Data Visualization Using Tableau

Simple Insights, Stunning Impact: Tableau's Basic Charts

Quick Recap

- Effective data presentations are essential for translating insights into actionable results.
- Data storytelling involves crafting a compelling narrative to convey tailored information to a particular audience.
- Tableau offers a free version, Tableau Public, and a paid version, Tableau Desktop.
- Tableau can import data from various file types into its workspace, such as text, CSV, and Excel.

Engage and Think

You are a fitness enthusiast tracking your progress on a health app. You have diligently logged your daily workouts, calorie intake, and weight over the past few months.

Have you ever thought about how we can turn this data into easy-to-understand charts to see how your fitness journey has evolved? Imagine being able to visualize your workout trends, compare your calorie intake with your weight changes, and identify patterns to optimize your fitness routine.

Learning Objectives

By the end of this lesson, you will be able to:

- Choose the appropriate chart type to represent a given set of data
- Apply color and formatting principles to improve the readability of a chart
- Assess the effectiveness of interactive features used in a Tableau dashboard for visualizing the data

Charts

What Is Chart?

It is a pictorial representation of data.

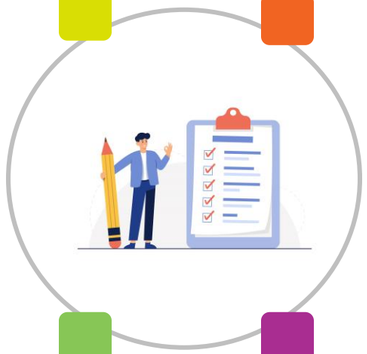
It can represent data that’s easy to analyze and comprehend.

Chart Selection Guide

Choose the chart type based on the answers to the following questions:

What is the relationship between the values in the dataset?

What is the type of data?



Whom will the data be presented to?

How big is the data?

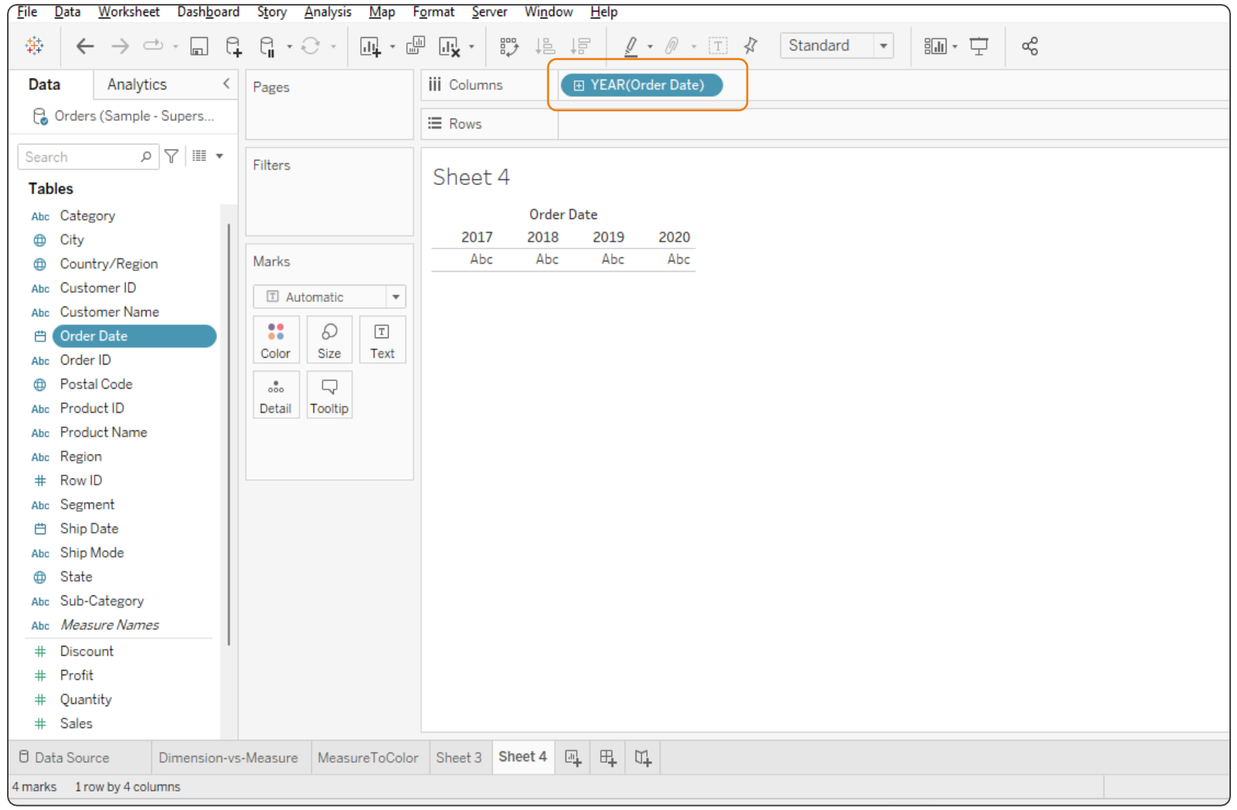
Types of Basic Charts

Some of the commonly used basic charts are:

Fundamental Features of Tableau

Date Variable

Depending on the analysis, date fields can be used as discrete or continuous variables.



Accordingly, it can be used as date part (when used as discrete) or date value (when used as continuous).

Date Part

It refers to a specific unit of time, such as a year, month, or day. It helps break down time into manageable and meaningful segments for analysis and visualization.

- It represents individual components of a date (year, month, day).
- It functions as discrete categories.
- It is useful for comparing values at specific points in time (For example: monthly sales).
- It is shown as labels on charts.

Date Value

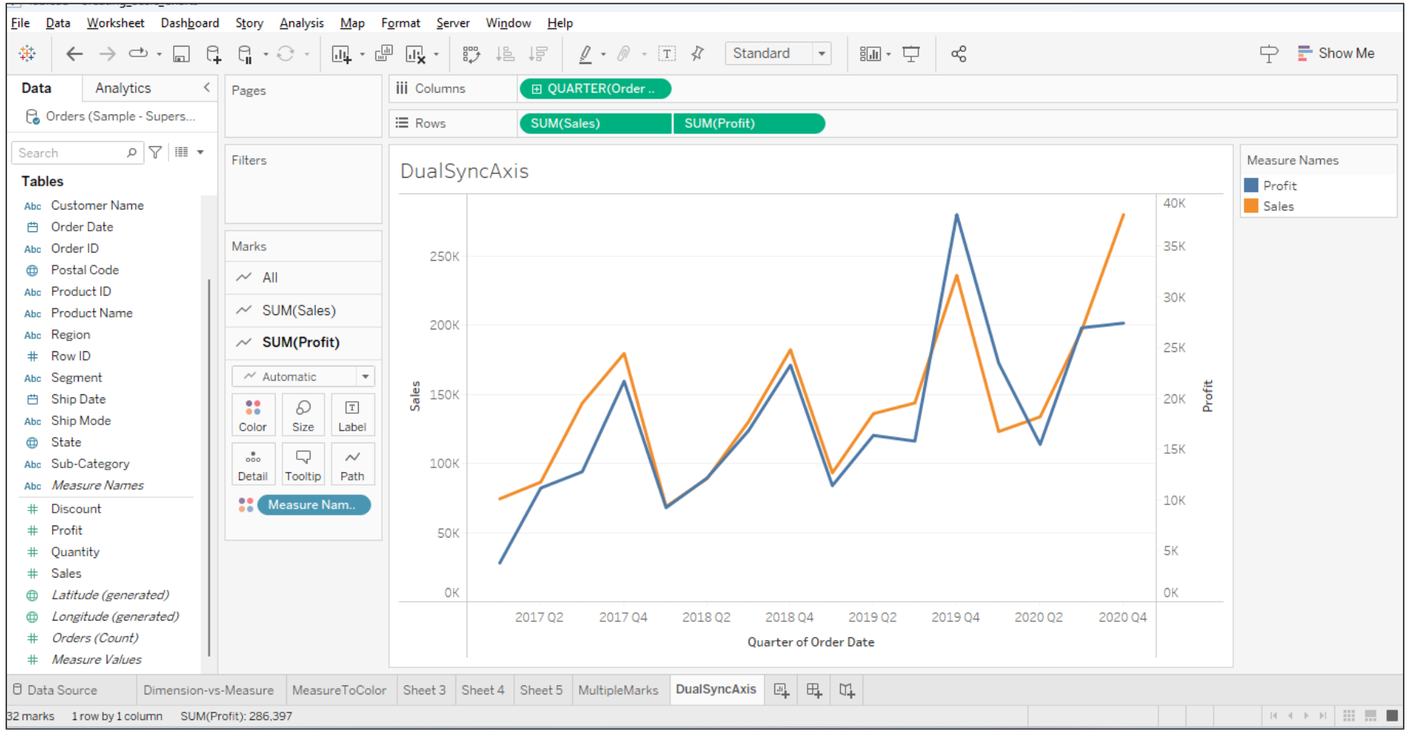
It is a specific point or instance within a chosen unit of time. It represents a particular date and time on the calendar.

- It represents a date as a single point on a continuous timeline.
- It shows trends and changes over time.
- It is used for visualizing chronological data.
- It is plotted on charts along an axis.

Dual Axis

It is used when we want to show two measures on a single chart for comparison.

Sales and profit trends by quarter from 2017 Q2 - 2020 Q4

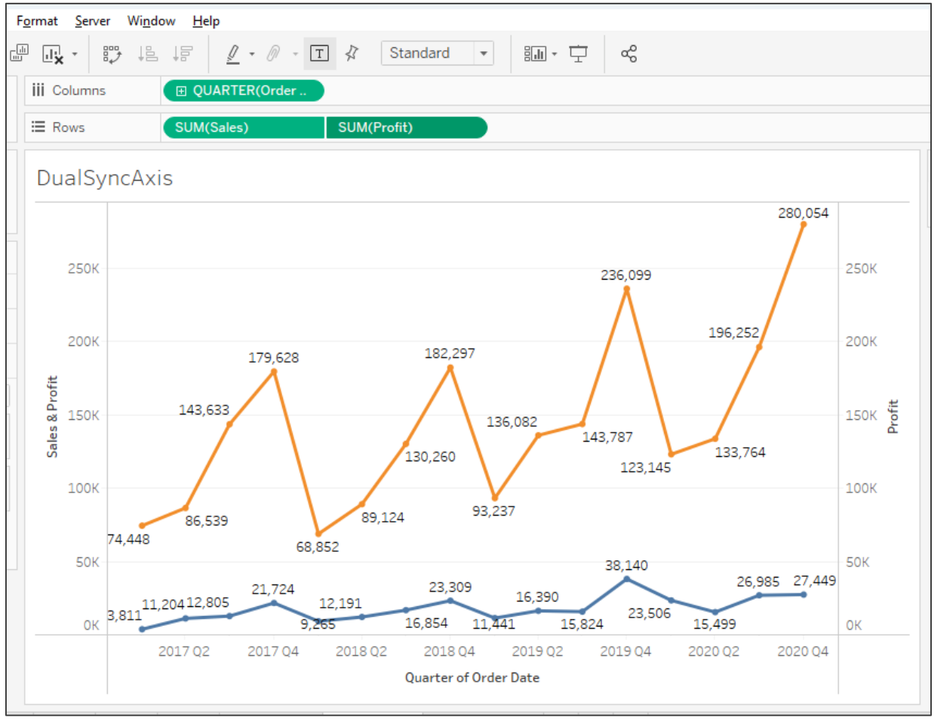


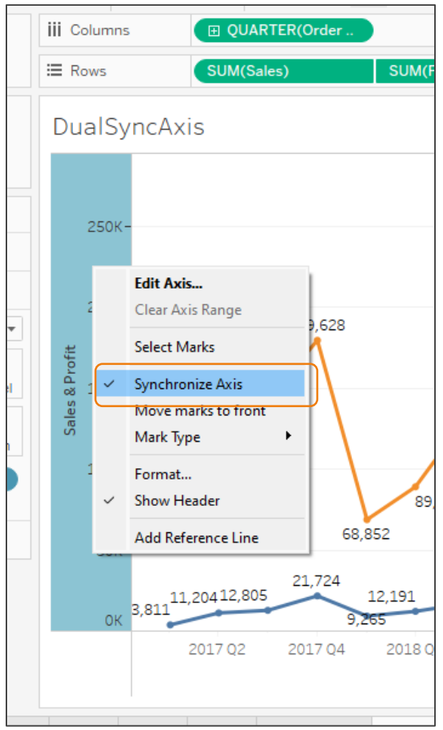
The Dual Axis option appears on the second measure dropdown when you place two measures side by side.

Sync Axis

It is used to synchronize the scales of multiple axes within a single view.

Sales and profit trends by quarter from 2017 Q2 - 2020 Q4



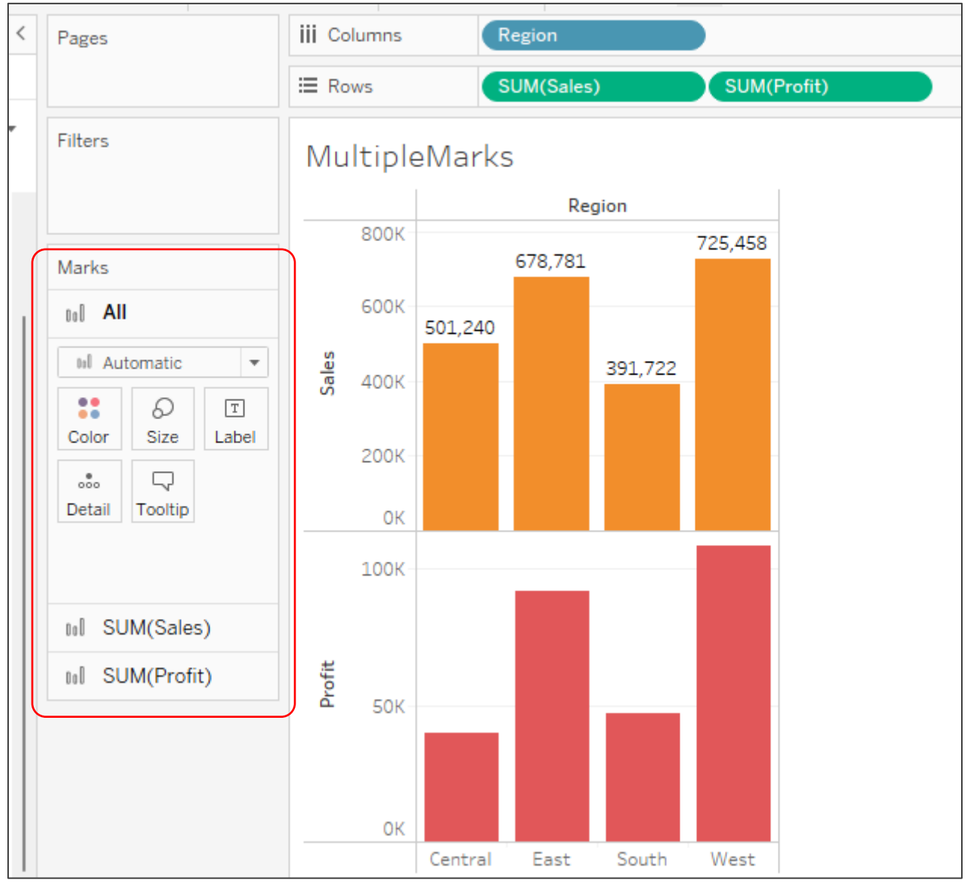


It can be accessed by right-clicking on any of the axes when you have two axes and measures on the same chart.

Multiple Marks

It is a visualization that contains more than one measure, resulting in the creation of separate marks or data points for each measure on the visualization.

Regional sales and profit analysis



Quick Check

In what scenario would you typically use a date field as a continuous variable?

A. When performing time series analysis

B. When creating categorical variables

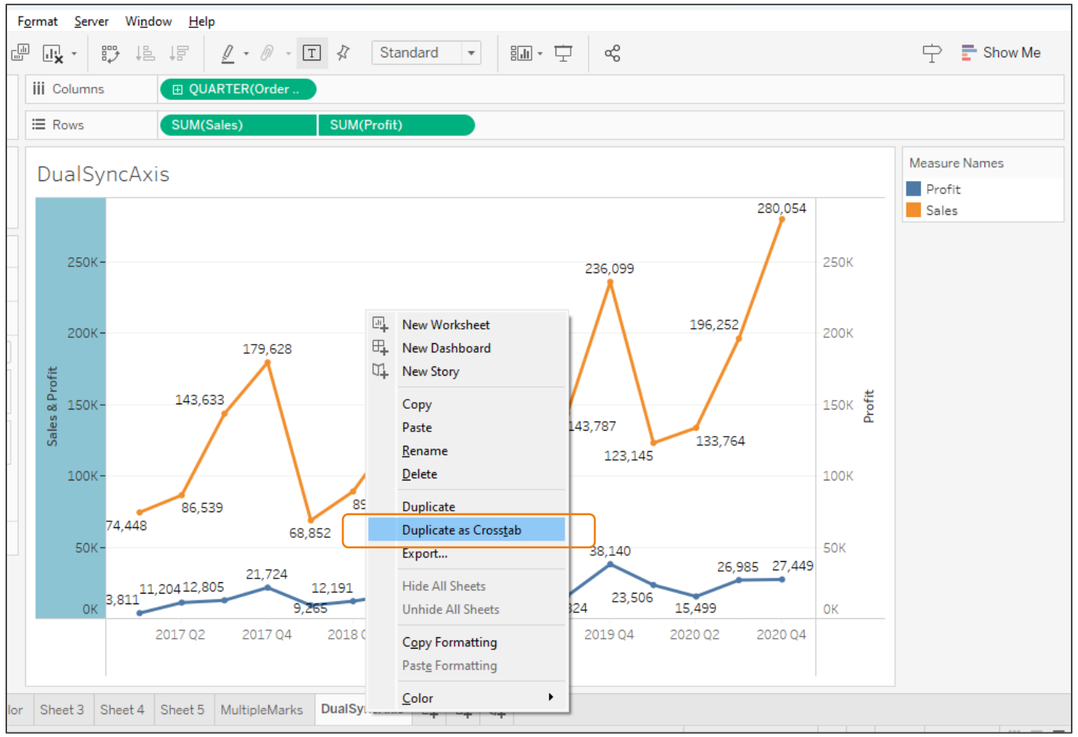
C. When conducting frequency distribution analysis

D. When identifying outliers in the data

Crosstab View

It presents data in a tabular format, resembling a spreadsheet, where dimensions and measures are displayed as rows and columns.

Sales and profit trends by quarter from 2017 Q2 - 2020 Q4

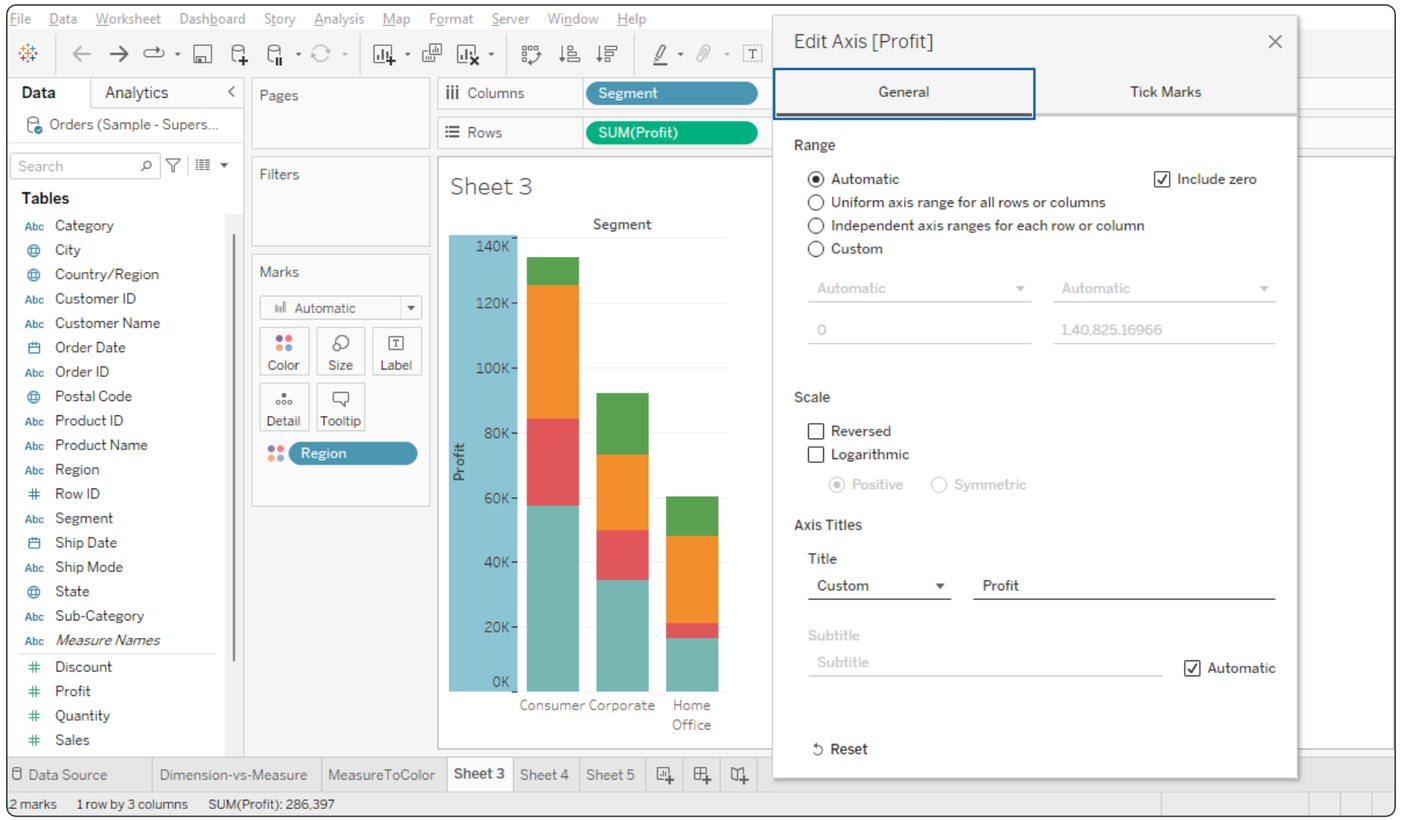


It allows one to quickly create a crosstab view based on an existing visualization in a new sheet. It can be accessed by right-clicking on the sheet name.

Edit Axis

It allows one to make changes to the axis range, axis scale, axis ticks, and axis format.

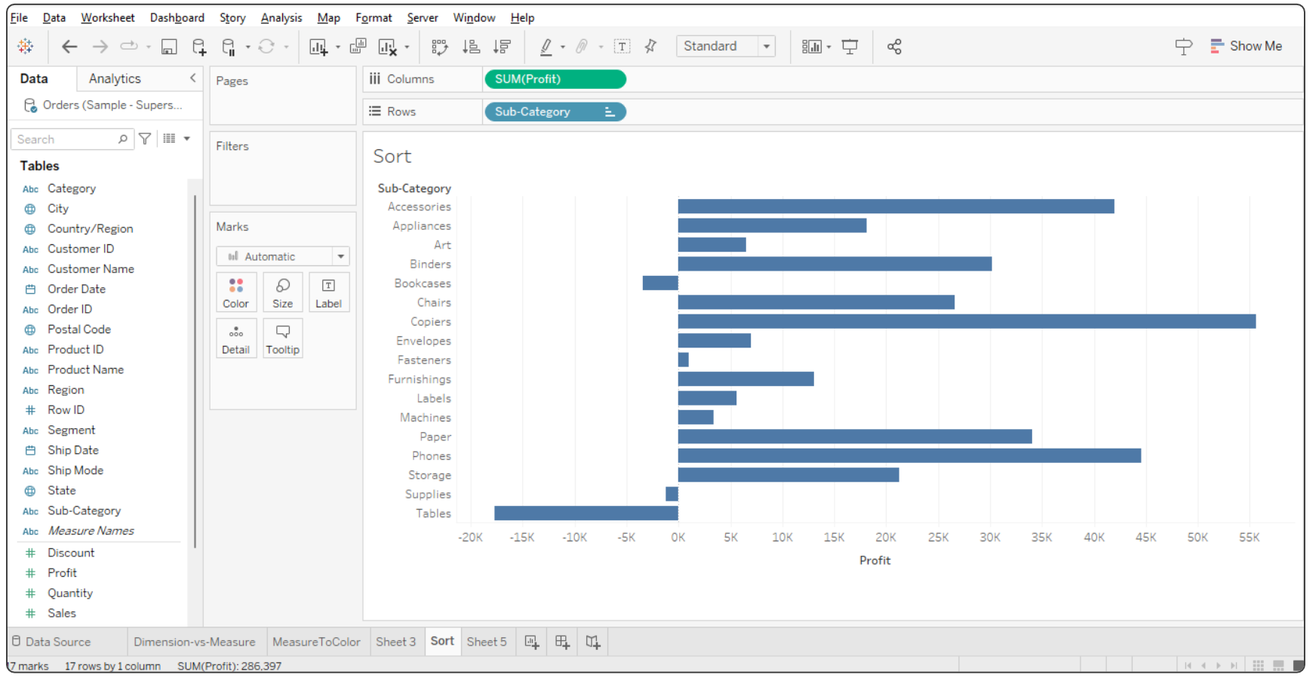
Profit analysis by customer segment



Sorting

It allows users to arrange data in ascending or descending order based on specified criteria.

Profit analysis by product sub-category from 2017 - 2020



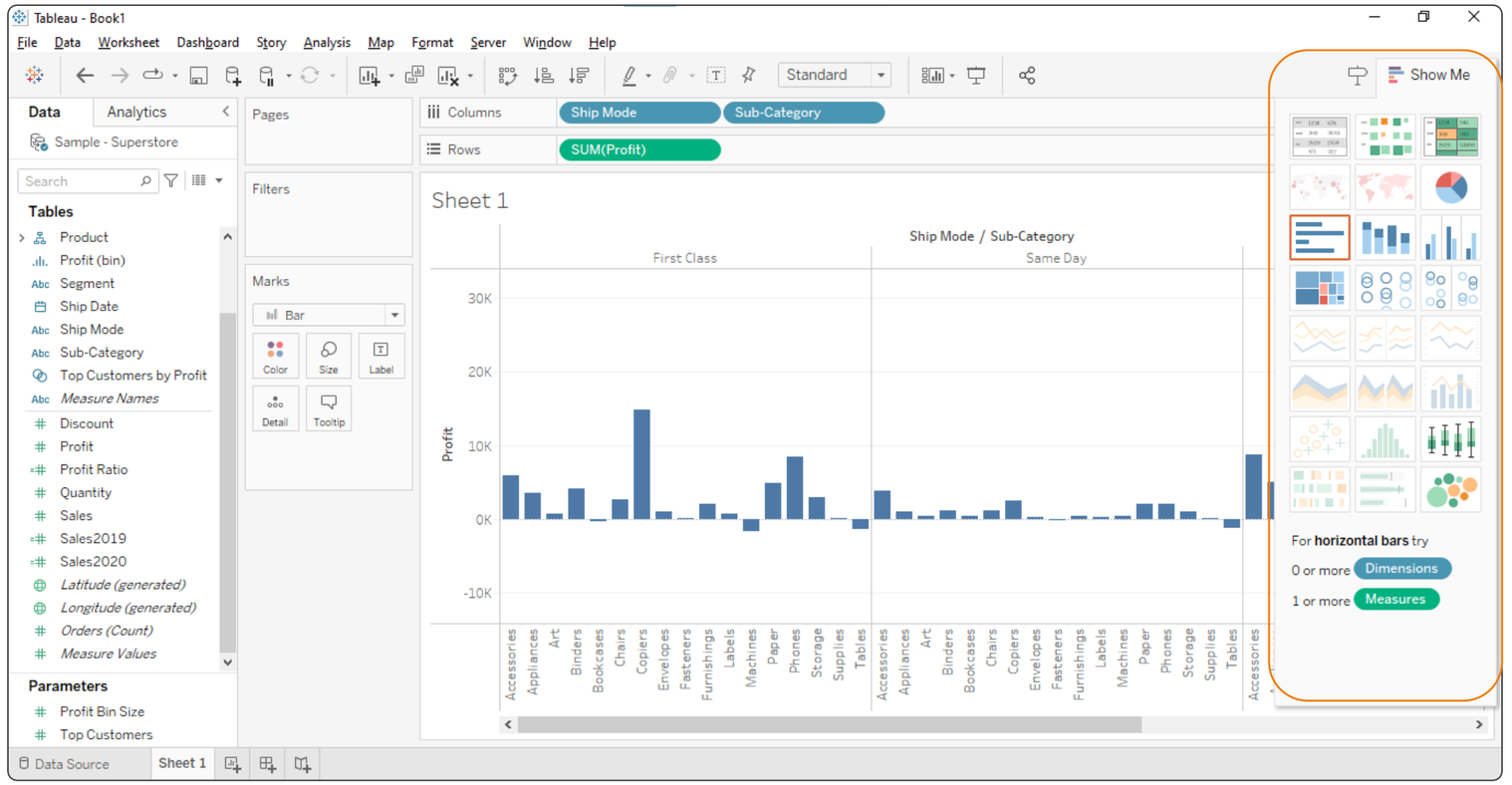
Users can sort the chart in Tableau using following options:

- Icons on the horizontal and vertical axis
- Using dimension menu
- Dragging the field from the chart

Show Me Option

The Show Me option in Tableau suggests visualization types based on selected data fields for quick exploration of suitable chart options.

Profit analysis by product sub-category from 2017 - 2020



The view is generated using existing fields from the Show Me option.

Demo: Axis

Duration: 10 minutes

Demonstrate the process of creating axes in Tableau to visualize sales data across categories and regions.

DEMONSTRATION

Quick Check

What does the sorting feature enable users to do in Tableau?

A. Group data points based on specific criteria

B. Apply filters to exclude certain data from visualizations

C. Rearrange data in ascending or descending order based on specified criteria

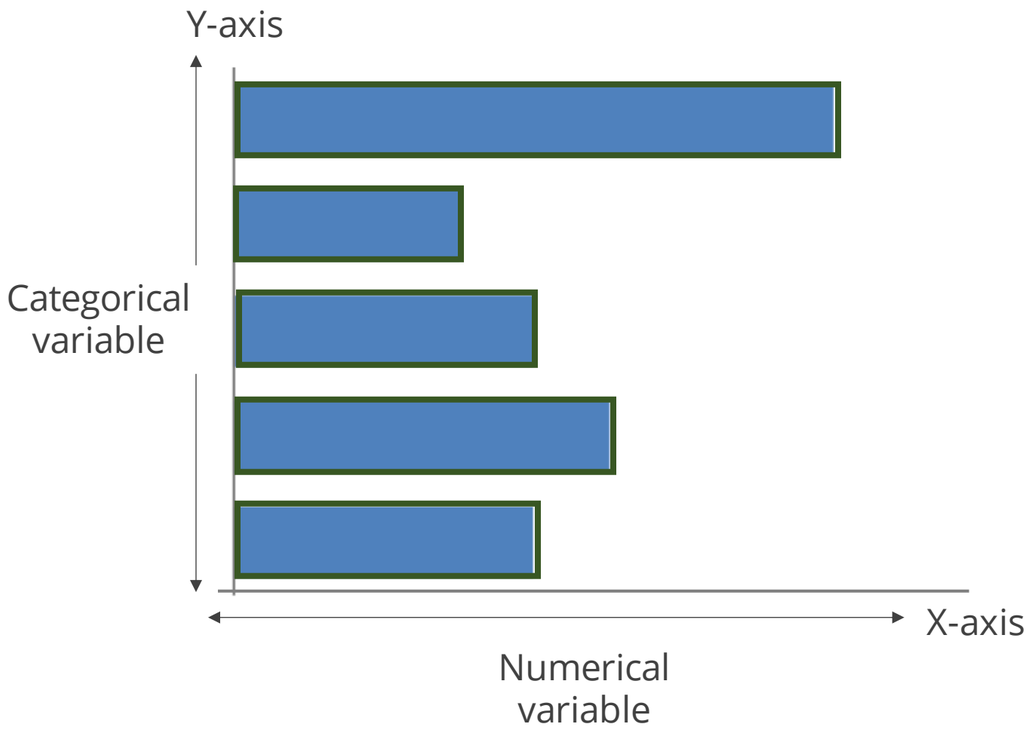
D. Combine multiple visualizations into a single dashboard

Bar Chart

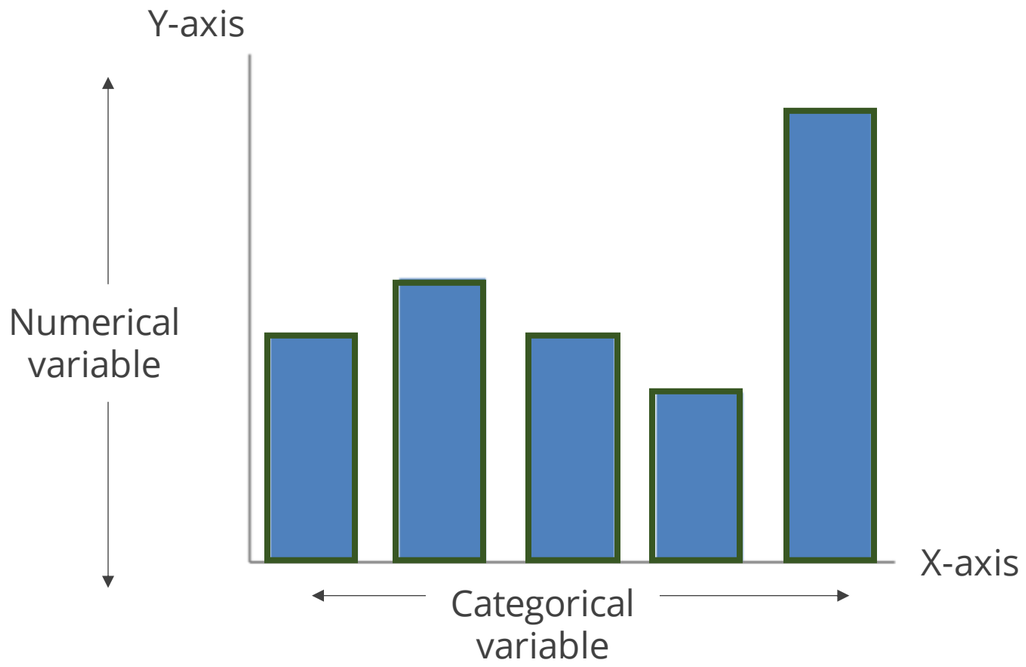
Bar Chart

It compares categories. There are two types of bar charts:

Horizontal bar chart



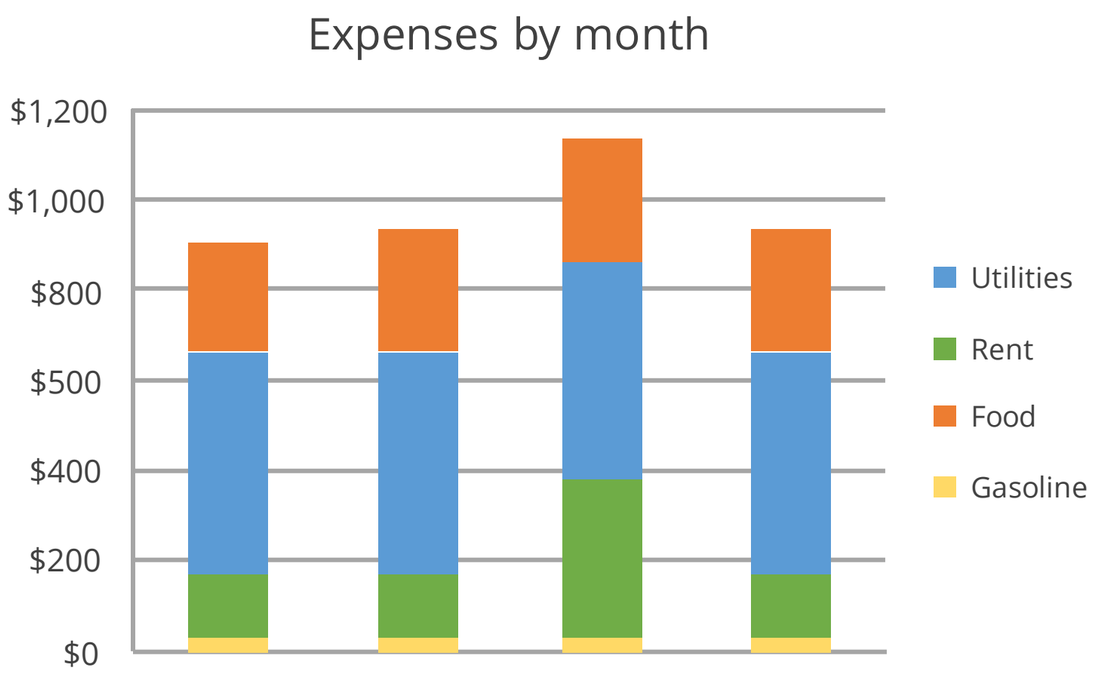
Vertical bar chart



It depicts the relationship between a numerical and a categorical variable.

Stacked Bar Chart

It summarizes and compares groups of data.



It segments the same bar into parts to compare two or more categories of data points.

Demo: Bar Charts

Duration: 10 minutes

Demonstrate how to advance from simple bar charts to complex ones in Tableau Desktop, emphasizing side-by-side, bar-in-a-bar, and stacked bar charts.

DEMONSTRATION

Quick Check

How do stacked bar charts segment data within each bar?

A. By arranging bars in a circular fashion

B. By dividing bars into equal parts

C. By stacking multiple bars on top of each other

D. By segmenting the same bar into parts

Line Chart, Slope Graph, and Area Chart

Line Chart

It uses lines to connect data points to show how values change over time.

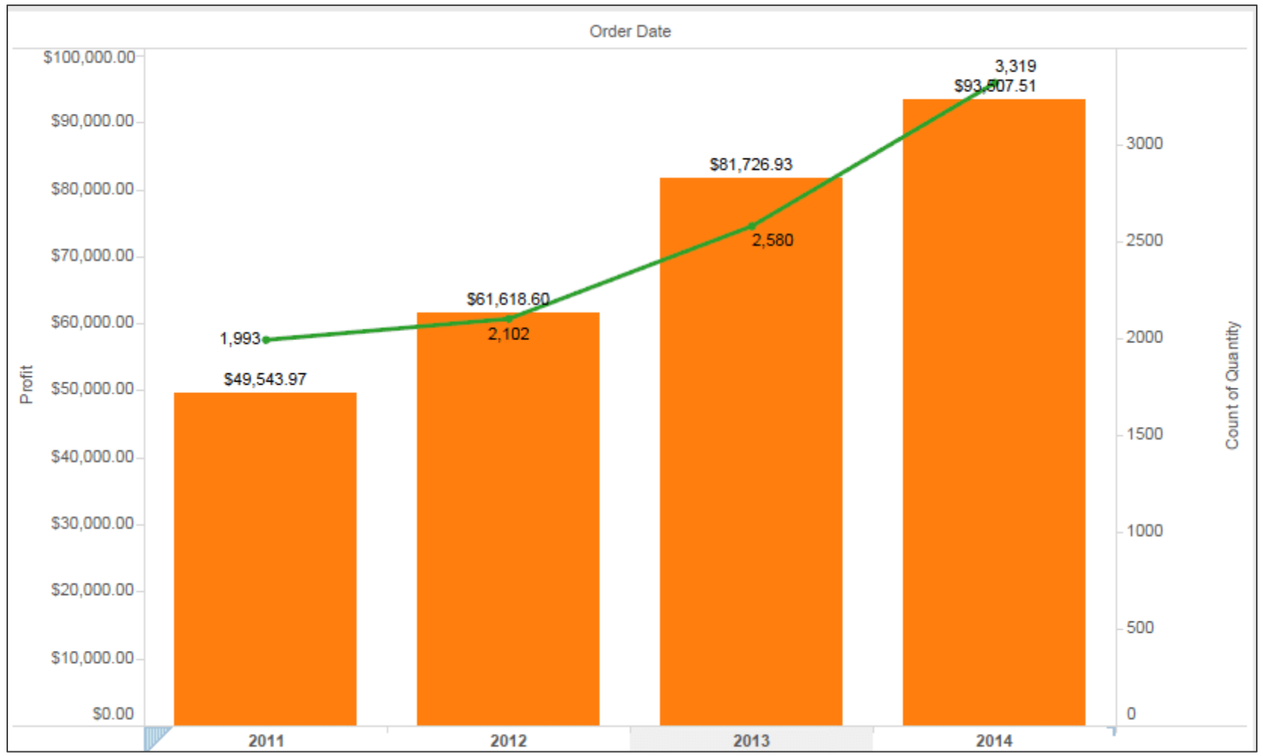
Produce sales trends from 2019 - 2020

Time periods or intervals are shown on the x-axis, and the quantitative values are shown on the y-axis.

Line and Bar Chart

It includes the representation of two measures, one using a line chart and the other using a bar chart.

Annual profit and order quantity growth of an organization

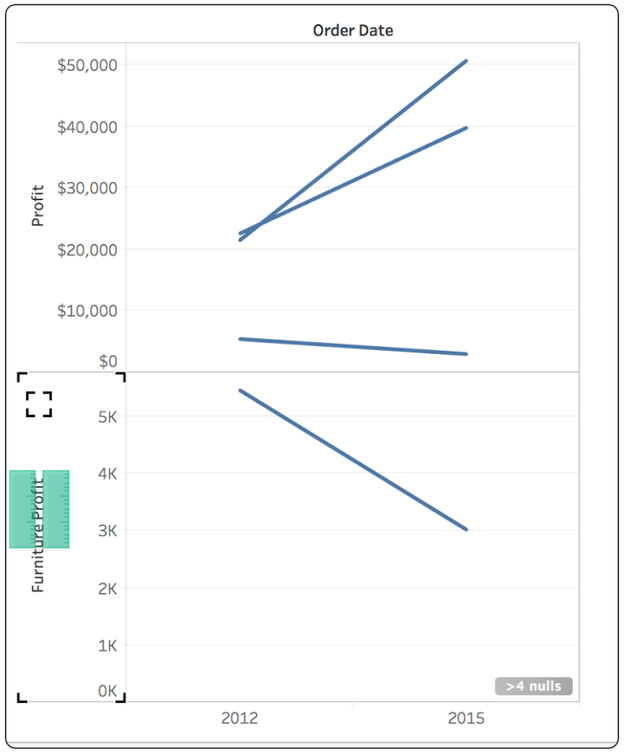


It will require dual axis to be used.

Slope Graph

It represents a steep rise, fall, or constant behavior of an entity.

Profit trends in furniture department from 2012 - 2015

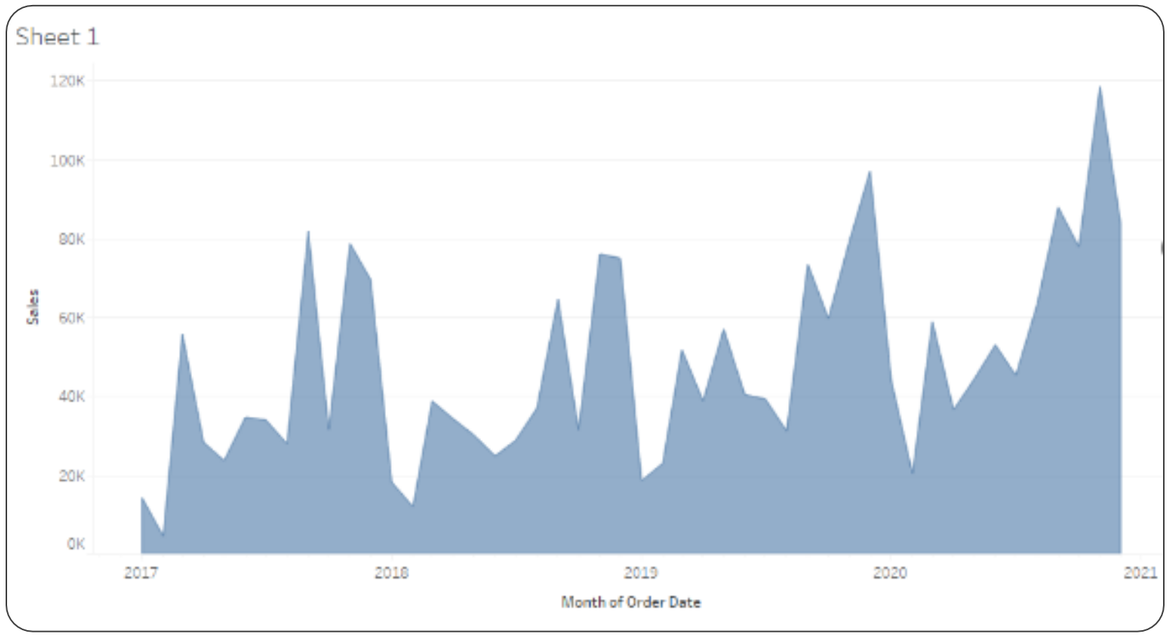


It helps to compare two categorical variables across different time periods or categories, which can be beneficial for analysis and understanding.

Area Chart

It shows how one or more quantities change over time.

Sales trends over the years



It can visualize:

- Profits made by a grocery store chain
- Yearly sales of a product
- Company revenue by year

The area between the line and the axis is usually filled with color.

Demo: Line Chart

Duration: 10 minutes

Demonstrate the process of creating line charts in Tableau to visualize sales data across categories and regions.

DEMONSTRATION

Quick Check

In a line chart, which axis typically represents the quantitative values?

A. X-axis

B. Y-axis

C. Z-axis

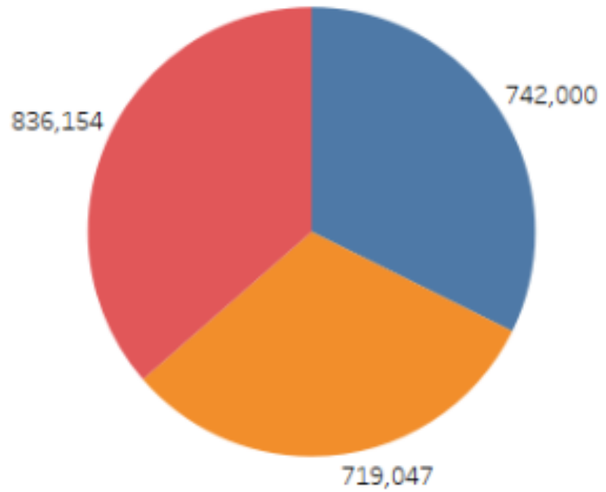
D. All of the above

Pie Chart, Treemap, and Bubble chart

Pie Chart

It illustrates the proportional distribution of data.

Pie representing the overall sales for each category

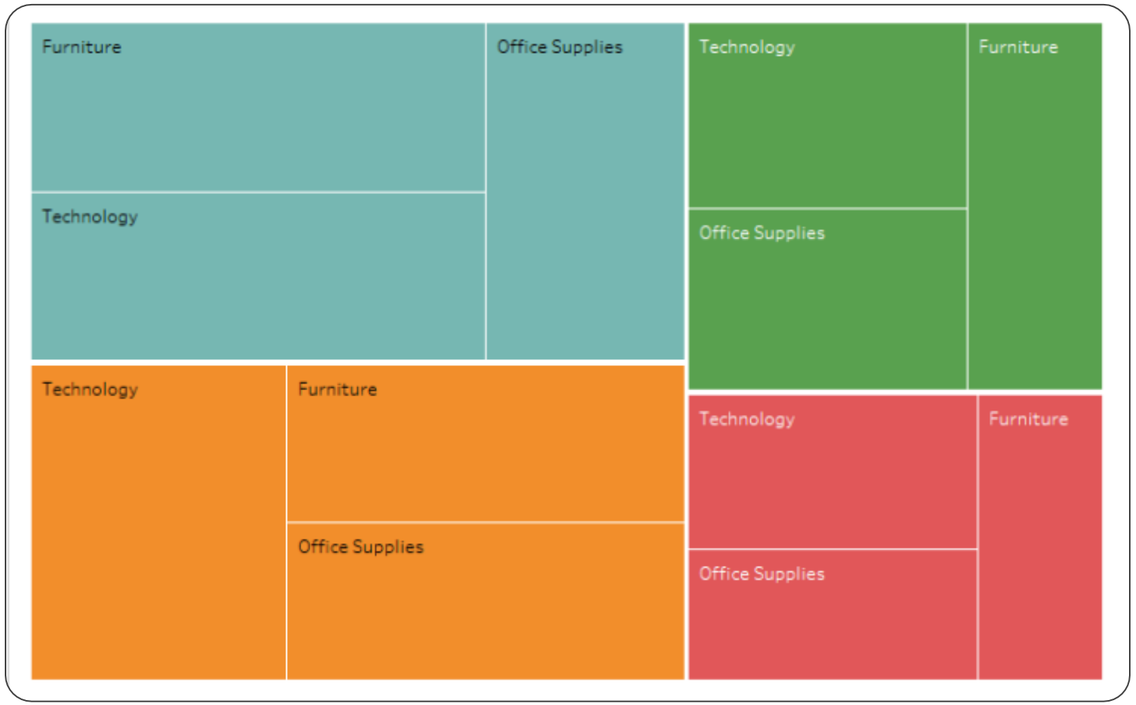


Each slice in the pie chart represents a numerical proportion, and the sum of all the slices is 100%.

Treemap

It shows hierarchical data as a set of nested rectangles.

Regional sales analysis by product category



Each group or category is a rectangle whose area is proportional to the value of the data point.

Bubble Chart

It visualizes data using circles or bubbles of varying sizes and colors.

Sales analysis per category

- Visualization of large data volumes is possible with bubble charts.
- They are used to visualize sales or profit across different product sub-categories and the performance per game for different teams or players.

The bubble chart displays the relationship between three or more dimensions, with the additional dimensions being visualized as the sizes and colors of bubbles.

Demo: Pie Chart, Treemap, and Bubble Chart

Duration: 10 minutes

Demonstrate the process of creating pie charts, treemaps, and packed bubble charts in Tableau to visualize sales data across categories and regions.

DEMONSTRATION

Quick Check

What does each slice in a pie chart represent, and what is the sum of all the slices?

A. Each slice represents a categorical variable, and the sum of all slices is the total number of categories.

B. Each slice represents a numerical proportion, and the sum of all slices is 100%.

C. Each slice represents a percentage increase or decrease, and the sum of all slices varies depending on the data.

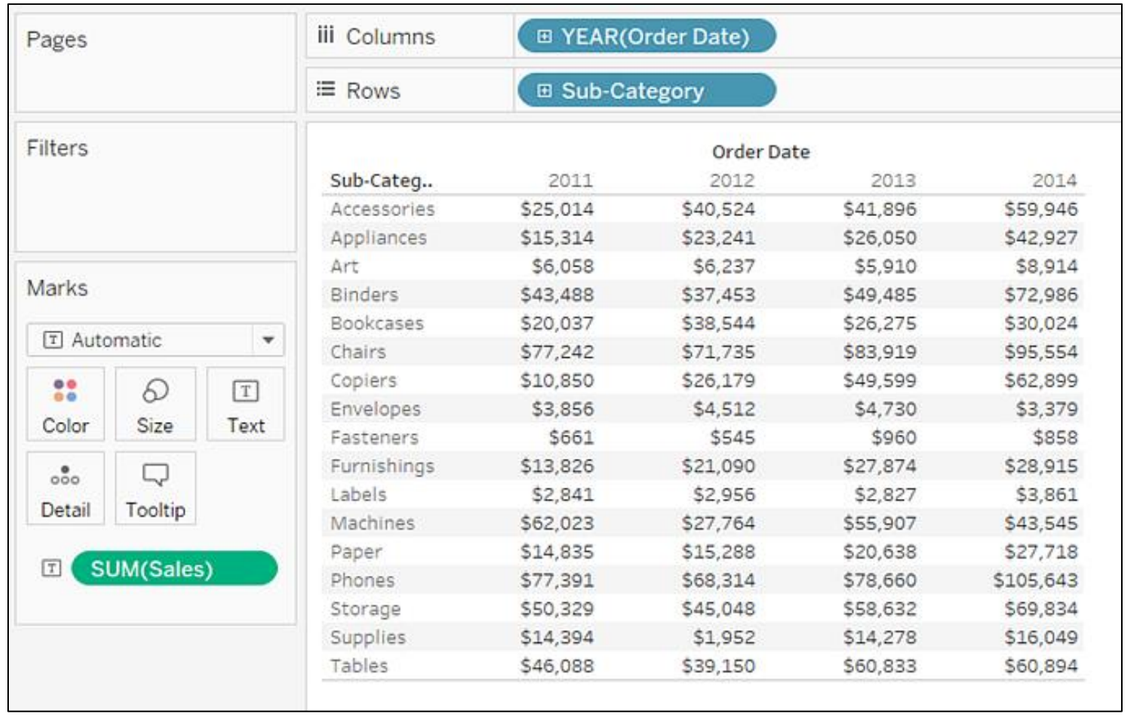
D. Each slice represents a different color, and the sum of all slices equals the number of colors used.

Tables, Heatmap, and Scatter Plot

Tables

It refers to visualizations that display data in a structured format, typically in rows and columns.

Sales trends by sub-category



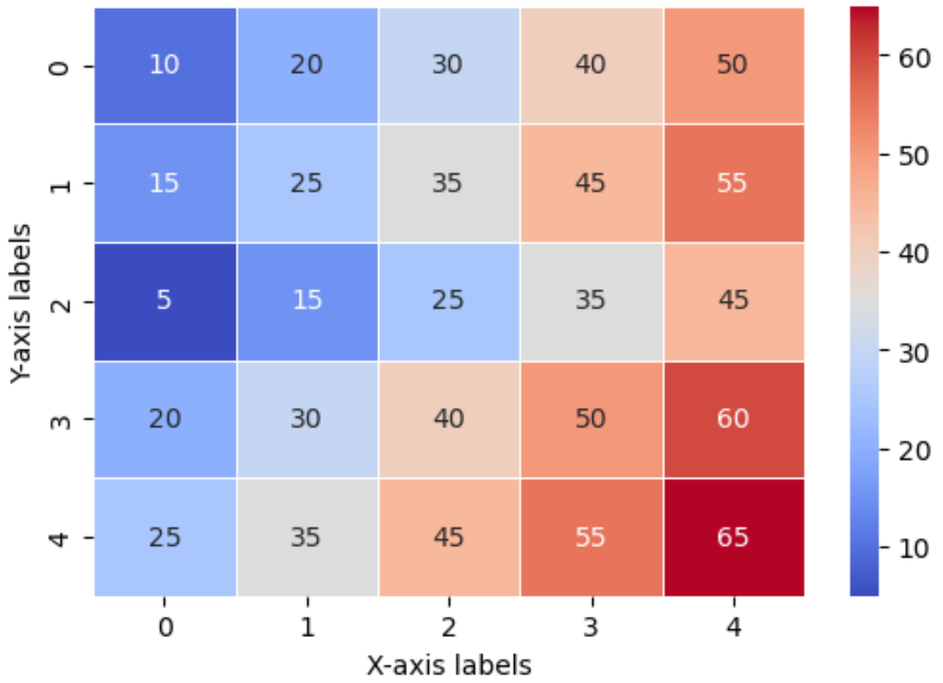
	Order Date			
Sub-Categ..	2011	2012	2013	2014
Accessories	$25,014	$40,524	$41,896	$59,946
Appliances	$15,314	$23,241	$26,050	$42,927
Art	$6,058	$6,237	$5,910	$8,914
Binders	$43,488	$37,453	$49,485	$72,986
Bookcases	$20,037	$38,544	$26,275	$30,024
Chairs	$77,242	$71,735	$83,919	$95,554
Copiers	$10,850	$26,179	$49,599	$62,899
Envelopes	$3,856	$4,512	$4,730	$3,379
Fasteners	$661	$545	$960	$858
Furnishings	$13,826	$21,090	$27,874	$28,915
Labels	$2,841	$2,956	$2,827	$3,861
Machines	$62,023	$27,764	$55,907	$43,545
Paper	$14,835	$15,288	$20,638	$27,718
Phones	$77,391	$68,314	$78,660	$105,643
Storage	$50,329	$45,048	$58,632	$69,834
Supplies	$14,394	$1,952	$14,278	$16,049
Tables	$46,088	$39,150	$60,833	$60,894

These tables present data in a tabular form, like spreadsheets, making it easy to view and analyze detailed information.

Heatmap

They represent data using color-coded systems.

Product sales heatmap

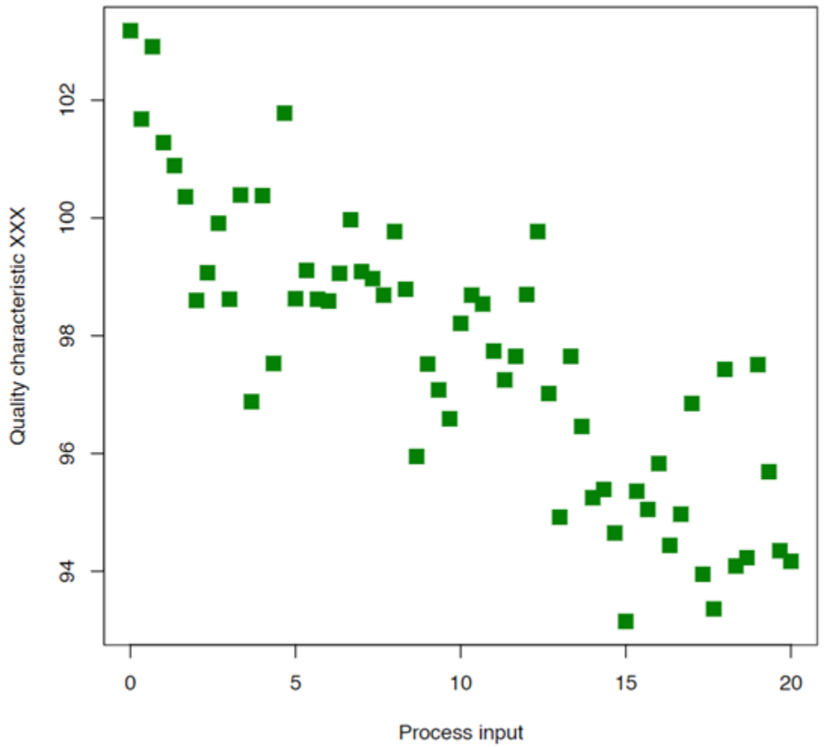


They efficiently organize comparisons across hundreds of dataset categories while ensuring easy understanding.

Scatter Plot

It shows the correlation between two data series in a dataset.

The impact of process input on quality



One data series is shown on the x-axis, and the other is shown on the y-axis.

Demo: Tables

Duration: 10 minutes

Demonstrate the process of creating tables in Tableau to visualize sales data across categories and regions.

DEMONSTRATION

Quick Check

Which type of visualization is best suited for identifying correlations between two numerical variables in a dataset?

A. Tables

B. Heatmaps

C. Scatterplots

D. Pie charts

Guided Practice

Overview

Duration: 20 minutes

In this exercise, you will delve into basic charting techniques using Tableau. The goal is to simulate real-world scenarios to enhance practical skills in data analysis. You will tackle specific questions and challenges to become proficient in enhancing data visualization and analysis processes.

Key Takeaways

- Each chart type serves a specific purpose. Understanding when to use a bar chart, pie chart, line chart, tree map, heatmap, bubble chart, or table is crucial for effectively communicating your data.
- Color and formatting can enhance the readability and visual appeal of your charts.
- Always label your axes and data points clearly to provide context and aid interpretation.

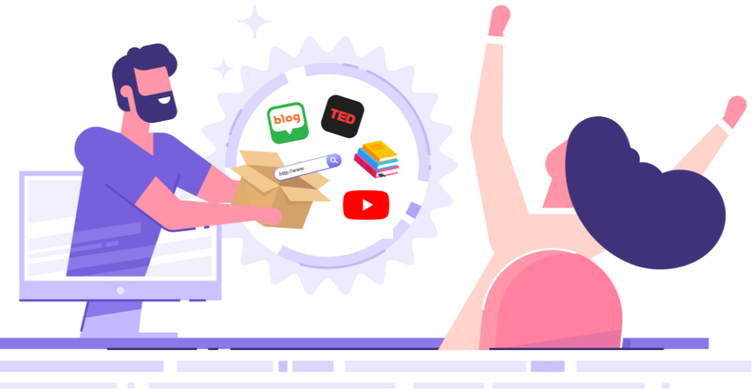
Practice Project

Sales Data Analysis

In this exercise, you will learn how to create basic charts in Tableau using sales data. The focus will be on connecting to data and creating simple visualizations, allowing you to grasp the foundational aspects of chart-making in Tableau. You will gain a fundamental understanding of chart-making in Tableau, making it an ideal starting point to explore data visualization techniques and tools.

PRACTICE PROJECT

Additional Resources



- More Charts in Tableau

Q&A