



Getting Started



INTERFACE



CONCEPTS



DATA

Goal

At the end of the first day, the user should understand:

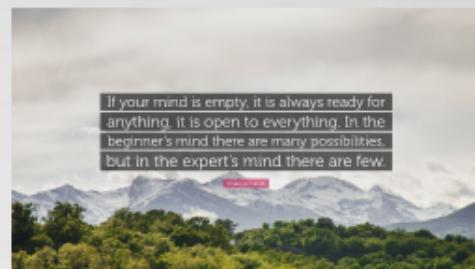
- Tableau interface (sheets, dashboards, stories)
- Connecting to a data set (Superstore data)
- Concept of dimensions and measures
- Concept of discrete and continuous data
- How Tableau handles data points in a view

HOUSEKEEPING

PURPOSE

COURSE
OBJECTIVES

STRUCTURE



This course is...

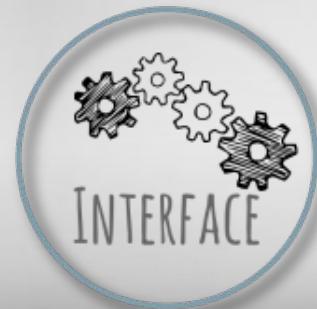
This course is intended for newcomers to data visualization with little to no prior experience using Tableau.

We will leverage Tableau's library of resources to demonstrate best practices for data visualization and data storytelling. We will work through a series of Tennessee related data sets to provide actionable insights and a completed product with meaningful data.

At the end of the course, the student will have a thorough understanding of Tableau and how to structure their data for reporting.



Getting Started



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SHEETS

DASHBOARDS

STORIES

Tableau Interface



It is not very effective if you don't know your way around!

Version 2018.3

This will take you directly to a sheet

Connect

To a File

- Microsoft Excel
- Text file
- JSON file
- Microsoft Access
- PDF file
- Spatial file
- Statistical file
- More...

To a Server

- Tableau Server
- MySQL
- Oracle
- Amazon Redshift
- Microsoft SQL Server
- More... >

Saved Data Sources

- Billing
- PEP_2017_PEPANNRES_...
- Sample - EU Superstore
- Sample - Superstore
- World Indicators

Open

Discover

Open a Workbook

Training

- Getting Started
- Connecting to Data
- Visual Analytics
- Understanding Tableau
- More training videos...

Resources

Get Tableau Prep

Blog - Here's what happened when we asked kids to explain data—and how you can join ou...

Register for Tableau Conference

Forums

Sample Workbooks

More Samples

VIZ OF THE WEEK

Boeing Commercial Market Outlook 2018-2037 →

Update to 2018.2 Now

The screenshot shows the Tableau desktop interface. On the left, there's a sidebar with options for 'Connect' (to files or servers), 'Saved Data Sources', and 'Sample Workbooks'. The main area has three main sections: 'Open' (with a preview of a Superstore workbook), 'Discover' (with links to training, resources, and a blog), and 'Sample Workbooks' (with previews of Superstore, Regional, and World Indicators workbooks). A red arrow points from the 'Discover' section towards the 'Open' section, with the text 'This will take you directly to a sheet' placed above it.

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Tableau Interface



It is not very effective if you don't know your way around!

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Sheets

The screenshot shows the Sheets interface. At the top, there's a navigation bar with File, Data, Worksheet, Dashboard, Story, Analysis, Map, Format, Server, Window, and Help. Below the navigation bar is a toolbar with various icons for file operations like Open, Save, Print, and Insert.

The main workspace is titled "Sheet 1". It features a "Dimensions" panel on the left containing "Filters" and a "Marks" section with options for Automatic, Color, Size, and Text. A "Measures" panel is also present. The workspace itself has three columns and two rows, each with a "Drop field here" placeholder.

At the bottom of the interface is a toolbar with icons for Data Source, Sheet 1, and other sheet-related functions. To the right of the main workspace, there's a large teal circle containing the text "VIEW WITH DATA".

Initial View

VIEW WITH
DATA

Tableau - Superstore [Read-Only]

File Data Worksheet Dashboard Story Analysis Map Format Server Window Help

Pages 6 Columns 10 Segment SUM(Sales) Rows 11 Category Sub-Category

1. DATA SOURCES

2. DIMENSIONS

3. MEASURES

4. SETS

5. PARAMETERS

6. PAGES SHELF

7. FILTER SHELF

8. MARKS CARD

9. LEGEND

10. COLUMNS SHELF

11. ROWS SHELF

12. VIEW

13. PILLS

14. MARKS

The screenshot shows a complex Tableau dashboard with various shelves and cards. The top navigation bar includes File, Data, Worksheet, Dashboard, Story, Analysis, Map, Format, Server, Window, and Help. Below the navigation is a toolbar with icons for zoom, refresh, and standard view. The main workspace contains several components:

- PAGES Shelf (1):** Shows 6 pages.
- COLUMNS Shelf (10):** Shows Segment and SUM(Sales).
- ROWS Shelf (11):** Shows Category and Sub-Category.
- Dimensions Shelf (2):** Includes Customer, Order, Location, Order Profitable?, Product, Ship Status, and Measure Names.
- Measures Shelf (3):** Includes Days to Ship Actual, Days to Ship Scheduled, Discount, Profit, Profit per Order, Profit Ratio, Quantity, Sales, Sales above Target?, Sales Forecast, Sales per Customer, Latitude (generated), Longitude (generated), Number of Records, and Measure Values.
- Sets Shelf (4):** Includes Folders.
- Parameters Shelf (5):** Includes Base Salary, Churn Rate, Commission Rate, New Business Growth, and New Quota.
- Marks Card (8):** Shows settings for Circle marks, including Color, Size, Label, Detail, Tooltip, AGG(Profit Ratio), Product Name, Category, and SUM(Profit). A color scale from -50.0% to 50.0% is also shown.
- Filter Shelf (7):** Includes filters for YEAR(Order Date), MONTH(Order D..., Action (YEAR...), Action (YEAR...), Action (Categ...), Region, and Order Date.
- Page Shelf (6):** Shows 13 numbered items corresponding to the numbered callouts on the right.
- View (12):** A bubble chart visual with Sales on the x-axis (0 to \$20,000) and AGG(Profit Ratio) on the y-axis (-50.0% to 50.0%). The chart is categorized by product type: Furniture, Office Supplies, and Technology. Each category contains multiple items like Bookcases, Chairs, Furnishings, Tables, etc. The bubbles are semi-transparent circles of varying sizes.
- Pills (13):** Located at the bottom of the View shelf.
- Marks (14):** Located at the bottom of the Marks shelf.

Tableau - Superstore

File Data Worksheet Dashboard Story Analysis Map Format Server Window Help

Show Me

Data Analytics

- Sales Commission
- Sales Target Extract
- Sample - Superstore

Dimensions

- All Ship Mode
- Location
 - Country
 - Region
 - State
 - City
 - Postal Code
- Order Profitable?
- Product
 - Category
 - Sub-Category
 - Product Name
 - Region
 - Order Date
- Ship Status
- Measure Names

Measures

- Days to Ship Actual
- Days to Ship Scheduled
- Discount
- Profit
- Profit per Order
- Profit Ratio
- Quantity
- Sales
- Sales above Target?
- Sales Forecast

Sets

- Product Family

Parameters

- Base Salary
- Churn Rate
- Commission Rate
- New Business Growth
- New Quota
- Sort by

366 marks | 17 rows by 3 columns | SUM(Sales): \$94,925

Segments: Standard

Pages: Columns: Segment: SUM(Sales)

Rows: Category: Sub-Category

MONTH(Order Date): January

Filters: YEAR(Order Date), MONTH(Order Date), Action(YEAR), Action(MONTH), Action(Category), Region, Order Date

Marks: Circle, Color, Size, Label, Detail, Tooltip

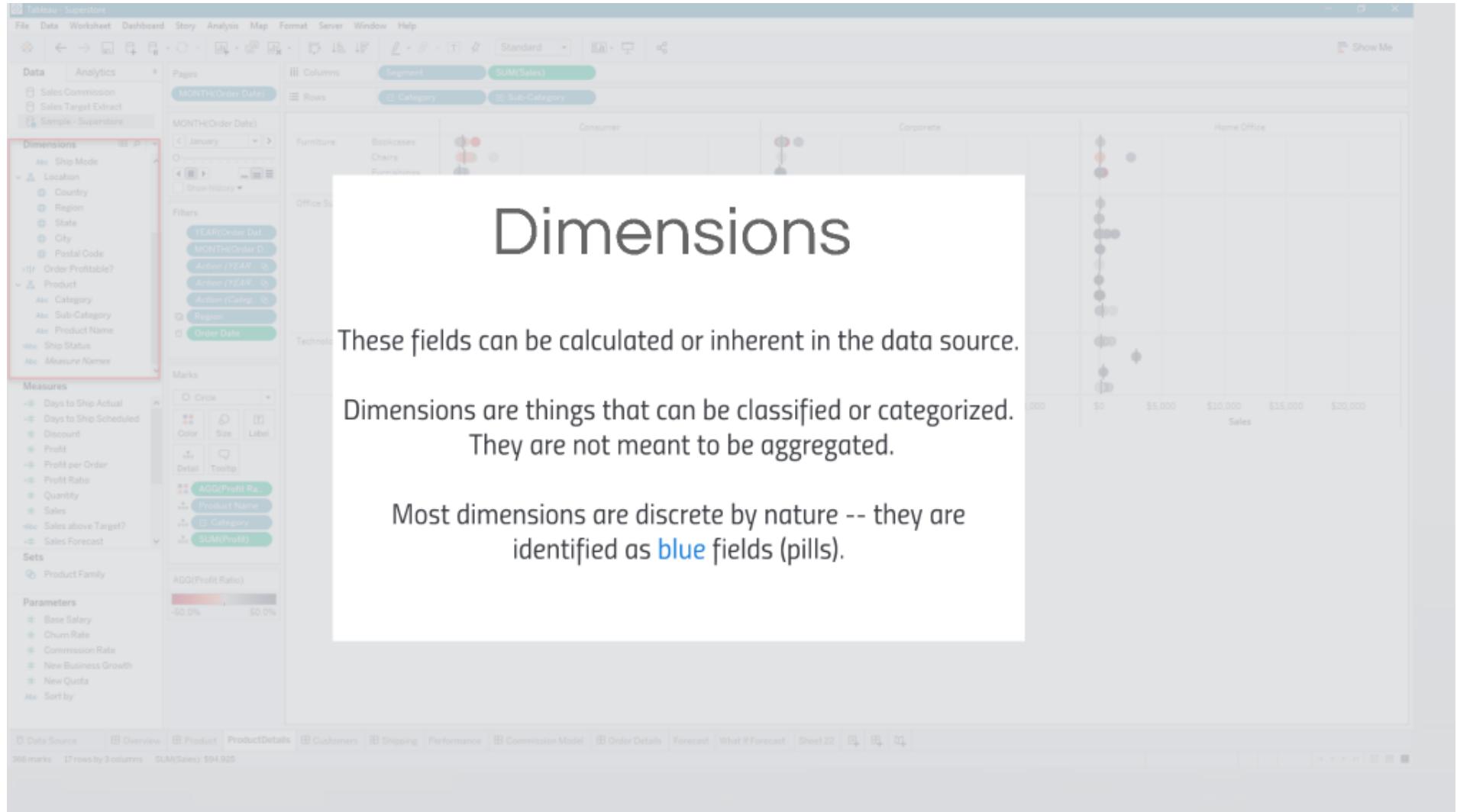
AGG(Profit Ratio): Product Name, Category, SUM(Profit)

AGG(Profit Ratio): -50.0% to 50.0%

Data Sources

Displays all the data connections in the workbook

You can have a live or extracted data source



Measures

All fields of the data sources that are classified as measures.

As its name suggests, are those fields that can be measured, aggregated, or used for mathematical operations.

Most measures are continuous by nature -- they are identified as **green** fields (pills).

Tableau - Superstore

File Data Worksheet Dashboard Story Analysis Map Format Server Window Help

Show Me

Data Analytics

Sales Commission
Sales Target Extract
Sample - Superstore

Dimensions
Ship Mode
Location
Country
Region
State
City
Postal Code
Order Profitable?
Product
Category
Sub-Category
Product Name
Ship Status
Measure Names

MONTH(Order Date)
YEAR(Order Date)
MONTH(Order Date)
Action (YEAR)
Action (YEAR)
Action (Category)
Region
Order Date

Measures
Days to Ship Actual
Days to Ship Scheduled
Discount
Profit
Profit per Order
Profit Ratio
Quantity
Sales
Sales above Target?
Sales Forecast

Sets
Product Family

Parameters
Base Salary
Churn Rate
Commission Rate
New Business Growth
New Quota
Sort by

Overview Product Details Customers Shopping Performance Commission Model Order Details Forecast What If Forecast Sheet 22

366 marks 37 rows by 3 columns SUM(Sales) \$94,925

Sets

If the data source contains at least one set, it will be here.

This section also shows *actions*.

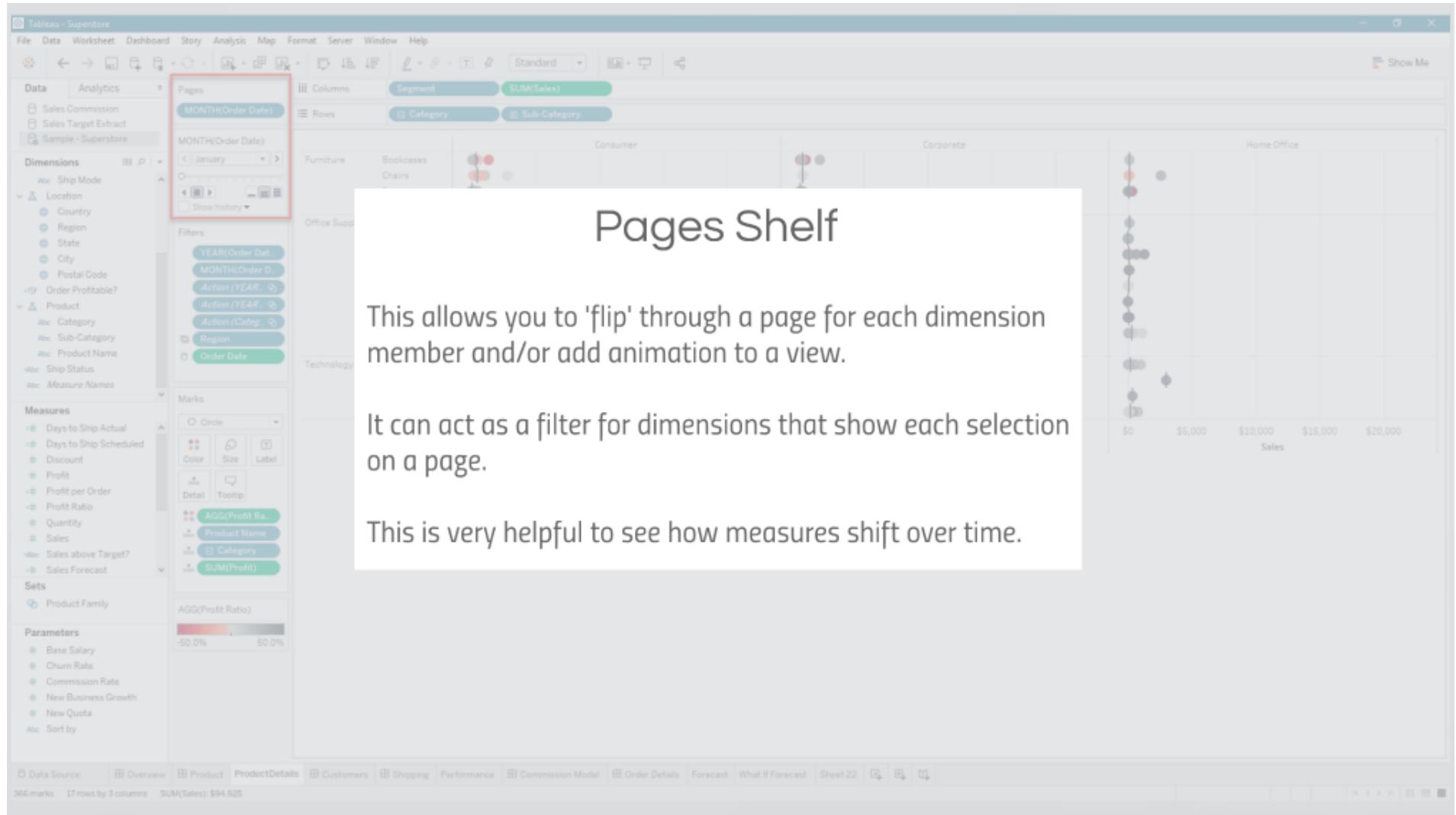
Sets and actions are created by the developer. They are not included in the initial data set

The screenshot shows the Tableau Data Prep interface. On the left, there's a sidebar with various data sources and parameters. A red box highlights the 'Parameters' section, which lists several variables: Base Salary, Churn Rate, Commission Rate, New Business Growth, New Quota, and Sort by. Below this is a 'Marks' section with color, size, and label settings. The main workspace contains a scatter plot with three data series: Furniture, Bookcases, and Chairs. The Furniture series is represented by grey dots, Bookcases by pink dots, and Chairs by light blue dots. The plot has 'Category' on the Y-axis and 'Sales' on the X-axis, ranging from \$0 to \$20,000. A large white callout box with a black border is overlaid on the plot area. Inside the callout box, the word 'Parameters' is centered in a large, bold, dark grey font. Below it, two paragraphs of text are displayed in a smaller, regular grey font:

If the data source contains at least one parameter, it will show up here.

Parameters are created by the developer. They are not included in the initial data set.

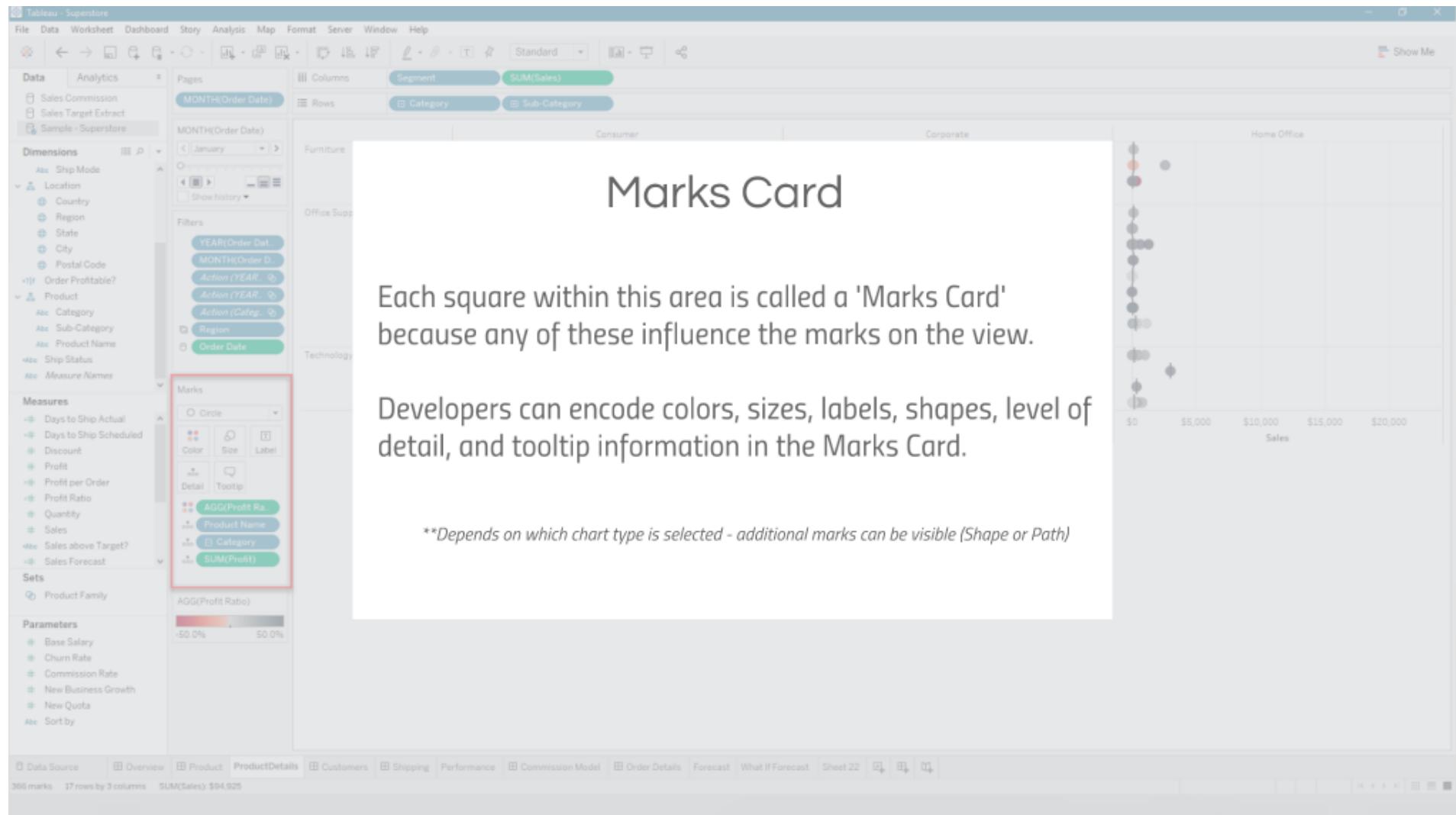
They enable the end user to interact more dynamically with the data. Parameters can be used across multiple data sets.

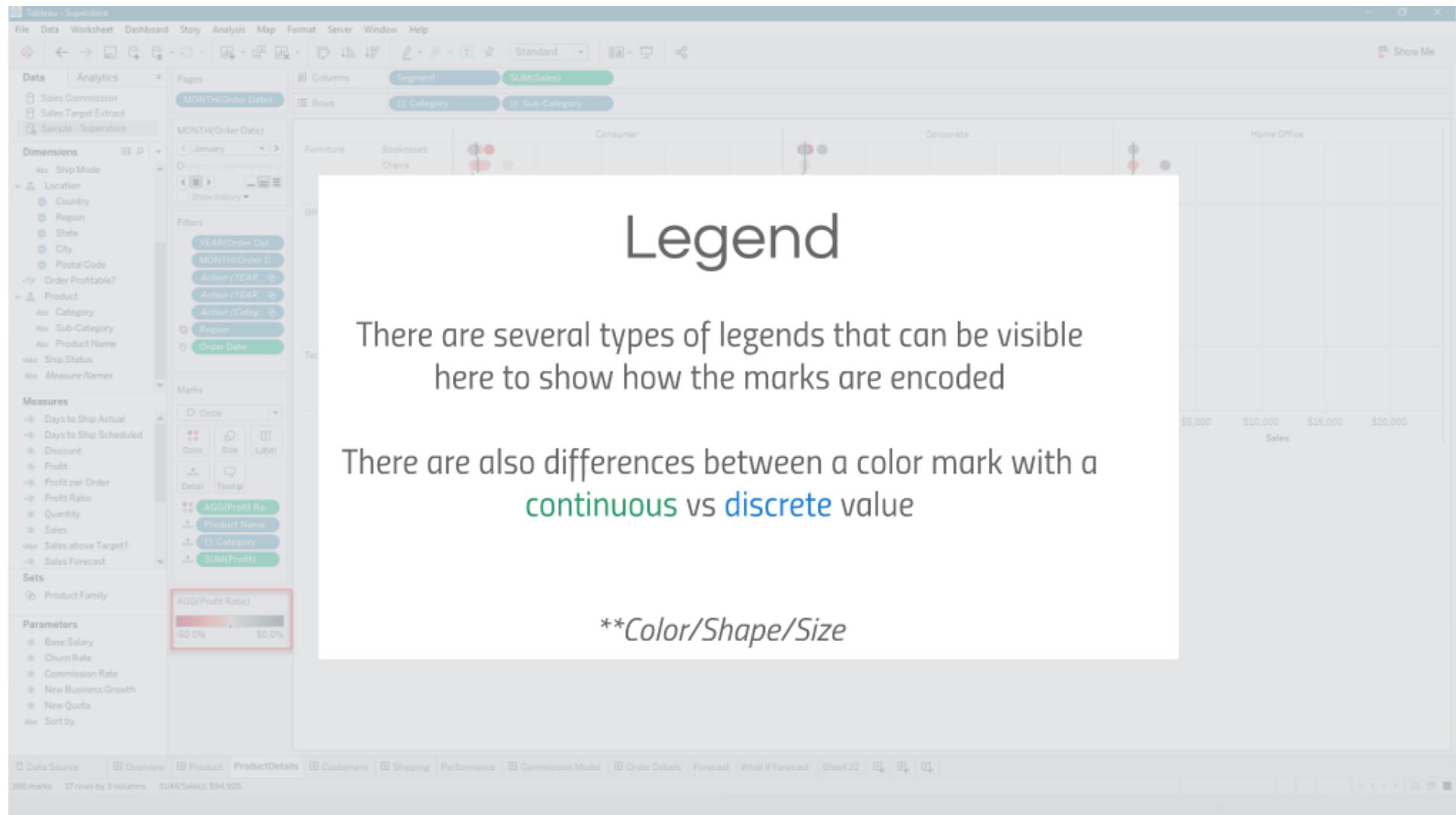


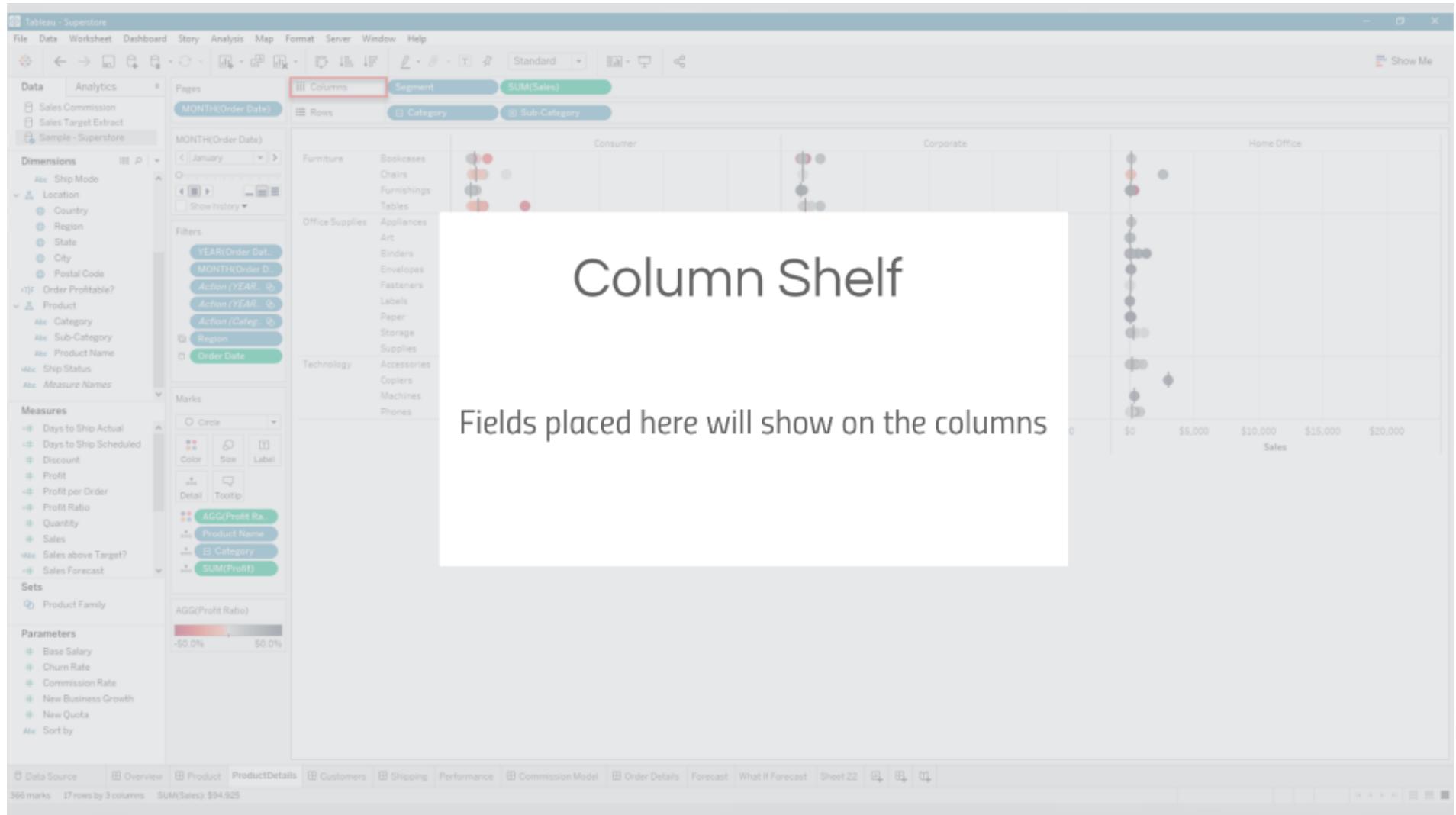
The screenshot shows the Tableau desktop application interface. On the left is the Data pane, which includes sections for Data, Analytics, Dimensions, Measures, Sets, and Parameters. A red box highlights the 'Filters' section under Dimensions, which contains several items: YEAR(Order Date), MONTH(Order Date), Action (YEAR...), Action (YEAR...), Action (Catalog...), Region, and Order Date. The main workspace displays a visualization with a grid of bars representing sales by category and sub-category. The Y-axis is labeled 'Sales' and ranges from \$0 to \$20,000. The X-axis categories are Furniture, Office Supplies, and Technology. The bars are color-coded according to a 'AGG(Profit Ratio)' scale ranging from -50.0% to 50.0%. The legend for this scale is also visible in the Data pane.

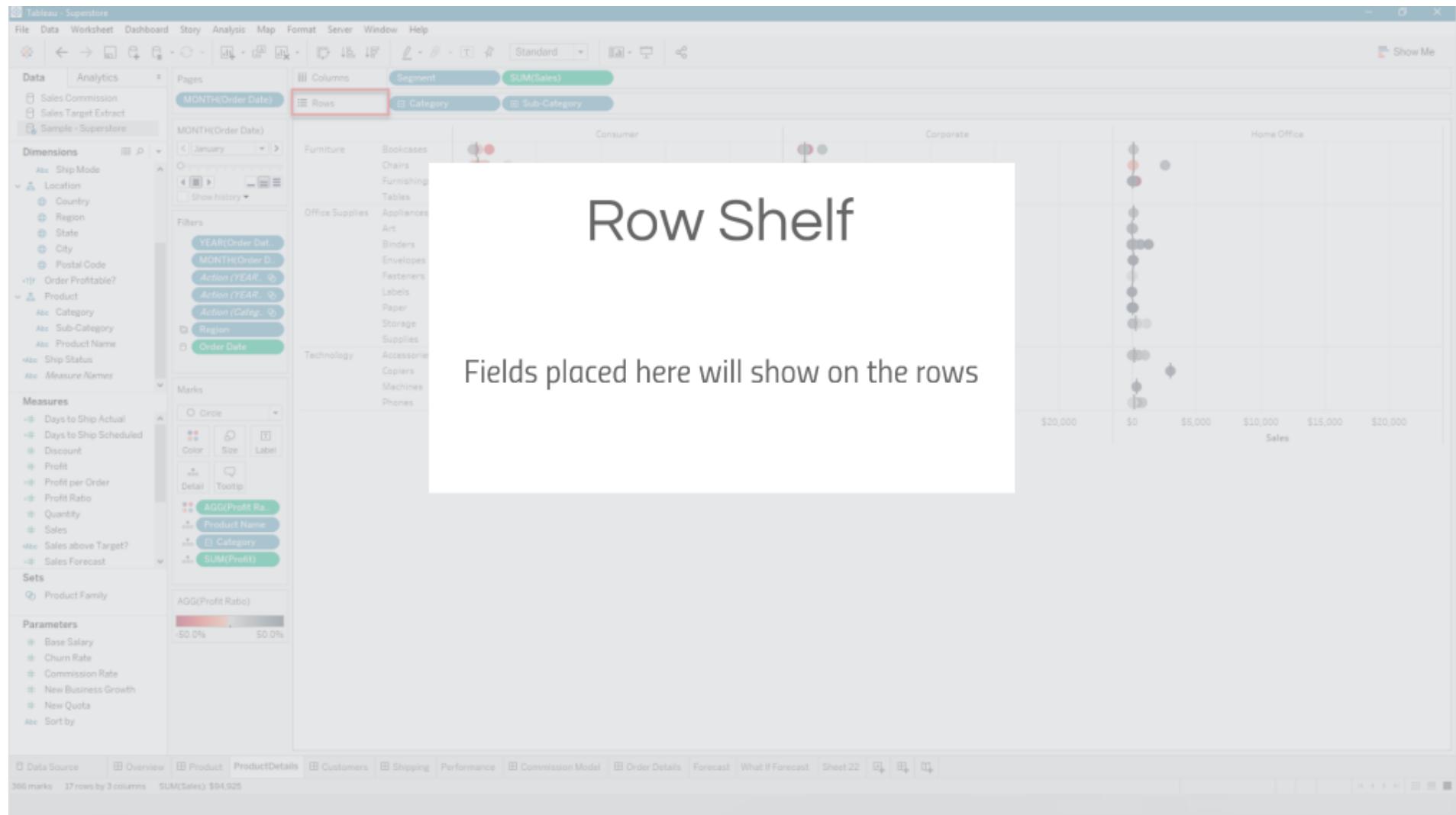
Filter Shelf

Any field or set that you filter a view by what is displayed is located here.









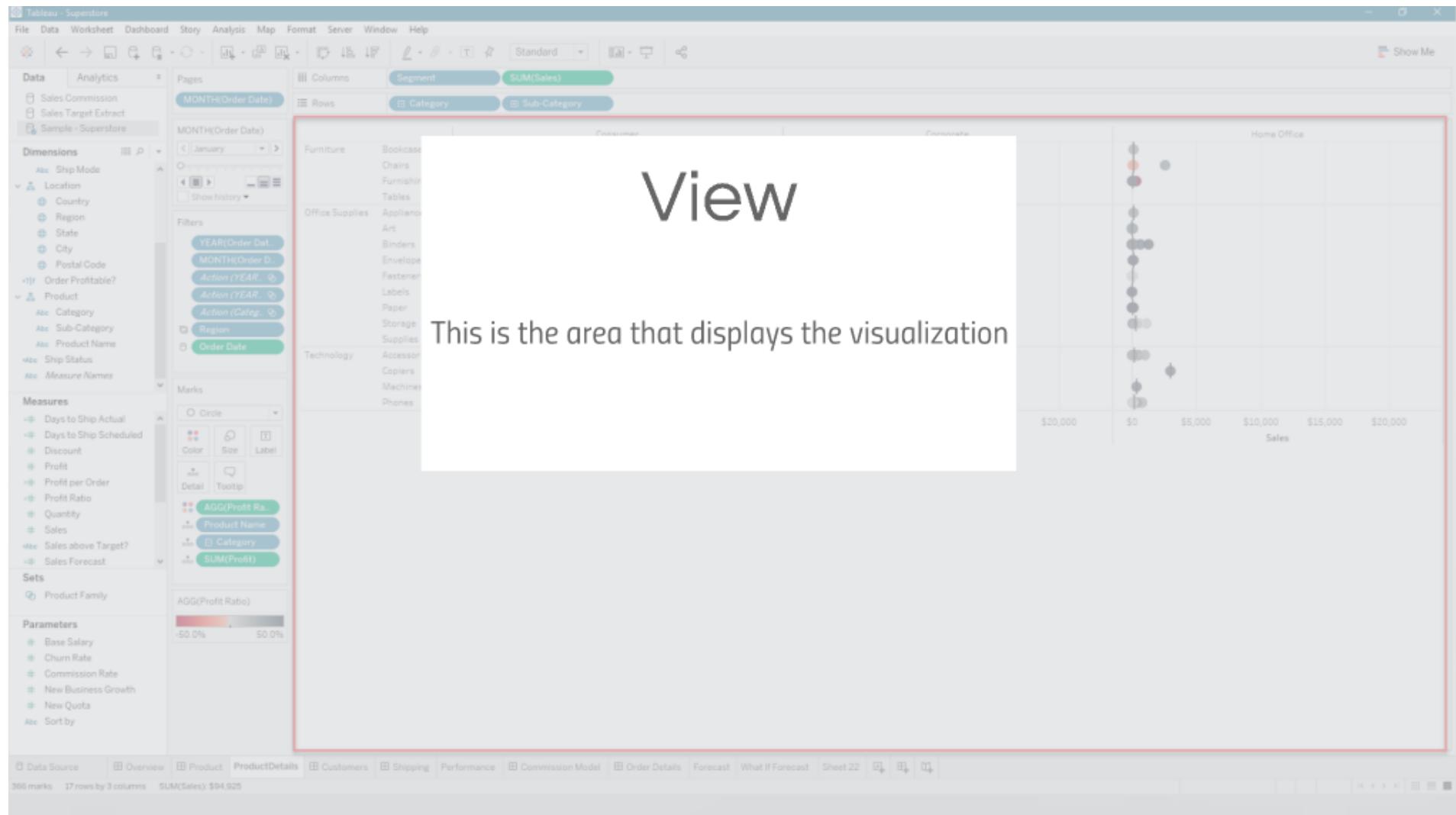


Tableau - Superstore

File Data Worksheet Dashboard Story Analysis Map Format Server Window Help

Show Me

Data Analytics

Sales Commission
Sales Target Extract
Sample - Superstore

Dimensions

- Ship Mode
- Location
 - Country
 - Region
 - State
 - City
 - Postal Code
- Order Profitable?
- Product
 - Category
 - Sub-Category
 - Product Name
- Ship Status
- Measure Names

Measures

- Days to Ship Actual
- Days to Ship Scheduled
- Discount
- Profit
- Profit per Order
- Profit Ratio
- Quantity
- Sales
- Sales above Target?
- Sales Forecast

Sets

- Product Family

Parameters

- Base Salary
- Churn Rate
- Commission Rate
- New Business Growth
- New Quota
- Sort by

Segments

MONTH(Order Date)

Columns

Segment SUM(Sales)
Category Sub-Category

Rows

MONTH(Order Date)

January

Show history

Filters

YEAR(Order Date)
MONTH(Order Date)
Action (YEAR...)
Action (YEAR...)
Action (Category...)
Region
Order Date

Marks

Circle
Color
Size
Label
Detail
Tooltip
AGG(Profit Ratio)
Product Name
Category
SUM(Profit)

Technology

Furniture Consumer Corporate Home Office

Pills

This is a slang term to denote the field once it is drug onto the rows/column shelf. The name comes from the shape of the object

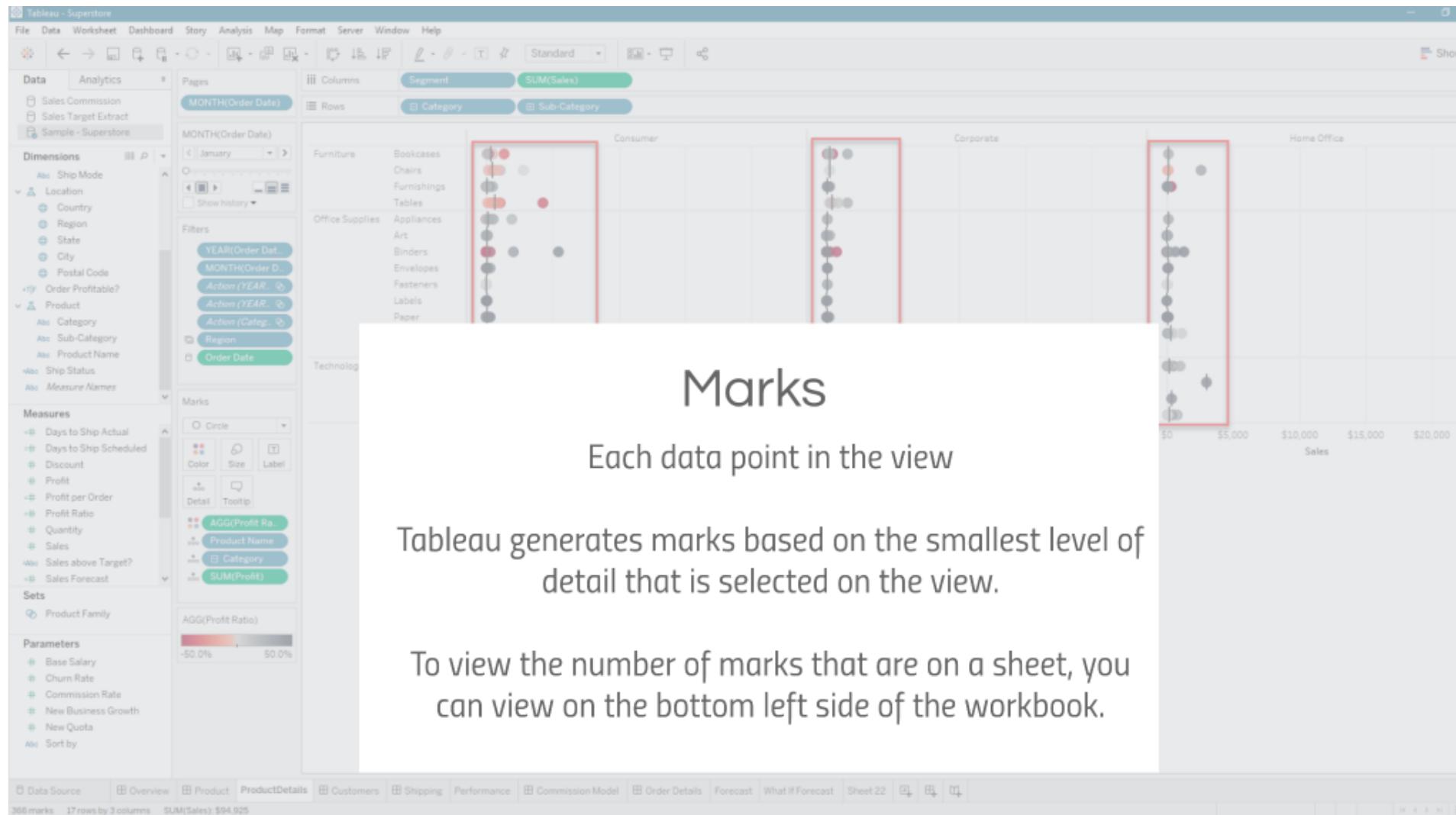
Green pills are continuous fields
Blue pills are discrete fields

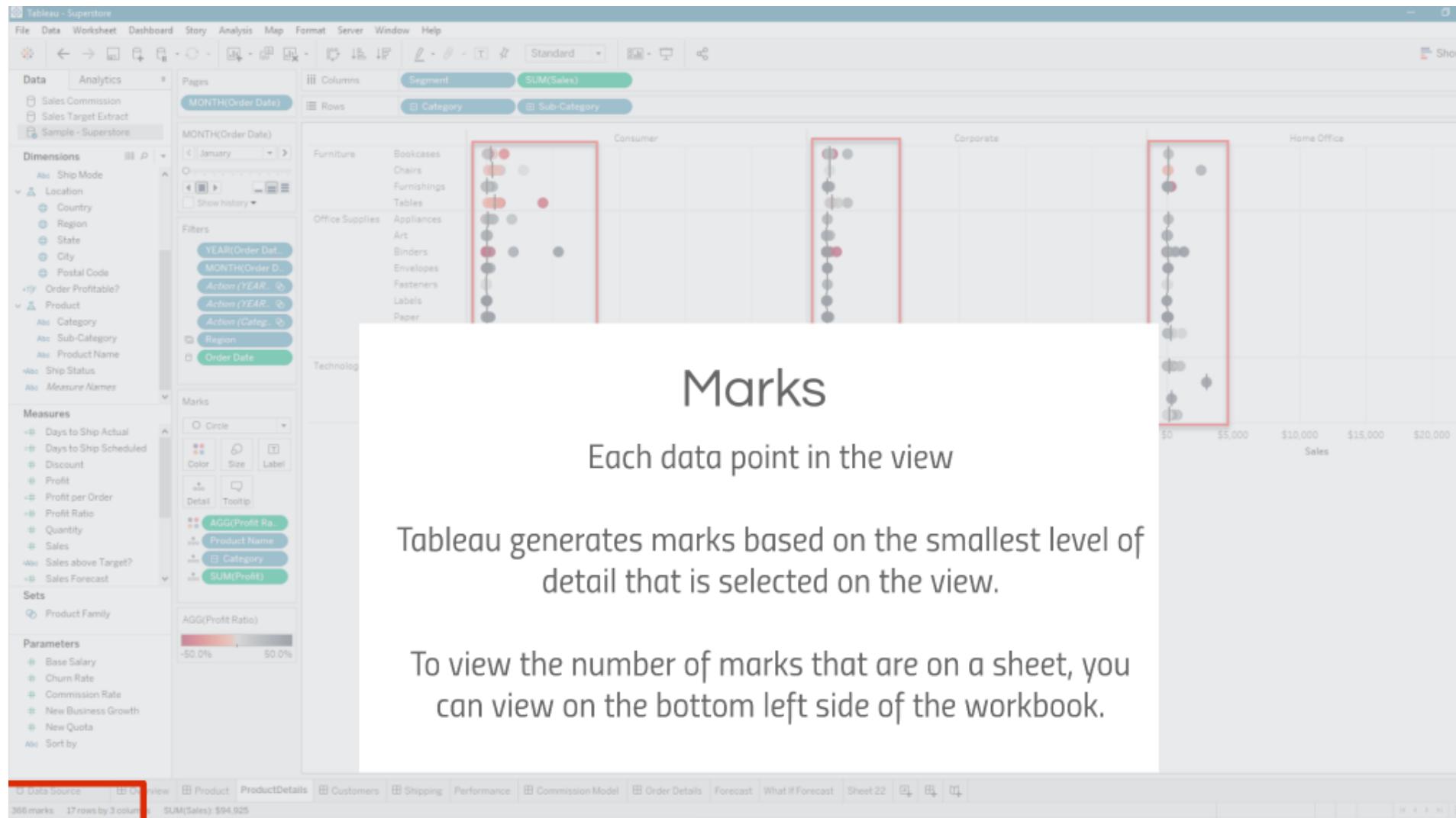
\$5,000 \$10,000 \$15,000 \$20,000

Sales

366 marks 37 rows by 3 columns SUM(Sales): \$94,925

The screenshot shows a Tableau interface with a tooltip overlay. The tooltip has a large title 'Pills' at the top. Below it, a descriptive text explains that it's a slang term for fields on shelves, with the name coming from the shape of the objects. It then defines 'Green pills' as continuous fields and 'Blue pills' as discrete fields. The background shows a dashboard with various data sources and visualizations.





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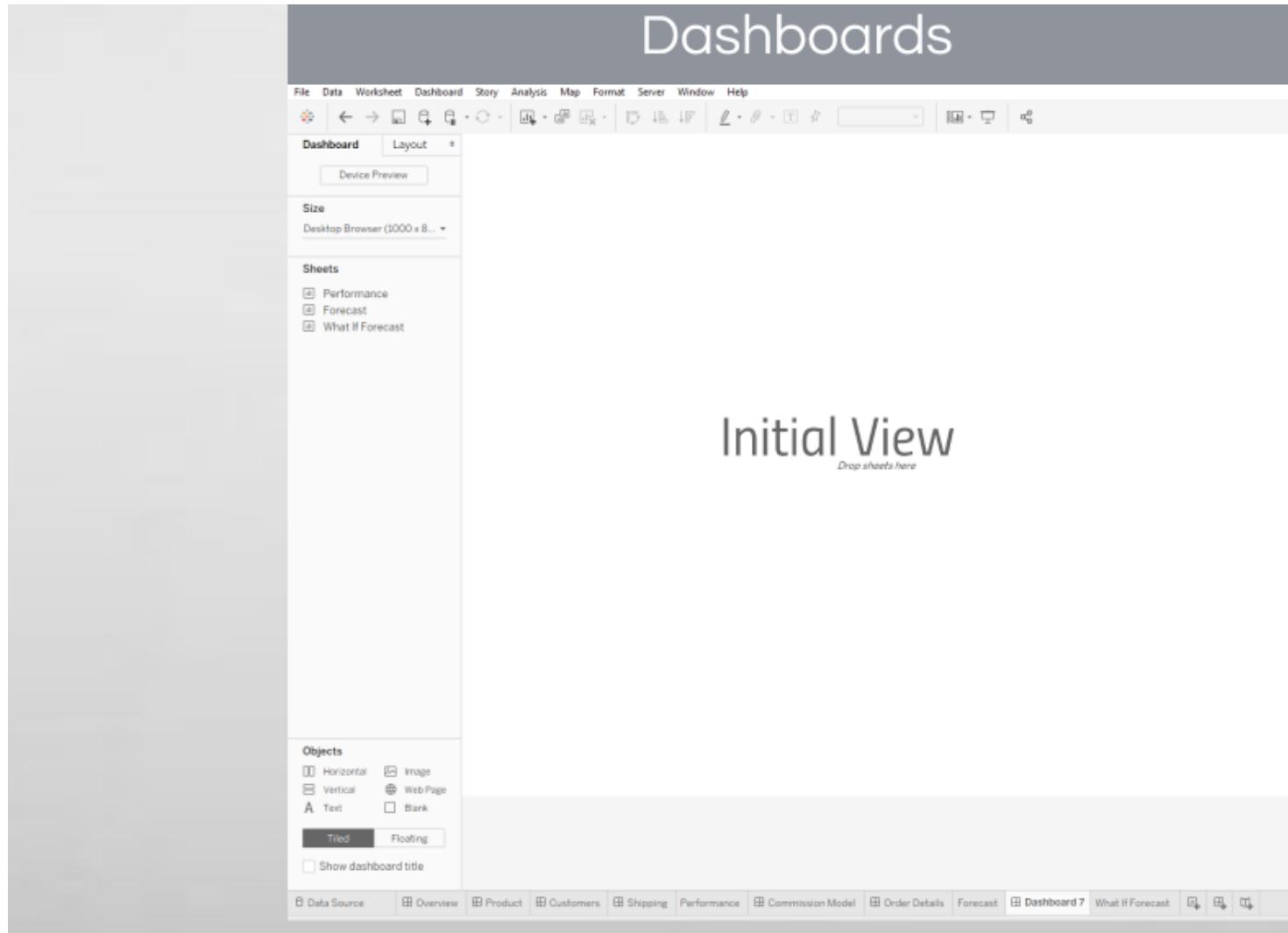
Tableau Interface



It is not very effective if you don't know your way around!

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Dashboards



Product Drilldown

Sales by Product Category

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Furniture	2014	\$6,243	\$1,840	\$14,574	\$7,945	\$6,913	\$13,206	\$10,821	\$7,320	\$23,816	\$12,304	\$21,565	\$30,646
	2015	\$11,740	\$3,134	\$12,500	\$10,476	\$9,375	\$7,714	\$13,674	\$9,639	\$26,273	\$12,027	\$30,881	\$23,086
	2016	\$7,623	\$3,926	\$12,801	\$13,212	\$15,120	\$13,071	\$13,069	\$12,483	\$27,263	\$11,873	\$31,784	\$36,679
	2017	\$5,964	\$6,866	\$10,893	\$9,066	\$16,958	\$19,009	\$11,813	\$15,442	\$29,028	\$21,884		
Office Supplies	2014	\$4,851	\$1,072	\$8,606	\$11,155	\$7,136	\$12,953	\$15,121	\$11,379	\$27,423	\$7,211	\$26,862	\$18,006
	2015	\$1,809	\$5,368	\$15,883	\$12,559	\$9,114	\$10,648	\$4,720	\$11,735	\$19,306	\$8,673	\$21,218	\$16,202
	2016	\$5,300	\$6,794	\$17,347	\$10,647	\$13,035	\$10,902	\$12,924	\$8,960	\$23,264	\$16,282	\$20,487	\$37,998
	2017	\$21,274	\$7,408	\$14,550	\$15,072	\$13,737	\$16,912	\$10,241	\$30,060	\$31,896	\$23,037		
Technology	2014	\$3,143	\$1,609	\$32,511	\$9,195	\$9,600	\$8,436	\$8,004	\$9,210	\$30,538	\$11,938	\$30,201	\$20,893
	2015	\$4,625	\$3,449	\$10,344	\$11,161	\$11,643	\$6,435	\$10,371	\$15,525	\$19,017	\$10,705	\$23,874	\$35,632
	2016	\$5,620	\$12,259	\$21,568	\$14,891	\$28,833	\$16,372	\$13,269	\$9,672	\$22,883	\$31,533	\$27,141	\$22,323
	2017	\$16,733	\$6,027	\$33,429	\$12,383	\$13,567	\$17,061	\$23,210	\$17,619	\$26,943	\$32,856		

Sales and Profit by Product Names

Year: All, Month: All, Product Category: All

	Consumer	Corporate	Home Office
Furniture	Bookcases, Chairs, Furnishings, Tables		
Office Supplies	Appliances, Art, Binders, Envelopes, Fasteners, Labels, Paper, Storage, Supplies	Accessories, Copiers, Machines, Phones	
Technology			

Region

(All)

Central

East

South

West

Sales

\$1,072
\$37,998

Profit Ratio

-50.0%
50.0%

1. DEVICE PREVIEW

2. SIZE

3. SHEETS

4. HORIZONTAL

5. VERTICAL

6. TEXT

7. IMAGE

8. WEB PAGE

9. BLANK

10. TILED OR FLOATING

START
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It is not very effective if you don't know your way around!

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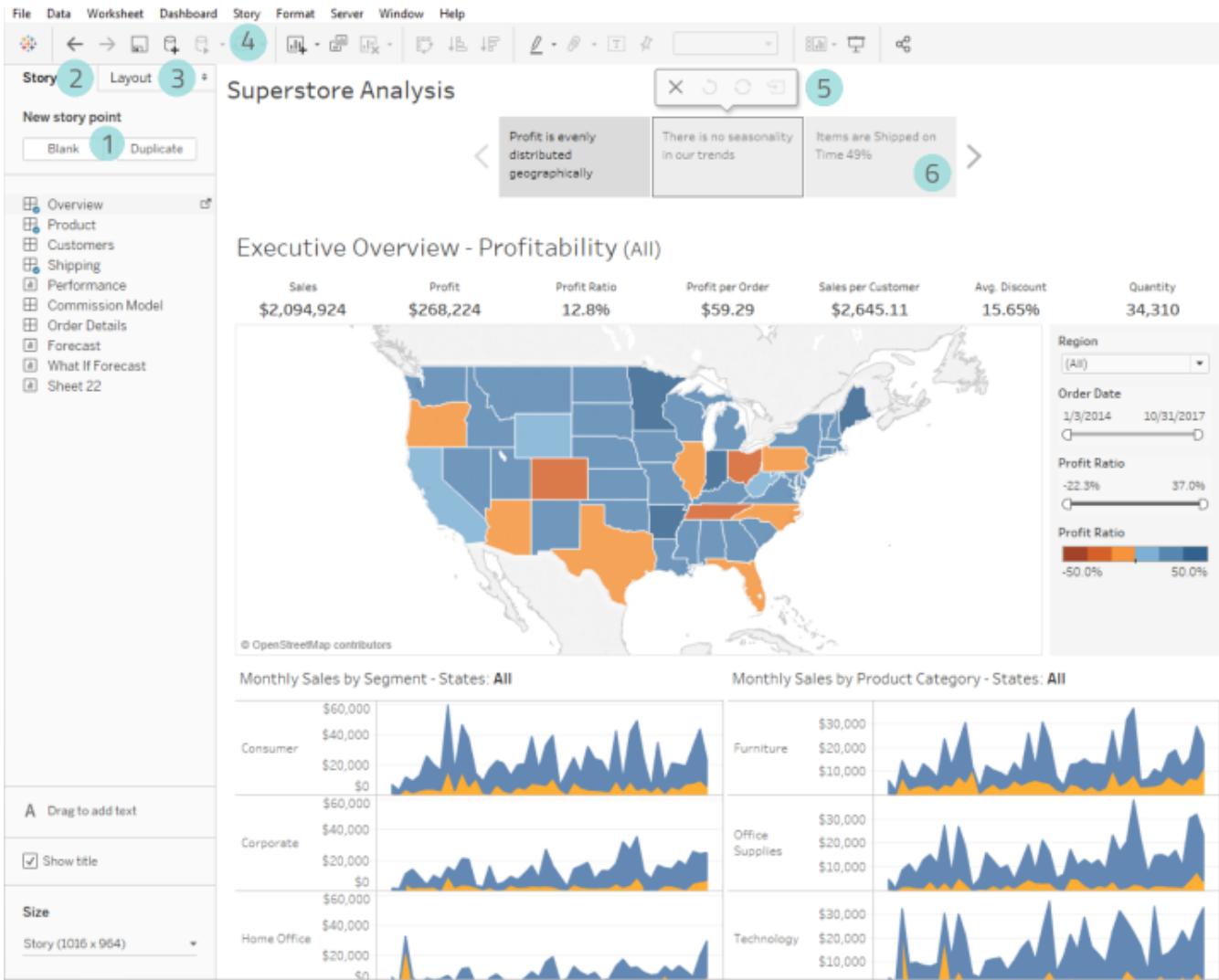
The screenshot shows the Tableau software interface for creating a story. The top menu bar includes File, Data, Worksheet, Dashboard, Story, Format, Server, Window, and Help. The left sidebar shows a tree view of data sources: Overview, Product, Customers, Shipping, Performance, Commission Model, Order Details, Forecast, What If Forecast, and Sheet 22. A "Story" tab is selected, and a "Layout" button is visible. Below the sidebar, a title "Story 2" is displayed, with a "New story point" section containing "Blank" and "Duplicate" buttons. A "Stories" section contains the following text:

In Tableau, a story is a sequence of visualizations that work together to convey information. You can create stories to tell a data narrative, provide context, demonstrate how decisions relate to outcomes, or to simply make a compelling case.

A story is a sheet, so the methods you use to create, name, and manage worksheets and dashboards also apply to stories (for more details, see Workbooks and Sheets). At the same time, a story is also a collection of sheets, arranged in a sequence. Each individual sheet in a story is called a story point.

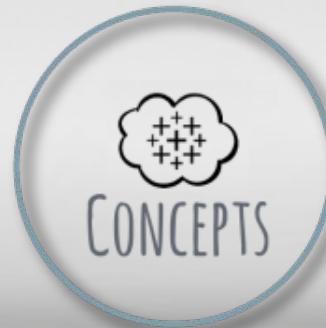
When you share a story —for example, by publishing a workbook to Tableau Public, Tableau Server, or Tableau Online—users can interact with the story to reveal new findings or ask new questions of the data.

On the right side of the interface, there is a teal circular button with the text "View with Data". The bottom navigation bar includes buttons for Data Source, Overview, Product, Customers, Shipping, Performance, Commission Model, Order Details, Forecast, What If Forecast, Sheet 22, Story 1, Story 2, and a search icon.





Getting Started



Concepts

Tableau is a relatively easy tool to pick up and learn. However, there are some things that make it easier if you are aware of them on the front end.

Version 2018.3

VALIDATING
YOUR DATA

DIMENSIONS
VS
MEASURES

DISCRETE
VS
CONTINUOUS

AGGREGATION

VISUAL
GRANULARITY

Validation!

It is always a best practice to have ways to validate your data as you add things to the view.

If the data is not correctly displayed, or confusing to understand, the user will not use your dashboard and lose trust in your work.

VIEWING THE
UNDERLYING DATA

VIEWING THE
NUMBER OF ROWS

Viewing the underlying data

You can view the underlying data at any point.

If I am working with a new data set, I like to review the data. This is helpful to verify calculations and building something meaningful and coherent the first time. You can view the underlying data in a few different kinds of ways:

- o Right click in the data connection and choose View Data
- o Click Data in the top navigation, hover over the connection and choose View Data
- o Click the first tab at the bottom of the workbook.

If you want to view one field, right click that field in the dimensions pane and select Describe. Then Load. That will give you a listing of everything that is within that field. You can also view aliases to perform the same action.



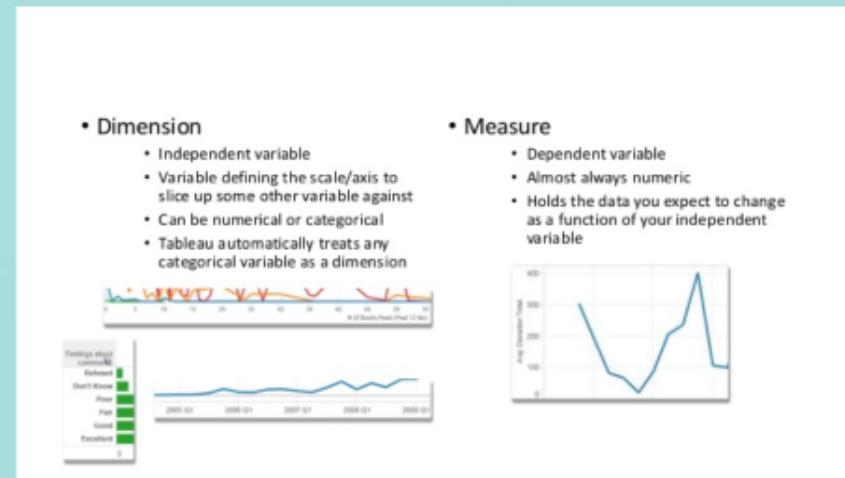
Number of Rows

It is always helpful to know what the number of records that are in a given data set.

You will know as you build calculations and/or blend/join data whether the actions are built as designed.

It is a field in the Measures Pane at the bottom. It is a Tableau generated calculation that is at a SUM aggregation

Dimensions and Measures



Dimensions are the *noun* and
measures are a *verb*.

Discrete and Continuous

Discrete

A variable whose attribute are separate from one another.
Also known as qualitative variable

Continuous

A variable can take on any value
An infinite number of values
Also known as quantitative variables

Dimensions are *usually* discrete
Measures are *usually* continuous

Aggregation

Every measure is aggregated in Tableau to some degree. The default aggregation is SUM and that is applicable for most things. There are several other options to use as well.

SUM

All rows for a measure added together

Avg

The sum of the measure divided by the number of records

COUNT

A count of all records

COUNTD

A count of all DISTINCT records

MIN

The smallest value in the data

MAX

The largest value in the data

MEDIAN

The measure in the exact middle of your data when sorted

Visual Granularity?!

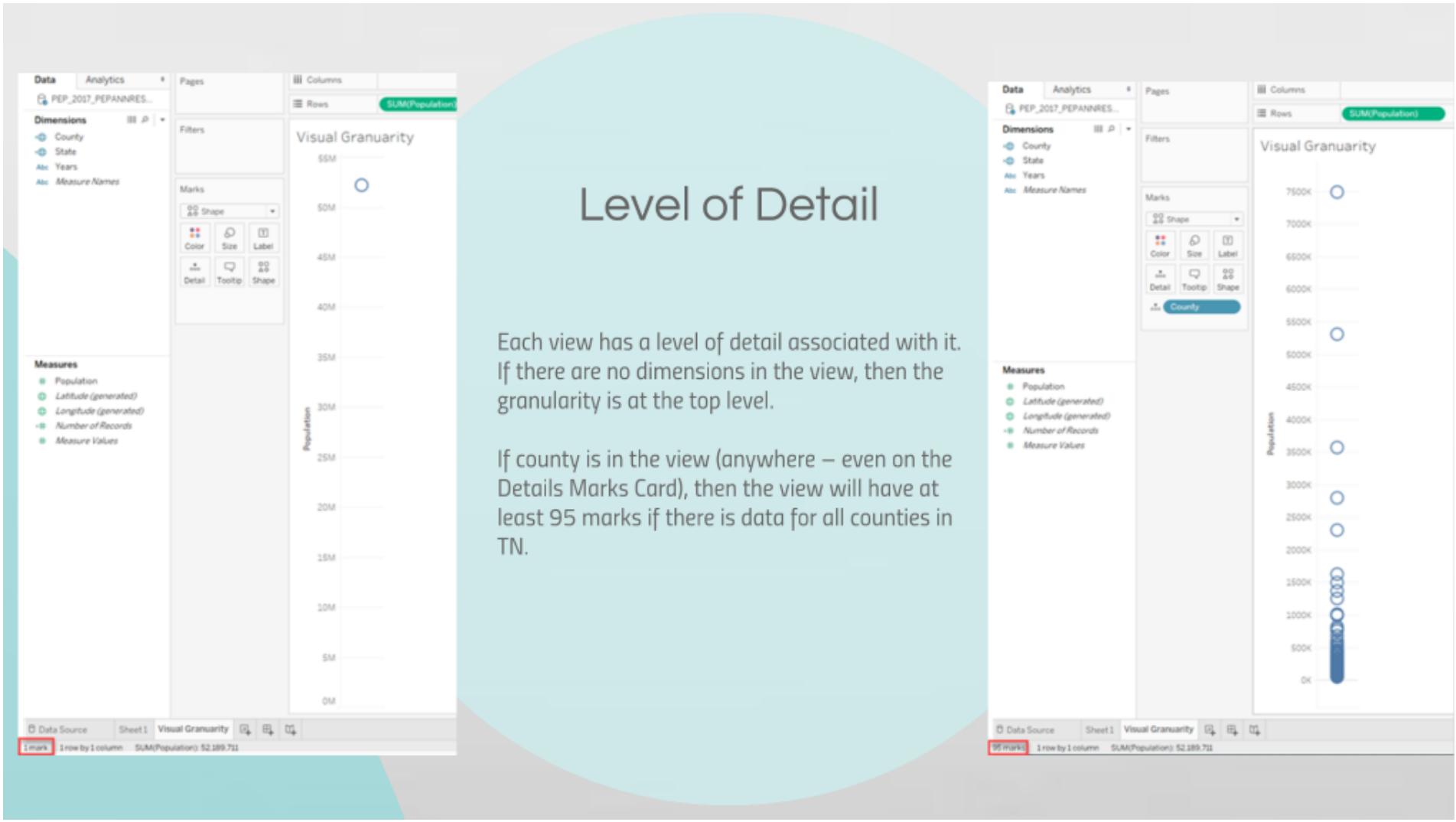
That means that every time a smaller level of data is put into the view, there will be more marks.

There are ways to break a view down that can handle a lot of data *instead* of showing it all on the screen at once.

LEVEL OF DETAIL

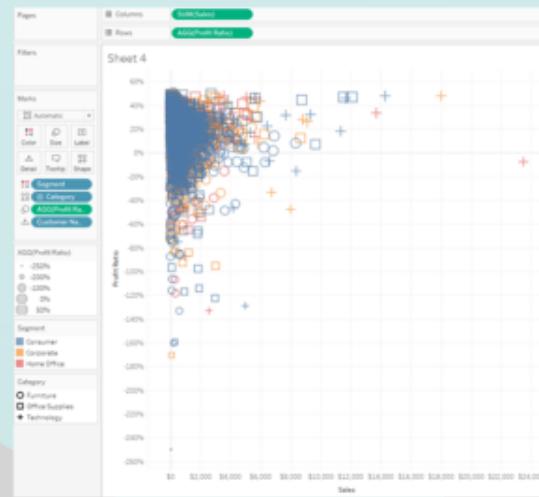
ENCODING MARKS

CONSEQUENCES



Encoding Marks

The Marks card offers a complex variety of selections to enhance the marks. It is easier to distinguish a mark if it is larger, a different shape, or color/hue. As you can see below, you can leverage each of these in a view.





Too many marks in a view will cause performance issues.

Think of ways to segment a view to provide the answers the user is looking for.



Getting Started



Data Connections

You can edit your data source within the data connections page without worrying about changing any of the data for other users.

Your experience can vary based on the data source type you are connecting to.

CANVAS
INTERFACE

Version 2018.3

Data Connection Canvas

Tableau allows you to manipulate your data in it's data connection view. You can pivot (in excel), alias, rename, and split columns. You can also join other tables or data sources to your view.



Version 2018.1

JOINING DATA

Joining Data

When you need to combine two data sets, think which data set will be your 'primary' data set. In this case, I want ALL orders with the sales person and the applicable returns.

Since I want ALL orders and that has the most granular data, I select that table first. Then join the people table and leave the default inner join because all orders should have a sales person. Since I want all orders and not just returns, I join the returns table as a left join. This captures all orders (the first venn diagram circle), and the returns.

It's important to check the number of rows in your data as you make joins to make sure the data is behaving as is expected.

Order ID	Order ID (Returns)	Customer ID	Customer Name	Segment	Country	City	State	Postal Code	Region	Product ID		
CG-12520	Claire Gute	Consumer	United States	Henderson	Kentucky	42420	South	FUR-BD-10001798				
CG-12520	Claire Gute	Consumer	United States	Henderson	Kentucky	42420	South	FUR-CH-10000454				
CA-2017-1286688	6/12/2017	6/16/2017	Second Class	DV-13045	Darrin Van Huff	Corporate	United States	Los Angeles	California	90036	West	OFF-LA-10000340
US-2016-108966	10/11/2016	10/18/2016	Standard Class	SO-20335	Sean O'Donnell	Consumer	United States	Fort Lauderdale	Florida	33311	South	FUR-TA-10000577
US-2016-108966	10/11/2016	10/18/2016	Standard Class	SO-20335	Sean O'Donnell	Consumer	United States	Fort Lauderdale	Florida	33311	South	OFF-ST-10000760
CA-2015-115812	6/9/2015	6/14/2015	Standard Class	BH-11710	Brosina Hoffman	Consumer	United States	Los Angeles	California	90032	West	FUR-FU-10001487
CA-2015-115812	6/9/2015	6/14/2015	Standard Class	BH-11710	Brosina Hoffman	Consumer	United States	Los Angeles	California	90032	West	OFF-AR-10002833
CA-2015-115812	6/9/2015	6/14/2015	Standard Class	BH-11710	Brosina Hoffman	Consumer	United States	Los Angeles	California	90032	West	TEC-PH-10002275
CA-2015-115812	6/9/2015	6/14/2015	Standard Class	BH-11710	Brosina Hoffman	Consumer	United States	Los Angeles	California	90032	West	OFF-BI-10003910
CA-2015-115812	6/9/2015	6/14/2015	Standard Class	BH-11710	Brosina Hoffman	Consumer	United States	Los Angeles	California	90032	West	OFF-AP-10002892
CA-2015-115812	6/9/2015	6/14/2015	Standard Class	BH-11710	Brosina Hoffman	Consumer	United States	Los Angeles	California	90032	West	FUR-TA-10001639
CA-2015-115812	6/9/2015	6/14/2015	Standard Class	BH-11710	Brosina Hoffman	Consumer	United States	Los Angeles	California	90032	West	TEC-PH-10002033
CA-2018-114412	4/15/2018	4/20/2018	Standard Class	AA-10480	Andrew Allen	Consumer	United States	Concord	North Carolina	28027	South	OFF-PA-10002365
CA-2017-115812	12/8/2017	12/10/2017	Standard Class	IS-10070	Ivana Mukherjee	Consumer	United States	Sacramento	California	95817	West	TEC-BL-10002333