19. Perform the data visualization operations using Tableau to get answers to various business questions on Retail dataset. a. Find and Plot top 10 products based on total sale b. Find and Plot product contribution to total sale c. Find and Plot the month wise sales in year 2010 in descending order d. Find and Plot most loyal customers based on purchase order e. Find and Plot yearly sales comparison f. Find and Plot country wise total sales price and show on Geospatial graph:

Step 0: Load the Dataset in Tableau

1. Open **Tableau Desktop / Tableau Public**.
2. Click on **"Connect"** → **"Text File"** (or Excel if your dataset is in .xlsx format).
3. Load the **Retail dataset**.
4. Drag the sheet to the canvas and click **"Go to Worksheet"**.

Make sure you create a **calculated field** for **Total Sales**:

- Go to the analysis → Right-click → **Create Calculated Field**
- Name it TotalSales and use the formula:

```
 css
CopyEdit
[Quantity] * [UnitPrice]
```

Task a: Find and Plot Top 10 Products Based on Total Sale

Objective: Identify top 10 products with the highest total sales.

1. Drag Description to **Rows**.
2. Drag TotalSales to **Columns**.
3. Click the dropdown on TotalSales → choose **Sort Descending**.

4. Click the filter icon on Description → choose **Top** tab.

5. Select **By field** → Top 10 by Sum of TotalSales.

6. Change the visualization to **Bar Chart** (Show Me → Bar).

7. Label values using the **Label** button in toolbar.

Task b: Find and Plot Product Contribution to Total Sale

Objective: Show how much each product contributes to total sales (like a pie or bar chart).

1. Drag Description to **Rows**.

2. Drag TotalSales to **Columns**.

3. Convert TotalSales to **% of Total**:

    - Right-click TotalSales on Columns → **Quick Table Calculation** → **Percent of Total**.

4. You can switch the visualization to:

    - **Pie Chart**: Drag both Description and TotalSales to **Marks** → **Angle and Color**.

    - Or **Horizontal Bar Chart** sorted by contribution.

5. Apply a **Top N filter** if the number of products is large.

✅ Step-by-Step for Task c: Month-wise Sales in 2010 (Descending Order)

🔹 Step 1: Filter Data to Year 2010

1. **Drag InvoiceDate to the Filters shelf**.

2. In the dialog:

- Choose **Years**
- Select only **2010**

3. Click **OK**

🔹 Step 2: Set InvoiceDate to Month-Year (Discrete)

1. On the **Columns shelf**, right-click the InvoiceDate pill.

Select:

sql
CopyEdit
More → Custom → Month / Year (e.g., Jan 2010)

OR use:

scss
CopyEdit
MONTH(InvoiceDate)

2. **Ensure the pill turns blue — this means it's a *discrete* (categorical) field, not continuous.**

✅ This will allow sorting to work.

🔹 Step 3: Drag TotalSales to Rows

- You'll now see a bar chart showing **sales per month** in 2010.

🔹 Step 4: Sort Months by TotalSales (Descending)

Now that you're using a **discrete date**, you can sort:

1. **Click the sort icon** on the top toolbar (↓ bar icon).
    - OR right-click on the InvoiceDate pill in **Columns shelf**
    - Click **Sort**
    - Sort by: **Field**
    - Field: TotalSales
    - Aggregation: **Sum**
    - Order: **Descending**

✅ You will now see months sorted by total sales in descending order.

🔹 Step 5: Add Labels

1. In the toolbar, click the **Label** button (Abc icon).
    - Or click on the **Marks card → Label → Show Mark Labels**

✅ Now the bars will show the exact sales values.

✅ Task d: Most Loyal Customers Based on Purchase Orders

🔹 Step 1: Set Up the View

1. **Drag CustomerID** to **Rows**
2. **Drag InvoiceNo** to **Columns**
    - Right-click on InvoiceNo pill in Columns →
      Measure → Count (Distinct)

(Now you'll see number of purchase orders per customer)

🔹 Step 2: Sort by Most Orders

- Right-click on CustomerID in **Rows shelf → Sort**
    - **Sort by:** Field
    - **Field Name:** InvoiceNo
    - **Aggregation:** Count (Distinct)
    - **Order:** Descending

🔹 Step 3: Apply Top N Filter on CustomerID

1. Click the **drop-down arrow** on the CustomerID pill in **Rows shelf**
2. Click **Filter…**
3. In the **Filter dialog**, go to the **Top tab**
4. Select:
    - **By field**
    - Keep: **Top 10**
    - By: **Count (Distinct)** of InvoiceNo
5. Click **OK**

✅ You'll now see the **Top 10 customers** by number of purchase orders.

🔹 Step 4: Change to Bar Chart

- Use the **“Show Me”** panel → Select **Bar Chart**
- OR from **Marks dropdown**, choose **Bar**

🔹 Step 5: Add Labels (Optional)

- Click the **Label icon** on the top toolbar (Abc)
- Or go to **Marks card → Label → Show Mark Labels**

✅ Task e: Find and Plot Yearly Sales Comparison

🔸 Step 1: Create or Use the TotalSales Field

If you haven't already created it:

1. In the **Data pane** (left sidebar), right-click → **Create Calculated Field**
2. Name: TotalSales

Formula:

tableau
CopyEdit
[Quantity] * [UnitPrice]

3.
4. Click **OK**

🔸 Step 2: Drag InvoiceDate to Columns

1. From the **Data pane**, drag InvoiceDate to the **Columns shelf**

Right-click the InvoiceDate pill → Select:

sql
CopyEdit
YEAR

2. ✅ The pill should now show YEAR(InvoiceDate) and turn **blue** (discrete)

🔸 Step 3: Drag TotalSales to Rows

1. Drag the TotalSales field to the **Rows shelf**

2. Tableau will create a bar chart of **total sales per year**

✅ You now see one bar per year (e.g., 2009, 2010, 2011…)

🔸 Step 4: Add Color by Year (Optional Visual Enhancement)

1. Drag YEAR(InvoiceDate) from Columns to the **Color** section of the **Marks card**

2. Each bar will now have a different color for better comparison

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🔸 Step 5: Add Labels (Optional but Recommended)

1. On the toolbar, click the **Label icon** (shows Abc)

    - OR go to **Marks → Label** → Check **Show Mark Labels**

2. Labels will now show total sales on top of each bar

✅ Task f: Country-wise Total Sales on a Geospatial Graph

🎯 Objective: Use a map visualization to display how much each country contributes to total sales.

🔹 Step 1: Ensure Country is Recognized as a Geographic Field

1. In the **Data Pane**, find the Country field.
2. It should have a **globe icon** 🌍 next to it.
    - ✅ If it does → great!
    - ❌ If not:
        - Right-click Country → **Geographic Role** → **Country/Region**

🔹 Step 2: Create the Map View

1. **Double-click on Country**
    - Tableau will automatically generate a **map**.
    - You'll see country dots on a world map.

🔹 Step 3: Add TotalSales to Marks

1. **Drag TotalSales** to the **Size** shelf on the **Marks card**
    - Now the dots on the map will grow bigger with higher sales

2. **Drag TotalSales** again to the **Color** shelf on the **Marks card**
    - Now each dot will also have a color intensity based on sales

✅ Now the map shows total sales per country using both **size** and **color**

🔹 Step 4: Fine-Tune the Map for Clarity

Adjust Color Gradient:

1. Click the **Color legend → Edit Colors**
    - Choose a meaningful color gradient (e.g., light to dark blue or red)
    - Check **"Stepped Color"** for clarity, if needed

Adjust Size Scale:

1. Click on the **Size legend**
    - Adjust the slider to make size differences clearer

Add Labels (Optional):

1. On **Marks card** → Click **Label**
    - Check **"Show mark labels"** → Select to show Country and TotalSales

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20. Perform the data visualization operations using Tableau to get answers to various business questions on Retail dataset. a. Find and Plot country wise popular product b. Find and Plot bottom 10 products based on total sale c. Find and Plot top 5 purchase order d. Find and Plot most popular products based on sales e. Find and Plot half yearly sales for the year 2011

a. **It is remaining!!**
b. **Find and Plot Bottom 10 Products Based on Total Sale**

🎯 Goal: Identify 10 products with the least total sales.

Steps:

1. Drag Description to Rows.
2. Drag TotalSales to Columns.
3. Sort TotalSales in Ascending Order.
4. Click the Filter icon on Description → Top tab → Choose "By field"
    - Bottom 10 by SUM(TotalSales)
5. Choose a Bar Chart.
6. Add labels using the Label button.

✅ Result: Bar chart with bottom 10 lowest selling products.

Find and Plot Top 5 Purchase Orders

🎯 Goal: Identify the top 5 invoices by total purchase value.

Steps:

1. Drag InvoiceNo to Rows.(if invoice is a measure convert it to dimension first and the drag)
2. Drag TotalSales to Columns.

3. Sort TotalSales in Descending Order.
4. Filter InvoiceNo → Top 5 by SUM(TotalSales).
5. Use Bar chart, add labels.

✅ Result: Bar chart showing top 5 invoice numbers with highest sales.

d. Find and Plot Most Popular Products Based on Sales

🎯 Goal: Show most selling products overall.

Steps:

1. Drag Description to Rows.
2. Drag Quantity or TotalSales to Columns.
3. Sort Descending on TotalSales.
4. Filter Description → Top 10 or Top 5 (as needed) → By SUM(TotalSales).
5. Bar chart + Label enabled.(Convert TotalSales to **% of Total**:
6. Right-click TotalSales on Columns → **Quick Table Calculation** → **Percent of Total**. In case if needed)

✅ Result: Top N most sold products by total sales.

e. Find and Plot Half-Yearly Sales for the Year 2011

🎯 Goal: Show sales in two halves (Jan–Jun, Jul–Dec) of 2011.

Steps:

1. Drag InvoiceDate to Columns.
    - Right-click → Choose Month.

2. Drag TotalSales to Rows.
3. Drag InvoiceDate to Filters → Select Year = 2011.
4. Add a Calculated Field called "HalfYear":
    - Right-click in Data Pane → Create Calculated Field.
    - Name: HalfYear
    - Formula: IF MONTH([InvoiceDate]) <= 6 THEN "H1" ELSE "H2" END
5. Drag HalfYear to Columns (instead of full Month).
6. Set aggregation as SUM(TotalSales).
7. Bar Chart with color/label.

✅ Result: Two bars showing total sales in H1 and H2 of 2011.

23 Perform the data visualization operations using Tableau to get answers to various questions on the census bureau databset(Adult data sets). a. Find and Plot Income class of People whose education is master's and doctorate. b. Find and Plot Income class of people who have private jobs. c. Find and Plot yearly sales comparison d. Find and Plot country wise statistics on Geospatial graph e. Plot agewise- education vs salary statistics. f. Plot Countrywise male female ratio. g. Plot Income class based on workclass(Government and other)

a. Find and Plot Income class of People whose education is Master's and Doctorate

Steps:

1. Drag `Education` to Rows→ Select only `Masters` and `Doctorate`.
2. Drag `Income` to Columns.
3. Cnt adult.csv to rows so that you can see bars showing how many adults are having income <50K and >50K

b. Find and Plot Income class of people who have private jobs

Steps:

1. Drag `Workclass` to Filters → Select `Private`.
2. Drag `Income` to Columns.
3. Drag Cnt adult.csv to Rows.

Chart Type: Bar Chart

C. Find and Plot yearly sales comparison

D. Country-wise Total Sales on a Geospatial Graph

🎯 Objective: Use a map visualization to display how much each country contributes to total sales.

🔹 Step 1: Ensure Country is Recognized as a Geographic Field

3. In the **Data Pane**, find the Country field.
4. It should have a **globe icon** 🌍 next to it.
    - ✅ If it does → great!
    - ❌ If not:
        - Right-click Country → **Geographic Role → Country/Region**

🔹 Step 2: Create the Map View

2. **Double-click on Country**

- Tableau will automatically generate a **map**.
- You'll see country dots on a world map.

🔹 Step 3: Add TotalSales to Marks

3. **Drag CapitalGain** to the **Size** shelf on the **Marks card**
    - Now the dots on the map will grow bigger with higher sales
4. **Drag CapitalGain** to again to the **Color** shelf on the **Marks card**
    - Now each dot will also have a color intensity based on sales

Do that label thing and then go to table calculation in the dropdown of sum capital convert to percent of total

✅ Now the map shows total sales per country using both **size** and **color**

e. Plot age-wise education vs salary statistics

Steps:

1. **Drag `Age` to Columns.**
2. **Drag `Education` to Color or Shape.**
3. **Drag `Income` to Rows or Tooltip.**

f. Plot Country-wise Male/Female ratio

Steps:

1. **Drag `Native-country` to Rows.**

2. **Drag `Sex` to Columns.**

3. **Drag `Number of Records` to Text . and then go to quick table calculation and then percent to total**

4. **Optional: Use `Sex` on Color.**

Chart Type: Side-by-side Bar Chart or Stacked Bar Chart

g. Plot Income class based on workclass (Government and others)

Steps:

1. **Drag `Workclass` to Rows.**
2. **Drag `Workclass` to Filters → Select `Government` and relevant others (e.g., Private, Self-emp).**

3. **Drag `Income` to Columns.**

4. **Drag `Number of Records` to Text.**
5. **then go to quick table calculation and then percent to total**

6. **Now change the chart**

Chart Type: Clustered Bar Chart