PROGRAM 1: Getting Started - Tableau Workspace, Tableau terminologies, Basic functionalities.

Steps:1

• Connect to Data:

1.Tableau Workspace Setup:

• Open Tableau, and on the "Start Page," select Connect -> To a File -> Text File.

• Browse to the location of vgsales.csv and open it.

2. **Data Preview:**

• After loading, Tableau will show a preview of the data. You can rename columns if necessary.

• Click on the "Sheet 1" tab at the bottom to go to your first worksheet.

Step: 2

2. Basic Functionalities:

a.Basic Visualization (Bar Chart of Global Sales by Genre):

• In your worksheet, drag Genre to the Columns shelf.

• Drag Global_Sales to the Rows shelf. • You should see a bar chart. If the data isn't aggregating correctly, check if the aggregation is set to SUM by right-clicking Global_Sales -> Measure -> Sum**.**

b.Sorting:

• Click on the Global_Sales axis and sort descending to show the genres with the most sales first.

c. Filtering:

• Drag Year to the Filters shelf.

• Choose the range of years you want to display (e.g., 2000-2016).

• Add Year to the Pages shelf to create a dynamic view of how sales changed over

Step 3:

3 .Additional Functionalities:

Dashboards: Combine different sheets to create a comprehensive dashboard. Go to the Dashboard tab, drag your created sheets to the layout, and arrange them accordingly**. a. Add one more worksheet** - Global Sales Trend by Year

• Drag Year to the Columns.

• Drag Global_Sales to the Rows.

• Create a line chart to show how global sales have trended over time.

• Add Genere to the Marks

• Apply color to Genere b.Go to the Dashboard tab in Tableau**.**

c. Add multiple visualizations to a single dashboard. (To increase dashboard size - select size-Automatic**)**

d. Arrange charts (e.g., a line chart for yearly sales, a bar chart for top genres, etc.).

PROGRAM 2 : Connecting to Data Source – Connecting to Database, Different types of Tableau Joins.

1. **Connecting to Excel Files in Tableau:**

• Open Tableau and click on Connect in the left pane.
• Under To a File, choose Microsoft Excel.
• Browse and select your Excel file (Tableau Joins File.xlsx).
• Tableau will display the sheets from the Excel file in the Data Source tab.
• Drag the relevant sheets to the workspace.

2. **Tableau Joins File.xlsx Dataset: has three Excel sheets**

• Demographics:
• EmployeeID
• Name of Employee
• Employee Age
• Employee Gender

• Salary:
• EmployeeID
• Employee Salary

(These sheets have a relationship based on the EmployeeID, and you can join them using this field. Drag and drop Demographics table- Right click-select open- that allows you to do following types of joins. Now Drag and drop Salary table - That allows you to do join of your choice.)

3. **Types of Joins in Tableau:**

Once both tables are in the Data Source tab, Tableau automatically suggests an inner join, but you can modify the type of join depending on the scenario.

a. Inner Join:

• **Description**: Returns only records where there is a match in both tables.
• **How to Create in Tableau:** • Drag Demographics and Salary sheets into the canvas. • Tableau automatically detects the common field (EmployeeID). If not, manually select it. • Choose Inner Join in the Join Type options. • Result: You will see only employees whose employee id matches in both Demographics and salary table

b. Left Join: a. Description: Returns all records from the left table (Demographics), and matched records from the right table (salary). If there's no match, NULL values are returned for fields from the right table. How to Create in Tableau: b. In the join settings, select Left Join. c. Result: All employees will be returned, even if data missing in Salary. Salary information will be NULL for those without a match.
c. Right Join: • Description: Returns all records from the right table (Salary), and matched records from the left table(Demographics). If there's no match, NULL values are returned for fields from the left table.

4. **Creating a Visualization Based on Joins:** After performing the joins, you can build different visualizations. Press on Sheet 1

PROGRAM 3: Creating a View – formatting charts, adding filters, creating calculated fields and defining parameters.

Step 1: Connect to Data

1. Open Tableau Desktop.2

2. Connect to Your Data Source:

a. Click on Connect on the left sidebar.

b. Choose your data source by selecting text file and load your vgsales dataset into Tableau.

Step 2: Create a Basic Visualization

• Create a New Worksheet:

a) Click on the Sheet tab at the bottom of the screen.

• Drag Fields to Shelves:

a) Drag Year to the Columns shelf.

b) Drag Global Sales to the Rows shelf.

c) Drag EU Sales to the Rows shelf.

2. Connect to Your Data Source:

a) Click on Connect on the left sidebar.

Step 3: Format the Chart

• Format Axes:

a) Right-click on the Global Sales axis and select Format.

b) In the Format pane, adjust the font style & size as needed.

Step 4: Add Filters Add a Filter for Year: Drag Year to the Filters shelf.Choose the range of years you want to display

Step 5: Create Calculated Fields

Create a Calculated Field for Sales Category:

a) Right-click on Global Sales - Select Create - Calculated Field.

b) Give name to your calculations as Global Sales - EU Sales

c) Do calculations as per your need - [Global Sales] - [EU Sales]

d) Press Ok

Add Calculated Fields to Visualization:

a) Drag Global Sales-EU Sales to the Rows shelf to show Global Sales over Year with GlobalSales-EU Sales over Year.

Step 6: Create a Parameter:

Name: "Select Genre"

• Data Type: String

• Values: List (e.g., "Action", "Adventure", "Shooter") or Add values from Genre.

• Create a Calculated Field:

• Name: "Sales by Genre"

• Formula:

• IF [Genre] = [Select Genre] THEN [Global Sales] ELSE 0 END Build the Visualization:

• Columns: Drag "Year".

• Rows: Drag "Sales by Genre".

• At the right side of your sheet you can select required Genre and can see different Visualization

PROGRAM 4 : Dashboard Design and Storytelling – Components of Dashboard, Understanding how to place worksheets in Containers, Action filters and its types.

Creating a Story in Tableau

Step 1: Open Tableau and Prepare Worksheets

1. Open **Tableau Public / Tableau Desktop**.
2. Ensure that at least **two worksheets** are already created (for example:

Step 2: Create a New Story

1. At the **bottom-right corner**, click on **New Story**.
2. A blank story workspace opens with the text **"Drag a sheet here"**.

Step 3: Add Worksheets to Story

1. Drag **Sheet 1** into the story pane.
2. Click **Add a caption** and rename it
3. Drag **Sheet 2** into the story pane.
4. Click **Add a caption** and rename it as:

Step 4: Add an Additional Story Point

1. Drag **Sheet 1 again** and place it **between** the two story points.
2. Click **Add a caption** and rename it (example):**"Ontario"**
3. On the map, **click on Ontario** to highlight it.
4. Click **Update** in the caption to save the highlighted view.

Step 5: Highlight Specific Data

1. Move to the **line chart story point**.
2. Hover over the line for **Ontario**.
3. Select the data point for **year 2016**.
4. Click **Update** to capture the highlight.

Step 6: Add Text Annotation

1. Drag **"Drag to add text"** onto the story.
2. Enter an explanation such as:
3. Resize and format the text box if needed.

Creating a Dashboard::

Step 7: Create a New Dashboard

1. Click on the **Dashboard tab** at the bottom.
2. A new blank dashboard opens.

Step 8: Add Worksheets to Dashboard

1. From the **Sheets panel (left side)**:
    - Drag **Map worksheet** into the dashboard.
    - Drag **Line chart worksheet** below or beside it.
2. Arrange the layout as required.

Step 9: Add Titles and Objects

1. Double-click on the automatic titles and rename them appropriately.
2. From the **Objects panel**

Action Filters (Interactivity)

Step 10: Add Action Filter

1. Click on the **line chart** in the dashboard.
2. A toolbar appears at the top-right of the chart.
3. Click on the **Filter icon** (funnel symbol).

Step 11: Test Action Filter

1. Click on any line (province) in the line chart.

PROGRAM 5: Introducing Power BI –Components and the flow of work. Power BI Desktop Interface-The Report has five main areas. Downloading and Installing Power BI Desktop

Step 1: Launch Power BI Desktop

1. Open **Power BI Desktop**.
2. The **Start screen** appears with options to get data, open recent files, and learn.

Step 2: Understand the Power BI Flow of Work

Power BI follows this workflow:

1. **Get Data** → connect to data sources
2. **Transform Data** → clean using Power Query
3. **Model Data** → relationships & measures
4. **Create Visuals** → reports & dashboards
5. **Publish** → share to Power BI Service

Step 3: Identify the Five Main Areas of Power BI Desktop

The report interface contains **five main areas**:

1. **Ribbon**
    - Contains commands for Home, Insert, View, Modeling, etc.
2. **Report Canvas**
    - Central workspace to build and arrange visuals.
3. **Visualizations Pane**
    - Contains charts (bar, line, pie, map, table, etc.)
    - Formatting and analytics options.
4. **Fields Pane**
    - Lists tables, columns, and measures from the dataset.
5. **Filters Pane**
    - Apply visual-level, page-level, and report-level filters.

Step 4: Connect to a Data Source

1. Click **Home → Get Data**.
2. Select **Text/CSV** or **Excel**.
3. Browse and select the dataset.
4. Click **Load** (or **Transform Data** if cleaning is required).

Step 5: Use Power Query Editor (Optional)

1. Click **Transform Data**.
2. In **Power Query Editor**, perform:
    - Remove unnecessary columns
    - Change data types
    - Remove duplicates / nulls
3. Click **Close & Apply**.

Step 6: Create a Basic Visualization

1. Select a chart from **Visualizations pane** (e.g., Bar Chart).
2. Drag a **dimension** to *Axis*.
3. Drag a **measure** to *Values*.
4. The visual appears on the report canvas.

Step 7: Apply Filters

1. Select a visual.
2. Drag a field into **Filters pane**.
3. Choose values to filter the data.

PROGRAM 6 : Querying Data from CSV - Query Editor Connecting the data from the Excel Source, Clean, Transform the data

Software Required

- **Power BI Desktop**

Step 1: Launch Power BI Desktop

1. Open **Power BI Desktop**.
2. The **Start screen** appears with options to load data.

Step 2: Connect to CSV / Excel Data Source

1. Click on **Home → Get Data**.
2. Select **Text/CSV** (for CSV file)
   *(or select **Excel** if Excel file is used)*.
3. Browse and select the dataset file.
4. Click **Open**.

Step 3: Load Data into Query Editor

1. A **Preview window** appears showing dataset columns and values.
2. Click on **Transform Data** (not Load).
3. The **Power Query Editor** window opens.

Step 4: Understand Query Editor Interface : In Query Editor:

- **Left Pane** → List of queries (tables)
- **Center Pane** → Data preview
- **Right Pane** → Applied Steps (transformation history)
- **Ribbon** → Transformation options

Step 5: Clean the Data: Perform the following cleaning operations as required:

1. **Remove unnecessary columns** :Right-click column → Remove
2. **Rename columns** :Double-click column header → Rename
3. **Change data types** :Select column → Data Type → Choose appropriate type
4. **Remove null or blank rows** :Filter column → Remove blanks
5. **Remove duplicate records** :Select column → Remove Duplicates

Step 6: Transform the Data :: Apply transformation operations such as:

1. **Split columns** : Select column → Split Column → By Delimiter
2. **Merge columns:** Select columns → Merge Columns
3. **Filter rows** : Apply conditions using filter dropdowns
4. **Sort data** : Ascending / Descending order
5. **Replace values** :Transform → Replace Values

Step 7: Verify Applied Steps

1. Observe the **Applied Steps** panel on the right.
2. Each transformation is recorded sequentially.
3. Modify or delete steps if required.

Step 8: Load Cleaned Data

1. After cleaning and transformation is complete:
2. Click **Home → Close & Apply**.
3. Data is loaded into **Power BI Report View**.

Step 9: Confirm Data Model

1. Verify fields in **Fields pane**.
2. Ensure:
   - Correct data types
   - Clean column names

PROGRAM 7: Creating Reports & Visualizations - Different types of charts, Formatting charts with Title, Colors

Step 1: Open Power BI Desktop

1. Launch **Power BI Desktop**.
2. Open the file created in **Program 6** (cleaned dataset).

Step 2: Verify Loaded Data

1. Check the **Fields pane** on the right.

Creating Different Types of Visualizations

Step 3: Create a Bar Chart

1. Select **Bar Chart** from the **Visualizations pane**.
2. Drag a **categorical field** (e.g., Category / Region) to **Axis**.
3. Drag a **numerical field** (e.g., Sales / Revenue) to **Values**.
4. A bar chart appears in the report canvas.

Step 4: Create a Line Chart

1. Select **Line Chart** from the Visualizations pane.
2. Drag a **date or time field** to **X-Axis**.
3. Drag a **measure** to **Y-Axis**.
4. The line chart shows trends over time.

Step 5: Create a Pie / Donut Chart

1. Select **Pie Chart** or **Donut Chart**.
2. Drag a **category field** to **Legend**.
3. Drag a **measure** to **Values**.
4. The chart displays percentage distribution.

Step 6: Create a Column Chart

1. Select **Clustered Column Chart**.
2. Drag a **dimension** to **Axis**.
3. Drag a **measure** to **Values**.
4. Compare values across categories.

Formatting Charts

Step 7: Add Chart Title

1. Select any visual.
2. Go to **Format (paint roller icon)**.
3. Expand **Title**.
4. Turn **Title ON**.
5. Enter an appropriate title (e.g., *Sales by Region*).

Step 8: Change Colors

1. Select the chart.
2. Go to **Format → Data Colors**.
3. Choose suitable colors for better clarity.
4. Apply consistent color themes.

Step 9: Format Labels and Legends

1. Enable **Data Labels** if required.
2. Adjust: :Font size ,Font color
3. Turn **Legend ON/OFF** as needed.
4. Position legend appropriately.

Step 10: Resize and Arrange Visuals

1. Resize visuals by dragging edges.

PROGRAM 8: Dashboards - Filters in Power BI, Formatting dashboards

Part A: Creating Dashboard Layout

Step 1: Open Power BI Desktop

1. Launch **Power BI Desktop**.
2. Open the **Program 7 report** containing multiple visualizations.

Step 2: Arrange Visuals on Report Canvas

1. Resize charts by dragging their borders.
2. Place visuals logically (top → KPIs, middle → trends, bottom → breakdowns).
3. Maintain proper spacing and alignment.

Part B: Applying Filters

Step 3: Apply Visual-Level Filters

1. Select a visual (e.g., bar chart).
2. In the **Filters pane**, locate **Visual level filters**.
3. Drag a field (e.g., Region / Category).
4. Select specific values to filter the visual.

Step 4: Apply Page-Level Filters

1. In the **Filters pane**, go to **Page level filters**.
2. Drag a field (e.g., Year / Date).
3. Select required values.
4. Filter applies to **all visuals on the page**.

Step 5: Apply Report-Level Filters

1. In the **Filters pane**, use **Report level filters**.
2. Drag a field (e.g., Country / State).
3. Filter applies to **all pages in the report**.

Step 6: Add Slicer for Interactive Filtering

1. Click **Slicer** from the Visualizations pane.
2. Drag a field (e.g., Region or Year) into the slicer.
3. Resize and place slicer on dashboard.

Part C: Formatting Dashboard

Step 7: Format Dashboard Theme

1. Go to **View → Themes**.
2. Select a built-in theme or customize colors.
3. Apply consistent color scheme.

Step 8: Format Visual Elements

1. Select a visual.
2. Use **Format (paint roller)** to adjust:
    - Title font & size
    - Data labels
    - Background color
    - Border and shadow

Step 9: Add Titles and Text Boxes

1. Click **Insert → Text box**.
2. Add dashboard title (e.g., *Sales Performance Dashboard*).
3. Adjust font size and alignment.

Step 10: Align and Group Visuals

1. Select multiple visuals using **Ctrl + Click**.
2. Use **Align** and **Distribute** options.

PROGRAM 9: BUILDING DASH BOARD

Step 1: Load Sales Dataset

1. Open **Power BI Desktop**.
2. Click **Get Data → Text/CSV or Excel**.
3. Select the **sales dataset**.
4. Click **Transform Data** (optional cleaning).
5. Click **Close & Apply**.

Step 2: Revenue Analysis

1. Insert a **Card visual**.
2. Drag **Revenue / Sales** field to *Values*.
3. This shows total revenue.

Step 3: Choropleth Map (Filled Map)

1. Select **Filled Map** visual.
2. Drag **State** to *Location*.
3. Drag **Revenue** to *Color saturation*.
4. Identify the state with **highest revenue** using darker shade.

Step 4: Line Chart – Revenue by Month

1. Select **Line Chart**.
2. Drag **Month** to *X-Axis*.
3. Drag **Revenue** to *Y-Axis*.
4. Shows revenue trend across months.

Step 5: Create Bin for Age

1. Right-click **Age** field → **New Group**.
2. Select **Bin**.
3. Set **Bin size = 10**.
4. Use the new **Age Bin** dimension.
5. Create a bar chart:

Step 6: Donut Chart – Revenue by Region

1. Create a **calculated column**:
2. Zero Axis = 0
3. Select **Donut Chart**.
4. Drag **Region** to *Legend*.
5. Drag **Revenue** to *Values*.
6. Donut chart shows percentage revenue per region.

Step 7: Butterfly Chart (Male vs Female Revenue) **1.** Create calculated field:

2. Male Revenue = IF(Gender="Male", Revenue, 0)
3. Female Revenue = IF(Gender="Female", -Revenue, 0)
4. Insert **Clustered Bar Chart**.
5. Axis → Product Category
6. Values → Male Revenue, Female Revenue
7. Creates a **butterfly chart** for comparison.

Step 8: Average Revenue per State **1.** Create calculated measure:

3. Avg Revenue = AVERAGE(Revenue)
4. Create another calculated column:
5. Profit Status = IF(Revenue >= Avg Revenue, "Profitable", "Non-Profitable")
6. Use **Table or Bar Chart** to display states with status.

Step 9: Build Dashboard

PROGRAM 10: Analysis of GDP Dataset

Step 1: Load GDP Dataset

1. Open **Power BI Desktop**.
2. Click **Get Data → Text/CSV or Excel**.
3. Select the **GDP dataset**.
4. Click **Transform Data** (if cleaning is needed).
5. Click **Close & Apply**.

Step 2: Symbol Map using Latitude & Longitude

1. Select **Map** visual.
2. Drag **Latitude** to *Latitude* field.
3. Drag **Longitude** to *Longitude* field.
4. Drag **Country Name** to *Legend* or *Tooltips*.
5. Drag **GDP** to *Size*.
6. This displays countries using **symbol maps**.

Step 3: Bar Graph – GDP of Belgium (2006–2026)

1. Select **Clustered Bar Chart**.
2. Drag **Year** to *Axis*.
3. Drag **GDP** to *Values*.
4. Drag **Country** to *Filters*.
5. Select **Belgium**.
6. Compare GDP from **2006 to 2026**.

Step 4: Pie Chart – GDP in Year 2010

1. Select **Pie Chart**.
2. Drag **Country** to *Legend*.
3. Drag **GDP** to *Values*.
4. Drag **Year** to *Filters* → select **2010**.
5. Ensure countries included:
    - India
    - Nepal

Step 5: GDP Comparison – Bhutan & Costa Rica

1. Select **Line Chart** or **Bar Chart**.
2. Drag **Year** to *X-Axis*.
3. Drag **GDP** to *Y-Axis*.
4. Drag **Country** to *Legend*.
5. Filter countries: Bhutan ,Costa Rica
6. Compare GDP trends visually.

Step 6: Scatter / Circle View (2004–2006)

1. Select **Scatter Chart**.
2. Drag **Year** to *X-Axis*.
3. Drag **GDP** to *Y-Axis*.
4. Drag **Country** to *Legend*.
5. Drag **Year** to *Filters* → select **2004–2006**.
6. Ensure countries: Mexico ,Algeria

Step 7: Build Interactive Dashboard

1. Arrange all visuals on one report page.
2. Add **Slicers** for :Country ,Year
3. Insert **Text Box** for dashboard title.

Program 11. Analysis of HR Dataset:

Step 1: Load HR Dataset

1. Open **Power BI Desktop**.
2. Click **Get Data → Text/CSV or Excel**.
3. Select the **HR dataset**.
4. Click **Transform Data** if cleaning is required.
5. Click **Close & Apply**.

Step 2: Create KPIs

Create the following KPI visuals using **Card**:

1. **Employee Count** : Drag *Employee ID* → Values (Count)
2. **Attrition Count** : Drag *Attrition Count* → Values
3. **Attrition Rate** : Attrition Rate = (Attrition Count / Employee Count) * 100
4. **Active Employees** : Active Employees = Employee Count - Attrition Count
5. **Average Age** :Drag *Age* → Values (Average)

Step 3: Lollipop Chart – Attrition Rate by Gender

1. Insert **Clustered Column Chart**.
2. Axis → Gender
3. Values → Attrition Rate
4. Reduce column width.
5. Overlay a **Scatter chart** dot to create lollipop effect.

Step 4: Pie Chart – Attrition by Department

1. Select **Pie Chart**.
2. Drag **Department** → Legend.
3. Drag **Attrition Count** → Values.
4. Enable **Data Labels → Percentage**.
5. Add total value in label.

Step 5: Bar Chart – Employees by Age Group

1. Create **Age Group** using bins (size = 10).
2. Select **Bar Chart**.
3. Axis → Age Group.
4. Values → Employee Count.

Step 6: Highlight Table – Job Satisfaction Rating

1. Select **Table / Matrix visual**.
2. Rows → Job Role.
3. Values → Employee Count.
4. Apply **Conditional Formatting → Background color**.
5. This forms a **highlight table**.

Step 7: Horizontal Bar Chart – Attrition by Education Field

1. Select **Horizontal Bar Chart**.
2. Axis → Education Field.
3. Values → Attrition Count.
4. Sort descending for clarity.

Step 8: Multiple Donut Charts – Attrition Rate by Gender & Age Group

1. Create **Donut Chart**.
2. Legend → Gender.
3. Values → Attrition Rate.
4. Filter by **Age Group**.

PROGRAM 12: Analysis of Amazon Prime Dataset

Step 1: Load Amazon Prime Dataset

1. Open **Power BI Desktop**.
2. Click **Get Data → Text/CSV or Excel**.
3. Select the **Amazon Prime dataset**.
4. Click **Transform Data** (optional cleaning).
5. Click **Close & Apply**.

Step 2: Donut Chart – Percentage of Movies and TV Shows

1. Select **Donut Chart** from Visualizations.
2. Drag **Type** (Movie / TV Show) to *Legend*.
3. Drag **Show ID** (or equivalent) to *Values* (Count).
4. Enable **Data Labels → Percentage**.
5. This shows the distribution of Movies vs TV Shows.

Step 3: Area Chart – Shows by Release Year and Type

1. Select **Area Chart**.
2. Drag **Release Year** to *X-Axis*.
3. Drag **Show ID** (Count) to *Y-Axis*.
4. Drag **Type** to *Legend*.
5. This displays trends of shows over years.

Step 4: Horizontal Bar Chart – Top 10 Genres

1. Select **Clustered Bar Chart**.
2. Drag **Genre** to *Axis*.
3. Drag **Show ID** (Count) to *Values*.
4. Sort in descending order.
5. Apply **Top N filter → Top 10** based on count.

Step 5: Map – Total Shows by Country

1. Select **Map** visual.
2. Drag **Country** to *Location*.
3. Drag **Show ID** (Count) to *Size*.
4. This displays total shows available per country.

Step 6: Text Sheet – Movie Description

1. Select **Table visual**.
2. Drag **Title** and **Description** fields.
3. Filter to show **any specific movie or movies**.
4. Resize columns for readability.

Step 7: Build Interactive Dashboard

1. Arrange all visuals neatly on one report page.
2. Add **Slicers** for:
    - Type
    - Release Year
    - Country
3. Insert **Text Box** for dashboard title.
4. Apply consistent theme and formatting.