



Tableau





Introduction

Why Tableau?

- Ultimate skill for Data Science
- Apply to any Business
- You don't need to do any Coding
- It makes it easier to understand and explain the Data Reports
- Community is Huge
- Fast and Easy

Why Visualization?

One of the most important benefits of visualization is that it allows us visual access to huge amounts of data in easily digestible visuals.

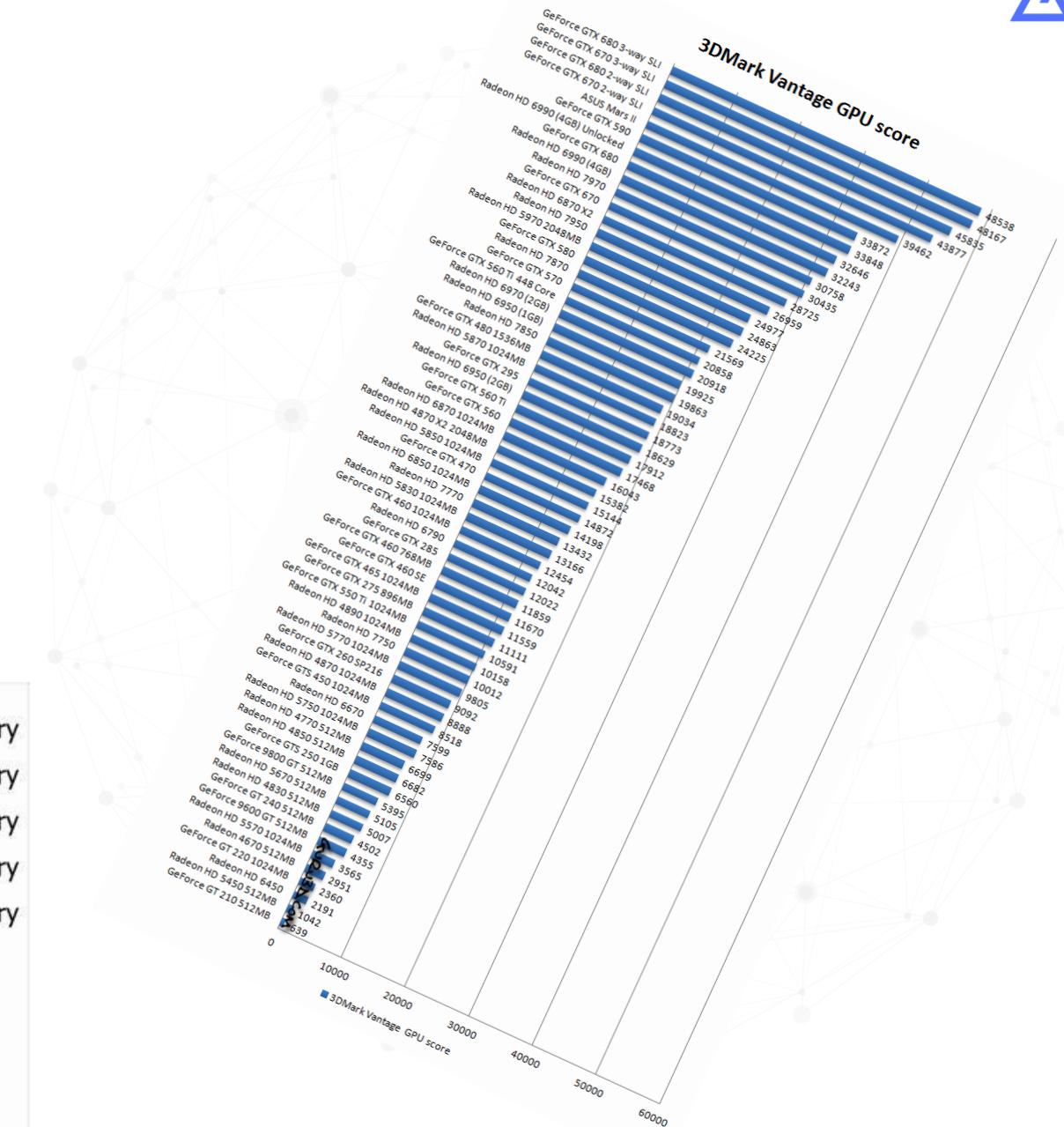
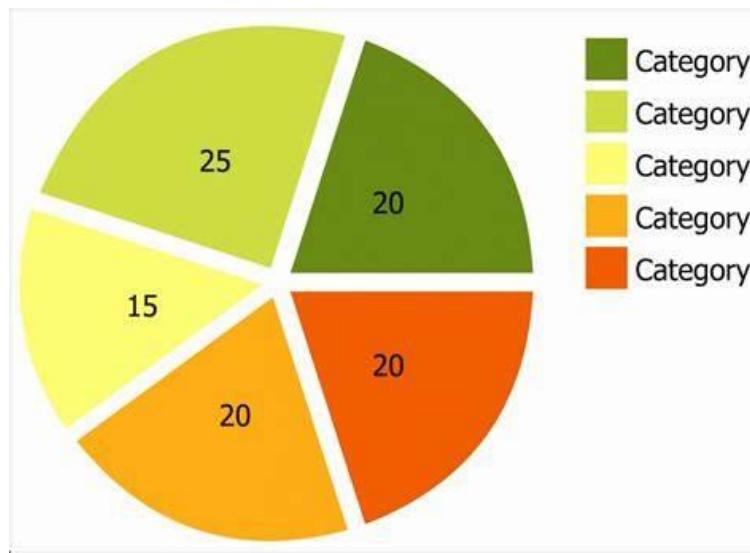
Well designed data graphics are usually the simplest and at the same time, the most powerful.



Data Visualization

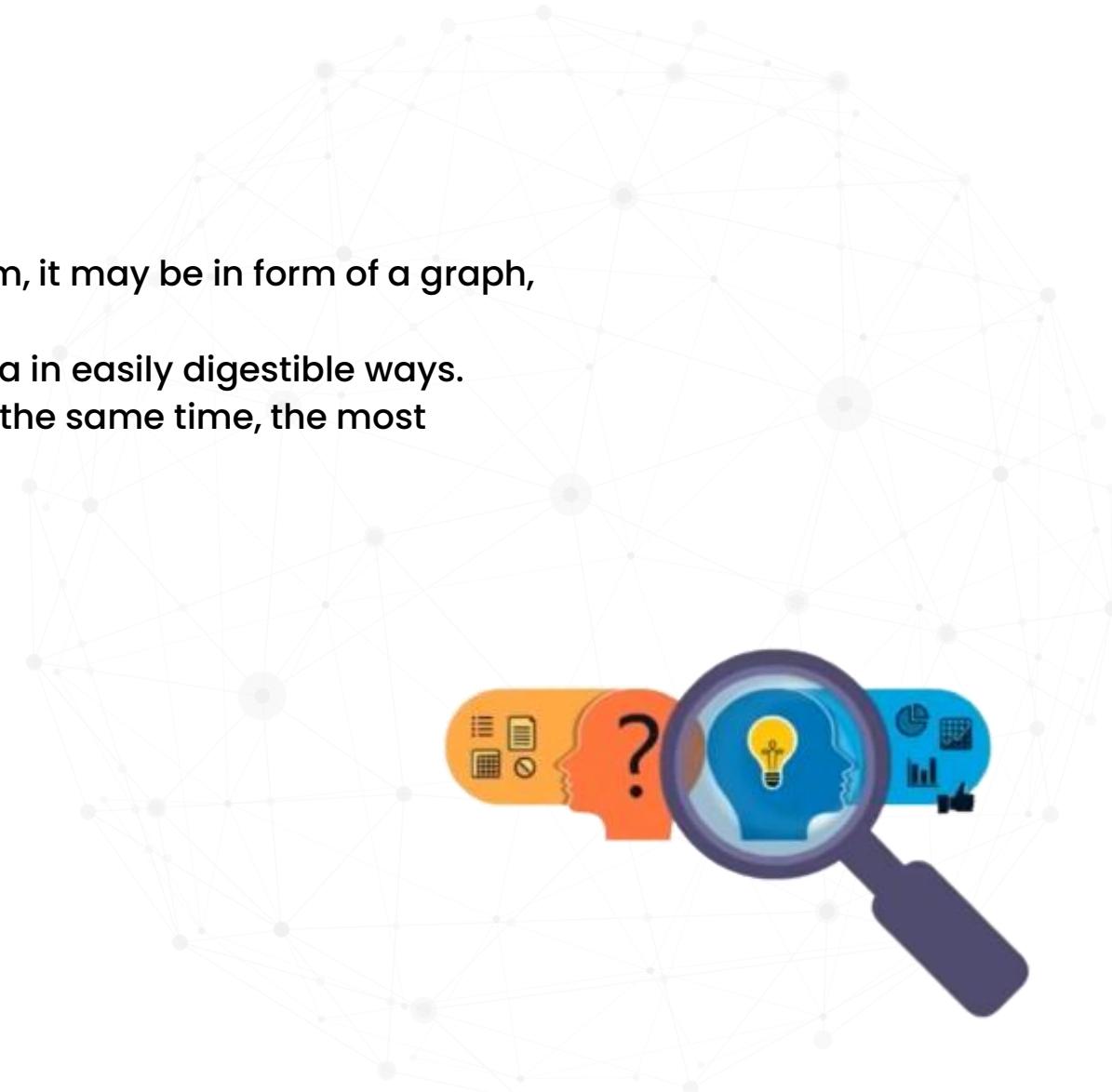


Data Visualization



Data Visualization

- Data Visualisation is representing your data in a pictorial form, it may be in form of a graph, bar diagram or different kind of charts.
- Visualisation allows us visual access to huge amounts of data in easily digestible ways.
- Well designed data graphics are usually the simplest and at the same time, the most powerful.



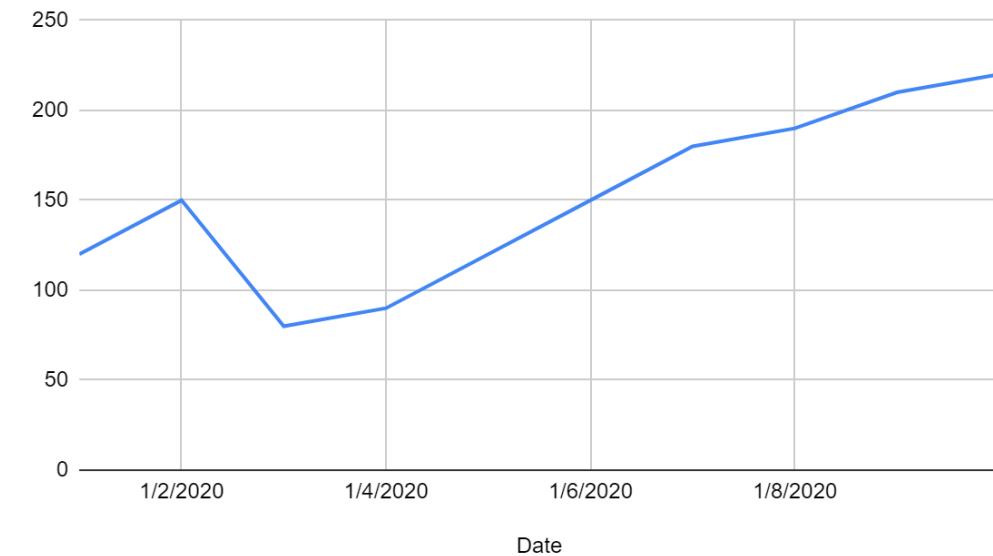


Power of Data Visualization

Date	Sales
1/1/2020	120
1/2/2020	150
1/3/2020	80
1/4/2020	90
1/5/2020	120
1/6/2020	150
1/7/2020	180
1/8/2020	190
1/9/2020	210
1/10/2020	220



Sales vs. Date





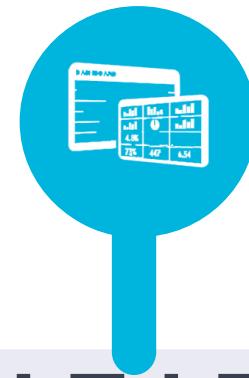
Visual Analysis

Integrate



Before visualizing data it is necessary to integrate, identify and prepare the data.

Analyze



After integrating data the next step is analyzing the data which is collected to visualize it.

Visualize



After analyzing the data next step is to create visuals to interpret data.



Visual Analysis

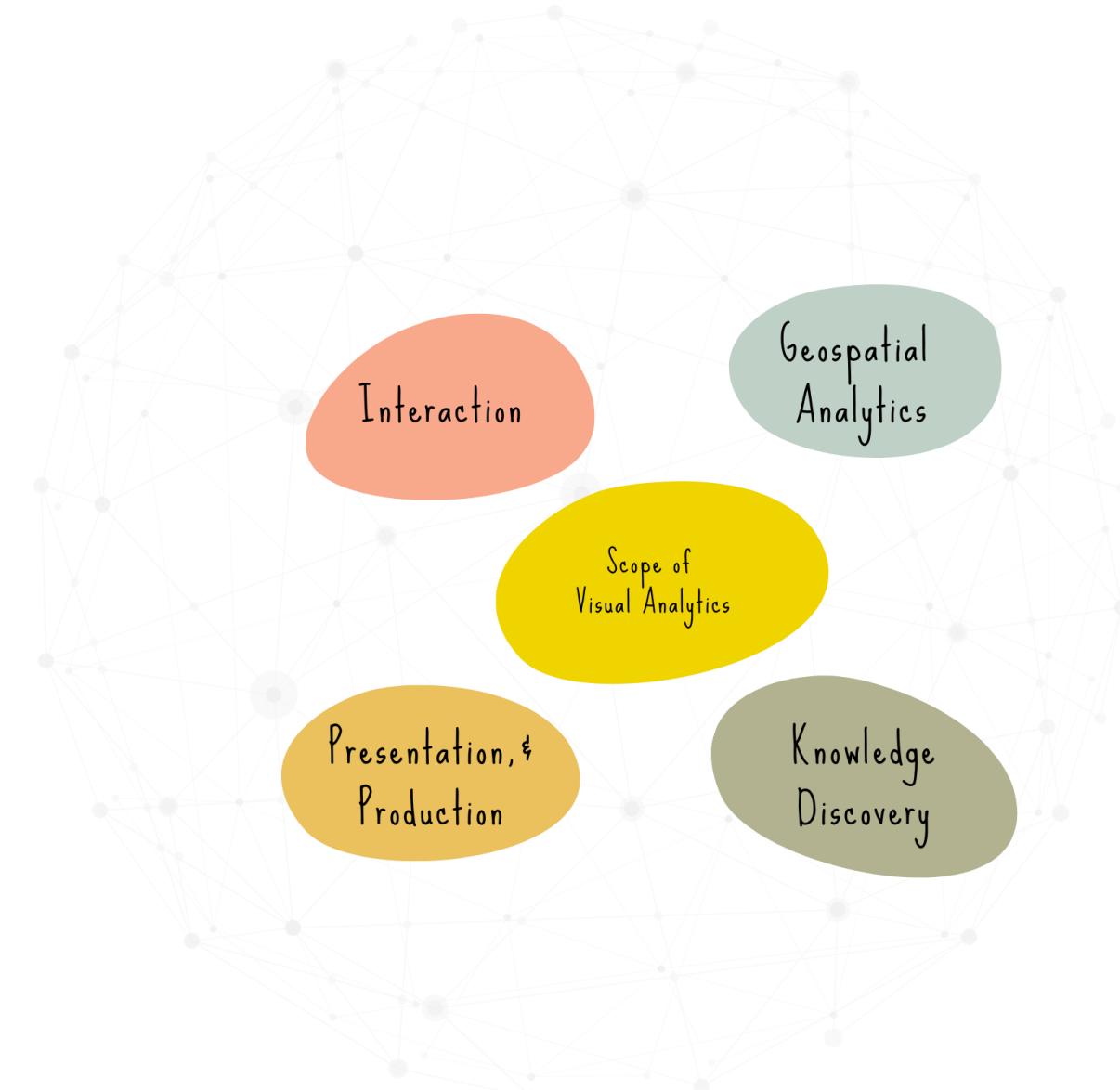
Visual analytics is essentially the marriage of data analytics and visualizations. This approach to solving problems is concerned with integrating interactive visual representations with underlying analytical processes to effectively facilitate high-level, complex activities, such as reasoning and data-driven decision making. Visual analytics falls under the category of visual business intelligence and visual business analytics, employing practices such as data mining and statistical work to visualize information in a format that is easy for humans to understand.





Scope of Visual Analysis

Visual analytics is used widely. It can be used for informational analytics, geospatial analytics, scientific analytics, knowledge discovery, data management and knowledge representation, and there are many more usage of it.





Scope of Visual Analysis

Decision Making &
Sense of Risk



Key Strategic
Initiative

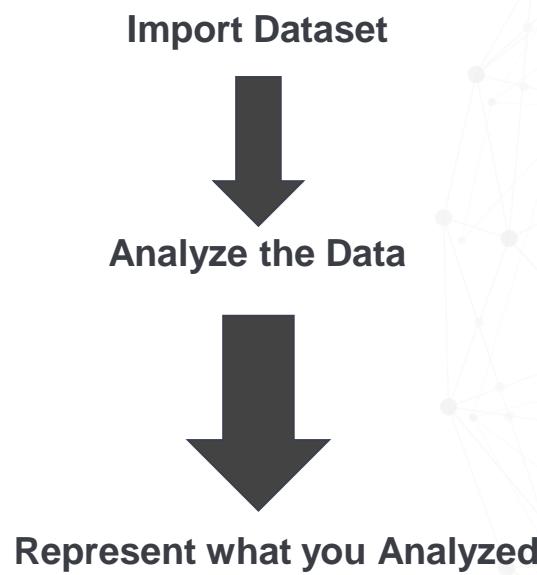


Customer
Relationship

Financial
Performance



How does Data Viz work?



BI Process



What will the weather
be like tomorrow?

Tomorrow will be
20 degrees and cloudy



BI Process



Get Data

Easily connect, clean, and mashup data



Analyze

Build powerful models and flexible measures



Visualize

Create stunning interactive reports



Publish

Share insights with others



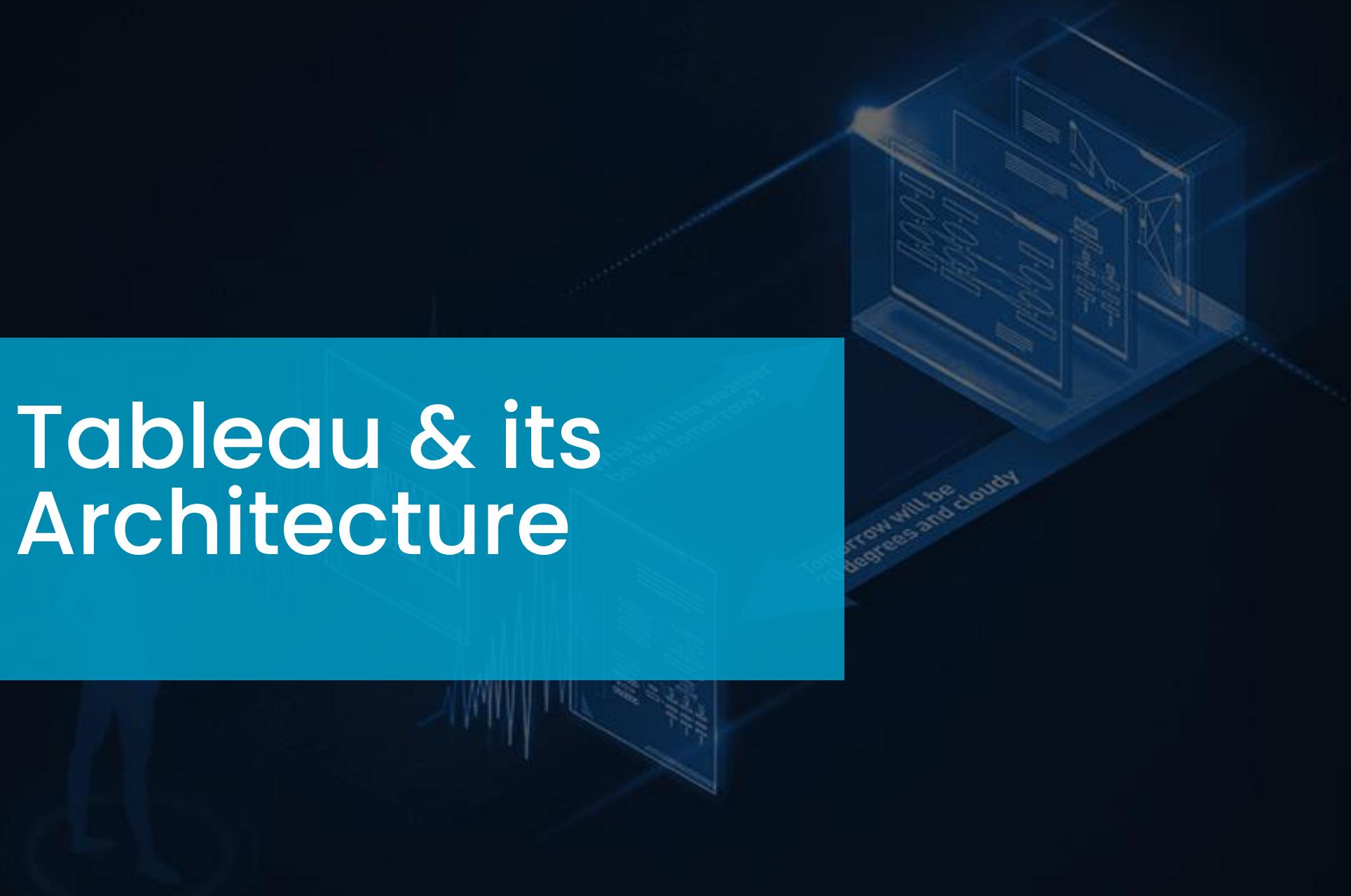
Collaborate

Empower your organization with self-service analytics





Tableau & its Architecture





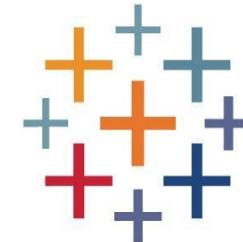
Tableau

- Tableau is a powerful and fastest growing data visualization tool used in BI (business intelligence) industry.
- Tableau helps the world's largest organizations unleash the power of their most valuable assets: their data and their people.
- Allows the customers to spend more time on Data Analysis and less on Data Wrangling.
- It helps in simplifying raw data in a very easily understandable format.
- Tableau helps create the data that can be understood by the professionals at any level in an organization.
- It also allows non-technical users to create dashboard.

Features of Tableau

The most significant features are as follows

Easy implementation



Quality Customer support

Amazing Data Visualization

Data source integration

Mobile support

Rich online community

Why Tableau?

Flexibility

It is highly flexible you can connect to any kind of data using tableau. Also it has optimized data connectors for databases.

1

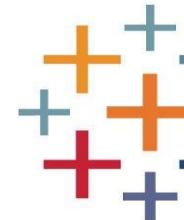
2

4

3

Intuitive Platform

It is highly used industrial tool and has vast uses. You can play and tweak with visuals you have created.



Interactive visuals

Tableau is a top class visualization tool and hence it has many visuals for your data. You can use variety of visualizations to interpret your data easily.

Quick Prediction time

Tableau is in Gartner's magic quadrant from many years. Tool is very quick in predicting insights.



Tableau vs PowerBI



Power BI VS. + a b | e a u.

Criteria	Power BI	Tableau
Cost	Starts at \$9.99/ user/month	Starts at \$500/ user/year
Ease of Use (10%)	5	4
Implementation (20%)	4	5
Customization (20%)	3	2
Integrations (20%)	3	5
Customer Support (15%)	4	5
Features & Add-ons (15%)	3	2
Total Rating 1-5	3.55	3.85



Tableau Architecture

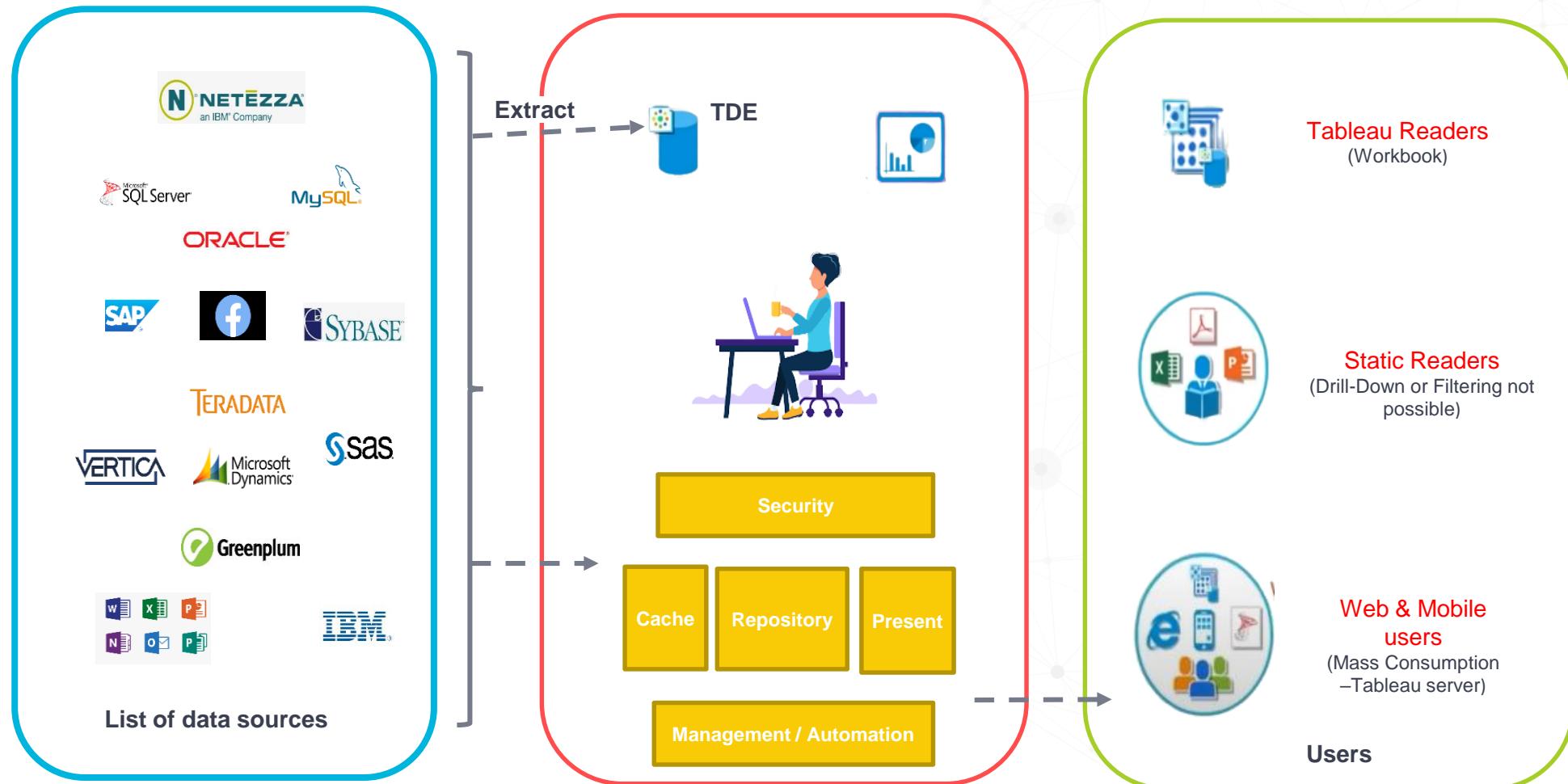




Tableau Installation

https://help.tableau.com/current/desktopdeploy/en-us/desktop_deploy_download_and_install.htm

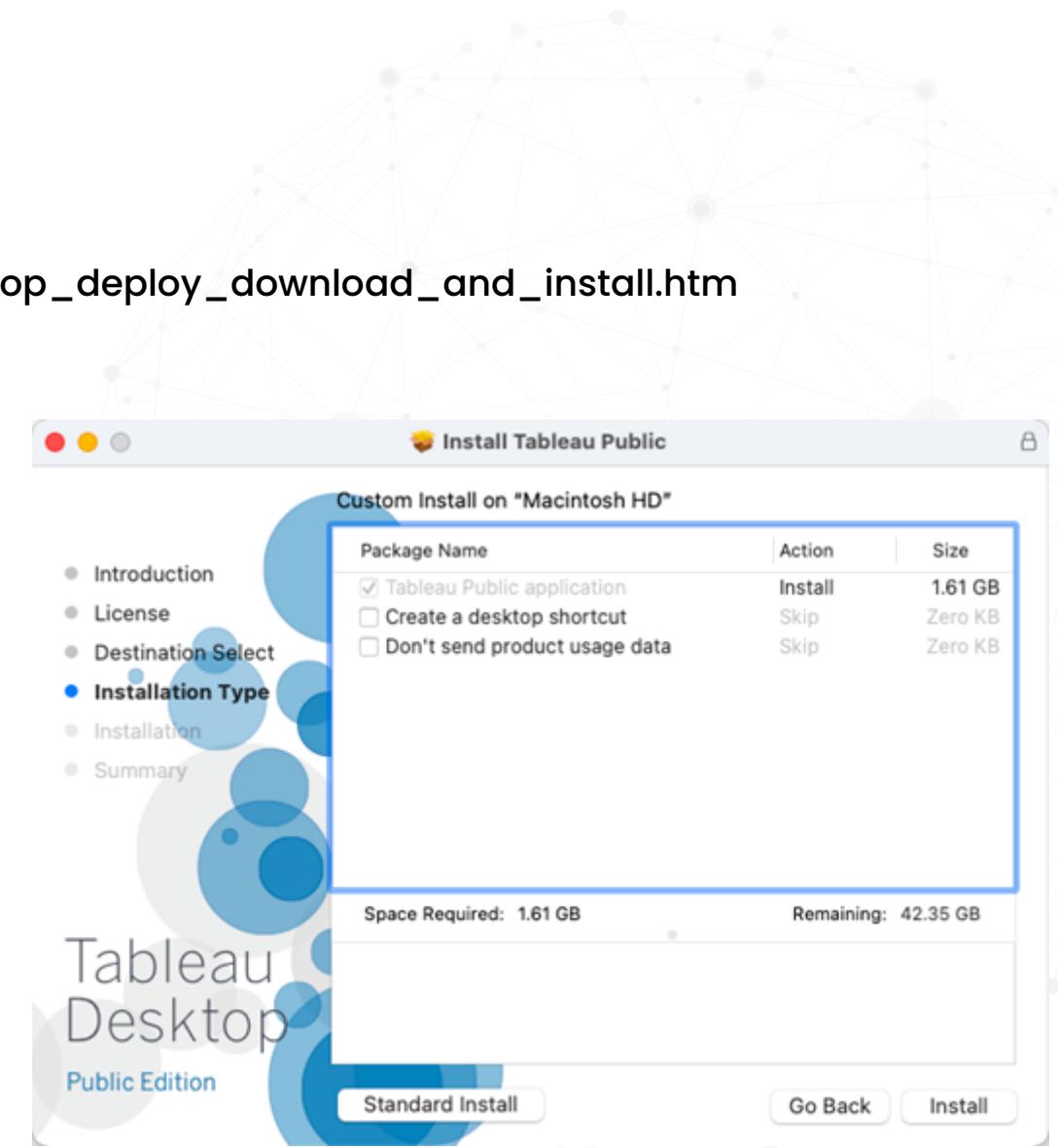
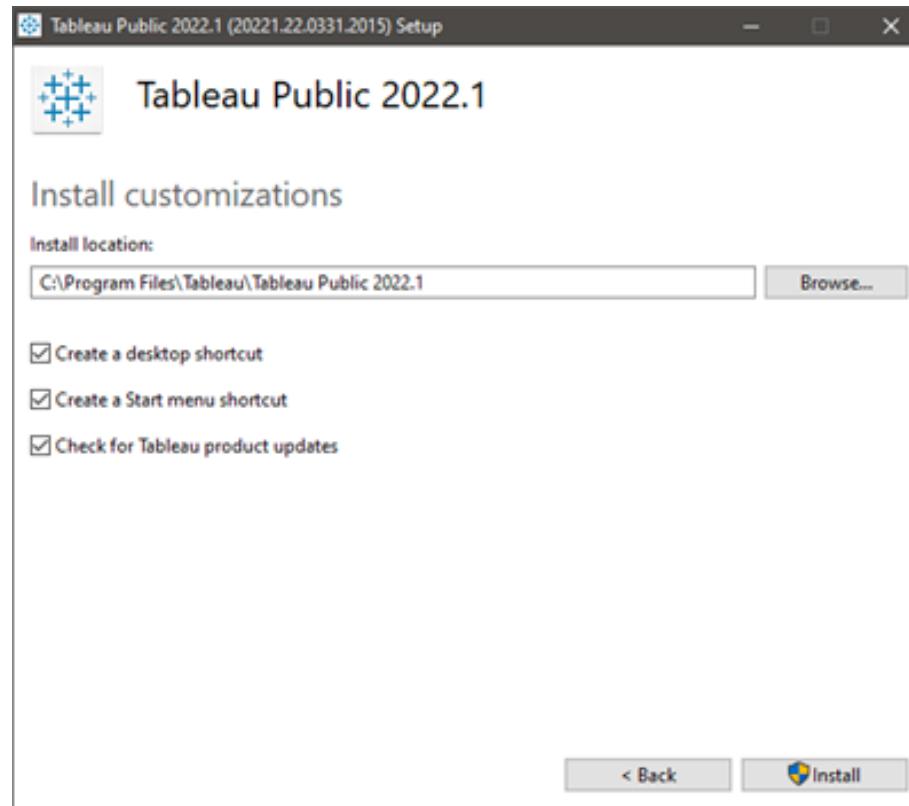
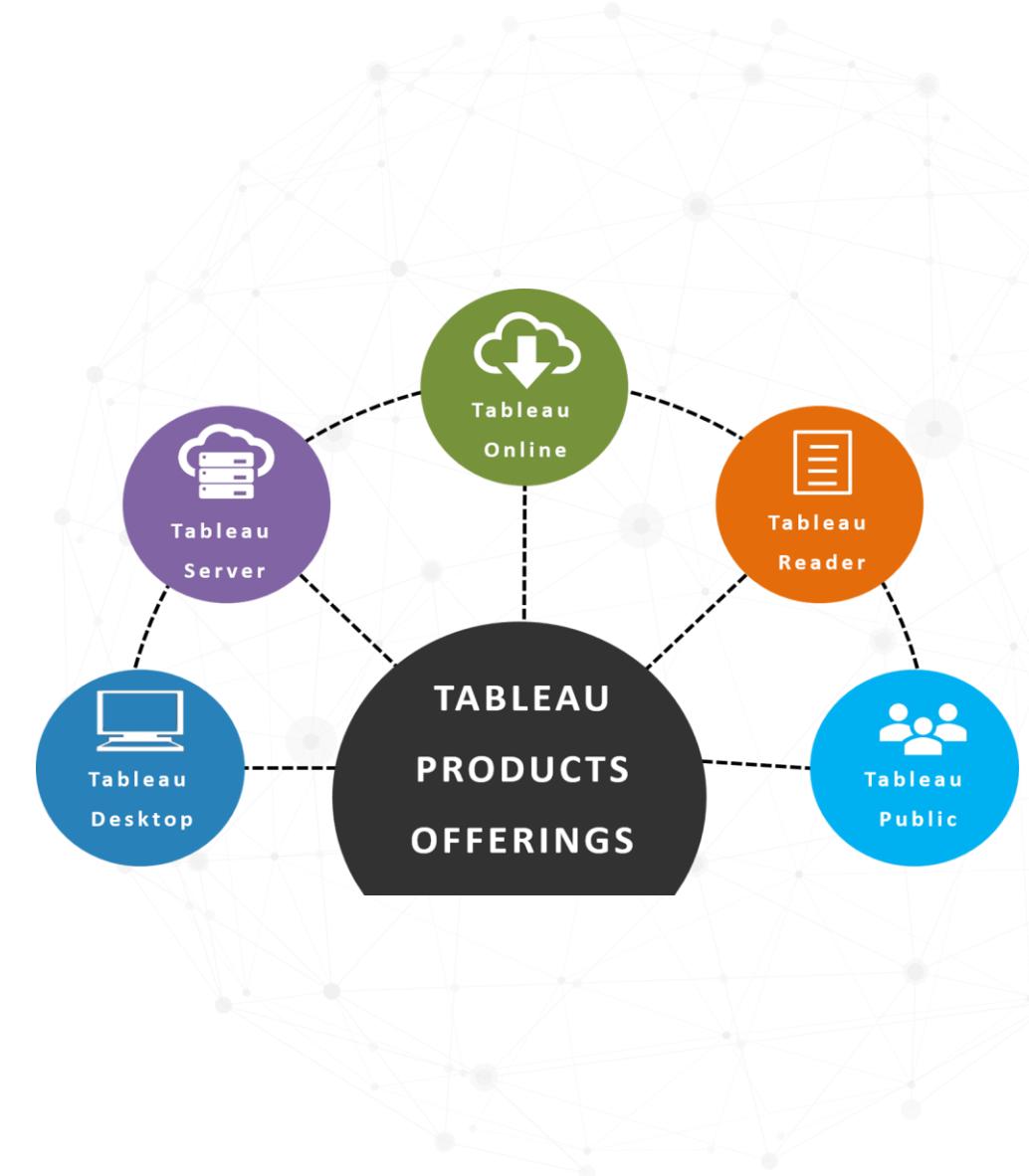


Tableau Product Line

- Tableau Server
- Tableau Online
- Tableau Public server
- Tableau Desktop
- Tableau Public Desktop
- Tableau Reader
- Tableau Mobile
- Tableau Prep Builder





Advantages of Tableau



High Performance



Mobile Friendly



Extensive Customer Resources



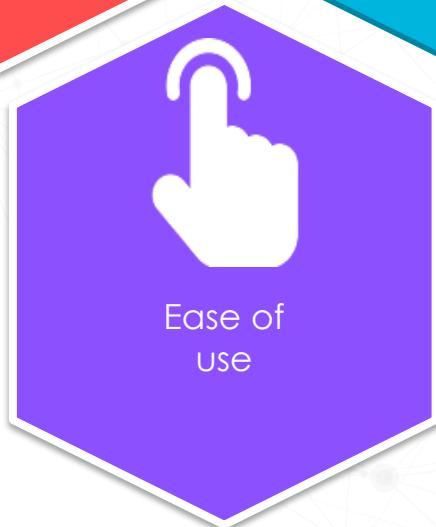
Easy to Upgrade



Low Cost



Quality Customer Service



Ease of use

How to use Tableau?



What will the weather
be like tomorrow?

Tomorrow will be
degrees and cloudy



Connecting to Data

1. Start Tableau Desktop and on the Connect pane, under Search for Data, select Tableau Server.
 1. To connect to Tableau Server, enter the name of the server and then select Connect.

To connect to Tableau Online, select Tableau Online under Quick Connect.

 1. To sign in:
 - a. For Tableau Server, enter your user name and password.
 - b. For Tableau Online, enter your email address and password.
 1. Select a data source from the list of published data sources. (Data that you don't have Connect permissions for is grayed out.)

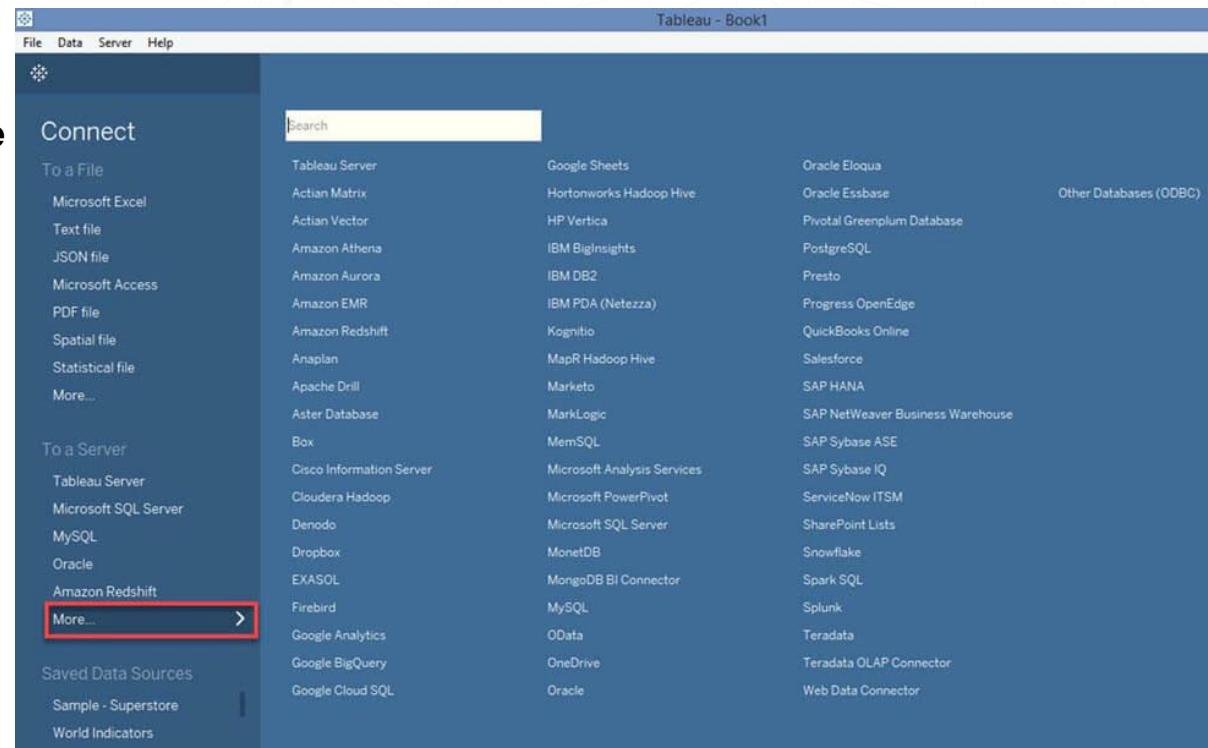




Tableau Datatypes

Sl. No.	Type	Size	Description
Integers			
1	Byte	8 bits	Byte length integer
2	Short	16 bits	Short Integer
3	Int	32 bits	Integer
4	Long	64 bits	Long Integer
Real Numbers			
5	Float	32 bits	Single Precision floating point
6	Double	64 bits	Double Precision floating point
Other Types			
7	char	16 bit Unicode character	A single character
8	Boolean	True or false	A Boolean value



Tableau Desktop

What will the weather
be like tomorrow?

Tomorrow will be
20 degrees and cloudy



Tableau Desktop UI

The screenshot illustrates the Tableau Desktop User Interface (UI) with various menu bars, toolbars, and workspace controls.

Data Window: Shows the "Tableau - My Workbook" interface with the following sections:

- Data:** Orders (Superstore Sales Train...)
- Dimensions:** Department, Item, Order Date, Order Priority, Postal Code, Region, Ship Date, Ship Mode, State, SubRegion, Measure Names.
- Measures:** Order Quantity, Product Base Margin, Profit, Row, Sales, Shipping Cost, Unit Price, Latitude (generated), Longitude (generated), Number of Records, Measure Values.

Toolbars: Standard toolbar icons for file operations, zoom, and selection.

View Cards: Displays a visualization of Sales by Customer Segment across four years (2010-2013). The visualization includes:

- Columns: SUM(Sales)
- Rows: YEAR(Order Date), Customer Segment
- Marks: Bar
- Color, Size, Label, Detail, Tooltip buttons.
- Summarized values: 506,723, 1,836,332.
- Labels: 50K, \$1,000K, \$2,000K, \$3,000K, \$4,000K, Sales.

Workspace Controls: Includes tabs for "My Worksheet 1" and "My Worksheet 2".

Status Bar: Shows "16 marks", "16 rows by 1 column", and "SUM(Sales): 530,070K".

Sheet Tabs: Shows tabs for "My Worksheet 1" and "My Worksheet 2".



Tableau UI - Dimensions and Measures

Dimensions typically contain qualitative values (such as names, dates, or geographical data). And measures typically contain things you can measure, like numeric and quantitative values.

Dimension is a field that is an independent variable

Measure is a field that is a dependent variable

But there is a more important conceptual difference.

Dimensions split up the data set into different categories and reveal different levels of detail in the data.

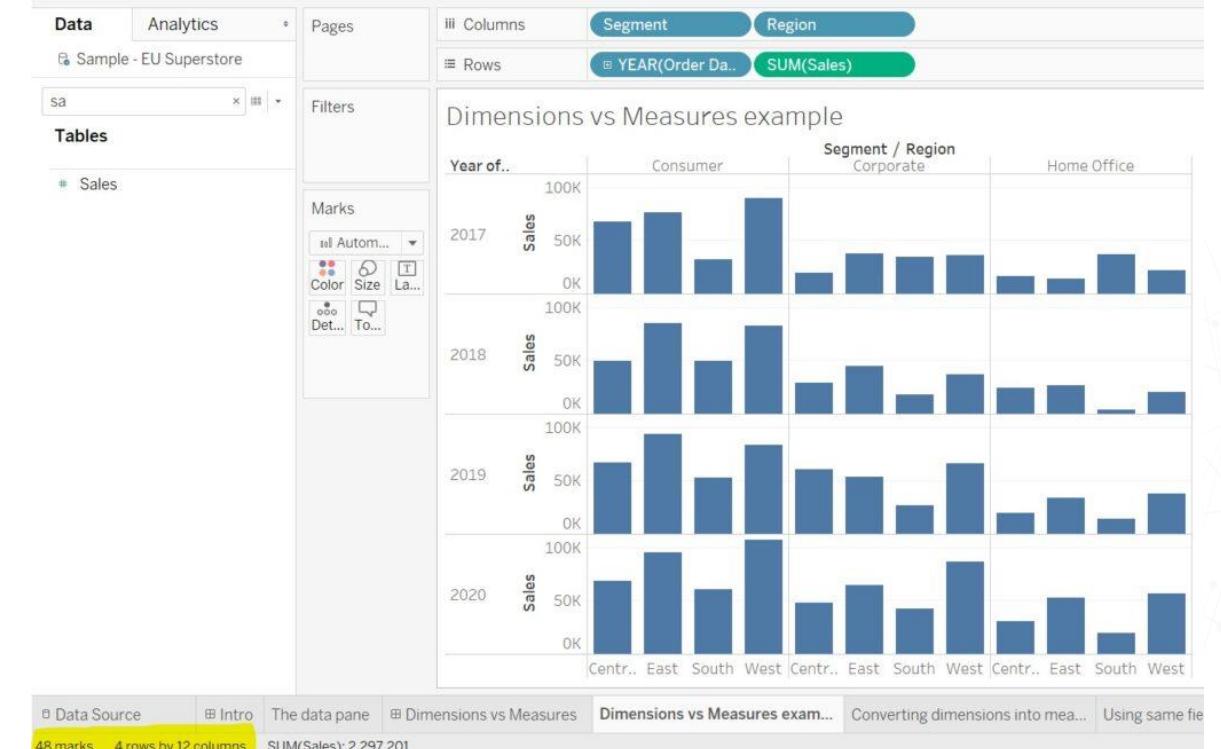
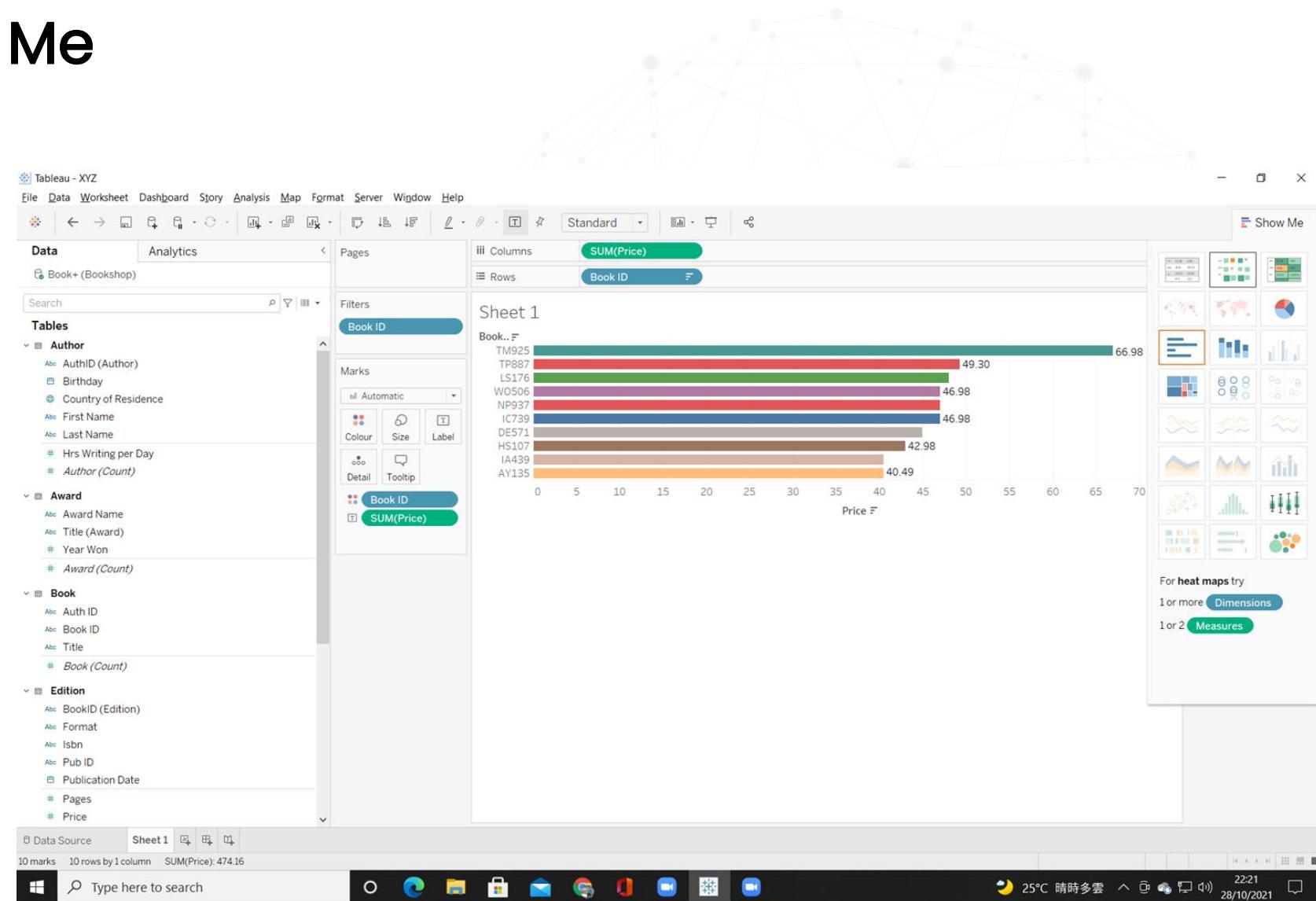




Tableau UI - Show Me

Show Me window holds the most commonly used charts in Tableau. You can use any of these charts to view the data. Click Show Me on the toolbar to open this window, as we have shown below.



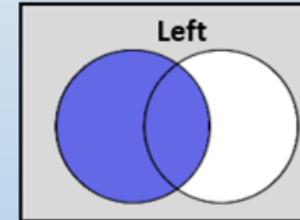
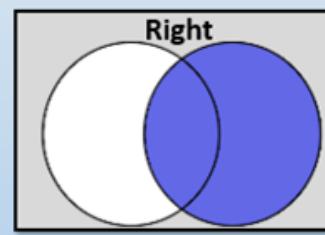
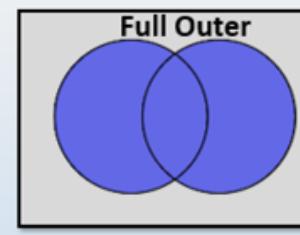
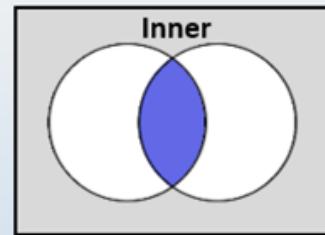


Functions in Tableau

What will the weather
be like tomorrow?

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degrees and cloudy

Relationship, Join and Union



The screenshot shows the Tableau interface with a network background. A context menu is open over a sheet labeled 'August2016'. A callout points from the 'New Union' option in the 'Sheets' list to the 'Connection: Purchases' dialog. The dialog lists tables: 'July2016', 'June2016', 'May2016', and 'August2016'. The 'August2016' table is selected and highlighted with an orange border. A cursor is hovering over the 'Remove' button next to the August table. At the bottom of the dialog, it says 'Tables in union: 3' with 'Apply' and 'OK' buttons.



Set

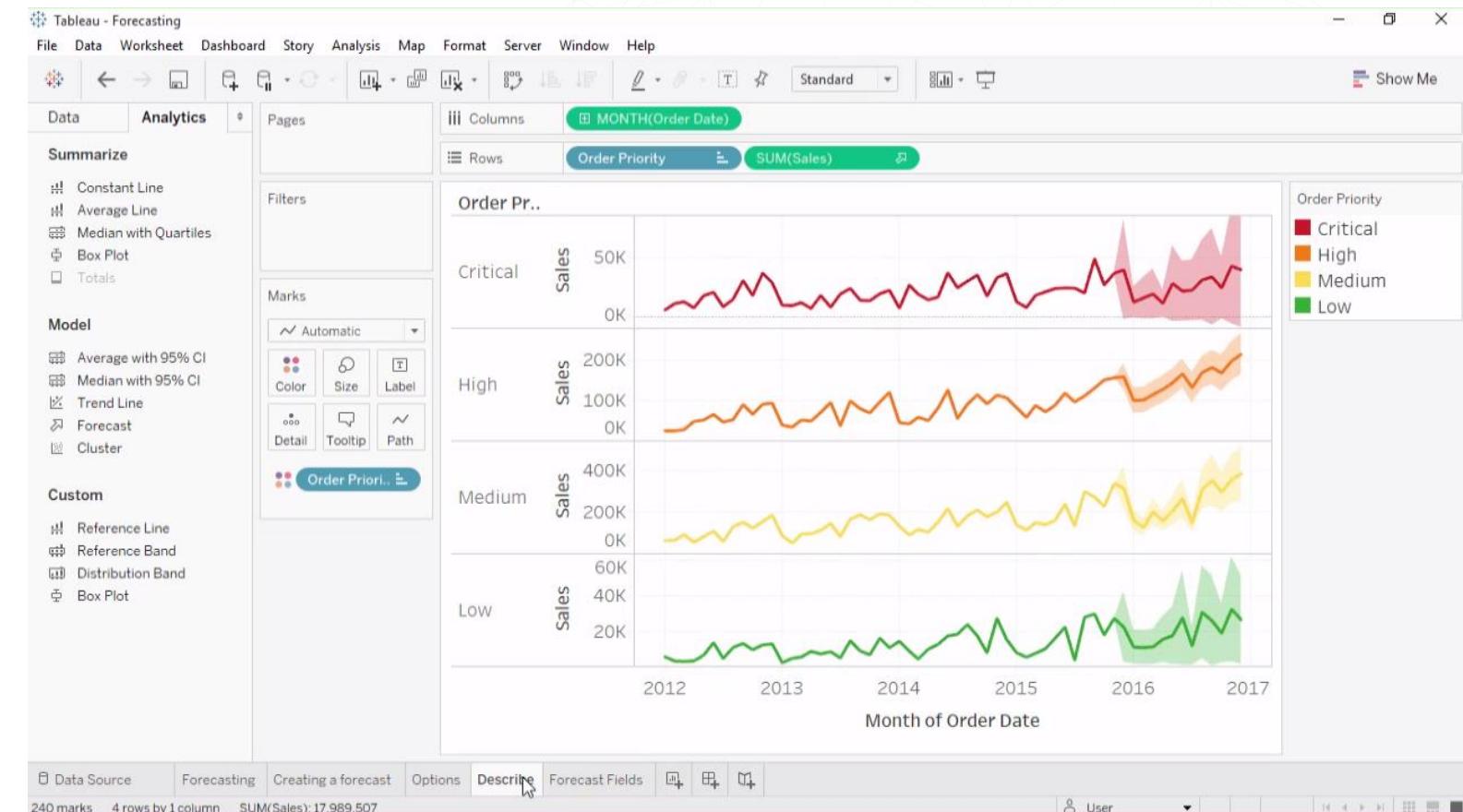
Tableau Sets are custom fields used to hold the subset of data based on a given condition. In real-time, you can create a set by selecting members from the list or a visualisation. You can also do the same by writing custom Conditions or Selecting Top/Bottom few records in a Measure.

The screenshot shows the Tableau Data Source pane. On the left, there are three sections: Dimensions, Measures, and Calculations. Under Dimensions, there are three collapsed categories: Customer, Order, and Location. The 'Customer' category is expanded, showing 'Customer Name' (highlighted with a blue box), 'Segment', and 'Customer ID'. Under 'Order', there are 'Order Date', 'Order ID', and 'Ship Date'. Under 'Location', there are 'Country' and 'State'. Below these sections is a 'Measures' section containing '# Discount', '# Profit', and '=# Profit Ratio'. A context menu is open over 'Customer Name'. The menu has a header 'Add to Sheet' and several options: 'Duplicate', 'Rename', 'Hide', 'Aliases...', 'Create' (which has a submenu with 'Calculated Field...', 'Group...', 'Set...' which is highlighted with a blue box, and 'Parameter...'), 'Transform', 'Convert to Measure', 'Change Data Type', 'Geographic Role', 'Default Properties', 'Group by', and 'Folders'.



Forecasting

Forecasting is a process of depicting future trends by identifying regular patterns in measure values. This technique of identifying regular patterns from existing data values and giving a forecast is known as exponential smoothing.

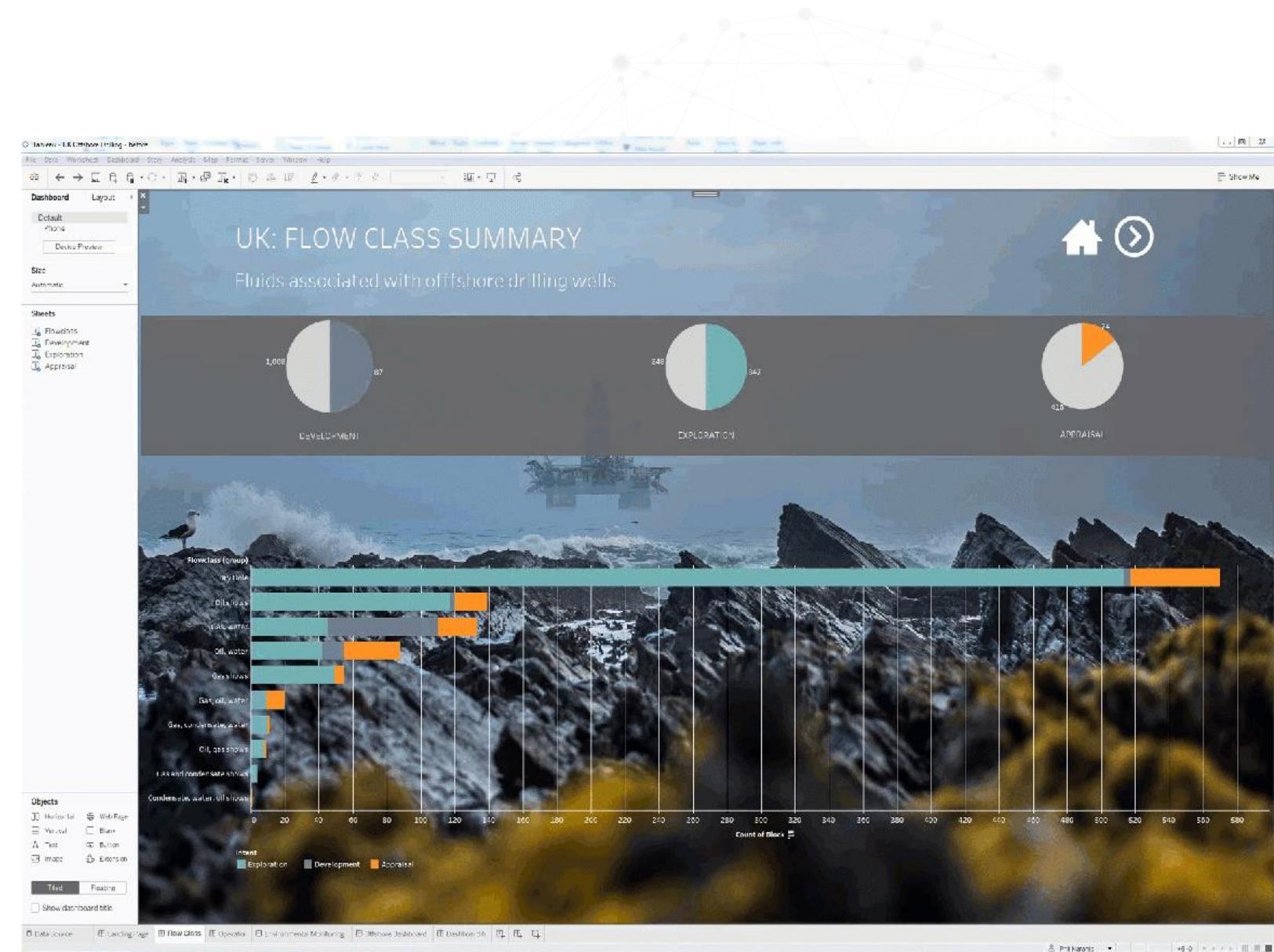




Highlighting

Highlight actions allow you to call attention to marks of interest by coloring specific marks and dimming all others. You can highlight marks in the view using a variety of tools. For example, you can manually select the marks you want to highlight, use the legend to select related marks, use the highlighter to search for marks in context or create an advanced highlight action.

Methods: Select Marks, Legends, Highlighter, Actions





Device Designer

With this feature, you can create specific, curated experiences for each device. Here's how to use device designer to make your viz shine on any device. Device Designer: letting you build different views for different devices.





Analytics Pane - Clustering

Marks

Shape

Colour

Size

Label

Detail

Tooltip

Shape

Clusters (1)

- Filter...
- Show Filter
- Show Highlighter
- Sort...
- Format...
- Include in Tooltip
- Describe clusters...**
- Edit clusters...
- Remove

Describe Clusters

Summary Models

Inputs for Clustering

Variables: Sum of #Passengers

Level of Detail: Year of Month

Scaling: Normalised

Summary Diagnostics

Number of Clusters: 3

Number of Points: 12

Between-group Sum of Squares: 1.0587

Within-group Sum of Squares: 0.15061

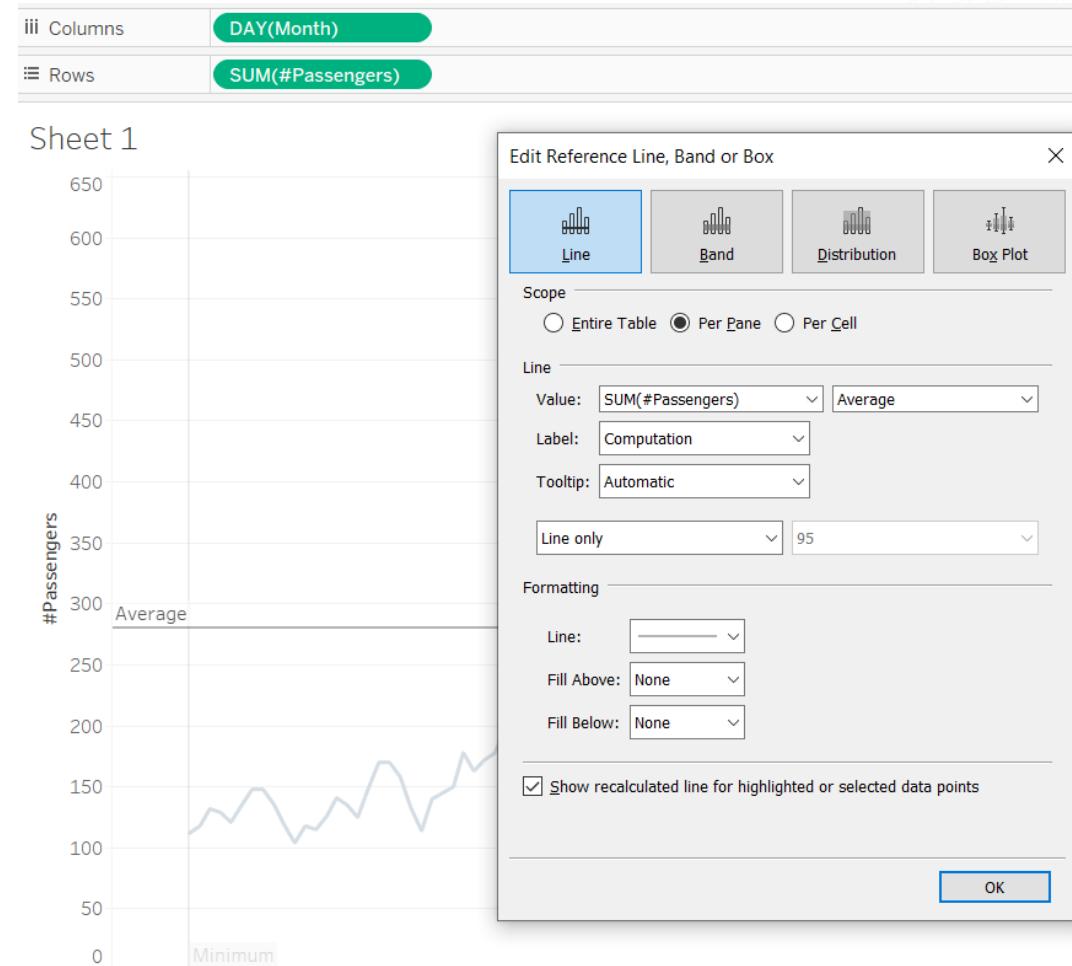
Total Sum of Squares: 1.2093

Show scaled centres

[Copy to Clipboard](#) [Learn more about the cluster summary statistics](#) [Close](#)



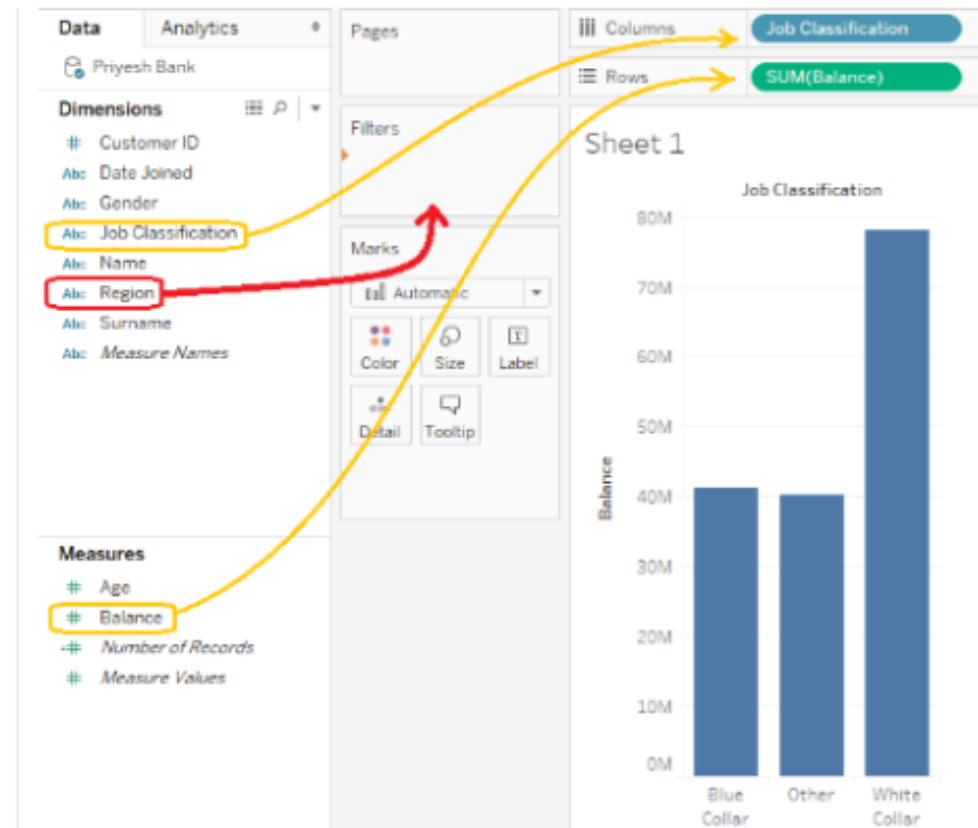
Analytics Pane - Reference Line



Filters

Filters in Tableau

- Quick Filter
- Context Filter
- Data Source Filters
- Measure Filter (Filter Shelf)
- Extract Filter (Data Source)
- Dimension Filter (Filter Shelf)



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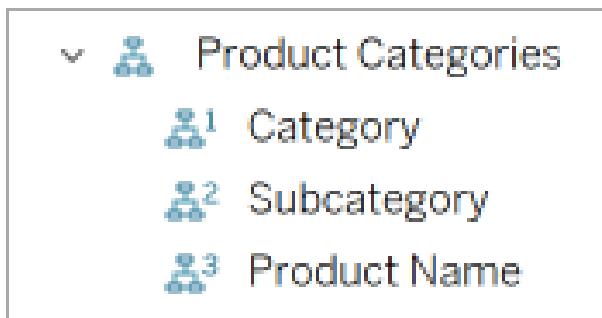


Drill, Down and UP

To drill down and drill up for individual dimension members in a hierarchy:

Right-click a table header and select Drill Down or Drill Up .

This is often referred to as non-uniform drill down because you expose only the members of interest instead of exposing all the members of a given level.



Category	Subcategory	Product Name	
Accessories	Bike Racks	Hitch Rack - 4-Bike	\$135,667.84
	Bike Stands	All-Purpose Bike Stand	\$20,829.00
	Bottles and Cages	Water Bottle - 30 oz.	\$16,427.35
		Mountain Bottle Cage	\$12,137.85
		Road Bottle Cage	\$7,749.38
Cleaners		Bike Wash - Dissolver	\$10,353.42
Fenders		Fender Set - Mountain	\$28,617.96
Helmets	Sport-100 Helmet, Red	Sport-100 Helmet, Red	\$8,599.45
	Sport-100 Helmet, Red	Sport-100 Helmet, Red	\$20,840.96
	Sport-100 Helmet, Red	Sport-100 Helmet, Red	\$65,227.02
	Sport-100 Helmet, Black	Sport-100 Helmet, Black	\$8,942.62
	Sport-100 Helmet, Black	Sport-100 Helmet, Black	\$21,749.05
	Sport-100 Helmet, Black	Sport-100 Helmet, Black	\$64,991.55
	Sport-100 Helmet, Blue	Sport-100 Helmet, Blue	\$10,384.35
	Sport-100 Helmet, Blue	Sport-100 Helmet, Blue	\$22,770.10
	Sport-100 Helmet, Blue	Sport-100 Helmet, Blue	\$67,598.23
Hydration Packs	Hydration Pack - 70 oz.	Hydration Pack - 70 oz.	\$55,923.42
Locks	Cable Lock	Cable Lock	\$11,024.98
Pumps	Minipump	Minipump	\$9,307.96
Tires and Tubes	Patch Kit/B Patches	Patch Kit/B Patches	\$4,603.82
	Mountain Tire Tube	Mountain Tire Tube	\$8,892.18
	Damper Tuner	Damper Tuner	\$5,222.01



Hierarchies

The hierarchy in Tableau is an arrangement where entities are presented at various levels. So, there's an entity or dimension under which there are further entities present as levels.

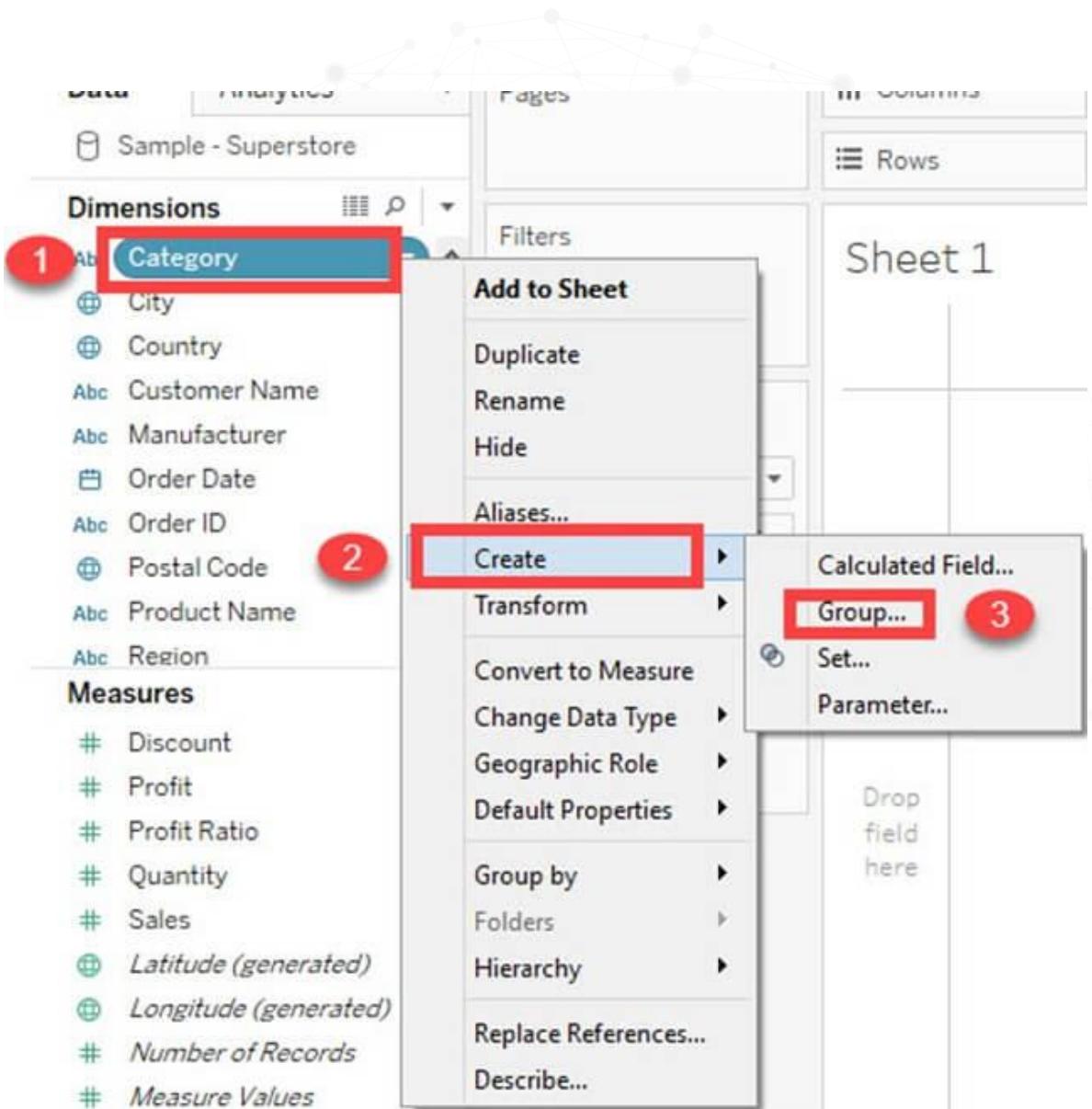
In Tableau, we can create hierarchies by bringing one dimension as a level under the principle dimension.

The screenshot shows the Tableau desktop interface with the 'Sample - Superstore' data source loaded. In the Data pane, the 'Dimensions' section is expanded, showing 'Country' as the top item. A context menu is open over 'Country', with step 1 circled in red. Step 2, 'Hierarchy...', is highlighted in the submenu, also circled in red. Step 3, 'Create Hierarchy...', is highlighted in the 'Add to Hierarchy' submenu, also circled in red. The main workspace displays a bar chart titled 'Sheet 1' with 'Category (group)' on the y-axis and 'Sales' on the x-axis, showing Furniture & Office S... and Technology as categories. The top of the interface includes the Analytics shelf with 'SUM(Sales)' and the Rows shelf with 'Category (group)'.

Groups

A Tableau Group is a set of multiple members combined in a single dimension to create a higher category of the dimension.

Tableau allows the grouping of single-dimensional members and automatically creates a new dimension adding the group at the end of the name.





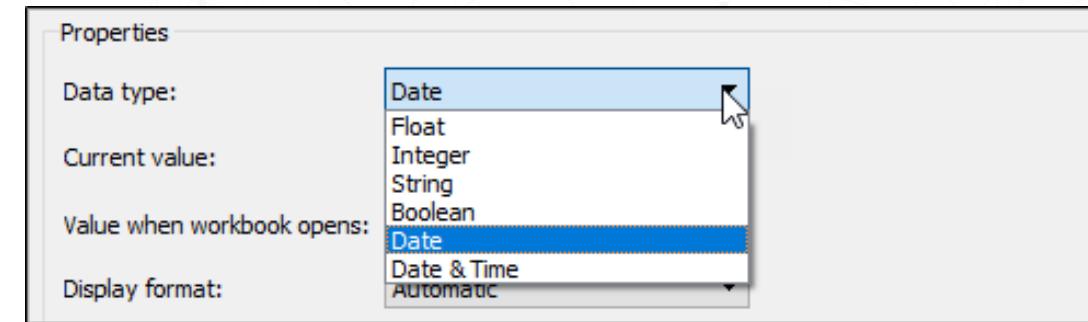
Creating a parameter in Tableau

–Specify a current value. This is the default value for the parameter.

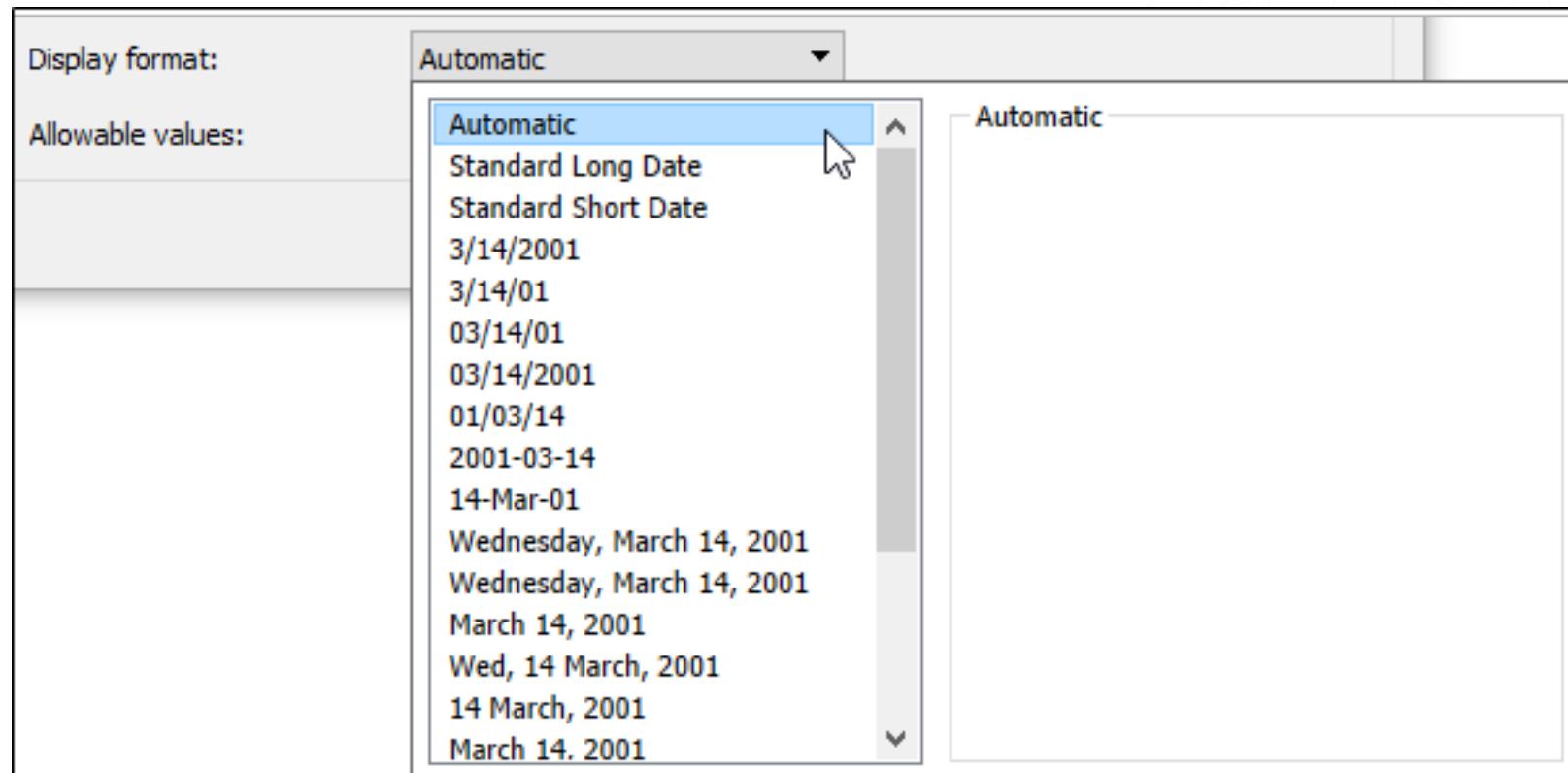
In this case, let's leave the field as is because we'll be using the latest data, which we'll configure in the next step.

Current value: 9/1/2019

–Specify the data type for the values it will accept:



Creating a parameter in Tableau



–Specify the display format to use in the parameter control



Creating a parameter in Tableau

- Specify how the parameter will accept values. You can select from the following options:
 - All - The parameter control is a simple text field.
 - List - The parameter control provides a list of possible values for you to select from.
 - Range - The parameter control lets you select values within a specified range.
- The availability of these options is determined by the data type. For example, a string parameter can only accept all values or a list. It does not support a range.
- If you select List, you must specify the list of values. Click in the left column to type your list of values, or you can add members of a field by selecting Add values from.

The screenshot shows the 'List of values' dialog box. On the left, there is a table with two columns: 'Value' and 'Display As'. The 'Value' column has a placeholder 'Click to add new value'. On the right, there is a dropdown menu for 'Source':

- Fixed
 - Add values from ▾ (highlighted with a blue border)
 - When workbook opens
 - None ▾



Creating a parameter in Tableau

-If you select Range, you must specify a minimum, maximum, and step size. For example, you can define a date range between January 1, 2019 and December 31, 2019, with the step size set to 1 month to create a parameter control that lets you select each month in 2019.

Range of values

Minimum:

Maximum:

Step size: Days

Fixed

When workbook opens



Creating a parameter in Tableau

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

The screenshot shows the Tableau Parameter Editor with the 'List of values' tab selected. On the left, there is a table with two columns: 'Value' and 'Display As'. The 'Value' column is currently empty and grayed out. The 'Display As' column also appears to be empty. To the right of the table, there are two radio button options: 'Fixed' and 'When workbook opens'. The 'When workbook opens' option is selected, and its dropdown menu is open, displaying five options: 'None', 'Date', 'Latest Month', 'Month with highest YoY growth', and 'Today's Month'. The 'Date' option is highlighted with a blue background and a cursor is hovering over it.



Creating a parameter in Tableau

-When finished, click OK.

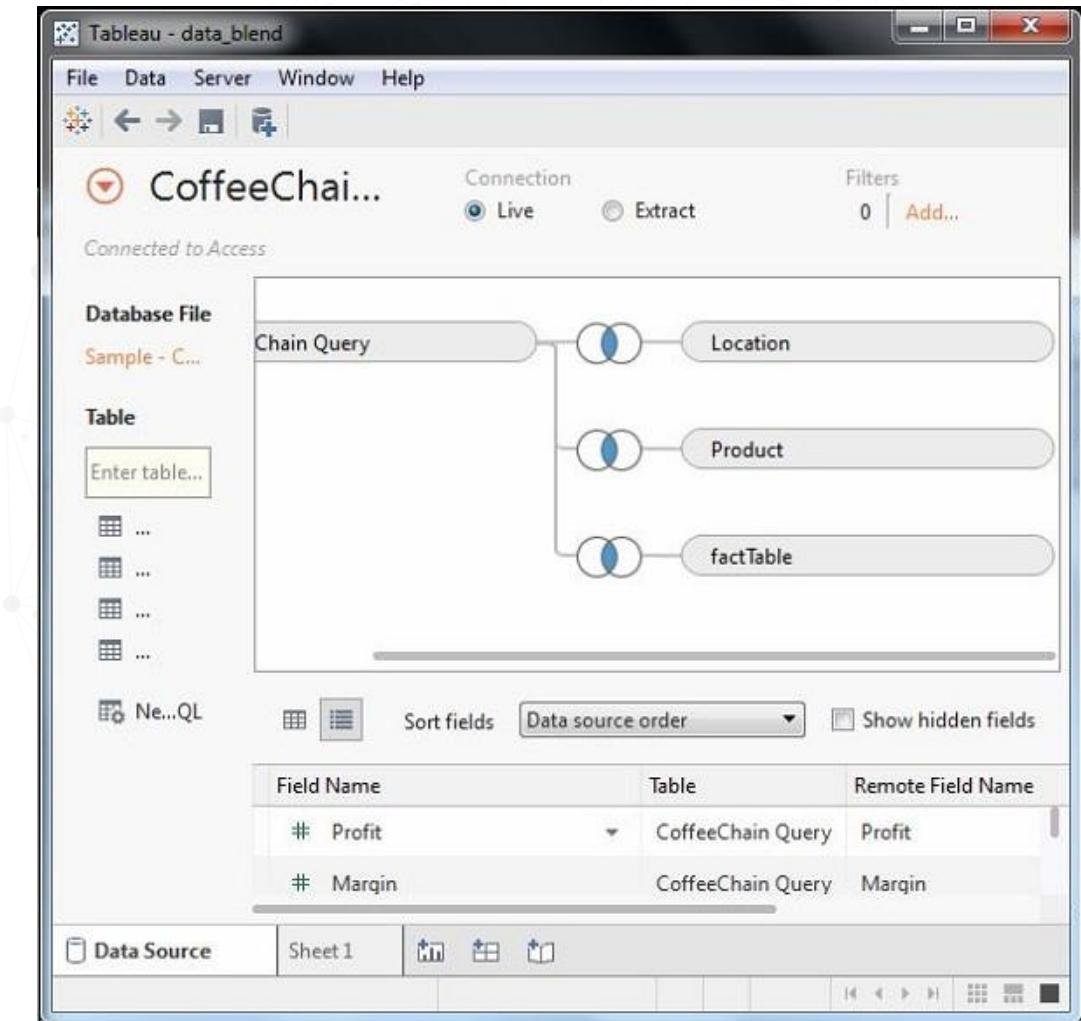
The parameter is now listed in the Parameters section at the bottom of the Data pane

The screenshot shows the Tableau Data pane. At the top, there are four items listed: "Latitude (generated)", "Longitude (generated)", "-# Number of Records", and "# Measure Values". The item "-# Number of Records" is highlighted with a green background and a dropdown arrow. Below this section is a header labeled "Parameters". Under "Parameters", there is one item: "Reference Date".



Data Blending

Data Blending is a very powerful feature in Tableau. It is used when there is related data in multiple data sources, which you want to analyze together in a single view. As an example, consider the Sales data is present in a relational database and Sales Target data in an Excel spreadsheet.





Blend vs Join vs Relationship

	Blend	Join	Relationships
Visual Cue			
# Data Sources	At least 2		1
# Connections	At least 1 per data source	Can be multiple	Can be multiple
Structure	Retain original table	New combined form	Retain original table
How tables are combined	Separate queries; linking field	Physical join	Logical; context specific
How numbers are aggregated	Based on primary	Based on join level granularity	Smart; context specific



Data Joining

Data joining is a very common requirement in any data analysis.

You may need to join data from multiple sources or join data from different tables in a single source.

Tableau provides the feature to join the table by using the data pane available under Edit Data Source in the Data menu.

The screenshot shows the Tableau Data pane within the 'Tableau - Book2' window. The pane displays a connection to an Excel file named 'Sample - Su...'. The 'Live' option is selected. A diagram at the top shows two tables, 'Orders' and 'Returns', connected by a line, with a callout indicating an 'Inner Join of "Orders and Returns." Order ID = Order ID (Returns)'. Below the diagram, the 'Sheets' section is empty, and the 'Sort fields' dropdown is set to 'Data source order'. The main area lists the fields from both tables:

Field Name	Table	Remote Field Name
Abc Order ID	Orders	Order ID
Order Date	Orders	Order Date
Ship Date	Orders	Ship Date
Abc Ship Mode	Orders	Ship Mode
Abc Customer Name	Orders	Customer Name
Abc Segment	Orders	Segment

Analysis

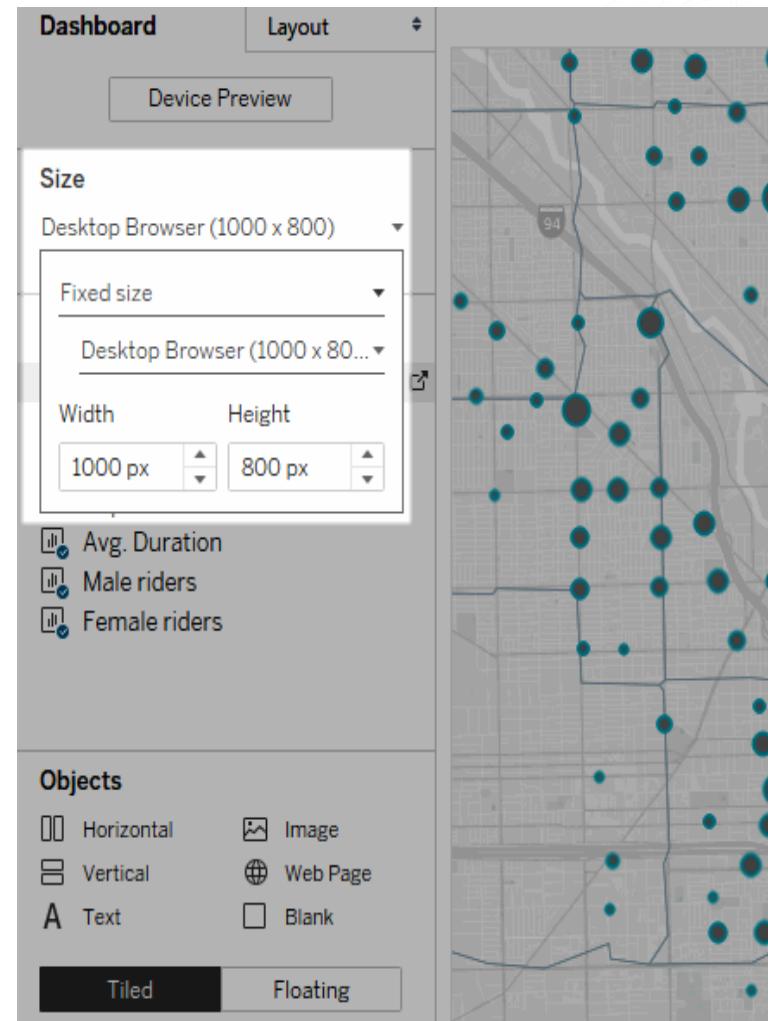
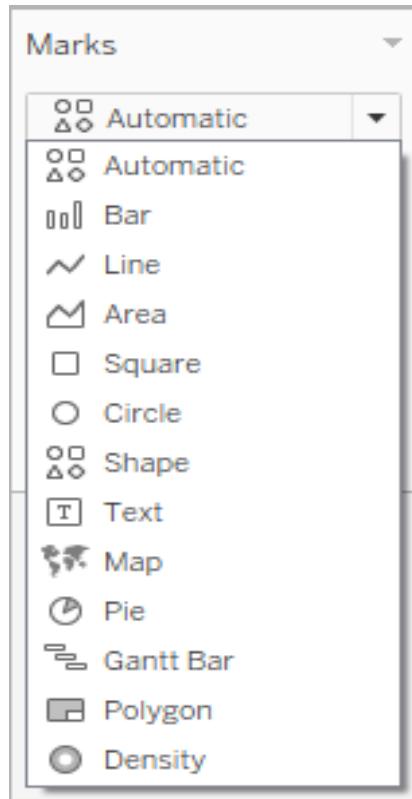
Tableau is an end-to-end data analytics platform that allows you to prep, analyze, collaborate, and share your big data insights.

Tableau excels in self-service visual analysis, allowing people to ask new questions of governed big data and easily share those insights across the organization.



Mark and Size

Type drop-down and select an option from the list.



Under Size on the Dashboard pane, select the dashboard's dimensions (such as Desktop Browser) or sizing behavior (for example, Automatic)



Transparency

The ability to set fully transparent backgrounds to worksheets in dashboards!

Step 1. right click and select format

Step 2. Select Shading

Step 3. Select none

Step 4. Some just for fun, add a semi-transparent box behind the graphs to help set them apart from the background.





Data Aggregation

Step 1: Create a Parameter with All Date Aggregations

Edit Parameter [Dynamic Order Date] X

Name: Comment >>

Properties

Data type: ▼

Current value: ▼

Value when workbook opens: ▼

Display format: ▼

Allowable values: All List Range

List of values

Value	Display As
day	Day
month	Month
quarter	Quarter
year	Year
week	Week

Fixed Add values from >
 When workbook opens None ▼
Clear All

OK Cancel



Data Aggregation

flexi order date

X

Step 2: Create a Calculated Field to Change Date Aggregations

`DATETRUNC([Dynamic Order Date], [Order Date])`

The calculation is valid.

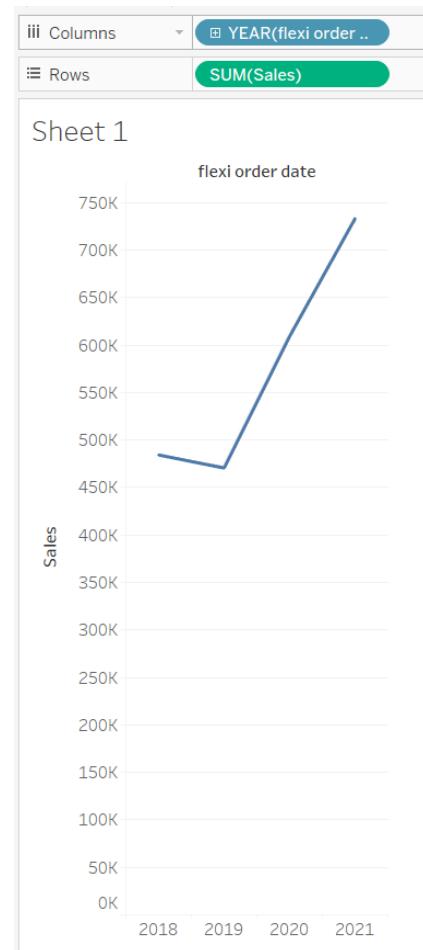
1 Dependency ▾

Apply

OK



Data Aggregation



Sheet 1

Columns: YEAR(flexi ord..)

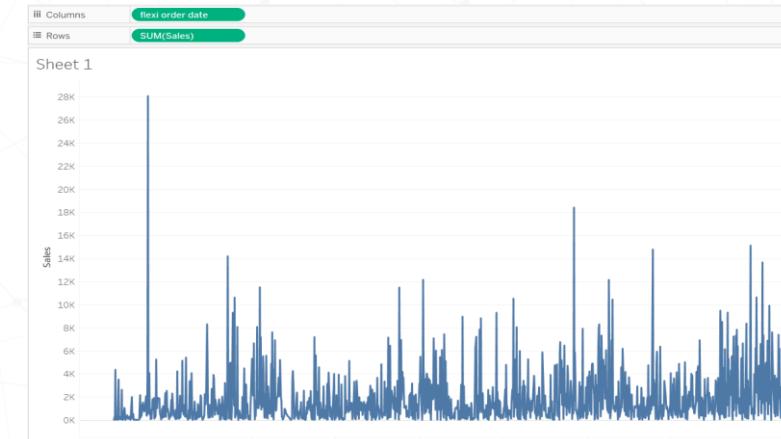
Rows: SUM(Sales)

Context menu for 'YEAR(flexi ord..)':

- Filter...
- Show Filter
- Show Highlighter
- Sort...
- Format...
- Show Header
- Include in Tooltip
- Show Missing Values
- Standard Gregorian ISO-8601 Week-Based
- Year: 2015
- Quarter: Q2
- Month: May
- Day: 8
- More
- Year: 2015
- Quarter: Q2 2015
- Month: May 2015
- Week Number: Week 5, 2015
- Day: 8th May, 2015
- More
- Exact Date
- Attribute
- Measure
- Discrete
- Continuous
- Edit in Shelf
- Remove

2018 2019 2020 2021

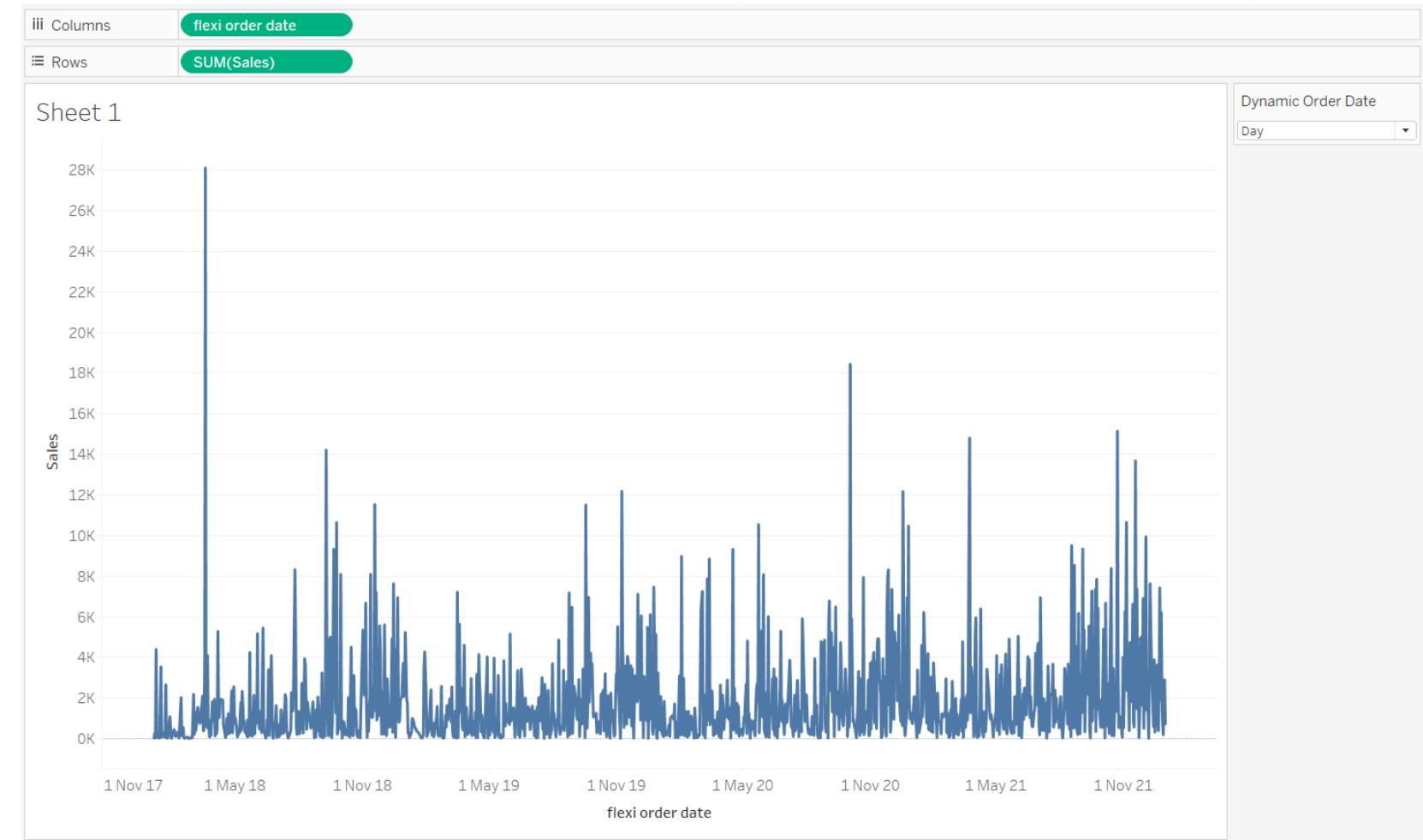
Step 3: Use the New Date Aggregation Calculation in the View





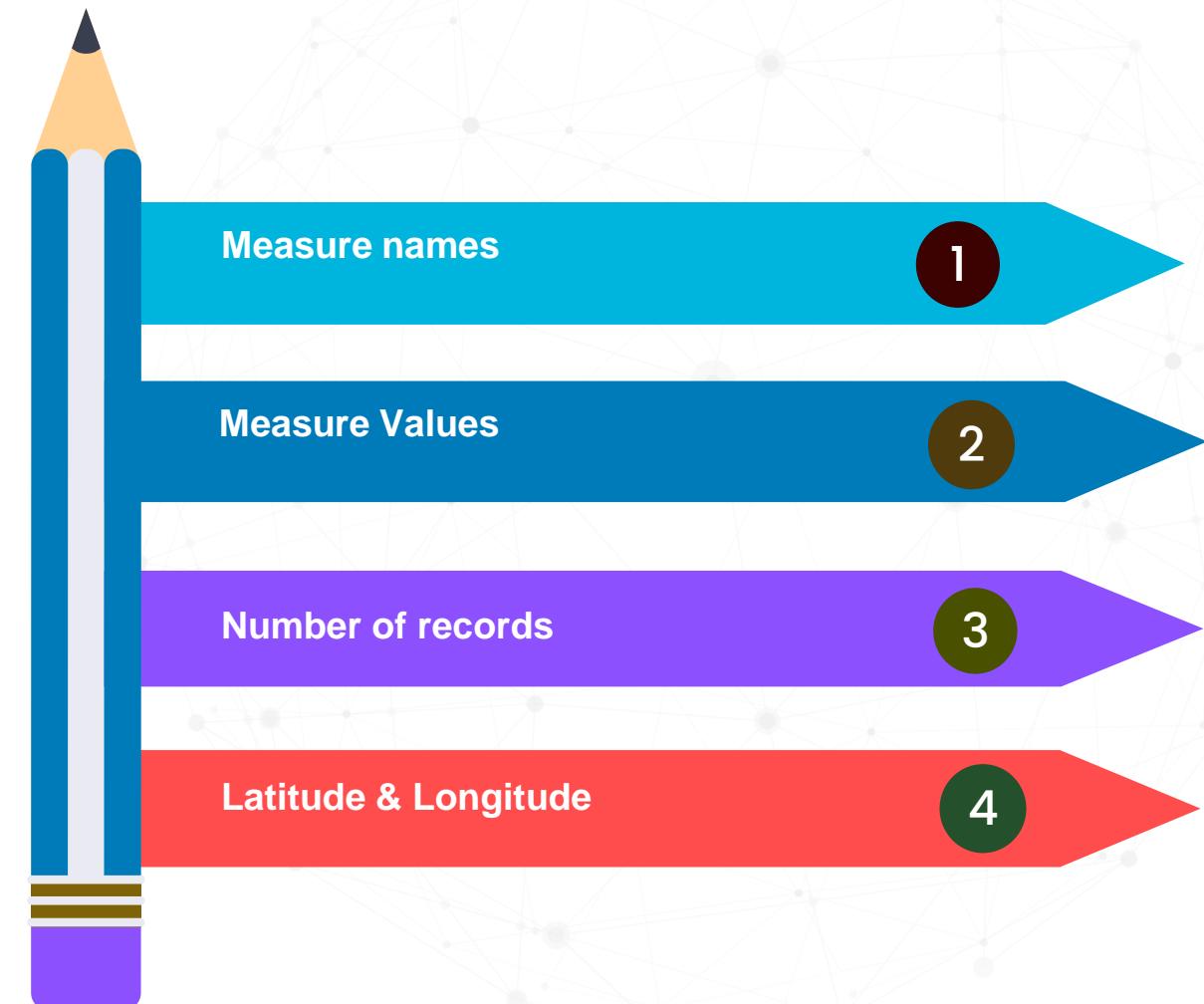
Data Aggregation

Step 4: Make the Date Aggregation Parameter Available to Users



General Fields

Generated fields are created and can be visible in the data pane in addition to the fields present in the data set.





Discrete vs Continuous

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

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

Tableau represents data differently in the view depending on whether the field is discrete (blue), or continuous (green). Continuous and discrete are mathematical terms. Continuous means "forming an unbroken whole, without interruption"; discrete means "individually separate and distinct."

- Green measures `SUM(Profit)` and dimensions `YEAR(Order Date)` are continuous. Continuous field values are treated as an infinite range. Generally, continuous fields add axes to the view.
- Blue measures `SUM(Profit)` and dimensions `Product Name` are discrete. Discrete values are treated as finite. Generally, discrete fields add headers to the view.

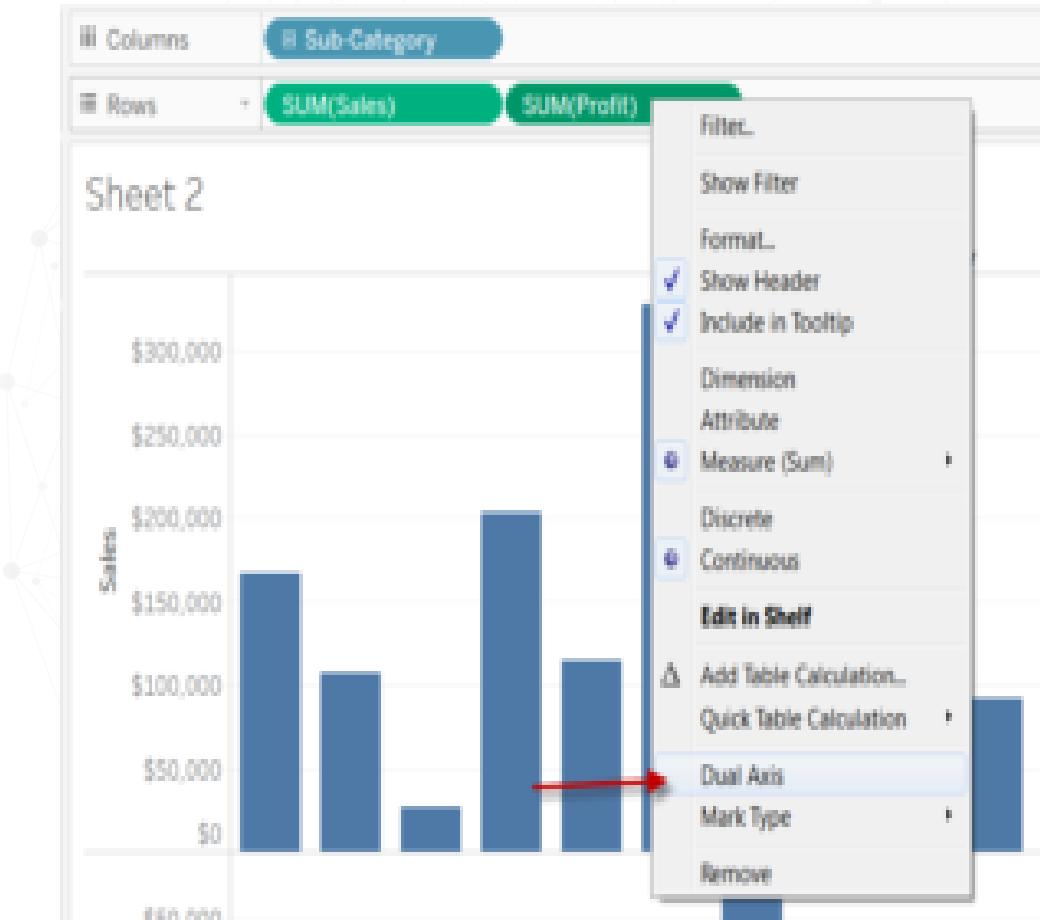
Dual Axis/ Multiple Measures

There are several different ways to compare multiple measures in a single view. You can:

Create individual axes for each measure.

Blend two measures to share an axis.

Add dual axes where there are two independent axes layered in the same pane.



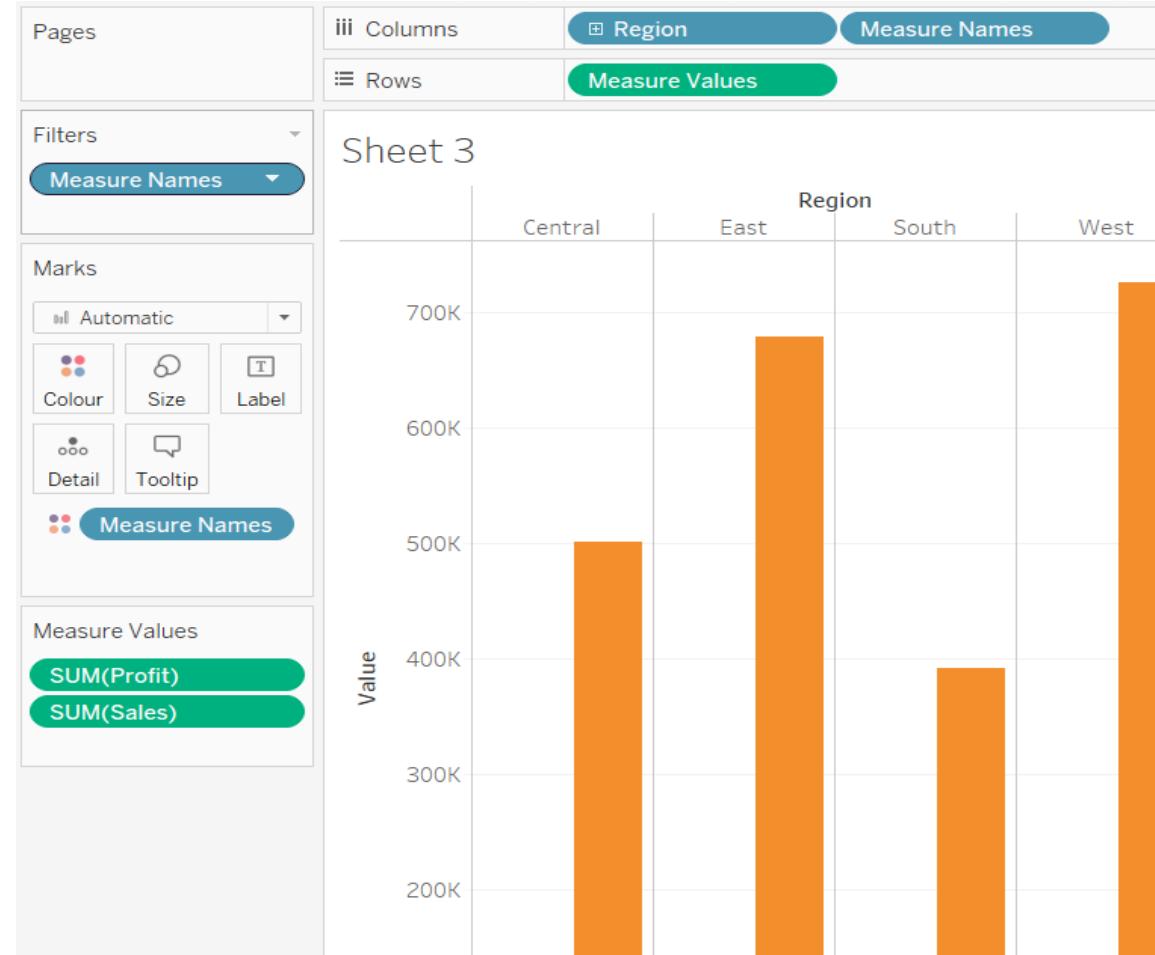


Combo Chart

Step 1 – Make a graph for one of the measures

Step 2 – Drag the second measure onto the opposite axis

Step 3 – Create a dual-axis combination chart by changing one of the mark types



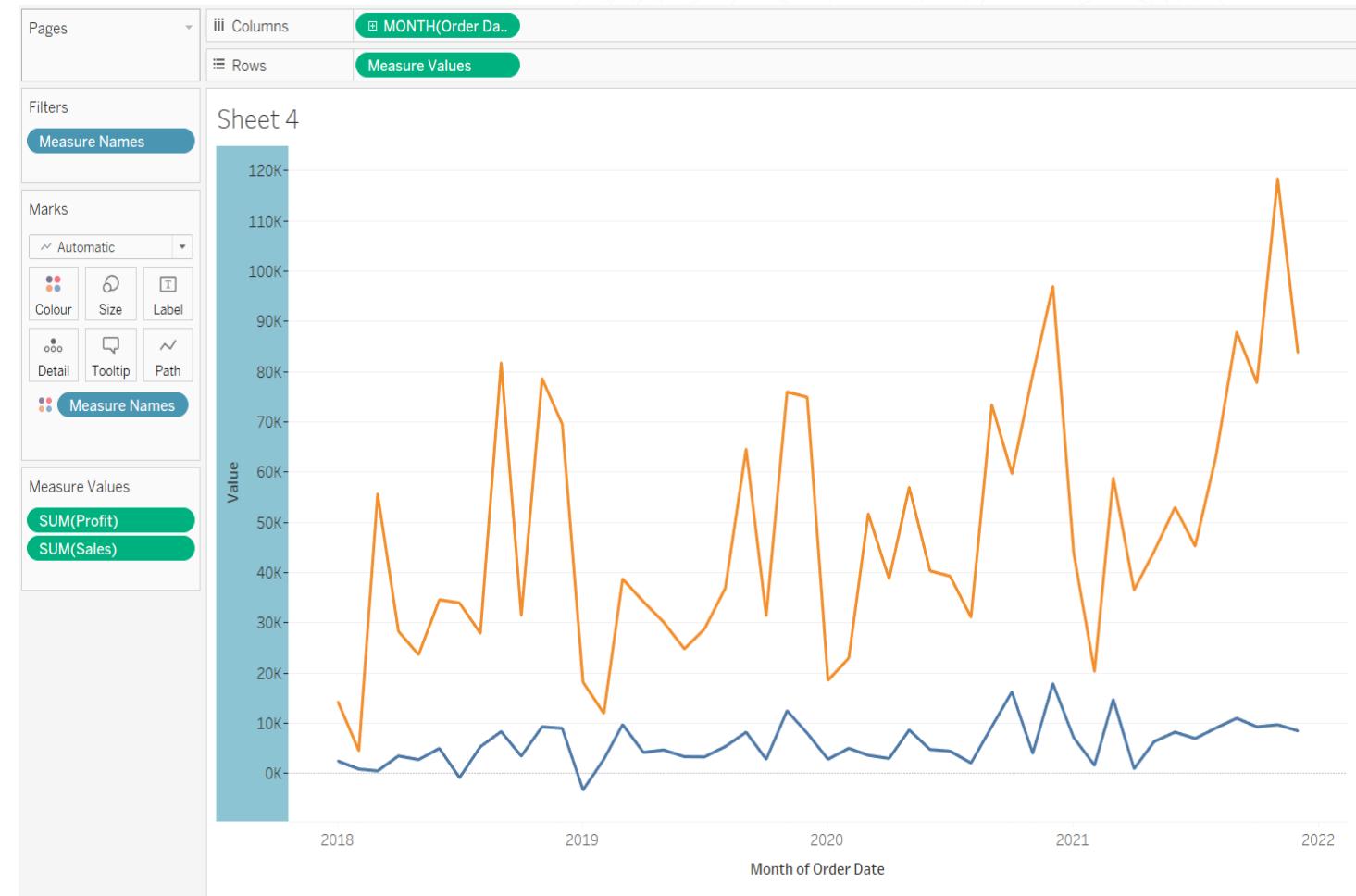


Combo Charts

Step 1 – Date vs Sales

Step 2 – Drag the second measure onto the opposite axis

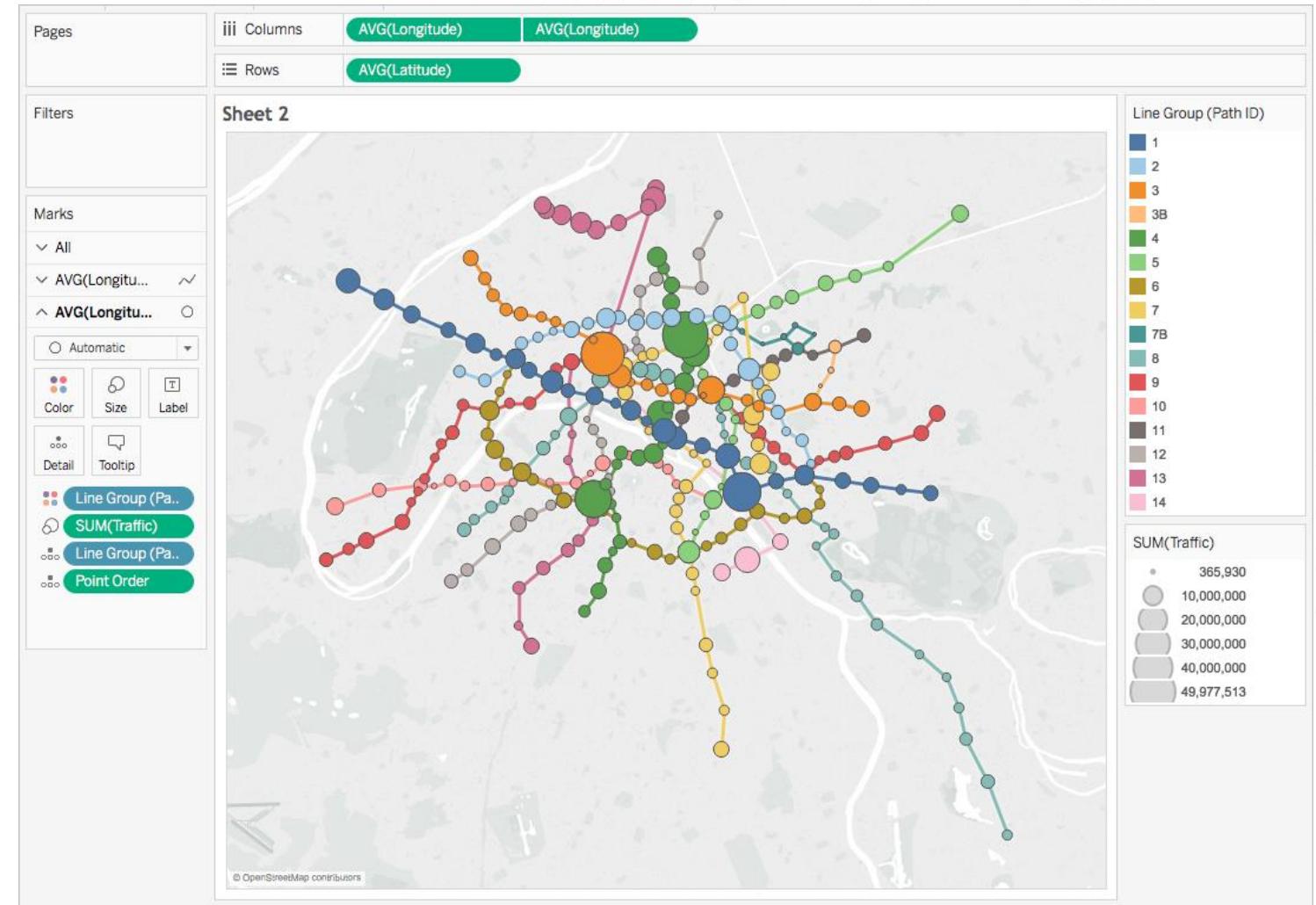
Step 3 – Create a dual-axis combination chart by changing one of the mark types





Geographic Map

Metro station traffic in Paris, France





Heat Map

Tableau heatmap is a visualization where marks on the view are represented using color. And as the density of records increases per mark, a more intense color is displayed (heating up).

Drag Order Date to the columns shelf.

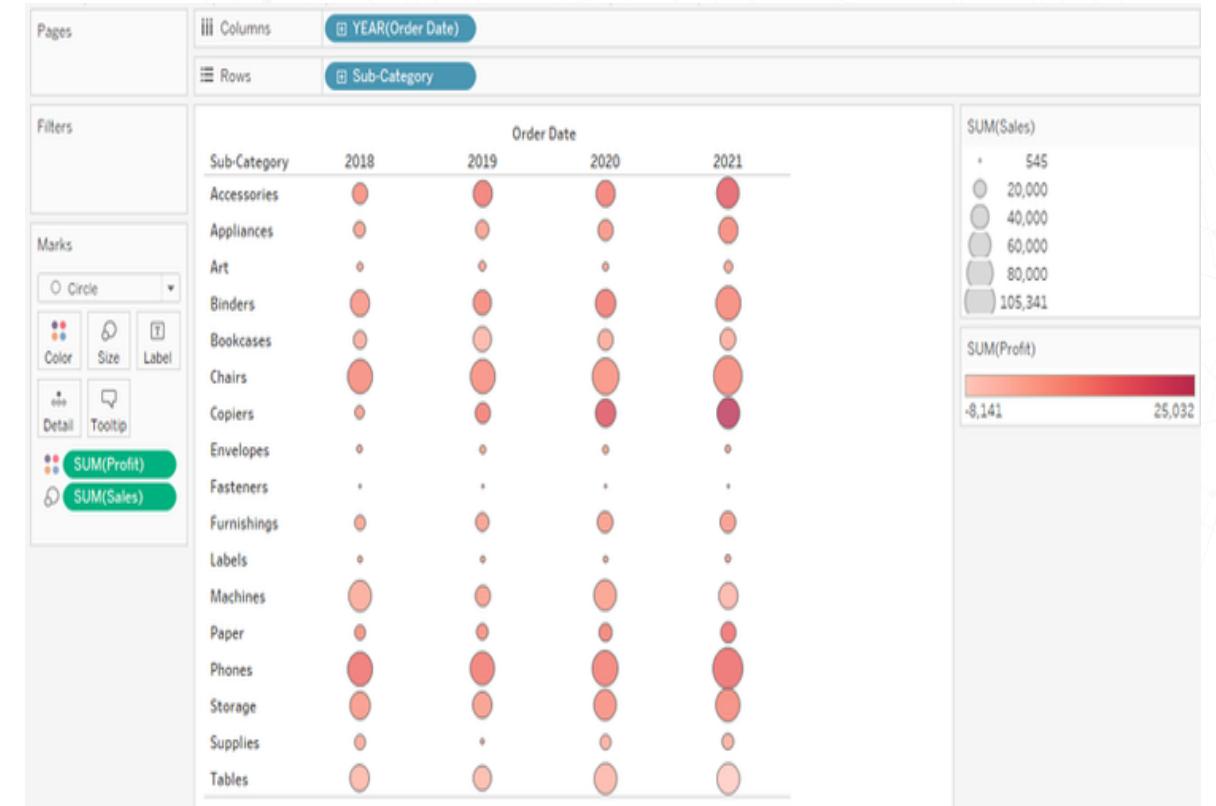
Drag product Sub-Category to the rows shelf.

Drag Sales to the text shelf.

Under Show Me Tab, select 'Heat Maps'

Changing marks to circles

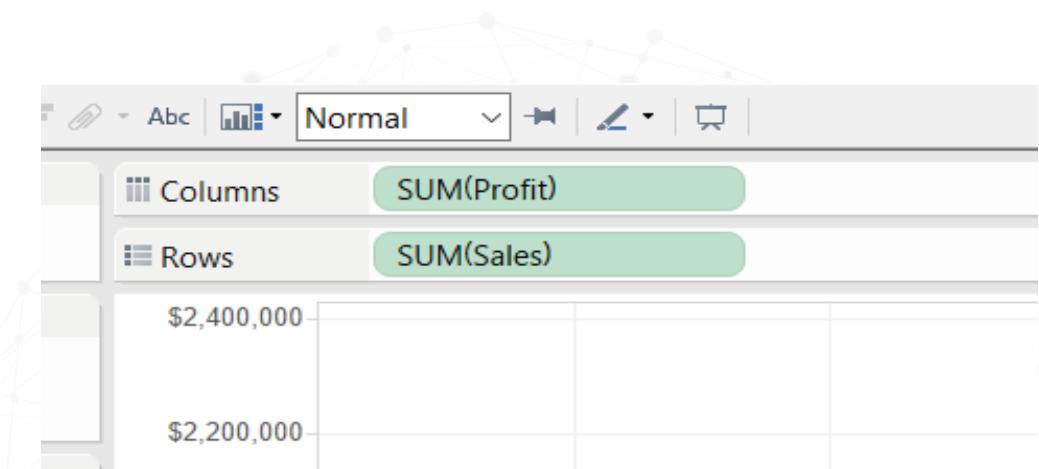
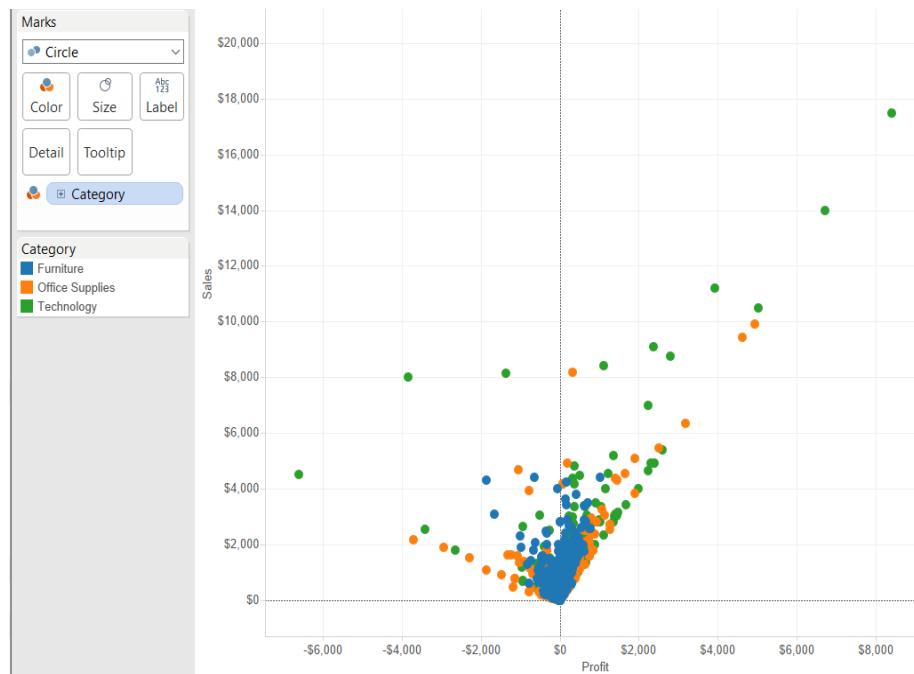
And adding Profit to color shelf



Scatter Plot

The scatter plot is a visualization used to compare two measures

Adding the Category dimension to the Color mark card



Adding Category to the Shape mark card.





Pie Chart

Connect to the Sample - Superstore data source

Drag the Sales measure to Columns and drag the Sub-Category dimension to Rows.

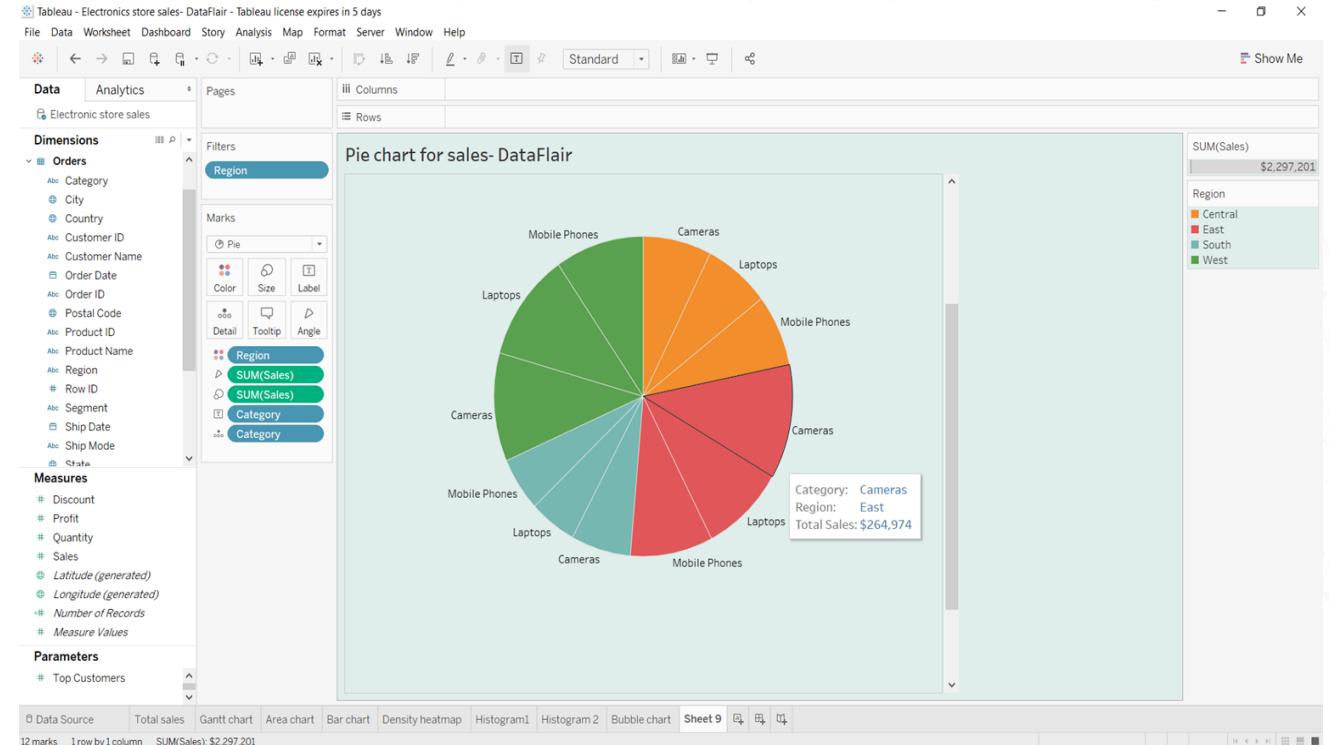
Tableau aggregates the Sales measure as a sum

Click Show Me on the toolbar, then select the pie chart type

Resize it as per your convenience

To add labels, drag the Category dimension from the Data pane to Label on the Marks card.

Mark type:	Pie
Color:	Dimension
Angle:	Measure





Bar Chart

Creates Vertical Bars

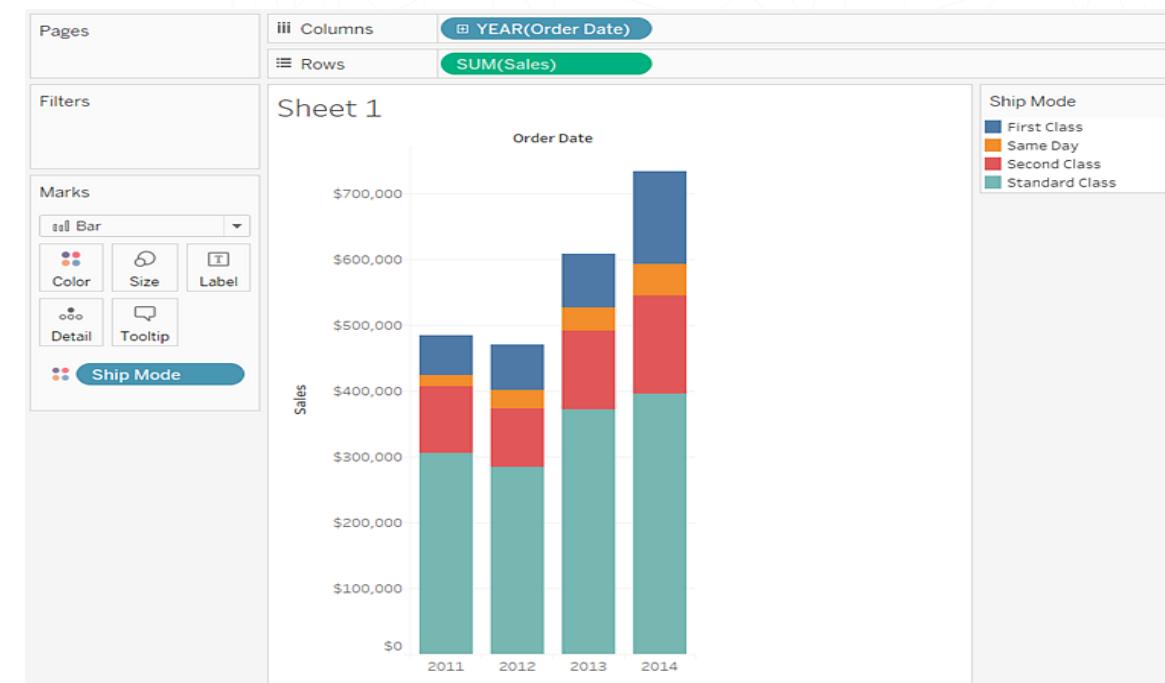
The screenshot shows the Tableau Data Source pane. The 'Columns' field contains 'Category'. The 'Rows' field contains 'SUM(Profit)'. Both fields have a green rounded rectangle overlay.

Connect to the dataset

Drag the Order Date dimension to Columns and drag the Sales measure to Rows.

On the Marks card, select Bar from the drop-down list.

Drag the Ship Mode dimension to Color on the Marks card.





Sorting, Grouping & Sets

Sorting –

Display your data in ascending or descending order based on other fields or custom formulas using computed sorts. Or you can manually sort your data to display in whatever order you choose.

Groups –

Combine dimension members into higher level categories.

Sets –

Create a custom field based on existing dimensions that can be used to encode the view with multiple dimension members across varying dimension levels.

The screenshot shows the Tableau desktop interface with a data source named "Sample - Superstore". On the left, there's a shelf with a single measure, "SUM(Sales)". The main area displays a bar chart by category: Furniture, Office Supplies, and Technology. A context menu is open over the "Category" pill in the Rows shelf, with the "Sort..." option highlighted (step 1). Another context menu is open over the "Category" dimension in the Dimensions shelf, with the "Create" option highlighted (step 2). A third context menu is open over the "Category" dimension in the Dimensions shelf, with the "Group..." option highlighted (step 3).

Cross-tabs (Pivot Tables)

CrossTab in Tableau is a type of chart that is also known as the text table or pivot table. Cross tab includes one or more measures along with the dimensions for the visualization. It also supports calculated fields for dynamic value representation.

The diagram illustrates the transformation of a cross-tab from a wide format to a long format. On the left, a wide-format cross-tab shows data for quarters Q1 '12 through Q4 '13 across three brands: Samsung, Nokia, and Apple. An orange box highlights the data for Q4 '12. An arrow points to the right, leading to a long-format pivot table. This long-format table has two columns: 'Pivot Field Names' (containing Quarter and Brand names) and 'Pivot Field Values' (containing the corresponding numerical values). An orange box highlights the value for Apple in Q4 '12.

Abc	#	#	#
Data	Data	Data	Data
Quarter	Samsung	Nokia	Apple
Q1 '12	89.2800	83.1600	33.1200
Q2 '12	90.4300	83.4200	28.9400
Q3 '12	97.9600	82.3000	24.6200
Q4 '12	106.9600	85.0500	43.4600
Q1 '13	100.6600	63.2200	38.3300
Q2 '13	107.5300	60.9500	31.9000
Q3 '13	117.0500	63.0500	30.3300
Q4 '13	119.2100	63.5800	50.2200

Abc	Abc	#
Data	Pivot	Pivot
Quarter	Pivot Field Names	Pivot Field Values
Q4 '12	Apple	43.460
Q1 '13	Apple	38.330
Q2 '13	Apple	31.900
Q3 '13	Apple	30.330
Q4 '13	Apple	50.220
Q1 '10	Nokia	110.110
Q2 '10	Nokia	111.470
Q3 '10	Nokia	117.460
Q4 '10	Nokia	122.280



Cross-tabs (Pivot Tables)

Abc Data Quarter	# Data Samsung	# Data Nokia	# Data Apple
Q4 '11	93.8300	111.7000	35.46
Q1 '12	89.2800	83.1600	33.12
Q2 '12	90.4300	83.4200	28.94
Q3 '12	97.9600	82.3000	24.62
Q4 '12	106.9600	85.0500	43.4600
Q1 '13	100.6600	63.2200	38.3300
Q2 '13	107.5300	60.9500	31.9000
Q3 '13	117.0500	63.0500	30.3300
Q4 '13	119.2100	63.5800	50.2200

- Rename
- Reset Name
- Copy Values
- Hide
- Create Calculated Field...
- Pivot
- Merge Mismatched Fields

Abc Data Quarter	# Data LG	Abc Data Pivot	# Data Pivot Field Values
Q1 '10	27.19		8.270
Q2 '10	29.37		8.740
Q3 '10	27.48		13.480
Q4 '10	30.12		16.010
Q1 '11	24.00	Add Data to Pivot	16.880
Q2 '11	24.42	Describe...	19.630
Q3 '11	21.0100	Apple	17.300
Q4 '11	16.9400	Apple	35.460

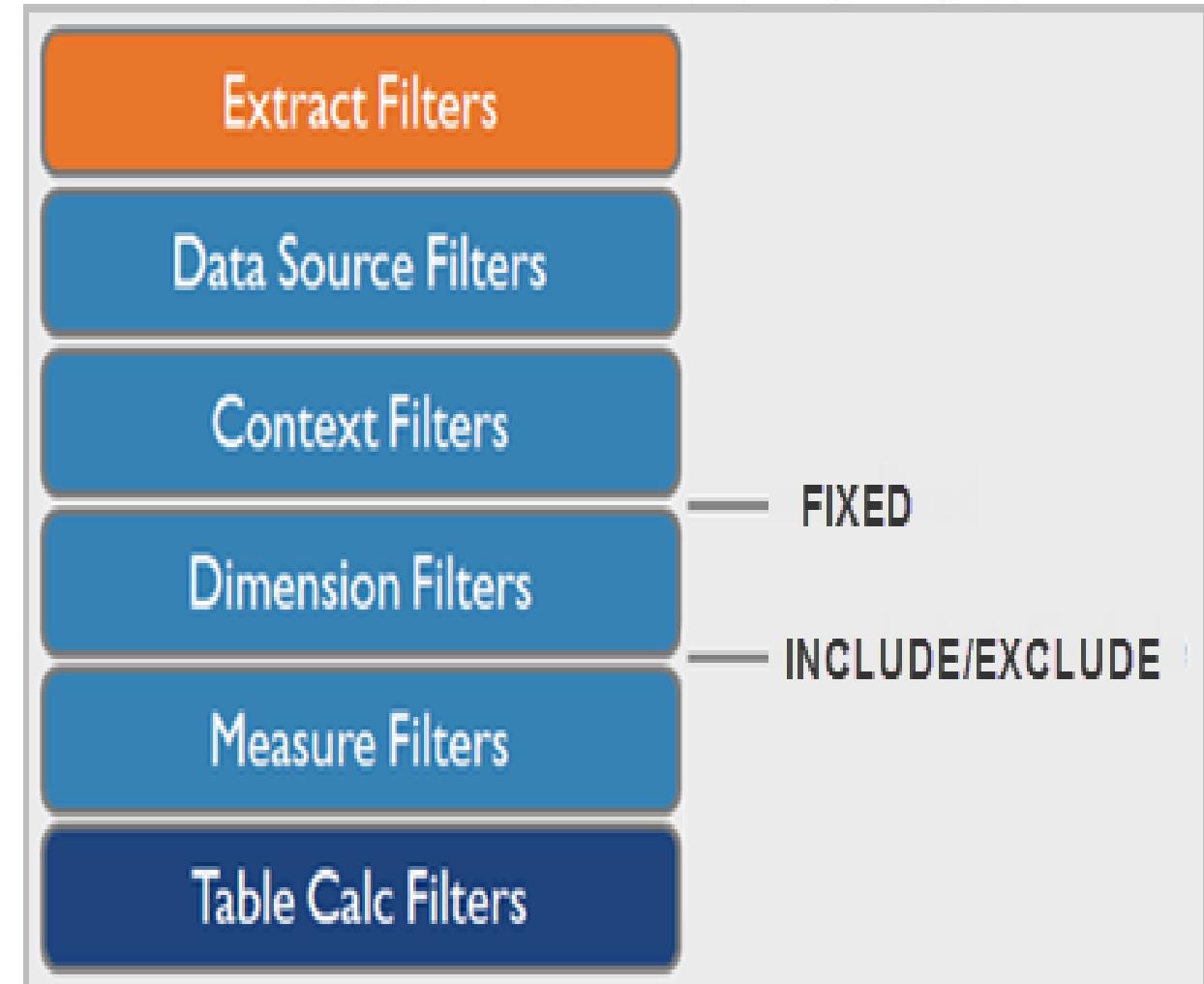
- Rename
- Copy Values
- Hide
- Create Calculated Field...
- Create Group...
- Create Bins...
- Add Data to Pivot
- Describe...



Level of Detail (LOD) Expression

Level of Detail expressions (also known as LOD expressions) allow you to compute values at the data source level and the visualization level

They can be performed at a more granular level (**INCLUDE**), a less granular level (**EXCLUDE**), or an entirely independent level (**FIXED**)





Level of Detail (LOD) Expression

- High Level

- Leave out the details
 - Summary
 - Less granular
 - More aggregated

- Low Level

- Include the details
 - More details
 - More granular
 - Less aggregated

Types of LOD Expressions:

1. FIXED → Independent of view
2. INCLUDE → minus from the view
3. EXCLUDE → add to the view

Syntax: {TYPE [Dimension List]: AGGREGATE}

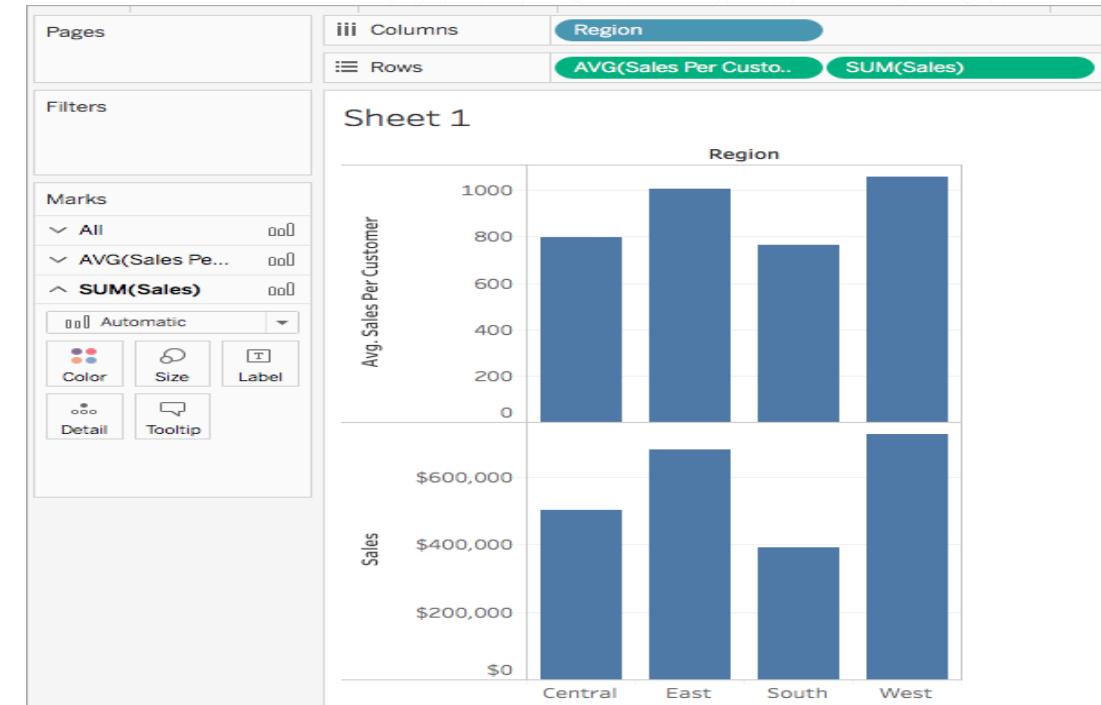
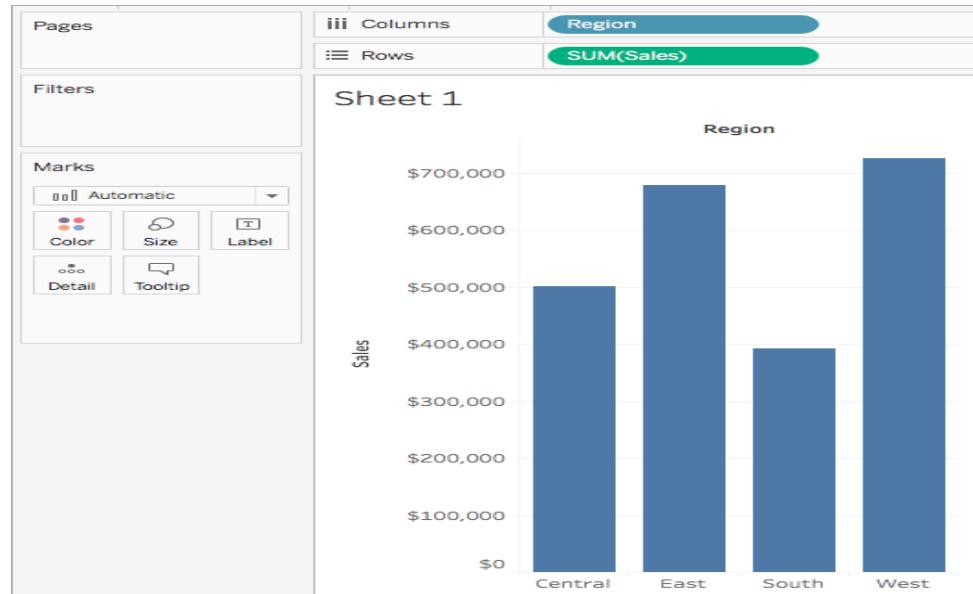


Level of Detail (LOD) Expression

Step 1 : Set up the Visualization

Step 2 : Create the LOD expression(using calculated field)
Ex: { INCLUDE [Customer Name] : SUM([Sales]) }

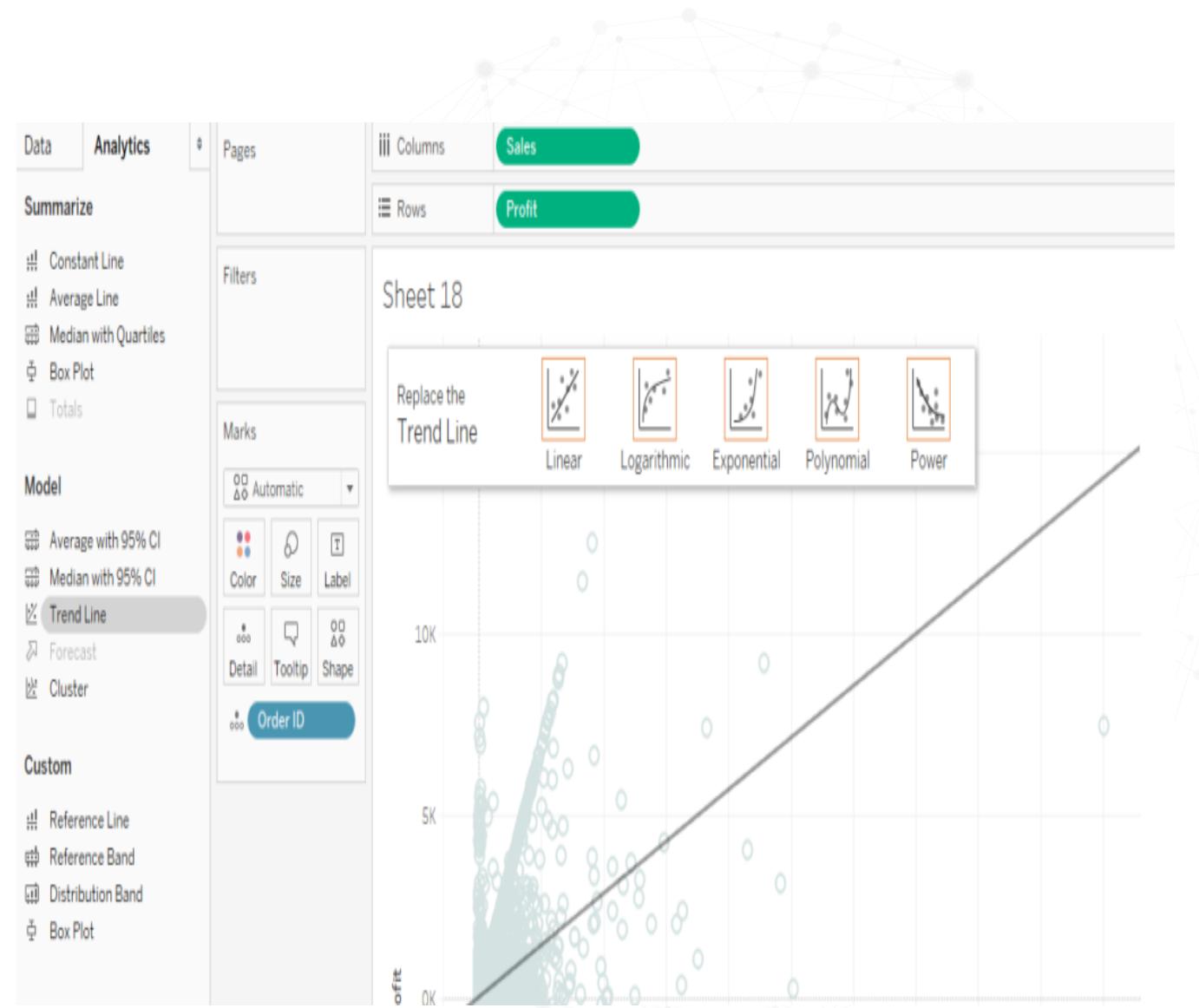
Step 3 : Use the LOD expression in the visualization





Statistics and Trend Line

Trend lines or lines of best fit can be used to predict the continuation of a trend and help to identify the correlation between two variables by mapping the trend of both at the same time.





Calculated Fields

CONTAINS:

```
IF CONTAINS([First Name], 'jit') THEN 'Contains Characters'  
ELSE 'Doesnt contain characters'  
END
```

SPLIT:

```
TRIM( SPLIT( [Email], "@", 1 ) )|
```

ENDSWITH/STARTSWITH

CONCAT: str1 + str2

LOWER/UPPER

MAKEDATE

DATEDIFF



Calculated Fields

Use Cases:

- To segment data
- To convert the data type of a field, such as converting a string to a date.
- To aggregate data
- To filter results
- To calculate ratios

CONTAINS (string, substring)

```
CONTAINS("InterWorks", "Works") = TRUE
```

REPLACE (string, substring, replacement)

```
REPLACE("calculation", "ion", "ed") = "calculated"
```

FIND (string, substring, [start])

```
FIND("Oklahoma", "la") = 3
```



Logical Statements

Calculated Field [IIF Certificate Formula]

Name: IIF Certificate Formula

Formula:

```
IIF([Letter Grade (Nulls)]="A","Create Certificate","Do Nothing")
```

The calculation is valid.

Fields: All

Parameters: All

Functions: Logical

IIF(test, then, else, [unknown])

Checks whether a condition is met, and returns one value if TRUE, another value if FALSE, and an optional third value or NULL if unknown.

Example: IIF(Profit>0,'Profit','Loss')

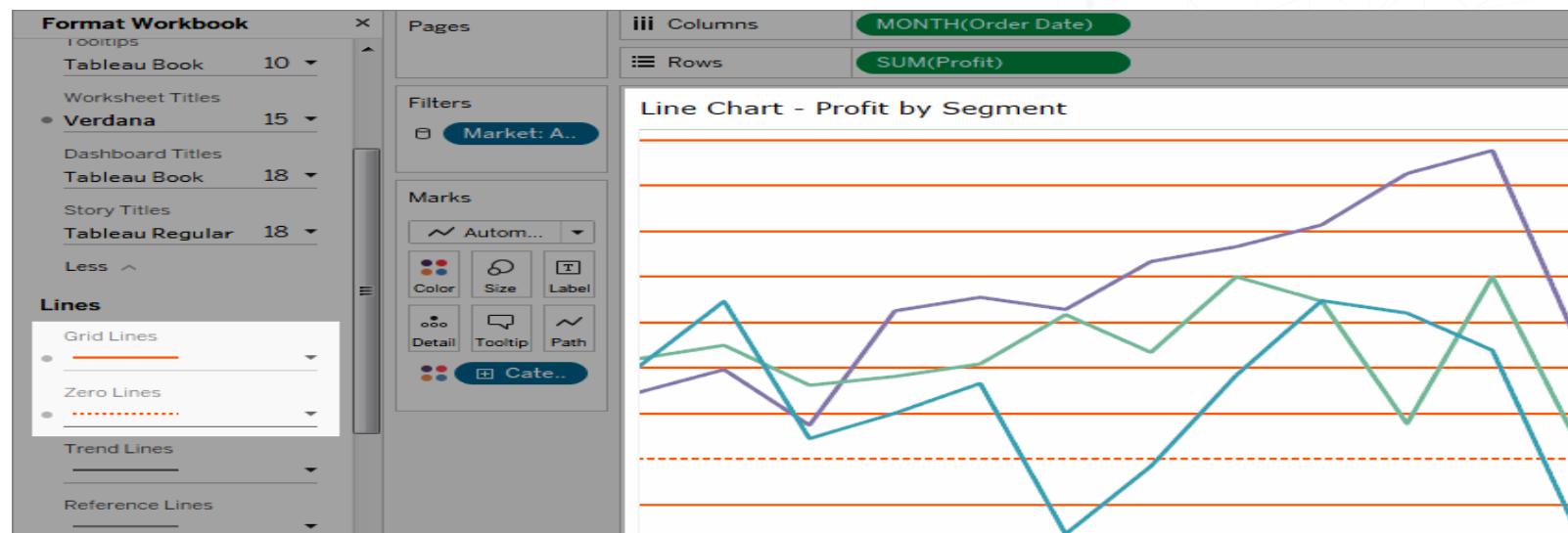
OK Cancel Apply



Formatting

Formatting is an important part of both your analysis and presentation. You can format almost everything you see on a worksheet including the fonts, shading, alignment, borders, and graph lines.

Tableau also allows you to format individual parts of the view as well. For example, you can format specific fields, resize the cells and the table, and edit individual axes.



Format at the Workbook Level

On the Format menu, select Workbook.

The Format Workbook pane replaces the Data pane on the left and provides a series of drop-down lists where you can change all line settings in a workbook



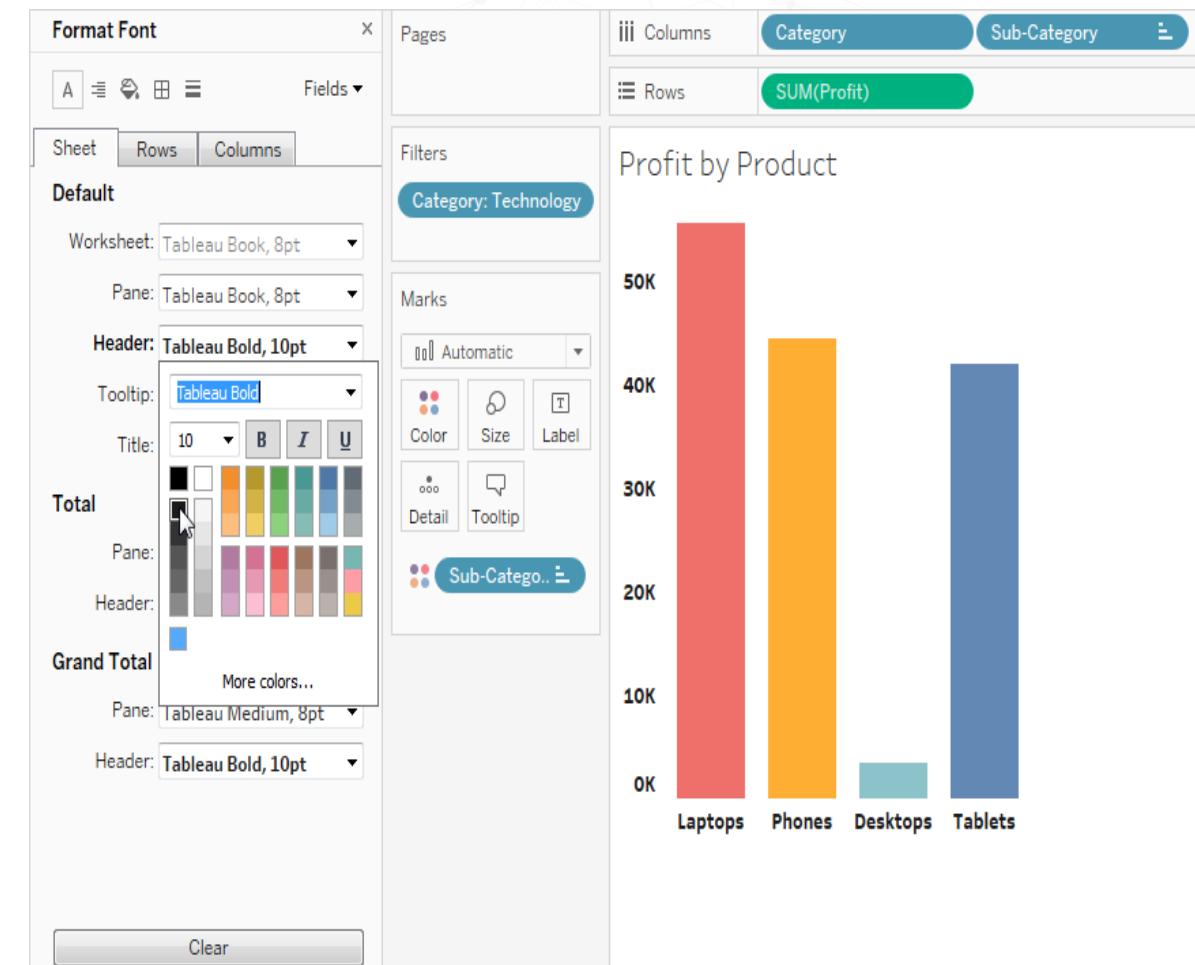
Formatting

Format at the Worksheet Level

Display a worksheet or dashboard.

From the Format menu, choose the part of the view that you want to format, such as Font, Borders, or Filters

- Format Font
- Format Text Alignment
- Format Shading
- Format Borders
- Format Lines
- Format Highlighters
- Format a Filter Card
- Format a Parameter Control Card





Dashboarding

Dashboard Layout ▼

Device Preview

Size
min 420x560 - max 650x860 ▼

Sheets

- Map
- Trends
- Bar Chart

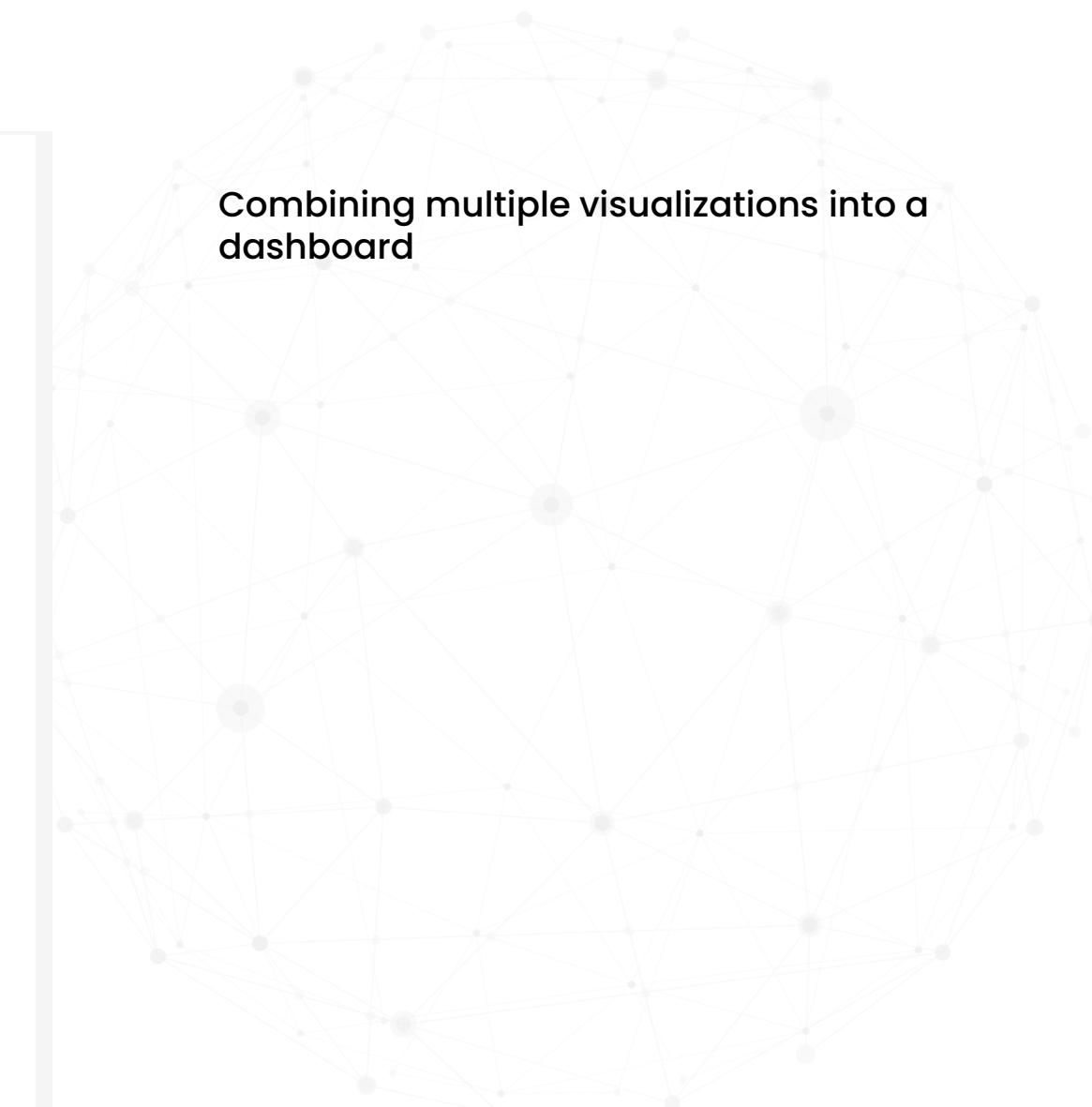
Drop sheets here

Objects

- Horizontal ☒ Image
- Vertical ☒ Web Page
- A Text ☐ Blank

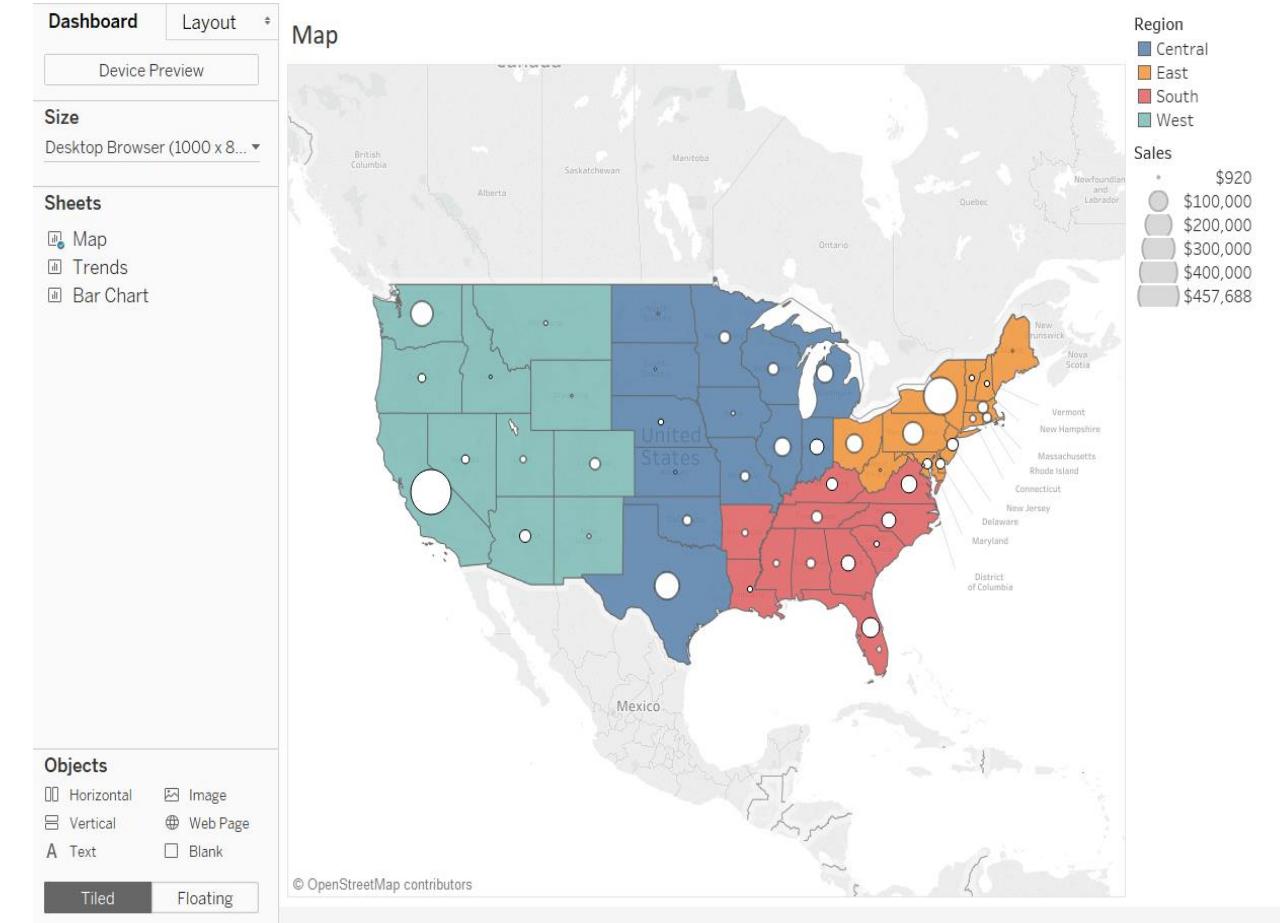
Tiled Floating

Show dashboard title

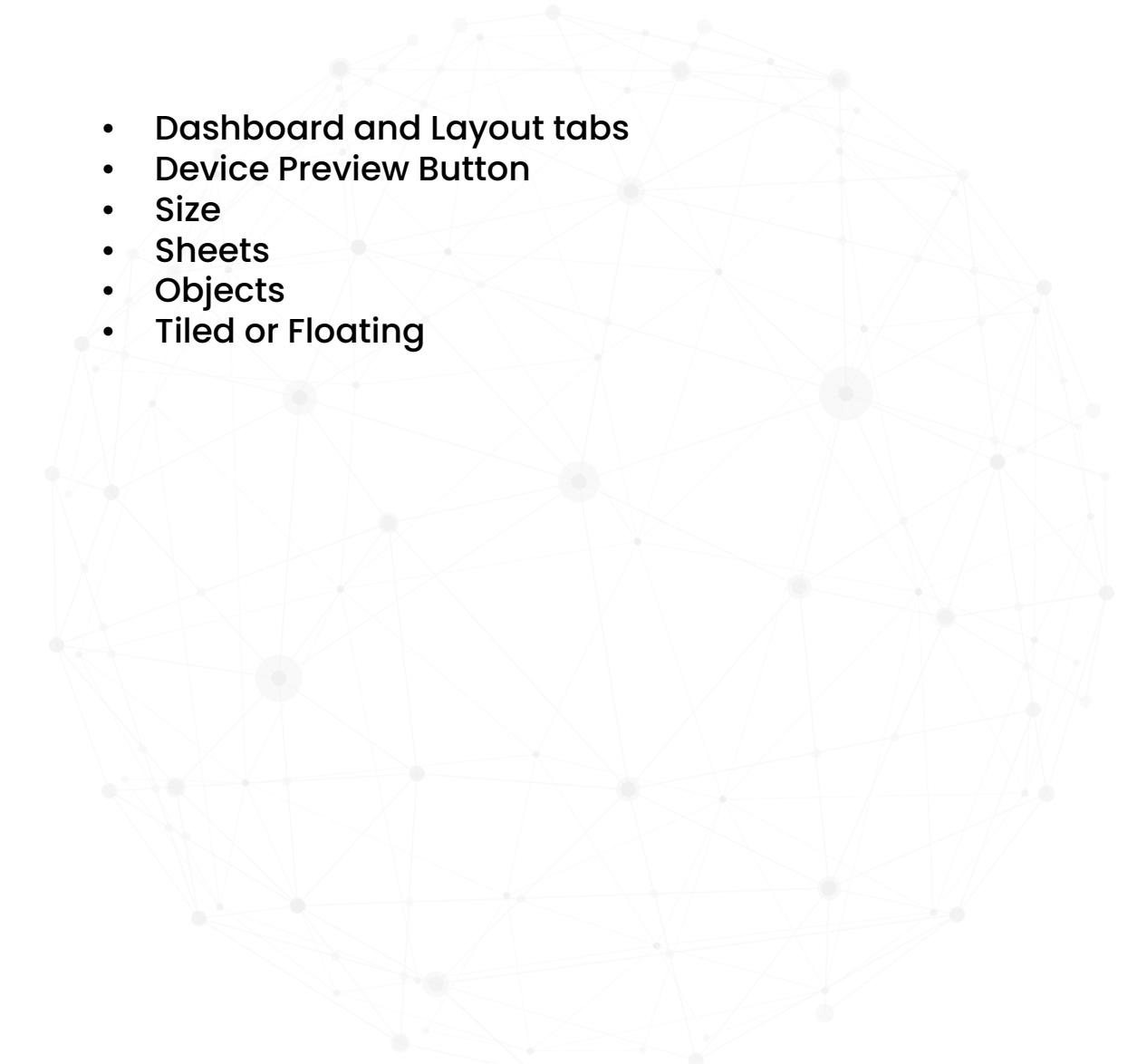




Elements and Options

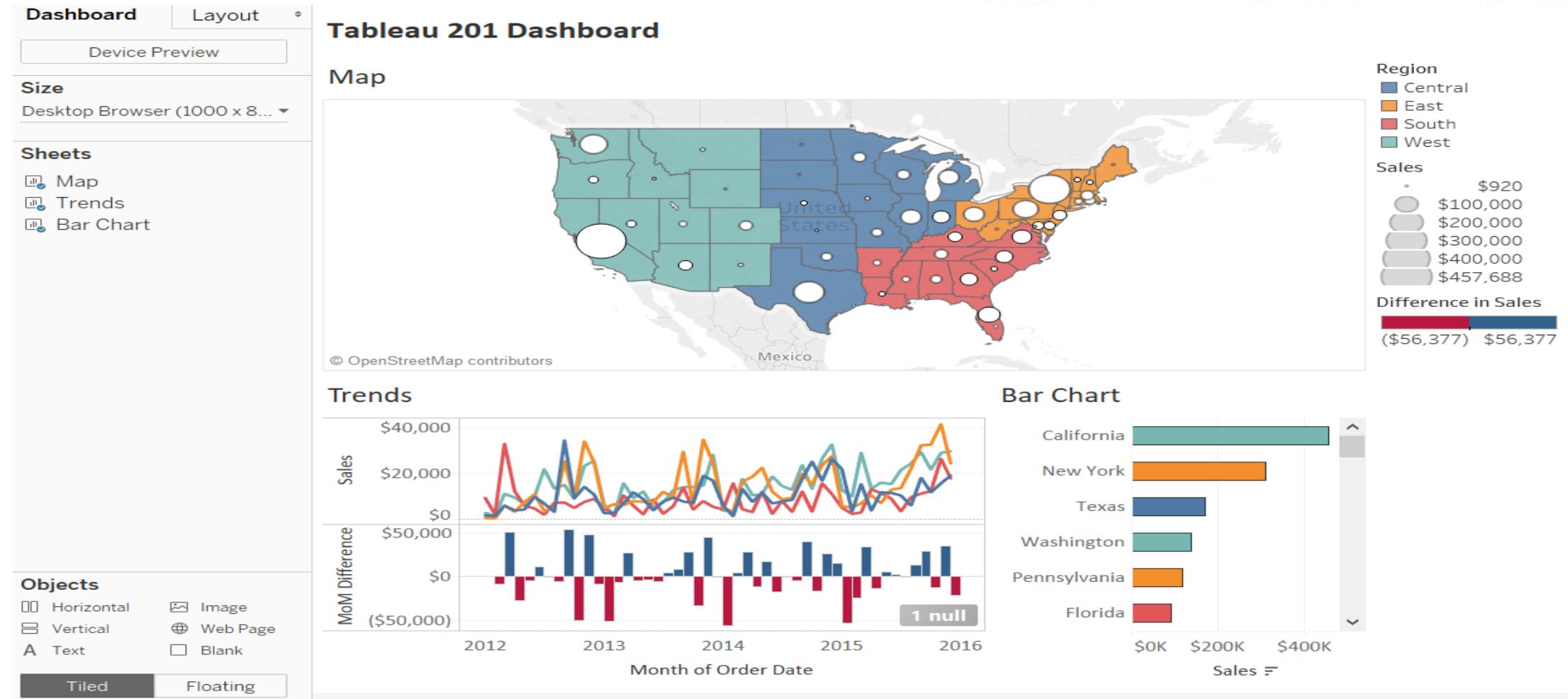


- Dashboard and Layout tabs
- Device Preview Button
- Size
- Sheets
- Objects
- Tiled or Floating





Complete Dashboard





Sharing Tableau Dashboard

Sharing Tableau Dashboards

After you've created a dashboard in Tableau, there are several ways the dashboard can be shared for consumption.

Packaged Workbooks

To package a workbook, navigate to File in the top navigation and click "Export Packaged Workbook...".

Tableau Public

To publish a dashboard from Tableau Desktop to Tableau Public, navigate to "Server", hover over "Tableau Public", and choose "Save to Tableau Public As...".

Tableau Server

To publish a workbook to Tableau Server, navigate to "Server" in the top navigation, and choose "Publish Workbook".



Technical Details





Thank you

