

# Data Science



# Tableau

- From the creators of Tableau - 'Tableau can help anyone see and understand their data'
- Tableau is a business intelligence software that allows anyone to easily connect to data, then visualize and create interactive, sharable dashboards.
- Users can create dashboards which depict the trends, variations, and density of the data in the form of graphs and charts.
- The software allows data blending and real-time collaboration, which makes it very unique.

# Tableau Popularity

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- Gartner's Magic Quadrant
  - [Gartner Magic Quadrant for Analytics and Business Intelligence Platforms](#)
  - <https://www.tableau.com/about/blog/2020/2/tableau-leader-2020-gartner-magic-quadrant>
- Tableau has literally changed the way people look at data- and in the process, boosted the field of data science almost single-handedly.

# Features of Tableau

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- Ease of use
- No need any technical knowledge
- Real-time analysis
- Data Connection to different data sources
- Interactive Dashboards
- Self reliant

# Tableau Installation

# Tableau Product Family

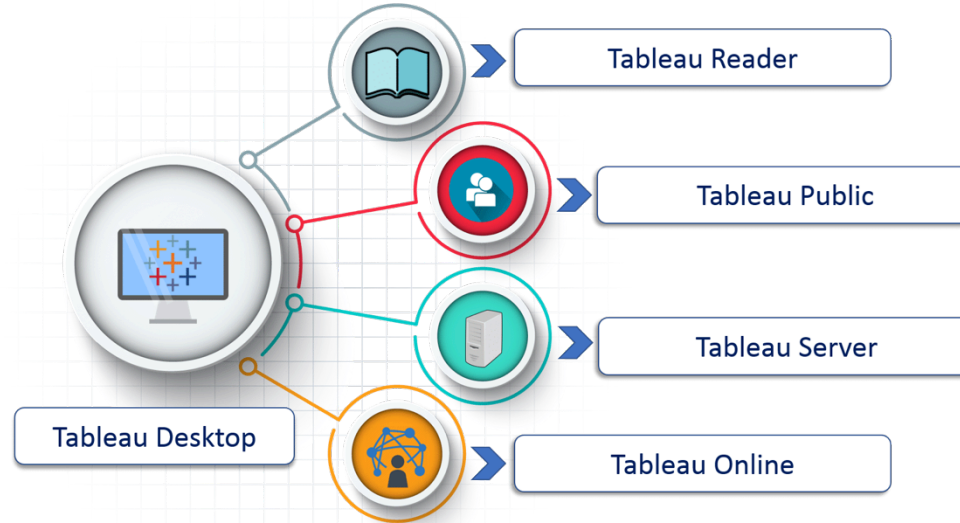


Image Referece - <https://d1jnx9ba8s6j9r.cloudfront.net/blog/wp-content/uploads/2017/05/Tableau-Product-Family-Tableau-Tutorial-Edureka.png>

# Tableau Product Family

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- Tableau Desktop
  - Can be installed on Windows or Mac, single-user version
  - Tableau Desktop has a rich feature set and allows you to code and customize reports
- Tableau Server
  - An enterprise level Tableau software
  - We can publish dashboards with Tableau Desktop and share them throughout the organization with web-based Tableau server.
- Tableau Online
  - It is a hosted version of Tableau Server
  - Its functionalities are similar to Tableau Server, but the data is stored on servers hosted in the cloud which are maintained by the Tableau group.



# Tableau Product Family

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- Tableau Reader
  - It's a free desktop application and a read-only tool
  - It enables you to open and view visualizations that are built in Tableau Desktop.
  - You can filter, drill down data but you cannot edit or perform any kind of interactions.
- Tableau Public
  - Free version of Tableau to create visualizations
  - But you need to save your workbook or worksheets in the Tableau Server which can be viewed by anyone.

# Tableau Installation

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- Link to download Tableau Public -
  - <https://public.tableau.com/en-us/s/download>

# Using Tableau

# Using Tableau

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- Connect with Data
- Build Data Views
- Create Visualization (Worksheets)
- Create Dashboard

# Connect With Data

# Connect with Data

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- Datasets available to use in Tableau Public -
  - <https://public.tableau.com/en-us/s/resources>

# Data Joins and Union

# Data Joins

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- The data sources have one or more columns in common that you can combine together, creating a wider table
- The tables present in the data source can be related to each other using the joins such as
  - Inner join (default)
  - Left join
  - Right join
  - Full outer join



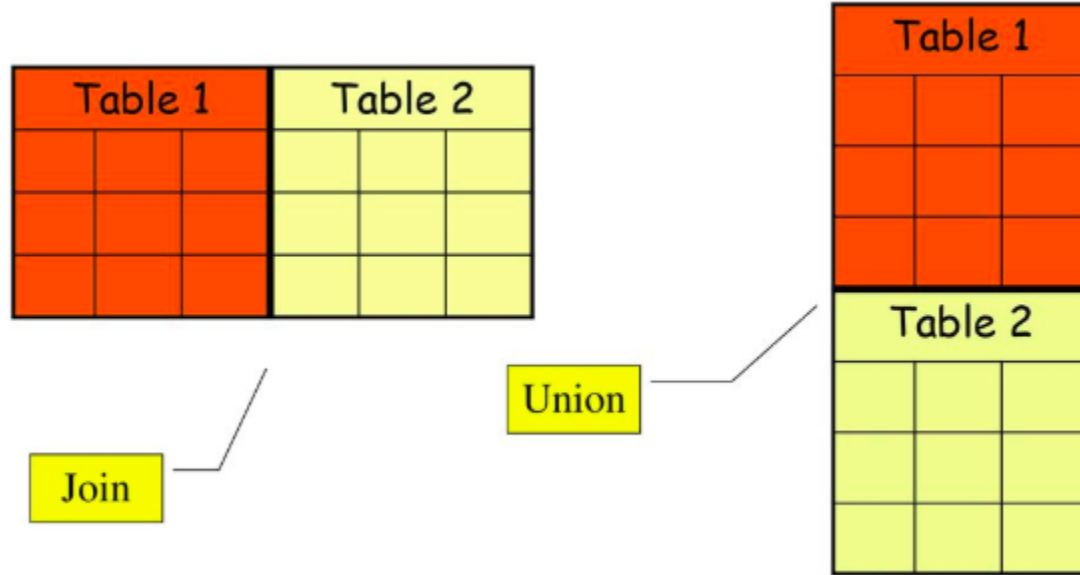
# Union

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- The data sources have the same columns and will be stacked on top of one another, creating a longer table
- It helps you combine together data that's been split into little files.
- Tableau will automatically append the rows onto the original, identifying matching fields by their shared name.
- If fields have mismatched names, Tableau will create a new field, simply adding nulls to entries where no data exists for that field name.

# Join vs Union



# Tableau Navigation

# Tableau Navigation

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- Start Page
- Data Source Page
- Workspace Area

# Start Page

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- Connect
  - Connect to data and open saved data sources.
- Open
  - Open recent workbooks, pin workbooks to the start page, and explore sample workbooks.
- Discover
  - Popular views in Tableau Public, blog posts and news about Tableau, and few training videos and tutorials to help in learning tableau.

# Data Source Page

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- Left Pane
- Canvas
- Data Grid
- Metadata Grid
- Data Source tab (at bottom)

# Workspace Area

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- **Menu Bar**
  - The menu bar in Tableau consists of various options to edit your visualization.
- **Left Pane**
  - **Data Pane**
    - The data pane is on the left side of the workbook displays the fields of the data sources to which Tableau is connected.
    - The fields are further divided into measures and dimensions.
  - **Analytics Pane (Ignore for now)**
- **Rows/Columns**
  - Row is treated as the X-Axis and Column as Y-Axis.

# Workspace Area

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- Show Me
  - It smartly highlights graphs that work best with the fields in your data
- Marks card shelf
  - It helps you in enhancing visualization by setting colour, size, label, detail, path or shapes.
- Page Shelf
- Filters shelf



# Tableau Data Types

# Data Types



Icon	Data type
Abc	Text (string) values
	Date values
	Date & Time values
#	Numerical values
T F	Boolean values (relational only)
	Geographic values (used with maps)
	Cluster Group (used with <b>Find Clusters in Data</b>  )

# Mixed Data Type

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- Mapped Data Type -
  - Text → date & numbers are treated as text
  - Dates → Text is treated as Null. Number is treated as day in numeric order from 1/1/1900
  - Numbers → Text is treated as Null. A date is treated as number of days since 1/1/1900
  - Boolean → Text, dates and numbers are treated as Null

# Data Types

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- We can change the data type of a column (if required), from
  - Data source page
  - Left panel of worksheet area

# Dimension & Measure

# Dimension & Measure

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## Dimension -

- It contains qualitative values that cannot be measured.
- Fields that cannot be aggregated. It is used for categorizing facts and revealing the details in your data.
- Fields are usually used for row or column headings
- Tableau treats any field containing qualitative, categorical data as a dimension.
- Ex: Name, date, Category, Country, City

## Measure -

- It contains numeric, quantitative values that you can measure.
- Fields that can be aggregated, or used for mathematical operations. When you use a measure field, Tableau applies an aggregation to that measure (by default).
- Usually used for plotting or giving values to the sizes of markers. It helps you to answer your business-related questions.
- A field containing a numeric value is placed under the measure.
- Ex. Discount, Profit, Sales

# Blue and green Fields

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- Green
  - Green measures and dimensions are continuous.
  - Continuous field values can have an infinite range of values
  - Continuous values create a continuous range
- Blue
  - Blue measures and dimensions are discrete.
  - Discrete values can have finite number of values
  - Discrete values are independent of each other and they create breakdowns
- You can change the fields from continuous to discrete and vice versa by right clicking on them and selecting 'Convert to Continuous' or 'Convert to Discrete'.

# Automatically Generated Fields



# Automatically Generated Fields

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- Measure Names & Measure Values
  - Used to express different measures present in our dataset.
- Number of records
  - It is a calculated field near the bottom of the measures shelf
  - it gives record count based on the dimension and measure added to the data source.
- Longitude and Latitude
  - Automatically added when geographical dimension fields added to the report.
  - If your data includes standard geographic fields like country, state, province, city, or postal codes (denoted by globe icon), Tableau will automatically generate the longitude and latitude values for the center points of each geographic entity displayed in your visualization.