Introduction to Tableau

A Comprehensive Guide to Data Analysis and Visualization

Elisha Oyewole

Understanding Data Concepts

Data analysis is a process of inspecting, cleansing, transforming, and modelling data with the goal of discovering useful information, informing conclusions, and supporting decision-making.

Data analytics is a broader term that includes data analysis, but also involves using those insights to make predictions and inform future decisions. It often involves more complex statistical and computational techniques.

Data visualisation involves the visual representation of data for easier understanding. It ranges from single charts to comprehensive dashboards. This visual form can be a chart, graphs, list, or a map, etc.

Source : (Ahmad, N.H., 2020), wikipedia

Data Analysis Process

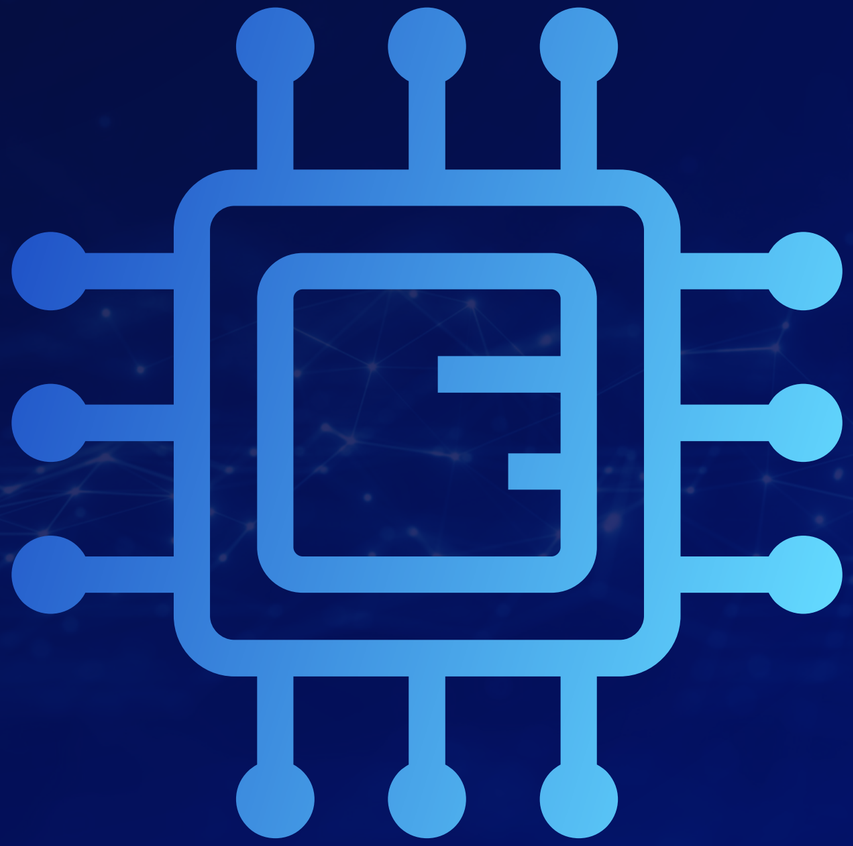
1. Define the problem
2. Collect data
3. Clean and preprocess data
4. Analyze data
5. Visualize results
6. Interpret findings

Common Tools

1. Excel
2. SQL
3. Python & R
4. Tableau &
5. Power BI
6. Google Data Studio

Types of Data Analysis

There are four main types of data analysis: descriptive (what happened), diagnostic (why it happened), predictive (what will happen), and prescriptive (what should be done). Each type serves a unique purpose and offers different insights.



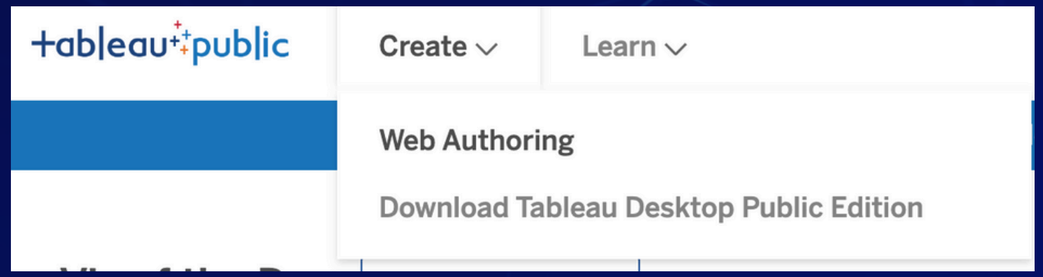
Role of Tableau in Data Analysis

- Simplifies data visualization
- Connects to various data sources
- Provides interactive dashboards
- Enhances business intelligence

Tableau Product Family

- **Tableau Desktop:** Core product to create interactive visualisations and dashboards.
- **Tableau Prep:** Cleans and prepares data for analysis.
- **Tableau Server/Online:** These platforms provide ways to share and collaborate on Tableau workbooks.
- **Tableau Public:** Free platform for public visualization sharing.
- **Tableau Mobile:** Mobile access to Tableau dashboards.

Installing & Setting Up Tableau Public



2. After the download is complete, open the installer file and follow the on-screen instructions to install Tableau Public on your computer.

Understanding Data & Data Types

- **Categorical Data:** Labels, categories (e.g., gender, region)
- **Numerical Data:** Numbers, measurements (e.g., sales, revenue)
- **Date/Time Data:** Time-related values (e.g., order date, event time)

Understanding Graphs

- Graphs visually represent data
- Help identify patterns and trends
- Common types: Bar, Line, Pie, Scatter, Histogram

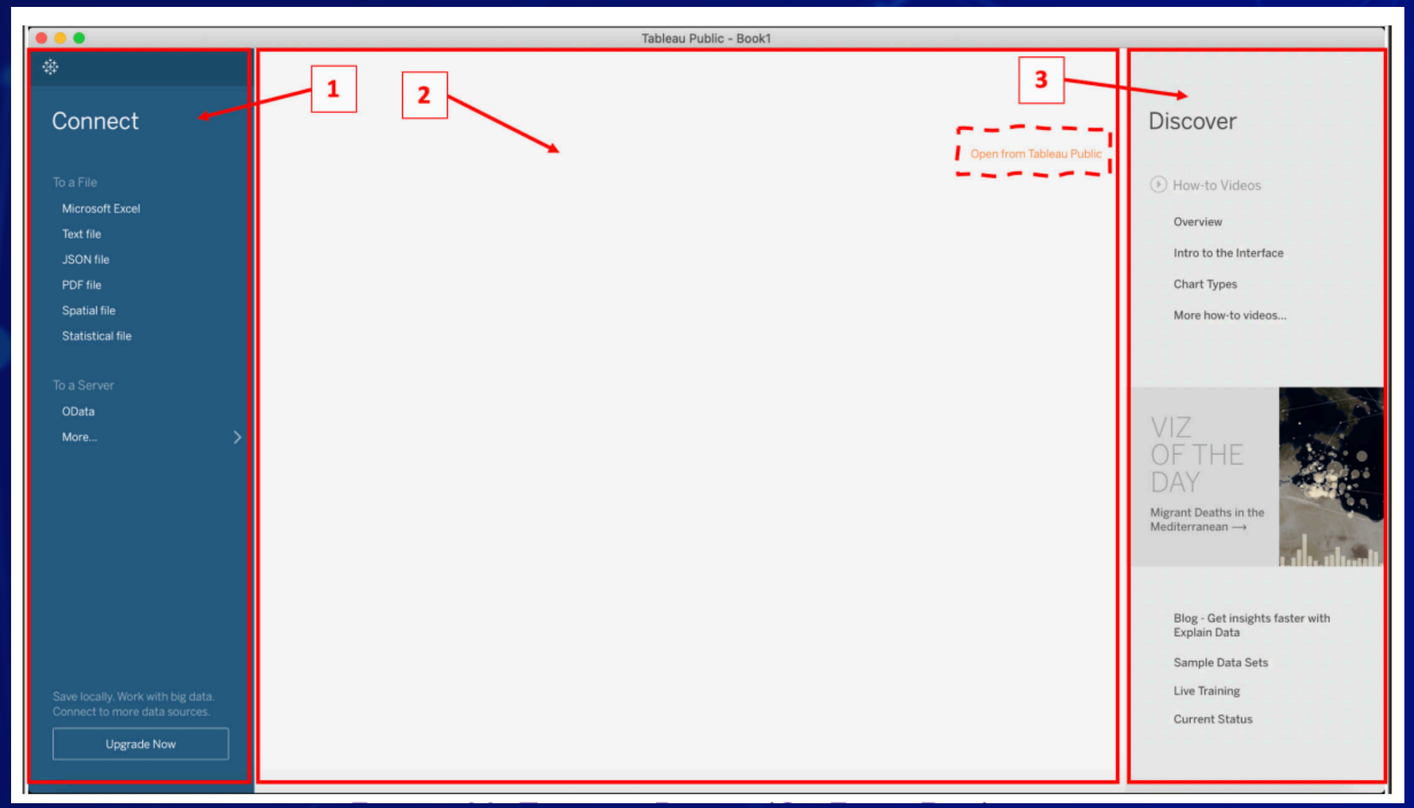
Tableau Graphs & When to Use Them

Graph Type	When to Use	Data Combination
Bar Chart	Comparing categorical data	Categorical + Numeric
Line Chart	Showing trends over time	Date + Numeric
Pie Chart	Displaying proportions	Categorical + Numeric
Scatter Plot	Identifying correlations	Numeric + Numeric
Heat Map	Showing density variations	Categorical + Numeric
Histogram	Displaying frequency distributions	Numeric
Map (Point/Symbol)	Show locations or events on a map	Geographic + Categorical/Numeric

Tableau Practice

Tableau Start Page

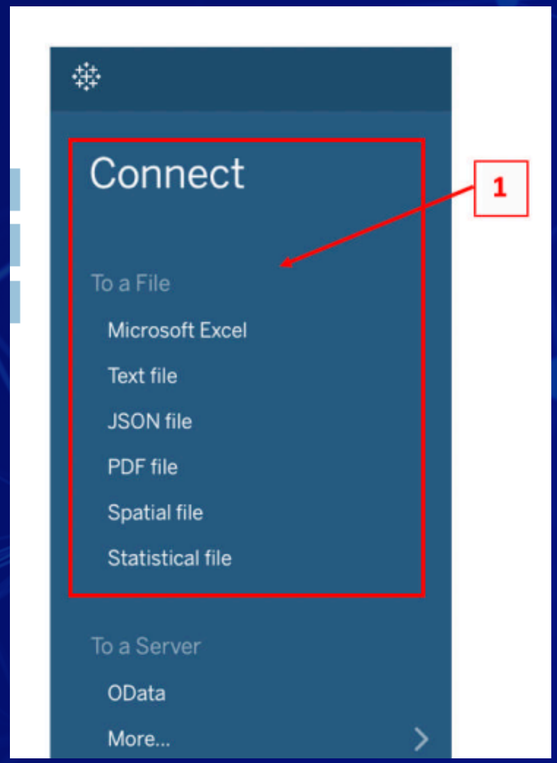
- Open the Tableau Public apps. A window with three panes will be shown similar to the figure shown here.
- The first pane (1) is a list of data sources allowed for Tableau Public.
- The second pane, depicted as number 2, is where all previous saved work is shown.
- The third pane, depicted as number 3, is where you learn about Tableau and get to see the latest and chosen Viz

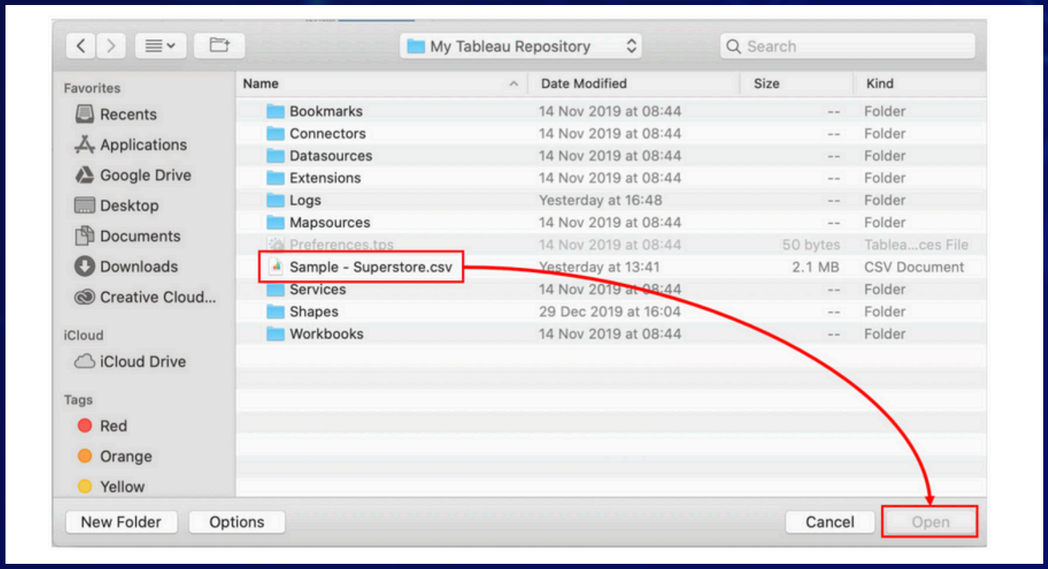


Note: For the purpose of this lecture, the data source used is Microsoft Excel and the dataset used is the famous Sample – Superstore.
Link : https://www.kaggle.com/datasets/naveenkumar20bps1137/sample-superstore

Connect to Data Source

- On Tableau Start Page, click on any of the available data sources. For this manual purpose, click on Text file. You may choose Microsoft Excel if you have file with extension ‘xls’ or ‘xlsx’.





- Upon shown the data source menu, choose the type of data source you wish to connect. In this manual, the sample used is csv-based file.

Note: For the purpose of this lecture, the data source used is a CSV and the dataset used is the famous Sample – Superstore.
Link : https://www.kaggle.com/datasets/konstantinognev/sample-superstorecsv?resource=download

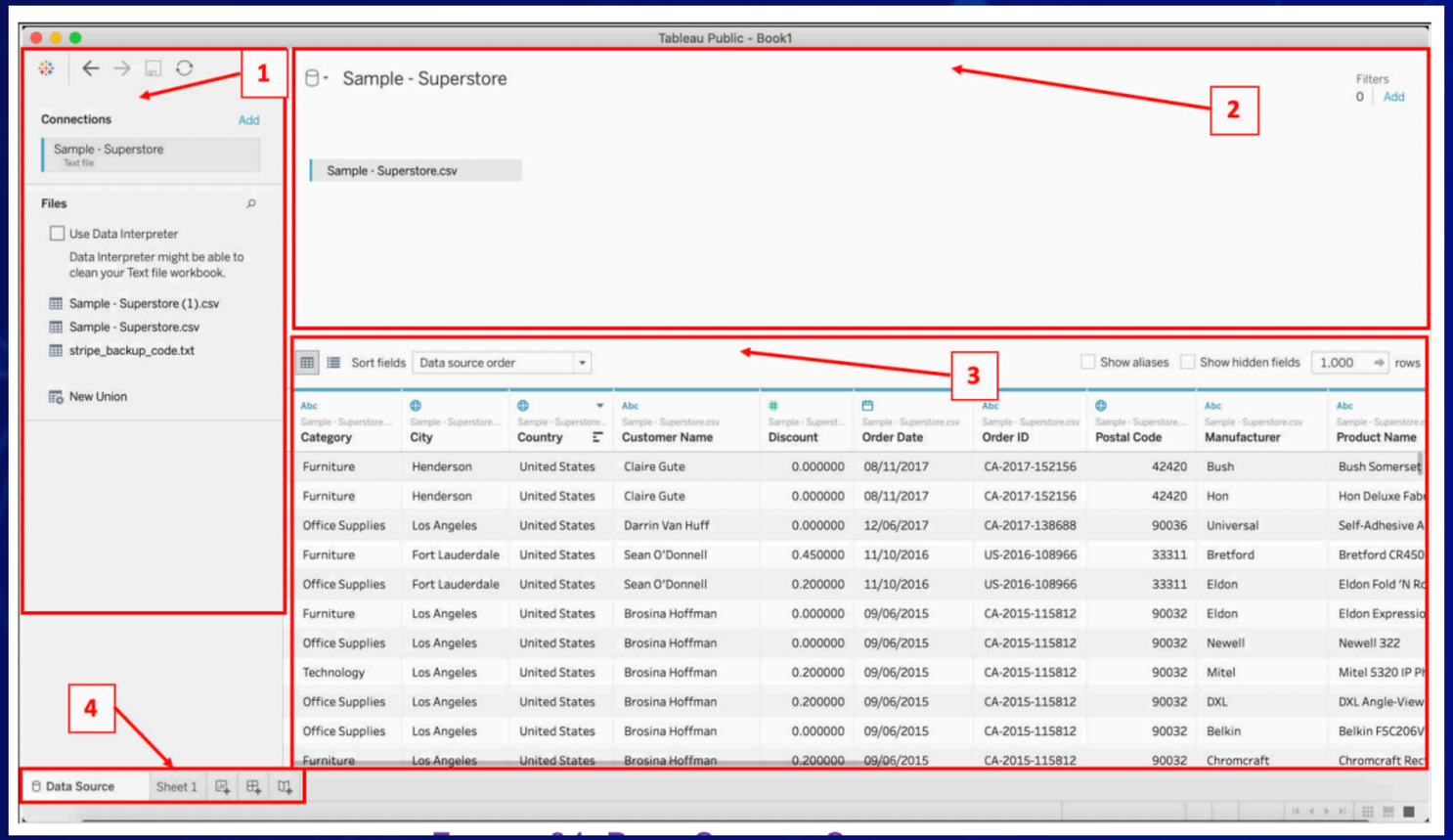
Data Source Screen

- Once Tableau successfully connected to a data source, similar screen as above will appear on your screen

- The first pane, depicted as number 1, is called the left pane. It shows the list of connected data sources and the content of the data source.

- The second pane is where tables or data sheets are dragged and linked together. In Tableau, it is known as Canvas.

- The third pane, a.k.a. Data Grid, will display all data residing in the table dragged in the second panel.



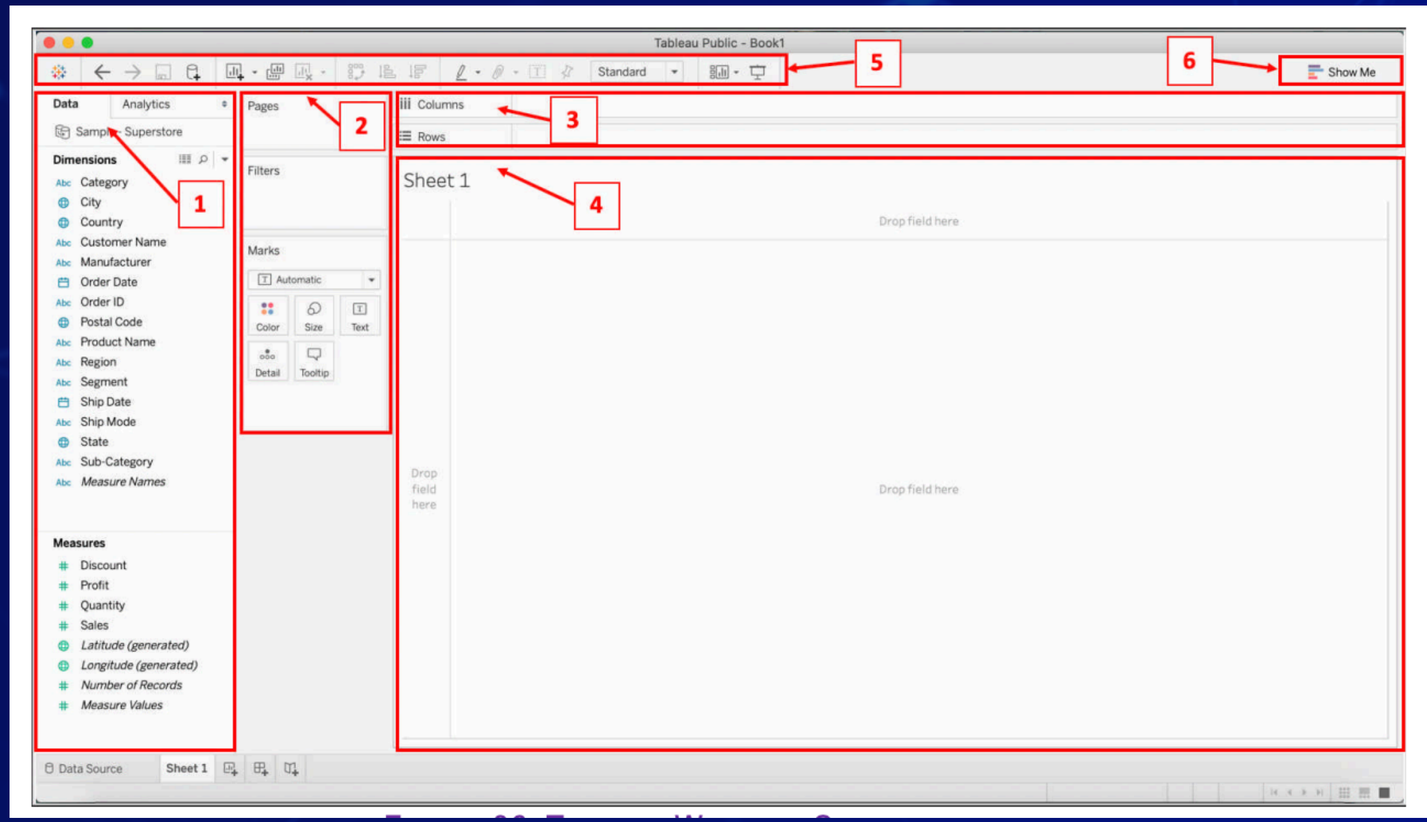
- The last pane, depicted as no. 4, is the bottom toolbar that iconized the creation button for Sheet, Dashboard, and Storyboard.

Tableau Workspace

- Upon successfully connected, click on the icon Sheet on the toolbar below the data grid. (if it is the first sheet, it will appear as Sheet 1).

- The first pane, depicted as number 1, is known as the sidebar. The sidebar contains the data pane and an analytics pane. The Data pane holds the data structures of your data set, which is divided into Dimension (categorical fields) and Measure (numerical fields).

- Pane 2, known as the Card Panel, is where you design the look and feel of your chart, set the text appearance, and define the set of filters.



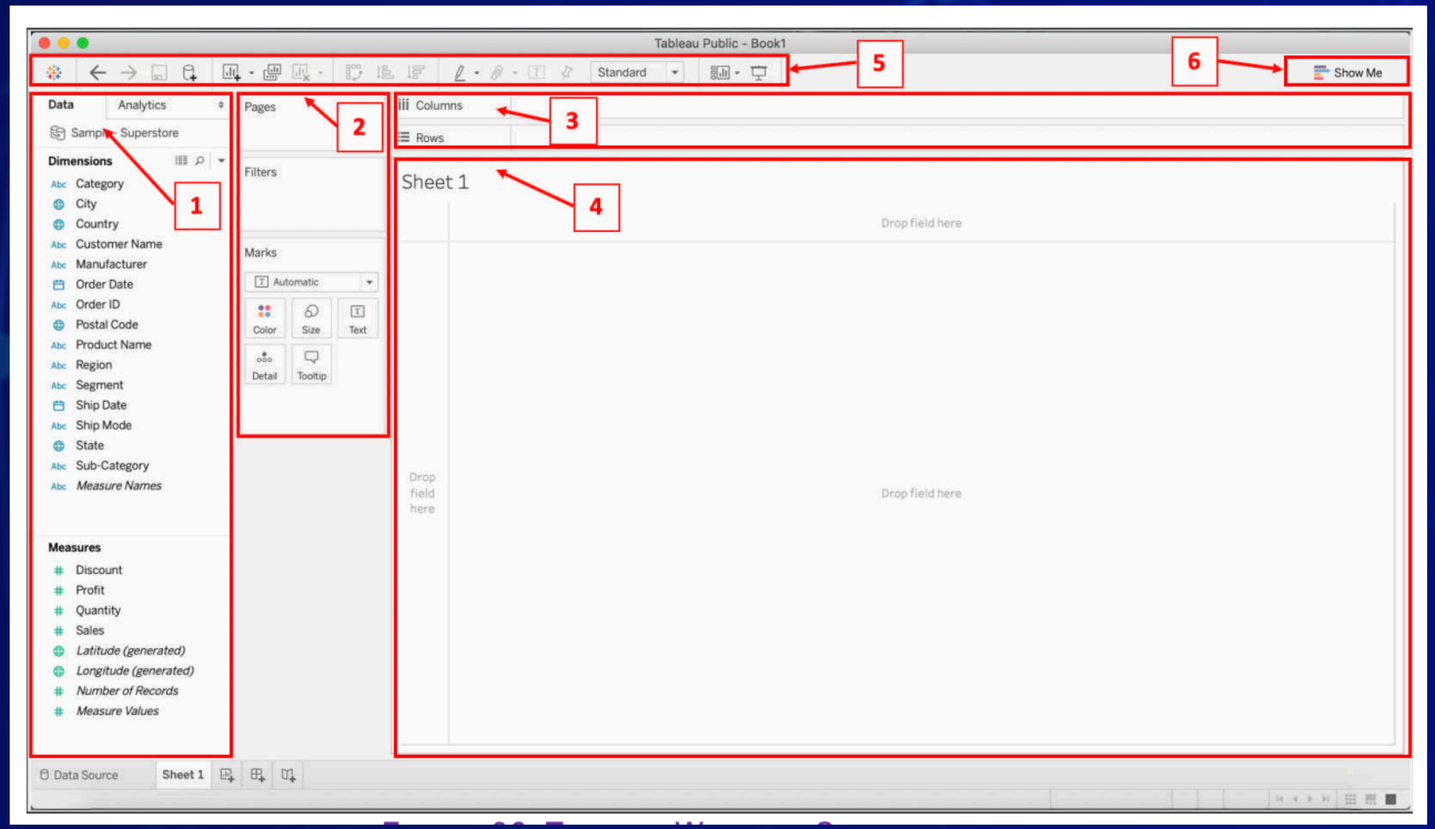
- The third pane is called Shelves. You can drag the dimensions and measurements into the shelves or double-click on any dimension or measure, and Tableau will automatically populate the selected data into the Shelves.

Tableau Workspace

- Once you put a dimension or measure, the content will appear in the fourth pane, a.k.a. View pane. This is the main working canvas of your worksheet.

- The fifth pane is the Tableau standard menu or toolbar, on top of the menu displayed on the top of the window. The toolbar is used for accessing command, analysis and navigation tools.

- The last highlighted (number 6), is a button is where you select and change the default chart to your preferred chart.



The overall working space is known as Workbook. A workbook contains sheets; that are worksheet (similar terms to excel), dashboard (contains at least 1 chart), and storyboard (contains at least 1 chart and/or 1 dashboard)

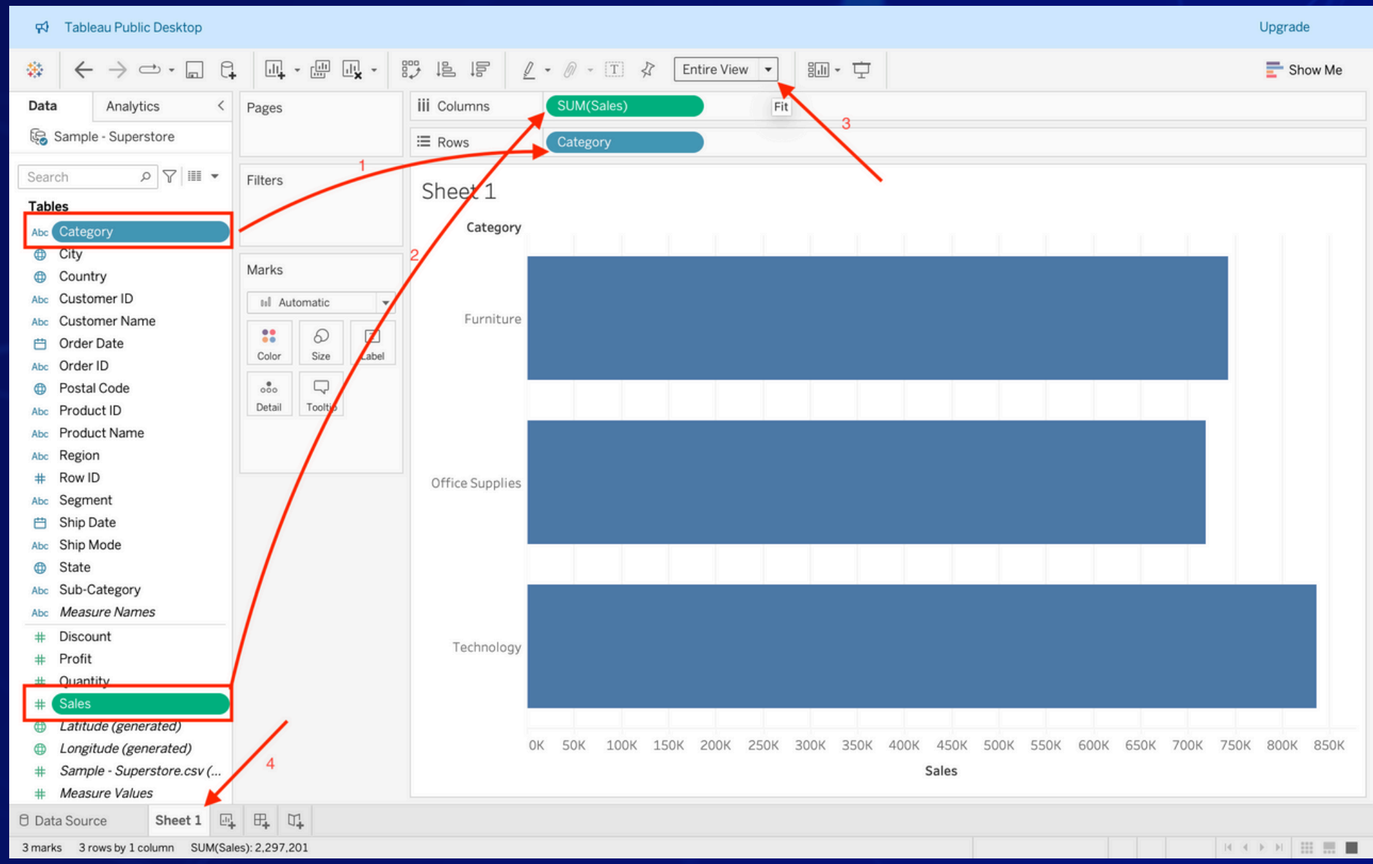
Creating Graphs : Bar Chart

1) Drag Category from Dimensions in Data Pane to Rows Shelves as shown in the following figure.

2) Drag Sales from Measures in the Data Pane to Column at Shelves as shown in the figure. Tableau will automatically change the visual into a bar chart as shown in the figure.

3) Click on the icon labelled standard at the menu or toolbar and choose the entire view.

4) Click on the icon labelled sheet and rename the worksheet to 'Sales by Category'.



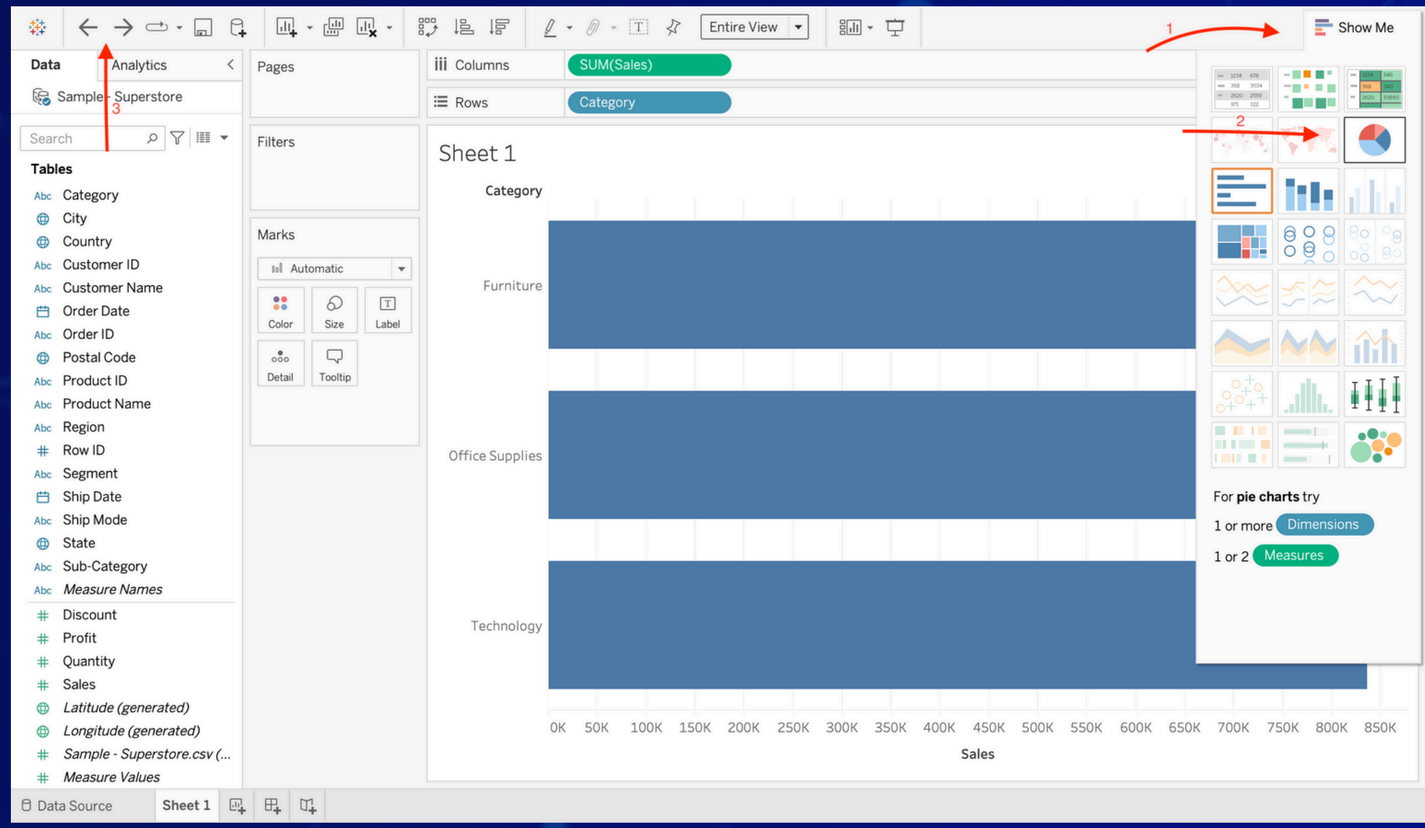
The overall working space is known as Workbook. A workbook contains sheets; that are worksheet (similar terms to excel), dashboard (contains at least 1 chart), and storyboard (contains at least 1 chart and/or 1 dashboard)

Creating Graphs : Pie Chart

1) Show Me Icon: You can convert the bar chart to another chart, like the pie chart, through the drop-down list from the Show Me icon at the toolbar. Alternatively, you can do the same from the drop-down list on the Marks card.

2) Click on the pie chart to turn the barchart to pie chart

3) You can always undo or redo actions done with the arrow icon at the top right of the toolbar.

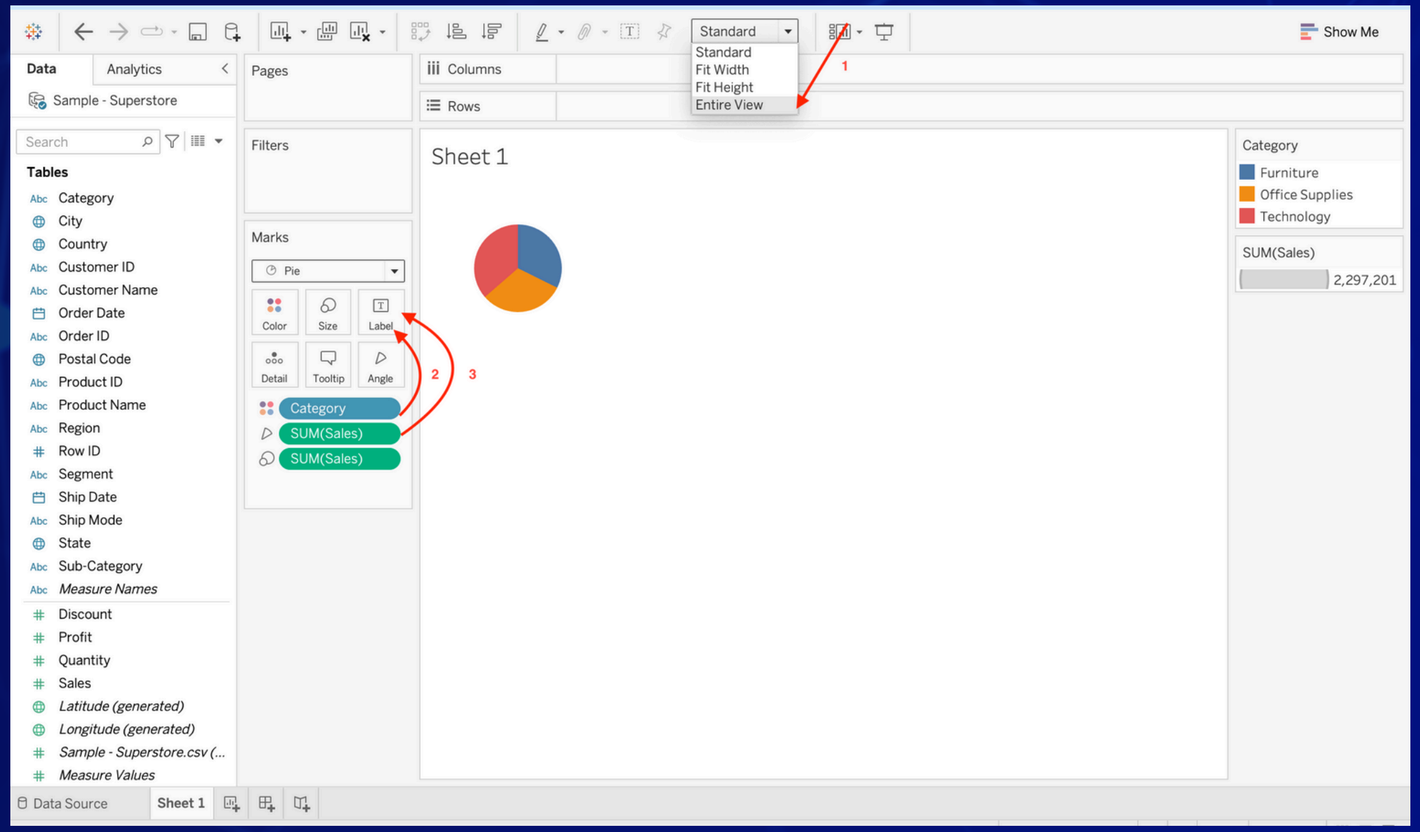


Creating Graphs : Pie Chart

1) Fit: Click on the icon labelled standard at the menu or toolbar and choose the entire view.

2) Label: Hold the command/shift key and drag the Category into the label icon in the Marks card to show the category label on the pie chart.

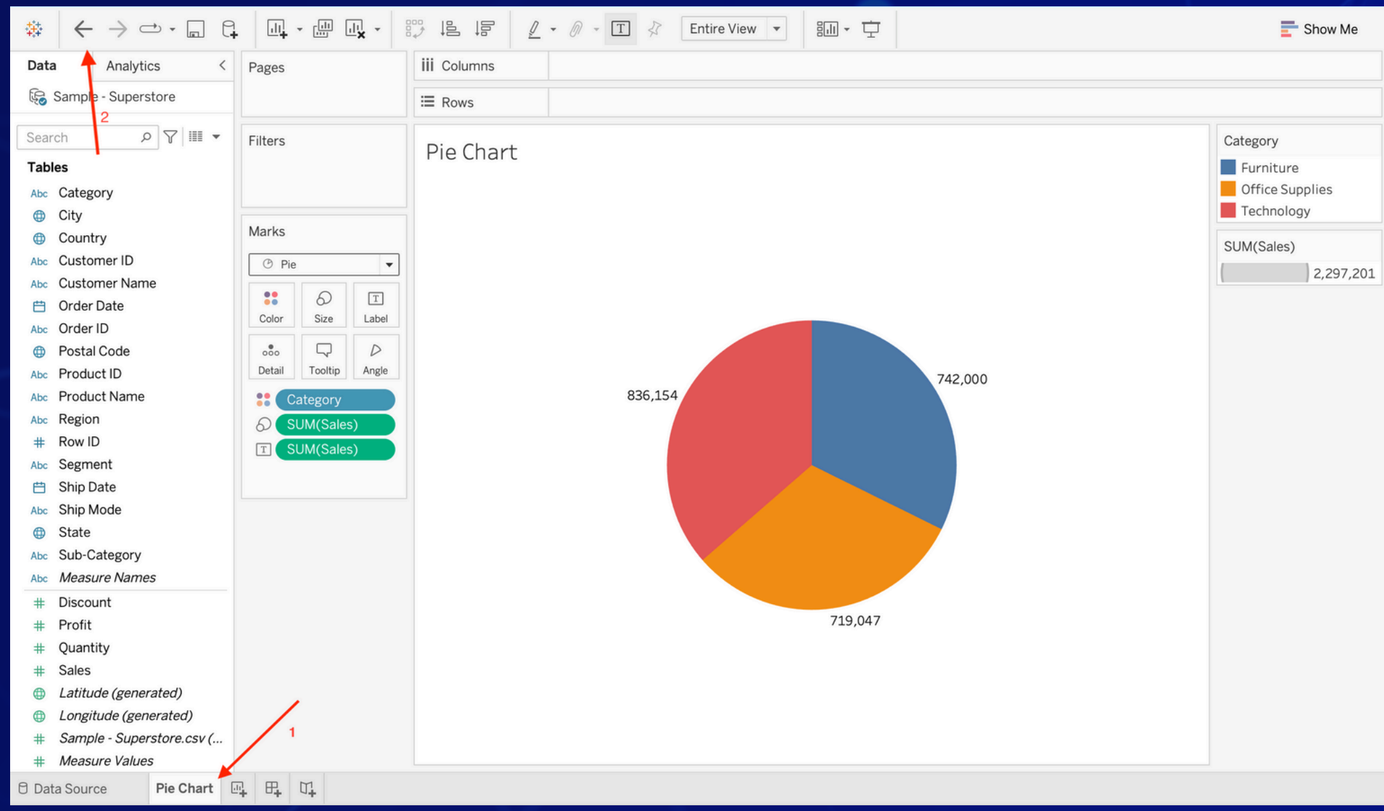
3) Hold the command/shift key and drag the SUM(Sales) into the label icon in the Marks card to show the sales sum on the pie chart.



Creating Graphs : Pie Chart

1) The image on the right should be your final result. You can rename the sheet to a Pie Chart by clicking on the Sheet 1 icon below.

2) Now we can undo all changes made and go back to our bar chart by clicking on the ← (Leftwards Arrow). We would be using the bar chart for our dashboard.

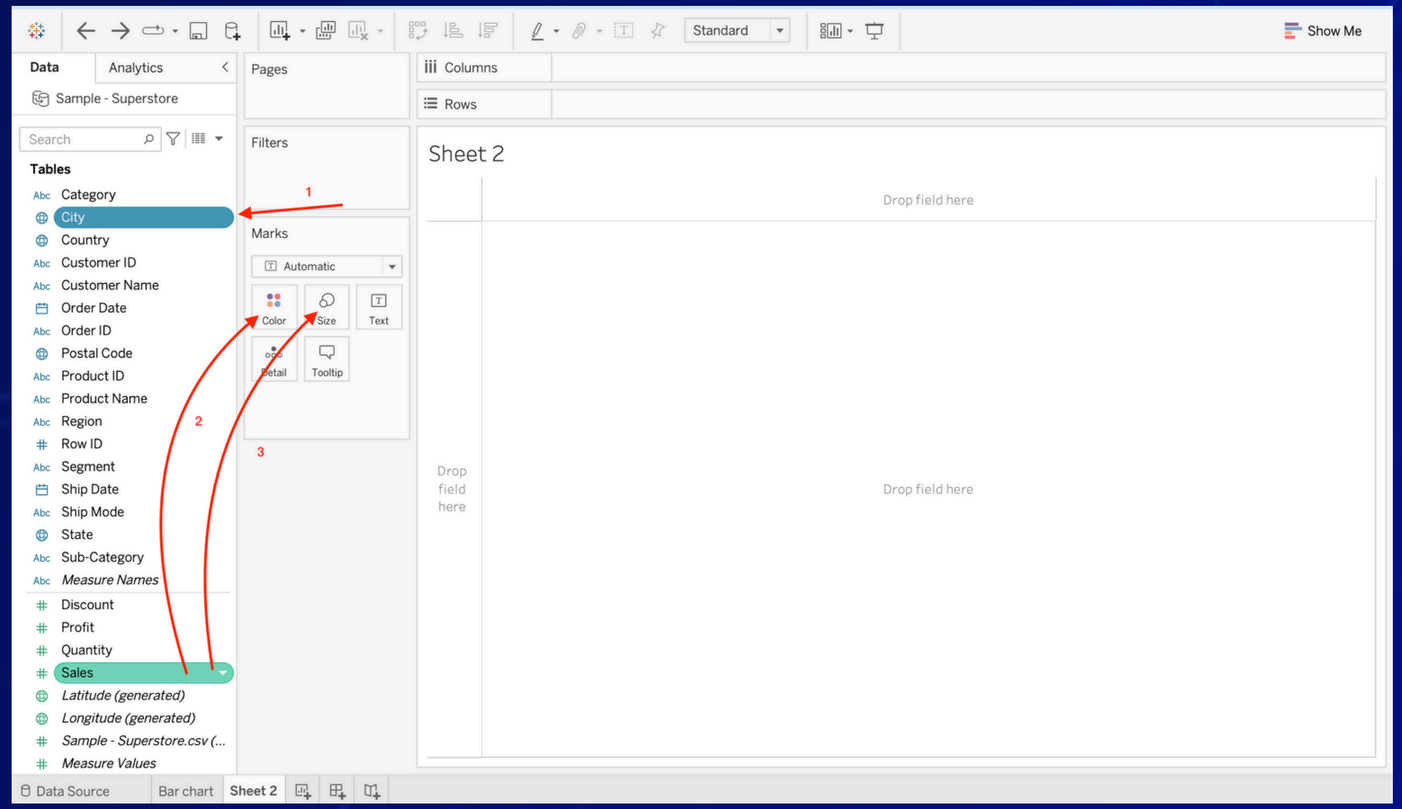


Creating Graphs : Map

1) Create a new sheet by clicking on the sheet icon below. Double-click on City in the data pane.

2) Drag sales to the Color icon in the Marks card.

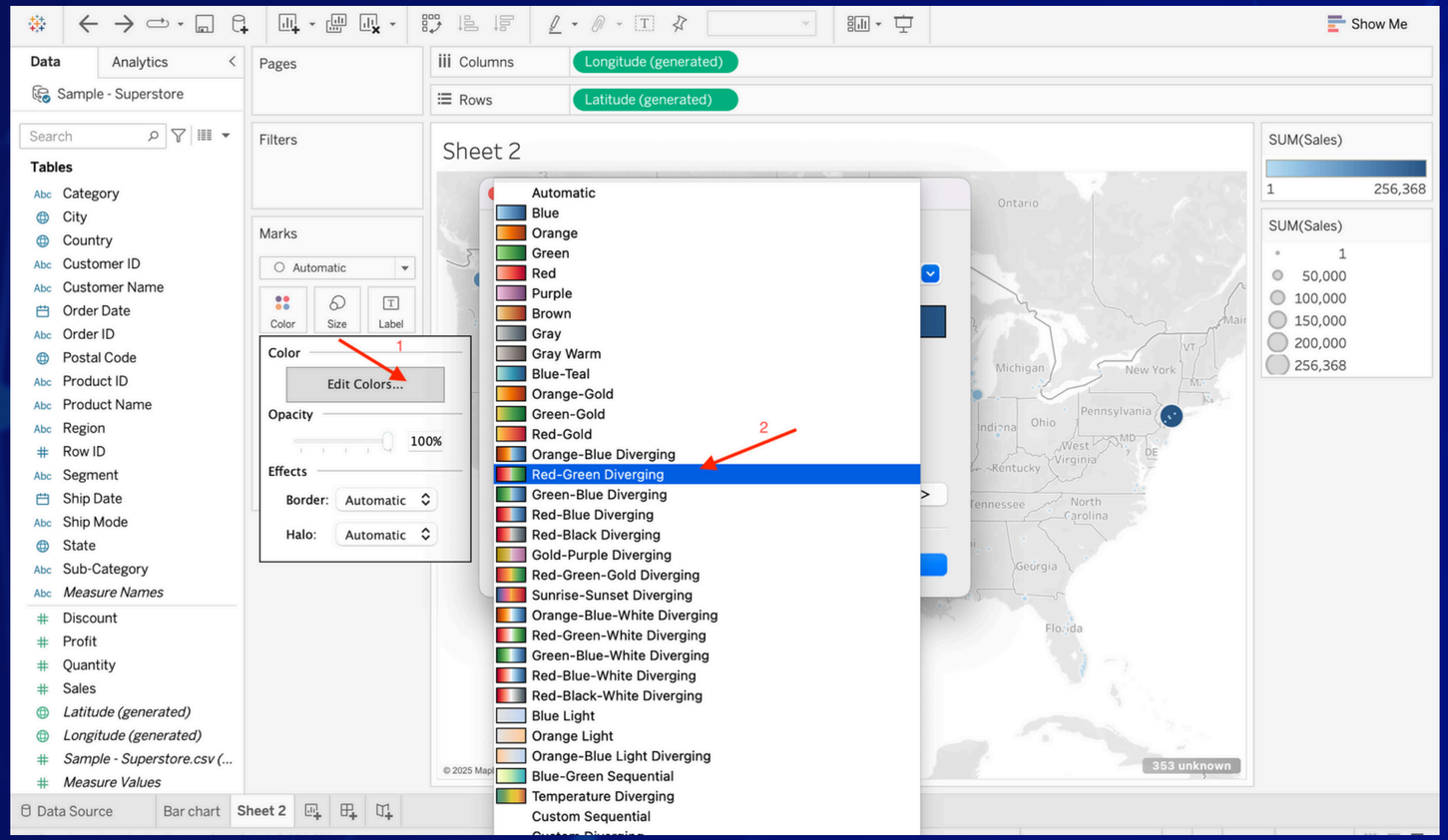
3) Drag Sales to the size icon in the Marks card.



Creating Graphs : Map

1) Edit colours: click on the Color icon in the Marks card, and select ‘Edit Color’.

2) Click on the Automatic icon and select the Red-Green Diverging to give a proper colour range for Sales on the map.

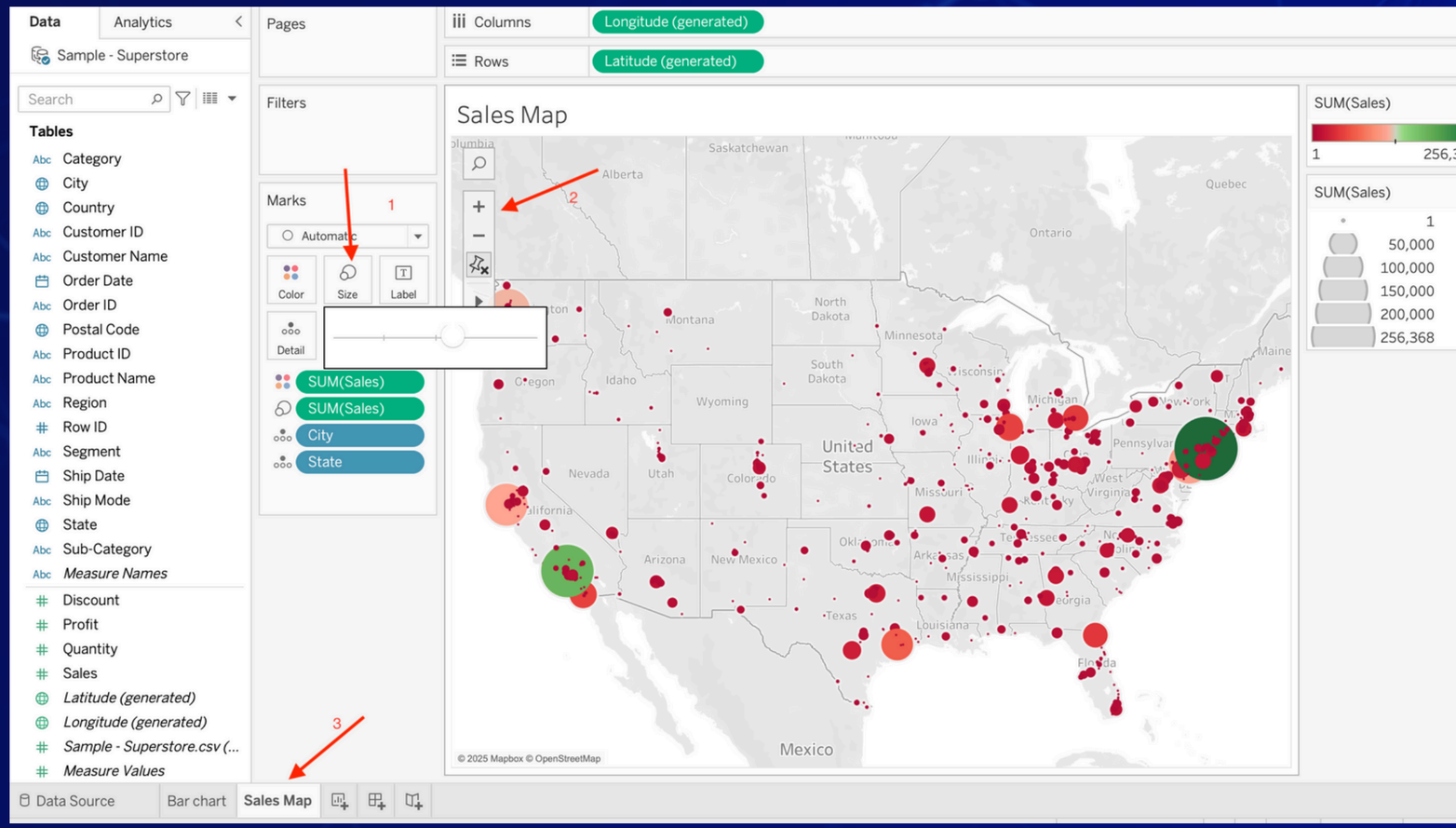


Creating Graphs : Map

1) Click on the size icon in the Marks card, and adjust the size of sales on the map.

2) You can zoom in and out, and also view the map in detail with the icon on the worksheet canvas

3) Rename the worksheet to Sales Map.



Creating Graphs : KPI Card

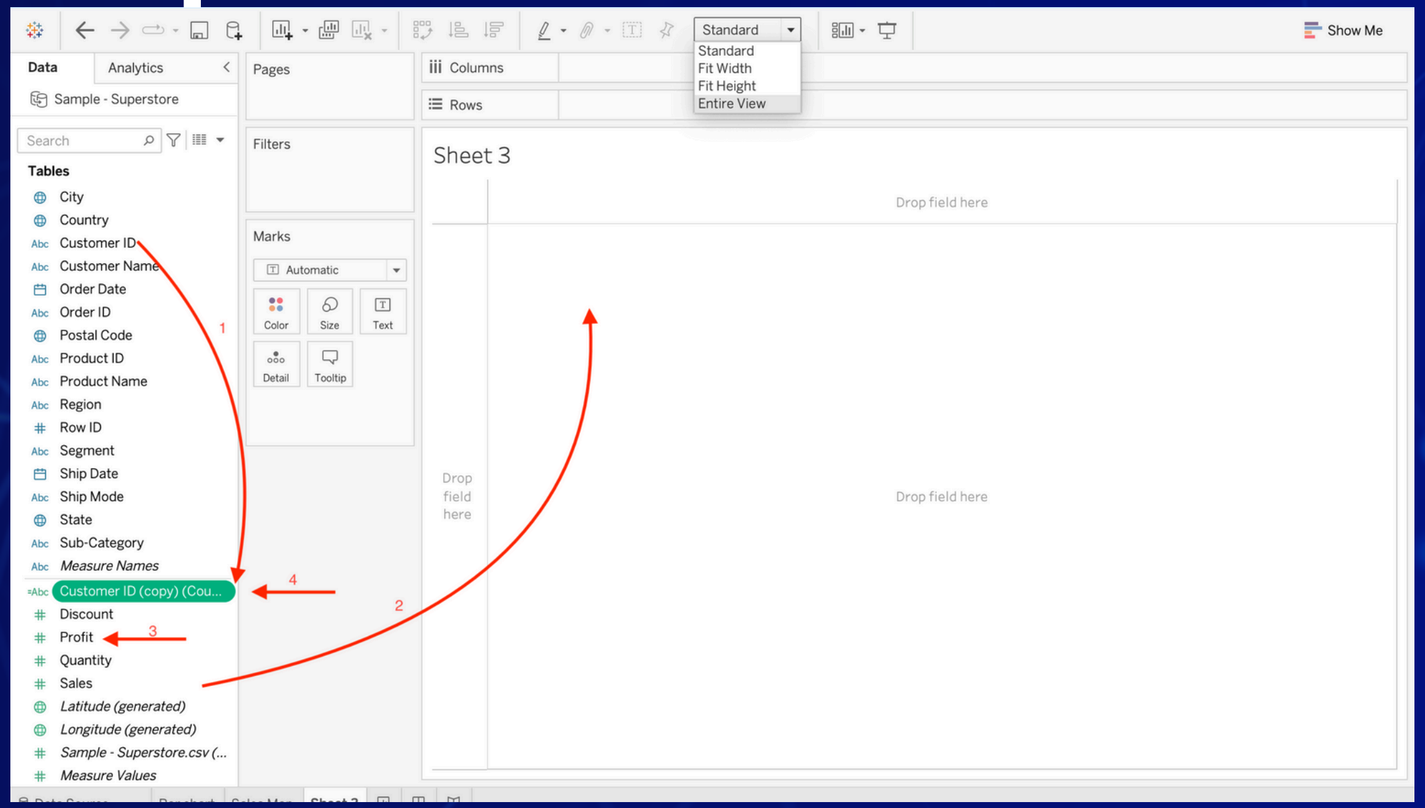
1) Hold the Shift or Ctrl (or Command on a Mac) key and drag the customer id from the dimension field to the measure field to get the count of customers.

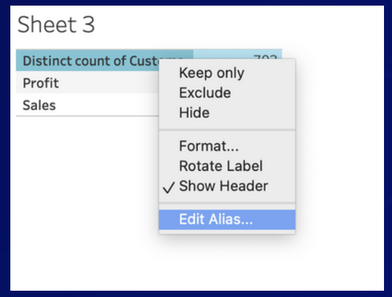
2) Drag sales to the canvas

3) Double-click on profit to add to the canvas

4) Double-click on the Customer ID in the measure field.

5) Right-click on the distinct count of customer field , click on edit alias and rename field to '# of Customers'





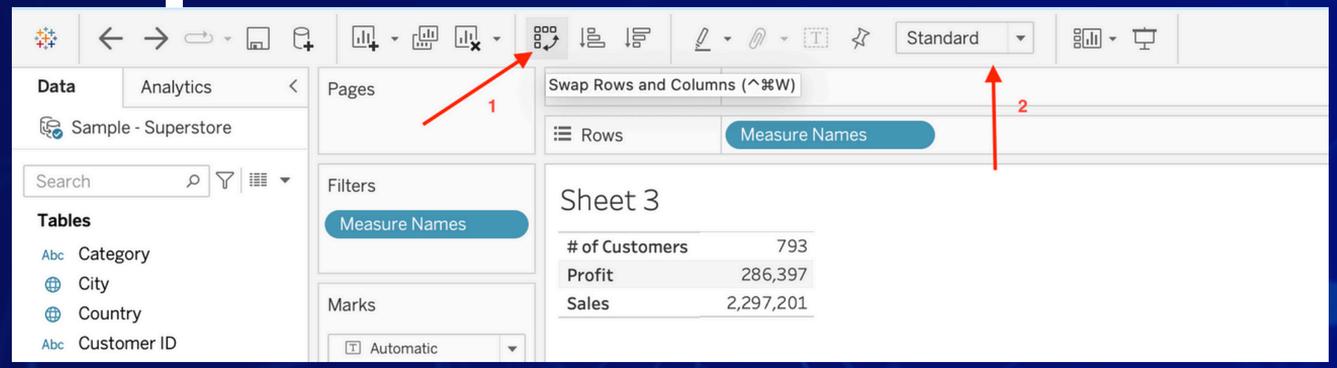
Creating Graphs : KPI Card

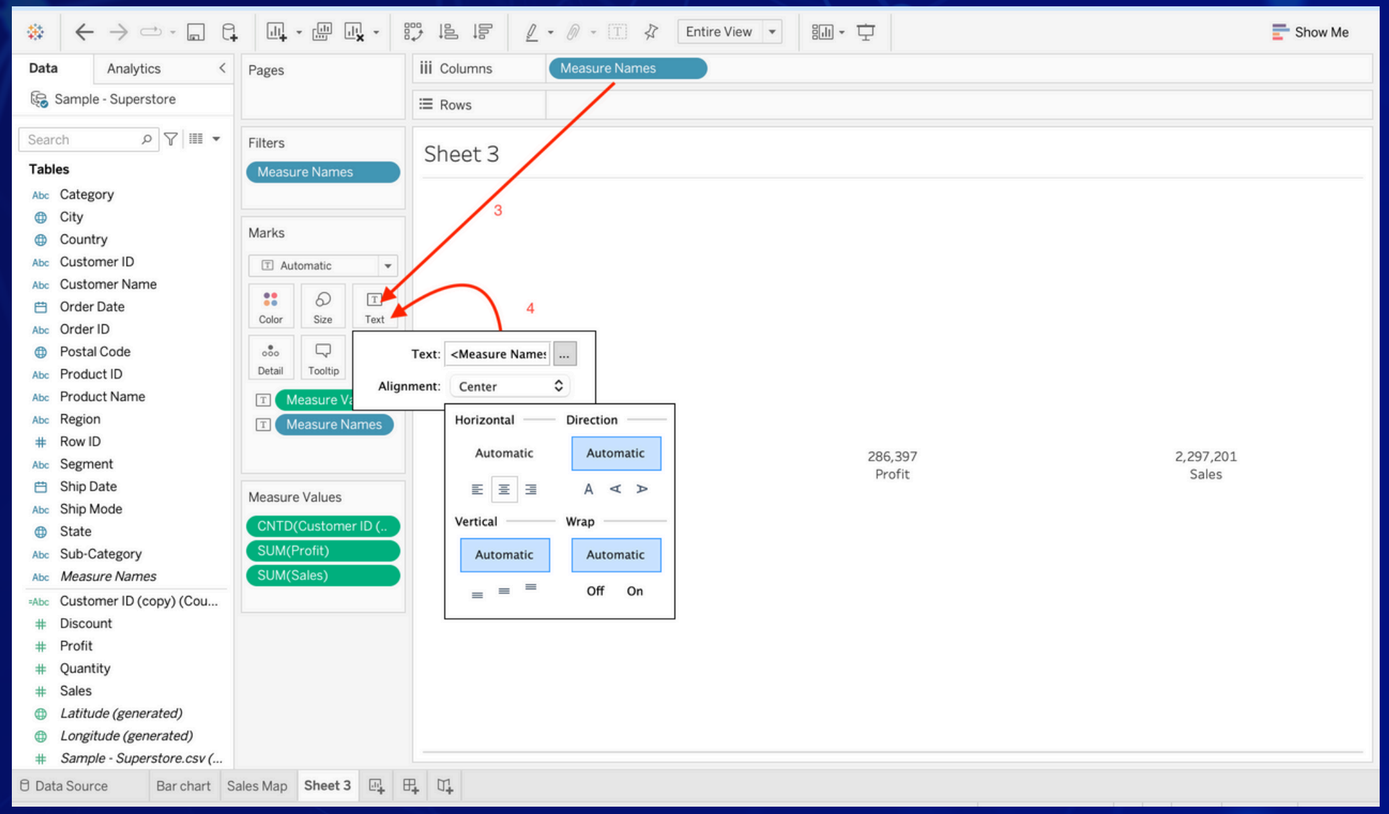
1) Click on the Swap row icon to swap the measure names

2) Change the fit to ‘Entire View’

3) Hold the shift key and drage the measure names to text

4) Click on the text field. Highlight and increase the font size of the measure names and value fields. Set the horizontal and vertical fields to centre.

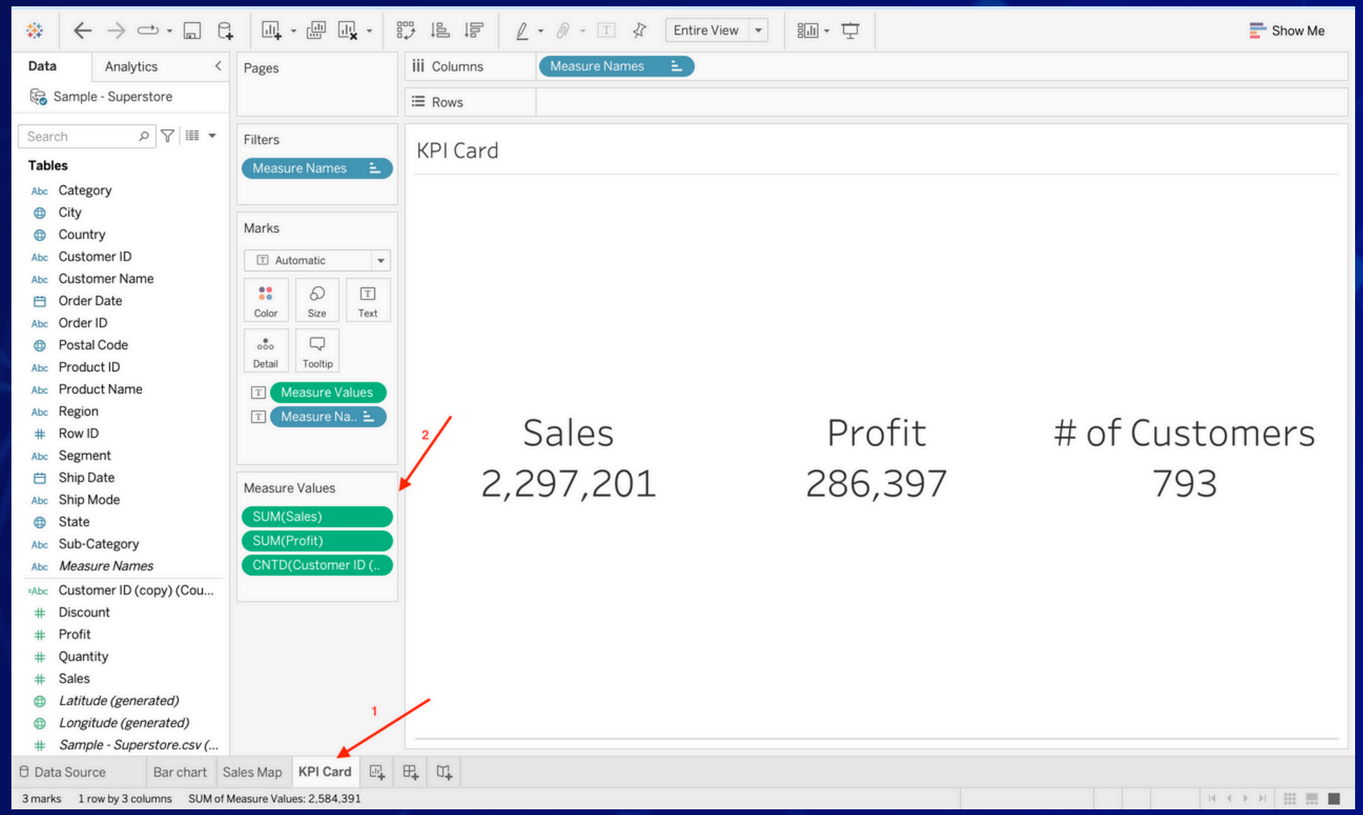




Creating Graphs : KPI Card

1) Rename sheet to ‘KPI Card’

2) Rearrange measure fields to preference. You can undo mistake with the Leftwards Arrow.



Creating Graphs : KPI Card

1) Rename sheet to ‘KPI Card’

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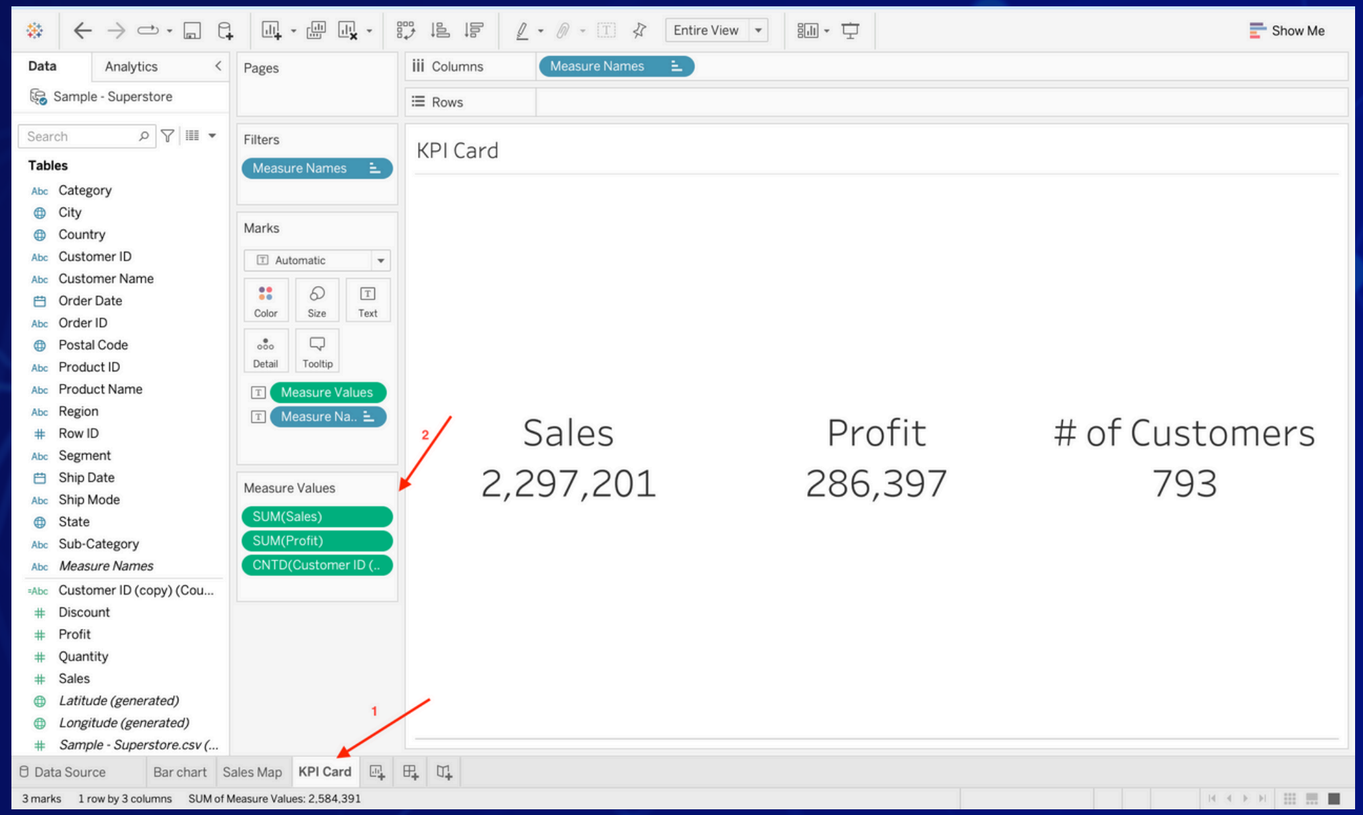
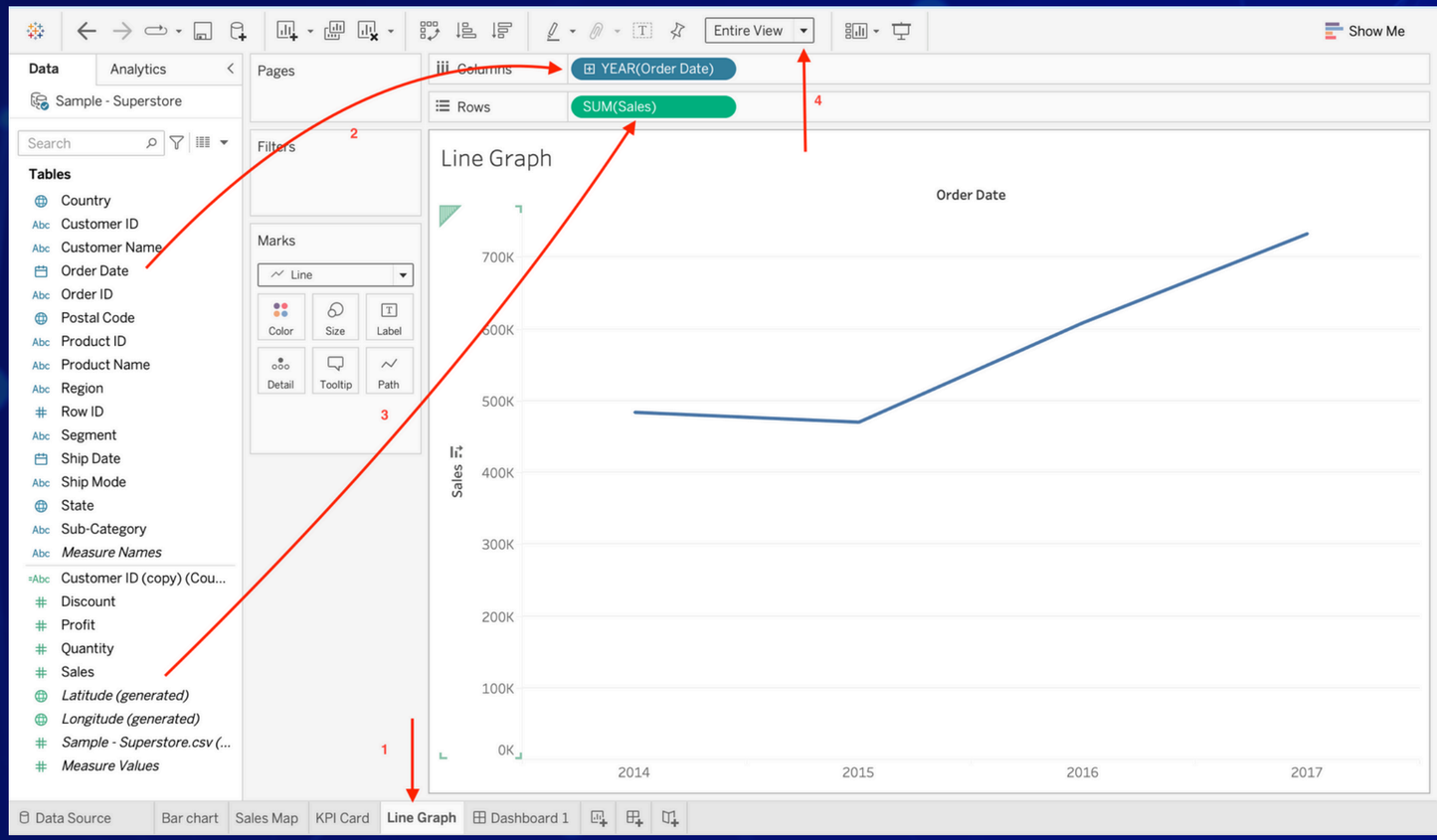


Creating Graphs : Line Graph

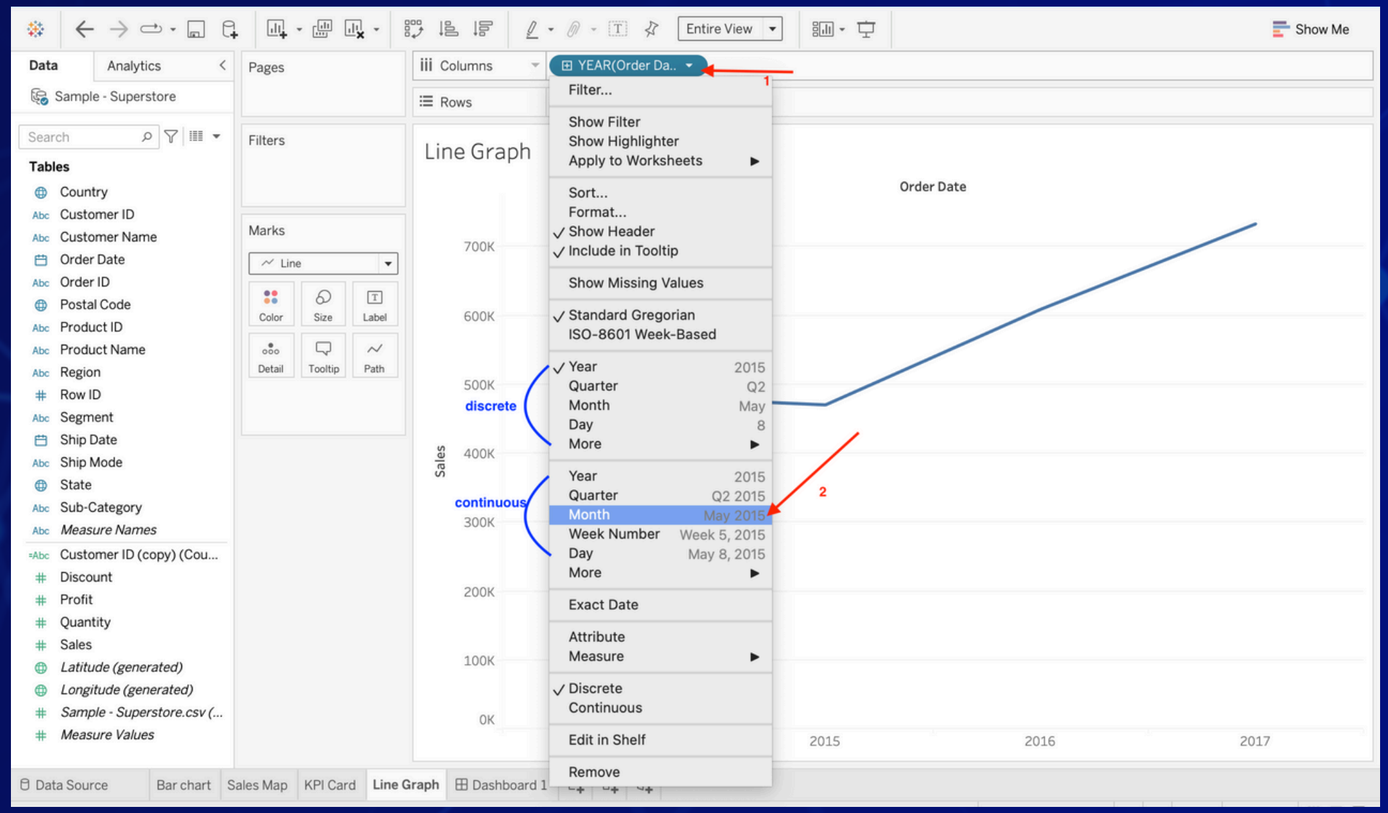
1) Create a new sheet and name ‘Line graph’.
2) Drag the Order Date field to the Columns field in the Canvas.
3) Drag sales to the Rows field.
4) Set the fit as Entire View.



Creating Graphs : Line Graph

1) Continuous or discrete date: Tableau dates are either discrete (blue), treating each date as a separate category for grouping and plots like bar charts, or continuous (green), treating dates as a timeline to show trends in line graphs. As seen in the image, click the down arrow.

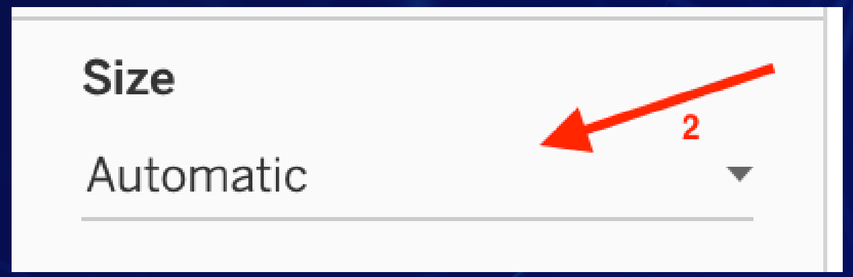
2) Select Month as continuous.



Creating A Dashboard

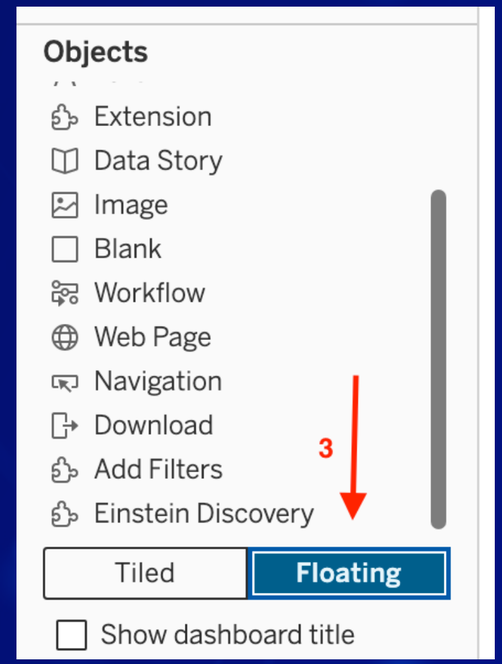
1) Create a New Dashboard: At the bottom of the Tableau workbook, click the "New Dashboard" tab.

2)Set Dashboard Size: On the left-hand side of the screen, in the "Dashboard" pane, you'll see options for sizing. You can choose a automatic to fit to any screen or fixed size (e.g., Desktop Browser, Generic Desktop) or customize the dimensions.



3)Layout: Tableau uses layout containers to organise objects on a dashboard.

- Tiled: Objects are placed in a grid and automatically resize to fit the available space. This is the default behavior.
- Floating: Objects can be placed anywhere on the dashboard and resized independently, allowing for more flexible layouts. we will primarily use floating layouts for greater flexibility.

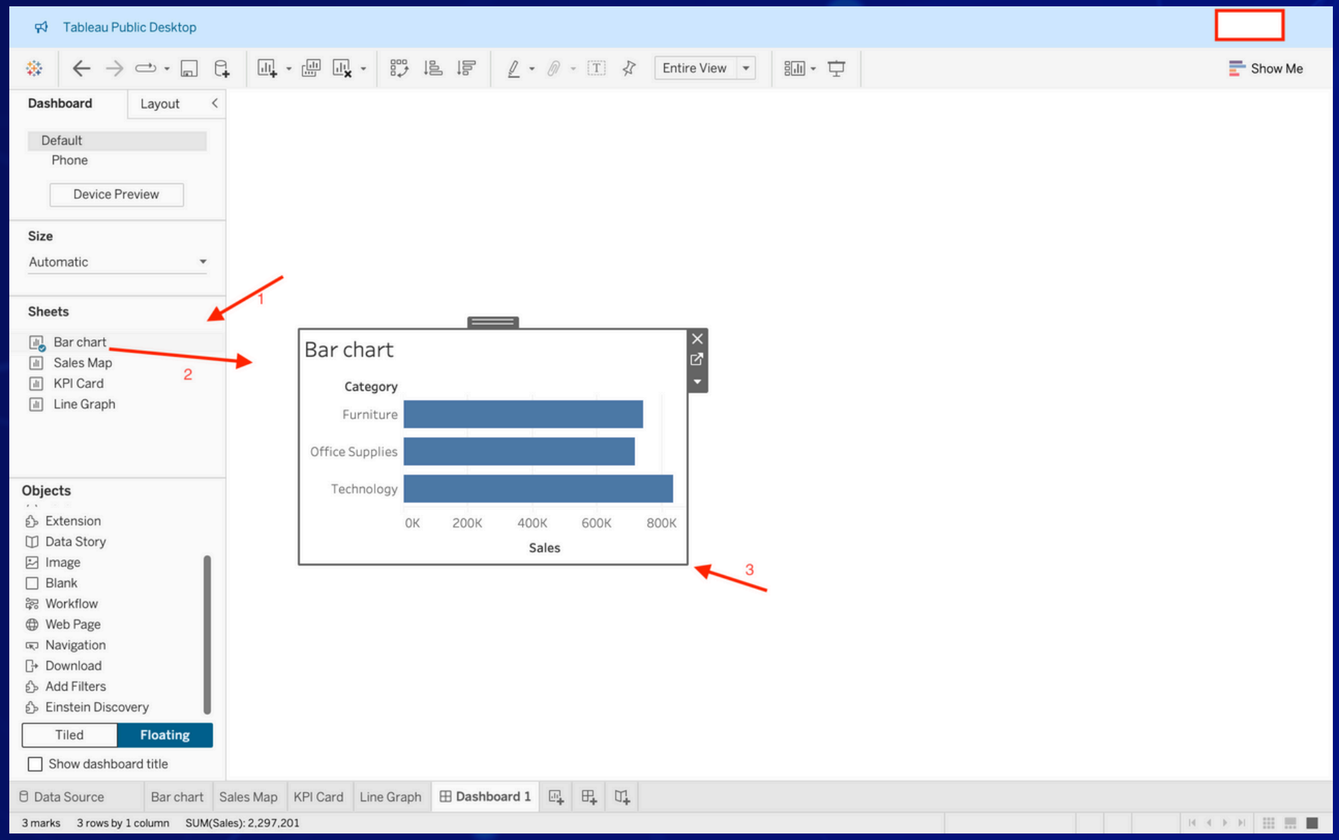


Creating A Dashboard

1) See Worksheet : In the "Sheets" section of the "Dashboard" pane, you'll see a list of all the visualizations you've created

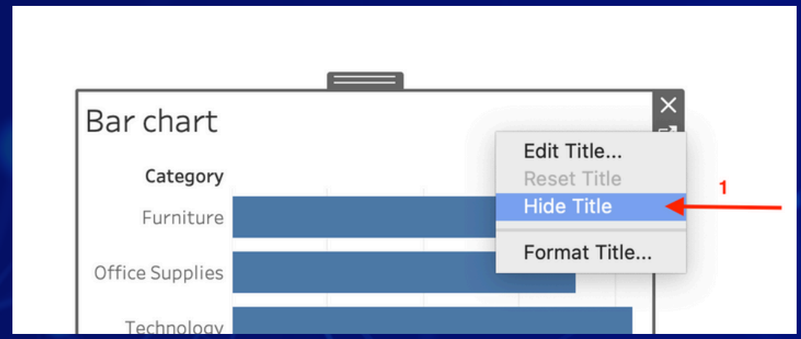
2) Drag and Drop Your Sheets: Drag and drop the sheets onto the dashboard canvas. Since "Floating" is selected, the sheets will be placed as floating objects. Drag the sheets to the desired location on the dashboard. Floating items can be positioned freely and can overlap.

3) Resize : Resize the sheets by clicking and dragging the handles (small squares) around the sheet's border.

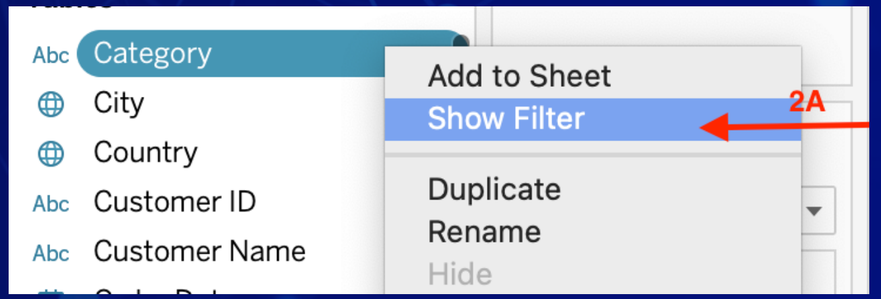


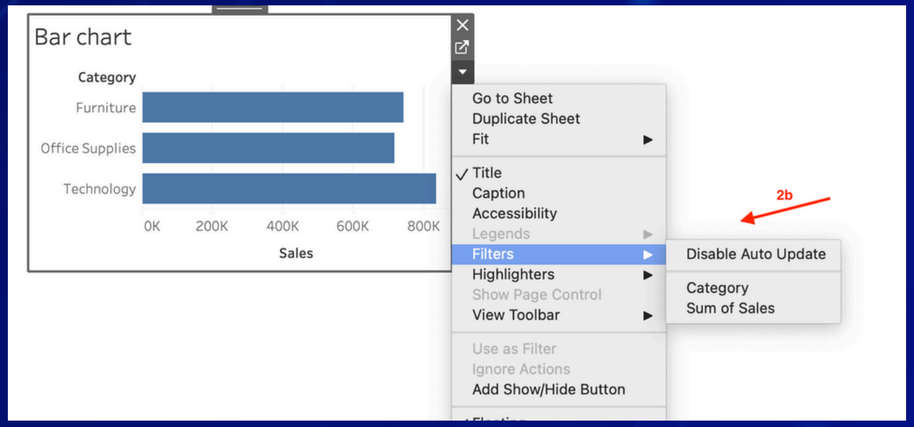
Creating A Dashboard

1) Hide Titles: To create a cleaner look and control text elements separately: Right-click on the title of each sheet on the dashboard. Select "Hide Title."



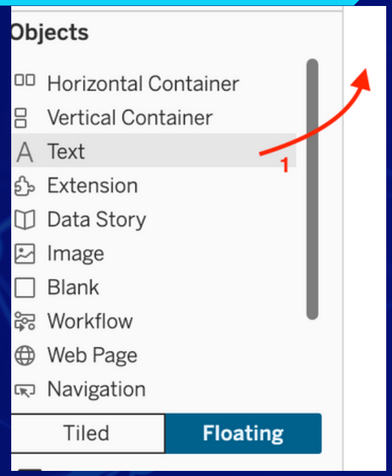
2) Filters : Navigate to the worksheet that contains the filter you want to add to the dashboard. Right-click on the field (dimension or measure) that you want to use as a filter. Select "Show Filter." The filter control will appear on the worksheet. Alternatively, on the dashboard, you can go to a worksheet in the canvas click on more options and also apply filters





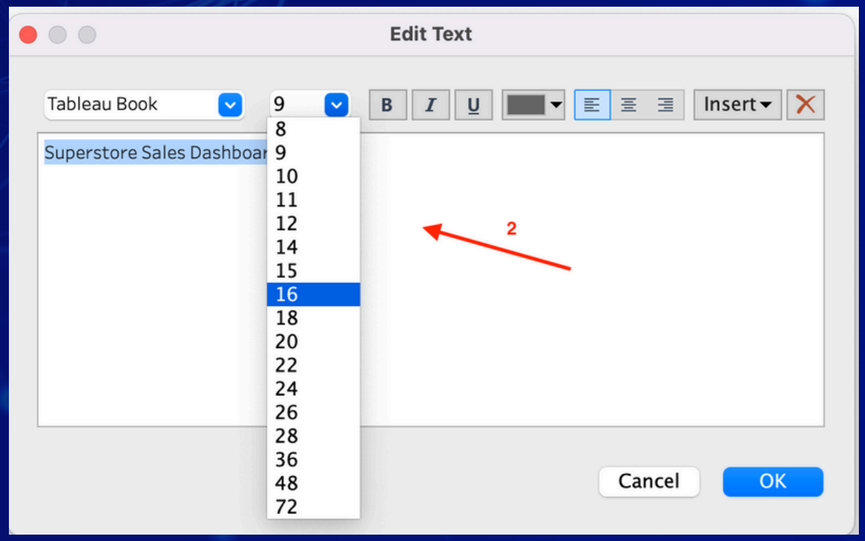
Creating A Dashboard

1) Adding Text to a Tableau Dashboard : In the "Objects" pane on the left side of the dashboard, find the "Text" object. Click and drag the "Text" object onto your dashboard.



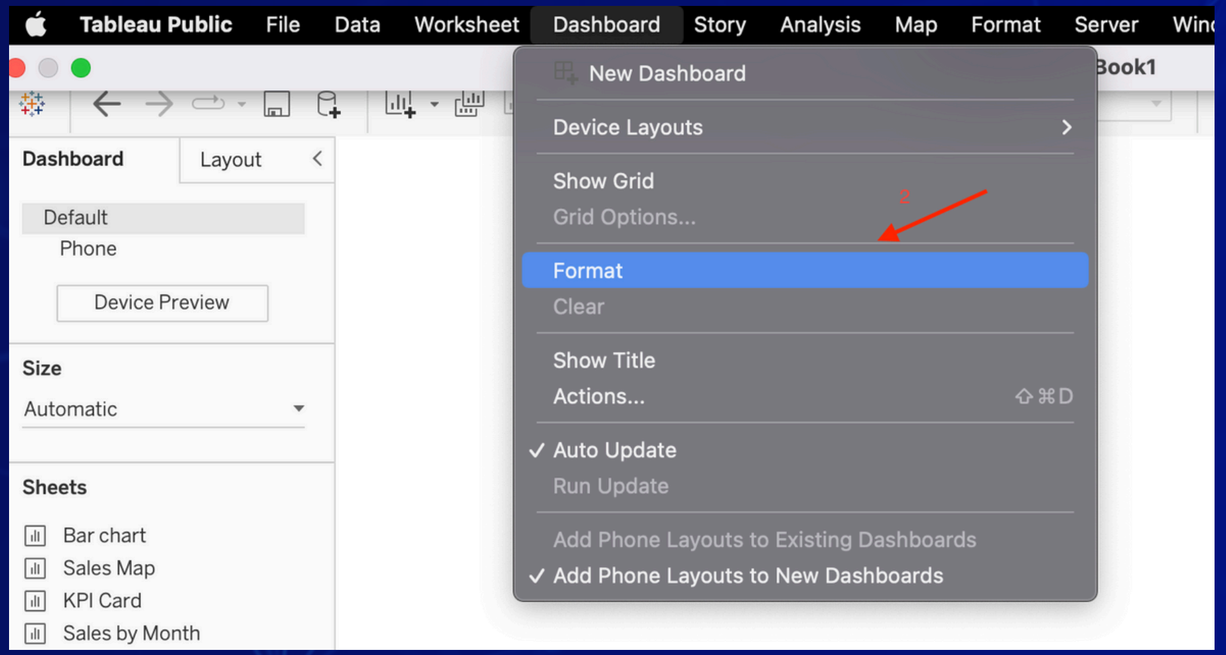
2) Enter Your Text: A text box will appear on your dashboard. Double-click inside the text box. Type the text you want to display. For example, type "Superstore Sales Dashboard" While still in the text box, you can format the text using the options that appear, these options are:

- Font type
- Font size
- Font colour
- Alignment (left, center, right)
- Bold, italics, underline



Creating A Dashboard

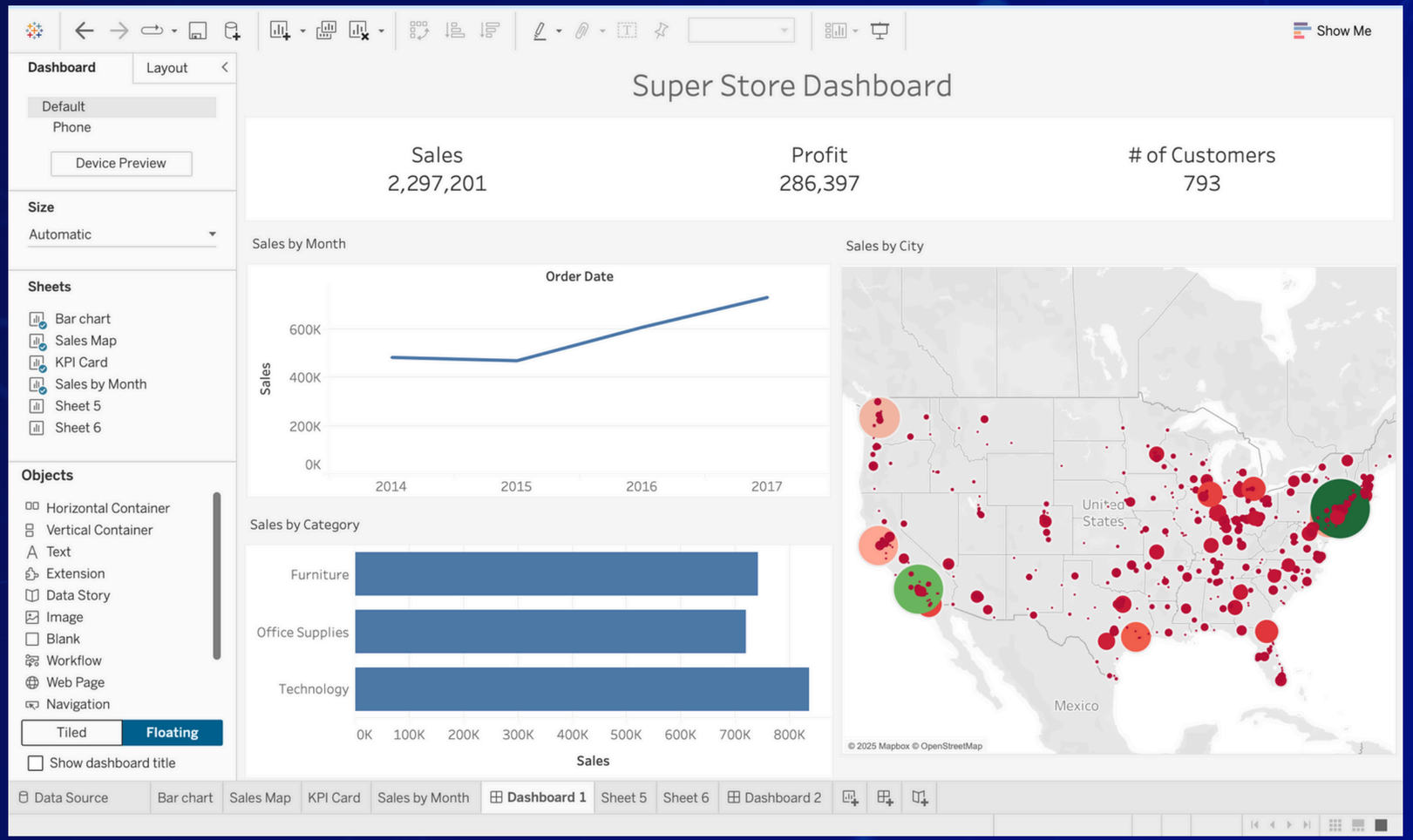
1) Access the Formatting Pane: At the top in the Dashboard toolbar, there is a "Format" option. The formatting pane provides various options to control the dashboard's appearance, including: Background Color: You can change the overall background color of the dashboard.



Creating A Dashboard

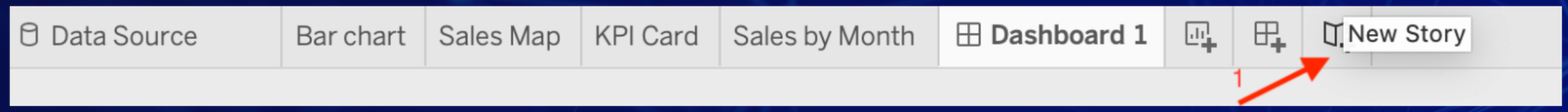
1) Format and Polish: Adjust the formatting of the dashboard, such as colors, fonts, and borders, to create a visually appealing presentation.
Clean dashboards are best, so keep the formatting simple.

2) Save and Publish :
Saving your workbook saves a local copy of your work on your computer, allowing you to close Tableau and resume later.
Publishing to Tableau Public uploads your workbook to the Tableau Public website, making it accessible to others online



Creating A Story

1) Stories: Tableau Stories are designed to help you present a data narrative. Instead of just showing individual charts or dashboards, stories allow you to combine them in a sequence, adding context and guiding your audience through your analysis. Begin by clicking the "New Story" tab at the bottom of your Tableau workbook. This action opens a new story worksheet.

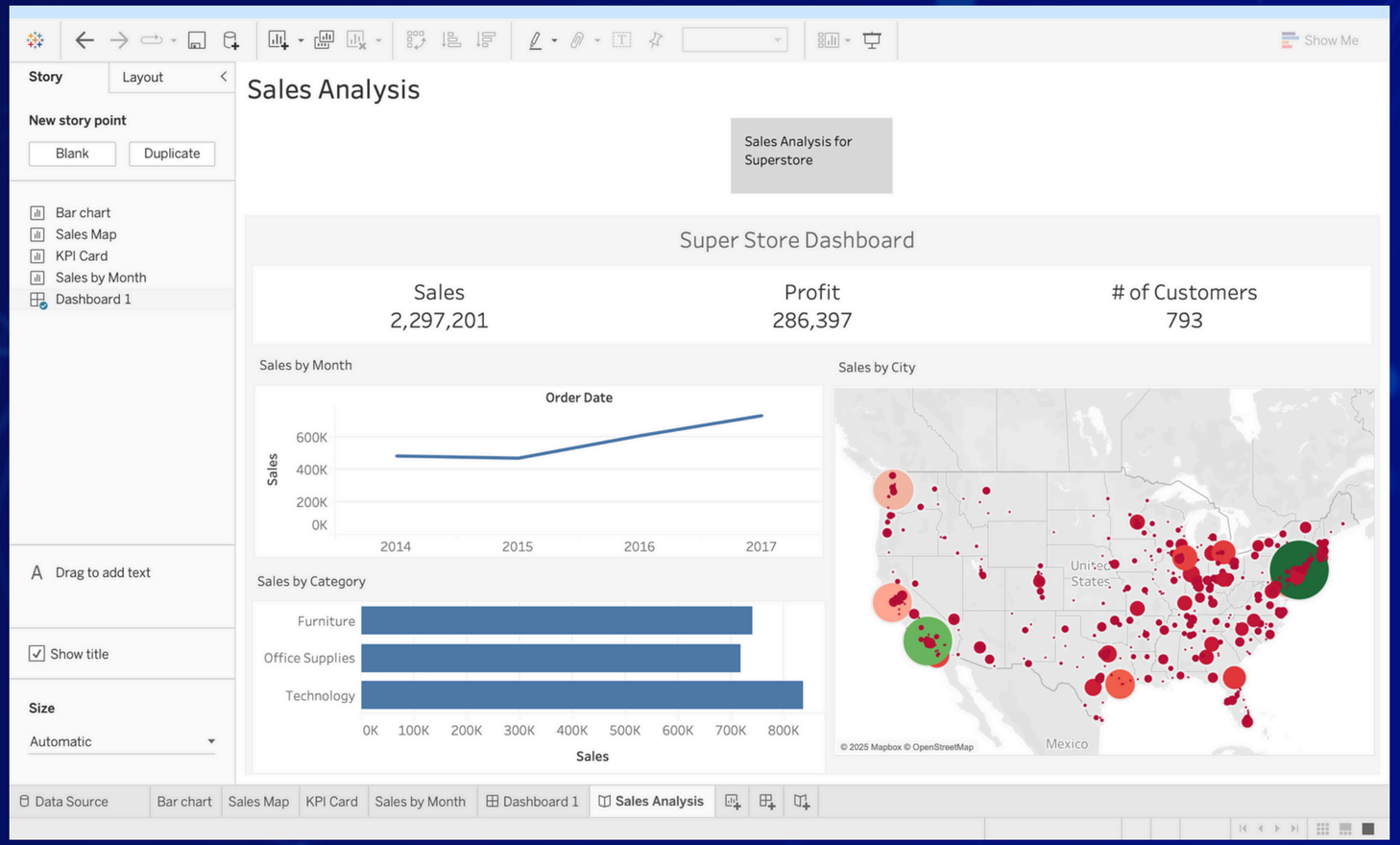


2) Story Size: Choose a size for your story in the "Story" pane. You can select a predefined size or specify custom dimensions to fit your intended display.

3) Drag and Drop: Populate your story by dragging sheets (worksheets or dashboards) from the "Sheets" pane onto the story canvas.

Creating A Story

4) Captions and Descriptions: Enhance each story point with captions or descriptions. These text elements provide context, explain the data shown, and guide your audience's understanding.



Thank you for your time