TABLEAU

Unit: 3

Business Intelligence and Data Visualization
(ACSAI0519)

Course Details
(B Tech 5th Sem)

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Assistant professor

CSE-IOT

- B. Tech (IOT)
- 5th Semester
- Professional Course

BUSINESS INTELLIGENCE AND DATA VISUALIZATION

L T P	Credits
3 – 0– 0	3

NOIDA INSTITUTE OF ENGG. & TECHNOLOGY, GREATER NOIDA, GAUTAM BUDDH NAGAR
(AN AUTONOMOUS INSTITUTE)

Bachelor of Technology
Computer Science And Engineering (Internet Of Things)
EVALUATION SCHEME
SEMESTER-V

Sl. No.	Subject Codes	Subject Name	Periods			Evaluation Scheme				End Semester		Total	Credit
			L	T	P	CT	TA	TOTAL	PS	TE	PE		
WEEKS COMPULSORY INDUCTION PROGRAM													
1	ACSIOT0501	Arm Architecture for IoT	3	1	0	30	20	50		100		150	4
2	ACSE0502	Computer Networks	3	1	0	30	20	50		100		150	4
3	ACSE0503	Design Thinking-II	2	1	0	30	20	50		100		150	3
4	ACSE0505	Web Technology	3	0	0	30	20	50		100		150	3
5		Departmental Elective-I	3	0	0	30	20	50		100		150	3
6		Departmental Elective-II	3	0	0	30	20	50		100		150	3
7	ACSIOT0551	Arm Architecture for IoT Lab	0	0	2				25		25	50	1
8	ACSE0552	Computer Networks Lab	0	0	2				25		25	50	1
9	ACSE0555	Web Technology Lab	0	0	2				25		25	50	1
10	ACSE0559	Internship Assessment	0	0	2				50			50	1
11	ANC0501 / ANC0502	Constitution of India, Law and Engineering / Essence of Indian Traditional Knowledge	2	0	0	30	20	50		50		100	
12		MOOCs(For B.Tech. Hons. Degree)											
		GRAND TOTAL										1100	24

B. TECH. (IOT)				
Course code		**L T P** **3 0 0**		**Credits** **3**
Course title	Business intelligence and Data visualization			
Course objective:				
This course covers fundamental concepts of Business Intelligence tools, techniques, components and its future. As well as a bit more formal understanding of data visualization concepts and techniques. The underlying theme in the course is feature of Tableau, its capabilities.				

Course Contents / Syllabus		
UNIT-III	**TABLEAU**	**8**
		Hours
Introductions and overview: What Tableau can and cannot do well, Debug and troubleshoot installation and configuration of the software. **Creating Your First visualization:** Getting started with Tableau Software, Using Data file formats, connecting your Data to Tableau, creating basic charts (line, bar charts, Tree maps), Using the Show me panel **Tableau Calculations:** Overview of SUM, AVR, and Aggregate features Creating custom calculations and fields, Applying new data calculations to your visualization. **Formatting Visualizations:** Formatting Tools and Menus, formatting specific parts of the view, Editing and Formatting Axes.		

Course outcomes : After completion of this course students will be able to		
CO 1	Apply quantitative modelling and data analysis techniques to the solution of real-world business problems	K1, K2
CO 2	Understand the importance of data visualization and the design and use of many visual components	K2
CO 3	Understand as products integrate defining various analytical process flow.	K2
CO4	Learn the basics of troubleshooting and creating charts using various formatting tools.	K3, K4
CO 5	Learn basics of structuring data and creating dashboard stories adding interactivity dashboard stories.	K5, K6

- Debug and troubleshoot installation and configuration of tableau.

- Connecting data file formats to tableau

- Creating different charts

- Perform basic tableau calculations

- Formatting visualizations

Course Objective

- This course introduces data visualization theories, techniques, and tools particularly for analyzing and presenting business data. Students will design, develop, and evaluate effective visualizations and dashboards, using various development tools.

- This course focuses on how business intelligence in Tableau uses business analytics tools that make it easy to combine data from multiple sources, analyze and visualize information. It helps trainees in making more informed and better decisions to guide the business. After the completion of the course trainee will be through with all the concepts of business intelligence and Tableau.

- The objective of this course is to assist the folks in running a business strategically. One of the main objectives of this training is to train you on all the concepts that are related to business intelligence and Tableau. The purpose of the Business Intelligence using Tableau training program is to support better business decision-making. Topics like BI – Business Intelligence, Business Intelligence with Tableau, are covered in the training program.

- Business intelligence (BI) is essentially the collection of tools and processes that are used to gather data and turn it into meaningful information that people can use to make better decisions. Using Excel, you can create powerful reports, scorecards, and dashboards. You can bring data into Excel, sort, and organize data, and use it to create reports and scorecards. You can also use powerful analytic capabilities in Excel to visualize and explore data. Through these tutorials, we are going to understand business intelligence and data visualization using the Tableau tool. This training will help you learn about.

- This course introduces data visualization theories, techniques, and tools particularly for analyzing and presenting business data. Students will design, develop, and evaluate effective visualizations and dashboards, using various development tools.

CO-PO and PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	1		2	2				1		1	1	1	
CO2	1	2	2	1	3	1		1	1	2	1	2	2	2	1
CO3	1	2	1	1	1	2				1	2	2		1	1
CO4	1	2			1	1			1	1	1	1	1	2	2
CO5	1	3	1	1	1		1	1				2		1	2
AVG	1.2	2	1.25	1	1.6	1.5	1	1	1	1.25	1.33	1.6	1.33	1.4	1.5

Discussion about Business Intelligence.

Basic Knowledge Of Business Intelligence.

Knowledge about Data mart Data warehouse.

- Tableau is a visual analytics engine that makes it easier to create interactive visual analytics in the form of dashboards. These dashboards make it easier for non-technical analysts and end users to convert data into understandable, interactive graphics.

- Tableau saves time when updating daily and weekly reports that currently reside in spreadsheets. That's because Tableau separates the data layer from the presentation layer and makes updating a spreadsheet data source a trivial append to the bottom of your source spreadsheet.

- Tableau reduces the burden on your IT team by enabling end users to conduct meaningful analysis, make useful discoveries and build interactive dashboards with much less technical support versus traditional (developer-centric) tools.

- Tableau is a way to expand the frequency, depth and variety of data used in your organization. Most importantly, Tableau's visual analytical capabilities are easy to use and present large and granular data sets more effectively than legacy reporting tools and spreadsheet reports.

- Tableau is not a data creation tool. You can make new data in Tableau using forecasts, trend lines, reference lines, calculated values and table calculations. However, if data creation or modeling of novel scenarios is your primary need (building a budget for example), use a spreadsheet.

- Tableau is not an ETL engine for cleaning-up bad data, although it can be very helpful in identifying missing or erroneous data in your existing data sources. Visualizing data via time series, bar charts, scatter plots or in maps highlights errors and outliers more effectively than grids of data in a spreadsheet.

- Tableau is not a table-production tool. It can be used to create text tables, but if you are asking for help to create your 500-row, 32-column grid, you are using Tableau the wrong way.

1. **Data visualization**

2. **Quickly Create Interactive visualizations:** Using drag-n-drop functionalities of Tableau, the user can create a very interactive visual within minutes.

3. **Ease of Implementation:** There are many different types of visualization options available in Tableau which enhance the user experience.

4. **Tableau can handle large amounts of data:** Tableau can handle millions of rows of data with ease. Different types of visualization can be created with a large amount of data without impacting the performance of the dashboards.

5. **Use of other scripting languages in Tableau:** To avoid the performance issues and to do complex table calculations in Tableau, users can incorporate Python or R.

6. **Mobile Support and Responsive Dashboard:** Tableau Dashboard has a great reporting feature that allows you to customize dashboard specifically for a certain device such as a mobile phone or laptop.

7. **Tableau Company Strategy:** Tableau has done a great job climb its way to the top of data visualization tools.

Disadvantages to Tableau

1. **Scheduling or notification of reports:** Tableau does not provide the feature of automatic refreshing of the reports with the help of scheduling.

2. **No Custom Visual Imports**: Tableau is not a complete open tool.

3. **Custom formatting in Tableau:** Tableau's conditional formatting and limited 16 column table displays are pain points for users.

4. **Static and single value parameters**

5. **Screen Resolution on Tableau Dashboards:** The layout of the dashboards gets disturbed if the tableau developer's screen resolution is different from end user's screen resolution

6. **Limited Data Preprocessing.** Tableau is strictly a visualization tool. Tableau Desktop allows you do to very basic preprocessing. This includes joining and blending data.

7. **Scaling and Pricing for Enterprise:** This is the biggest issue with Tableau, it's a very expensive product to scale across a large organization.

STEPS

Step 1: Connect to your data

Learn all about the Start page and how to connect to your data.

Step 2: Drag and drop to take a first look

Get to know the Tableau workspace, learn the language of Tableau, and start examining your data.

Step 3: Focus your results

Ask deeper questions and use additional tools to refine your views and gain insights about your data.

Step 4: Explore your data geographically

Learn how to plot your data on a map to see if you can spot any trends.

Step 5: Drill down into the details

Drill down into the details of your data and learn how to create a Top filter.

Step 6: Build a dashboard to show your insights

Learn how to build and format a dashboard to display the visualizations you created.

Step 7: Build a story to present

Learn how to build and format a story to present your findings.

Step 8: Share your findings

Share your findings with your organization on Tableau Server or Tableau Online, or share them with the world on Tableau Public.

Note: Starting 2019.3, on the **Connect** pane, **Tableau Server** has moved to the top of the pane under **Search for Data**. Select this option to connect to Tableau Server or Tableau Online from Tableau Desktop.

1. Start Tableau Desktop and on the **Connect** pane, under **Search for Data**, select **Tableau Server**.

2. To connect to Tableau Server, enter the name of the server and then select **Connect**.

   To connect to Tableau Online, select **Tableau Online** under **Quick Connect**.
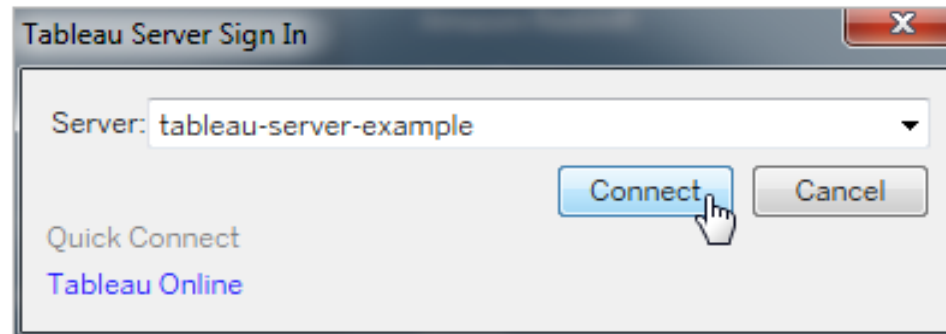
Tip: If you don't sign out, Tableau Desktop saves your server connection, so you can skip step 3. You can also skip it if Kerberos is enabled on Tableau Server and your computer has valid credentials. For more information, see Automatically keep Tableau Desktop connected to Tableau Server or Online.

3. To sign in:
   - For Tableau Server, enter your user name and password.
   - For Tableau Online, enter your email address and password.

4. Select a data source from the list of published data sources. (Data that you don't have Connect permissions for is grayed out.)

Note: If you select a cube (multidimensional) data source, the Create Local Copy dialog box appears, and you must create a local copy of the data before you can start your analysis.

Search for data by using the Search box. Or you can sort the list by selecting the column headers. Column headers that support sorting are underlined when you hover over the header. You can also select the filter icon to filter data by Connection Type and by Certified.

- In addition to connecting to data sources, when you have the Data Management Add-on, you can connect to data using a virtual connection. When Tableau Catalog is enabled you can also connect to databases, files, and tables.
  - You can select from **Data Sources**, **Virtual Connections**, **Databases and Files**, or **Tables** to search for data.
  - You can filter assets by several options including Tag, Data Quality Warning, Certified, and more.

- **Note:** From the **Search for Data** results, you can make a connection with a subset of the data connectors that Tableau Desktop supports. If a data source, database, file, or table is grayed out, you can't connect from Tableau Server or Tableau Online. You can, however, connect from the Tableau Desktop **Connect** pane, if you have the correct permissions.
- After you select the data you want to connect to, click **Connect**.
- Select the sheet tab to start your analysis.
- Data sources published to Tableau Server or Tableau Online are shown in the **Data** pane with a Tableau icon.
- You might want to download a local copy of the data source so that you can, for example, work offline or make changes to a data source without modifying the original. To download a local copy, on the **Data** menu, select the data source, and then select **Create Local Copy**. A duplicate of the data source is added to the **Data** pane.

- The most widely used interactive Data Visualization tool is Tableau. It has a large number of charts to help you easily and effectively explore your data. Data is represented by Rectangle Boxes in **Tableau Treemap**. Each rectangle box can be determined by any of your **Dimension** members, and the box size can be determined by the **Measure** value. Tableau Treemaps are extremely useful for displaying the most complex data set information in a small data region.

- The Tableau Treemap was designed to display hierarchical data, but it is now also used to display part-to-whole relationships. **Dimensions** are used to define the Tableau Treemap's structure, while **Measures** are used to define the size and color of the individual rectangles. Treemaps are simple Data Visualization that can present information in a visually appealing manner. When you need to show cumulative totals for the working data, the Tableau Treemap chart is the way to go. When making the chart, you can include labels such as date, time, name, and budget.
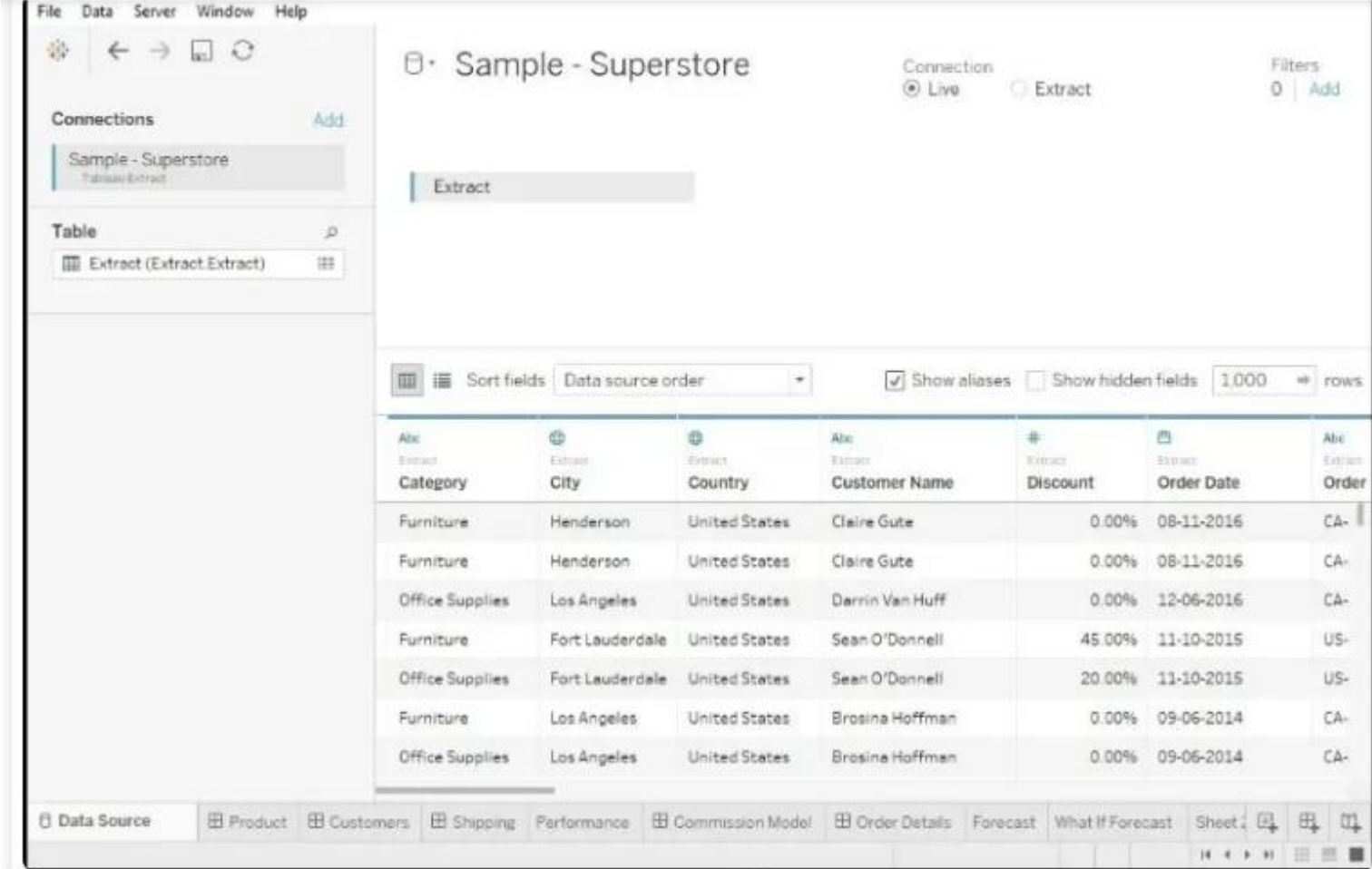
- A Tableau Treemap's fundamental components are:

- Mark type:Automatic or Square

- Color:Dimension or Measure

- SizeMeasure

- Label or Detail:Dimension(s)

- When there are many components in a whole, a Tableau Treemap is used to show how they fit together. A rectangular area divided into smaller rectangles to represent sub-categories is typically (but not always) used for the arrangement. The size of these subcategory rectangles is a numerical value. The small rectangles are usually logically grouped into a different categorical family and colored to indicate a key data attribute.

- The Tableau Treemap has some drawbacks, such as the fact that it offers very limited customization options to the user and is inefficient at representing data ranges. It's a good idea to give the Treemap in Tableau proper labels, colors, sizes, and naming conventions so that the visualizations are more meaningful.

- Here you'll be making a Treemap Chart showing no profit and no sales in specific years, along with the profit ratios that go with them.

- **Step 1**: You need to connect the TABLEAU application to a dataset as users:

- The **'Superstore'** dataset, which comes preinstalled with the application, can be seen in the main section (black area). To create a **Treemap Chart**, you will use this dataset.

- **Step 2**: When you click on the **Sample Superstore** dataset, you'll see the screen below:

- The content of the data set is listed in multiple tabs at the bottom of the screen, indicating that **Sample Superstore** is fully loaded. This is a type of working data reference chart.

- **Step 3**: Now you'll create your own **Treemap Chart**; when you create a new worksheet on the dashboard, you'll see something like this:
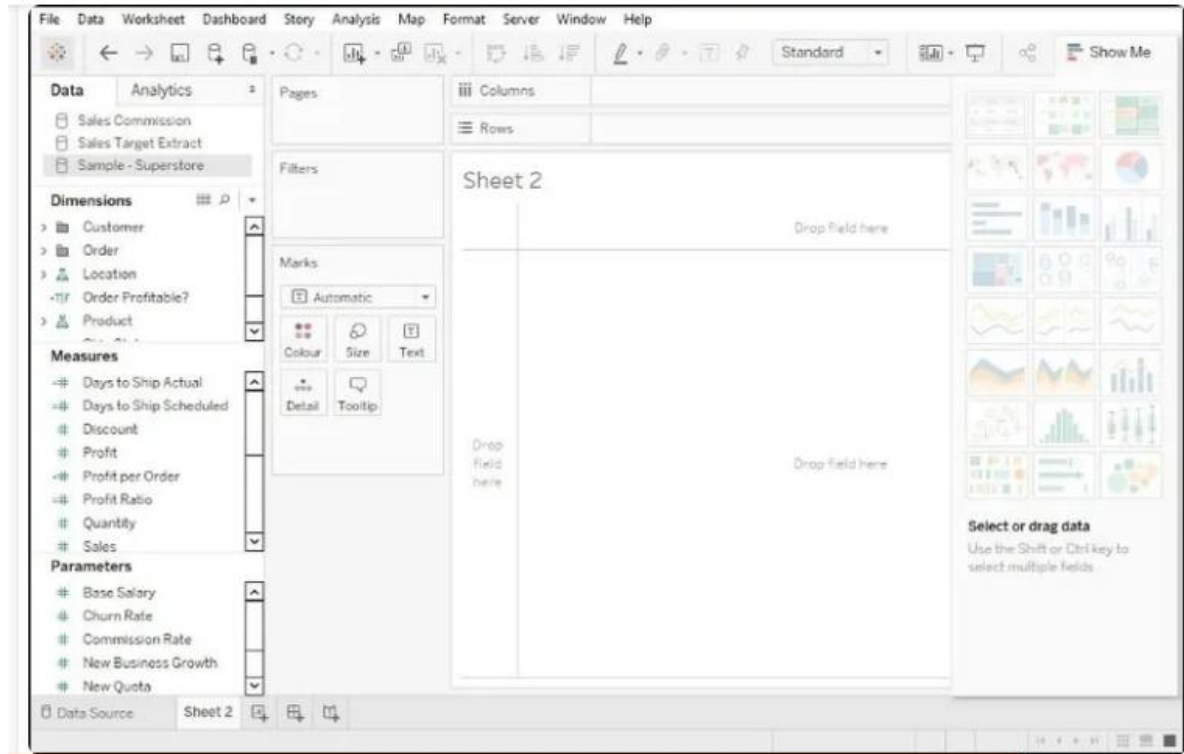
- Only two-dimensional data is considered within a Treemap Chart. On the left-hand side of the screen, you can see the **'Dimension,' 'Measures,'** and **'Parameters'** sections. All of these contain various types of data or data measurement techniques.

- **Step 4**: Then, from the **Dimension** and **Measure** section, you drag and drop data. The actual chart-making process starts from here. You want the **YEAR** and **REGIONAL** information to be at the top of your chart. So you select **'Text'** and drag the **Region** and **Year of Order dates** to it.

- **Step 5**: Drag and drop **'Sales'** into the **'Size'** section to add the **Sales** information to the chart (present under the **Marks**) as shown below:

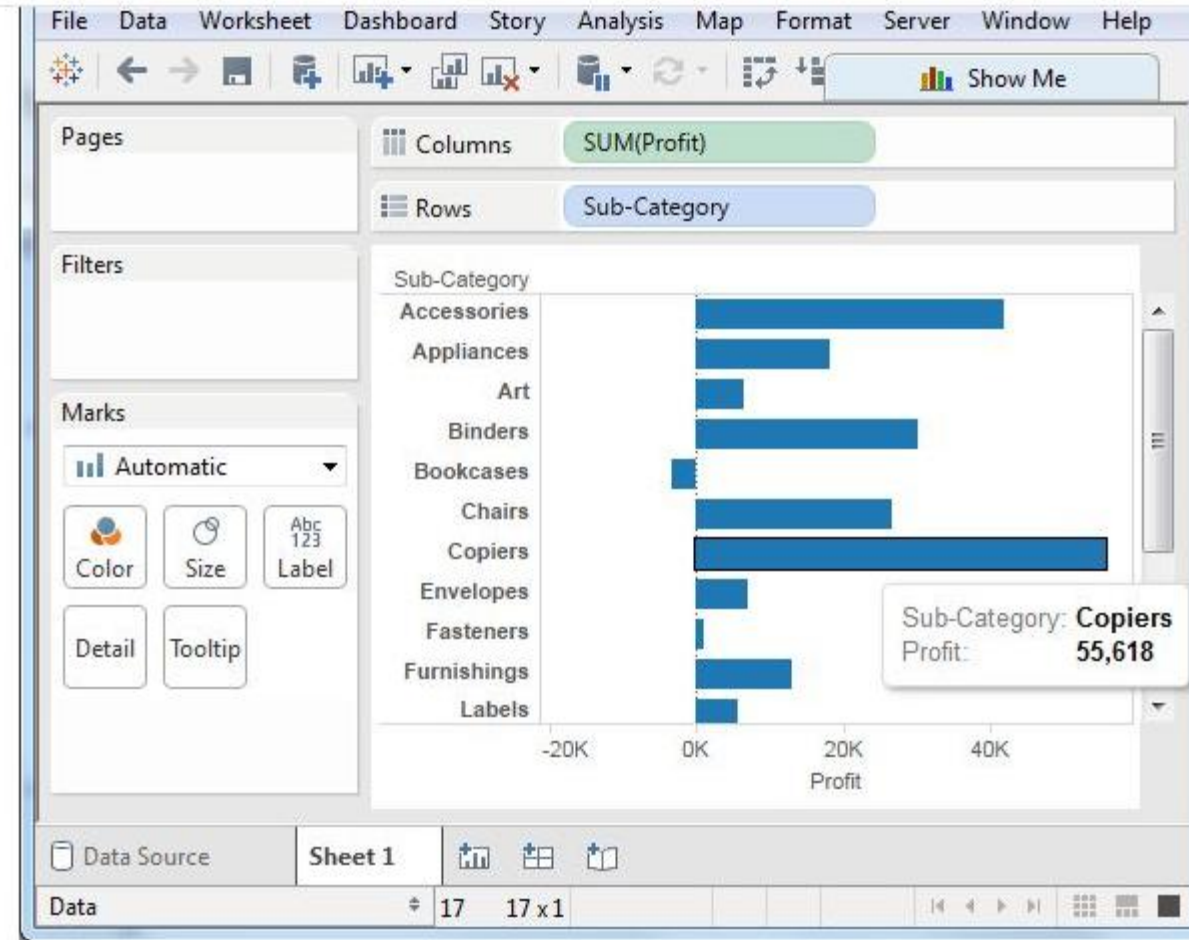Ms. Vatika Jalali   ACSAI0519 BI   Unit 3
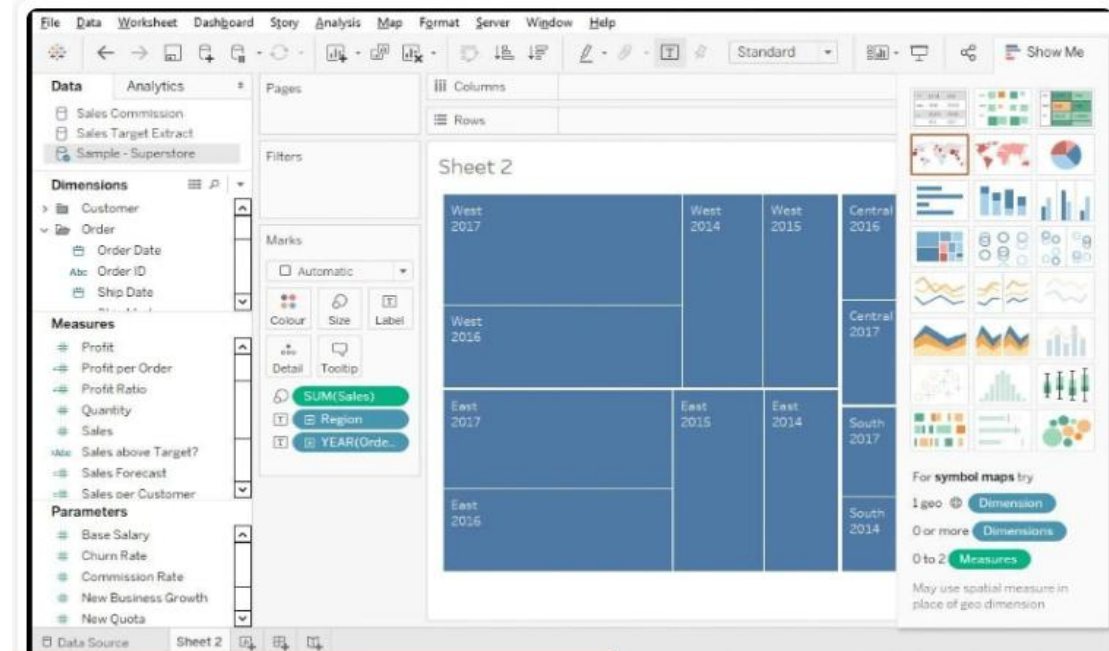
- **Step 6:** With this, you'll be able to add the term **'Profit'** to the chart, which will display the profits earned as a percentage of total sales in a given region over time.

- **Step 7**: This is the basic structure of a **Treemap Chart**, but you want to sort the profit by color. Drag and drop the **'Profit'** mark to the **'Color'** marks section to accomplish this. Examine the image below:

- **Step 8**: The information in the **Marks** section specifies the types of details that will be reflected. Take a look at the illustration below:

- A bar chart represents data in rectangular bars with the length of the bar proportional to the value of the variable. Tableau automatically produces a bar chart when you drag a dimension to the Row shelf and measure to the Column shelf. We can also use the bar chart option present in the Show Me button. If the data is not appropriate for bar chart, then this option will be automatically greyed out.

- In Tableau, various types of bar charts can be created by using a dimension and a measure.

- **Simple Bar Chart**

- From the Sample-Superstore, choose the dimension, take profit to the columns shelf and Sub-Category to the rows shelf. It automatically produces a horizontal bar chart as shown in the following screenshot. In case, it does not, you can choose the chart type from the Show Me tool to get the following result.

- **Bar Chart with Color Range**

- You can apply colors to the bars based on their ranges. The longer bars get darker shades and the smaller bars get the lighter shades. To do this, drag the profit field to the color palette under the Marks Pane. Also note that, it produces a different color for negative bars.
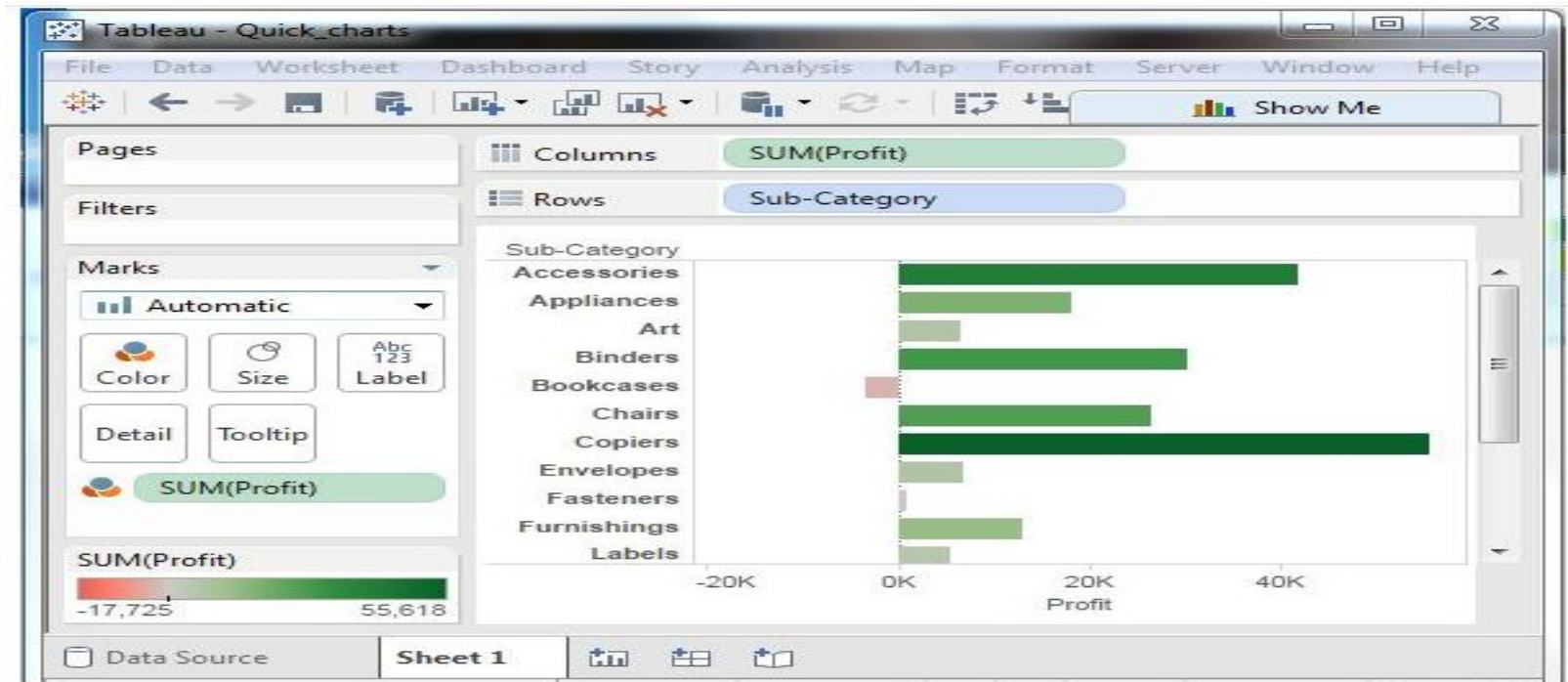
- **Stacked Bar Chart**

- You can add another dimension to the above bar chart to produce a stacked bar chart, which shows different colors in each bar. Drag the dimension field named segment to the Marks pane and drop it in colors. The following chart appears which shows the distribution of each segment in each bar.
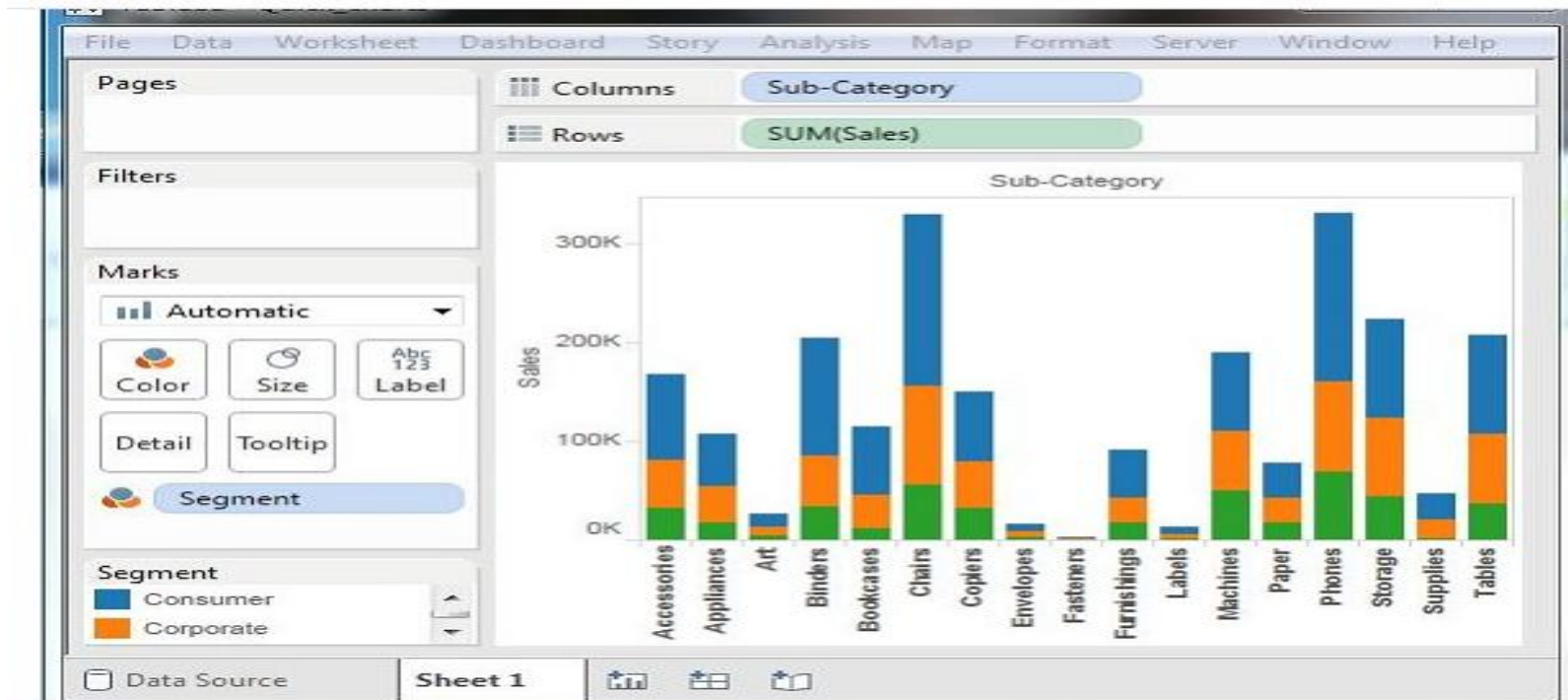
- In a line chart, a measure and a dimension are taken along the two axes of the chart area. The pair of values for each observation becomes a point and the joining of all these points create a line showing the variation or relationship between the dimensions and measures chosen.

- **Simple Line Chart**

- Choose one dimension and one measure to create a simple line chart. Drag the dimension Ship Mode to Columns Shelf and Sales to the Rows shelf. Choose the Line chart from the Marks card. You will get the following line chart, which shows the variation of Sales for different Ship modes.
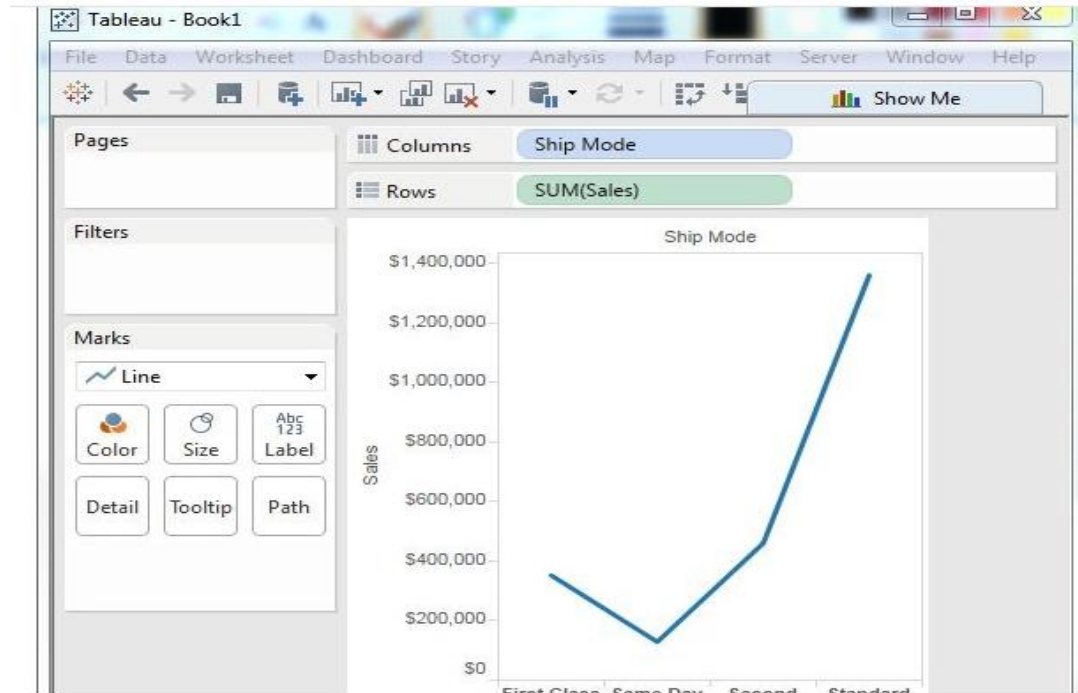
- Data is generated and analyzed at many different levels of granularity. Granularity is the level of detail of the data. For example, when looking at graduation data, granularity would describe whether a row in the data set represents a single person or the graduating class of a university.

- But what if you wanted to take a data set of student information and identify a value for the graduating class as a whole—that is, decrease the granularity? **Aggregation and granularity are complementary concepts. Aggregation is a mathematical operation that takes multiple values and returns a single value: operations like sum, average, count, or minimum.** This changes the data to a lower granularity (aka a higher level of detail).

- If your analysis requires aggregation, you need to consider two things:

- **How the outcome will be structured:** Consider the new granularity—that is, what a row represents. If we're looking at voter turnout, is it at the level of political party? Political party and voting district? Political party, voting district, age bracket, and gender? The field or fields that determine what makes up a row are the grouping fields (in Tableau Prep).

- **How we aggregate multiple values down to a single value:** For example, are we *summing* the number of shirts of each color for a total number of shirts? Are we taking the *maximum* hourly temperature reading over the course of a day and providing the daily max? Are we doing a *count distinct* of IP addresses to hit a webpage and measuring the unique page views?

- Numeric fields can be aggregated by various mathematical operations depending on the desired outcome. See the full list here. This includes:

- Sum

- Average or Median

- Count or Count Distinct

- Minimum or Maximum

- Or various statistical operations can be performed such as variance or standard deviation.

- Dates and text-based fields can be aggregated as count, count distinct, maximum, or minimum (for text, maximum and minimum are based on sort order).

- Oftentimes, data at different levels of granularity needs to be combined. For example, to give a comprehensive view for geospatial analysis, city-level data often needs to be combined with country-level data.

- Joins are a common way to combine data. But if we perform a join across different levels of granularity, we will inevitably introduce issues of data replication or loss.

- Let's say we have two tables of data, one with the observed number of picnic blankets in various colors per year, and another with the number of ants seen in a year. Here's how the data looks:

Year	Color	Blankets seen
2015	Orange	7
2015	Grey	18
2015	Brown	109
2015	Green	161
2016	Orange	7
2016	Grey	16
2016	Brown	96
2016	Green	145
2017	Orange	8
2017	Grey	13

Year	Number of ants
2015	52,056
2016	3,210
2017	3,920

- If we join the tables, we'll either:

- Repeat the number of ants seen for every blanket color OR

- Lose the color-level information

- If we don't like either of the options above, we can choose to not join the tables and perform the analyses with the two tables independently.

- **1. Repeat the number of ants seen for every blanket color:** If we were to join these tables, we could simply replicate the number of ants seen in a given year for each row in the blanket table.

- Structuring the data this way isn't perfect because we have the number of ants repeated for each year. This means that, in analysis, if we simply brought out Year and Number of Ants (as a sum) we'd quadruple the number of ants. To get around this, we'd need to use a different aggregation (such as average or min), or use an LOD expression to fix the number of ants per year, thus preventing accidental over-counting: {FIXED [Year] : MIN([Number of ants])}.

- Data structured like the table above is also potentially misleading because it would be easy to assume that, as there were 18 grey blankets in 2015, there were 52,056 ants seen on those 18 grey blankets. Most data sets with this appearance are structured so each row is an independent observation, which could lead to misinterpretation if that's not the case.

- **2. Lose the color-level information:** To get around that, we can aggregate the number of blankets, dropping the color information before the join, resulting in a single data set with yearly information about ants and blankets.

- Now the data is neither replicated nor likely to be misinterpreted, but we've lost the color breakdown entirely. **Hint:** Remember that changes in the level of detail can only ever be towards more aggregation, never more granularity. If we do this, we lose the color information entirely.

Format Text

- Whether you're changing the font size, position, color, or direction, Tableau provides a wide range of customization options for your text.

- When you make formatting changes at this level, they apply only to the view you're working on. See [Format at the Workbook Level](#) for how to make changes that apply to every view in your workbook.

- To access worksheet-level format settings, select the **Format** menu, then choose the part of the view, such as **Font,** or **Border,** that you want to format.

-

- Select **Format** > **Font** . A **Format Font** control pane will open. This control pane

  will let you customize the text in the view.

- Tableau uses visual best practices to determine how text is aligned in a view, but you can also customize text. For example, you can change the direction of header text so that it is horizontal (default) instead of vertical (up).

- To format the text alignment, select **Format** > **Alignment** to open the text alignment pane.

Header Text is Horizontal
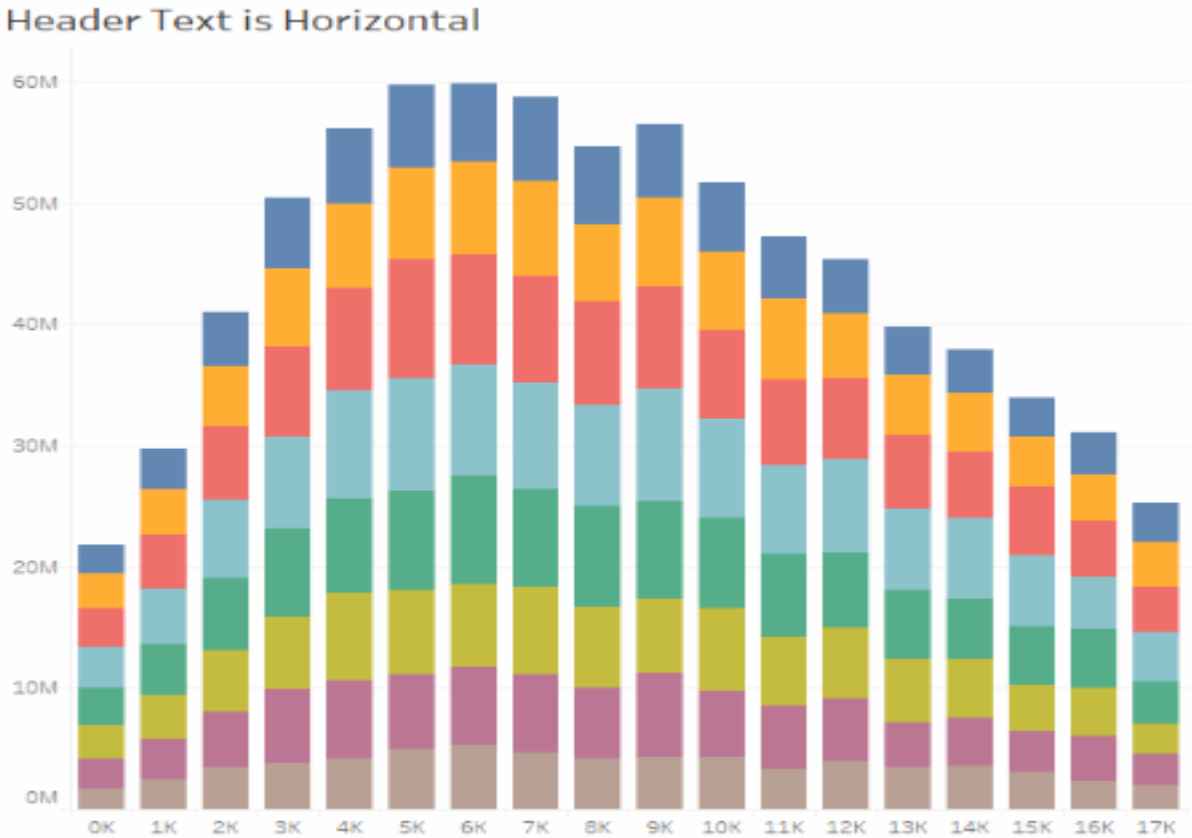
For each text area you can specify the following alignment options:

Horizontal - Controls whether text aligns to the left, right, or center.

Vertical Alignment - Controls whether text aligns at the top, middle, or bottom.

Direction - Rotates text so that it runs horizontally (default), top-to-bottom (up), or bottom-to-top (down).

Wrap - Controls whether long headers wrap to the next line or are abbreviated. It does not control text marks in the visualization.

Vatika Jalali   Unit III

- Tooltips are details that appear when you rest the pointer over one or more marks in the view. Tooltips also offer convenient tools to quickly filter or remove a selection, select marks that have the same value or view underlying data. You can edit the tooltip to include both static and dynamic text. You can also modify which fields are included in the automatic tooltip.

- **To edit a tooltip:**

- Select **Worksheet** > **Tooltip**. Tooltips are specified for each sheet and can be formatted using the formatting tools along the top of the Edit Tooltip dialog box. Use the **Insert** menu at the top of the dialog box to add dynamic text such as field values, sheet properties, and more.

- Use the formatting tools along the top of the Edit Tooltip dialog box.

- (Optional) Use the **Insert** drop-down list at the top of the dialog box to add dynamic text such as field values, sheet properties, and more.

- The **All Fields** option on the **Insert** menu adds all field names and values that are used in the view. Inserting the All Fields parameter updates the tooltip as you change the view. You can also use the All Fields option to exclude fields.

- (Optional) Select the **Include command buttons** option to show filtering and view data options in the tooltip. For example, including command buttons will add **Keep Only**, **Exclude**, and **View Data** buttons to the bottom of the tooltip. These command buttons are available both in Tableau Desktop and when the view is published to the web or viewed on a mobile device.

- (Optional) Select the **Allow selection by category** check box to select marks in a view that have the same value by clicking on a discrete field in a tooltip. For more information see [Tooltips](#).

Do one of the following:

On Tableau Server or Tableau Online web editing, double click the item you want to change.

On Tableau Desktop, Right-click (control-click on Mac) the item you want to change and select **Edit <item>**, for example, **Edit Title**.

On a worksheet, hover on the title, click the drop-down arrow on the right-hand side and select **Edit Title** or **Edit Caption** from the context menu.

In the Edit dialog box, modify the text and format the font, size, style, color, and alignment. Use the **Insert** menu to add dynamic text such as sheet properties and field values. Click **OK**.

To reset the title back to the default, click **Reset**.

To edit an axis range, double-click the axis that you want to edit.

- **Note**: In Tableau Desktop, you can right-click (control-click on Mac) the axis, and then select **Edit Axis**. In web authoring, you can click the arrow button on an axis, and then select **Edit Axis**.

- When you select an axis, the marks associated with the axis are not selected so that you can edit and format the axis without modifying the marks.

- **To select the marks associated with the axis**, right-click the axis and select **Select Marks**. You can also select each mark individually.

- Youtube/other Video Links

- Introduction to Business Intelligence - YouTube

- Business Intelligence Tutorial - YouTube

- What Is Power BI? | Introduction To Microsoft Power BI | Power BI Training | Edureka - YouTube

- https://www.tableau.com/academic/students

- Top 10 Data Visualization Tools in 2020 | Best Tools for Data Visualization | Edureka - YouTube

- Learn Data Visualization Using Tableau | Tableau Tutorial | Tableau | Edureka Live - YouTube

- **Default aggregation used for tree map_____**
- Avg
- Count
- **Sum**
- Countd

- **The best feature Tableau are except_____-**
- Collaboration of data
- Data Blending
- Real time analysis
- **Data is more small and fit**

- **How do you find the field is discrete in Tableau ?**
- Green color
- # symbol
- **Blue color**
- None

- **What percent of total profits do the top 10 customer by Sales represent?**
- **5.03%**
- 17.54%
- 16.26%
- 3.50%

- **Which of the following is not a Trend Line model ?**
- Linear Trend Line
- **Binomial Trend Line**
- Exponential Trend Line
- Logarithmic Trend Line

- **Where can we apply global filters?**
- Dashboards
- Stories
- Sheets
- All of the above

- **The Tableau Product Suite consists of_____-**
- Tableau Desktop ,Tableau Public, Tableau Online, Tableau Server, Tableau Measure
- Tableau Desktop, Tableau Public ,Tableau Online ,Tableau Server ,Tableau Reader
- **Tableau Desktop ,Tableau Public ,Tableau Dimension ,Tableau Server, Tableau Reader**
- Tableau Desktop ,Tableau Public ,Tableau Online, Tableau Server ,Tableau Organic

- **Tableau File Extension is_____**
- **twbx**
- twby
- twbw
- twbz

- **The possible cause of the data not being updated is:**
- Data Extract needs an update
- The data source configuration of Data Extract needs to be refreshed
- **Services on Data Extrac are not running**
- The workers of Data Extrac are taking a timeout

- **State the type of join is used in blending?**
- **Left join**
- Full join
- Right join
- Inner join

1. State the difference between Traditional BI Tools and Tableau?

2. Define Tableau?

3. Explain the different Tableau Products and state the latest version of Tableau?

4. State the different connections you can make with your dataset?

5. Describe shelves?

6. Define sets?

1. State Tableau Data Server?

2. Define Tableau Data Engine?

3. Sate the different filters in Tableau and how are they different from each other?

4. Describe the steps to create a calculated field in Tableau?

5. Sate dual axis?

6. Explain the difference between a tree map and heat map?

7. Define disaggregation and aggregation of data?

8. Name the components of a Dashboard.

9. Sate TDE file?

- This unit provides us the basic concept of tableau

- How to install it

- How to ceate visualization in tableau

- Performing basic calculations

- Formatting tools

Thank You