DATA VISUALIZATION

Unit: 4

Business Intelligence and Data Visualization
(ACSAI0519)

Course Details
(B Tech 5th Sem)

SONAM
Assistant professor
CSE-DS

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Evaluation Scheme

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

BUSINESS INTELLIGENCE AND DATA VISUALIZATION

L T P	Credits
3 – 0– 0	3

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Evaluation Scheme

NOIDA INSTITUTE OF ENGG. & TECHNOLOGY, GREATER NOIDA, GAUTAM BUDDH NAGAR
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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

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Course objective

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.			

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Course Syllabus

UNIT-IV	DATA VISUALIZATION	8 HOURS

Manipulating Data in Tableau: Cleaning-up the data with the Data Interpreter, structuring your data, Sorting, and filtering Tableau data, Pivoting Tableau data.

Advanced Visualization Tools: Using Filters, Using the Detail panel Using the Size panels, customizing filters, Using and Customizing tooltips, Formatting your data with colours.

Creating Dashboards & Stories: Using Storytelling, creating your first dashboard and Story, Design for different displays, Adding interactivity to your Dashboard

Distributing & Publishing Your Visualization: Tableau file types, Publishing to Tableau Online, sharing your visualization, Printing, and exporting.

Given a case study: Perform Interactive Data Visualization with Tableau

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Course Outcomes

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

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Previous Year Question Paper

Printed Page:- Subject Code:- ACSAI0519

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech.

SEM: V - THEORY EXAMINATION (2022 - 2023)

Subject: Business Intelligence and Data Visualization

Time: 3 Hours Max. Marks: 100

General Instructions:

IMP: Verify that you have received the question paper with the correct course, code, branch etc.

1. This Question paper comprises of three Sections -A, B, & C. It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.
2. Maximum marks for each question are indicated on right -hand side of each question.
3. Illustrate your answers with neat sketches wherever necessary.
4. Assume suitable data if necessary.
5. Preferably, write the answers in sequential order.
6. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

SECTION A 20

1. Attempt all parts:-

1 KPI stands for? (CO1) 1

(a) Key Performance Indicators
(b) Key Performance Identife
(c) Key Processes Identifer
(d) OBIEE

1 _____ is a system where operations like data extraction, transformation and loading operations are executed (CO1) 1

(a) Data staging
(b) Data integration
(c) ETL
(d) Can not say

1 Data Visualisation is the component of (CO2) 1

(a) Business Intelligence
(b) RDBMS

(c) OLAP
(d) None of these

1 What is NumPy? (CO2) 1

(a) BI tool
(b) Map
(c) Charts
(d) Python Library

1 Tableau File Extension is_____ (CO3) 1

(a) twbx
(b) twby
(c) twbw
(d) twbz

1 What is SQL? (CO3) 1

(a) language
(b) Datasource filters
(c) database
(d) commands

1 What are the benefits of data visualization? (CO4) 1

(a) Better analysis
(b) Identifying patterns
(c) Exploring business insights
(d) All of the above

1 What are the functions of Data Mining? (CO4) 1

(a) Association and correctional analysis classification
(b) Prediction and characterization
(c) Cluster analysis and Evolution analysis
(d) All of the above

1 What is the recommend method to share your reports? (CO5) 1

(a) Publish them to the Power BI service
(b) Create a PDF of the report, and share the PDF with others
(c) Copy the .PBIX file to a file folder, and give coworkers access to that folder

(d) None

1 What is the SQL command to return the values from a table? (CO5) 1

(a) SELECT
(b) WHERE
(c) DISTINCT
(d) ORDER BY

2. Attempt all parts:-

2.a. What is the difference between data, information and knowledge? (CO1) 2

2.b. Define BI Reporting (CO2) 2

2.c. State some ways to improve the performance of Tableau. (CO3) 2

2.d. Explain an outlier. How would you address outliers? (CO4) 2

2.e. Define Power BI Desktop. (CO5) 2

SECTION B 30

3. Answer any five of the following:-

3 Describe the process of knowledge creation. (CO1) 6

3 What are the major applications of Power BI? Explain each one of them in detail. CO1) 6

3 Explain difference between Dashboard and Reports (CO2) 6

3 Describe data exploration? Explain its compatibilty with drill down procedure. (CO2) 6

3.e. Write the differences between Tableau and MS Excel with respect to designing. (CO3) 6

3.f. Why is it important for data scientists to focus on storytelling and presentation skills? Justify your answer with example. (CO4) 6

3.g. How to sort data in Power BI and what types of sorting used in power BI. (CO5) 6

SECTION C 50

4. Answer any one of the following:-

4 What are the critical components of the Power BI toolkit? Explain in detail. (CO1) 10

4 Describe data modeling explain with example. (CO1) 10

5. Answer any one of the following:-

5 How to build a successful Business Intelligence strategy? Write step by step procedure of it. (CO2) 10

5 Difference between Business Intelligence and Business Analytics with an example. (CO2) 10

6. Answer any one of the following:-

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Previous Year Question Paper

6	Describe Manupulating of data in Tableau in detail. (CO3)	10
6	State some ways to improve the performance of Tableau. What is the difference between published data and embedded data sources in Tableau? (CO3)	10
7. Answer any one of the following:-		
7	Explain the process of exporting a file in Tableau. Write the step by step Procedure. (CO4)	10
7	Describe infographics in detail Why it used for Data Storytelling justify your answer with example. (CO4)	10
8. Answer any one of the following:-		
8	Elaborate Forecast in Power BI. (CO5)	10
8	How would you gather dashboard requirements from stakeholders? (CO5)	10

Printed Page:- 04 **Subject Code:- ACSAI0519**

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: V - THEORY EXAMINATION DEC - 2023

Subject: Business Intelligence and Data Visualization

Time: 3 Hours **Max. Marks: 100**

General Instructions:

IMP: *Verify that you have received the question paper with the correct course, code, branch etc.*

1. *This Question paper comprises of* **three Sections -A, B, & C.** *It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.*

2. *Maximum marks for each question are indicated on right -hand side of each question.*

3. *Illustrate your answers with neat sketches wherever necessary.*

4. *Assume suitable data if necessary.*

5. *Preferably, write the answers in sequential order.*

6. *No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.*

SECTION A **20**

1. Attempt all parts:-

1-a. Choose from the following which does not form part of BI Stack in SQL Server (CO1) 1

(a) SSIS
(b) OBIEE
(c) SSAS
(d) None

1-b. _____ is a category of applications and technologies for presenting and analyzing corporate and external data. (CO1) 1

(a) EIS
(b) MIS
(c) Data warehouse
(d) Decision power

1-c. NumPy is_____(CO2) 1

(a) BI tool
(b) Map
(c) Charts
(d) Python Library

1-d. _____ is a system where operations like data extraction, transformation and loading operations are executed.(CO2) 1

(a) Data staging
(b) Data integration
(c) ETL
(d) None of the above

1-e. Dimension in TABLEAU is (CO3) 1

(a) A measure that is computed based on the values of one or more dimensions
(b) A column in a data source that contains categorical data
(c) A data type used to represent numerical values
(d) A type of join used to combine data from multiple tables

1-f. The type of join used in blending is _____ (CO3) 1

(a) NONE
(b) Right join
(c) LEFT join
(d) OUTER JOIN

1-g. The benefits of data visualization is (CO4) 1

(a) Better analysis
(b) Identifying patterns
(c) Exploring business insights
(d) All of the above

1-h. A ____ is a line that provides an approximation of the relationship between the variables. (CO4) 1

(a) sparkline
(b) gridline
(c) trendline
(d) None of these

1-i. A function that can only work on numeric fields is_____.(CO5) 1

(a) ISNUMBER

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Previous Year Question Paper

(b) AVERAGE
(c) AND
(d) CONCATENATE

1-j. The expression used to indicate the table where the values would be searched from is _____ (CO5) 1

(a) WHERE
(b) FROM
(c) TABLE
(d) SELECT

2. Attempt all parts:-

2.a. Discuss the advantages of making decision using business intelligence over making decision without business intelligence.(CO1) 2

2.b. Define Software Development Kit(SDK). (CO2) 2

2.c. Enlist the various data file formats in TABLEAU.(CO3) 2

2.d. Write down the steps to publish visualization in TABLEAU online.(CO4) 2

2.e. Elaborate about Workspace in Power BI.(CO5) 2

SECTION B **30**

3. Answer any five of the following:-

3-a. Explain in detail the features of Data Warehouse.(CO1) 6

3-b. Define data mining and its application in Business Intelligence.(CO1) 6

3-c. Explain Risk Mitigation with suitable diagram.(CO2) 6

3-d. Differentiate between dashboard and scorecard in detail.(CO2) 6

3.e. State some ways to improve the performance of Tableau.(CO3) 6

3.f. Discuss the various ways in which data can be manipulated in TABLEAU.(CO4) 6

3.g. Describe how the Power BI products integrate.(CO5) 6

SECTION C **50**

4. Answer any one of the following:-

4-a. Discuss the architecture and the various components of BI with help of diagram.(CO1) 10

4-b. Differentiate between BI traditional tools with Modern BI tools in detail.(CO1) 10

5. Answer any one of the following:-

5-a. Discuss the need of Business Intelligence Reporting Tools in various business with suitable examples.(CO2) 10

5-b. Discuss the various trends and technologies used in Business Intelligence.(CO2) 10

6. Answer any one of the following:-

6-a. Explain in detail the various ways to connect your data to TABLEAU.(CO3) 10

6-b. Describe the various types of charts used in TABLEAU with suitable diagrams.(CO3) 10

7. Answer any one of the following:-

7-a. Discuss in detail the steps to create a story and dashboard in TABLEAU.(CO4) 10

7-b. Explain the steps of sorting and filtering data in TABLEAU.(CO4) 10

8. Answer any one of the following:-

8-a. Discuss the Power BI ecosystem in detail.(CO5) 10

8-b. Define Power BI and its relationship with Excel in detail.(CO5) 10

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Content

- Manipulating Data in Tableau
- Advanced Visualization Tools
- Creating Dashboards & Stories
- Distributing & Publishing Your Visualization

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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.

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Course Outcome

- 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.

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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

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Prerequisite and Recap

- Basic Knowledge Of Business Intelligence.
- Knowledge about Data mart Data warehouse.

Manipulating Data in Tableau

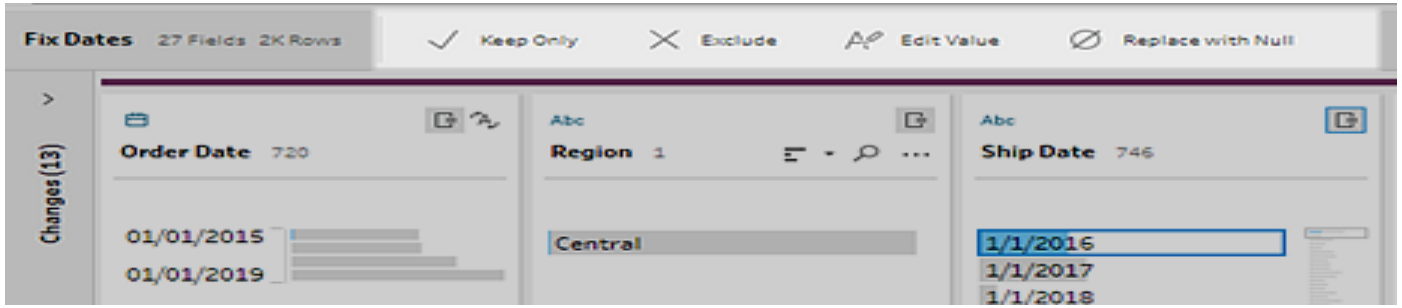
- **Cleaning-up the data with the Data Interpreter:**

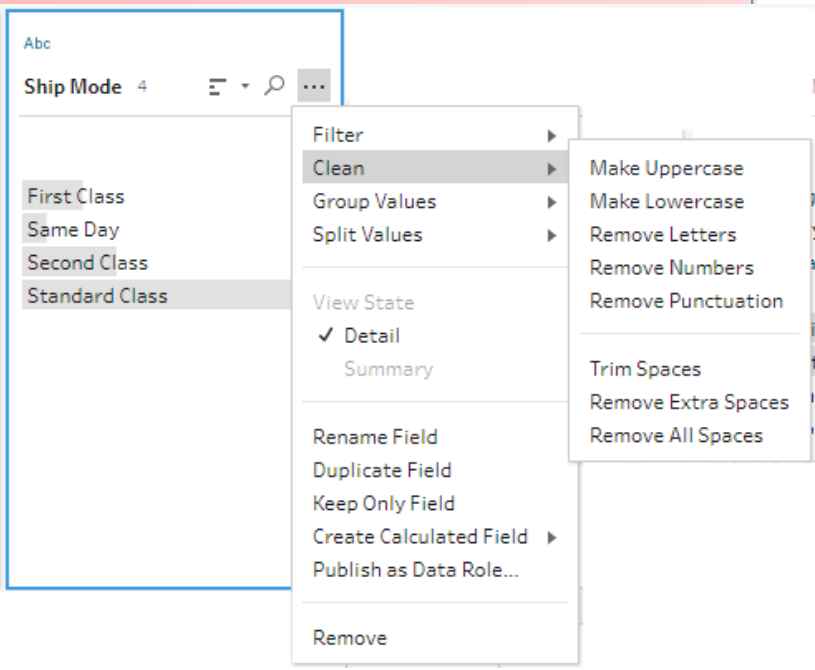
- Data Interpreter can give you a head start when cleaning your data. It can detect things like titles, notes, footers, empty cells, and so on and bypass them to identify the actual fields and values in your data set.

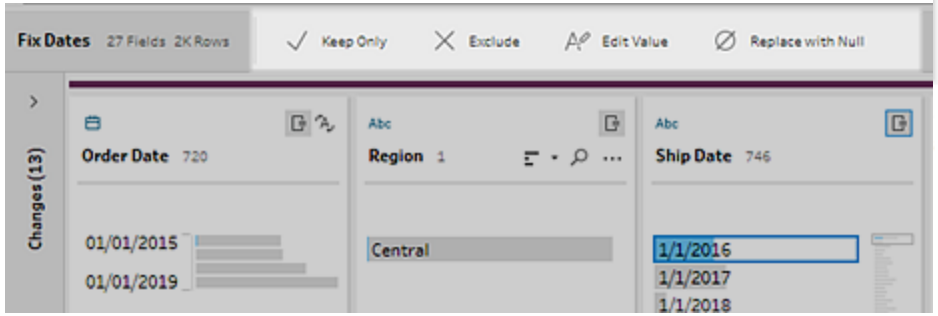
- To apply cleaning operations to fields, use the toolbar options or click More options on the field profile card, data grid or Results pane to open the menu.

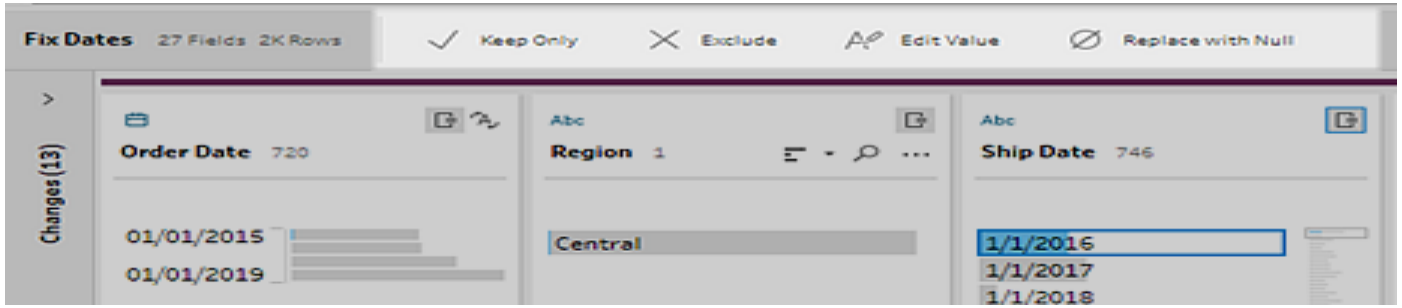
- you perform the same cleaning operations or actions over and over throughout your flow, you can copy and paste your steps, actions or even fields. For more information

Manipulating Data in Tableau (Continue..)









Manipulating Data in Tableau (Continue..)

- **Select your view:**
- You can perform cleaning operations outside of the profile or results pane in the data grid or in the list view. Use the view toolbar to change your view, then click More options on a field to open the cleaning menu.
- Show profile pane : This is the default view. Select this button to go back to the Profile pane or Results pane view.

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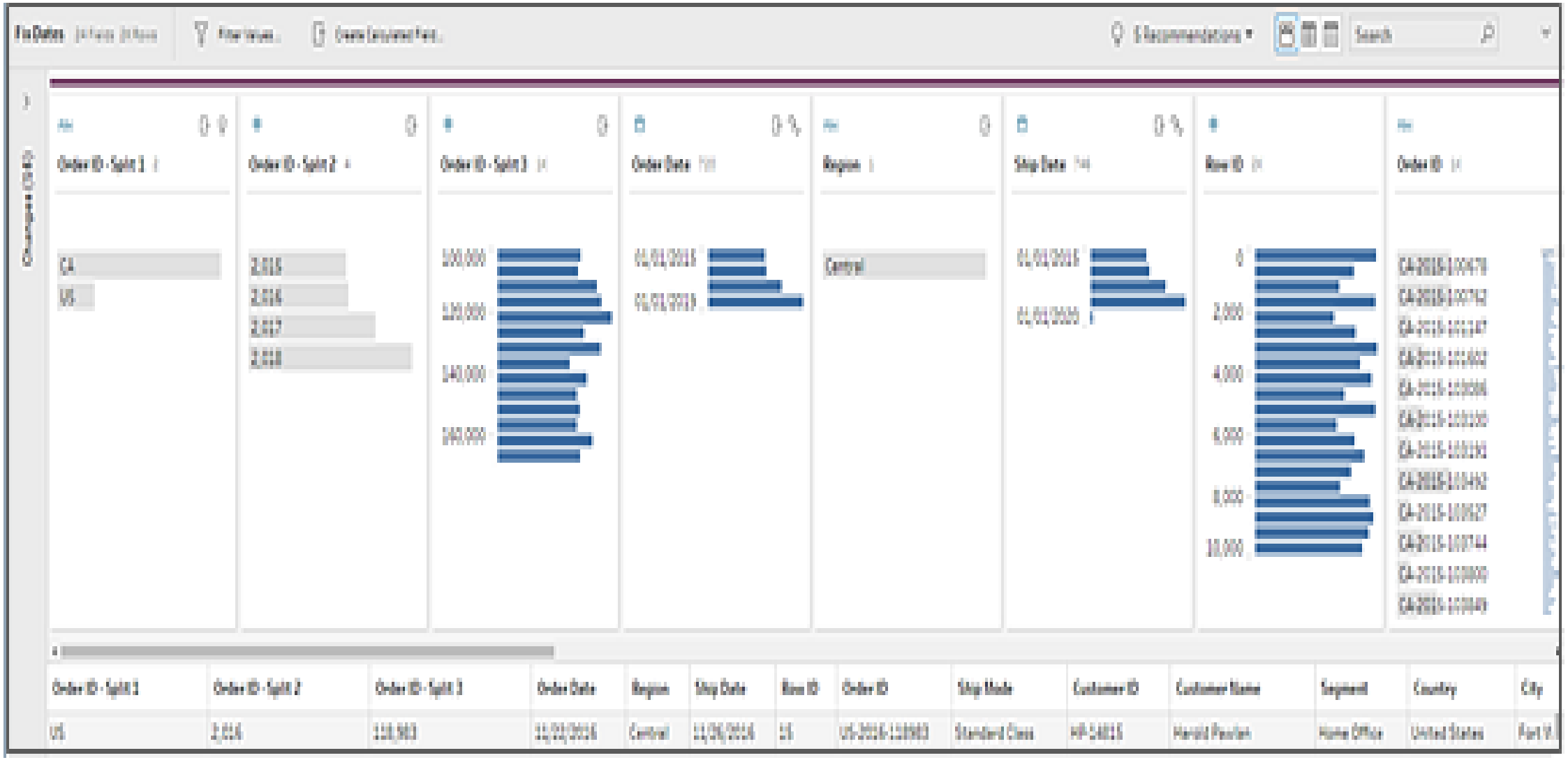
Manipulating Data in Tableau (Continue..)



Manipulating Data in Tableau (Continue..)

- .
- **Show data grid :**
- Collapse the profile or results pane to expand and show only the data grid. This view provides a more detailed view of your data and can be useful when you need to work with specific field values. After you select this option, this view state persists across all steps in your flow but you can change it at any time.

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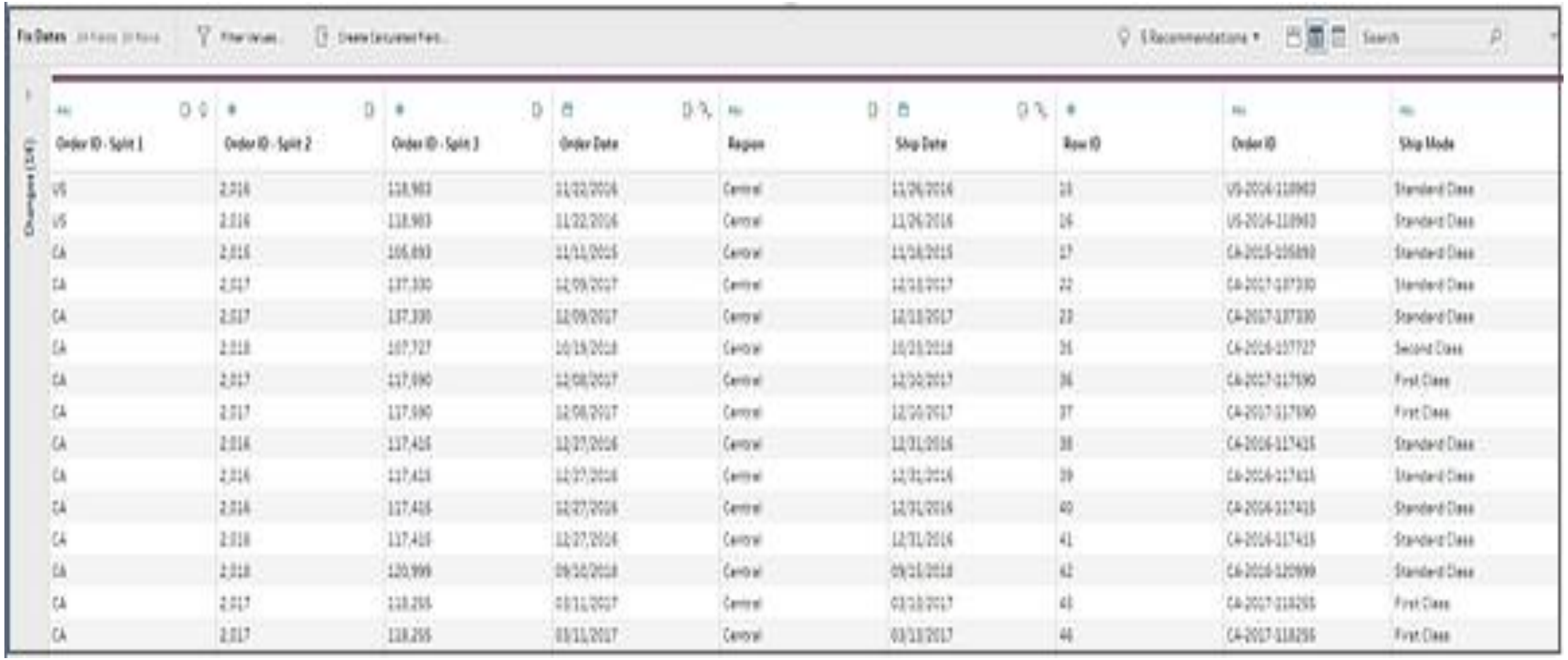
Manipulating Data in Tableau (Continue..)



Manipulating Data in Tableau (Continue..)

- **Show list view :**
- Convert the profile pane or results pane into a list. After you select this option, this view state persists across all steps in your flow but you can change it at any time.
- In this view you can:

- Select and remove multiple rows using the X option.
- (version 2021.1.4 and later) Select and hide or unhide multiple rows using the option.
- (version 2021.2.1 and later) Rename fields in bulk.
- Use the More options menu to apply operations to selected fields.

- If you assign a data role to the field, or select Filter, Group Values, Clean, or Split Values, you will be returned to the Profile or Results view to complete those actions. All other options can be performed in the list view.

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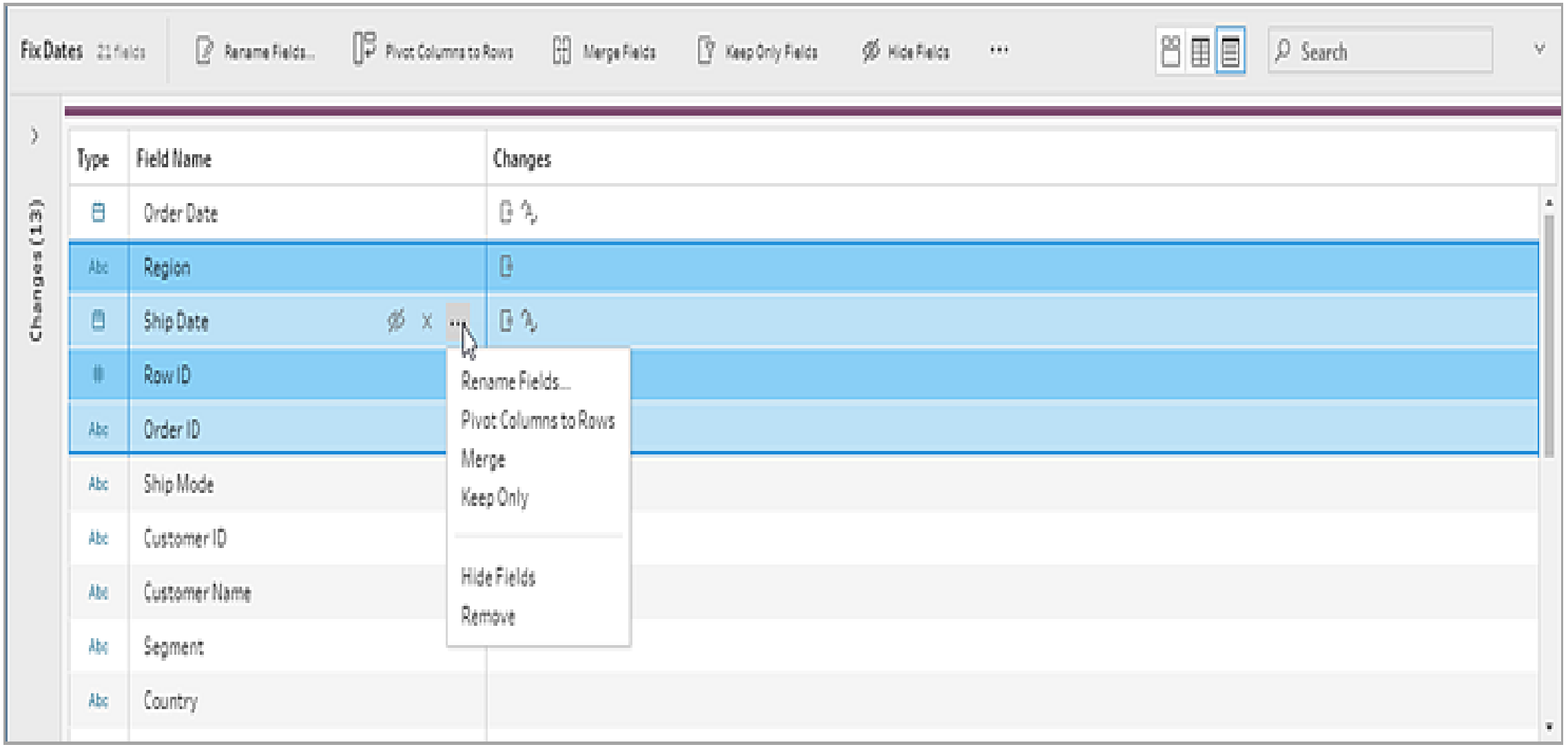
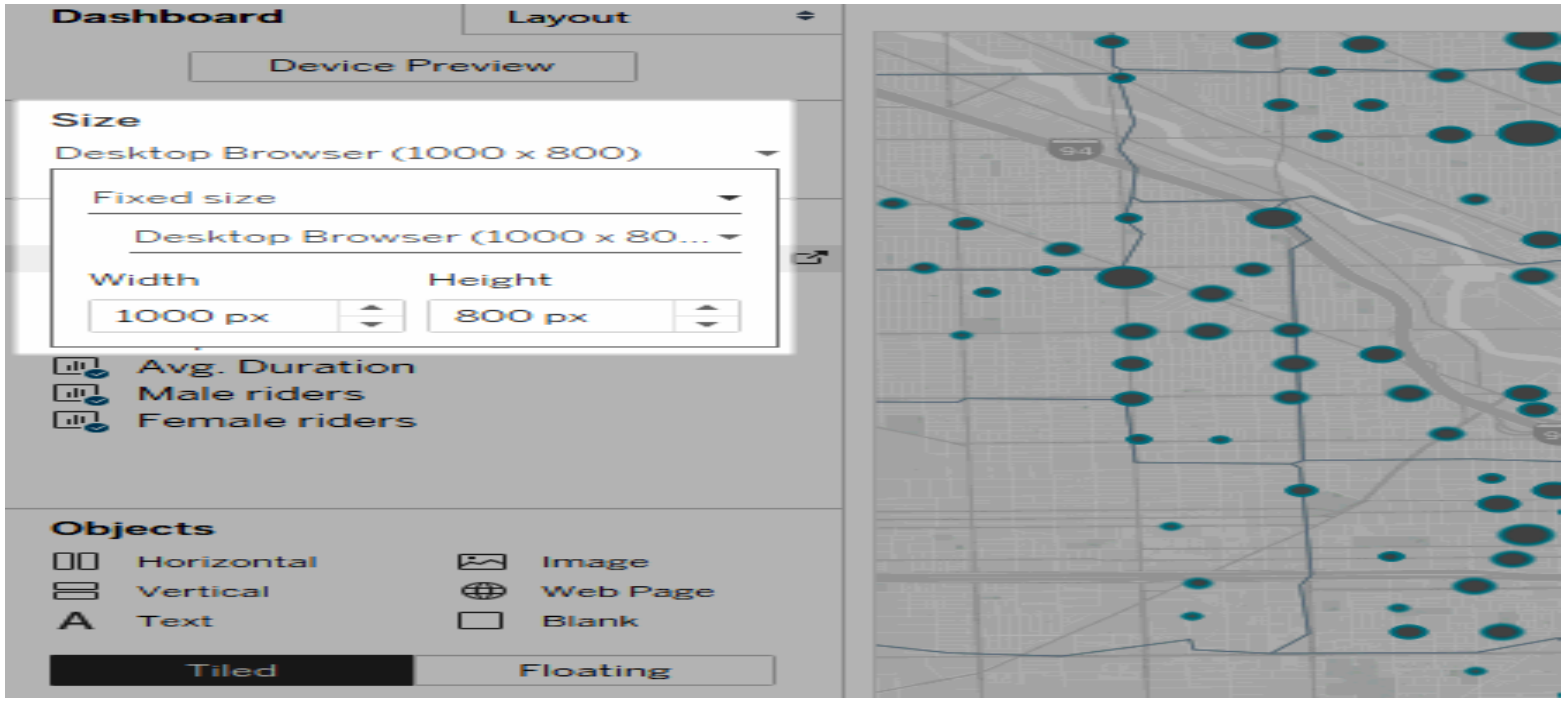
Manipulating Data in Tableau (Continue..)



Structuring Your Data

- Use this setting if you want Tableau to take care of any resizing. For best results, use a tiled (rather than floating) dashboard layout. Automatic sizing can lead to unpredictable results on different screens, so use this setting with caution if you don't know where the dashboard will be consumed.

Under Size on the Dashboard pane, select the dashboard's dimensions



Sorting, and filtering Tableau data

1) **Sorting** of data is a very important feature of data analysis. Tableau allows the sorting of data of the fields, which are called dimensions. There are two ways in which Tableau carries out the sorting.

- **Computed Sorting** is the sort directly applied on an axis using the sort dialog button.

- **Manual Sorting** is used to rearrange the order of dimension fields by dragging them next to each other in an ad hoc fashion.

- **2) Filtering** is the process of removing certain values or range of values from a result set. Tableau filtering feature allows both simple scenarios using field values as well as advanced calculation or context-based filters. In this chapter, you will learn about the basic filters available in Tableau.

Sorting, and filtering Tableau data (Continue..)

There are three types of basic filters available in Tableau.

1) Filter Dimensions are the filters applied on the dimension fields.

2) Filter Measures are the filters applied on the measure fields.

3) Filter Dates are the filters applied on the date fields

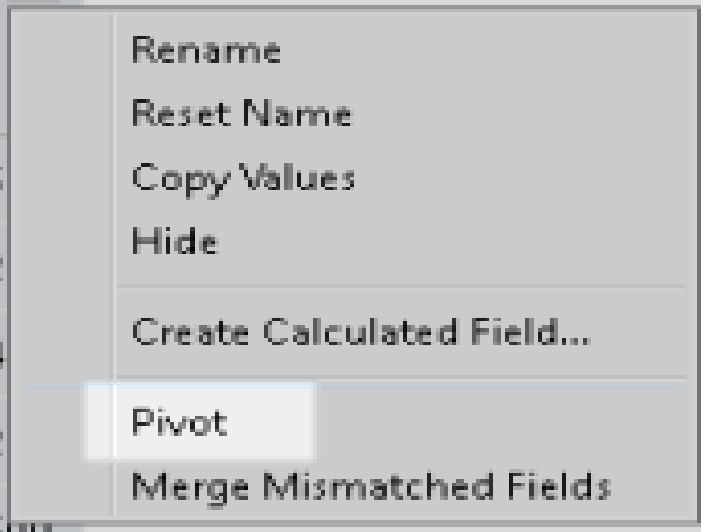
Pivoting Tableau data

- **Pivoting data** is the technique of data shaping that rotates data from a state of rows to a state of columns. Simply put as the process of converting data from crosstab format (which can be difficulty to work with) to columnar format.

- **Pivot the data** after you have set up the data source, in the grid, select two or more columns. Click the drop-down arrow next to the column name, and then select Pivot. New columns called "Pivot field names" and "Pivot field values" are created and added to the data source. The new columns replace the original columns that you selected to create the pivot

Pivoting Tableau data

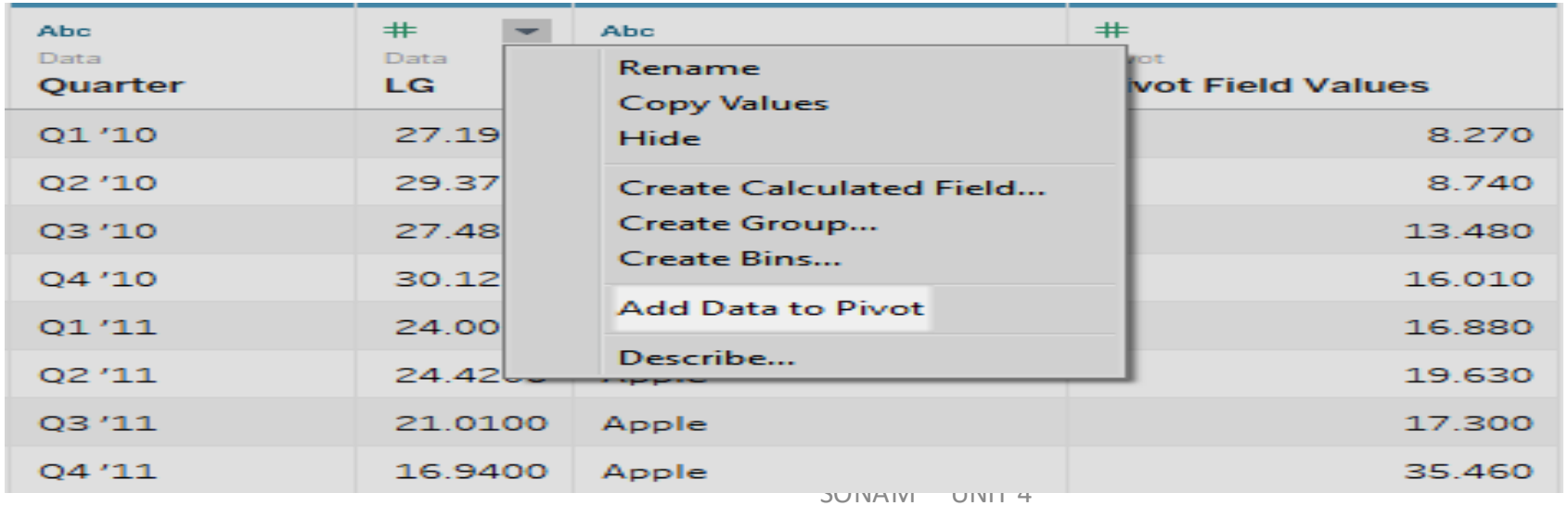
Abc Data Quarter	# Data Samsung	# Data Nokia	# Data Apple
Q4 '11	93.8300	111.7000	35.46
Q1 '12	89.2800	83.1600	33.12
Q2 '12	90.4300	83.4200	28.94
Q3 '12	97.9600	82.3000	24.62
Q4 '12	106.9600	85.0500	43.4600
Q1 '13	100.6600	63.2200	38.3300
Q2 '13	107.5300	60.9500	31.9000
Q3 '13	117.0500	63.0500	30.3300
Q4' 13	119.2100	63.5800	50.2200



Pivoting Tableau data

Add to the pivot

- To add more data to the pivot, select another column, click the drop-down arrow next to the column name, and then select Add Data to Pivot. Make sure that the pivot columns and values look as expected before you begin your analysis.



Creating Dashboards & Stories

- **Data storytelling**

- Data storytelling is the concept of building a compelling narrative based on complex data and analytics which help support the message of your story to influence and inform a particular audience. Data storytelling is very similar to human storytelling, but provides the added benefits of deeper insights and supporting evidence through graphs and charts.

- Effective data storytelling can also:

1. Help businesses learn about its audience's wants and needs.

2. Eliminate risk exposures to unknown processes.

3. Provide credibility as an industry and topic thought leader

Creating Dashboards & Stories (Continue..)

- **Benefits of data storytelling**

- Constructing a data story that moves a person to take action can be a very powerful tool. Effective data storytelling can be a positive impact for people and your organization. Some benefits of successful data storytelling include:

1. Adding value to your data and insights.

2. Interpreting complex information and highlighting essential key points to the audience.
3. Providing a human touch to your data.

4. Offering value and potential influence for your audience and industry.

5. Provide credibility as an industry and topic thought leader

Creating Dashboards & Stories (Continue..)

- **Creating your first dashboard and Story**

- Use stories to make your case more compelling by showing how facts are connected, and how decisions relate to outcomes. You can then publish your story to the web, or present it to an audience.

- Each story point can be based on a different view or dashboard, or the entire story can be based on the same visualization seen at different stages, with different filters and annotations.

- 1. Click the New Story tab.

- Tableau opens a new story as your starting point

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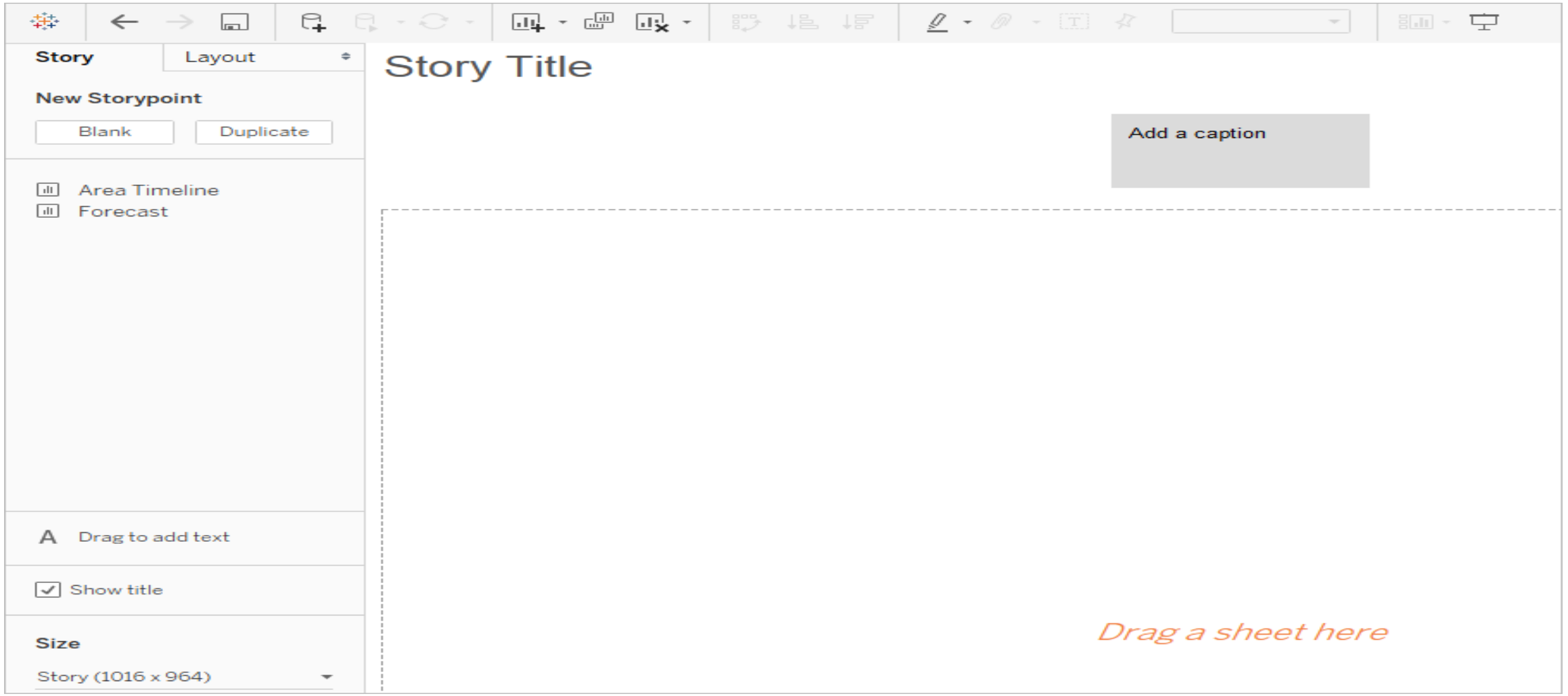
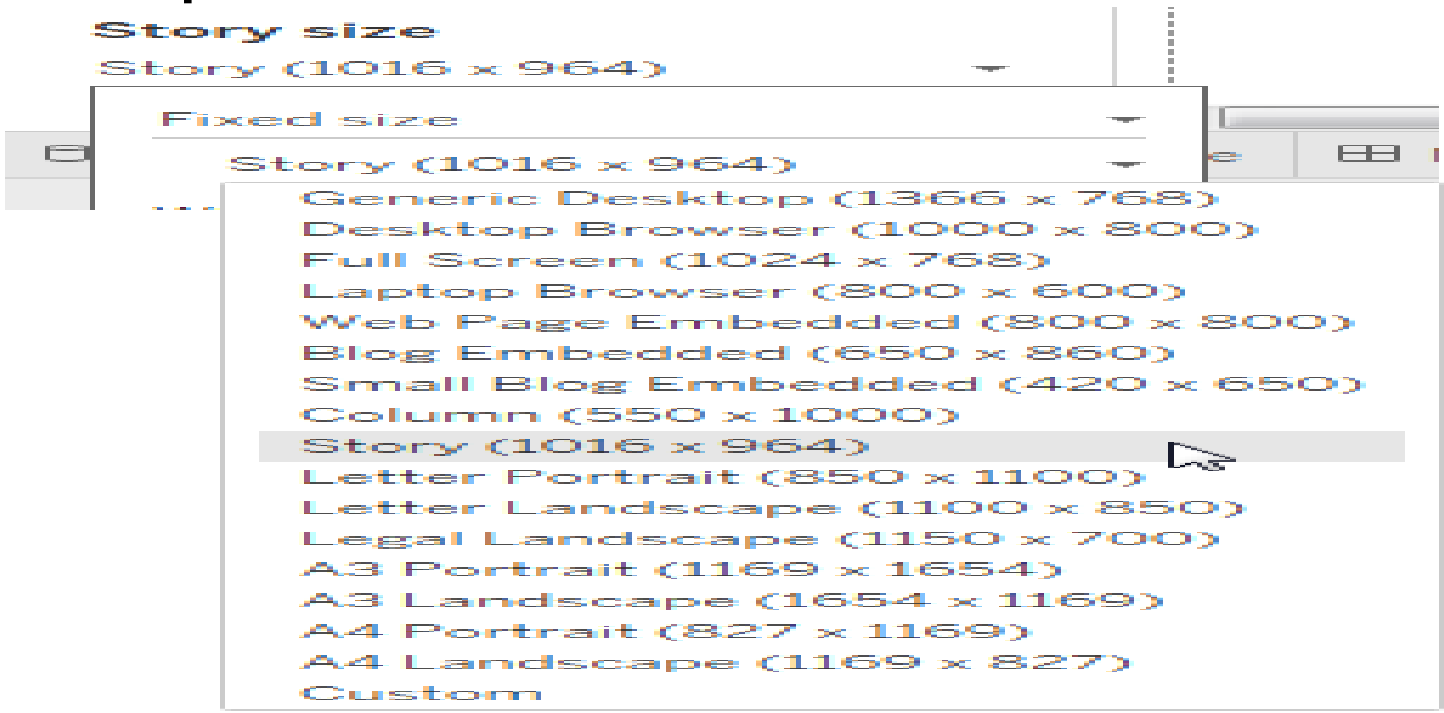
Creating Dashboards & Stories (Continue..)



Creating Dashboards & Stories (Continue..)

2. the lower-left corner of the screen, choose a size for your story. Choose from one of the predefined sizes, or set a custom size, in pixels:



Creating Dashboards & Stories (Continue..)

- 3. By default, your story gets its title from the sheet name. To edit it, right-click the sheet tab, and choose Rename Sheet.
- If you're using Tableau Desktop, you can also rename a story by double-clicking the title.
- 4. To start building your story, double-click a sheet on the left to add it to a story point.
- In Tableau Desktop, you can also drag sheets into your story point.

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Creating Dashboards & Stories (Continue..)

- 5. Click Add a caption to summarize the story point.

- In Tableau Desktop, you can highlight a key takeaway for your viewers by dragging a text object to the story worksheet and typing a comment.

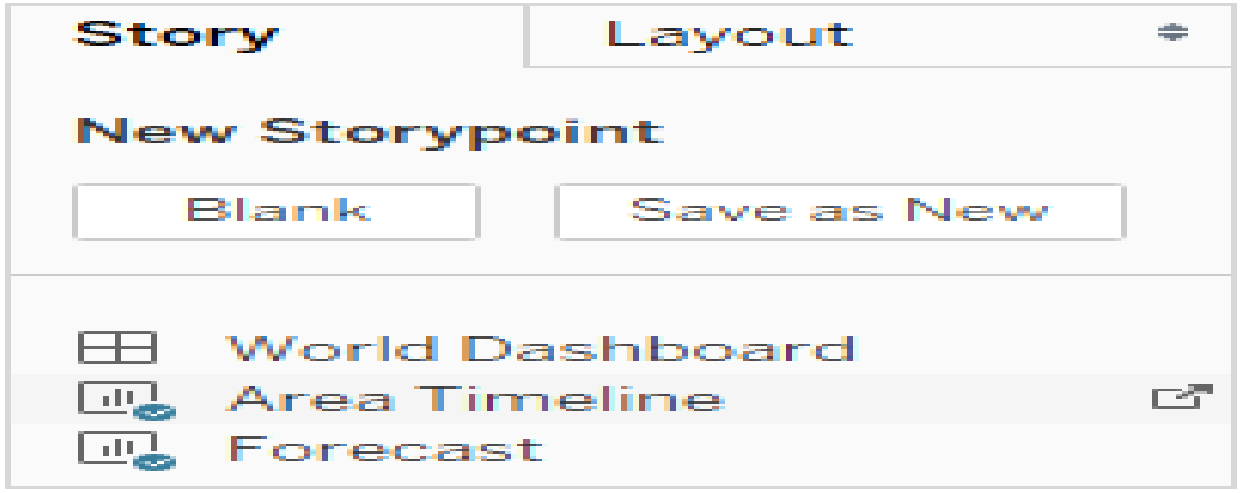
- 6. To further highlight the main idea of this story point, you can change a filter or sort on a field in the view. Then save your changes by clicking Update on the story toolbar above the navigator box.

Creating Dashboards & Stories (Continue..)

7. Add another story point by doing one of the following.

Click Blank to use a fresh sheet for the next story point.

Start customizing a story point and click Save as New on the toolbar above the navigator box.



Creating Dashboards & Stories (Continue..)

- **Design for different displays**

- When you open a dashboard, you'll notice a "device preview" button in the dashboard pane.
- Clicking the button reveals two new authoring tools that preview the dashboard layout across a variety of device types and models.
- The first is the preview toolbar. It lets you select from a variety preview device types (desktop, tablets, and phones) and models (iPhone 6S, iPad Pro, etc.). The second is a black outline of the device's screen (in logical pixels) overlaid on your dashboard. We call this the preview frame.
- the example below, notice that the dashboard extends beyond the borders of the preview screen

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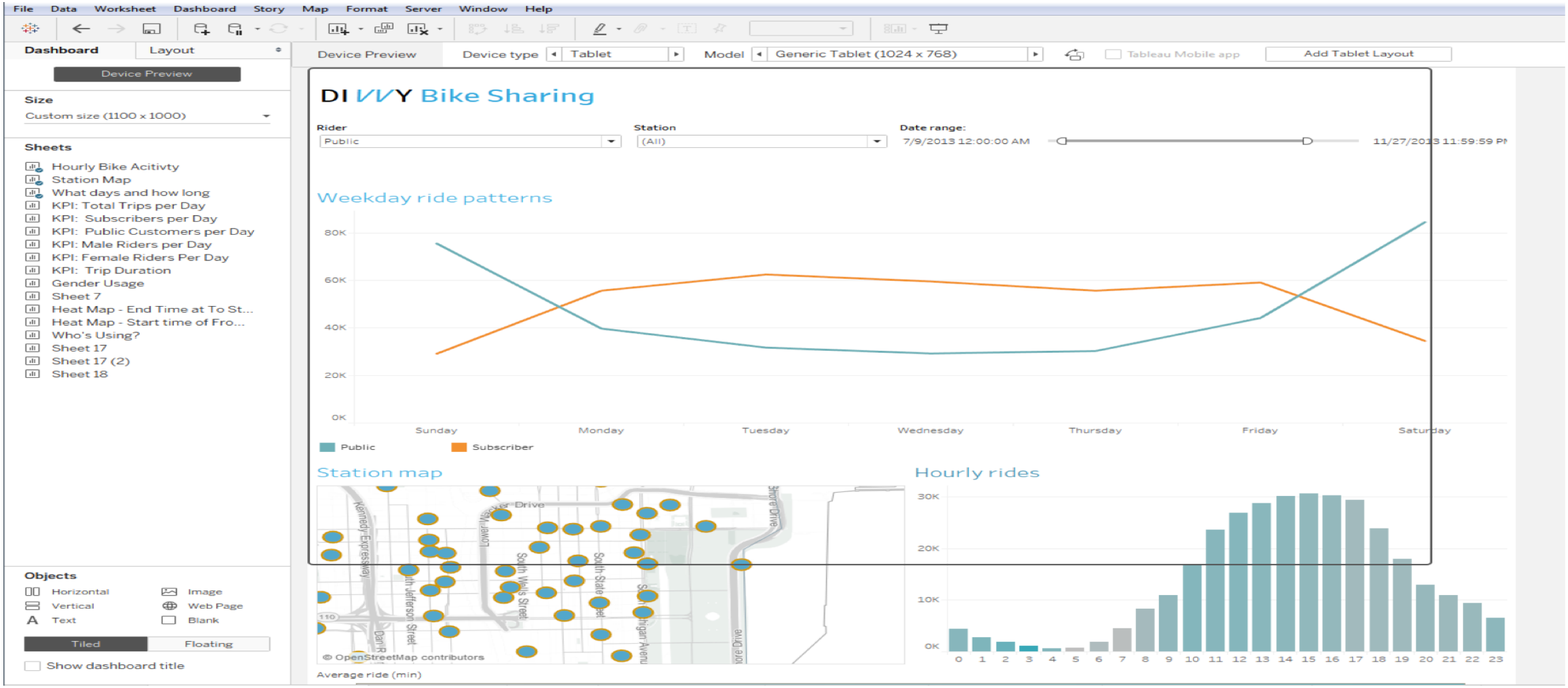


Creating Dashboards & Stories (Continue..)

- .
- But there's an easy fix! Click the "add tablet layout" button in the preview toolbar. That creates a special customization of the dashboard that we call device layout.
- With device layout, you can customize the dashboard's content on a device by its sizing behavior. For this dashboard, I'll select the "fit all" option, and the dashboard will automatically scale to fit inside the preview frame.
-

Creating Dashboards & Stories (Continue..)

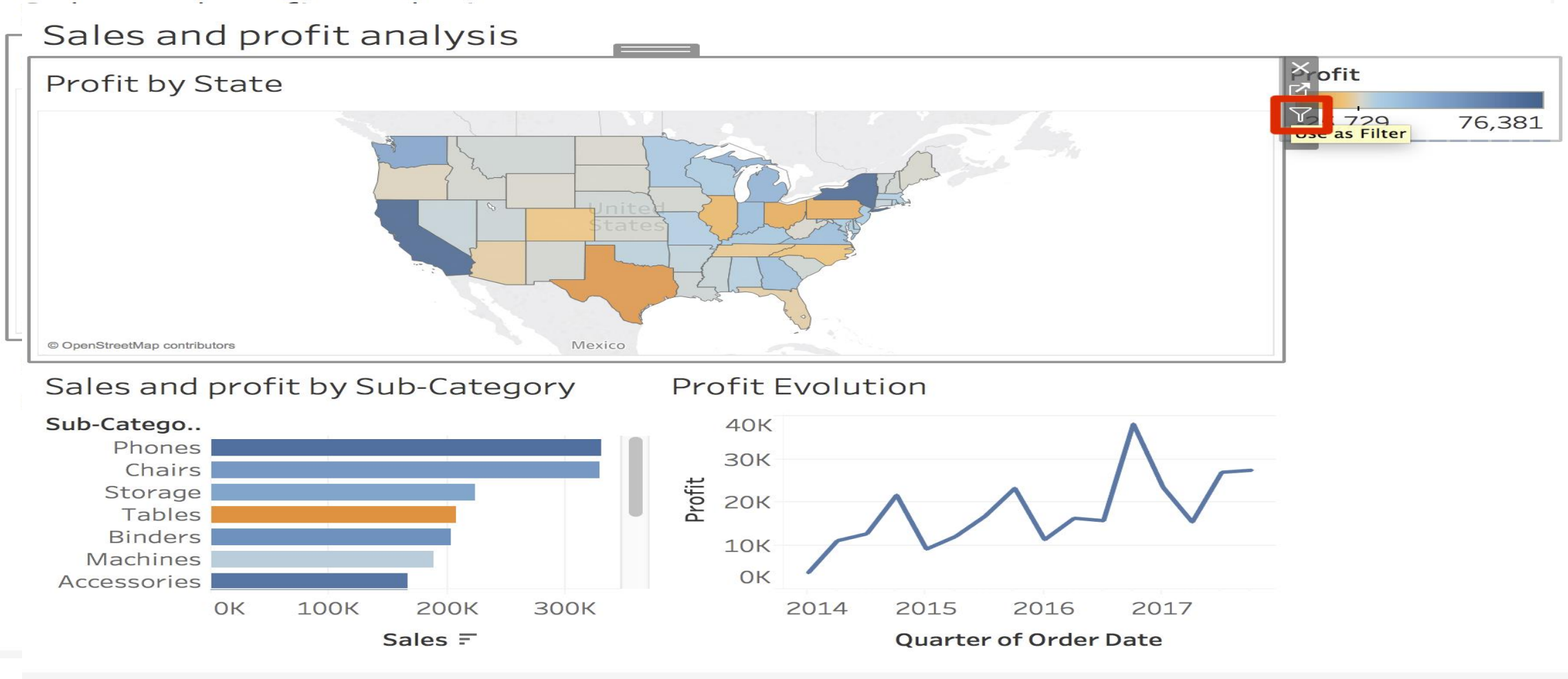
- **Adding interactivity to your Dashboard:**

1. Click on the Profit by State Worksheet to select it (there is a gray outline once it's selected).

2. Click on the funnel icon, the third one. It turns white once you've clicked on it. The icon is highlighted

3. Click on any state on the map and be proud! You just created an interactive Dashboard that automatically filters a selected state. You can also use Ctrl (Windows) or command (Mac) to select multiple states

Creating Dashboards & Stories (Continue..)



Distributing & Publishing Your Visualization

- **Tableau file types:**

- You can save your work using several different Tableau specific file types, workbooks, bookmarks, packaged data files, data extracts, and data connection files. Each of these file types are described below. For related details, see Save Your Work.

- **Workbooks (.twb) –** Tableau workbook files have the .twb file extension. Workbooks hold one or more worksheets, plus zero or more dashboards and stories.

- **Bookmarks (.tbm) –** Tableau bookmark files have the .tbm file extension. Bookmarks contain a single worksheet and are an easy way to quickly share your work. For more information

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- **Packaged Workbooks (.twbx) –** Tableau packaged workbooks have the .twbx file extension. A packaged workbook is a single zip file that contains a workbook along with any supporting local file data and background images. This format is the best way to package your work for sharing with others who don't have access to the original data.
- **Extract (.hyper or .tde) –** Depending on the version the extract was created in, Tableau extract files can have either the .hyper or .tde file extension. Extract files are a local copy of a subset or entire data set that you can use to share data with others, when you need to work offline, and improve performance.
- **Data Source (.tds) –** Tableau data source files have the .tds file extension. Data source files are shortcuts for quickly connecting to the original data that you use often. Data source files do not contain the actual data but rather the information necessary to connect to the actual data as well as any modifications you've made on top of the actual data such as changing default properties, creating calculated fields, adding groups, and so on.

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- **Packaged Data Source (.tdsx) –** Tableau packaged data source files have the .tdsx file extension. A packaged data source is a zip file that contains the data source file (.tds) described above as well as any local file data such as extract files (.hyper or .tde), text files, Excel files, Access files, and local cube files.

- **Publishing to Tableau Online:**
- 1. With the workbook open in Tableau Desktop, click the Share button in the toolbar.
- If you aren't already signed in to Tableau Server or Tableau Online, do so now. If you don't have a site yet, you can create one on Tableau Online.
- 2. In the Publish Workbook dialog box, select the project to publish to.
- 3. Name the workbook according to whether you're creating a new one or publishing over an existing one.

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Youtube & NPTEL Video Links and Online Courses Details

- Youtube/other Video Links
- https://www.youtube.com/watch?v=2nwgVMsf0xc
- https://www.youtube.com/watch?v=jkCCnwvO_fg
- https://www.coursera.org/lecture/business-intelligence-tools/bi-concepts-video-lecture-2arFU
- https://www.coursera.org/lecture/business-intelligence-tools/business-analytics-video-lecture-Sr8Ic

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Daily Quiz

- **1. What is true about Data Visualization?**
- A. Data Visualization is used to communicate information clearly and efficiently to users by the usage of information graphics such as tables and charts.
- B. Data Visualization helps users in analysing a large amount of data in a simpler way.
- C. Data Visualization makes complex data more accessible, understandable, and usable.
- **D. All of the above**

- **2. Data can be visualized using?**
- A. graphs
- B. charts
- C. maps
- **D. All of the above**

Daily Quiz

- **3. Which method shows hierarchical data in a nested format?**
- **A. Treemaps**
- B. Scatter plots
- C. Population pyramids
- D. Area charts

- **4. Which is used to inference for 1 proportion using normal approx?**
- A. fisher.test()
- B. chisq.test()
- C. Lm.test()
- **D. prop.test()**

- **5. Data can be visualized using?**
- A. graphs
  B. charts
  C. maps
  D. All of the above

Daily Quiz

- **6. Data visualization is also an element of the broader _____.**
- A. deliver presentation architecture
- **B. data presentation architecture**
- C. dataset presentation architecture
- D. data process architecture

- **7. Amongst which of the following is best fitted to Tableau?**

1. **Tableau is a powerful and fastest growing data visualization tool used in the Business Intelligence Industry**
2. Tableau is a people in Business Intelligence Industry
3. Tableau is suitable for factory industry only
4. Tableau is a new alternative for data programming

- 8. **Tableau displays measures over time as a ___.**

1. Bar
2. **Line**
3. Histogram
4. Scatter Plots

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Weekly Assignment

- 1.Discuss which are the best libraries for data visualization in python?
- 2.Explain the use of Stacked plots?
- 3.Discuss how can we visualize more than three dimensions of data in a single chart?
- 4. Explain how to add a title to subplots in matplotlib.
- 5.Discuss Data Visualization with example

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MCQ s

- 1. Which of the following does not visualize data?
- a. Charts
- b. Maps
- **c. Shapes**
- d. Graphs

- 2. Which of the following type of chart is not supported by pyplot?
- a. Histogram
- b. Boxplot
- c. Pie
- **d. All are correct**

- 3. To display histogram with well-defined edge we can write
- a. df.plot(type = ‘hist’, edge = ‘red’)
- **b. df.plot(type = ‘hist’, edgecolor = ‘red’)**
- c. df.plot(type = ‘hist’, line = ‘red’)
- d. df.plot(type = ‘hist’, linecolor = ‘red’)

MCQ s

- 4. Plot which is used to given statistical summary is
- a. Bar
- b. Line
- c. Histogram
- **d. Box plot**

- 5. What is true about Data Visualization?

- A. Data Visualization is used to communicate information clearly and efficiently to users by the usage of information graphics such as tables and charts.
  B. Data Visualization helps users in analyzing a large amount of data in a simpler way.
  C. Data Visualization makes complex data more accessible, understandable, and usable.
  D. All of the above

MCQ s

5. I can catalyze a business's success in terms of_____

A. Distinguish the products and services that drive revenues
B. Rank customers and locations based on profitability
C. Ranks customers and locations based on probability
D. All of above

6.In an Internet context, this is the practice of tailoring Web pages to individual users' characteristics or preferences_____

A. customer valuation
B. customer-facing
C. Web services
D. personalization

MCQ s

7. Business intelligence is only possible with big applications like power BI_____

A. Yes, if it doesn't have a database, it's not really BI

B. No, Business intelligence means using data to support your case and displaying it in an understandable way

C. No, anything can be used as business intelligence

D. Yes, Expensive software is necessary

8. The important aspect of the data warehouse environment is that data found within the data warehouses _____

A. time-variant

B. subject-oriented

C. integrated

D. None

MCQ s

9. This is the processing of data about customers and their relationship with the enterprise in order to improve the enterprise's future sales and service and lower cost_____

A. customer relationship management

B. CRM analytics

C. database marketing

D. customer relationship management

10.This is a broad category of applications and technologies for gathering, storing, analyzing, and providing access to data to help enterprise users make better business decisions_____

A. Data mart

B. Data mining

C. Business intelligence

D. Artificial intelligence

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Expected Questions for University Exam

- 1. Explain data visualisation good?
- 2. Discuss how can you visualise more than three dimensions in a single chart?
- 3. Discuss the steps involved in 3D Transformation of data visualisation?
- 4. Explain depth cueing in visualisation?
- 5. Discuss Row-Level Security?

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RECAP OF THE UNIT

- Data visualization is the graphical representation of information and data. By using visual elements like charts, graphs, and maps, data visualization tools provide an accessible way to see and understand trends, outliers, and patterns in data

- Data visualization is the representation of data through use of common graphics, such as charts, plots, infographics, and even animations. These visual displays of information communicate complex data relationships and data-driven insights in a way that is easy to understand.

References

Thank You