

Experiment-6

Date: 3/6/2022

AIM

Foundations for building data visualizations, Creating first visualization.

PROCEDURE

Step-1: Study about basics of data visualization

Step-2: Study about prerequisites of data visualization

Step-3: Study about different visualization charts for data visualization

Step-4: read the required data into tableau using source connection in Tableau

Step-5: Study different visualization charts available in Tableau on the data

SOURCE CODE

What is Data?

Data refers to raw facts, Statistics, or information collected or stored in a structural or unstructured form. Data can take various forms, such as text, numbers, images, videos, and more. It's a foundation of all information and knowledge and is used in various fields for analysis, decision-making, and

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understanding trends and patterns.

Data can be categorized into two main types:

*~~Structured Data~~: This type of data is organized into a specific format, such as tables or databases, and is easily searchable and analyzable. Examples include spreadsheets, relational databases, and CSV files.

*~~Unstructured Data~~: Unstructured data lacks a specific format and can include text documents, social media posts, images, audio recordings, and more. Analyzing unstructured data often requires advanced techniques like natural language processing and image recognition.

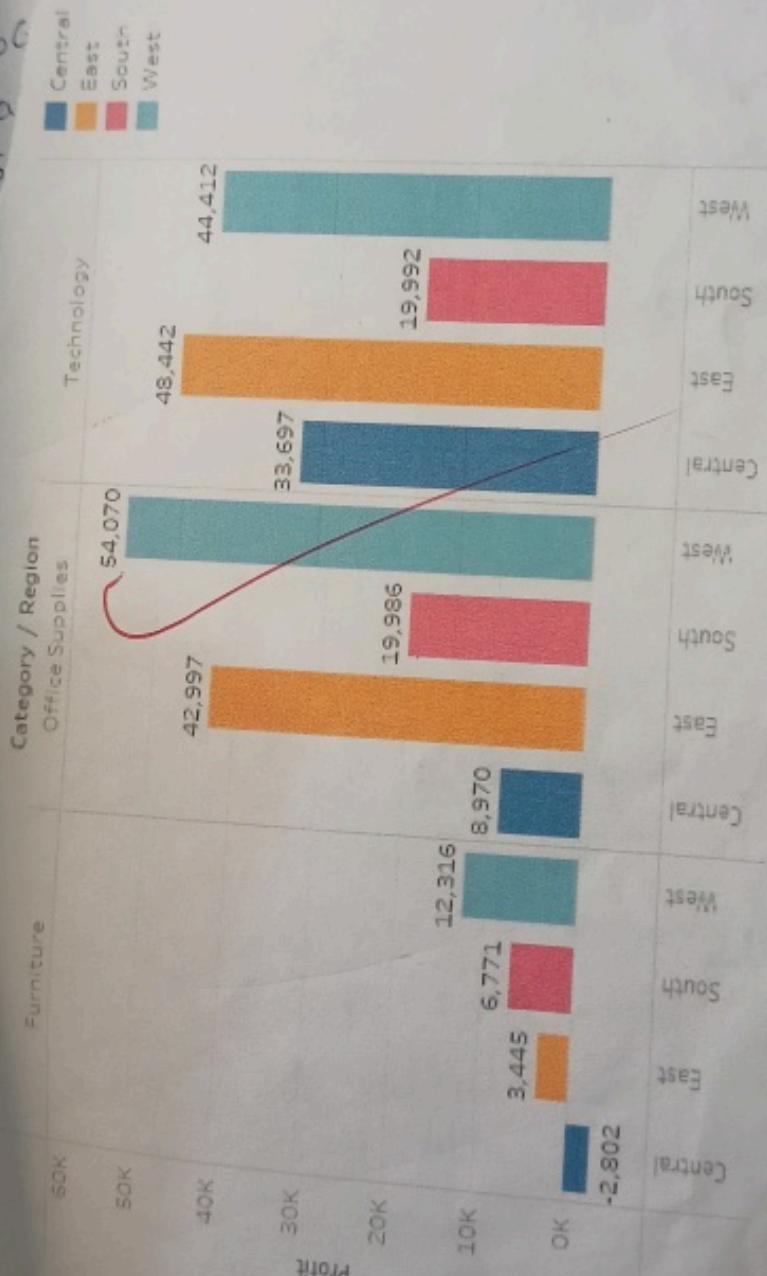
Where to find Data?

You can find data from various sources, depending on your specific needs:

*~~Open Data Portals~~: Many governments and organizations provide free access to a wide range of data through open data portals. Examples include Data.gov (United States) and data.gov.uk (United Kingdom).

*~~Data Repositories~~: Academic institutions, research organizations, and data enthusiasts often share datasets on platforms like Kaggle, GitHub, and the UCI Machine Learning Repository.

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Sum of profit for each Region broken down by Category. Color shows details about Region.

* APIs (Application Programming Interfaces): Some websites and services offer APIs that allow you to programmatically access and retrieve data. Examples include Twitter API, Google Maps API, and financial market APIs.

* web Scraping: You can extract data from websites using web scraping tools and libraries like BeautifulSoup and Scrapy. However, be mindful of the website's terms of use and legal restrictions.

* Surveys and Survej: You can conduct your own survey or collect data through questionnaires and interviews.

* IoT Devices: Internet of Things (IoT) devices generate vast amounts of data that can be used for various purposes.

* Commercial Data Providers: Some companies specialize in selling datasets for specific industries, such as market research, finance, and healthcare.

Foundations for Building Data Visualizations:
Creating effective data visualizations requires a foundation in several key areas.

* Data Analysis: Before creating visualizations, you should thoroughly analyze your data to understand its structure, relationships, and any patterns or trends.

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*Exploratory data analysis (EDA) techniques can help with this.

*Statistical knowledge: Understanding basic statistics is essential for making meaningful interpretations of data. Concepts like mean, median, standard deviation, and correlation are commonly used in data visualization.

*Domain knowledge: Having knowledge of the specific domain or subject matter related to your data is crucial for creating contextually relevant visualizations. It helps you ask the right questions and provide valuable insights.

*Visualization Tools: Familiarize yourself with data visualization tools and libraries such as matplotlib, Seaborn, ggplot2, Plotly, and Tableau. Each tool has its strengths and can be used for different types of visualizations.

*Design Principles: Study design principles, including color theory, typography, and visual hierarchy to create visually appealing and effective visualizations. Avoid common pitfalls like misleading visualizations.

*Interactivity: Learn how to add interactive elements to your visualizations to engage users and allow them to explore the data. This can be achieved using tools like Java Script, Python libraries or dedicated visualization software.

Creating Your First Visualization:

To create your first data visualization, follow these general steps:

* Select Your Data: Choose a dataset that aligns with your goals and interests. Ensure that the data is clean and well-structured.

* Define Your Objective: Clearly define what you want to communicate or explore with your visualization. Are you looking to show trends, comparisons, or distributions?

* Choose the Right Visualization Type: Select a visualization type that suits your data and objectives. Common types include bar charts, line charts, scatter plots, histograms, and pie charts.

* Prepare and Transform Data: Preprocess your data as needed. This may involve aggregating, filtering, or transforming the data to fit the chosen visualizing.

* Create the Visualization: Use a suitable tool or library to create your visualization. Customize it with labels, colors, and other design elements.

* Interactivity (Optional): If appropriate, add interactive features to your visualization to allow users to interact with the data.

* Test and Iterate: Review your visualization for accuracy and clarity. Seek feedback from others and make improvements as necessary.

* Publish or Share: Once you are satisfied with your visualization, publish it on a platform, embed it in a report, or share it with your intended audience.

Experiment-7

Date: 14/09/2017

AIM

Getting started with tableau software using data file formats, connecting data to tableau, creating basic charts (line, bar charts, tree maps) using the show me panel.

PROCEDURE

Step-1: Study about overview of Tableau

Step-2: To open the application, click the Tableau icon on your desktop (or in your Start menu).

Step-3: In the Connect panel at the left side of the Start page, click the Excel link under the "File" heading to the open file selection option.

Step-4: Using the file selection box, select the Excel worksheet that you want to open, and click the Open button to continue

Step-5: Drag the dimension and measure in row and column input field and it will automatically suggest a graph best fitted on data.

Step-6: You can change the graph by clicking on the show me button and select which graph you want.

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Procedure:-

Step 1:- Study our review of Tableau.

Step 2:- To open the application click the Tableau icon on your desktop (or in your Start menu).

Step 3:- In the Start menu, click on the "Tableau" option.

Step 4:- Using the "Open" option, click on the "Open" button.

Step 5:- Make a connection to the data source.

Step 6:- Drag the dimension and measure fields to the respective input fields.

Step 7:- You can change the graph by clicking on the "Show Me" button and selecting the type of chart you want.

a. Line Chart
1. from a field to Cex: Sta

b. Bar Chart
1. drag categories named

step3: In the connect page, click "TO a file" option.

step4: Using the fi work sheet click then

step5: Make de lafio common field

step6: Drag the dim column input suggest a gg

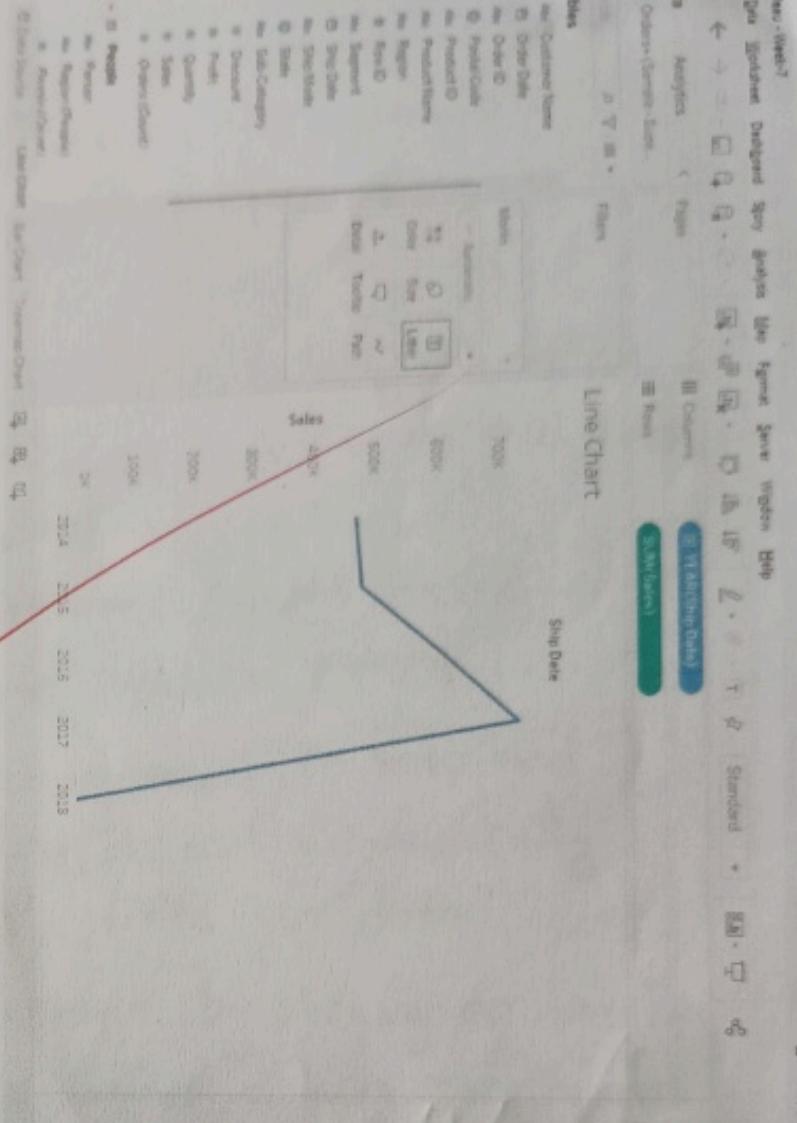
step7: You can ch "show me" bo you want.

a. Line char:

from the "data Source Panp", drag and drop the date field to the columns shelf and a numeric field (ex: sales, revenue) to the rows shelf.

b. Bar char:

drag and drop a categorical field (ex: product category, region) to the columns shelf and a numeric field to the rows shelf.



Step 5: In the connect panel at the left side of the first page, click the excel line under the "To a file" heading to the open file selection option.

Step 6: Using the file selection box, select the Excel work sheet that you want to open and then click the open button to continue.

Step 7: Make relationship between sheets based on common fields in data source pane.

Step 8: Drag the dimension and measure in rows and column input field and it will automatically suggest a graph best fitted on data.

Step 9: You can change the graph by clicking on the "show me" button and Select which ever graph you want.

a. Line char:

1. from the "data Source Pane", drag and drop the date field to the columns Shelf and a numeric field (ex: sales, revenue) to the Rows shelf.

b. Bar char:

1. drag and drop a Categorical field (ex: product category, region) to the columns Shelf and a numeric field to the Rows shelf.

2. Then tableau will create a bar chart. You can adjust the orientation and formatting as needed. To display labels on the bars click on Labels under marks and select "Show Marks Labels".

Tree Map:

1. drag and drop a categorical field to the columns shelf.

2. drag and drop a numeric field to the size shelf under marks.

3. Tableau will create treemap visualization. You can further customize it by adjusting colours and labels.

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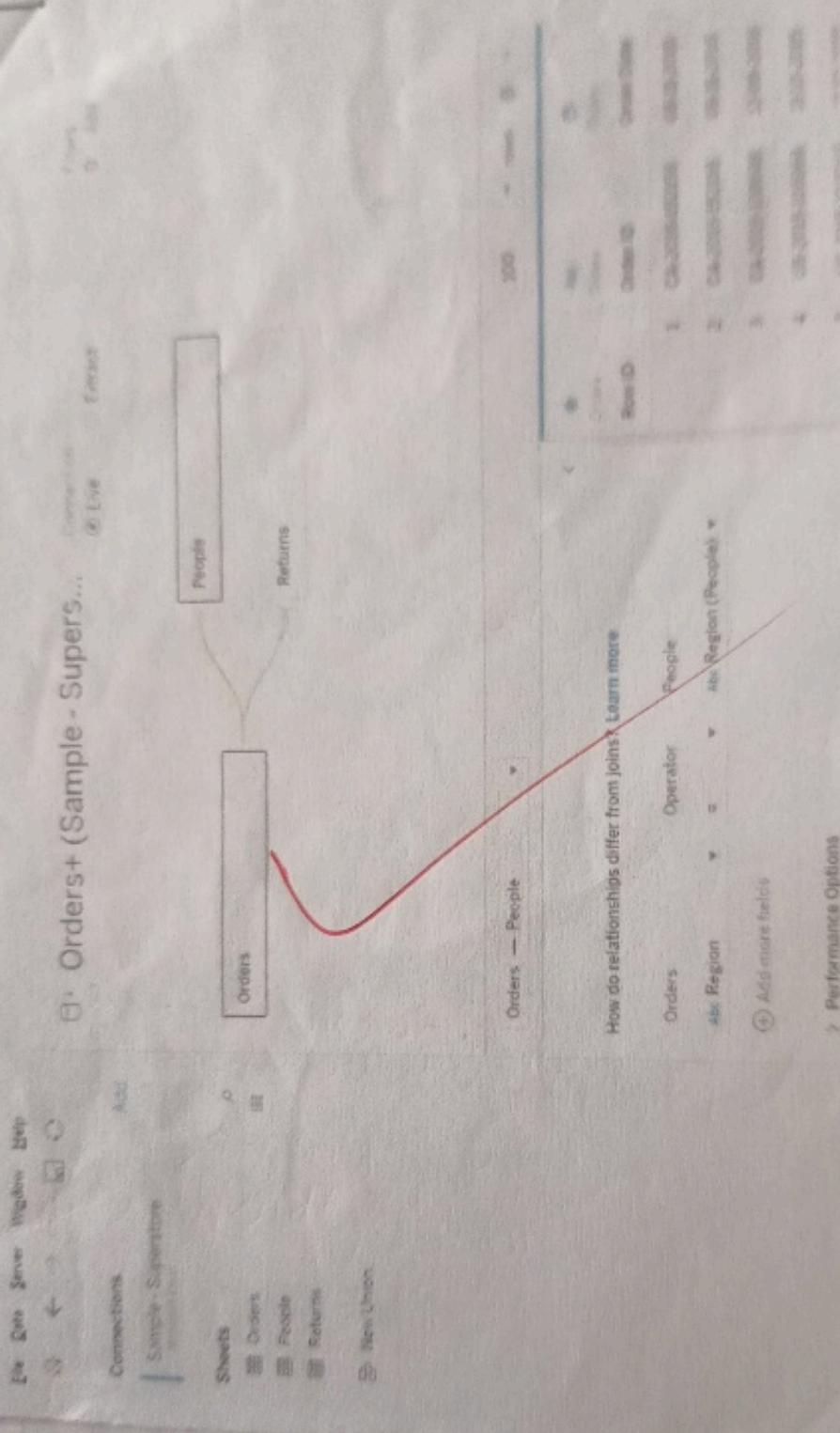


Tableau - Week 7

File Data Worksheet Dashboard Story Analytics Map Format Server Window Help

Rows Columns Rows > Pages Filters

Tables

ABC Customer Name Order ID Order Date Order ID Product Name Postal Code Region Row ID Segment Ship Date Ship Mode State Sub-Category Discount Profit Quantity Sales Orders (Count) People

Treemap Chart

Marks

- Automatic
- Color
- Size
- Label
- Detail
- Toolbox
- SLAM(Sales)
- Ship Mode
- Sub-Category

Q) Taken - Week?

Elle Don Whistler Outland Spy Analysts Ibsen Smart Snow White Hop

Analytics

Customer Service Sales

Order ID

Postal Code

Product ID

Product Name

Region

Row ID

Segment

Ship Date

Ship Mode

State

Sub-Categories

Discount

Profit

Quantity

Sales

Orders (Count)

People

Person

Region (People)

People (Count)

Data Source

Line Chart

Bar Chart

Treemap Chart

Map

Gauge

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Procedure:

Step 1: Create the calculated field.

- in a work sheet in Tableau, select Analysis > Create calculated field.
- in the calculation editor that opens, give the calculated a name.

Step 2: Enter your calculation.

- in the calculation editor, enter a formula. For example, you can create a calculation field to calculate.

Profit margin as $((\text{Sum}[\text{Pif}]) / \text{Sum}(\text{Sales})) * 100$.

- when you finished, click OK. the new calculated field is added to the Data pane.

Step 3: Study the overview of Sum, Avg and Aggregate function.

These are 3 main types of calculations to create calculated field.

1. Basic calculations: Row level calculations of at the visualization level of detail (an aggregate calculation).

2. Expressions: Level of details.

Table calculations :

Table calculations allow you to transform value at the level of detail of the visualization only sum & avg (average) functions.

The sum function in Tableau calculation the total sum of a numeric field.

You can use it to find the sum of values in a column or as part of a more complex calculated field using the sum function.

Avg Function calculates the Average [mean] values of a numeric field like sum. You can use it dragging a numeric field in the avg shelf. or creating a calculated field with the Average function.

Aggregate function:- Tableau provides a variety of aggregate function that allow you to perform calculations on tools group of data. Common aggregate function include SUM, AVG, COUNT, MIN (minimum value), MAX (maximum value). These functions are particularly useful when you want granularity (example :- by category, region or time period).

Create one mode calculated field.

% Returned Sales by overall Sales.

(Region wise return sales) / (Region - Sales)

Region wise return Sales.

If (If Null([Returned]) = "Yes",

(Sales), Null).

Region - Sales.

{fixed [Person], [Region]: Sum((Sales))}.

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Experiment-8

Lab Record

Step- Enter your calculation:

- a. in the calculation editor, enter a formula.
for example, you can create a calculation field to calculate profit margin as $((\text{Sum}[\text{Profit}]) / \text{Sum}[\text{Sales}])$

b. When you finished, click OK the new calculated field is added to the Data pane

Q3: Study the overview of SUM, AVG and COUNTA functions. There are 3 main types of calculated fields:

- Basic calculations: You can use the following level calculations:
 - Aggregate calculation
 - Expression
- Level of Detail calculations

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4

Experiment-9

Date: 19/10/22

AIM

Applying new data calculations to visualizations, formatting visualizations, formatting tools menus, formatting specific parts of the view.

PROCEDURE

I. Applying new data calculations to visualizations

Step-1: Build the view

- From Dimensions, drag Required field to the Columns shelf.
- From Dimensions, drag Required field to the Rows shelf.
- On the Rows shelf, click the plus icon (+) on the Category field to drill-down Subcategory.

Step-2: Add the calculated field to the view

From Measures, drag Required Field to Color on the Marks card.

On the Rows shelf, right-click select required field and select Measure (Sum) > Average.

SOURCE CODE

1. Drag and Drop Calculated Field.

To apply your newly calculated fields to a visualization simply drag and drop them into the appropriate shelves in your worksheet.

For example you can drag and calculated field to the rows or columns shelf, use it in filters or place it on the marks card to control the appearance of marks.

2. Filters with calculated fields.

Create filters using calculated-fields to control when data points are displayed in your visualization. You can use calculate fields to a filter by specific criteria, such as a calculated data range or a custom ranking.

Step-1: Display a worksheet or dashboard.

Step-2: From the Format menu, choose the part of the view that you want to format, such as Font, Borders, or Filters.

Step-3: To format interactive controls go to **Format > Worksheet > Interactive Controls**.

Step-4: To control the background color of the worksheet, pane, and headers, go to **Format > Worksheet > Shading**.

Step-5: To format Filters and Sets, formatting by either going into **Format > Filters and Sets**.

Step-6: To access highlighter formatting by either going into **Format > Highlighters**.

SOURCE CODE

Formatting visualizations:

i) Format Pane:

on the left side as the tableau interface you find the format pane. It allows you to format various aspects of your visualization, such as fonts, colors, shading, and borders. Simply select the element you want to format and use the options in the format pane to make changes.

2- Marks card:

The mark card, located above your visualization, offers formatting options specific to the type of marks card to access these options and modify how your data is represented.

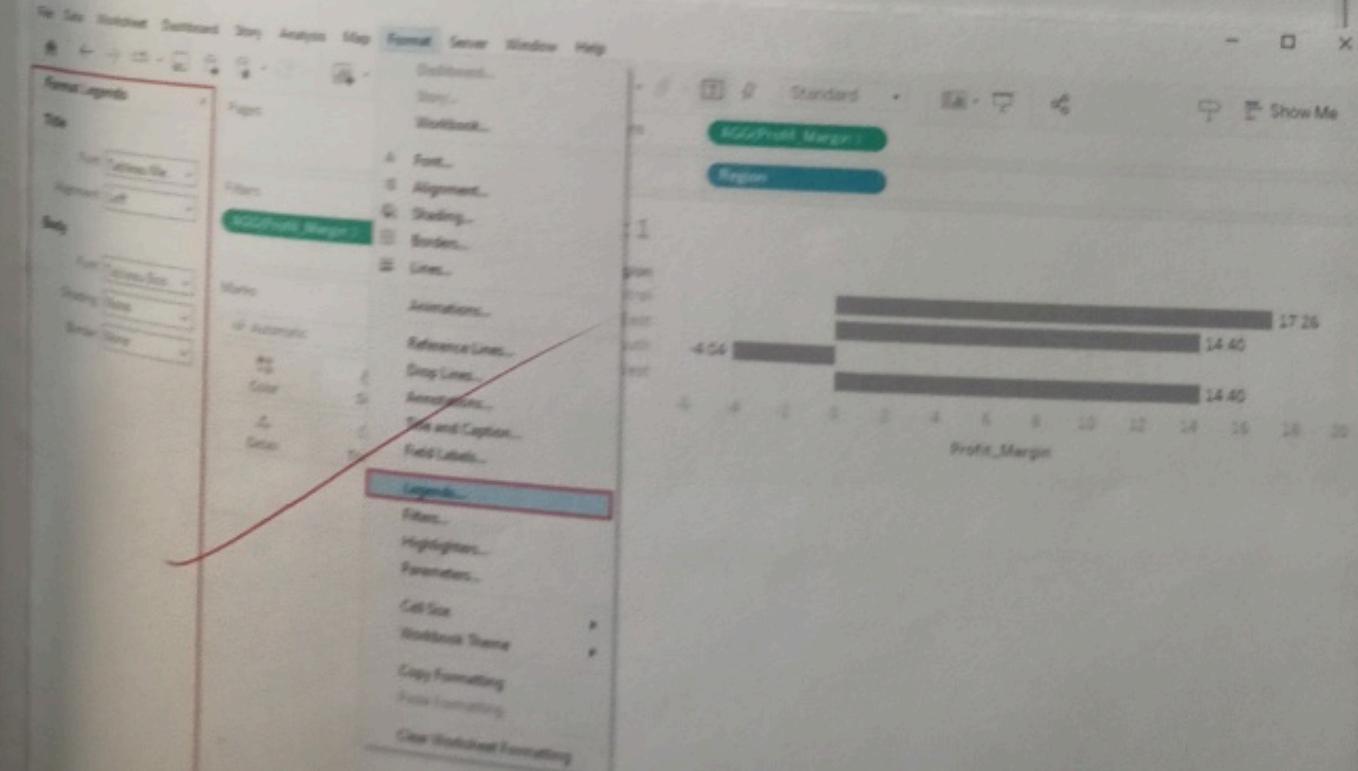
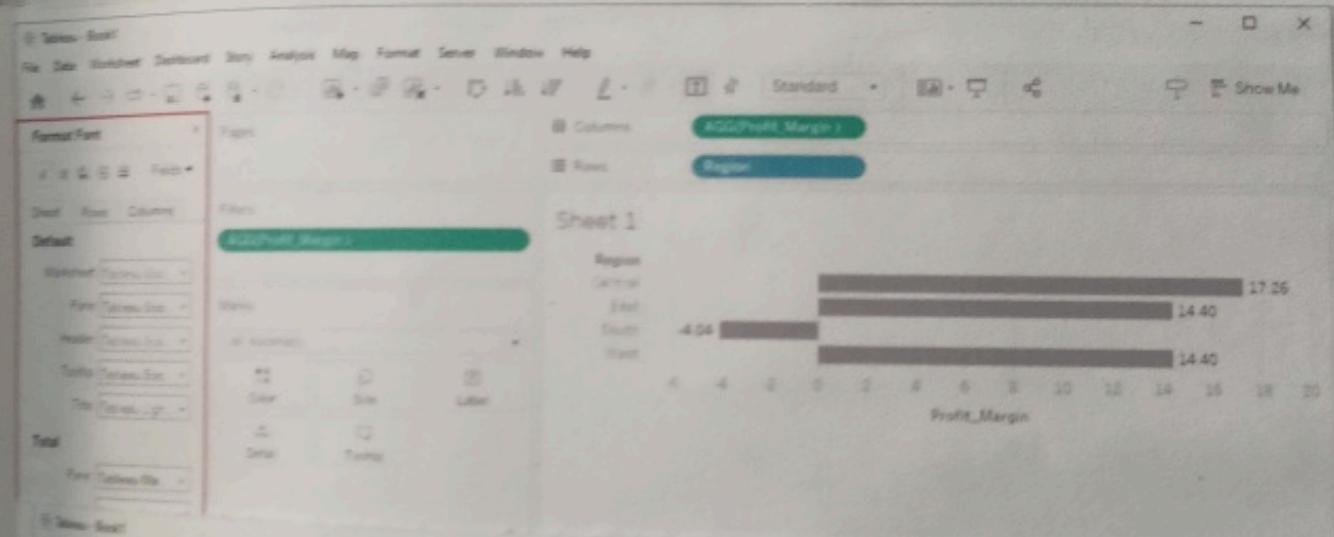
3- Axis and Gridlines:

You can format axis labels, titles, and gridlines to improve the readability of your visualization. Right-click on the axis or gridline to open the context menu and select "Format Axis" or "Format Gridline".

click on an axis or gridline to access formatting options.

4. Legends and Color Scales:

Customize legends and color scales to provide context for your visualization. You can change colors, labels, and the position of legends to match your data.



Formatting Tools and menus

Tableau provide several formatting tools and to help you define the appearance of your visual.

1. Format menu:

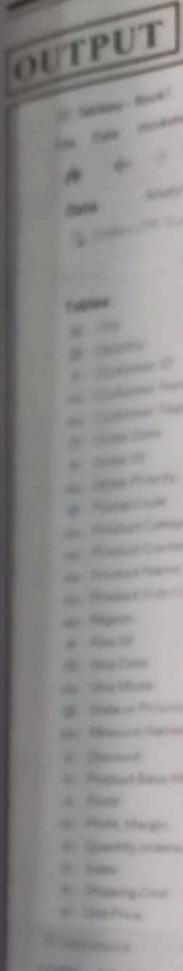
The format menu at the top of the Tableau interface provides access to various formatting options, including font styles, shading, borders, alignment, and more. You can use this menu to format text, labels, and other elements.

2. Worksheet menu

In the Worksheet menu, you'll find options to format the entire worksheet, including background color, borders and worksheet title. You can also adjust the worksheet size.

3. Dashboard menu:

If you're working with dashboard the Dashboard menu allows you to format the entire dashboard layout, including background, size and title.



PROCEDURE

Views can optionally include rows, columns, headers, and marks.

Step-1: To show and unshow headers:

- Right-click (control-click on Mac) the headers in the view whose headers you want to show and select Show Headers.
- Right-click (control-click on MOUSE) the axis in the view and select Show Headers.

Step-2: To show and unshow axis:

- Right-click (control-click on MOUSE) the axis in the view and select Show Headers.
- Right-click (control-click on MOUSE) the measure in the view whose axis you want to show and select Show Header on the field menu.

Step-3: To Disable tooltip commands:

- If you don't want users to be able to access tooltip commands, you can disable Click Tooltip on the Marks card or select Worksheet > Tooltip.

Step-4: To show or hide titles in a worksheet

- From the toolbar menu, click Worksheet > Show Title.
- On the toolbar, click the drop-down arrow on the Show/Hide Cards button select Title from the context menu.
- Toggle the check mark on or off to show or hide the title.

SOURCE CODE

Formatting specific parts of the view lets you format specific elements of your Tablau

Visualization:

Annotations:
1. You can add annotations to your visualization to import points or provide additional information. Format these annotations using the right-click context menu. Format available when you right-click on an annotation.

2. Tooltips:

Customize tooltips to display relevant information when users hover over data points. You can format tooltips to show or hide specific fields and control their appearance.

3. Headers and Titles:

Format headers, titles and subtitles for clarity and consistency. Use the Format pane or the format menu to adjust text formatting, alignment and shading.

Experiment-10

Date: 26/10/24

③ edit the bottom to specify the past of calculated fields in tableau? to show or hide a way to combine multiple dimension members in higher level category 1. Create a group 2. Use groups in calculate fields. 3. Use groups in hierarchy in tableau? aggregation 4. Editing group hierarchy in tableau, we have to drag the fields onto each other in the data eau?

Tableau is a visualization, or viz create to explore data.

Tableau?

a visual representation of one or more raw source. It allows you to modify analysis type, user experience, and of analysis all in one place.

26/10/24

AIM

Editing and formatting axes, manipulating data in tableau data, pivoting tableau data.

PROCEDURE

I. Editing and Formatting Axes

Step-1: Double-click an axis to open the Edit Axis dialog box and change the axis configuration and formatting

Step-2: To select the marks associated with the axis, right-click the axis and select Marks.

Step-3: To hide an axis

Right-click (control-click on windows) the axis in the view, and then clear the check mark next to the Show Header option.

Step-4: Try remaining options of axis

SOURCE CODE

Editing and formatting Axes:

1. Edit Axis Title.

• Click on the axis title you want to edit.

• You can now modify the title text, font size, color, and alignment using the format pane of the

toolbar at the top

2. Edit Axis Labels:

- Right-click on an axis and select "Edit Axis".
In the edit axis dialog box, you can change the following formatting of labels, tick marks, and other axis-related properties.

3. Scale and Range:

- To change the scale or range of an axis right-click on it and Select "Edit Axis".
In the dialog box, adjust the minimum and maximum value, scale, or range according to your needs.

Change Data type:

If tableau has inferred a wrong data type for a column the data type can be changed by clicking on the data type symbol in the column header.

New column (Calculated Field)

Calculated field can be used if you need to create customized logic for manipulating certain data type of data values. There are a large - range of functions available Tableau Data .

Data provides enable you to reorganize columns and rows in a report so you can view data from different perspectives.