University Institute of Engineering

Department of Computer Science & Engineering

Experiment:2

Date of Experiment: 28-07-2025

1. Aim of the practical: To create and differentiate between basic and advanced visualizations using Tableau charts and formatting techniques.

2.Objective: To gain hands-on experience in designing different types of charts using Tableau, understand when to use each type, and apply various formatting techniques for effective visual communication.

3. Tool Used/ Apparatus Required:

- Internet connectivity
- A system with Tableau Desktop or Tableau Public installed
- Sample datasets (Sales.csv)
- Basic understanding of databases and data formats

4. Theory:

Data visualization is the practice of converting raw data into graphical representations like charts and graphs. The primary goal is to make complex data more accessible, understandable, and usable. This process helps in identifying trends, discovering patterns, and communicating insights that might be missed in text-based data. Visual analytics enhances this by combining interactive visuals with automated analysis, enabling users to explore data dynamically and make informed decisions.

Tableau is a leading software that simplifies this process. It distinguishes between **basic charts** (e.g., bar, line) for straightforward comparisons and trend analysis, and **advanced charts** (e.g., dual-axis, heat maps) for exploring complex relationships between multiple variables. Effective visualization isn't just about creating charts; it involves strategic formatting—using color, size, and labels—to guide the viewer's attention and tell a clear story. The choice of visualization and its formatting directly impacts the clarity and effectiveness of the data's narrative.

5. Procedure:

- **Open Tableau and Load Dataset**
  - Launch Tableau Desktop or Tableau Public.
  - Connect to the dataset.
  - Load the data into Tableau and understand the data fields.
- **Create Basic Visualizations**
  - **Bar Chart**: Display Sales by Region.
  - **Line Chart**: Show Sales trend by Month.
  - **Pie Chart**: Illustrate Profit distribution by Category.
- **Create Advanced Visualizations**
  - **Dual-Axis Chart**: Combine Sales and Profit in one chart.
  - **Heat Map**: Display Sales values by Region and Category.

- **Scatter Plot**: Compare Discount vs Profit.
- **Dashboard**: Combine multiple charts into a single view.

- **Apply Formatting Techniques**
  - Add labels, tooltips, titles, filters, legends.
  - Use colour coding, shapes, and sizes to highlight data trends.
  - Format axes, apply sorting, and create calculated fields if necessary.
- **Interpret and Differentiate**
  - Analyse which charts are suitable for which types of data.
  - Differentiate basic vs advanced visualizations in terms of complexity and interpretability.

6. Result:

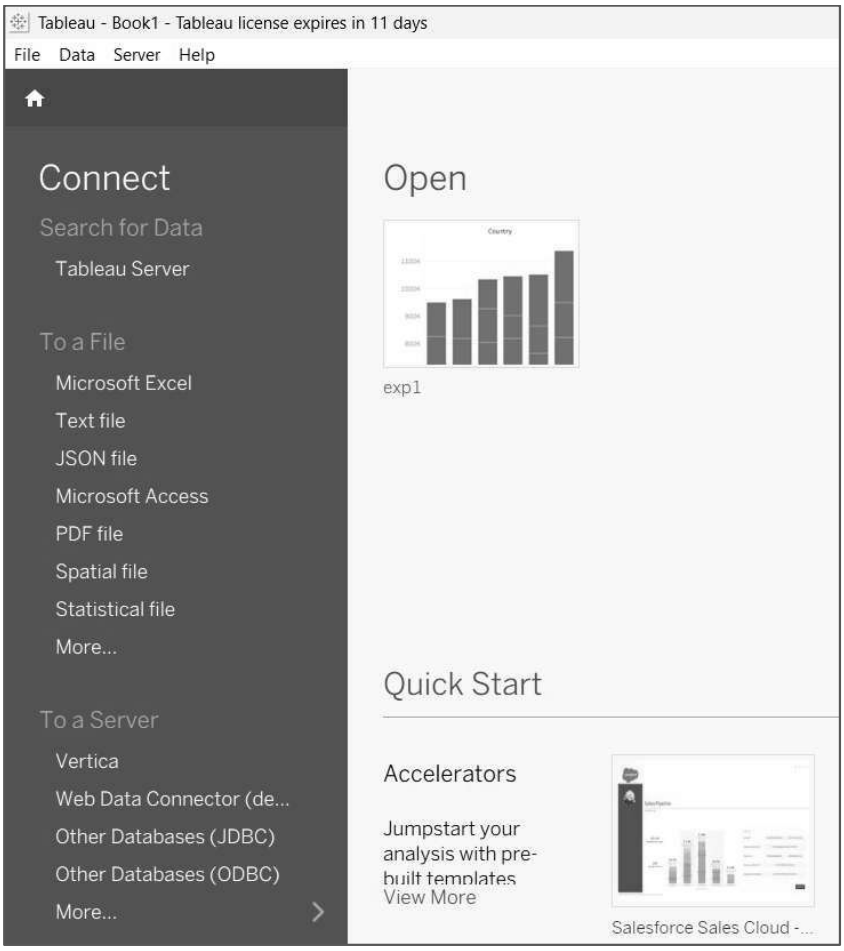

Figure 2.1: Tableau Interface

figure 2.6: Different type of visualization styles

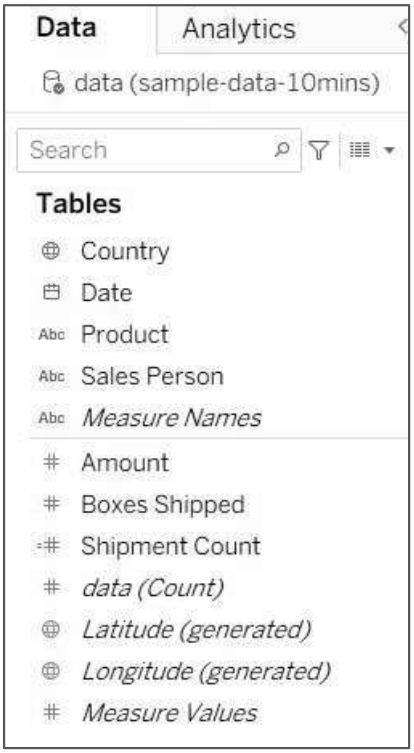

figure 2.7: Different type of parameters

Conclusion:

This experiment successfully demonstrated the process of creating and differentiating between various chart types using Tableau. Through hands-on practice with the Superstore dataset, we built fundamental visualizations like bar, line, and pie charts to analyze simple trends and distributions. The creation of advanced charts, including dual-axis, heat maps, and scatter plots, revealed how to explore more complex relationships between multiple data variables.

A critical outcome was understanding that the effectiveness of a visualization depends not only on the chosen chart type but also on strategic formatting. By applying labels, colors, and tooltips, raw data was transformed into clear, actionable insights. This exercise solidified the principles of visual analytics and its vital role in data-driven storytelling and decision-making.

Learning outcomes (What I have learnt):

1. **We learned to create basic and advanced visualizations,** building everything from fundamental bar and line charts to more complex visuals like dual-axis charts and heat maps in Tableau.
2. **We learned to apply effective formatting techniques,** using colors, labels, tooltips, and filters to improve the clarity and impact of our charts.
3. **We learned how to differentiate between various chart types** and select the most suitable one to answer a specific analytical question based on its strengths.
4. **We learned to operate the Tableau interface with confidence,** from connecting to a data source to using its core features like shelves and cards to build visuals from scratch.
5. **We learned to synthesize information** by combining multiple charts into a single, interactive dashboard that tells a cohesive data story and allows for user exploration.

Evaluation Grid:

Sr. No.	Parameters	Marks Obtained	Maximum Marks
1.	Student Performance (Conduct of experiment)		12
2.	Viva Voce		10
3.	Submission of Work Sheet (Record)		8
	Signature of Faculty (with Date):	Total Marks Obtained:	30