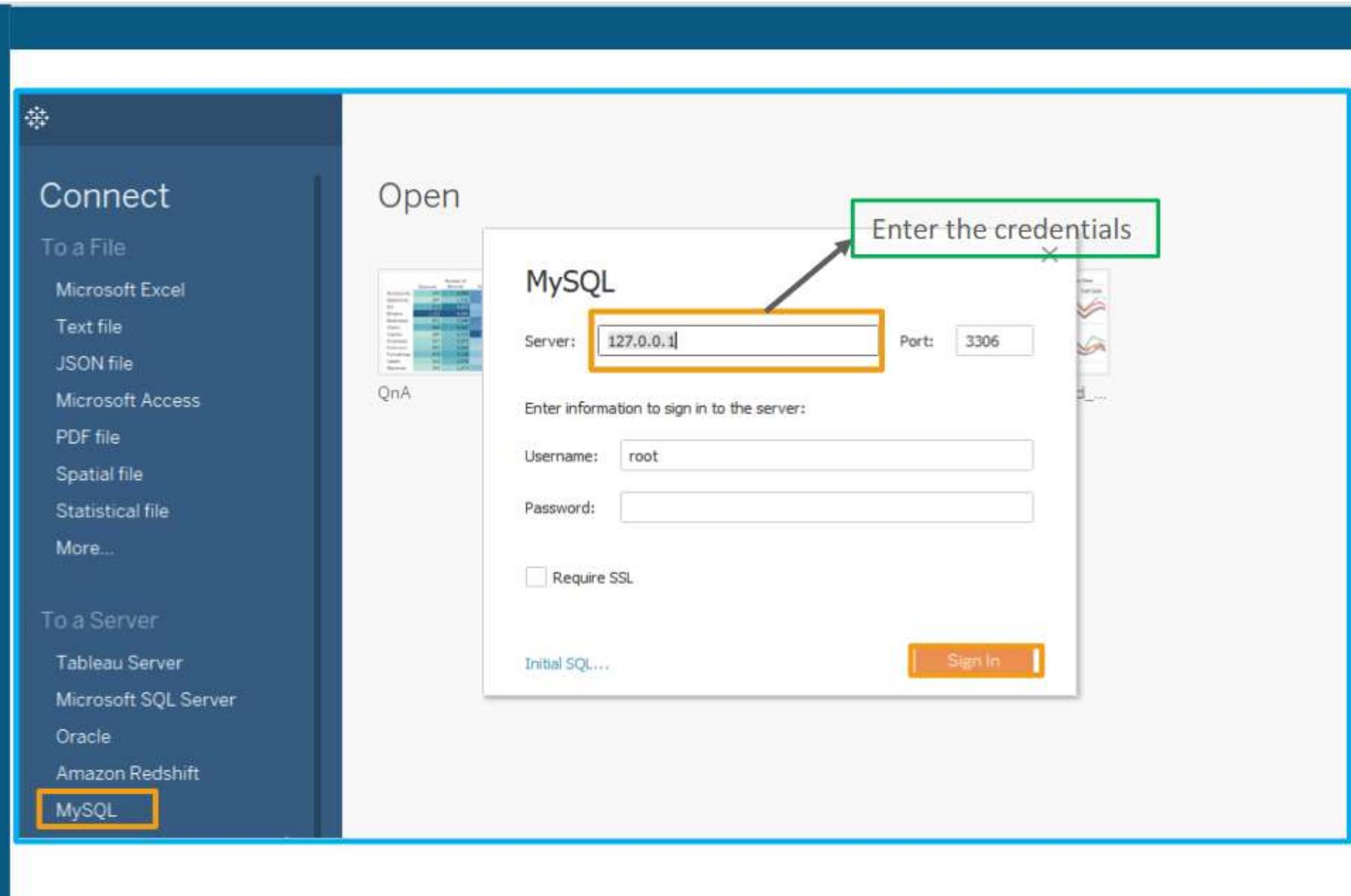
Tableau connects with excel file and sheets present in excel file is visible on left side of the window.



## Connect to a database or server

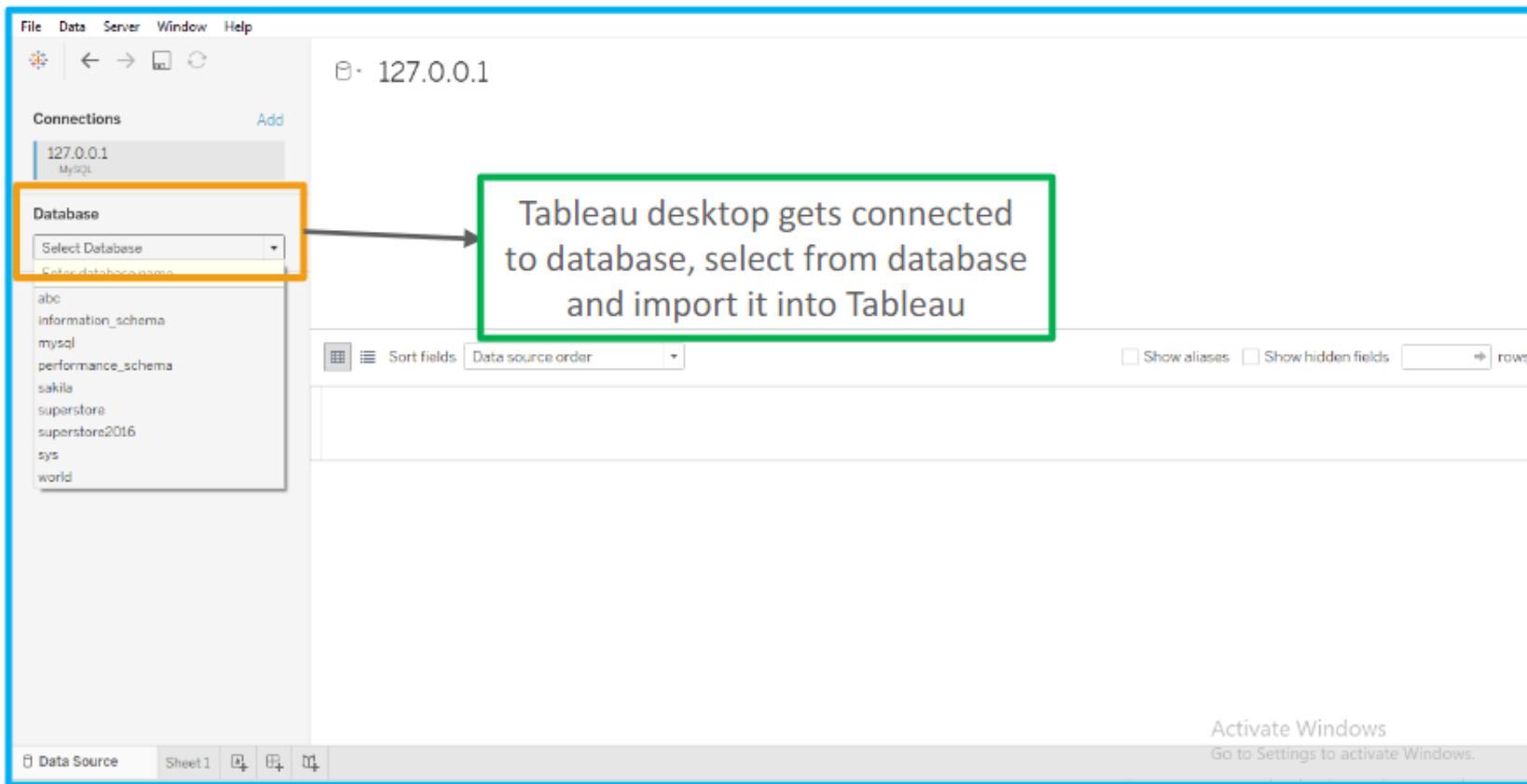
1 Connect to Files

2 Connect to a database or server



# Connect To A Database Or Server

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# Connect To A Database Or Server

The screenshot shows the Power BI Data Source view. At the top, there's a navigation bar with File, Data, Server, Window, and Help. Below it is a toolbar with icons for back, forward, refresh, and search. The main area has a title 'ordersheet (superstore2016)' and a status bar indicating 'Connection Live' and 'Extract' options. On the left, there's a sidebar with 'Connections' (showing '127.0.0.1 MySQL') and 'Database' (with a dropdown menu set to 'superstore2016', which is highlighted with an orange box). Below that are 'Table' (listing 'ordersheet'), 'New Custom SQL', and 'New Union'. The main workspace displays a table with columns: Row ID, Order ID, Order Date, Ship Date, Ship Mode, Customer ID, Customer Name, Segment, and Postal Code. The first few rows of data are visible. A callout box with a green border and black arrow points from the text 'All the data from selected database reflects on you workbook' to the 'superstore2016' dropdown in the sidebar. The bottom of the screen shows a ribbon with tabs for Data Source, Sheet 1, and other options, along with a watermark for 'Activate Windows'.

All the data from selected database reflects on you workbook

Row ID	Order ID	Order Date	Ship Date	Ship Mode	Customer ID	Customer Name	Segment	Postal Code
40098	CA-2014-AB1001514...	2014-11-11	2014-11-13	null	AB-100151402	Aaron Bergman	Consumer	73120
26341	IN-2014-JR162107-41...	2014-02-05	2014-02-07	null	JR-162107	Justin Ritter	Corporate	
25330	IN-2014-CR127307-4...	2014-10-17	2014-10-18	null	CR-127307	Craig Reiter	Consumer	
13524	ES-2014-KM1637548-	2014-01-28	2014-01-30	null	KM-1637548	Katherine Murray	Home Office	
47221	SG-2014-RH9495111...	2014-11-05	2014-11-06	null	RH-9495111	Rick Hansen	Consumer	
22732	IN-2014-JM156557-4...	2014-06-28	2014-07-01	null	JM-156557	Jim Mitchum	Corporate	
30570	IN-2012-TS2134092-4...	2012-11-06	2012-11-08	null	TS-2134092	Toby Swindell	Consumer	
21197	IN-2012-MB180693	2012-04-14	2012-04-19	null	MB-180693	Mitch Brin		

# Connect To A Database Or Server

The screenshot shows the Power BI desktop application interface. At the top, there's a menu bar with File, Data, Server, Window, and Help. Below the menu is a toolbar with icons for back, forward, refresh, and search. The main area is titled "ordersheet (superstore2016)". On the left, there's a sidebar with sections for Connections (showing 127.0.0.1 MySQL), Database (with a dropdown set to "superstore2016" which is highlighted with an orange box and has an arrow pointing to it from a callout box), Table (listing "ordersheet"), and New Custom SQL/New Union. The main workspace displays a table with columns: Row ID, Order ID, Order Date, Ship Date, Ship Mode, Customer ID, Customer Name, Segment, and Postal Code. The first few rows of data are visible. At the bottom, there are tabs for Data Source (disabled) and Sheet 1 (selected), along with other ribbon-style buttons. A callout box with a green border contains the text "All the data from selected database reflects on you workbook". A watermark at the bottom right says "Activate Windows" and "Go to Settings to activate Windows".

Row ID	Order ID	Order Date	Ship Date	Ship Mode	Customer ID	Customer Name	Segment	Postal Code
40098	CA-2014-AB1001514...	2014-11-11	2014-11-13	null	AB-100151402	Aaron Bergman	Consumer	73120
26341	IN-2014-JR162107-41...	2014-02-05	2014-02-07	null	JR-162107	Justin Ritter	Corporate	
25330	IN-2014-CR127307-4...	2014-10-17	2014-10-18	null	CR-127307	Craig Reiter	Consumer	
13524	ES-2014-KM1637548-	2014-01-28	2014-01-30	null	KM-1637548	Katherine Murray	Home Office	
47221	SG-2014-RH9495111...	2014-11-05	2014-11-06	null	RH-9495111	Rick Hansen	Consumer	
22732	IN-2014-JM156557-4...	2014-06-28	2014-07-01	null	JM-156557	Jim Mitchum	Corporate	
30570	IN-2012-TS2134092-4...	2012-11-06	2012-11-08	null	TS-2134092	Toby Swindell	Consumer	

# Exercise

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- **Import Excel file (Excel.xlsx)**
  - Note that all sheets in excel file were imported in Tableau
- **Import Customer.csv**
  - Note that all other csv files in the same folder were imported in tableau

# Text file Properties

You can change the delimiters of the csv files → (right click) on the table

A screenshot of a data editor interface. On the left, there's a sidebar with 'Connections' (AdventureWorks\_Customers selected), 'Files' (checkbox for 'Use Data Interpreter'), and a list of CSV files. The main area shows a table with columns: Customer Key, Prefix, First Name, Last Name. A context menu is open over the table, with the 'Data source' option highlighted. Other options in the menu include 'Open...', 'Rename', 'Remove', 'Field names are in first row' (which is checked), 'Generate field names automatically', 'Text File Properties...', and 'Convert to Union...'. The 'Text File Properties...' option is highlighted in green.

A screenshot of the 'Text File Properties...' dialog box for the 'AdventureWorks\_Customers' connection. It shows settings for the currently selected file 'AdventureWorks\_Customers.csv': 'Field separator' is set to 'Comma', 'Text qualifier' is 'Automatic', 'Character set' is 'W. European ANSI', and 'Locale' is 'English (United States)'. Below the dialog, a preview of the table data is shown with columns: Customer Key, Prefix, First Name, Last Name. The data rows are identical to the ones in the main editor: 11000, MR., JON, YANG; 11001, MR., EUGENE, HUANG; 11002, MR., RUBEN, TORRES; 11003, MS., CHRISTY, ZHU; 11004, MRS., ELIZABETH, JOHNSON; 11005, MR., JULIO, RUIZ; 11007, MR., MARCO, MEHTA; 11008, MRS., ROBIN, VERHOFF.

# Data types

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You can check the datatype of each column at the header area.

#	Abc	Abc	Abc	Abc	白	Abc	Abc	Abc	#
AdventureWorks_Custo...	AdventureWorks_...	AdventureWorks_Custo...	AdventureWorks_Custo...	AdventureWorks_Custo...	AdventureWorks_Custo...	AdventureWorks_Customers...	AdventureWorks_C...	AdventureWorks_Customers.c...	AdventureWorks_C...
Customer Key	Prefix	First Name	Last Name	Birth Date	Marital Status	Gender	Email Address		Annual Incom
11000	MR.	JON	YANG	4/8/1966	M	M	jon24@adventure-wo...		
11001	MR.	EUGENE	HUANG	5/14/1965	S	M	eugene10@adventur...		
11002	MR.	RUBEN	TORRES	8/12/1965	M	M	ruben35@adventure-...		
11003	MS.	CHRISTY	ZHU	2/15/1968	S	F	christy12@adventure...		
11004	MRS.	ELIZABETH	JOHNSON	8/8/1968	S	F	elizabeth5@adventur...		
11005	MR.	JULIO	RUIZ	8/5/1965	S	M	julio1@adventure-wo...		
11007	MR.	MARCO	MEHTA	5/9/1964	M	M	marco14@adventure-...		
11008	MRS.	ROBIN	VERHOFF	7/7/1964	S	F	rob4@adventure-wor...		



# Types Of Connection

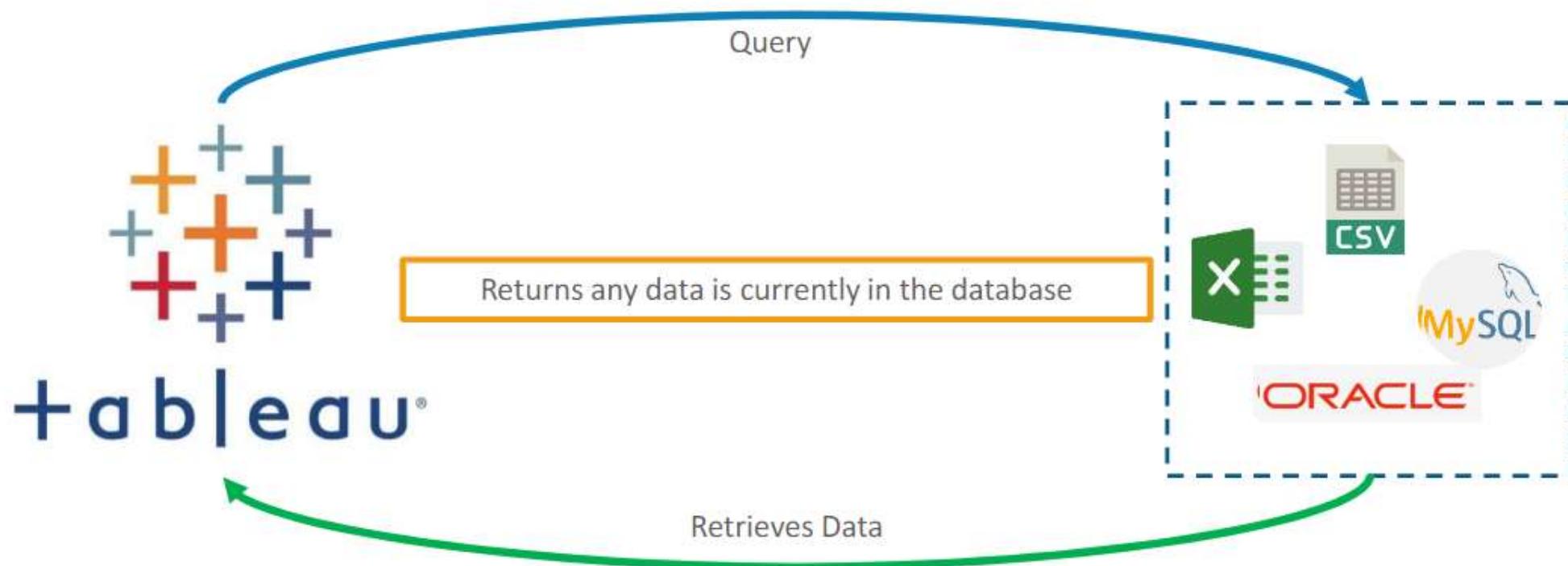
# Types Of Connections

The screenshot shows the Microsoft Power BI Data Source view. At the top, there's a navigation bar with File, Data, Server, Window, and Help. Below it is a toolbar with icons for Refresh, Save, and other operations. On the left, there's a 'Connections' section with a 'Global Superstore Orders 2016' entry selected, and a 'Sheets' section with 'Orders' and 'People' listed. A note about 'Use Data Interpreter' is present. In the center, the title 'Orders+ (Global Superstore Orders 2016)' is displayed above a diagram showing a relationship between 'Orders' and 'People'. To the right, there are buttons for 'Connection' (with 'Live' selected) and 'Filters' (with 0 selected). The main area shows a preview of the data with columns: Row ID, Order ID, Order Date, Ship Date, Ship Mode, Customer ID, Customer Name, Segment, and Postal Code. The data includes rows for various orders with details like 'First Class' shipping and consumer/Corporate segments. At the bottom, there are tabs for 'Data Source' (selected), 'Sheet 1', and 'M1', along with activation and settings information.

#	Order ID	Order Date	Ship Date	Ship Mode	Customer ID	Customer Name	Segment	Postal Code
40098	CA-2014-AB1001514...	11-11-2014	13-11-2014	First Class	AB-100151402	Aaron Bergman	Consumer	nu.
26341	IN-2014-JR162107-41...	05-02-2014	07-02-2014	Second Class	JR-162107	Justin Ritter	Corporate	nu.
25330	IN-2014-CR127307-4...	17-10-2014	18-10-2014	First Class	CR-127307	Craig Reiter	Consumer	nu.
13524	ES-2014-KM1637548-...	28-01-2014	30-01-2014	First Class	KM-1637548	Katherine Murray	Home Office	nu.
47221	SG-2014-RH9495111-...	05-11-2014	06-11-2014	Same Day	RH-9495111	Rick Hansen	Consumer	nu.
22732	IN-2014-JM156557-4...	28-06-2014	01-07-2014	Second Class	JM-156557	Jim Mitchum	Corporate	nu.
30570	IN-2012-TS2134092-4...	06-11-2012	08-11-2012	First Class	TS-2134092	Toby Swindell	Consumer	nu.
31192	IN-2013-MB1808592-...	14-04-2013	18-04-2013	Standard Class	MB-1808592	Mick Brown	Consumer	nu.

# What Is Live Connection?

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Live Connection is very helpful in updating high volume of data in real time

# Live Connection: Real Time Update

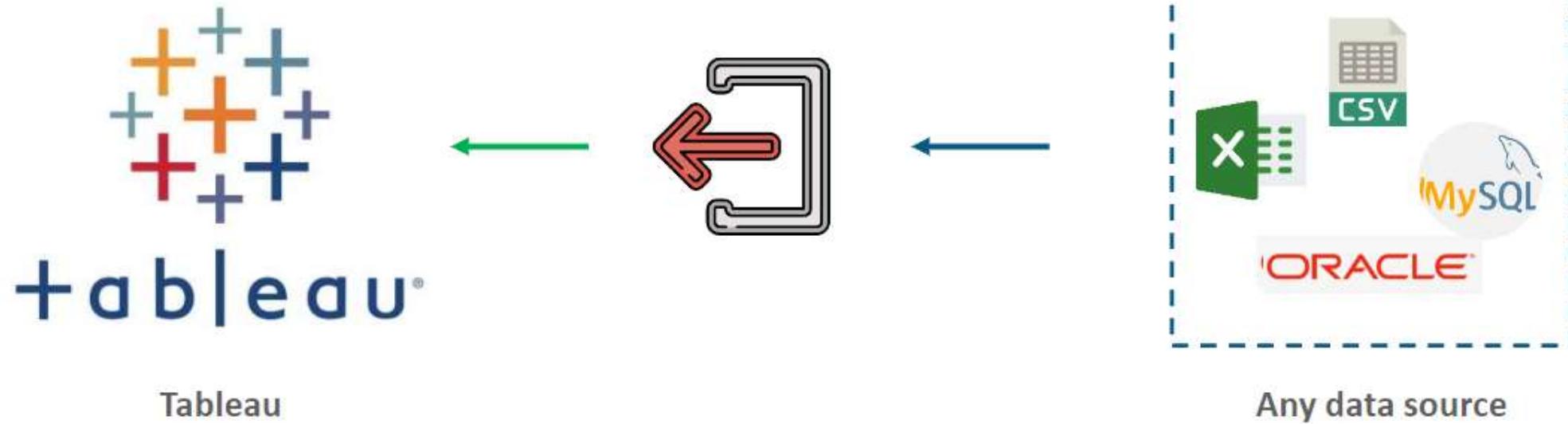
The screenshot shows the Microsoft Power BI Data Editor interface. At the top, there's a ribbon with File, Data, Server, Window, and Help. Below the ribbon, a toolbar includes icons for back, forward, search, and refresh. The main area displays a connection named "Orders+ (Global Superstore Orders 2016)". On the left, a sidebar shows "Connections" with "Global Superstore Orders 2016" selected, and "Sheets" with "Orders" and "People" listed. A note about "Data Interpreter" is present. In the center, a diagram shows two tables connected by a line: "Orders" and "People". To the right of the diagram, there are "Connection" and "Extract" buttons, with "Live" being the selected option (indicated by a red box). A green box highlights a note: "Real Time Update: Any changes in the data source gets automatically reflected". At the bottom, a table preview shows columns for Order ID, Order Date, Ship Date, Ship Mode, Customer ID, Customer Name, Segment, and Postal Code, with several rows of sample data. The bottom navigation bar includes "Data Source", "Sheet 1", and other standard Excel-like buttons.

Real Time Update: Any changes in the data source gets automatically reflected

#	Order ID	Order Date	Ship Date	Ship Mode	Customer ID	Customer Name	Segment	Postal Code
40098	CA-2014-AB1001514...	11-11-2014	13-11-2014	First Class	AB-100151402	Aaron Bergman	Consumer	nu
26341	IN-2014-JR162107-41...	05-02-2014	07-02-2014	Second Class	JR-162107	Justin Ritter	Corporate	nu
25330	IN-2014-CR127307-4...	17-10-2014	18-10-2014	First Class	CR-127307	Craig Reiter	Consumer	nu
13524	ES-2014-KM1637548...	28-01-2014	30-01-2014	First Class	KM-1637548	Katherine Murray	Home Office	nu
47221	SG-2014-RH9495111...	05-11-2014	06-11-2014	Same Day	RH-9495111	Rick Hansen	Consumer	nu
22732	IN-2014-JM156557-4...	28-06-2014	01-07-2014	Second Class	JM-156557	Jim Mitchum	Corporate	nu
30570	IN-2012-TS2134092-4...	06-11-2012	08-11-2012	First Class	TS-2134092	Toby Swindell	Consumer	nu
31192	IN-2013-MB1808592...	14-04-2013	18-04-2013	Standard Class	MB-1808592	Mick Brown	Consumer	nu

# Extract Connection

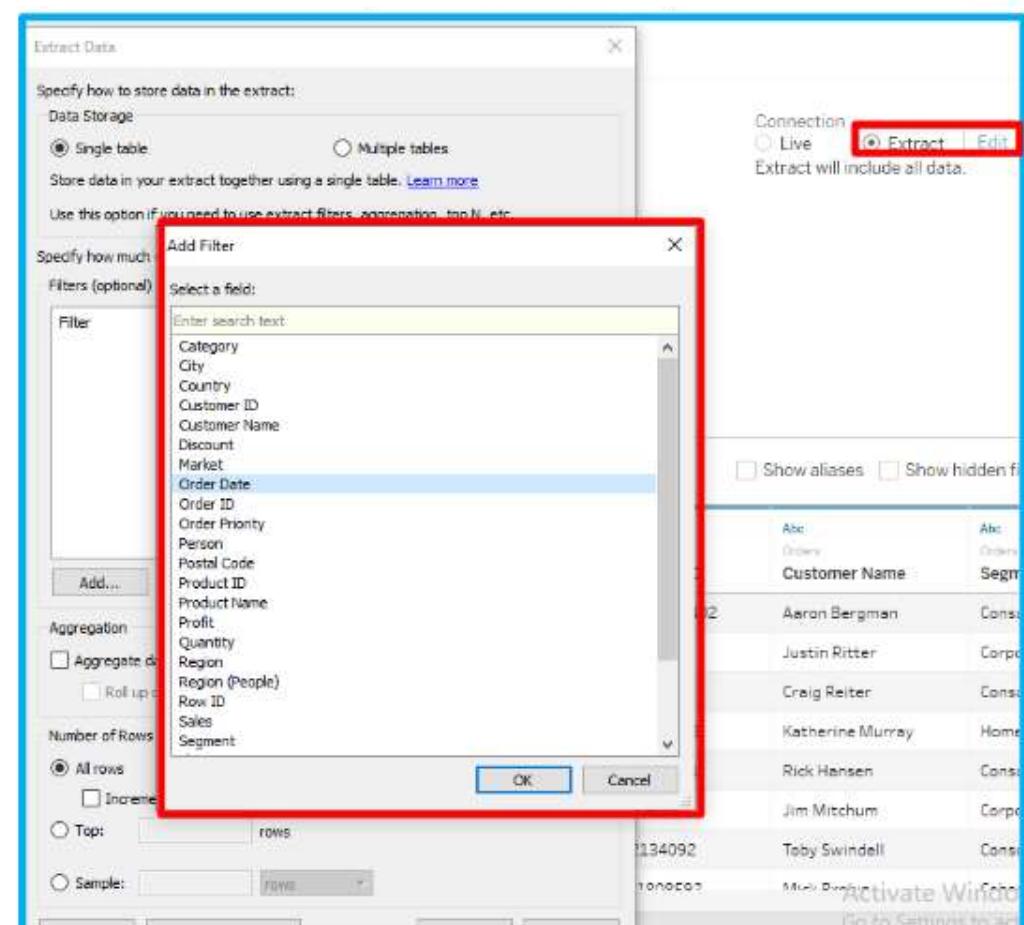
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Snapshot of data from any data source is loaded into system memory for quick visualisation

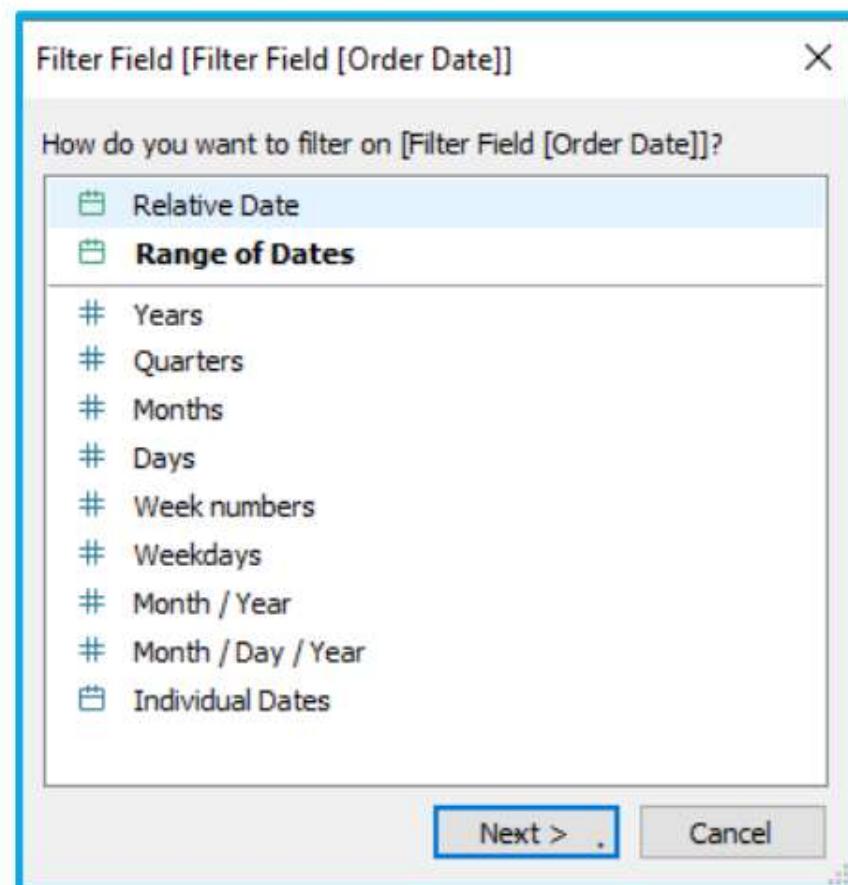
# Extract Connection (Contd...)

- Go to **Data Connection** Workspace
  - Click on **Extract**
    - Click on **Edit**, to get **Extract Data** dialog box
      - Click on **Add**, to get **Add Filter** dialog box
        - Select on **Order date**



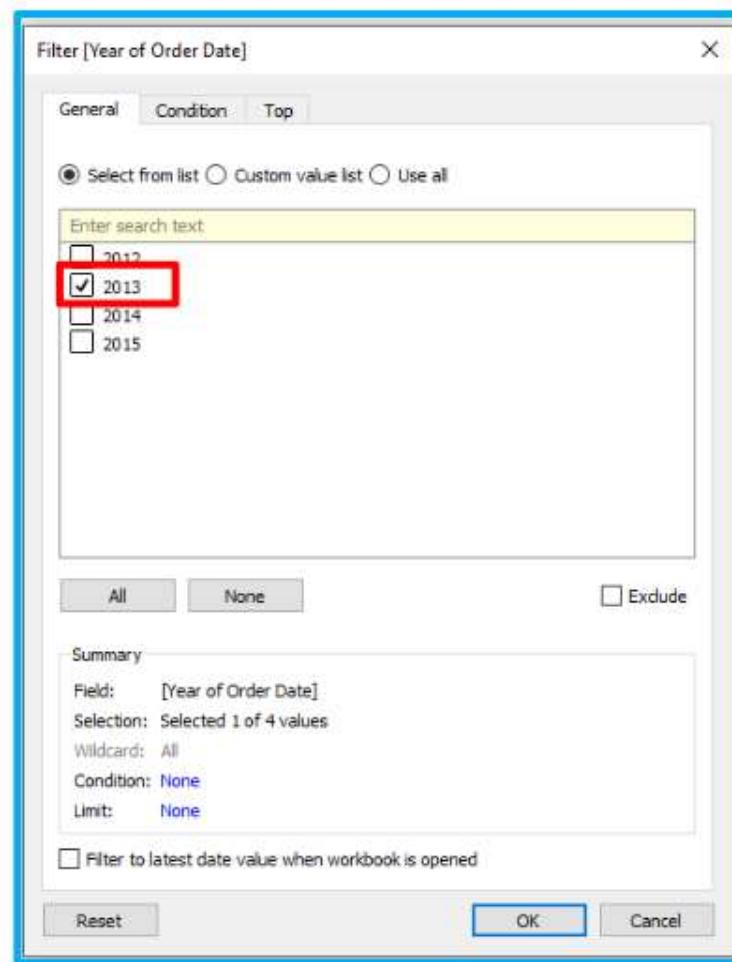
## Extract Connection (Contd...)

- Click on Order date, to get Filter Field dialog box
  - Select Years
    - Click on Next



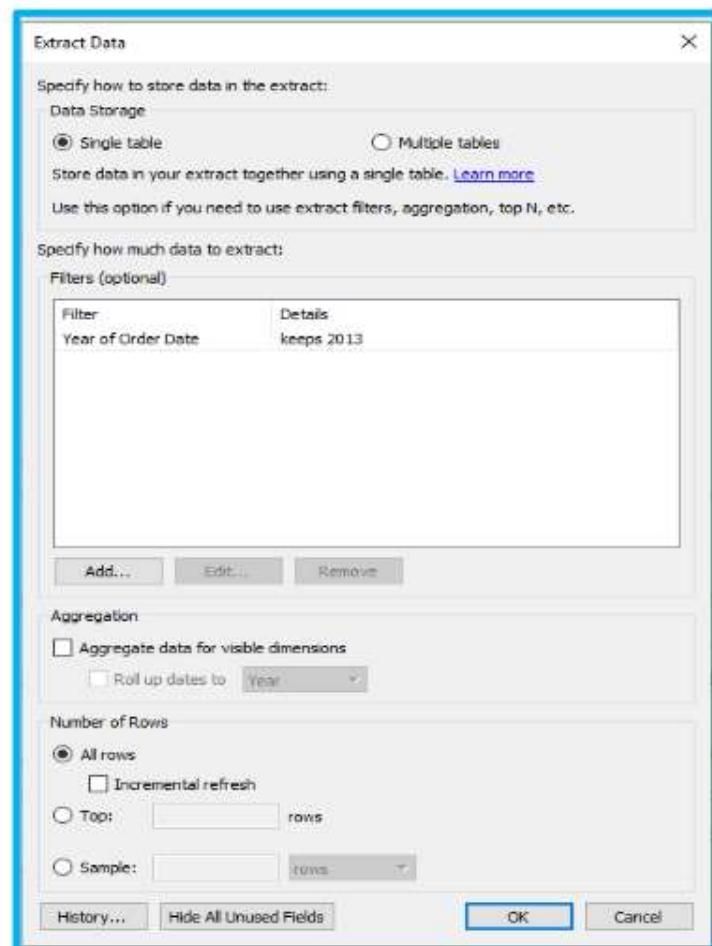
## Extract Connection (Contd...)

- Select **2013** from the list
  - Click on **OK** to get back to **Extract Data** dialog box



## Extract Connection (Contd...)

- Click on **OK**
  - All order data, related to year 2013 is now present on your workbook



# When To Use – Live/ Extract Connection?

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Both types of connections have their usage based on the requirement



- |- **Live connection** to make real time decisions by monitoring the incoming patients records

- |- **Extract** of data source helps to build visualization to monitor daily and weekly trends

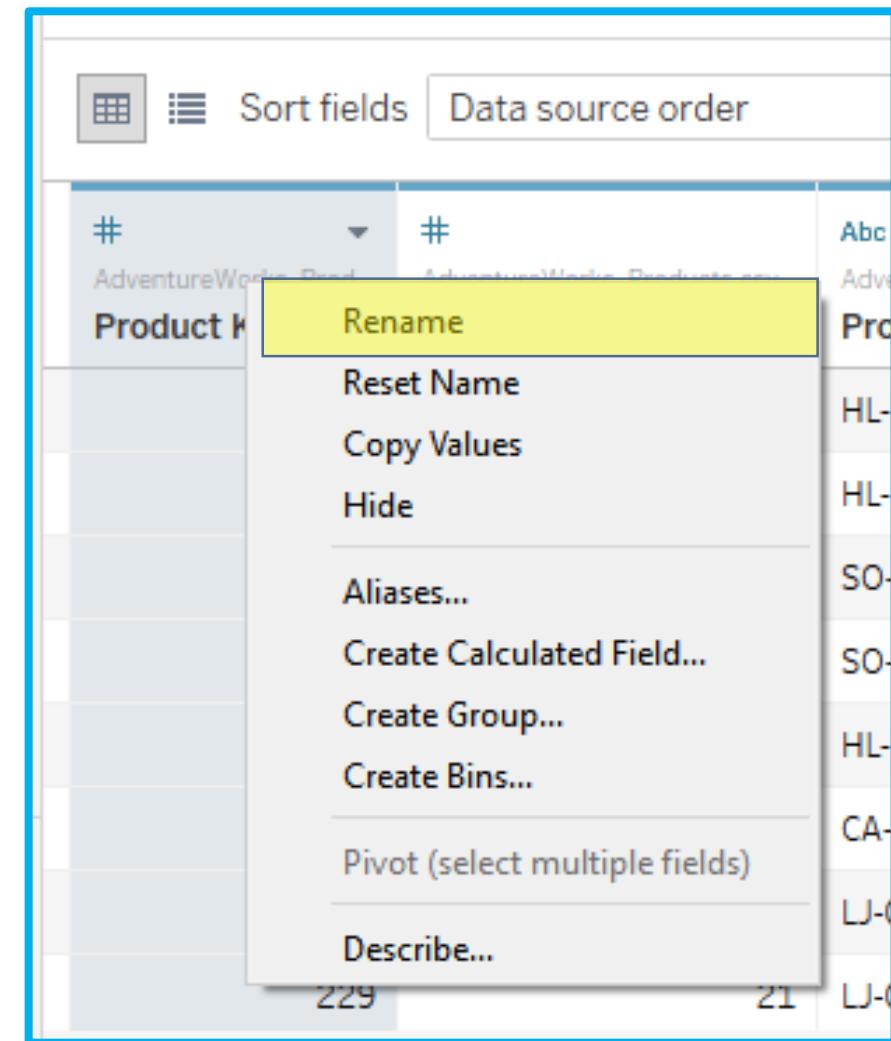


# Data Cleaning

# Rename the column header

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You can change the column header

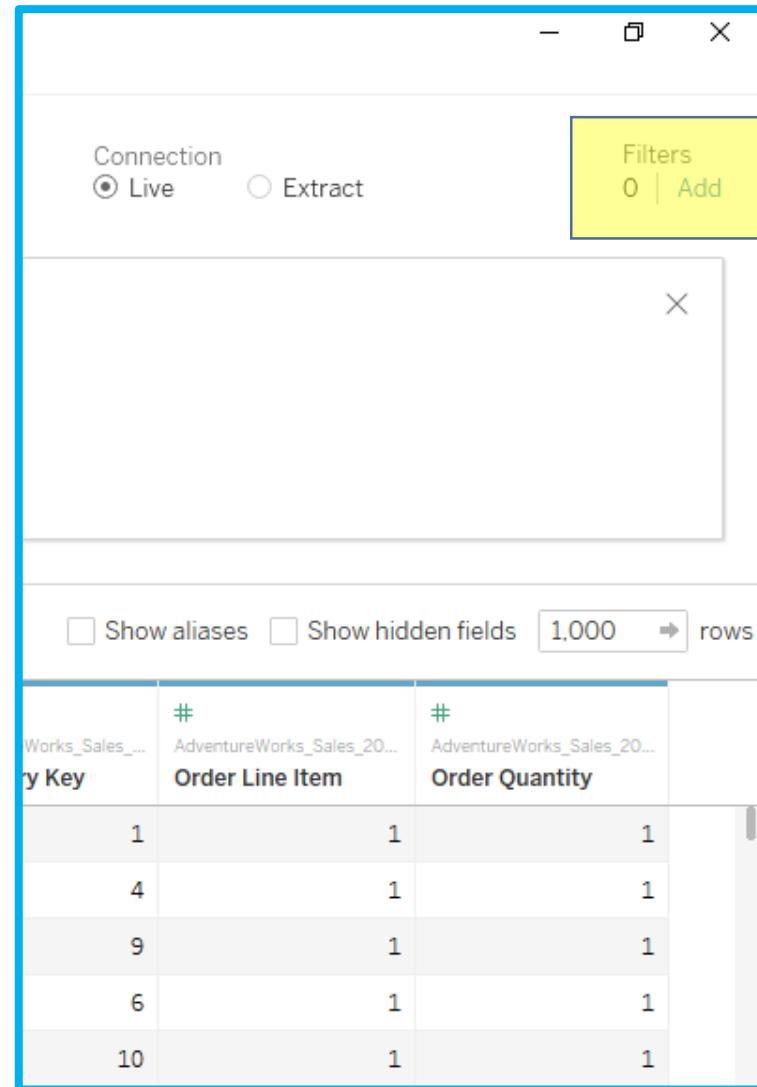


# Filter

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You can filter the data based on:

- The column categorical values
- Condition
- Selecting certain number of rows



The screenshot shows a data filtering interface. At the top, there are two radio buttons: 'Live' (selected) and 'Extract'. To the right of these is a yellow box containing the text 'Filters' with a '0' next to it, and a green 'Add' button. Below this is a large empty rectangular area with a close button 'X' in the top right corner. At the bottom, there are three checkboxes: 'Show aliases', 'Show hidden fields', and a 'rows' input field set to '1,000' with a right-pointing arrow. The main table has three columns: 'Sales Order Key', 'Order Line Item', and 'Order Quantity'. The data rows are: 1, AdventureWorks\_Sales\_20..., 1; 4, AdventureWorks\_Sales\_20..., 1; 9, AdventureWorks\_Sales\_20..., 1; 6, AdventureWorks\_Sales\_20..., 1; and 10, AdventureWorks\_Sales\_20..., 1.

Sales Order Key	# AdventureWorks_Sales_20...	# AdventureWorks_Sales_20...
Order Line Item	Order Quantity	
1	1	1
4	1	1
9	1	1
6	1	1
10	1	1

# Exercise

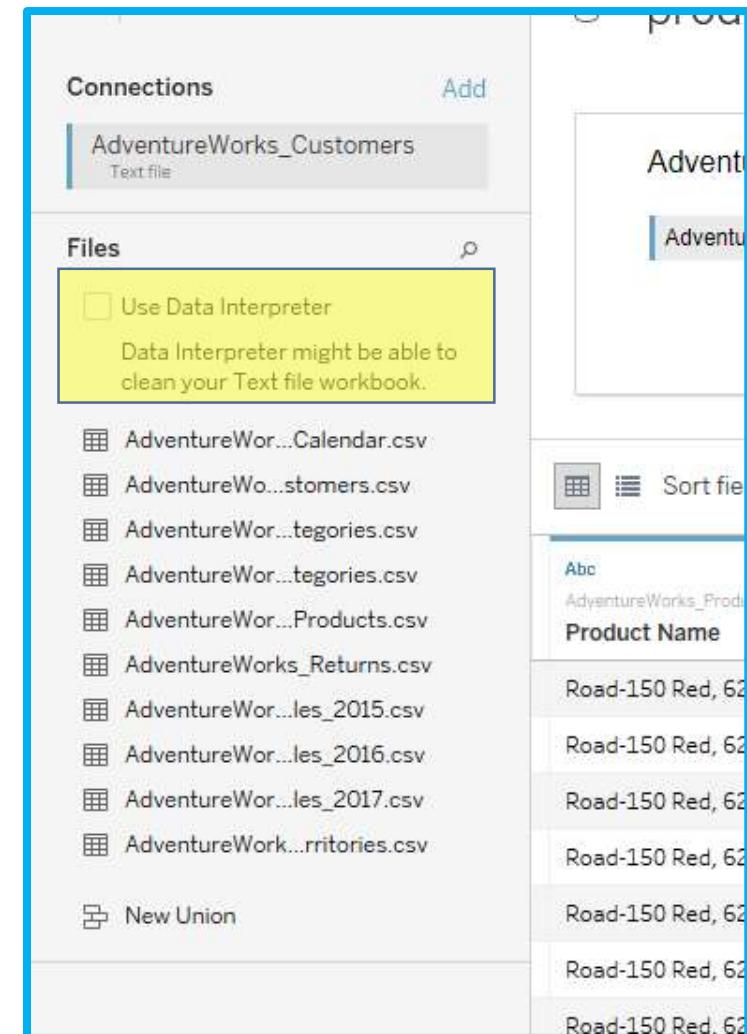
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- Import products.csv
- Try to filter the data based on the size of the product (60 , 62)

# Use Data Interpreter

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It will clean the data and create other versions of the data which is more clean and you can use it to do analysis



# Exercise

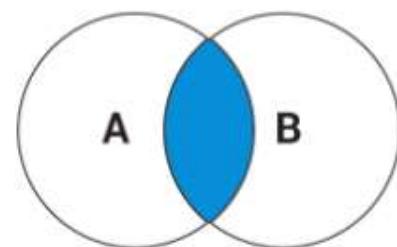
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- Import Tobacco\_Hollywood.xlsx
- Drag it to the workspace.
- Click on (Use Data Interpreter).
- Drag the generated table from the previous step ---> right click on it ---> click on (Edit found Table) and choose the exact cell you want to slice (C3:C30).

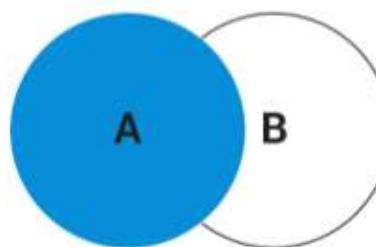
# Joins And Unions

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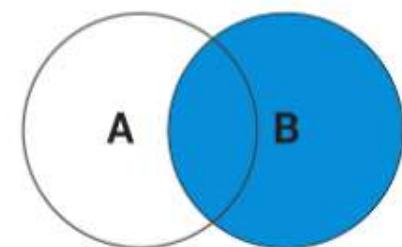
Joins are used to link tables of data together on **Row By Row** basis whereas union is used to combine tables.



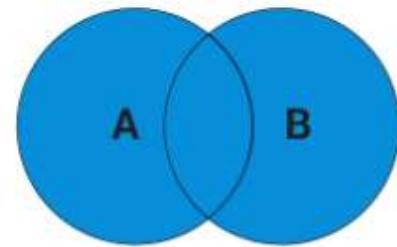
INNER JOIN



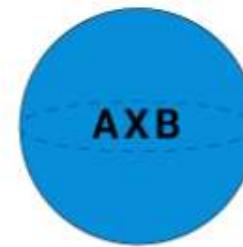
LEFT OUTER JOIN



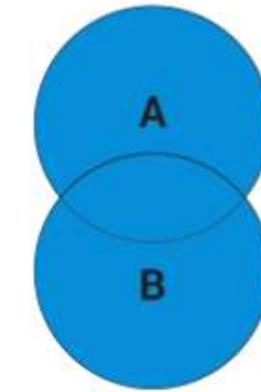
RIGHT OUTER JOIN



FULL OUTER JOIN



CROSS JOIN



UNION

# Inner Join Example

Table!1 Student Name	Table!1 Branch
Elle	Arts
Anne	Commerce
Chris	Economics
Leena	Sociology
Abby	Mathematics
Suzy	Politics

Table!2 Student Name	Table!2 Country
Abby	China
Shane	USA
Chris	India
Sheela	France

Inner Join returns a table, which contains the value that have matches in **both** tables present in one data source

Table!1 Student Name	Table!1 Branch	Table!2 Student Name (Ta... Country
Chris	Economics	Chris India
Abby	Mathematics	Abby China

# Left Join Example

Table!1 Student Name	Table!1 Branch
Elle	Arts
Anne	Commerce
Chris	Economics
Leena	Sociology
Abby	Mathematics
Suzy	Politics

Left Join returns a table, which contains *all* the values from **left** table and *corresponding matches* from **right** table, present in one data source

Table!2 Student Name	Table!2 Country
Abby	China
Shane	USA
Chris	India
Sheela	France

Table!1 Student Name	Table!1 Branch	Table!2 Student Name (Ta...)	Table!2 Country
Elle	Arts	null	null
Anne	Commerce	null	null
Chris	Economics	Chris	India
Leena	Sociology	null	null
Abby	Mathematics	Abby	China
Suzy	Politics	null	null

# Right Join Example

Table1 Student Name	Table1 Branch
Elle	Arts
Anne	Commerce
Chris	Economics
Leena	Sociology
Abby	Mathematics
Suzy	Politics

Table2 Student Name	Table2 Country
Abby	China
Shane	USA
Chris	India
Sheela	France

Right Join returns a table, which contains *all* the values from **right** table and *corresponding matches* from **left** table, present in one data source

Table1 Student Name	Table1 Branch	Table2 Student Name (Ta...)	Table2 Country
Chris	Economics	Chris	India
Abby	Mathematics	Abby	China
null	null	Shane	USA
null	null	Sheela	France

# Full Outer Join Example

Table1 Student Name	Table1 Branch
Elle	Arts
Anne	Commerce
Chris	Economics
Leena	Sociology
Abby	Mathematics
Suzy	Politics

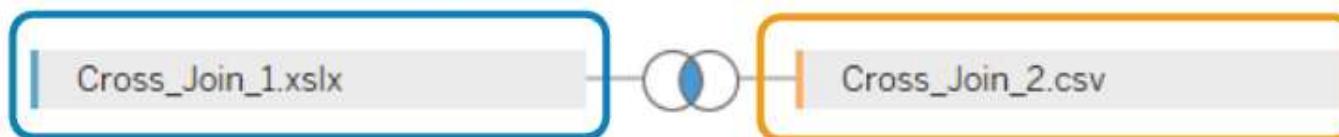
Table2 Student Name	Table2 Country
Abby	China
Shane	USA
Chris	India
Sheela	France

Full Outer Join returns a table, which contains *all* the values from **both** tables, present in one data source

Table1 Student Name	Table1 Branch	Table2 Student Name (Ta...)	Table2 Country
Elle	Arts	null	null
Anne	Commerce	null	null
Chris	Economics	Chris	India
Leena	Sociology	null	null
Abby	Mathematics	Abby	China
Suzy	Politics	null	null
	null	Shane	USA

# Cross Join Example

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Cross Join is used to join data between **two different data sources**, at row level

Sort fields Data source order			
Abc Cross!Join!1.xlsx Student Name	Abc Cross!Join!1.xlsx Country	Abc Cross_Join_2.csv Student Name (Cr...)	Abc Cross_Join_2.csv Branch
Chris	India	Chris	Economics
Abby	China	Abby	Mathematics

# Perform Join

The screenshot shows the Microsoft Power BI Data Editor interface. On the left, the 'Connections' pane displays a single connection named 'Sample - Superstore'. The 'Sheets' pane lists three sheets: 'Orders' (selected), 'People' (highlighted with an orange border), and 'Returns'. A green callout box with the text 'Drag People sheet next to Order sheet' has an arrow pointing towards the 'People' sheet in the 'Sheets' list.

The main workspace displays the 'Orders' table with the following schema:

#	Abs: Orders	Abs: Orders	Abs: Orders	Abs: Orders	Abs: Orders	Abs: Orders	Abs: Orders	Abs: Orders
Row ID	Order ID	Order Date	Ship Date	Ship Mode	Customer ID	Customer Name	Segment	Country
1	CA-2013-152156	11/9/2013	11/12/2013	Second Class	CG-12520	Claire Gute	Consumer	United States
2	CA-2013-152156	11/9/2013	11/12/2013	Second Class	CG-12520	Claire Gute	Consumer	United States
3	CA-2013-138688	6/13/2013	6/17/2013	Second Class	DV-13045	Darrin Van Huff	Corporate	United States
4	US-2012-1089...	10/11/2012	10/18/2012	Standard Class	SO-20335	Sean O'Donnell	Consumer	United States
5	US-2012-1089...	10/11/2012	10/18/2012	Standard Class	SO-20335	Sean O'Donnell	Consumer	United States
6	CA-2011-115812	6/9/2011	6/14/2011	Standard Class	BH-11710	Brosina Hoffman	Consumer	United States
7	CA-2011-115812	6/9/2011	6/14/2011	Standard Class	BH-11710	Brosina Hoffman	Consumer	United States
8	CA-2011-115812	6/9/2011	6/14/2011	Standard Class	BH-11710	Brosina Hoffman	Consumer	United States

At the bottom, the ribbon shows 'Data Source' and 'Sheet1' selected. A 'Go to Worksheet' button is also visible.

## Joins (Contd...)

The screenshot shows a data visualization interface for a 'Superstore' dataset. At the top, there are tabs for 'Orders' and 'People', with 'Orders' currently selected. To the right of the tabs are buttons for 'Connection' (Live or Extract) and 'Filters' (0 rows). A red box highlights the 'Orders' tab and the connection status.

A green callout box with a black border and arrow points from the text below to the 'Orders' tab area.

**This shows joins between Order and People  
( Click here to view other join option )**

The main area displays a table with 8 rows of data, showing the joined results of the 'Orders' and 'People' tables. The columns are:

#	Order ID	Order Date	Ship Date	Ship Mode	Customer ID	Customer Name	Segment	Country
1	CA-2013-152156	11/9/2013	11/12/2013	Second Class	CG-12520	Claire Gute	Consumer	United States
2	CA-2013-152156	11/9/2013	11/12/2013	Second Class	CG-12520	Claire Gute	Consumer	United States
3	CA-2013-138688	6/13/2013	6/17/2013	Second Class	DV-13045	Darrin Van Huff	Corporate	United States
4	US-2012-1089...	10/11/2012	10/18/2012	Standard Class	SO-20335	Sean O'Donnell	Consumer	United States
5	US-2012-1089...	10/11/2012	10/18/2012	Standard Class	SO-20335	Sean O'Donnell	Consumer	United States
6	CA-2011-115812	6/9/2011	6/14/2011	Standard Class	BH-11710	Brosina Hoffman	Consumer	United States
7	CA-2011-115812	6/9/2011	6/14/2011	Standard Class	BH-11710	Brosina Hoffman	Consumer	United States
8	CA-2011-115812	6/9/2011	6/14/2011	Standard Class	BH-11710	Brosina Hoffman	Consumer	United States

# Join Options Available

The screenshot shows the Tableau Data Source view for a 'Superstore' connection. A red box highlights the 'Join' dialog window, which displays four join types: Inner, Left, Right, and Full Outer. Below the dialog, a dropdown menu shows 'Region' as the current join condition, with 'Region (People)' selected. A green callout box points to the right side of the 'Join' dialog, containing the text 'Different joins option available with Tableau'. The main data grid below the join dialog shows a sample of data from the 'Orders' and 'People' tables.

#	Order ID	Order Date	Ship Date	Ship Mode	Customer ID	Customer Name	Segment
1	CA-2013-152156	11/9/2013	11/12/2013	Second Class	CG-12520	Claire Gute	Consumer
2	CA-2013-152156	11/9/2013	11/12/2013	Second Class	CG-12520	Claire Gute	Consumer
3	CA-2013-138688	6/13/2013	6/17/2013	Second Class	DV-13045	Darrin Van Huff	Corporate
4	US-2012-1089...	10/11/2012	10/18/2012	Standard Class	SO-20335	Sean O'Donnell	Consumer
5	US-2012-1089...	10/11/2012	10/18/2012	Standard Class	SO-20335	Sean O'Donnell	Consumer
6	CA-2011-115812	6/9/2011	6/14/2011	Standard Class	BH-11710	Brosina Hoffman	Consumer

# Cross Join

A	B	C	D	E	F	
1	Row ID	Order ID	Order Date	Market	Product ID	Sales
2	1	MX-2015-SC205/582-42279	10/2/2015	LATAM	OFF-LA-4658	\$13.08
3	2	MX-2013-KW1657028-41562	10/15/2013	LATAM	FUR-FU-6238	\$252.16
4	3	MX-2013-KW1657028-41562	10/15/2013	LATAM	FUR-BO-4845	\$193.28
5	4	MX-2013-KW1657028-41562	10/15/2013	LATAM	OFF-BI-3720	\$35.44
6	5	MX-2013-KW1657028-41562	10/15/2013	LATAM	OFF-AR-5905	\$71.60
7	6	MX-2013-KW1657028-41562	10/15/2013	LATAM	OFF-EN-4446	\$56.12
8	7	MX-2014-DP1300018-41909	9/27/2014	LATAM	OFF-EN-4446	\$56.12
9	8	MX-2014-DP1300018-41909	9/27/2014	LATAM	TEC-MA-5003	\$344.64
10	9	MX-2014-DP1300018-41909	9/27/2014	LATAM	OFF-SU-4116	\$97.36
11	10	MX-2014-DP1300018-41909	9/27/2014	LATAM	TEC-AC-4186	\$341.52
12	11	MX-2014-DP1300018-41909	9/27/2014	LATAM	OFF-BI-6398	\$12.06
13	12	MX-2014-TB2125093-41703	3/5/2014	LATAM	OFF-FA-2955	\$20.76
14	13	MX-2014-TB2125093-41703	3/5/2014	LATAM	FUR-CH-4698	\$210.64
15	14	MX-2015-PK1891093-42271	9/24/2015	LATAM	OFF-EN-5034	\$80.10
16	15	MX-2015-JK1562518-42295	10/18/2015	LATAM	OFF-AR-6106	\$132.64
17	16	MX-2015-JK1562518-42295	10/18/2015	LATAM	OFF-FA-3022	\$12.94
18	17	US-2014-HE1480098-41816	6/26/2014	LATAM	OFF-EN-4926	\$18.84
19	18	US-2014-HE1480098-41816	6/26/2014	LATAM	FUR-FU-3941	\$308.28
20	19	US-2014-HE1480098-41816	6/26/2014	LATAM	OFF-EN-4440	\$40.18
21	20	US-2014-HE1480098-41816	6/26/2014	LATAM	OFF-EN-4906	\$8.78
22	21	MX-2014-JE1561082-41992	12/19/2014	LATAM	FUR-CH-4682	\$273.47
23	22	MX-2014-TB2105526-41941	10/29/2014	LATAM	TEC-AC-4174	\$27.00
24	23	MX-2014-TB2105526-41941	10/29/2014	LATAM	OFF-SU-2967	\$207.00
25	24	US-2015-DW1319598-42280	10/3/2015	LATAM	OFF-BI-2899	\$60.66
26	25	US-2015-DW1319598-42280	10/3/2015	LATAM	EUO-EU-3050	\$101.19

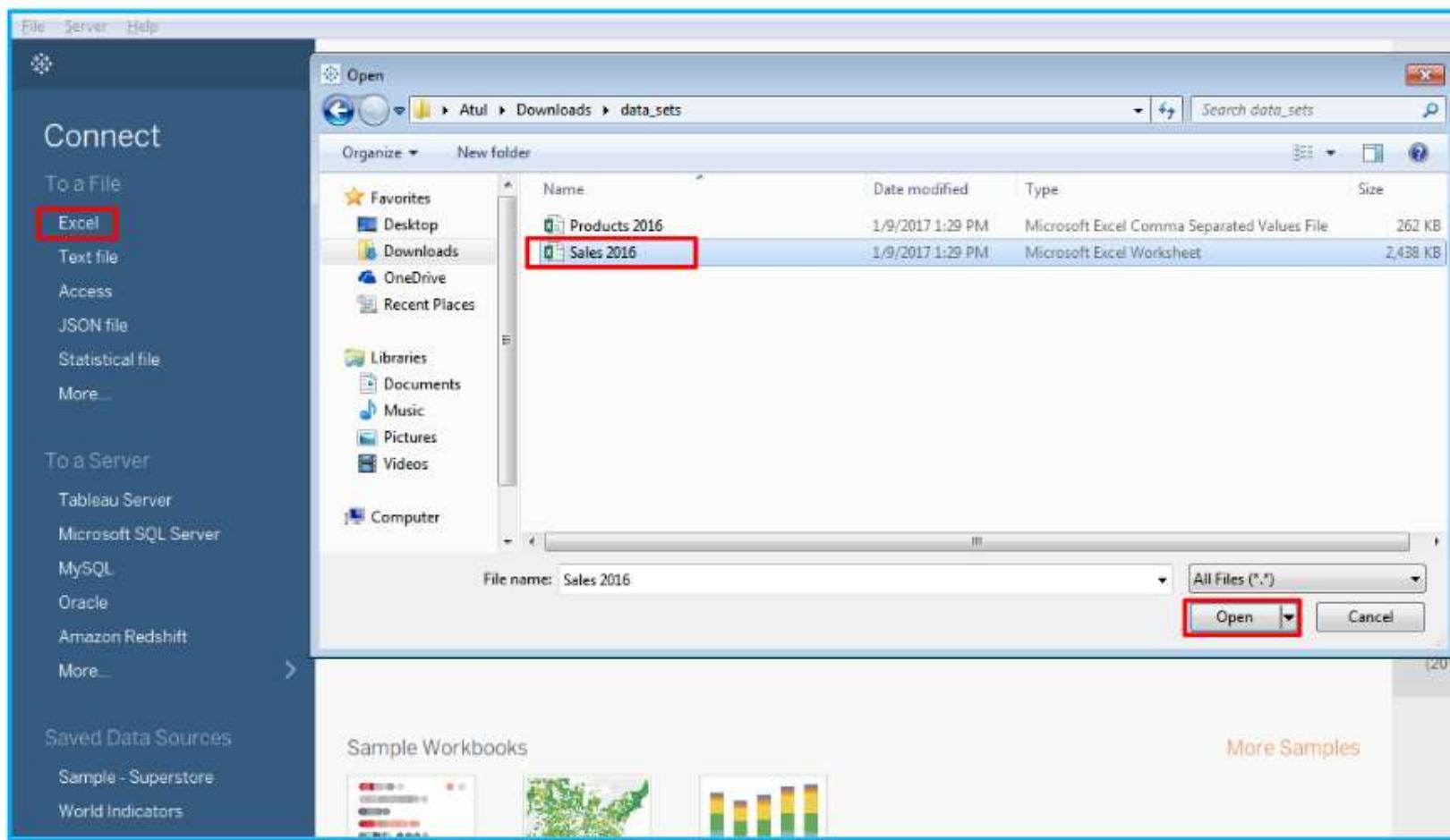
Sheet1

A	B	C	D	E	F	G	H	I
1	Product ID	Category	Sub-Categ	Product Name				
2	FUR-BO-3	Furniture	Bookcase	Atlantic Metals Mobile 2-Shelf Bookcases, Custom Colors				
3	FUR-BO-3	Furniture	Bookcase	Atlantic Metals Mobile 3-Shelf Bookcases, Custom Colors				
4	FUR-BO-3	Furniture	Bookcase	Atlantic Metals Mobile 4-Shelf Bookcases, Custom Colors				
5	FUR-BO-3	Furniture	Bookcase	Atlantic Metals Mobile 5-Shelf Bookcases, Custom Colors				
6	FUR-BO-3	Furniture	Bookcase	Bestar Classic Bookcase				
7	FUR-BO-3	Furniture	Bookcase	Bush 3-Shelf Cabinet, Metal				
8	FUR-BO-3	Furniture	Bookcase	Bush 3-Shelf Cabinet, Mobile				
9	FUR-BO-3	Furniture	Bookcase	Bush 3-Shelf Cabinet, Pine				
10	FUR-BO-3	Furniture	Bookcase	Bush 3-Shelf Cabinet, Traditional				
11	FUR-BO-3	Furniture	Bookcase	Bush Andora Bookcase, Maple/Graphite Gray Finish				
12	FUR-BO-3	Furniture	Bookcase	Bush Birmingham Collection Bookcase, Dark Cherry				
13	FUR-BO-3	Furniture	Bookcase	Bush Classic Bookcase, Metal				
14	FUR-BO-3	Furniture	Bookcase	Bush Classic Bookcase, Mobile				
15	FUR-BO-3	Furniture	Bookcase	Bush Classic Bookcase, Pine				
16	FUR-BO-3	Furniture	Bookcase	Bush Classic Bookcase, Traditional				
17	FUR-BO-3	Furniture	Bookcase	Bush Corner Shelving, Metal				
18	FUR-BO-3	Furniture	Bookcase	Bush Corner Shelving, Mobile				
19	FUR-BO-3	Furniture	Bookcase	Bush Corner Shelving, Pine				
20	FUR-BO-3	Furniture	Bookcase	Bush Corner Shelving, Traditional				
21	FUR-BO-3	Furniture	Bookcase	Bush Cubix Collection Bookcases, Fully Assembled				
22	FUR-BO-3	Furniture	Bookcase	Bush Floating Shelf Set, Metal				
23	FUR-BO-3	Furniture	Bookcase	Bush Floating Shelf Set, Mobile				

Products 2016

Cross Join return all rows by applying Cartesian product on both the tables

## Cross Join (Contd...)



## Cross Join (Contd...)

The screenshot shows the Microsoft Power BI Data Editor interface. On the left, the 'Connections' pane has a red box around the 'Add' button, and a callout arrow points to a green box labeled 'Click to add Data Connection'. The main workspace is titled 'Sheet1 (Sales 2016)' and contains a table with the following data:

#	Abo Sales	白 Sales	Abo Sales	Abo Sales	# Sales
Row ID	Order ID	Order Date	Market	Product ID	Sales
1	MX-2015-SC2057582...	10/2/2015	LATAM	OFF-LA-4658	13.08
2	MX-2013-KW165702...	10/15/2013	LATAM	FUR-FU-6238	252.16
3	MX-2013-KW165702...	10/15/2013	LATAM	FUR-BO-4845	193.28
4	MX-2013-KW165702...	10/15/2013	LATAM	OFF-BI-3720	35.44
5	MX-2013-KW165702...	10/15/2013	LATAM	OFF-AR-5905	71.60
6	MX-2013-KW165702...	10/15/2013	LATAM	OFF-EN-4446	56.12
7	MX-2014-DP1300018...	9/27/2014	LATAM	OFF-EN-4446	56.12
8	MX-2014-DP1300018...	9/27/2014	LATAM	TEC-MA-5003	344.64
9	MX-2014-DP1300018...	9/27/2014	LATAM	OFF-EN-4446	56.12

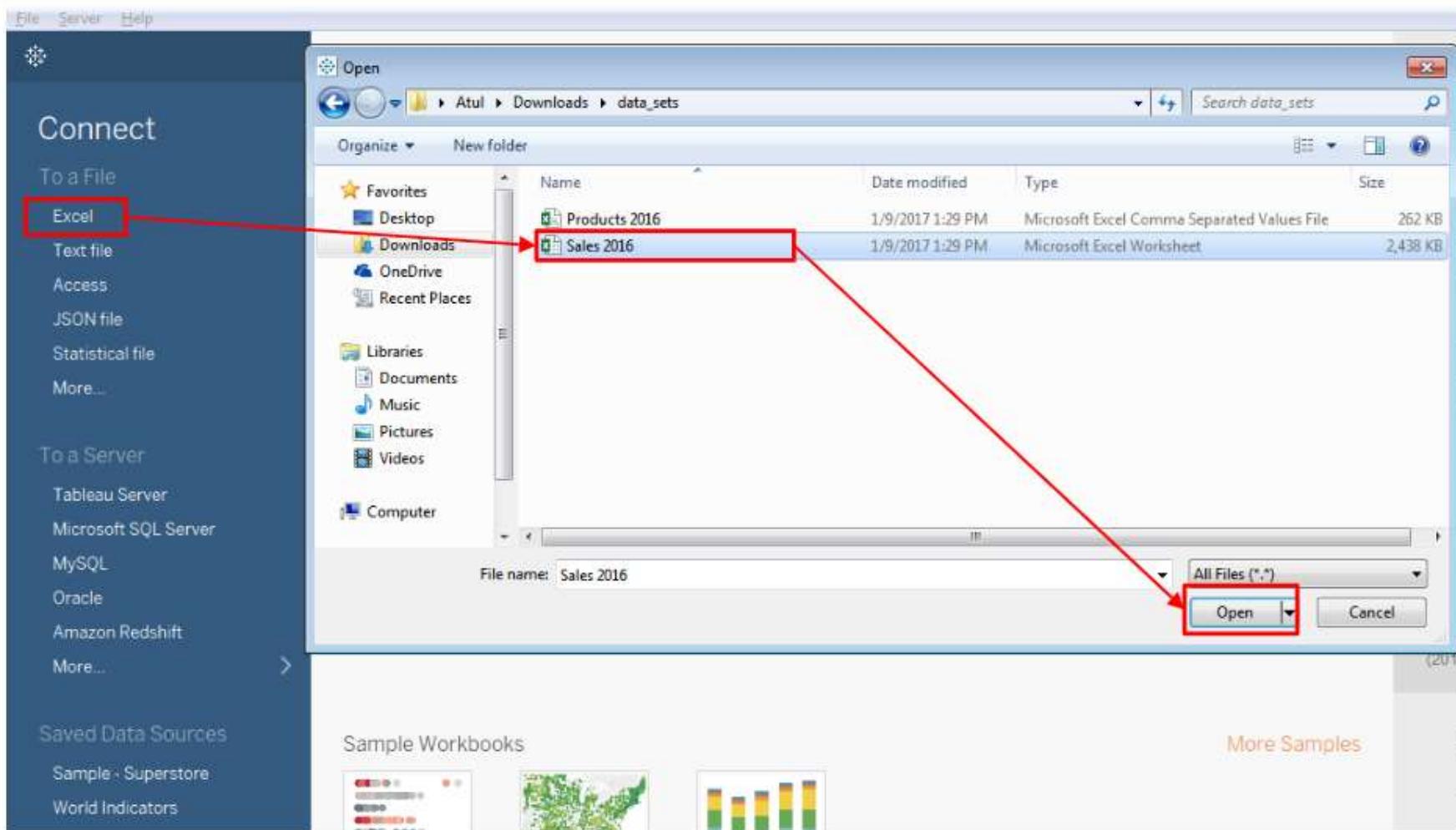
At the bottom, there are buttons for 'Data Source', 'Sheet1' (which is highlighted in orange), and other worksheet tabs.

## Cross Join (Contd...)

The screenshot shows the Tableau Data Source dialog with a blue border. On the left, the 'Connections' pane lists 'Sales 2016' and 'Data'. A red box highlights the 'Add' button. A black arrow points from this button to the 'Excel' option in the 'To a File' section of the central 'Add a Connection' dialog. This dialog also includes options for 'Text file', 'Access', 'JSON file', 'Statistical file', and 'More...'. Below these, the 'To a Server' section lists 'Tableau Server', 'Microsoft SQL Server', 'MySQL', 'Oracle', 'Amazon Redshift', and 'More...'. To the right of the dialog, a preview of a data table is visible, showing columns for '#', 'Sales', and 'Sales' with corresponding values: 13.08, 252.16, 193.28, 35.44, 71.60, and 56.12. The top right corner of the dialog shows 'Connection' (radio buttons for 'Live' and 'Extract') and 'Filters' (button for '0 | Add').

#	Sales	Sales
6	MX-2013-RW165702...	13.08
7	MX-2014-DP1300018...	252.16
		193.28
		35.44
		71.60
		56.12

# Cross Join (Contd...)



## Cross Join (Contd...)

The screenshot shows the Microsoft Power BI Data View interface. On the left, the Connections pane lists "Sales 2016" (Excel) with an "Add" button highlighted by a red box. A green box highlights the text "Click to add Data Connection". The Sheets pane shows "Sheet1". The main area displays a table with the following data:

#	Abc Sales	Abc Sales	Abc Sales	Abc Sales	#
Row ID	Order ID	Order Date	Market	Product ID	Sales
1	MX-2015-SC2057582...	10/2/2015	LATAM	OFF-LA-4658	13.08
2	MX-2013-KW165702...	10/15/2013	LATAM	FUR-FU-6238	252.16
3	MX-2013-KW165702...	10/15/2013	LATAM	FUR-BO-4845	193.28
4	MX-2013-KW165702...	10/15/2013	LATAM	OFF-BI-3720	35.44
5	MX-2013-KW165702...	10/15/2013	LATAM	OFF-AR-5905	71.60
6	MX-2013-KW165702...	10/15/2013	LATAM	OFF-EN-4446	56.12
7	MX-2014-DP1300018...	9/27/2014	LATAM	OFF-EN-4445	56.12
8	MX-2014-DP1300018...	9/27/2014	LATAM	TEC-MA-5003	344.64
9	MX-2014-DP1300018...	9/27/2014	LATAM	OFF-SU-1116	97.26

At the bottom, there are buttons for "Data Source" (unchecked), "Sheet1" (highlighted in orange), and other navigation icons.

## Cross Join (Contd...)

The screenshot shows the Tableau Data Source dialog. On the left, under 'Connections', there is a list with 'Sales 2016' (Excel) selected. Below it are 'Sheets' (Sheet1) and 'New Union'. A red box highlights the 'Add' button. A secondary red box highlights the 'Text file' option in the 'To a File' section of the dropdown menu.

**Add a Connection**

Add a new connection to use cross-database joins.

Search

Connection  
① Live    ○ Extract

Filters  
0 | Add

Connections

Sales 2016 (Excel)

To a File

Text file (highlighted)

Excel

Access

JSON file

Statistical file

More...

To a Server

Tableau Server

Microsoft SQL Server

MySQL

Oracle

Amazon Redshift

More...

Tableau Server

Action Matrix

Action Vector

Amazon Aurora

Amazon EMR

Amazon Redshift

Anaplan

Aster Database

Cisco Information Server

Cloudera Hadoop

DataStax Enterprise

EXASolution

Firebase

Google Analytics

Google BigQuery

Google Cloud SQL

Google Sheets

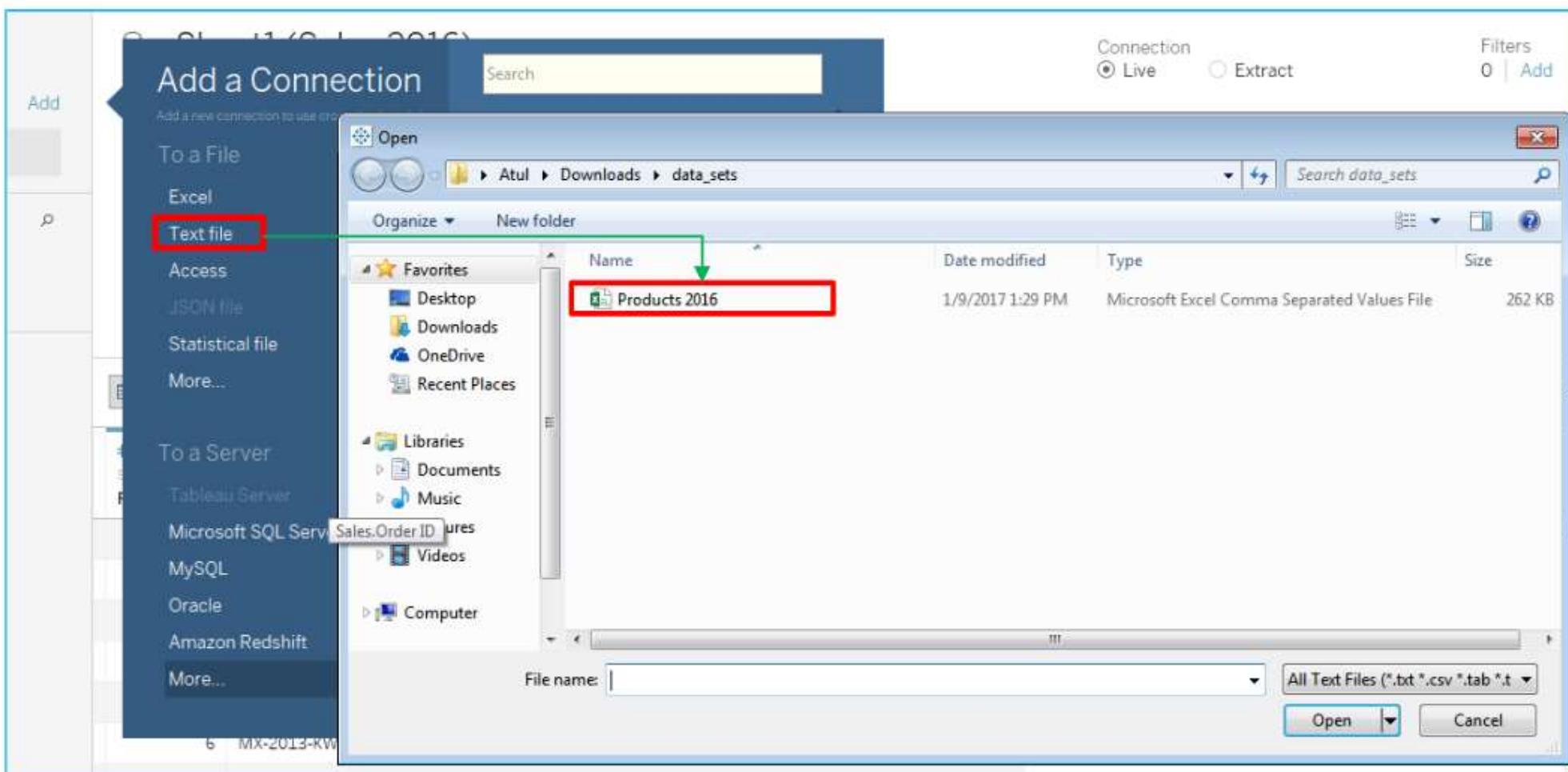
Show aliases

Show hidden fields

1,000 rows

#	Sales
1	13.08
2	252.16
3	193.28
4	35.44
5	71.60
6	56.12
7	56.12

## Cross Join (Contd...)



# Cross Join (Contd...)

The screenshot shows the Microsoft Power BI Data View interface. On the left, the Connections pane lists "Sales 2016" (Excel) and "Products 2016" (Text File), with "Products 2016" selected and highlighted by a red box. The main workspace displays a diagram titled "Sales+ Product" showing a cross join between "Sales" and "Products". Below the diagram is a table with the following data:

Product ID (Produ...	Category	Sub-Category	Product Name	Row ID	Order ID	Order Date	Market	Product
OFF-LA-4658	Office Supplies	Labels	Hon File Folder Labels...	1	MX-2015-SC2057582...	10/2/2015	LATAM	OFF-L
FUR-FU-6238	Furniture	Furnishings	Tenex Clock, Durable	2	MX-2013-KW165702...	10/15/2013	LATAM	FUR-F
FUR-BO-4845	Furniture	Bookcases	Ikea 3-Shelf Cabinet,...	3	MX-2013-KW165702...	10/15/2013	LATAM	FUR-B
OFF-BI-3720	Office Supplies	Binders	Cardinal Binder, Clear	4	MX-2013-KW165702...	10/15/2013	LATAM	OFF-B
OFF-AR-5905	Office Supplies	Art	Sanford Canvas, Wat...	5	MX-2013-KW165702...	10/15/2013	LATAM	OFF-A
OFF-EN-4446	Office Supplies	Envelopes	GlobeWeis Mailers, w...	6	MX-2013-KW165702...	10/15/2013	LATAM	OFF-E
OFF-EN-4446	Office Supplies	Envelopes	GlobeWeis Mailers, w...	7	MX-2014-DP1300018...	9/27/2014	LATAM	OFF-E
TEC-MA-5003	Technology	Machines	Konica Card Printer, R...	8	MX-2014-DP1300018...	9/27/2014	LATAM	TEC-M

## Cross Join (Contd...)

Sheet1+ (Multiple Connections)

Connection  
Live Extract

Filters 0 | Add

Join between .xlsx and .csv file

Product

Sales

Connection showing Both the files

Product ID (Produ...	Category	Sub-Category	Product Name	Row ID	Order ID	Order Date	Market	Product
OFF-LA-4658	Office Supplies	Labels	Han File Folder Labels...	1	MX-2015-SC2057582...	10/2/2015	LATAM	OFF-L
FUR-FU-6238	Furniture	Furnishings	Tenex Clock, Durable	2	MX-2013-KW165702...	10/15/2013	LATAM	FUR-F
FUR-BO-4845	Furniture	Bookcases	Ikea 3-Shelf Cabinet, ...	3	MX-2013-KW165702...	10/15/2013	LATAM	FUR-B
OFF-BI-3720	Office Supplies	Binders	Cardinal Binder, Clear	4	MX-2013-KW165702...	10/15/2013	LATAM	OFF-B
OFF-AR-5905	Office Supplies	Art	Sanford Canvas, Wat...	5	MX-2013-KW165702...	10/15/2013	LATAM	OFF-A
OFF-EN-4446	Office Supplies	Envelopes	GlobeWeis Mailers, w...	6	MX-2013-KW165702...	10/15/2013	LATAM	OFF-E
OFF-EN-4446	Office Supplies	Envelopes	GlobeWeis Mailers, w...	7	MX-2014-DP1300018...	9/27/2014	LATAM	OFF-E
TEC-MA-5003	Technology	Machines	Konica Card Printer, R...	8	MX-2014-DP1300018...	9/27/2014	LATAM	TEC-M

# Cross Join (Contd...)

The screenshot shows the Microsoft Power BI Data Editor interface. On the left, the 'Connections' pane lists 'Sales 2016' and 'Products 2016'. The main area displays a query titled 'Sales+ Product' with a tooltip 'Integrated Data Source renamed'. Below it is a 'Join' dialog box with four options: Inner, Left, Right, and Full Outer. The 'Right' option is selected, indicated by a red circle. A tooltip 'Change the join to left join' points to the 'Left' button. The query results show a cross join between Sales and Products tables.

Sales+ Product

Integrated Data Source renamed

Change the join to left join

#	Order ID	Order Date	Market	Product ID (Produ...	Category	Sub-Category	Product Name	Region	Segment	Product Line
1	MX-2015-SK2057582...	10/2/2015	LATAM	OFF-LA-4658	Office Supplies	Labels	Hon File Folder Labels...	OFFICE	SALES	OFF-L
2	MX-2013-KW165702...	10/15/2013	LATAM	FUR-FU-6238	Furniture	Furnishings	Tenex Clock, Durable	FURNITURE	SALES	FUR-F
3	MX-2013-KW165702...	10/15/2013	LATAM	FUR-BD-4945	Furniture	Bookcases	Ikea 3-Shelf Cabinet,...	FURNITURE	SALES	FUR-B
4	MX-2013-KW165702...	10/15/2013	LATAM	OFF-BI-3720	Office Supplies	Binders	Cardinal Binder, Clear	OFFICE	SALES	OFF-B
5	MX-2013-KW165702...	10/15/2013	LATAM	OFF-AR-5905	Office Supplies	Art	Sanford Canvas, Wat...	OFFICE	SALES	OFF-A
6	MX-2013-KW165702...	10/15/2013	LATAM	OFF-EN-4446	Office Supplies	Envelopes	GlobeWeis Mailers, w...	OFFICE	SALES	OFF-EI
7	MX-2014-DP1300018...	9/27/2014	LATAM	OFF-EN-4446	Office Supplies	Envelopes	GlobeWeis Mailers, w...	OFFICE	SALES	OFF-EI
8	MX-2014-DP1300018...	9/27/2014	LATAM	TEC-MA-5003	Technology	Machines	Konica Card Printer, R...	TECHNOLOGY	SALES	TEC-M

Data Source Sheet1

# Cross Join (Contd...)

The screenshot shows the Tableau Data Source pane with the following details:

- Data** tab selected.
- Sales+ Product** is highlighted in the Data Sources list.
- Dimensions** section:
  - Products**: Category, Product ID (Products 2016.csv), Product Name, Sub-Category.
  - Sales**: Market, Order Date, Order ID, Product ID, Row ID.
- Measures** section:
  - Sales, Number of Records, Measure Values.
- Marks** section: Automatic, Color, Size, Text, Detail, Tooltip.
- Sheet 1** area: Drop field here.

A red arrow points from the "Sales+ Product" selection in the Data Sources list to a green callout box containing the text: "Single Data Source from two different files".

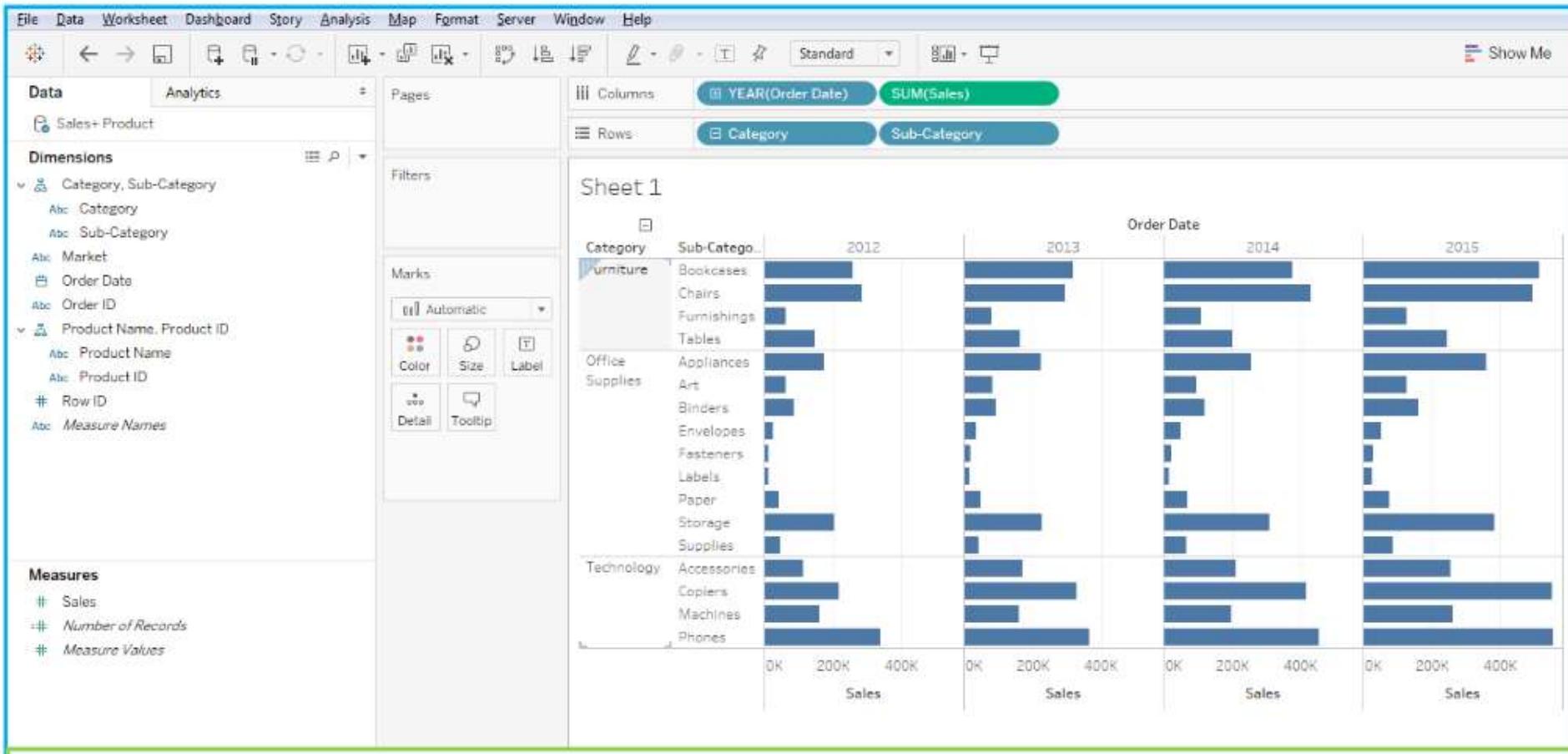
An orange box highlights the "Products" and "Sales" dimensions sections. A red arrow points from the right edge of the "Sales" section to a green callout box containing the following list:

- Fields are broken by tables (Products and Sales)
- Do a right click and select group by folders

# Cross Join (Contd...)

The screenshot shows the Tableau Data Source view. On the left, the **Dimensions** pane is highlighted with an orange border, containing fields like Category, Market, Order Date, Order ID, Product ID, Product ID (Products 2016.csv), Product Name, Row ID, Sub-Category, and Measure Names. The **Measures** pane contains Sales, Number of Records, and Measure Values. In the center, the **Marks** card is visible, showing options for Automatic, Color, Size, Text, Detail, and Tooltip. A green callout box points to the **Marks** card with the text "View after selecting group by folders". The main workspace is labeled "Sheet 1" with three "Drop field here" placeholder boxes.

# Cross Join (Contd...)



# Exercise

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- Import (Product.csv and Sales 2015.csv) to tableau desktop data connection
- Drag (sales\_2015.csv) to the workspace
- Double click on the (sales\_2015.csv)
- Drag product.csv to the workspace
- Change the join type to (left join)

# Union Example

Table!1 Student Name	Table!1 Branch
Elle	Arts
Anne	Commerce
Chris	Economics
Leena	Sociology
Abby	Mathematics
Suzy	Politics

Union combines two tables, by appending rows of data from one table to another

Table!2 Student Name	Table!2 Country
Abby	China
Shane	USA
Chris	India
Sheela	France

Table!1+ Student Name	Table!1+ Branch	Table!1+ Country	Table!1+ Sheet	Table!1+ Table Name
Elle	Arts	null	Table!1	Table_1
Anne	Commerce	null	Table!1	Table_1
Chris	Economics	null	Table!1	Table_1
Leena	Sociology	null	Table!1	Table_1
Abby	Mathematics	null	Table!1	Table_1
Suzy	Politics	null	Table!1	Table_1
Abby	null	China	Table!2	Table_2
Shane	null	USA	Table!2	Table_2
Chris	null	India	Table!2	Table_2

# Union Example

Manual: you can drag the other data file

Wildcard: it will choose all file existing in the same folder.

product + sales

Add

Works\_Customers

Interpreter

Interpreter might be able to  
r Text file workbook.

reWor...Calendar.csv

reWo...stomers.csv

reWor...egories.csv

reWor...egories.csv

reWor...Products.csv

reWorks\_Returns.csv

reWor...les\_2015.csv

reWor...les\_2016.csv

reWor...les\_2017.csv

reWork...rritories.csv

AdventureWorks\_Sales\_2...

Open...

Rename

Remove

Field names are in first row

Generate field names automatically

Text File Properties...

Convert to Union...

Sort fields

Drag tab

AdventureWorks_Sales_2...	AdventureWorks_Sales_2...	AdventureWorks_Sales_2015...	Adventure
Order Date	Stock Date	Order Number	Product
1/1/2015	9/21/2001	S045080	
1/1/2015	12/5/2001	S045079	
1/1/2015	10/29/2001	S045082	
1/1/2015	11/16/2001	S045081	

AdventureWorks\_Sales\_2015.csv+

Specific (manual) Wildcard (automatic)

Connection: AdventureWorks\_Customers

AdventureWorks\_Sales\_2015.csv

Fields Data source

AdventureWorks\_Sales\_2015.csv

Stock Date

9/21/2001

12/5/2001

10/29/2001

11/16/2001

Tables in union: 1

Apply OK

AdventureWorks_Sales_2015.csv	Stock Date	Order Number	Product
	9/21/2001	S045080	
	12/5/2001	S045079	
	10/29/2001	S045082	
	11/16/2001	S045081	

# Exercise

---

- Create new folder for sales data including (Sales\_2015,sales\_2016)
- Import (sales\_2015.csv) to tableau desktop data connection
- Right click on the (sales\_2015.csv) → Convert to Union
- Choose wildcard option → apply
- Then include (sales\_2017.csv) in the folder → refresh tableau connection
- Check if the data for (2017) was added.