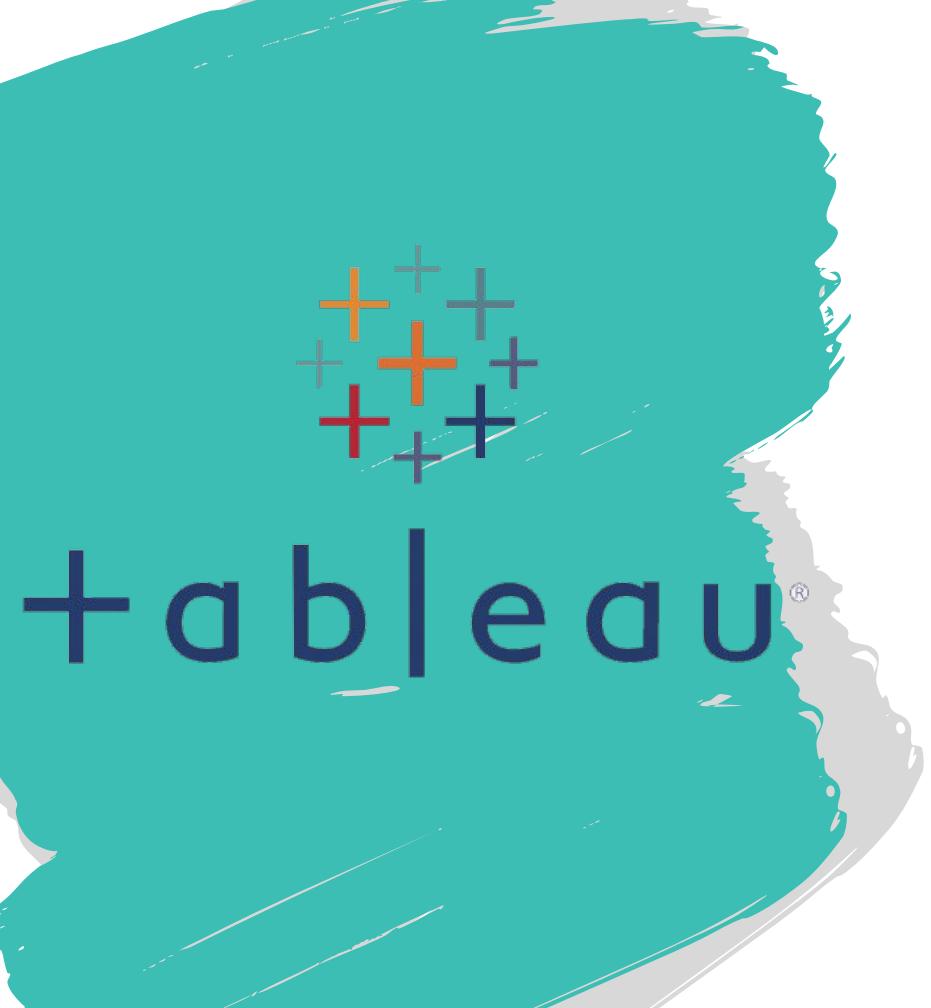




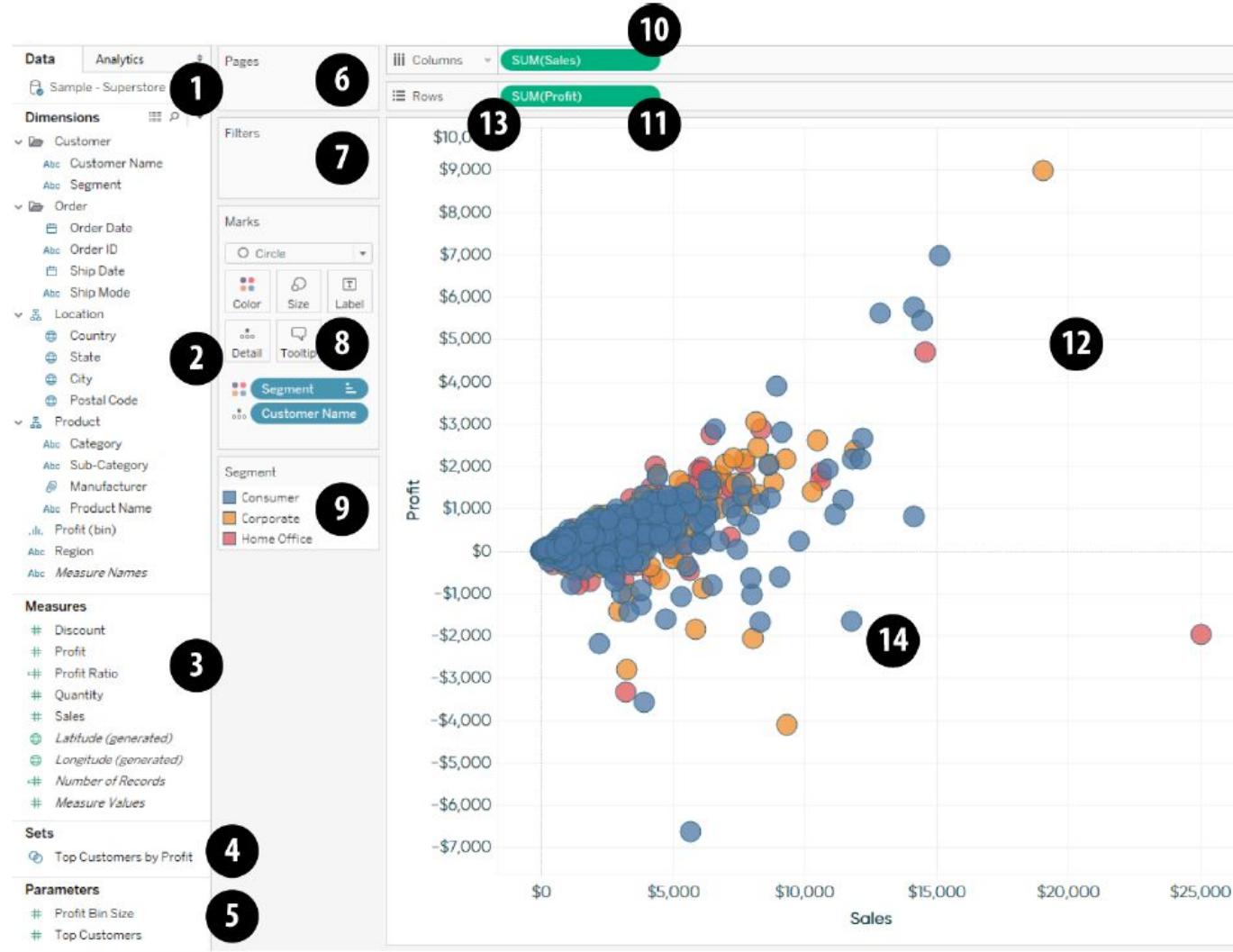
*Become a* **Tableau Desktop Specialist**

Prepared by- Muskaan Gupta

Prepared for the exclusive use of SMUBIA Tableau Certification Program



## Tableau- Terminology



## Terminology



- 1. Data Sources:** Displays all of the data connections in the workbook.
- 2. Dimensions area of the Data pane:** A list of all of the fields in the data source classified as dimensions.
- 3. Measures area of the Data pane:** A list of all the fields in the data source classified as measures.
- 4. Sets area of the Data pane:** If the data source you are using contains at least one set, or if you have created one or more sets, they will show up here.
- 5. Parameters area of the Data pane:** If the workbook you are using contains at least one parameter, or if you have created one or more parameters, they will show up here.

## Terminology

---

**6. Pages Shelf:** This allows you to “flip” through each dimension and/or add animation to a view. Eg: You can put Month of Order Date on the Pages Shelf and rotate the view one month at a time.

**7. Filters Shelf:** Any dimension or measure that you filter a view by.

**8. Marks Card:** Each square in this area is called a Marks Card because they influence the marks on the view. Depending on the chart type you are creating, additional cards will show up, such as for Shape or Path.

**9. Legend:** There are several different legends that will appear here to show how the marks are encoded, including Color, Size, and Shape.

**10. Columns Shelf:** Fields placed here will create columns on the view.

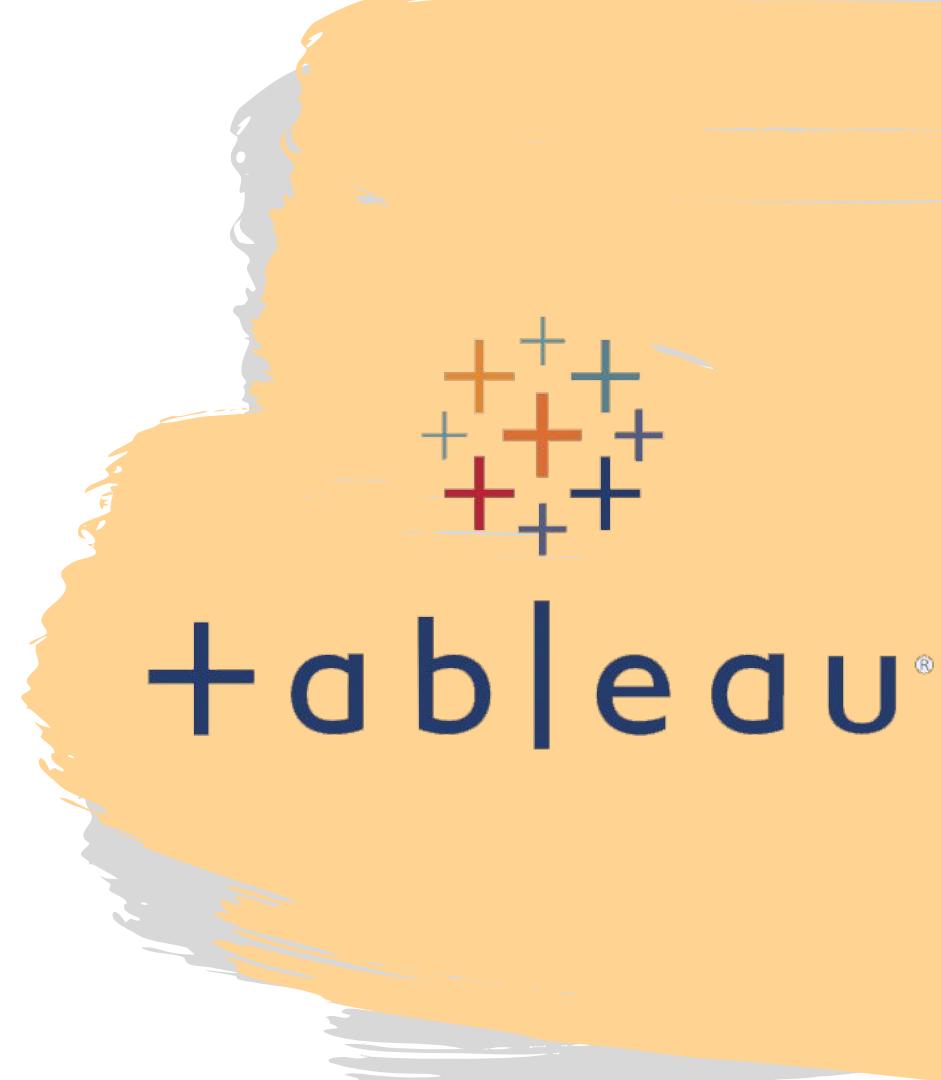
**11. Rows Shelf:** Fields placed here will create rows on the view.

## Terminology

---

- 12. Worksheet/View:** Each tab in a Tableau workbook is called a worksheet and the area that displays a data visualization is a view.
- 13. “Pill”:** A term for fields being used on a worksheet.
- 14. Mark:** Each data point on the view.
- 15. Show Me (not pictured):** When you click Show Me in the upper-right corner of the interface, you will see thumbnails for 24 different chart types. If you are using a combination of dimensions and measures required to create each respective chart, the thumbnail will be in color; otherwise it will be grayed out. Clicking a full-color thumbnail will draw that visualization with the combination of fields you are using.

## Tableau- Products Offered



## Products



1. Both the **Personal and Professional** versions have the same free development capabilities, but the **Professional** version provides access to every data type and distribution channel currently available.
2. **Tableau Reader** is another free product that allows you to open and interact with Tableau workbooks, but not develop them.
3. **Tableau Public** provides free development capabilities as well. However, the workbooks have to be saved to Tableau Public Cloud, making this an unsuitable for proprietary business data.

## Products



**4. Tableau Server** provides a central repository for all your Tableau workbooks that can be accessed by your business users via a web browser. It has data refresh capabilities and a way for organizations to keep its data on premise for tighter security. It requires additional user licenses, even if one already has a Tableau Desktop license.

**5. Tableau Online** is similar to Tableau Server, but it is hosted via a third-party partner of Tableau. This product still has the advantages of cloud distribution and automatic refreshes, but it is hosted off premise, which can result in security challenges. Like Tableau Server, Tableau Online requires additional per-user licensing.



# CHECKLIST

Materials you should know before attempting the test

1. Connecting & Preparing Data

2. Exploring & Analyzing Data

3. Sharing Insights

4. Understanding Tableau Concepts

5. Timeliness



+ a b | e d u

## 1) Connecting and Prepping Data

# 1. Connecting & Preparing Data

## Create and save data connections

- Create a live connection to a data source
- Explain the differences between using live connections versus extracts
- Create an extract
- Save metadata properties in a .TDS

## Modify Data Connections

- Add a join
- Add a blend
- Add a union
- What are join, blend, union?
- What is the difference?

## Manage Data Properties

- Rename a data field
- Assign an alias to a data value
- Assign a geographic role to a data field
- Change data type for a data field (number, date, string, boolean, etc.)
- Change default properties for a data field (number format, aggregation, color, dateformat)

# 1. Connecting & Preparing Data

Create and save data connections

**Connect**

To a File

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

To a Server

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

Saved Data Sources

- Sample - Superstore
- World Indicators

Search

Tableau Server	Intuit QuickBooks Online	Spark SQL
Amazon Athena	Intuit QuickBooks Online (9.3-2018.1)	Teradata
Amazon Aurora	Kognitio	Vertica
Amazon EMR Hadoop Hive	MapR Hadoop Hive	Web Data Connector
Amazon Redshift	MariaDB	
Anaplan	Marketo	Other Databases (JDBC)
Apache Drill	MemSQL	Other Databases (ODBC)
Aster Database	Microsoft SQL Server	
Azure SQL Data Warehouse	MongoDB BI Connector	
Box	MySQL	
Cloudera Hadoop	OData	
Denodo	OneDrive	
Dropbox	Oracle	
Exasol	Oracle Eloqua	
Firebird	Pivotal Greenplum Database	
Google Ads	PostgreSQL	
Google Analytics	Presto	
Google BigQuery	Salesforce	
Google Cloud SQL	SAP HANA	
Google Drive	ServiceNow ITSM	
Google Sheets	SharePoint Lists	
Hortonworks Hadoop Hive	Snowflake	

## Connections Supported

...

## 1. Connecting & Preparing Data

Create and save data connections

# Live connection vs Data Extracts

Connection  
 Live  Extract

## LIVE CONNECTION

Useful in situations:

- Real-time decisions (eg: hospital monitoring incoming patient levels)
- Daily/weekly trend monitoring
- Working with large datasets or datasets held on powerful, in-memory databases.

Live connections also offer the best security in most large organizations.

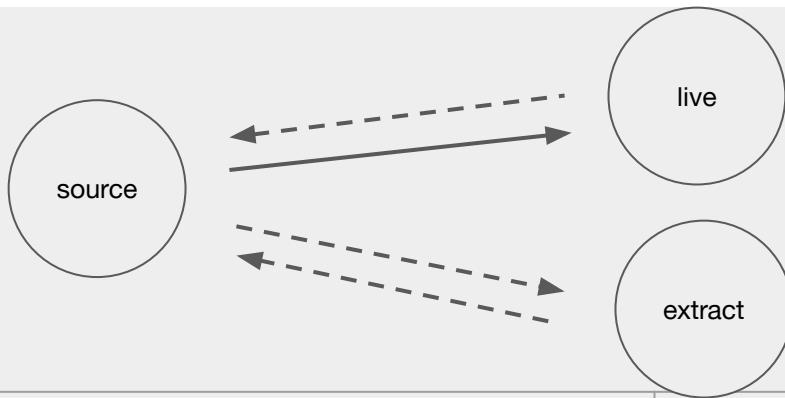
## TABLEAU DATA EXTRACTS-TDE

TDE is an in-memory technology to ensure fast loading of data stored in the software. Extracts have to be refreshed periodically so that you are working with the latest data possible.

**Defined:** A Tableau data extract is a compressed snapshot of data stored on disk and loaded into memory as required to render a Tableau viz

# 1. Connecting & Preparing Data

Create and save data connections



1. Changes in Original Source will affect Tableau: live connections but not affect extracts.
2. Changes in Tableau will not affect original source.

		Affects		
		Original Source	Tableau: Live Connection	Tableau: Extract
Changes in	Original Source	-	Yes	No
	Tableau: Live Connection	No	-	-
	Tableau: Extract	No	-	-

## 1. Connecting & Preparing Data

### Modify Data Connections

# Join, Union & Blend- Inner Join

Join Type	Result	Description
Inner	When you use an inner join to combine tables, the result is a table that contains values that have matches in both tables.	

## 1. Connecting & Preparing Data

### Modify Data Connections

# Join, Union & Blend- Left Join

Join Type	Result	Description
Left	<p>When you use a left join to combine tables, the result is a table that contains all values from the left table and corresponding matches from the right table.</p> <p>When a value in the left table doesn't have a corresponding match in the right table, you see a null value in the data grid.</p>	

## 1. Connecting & Preparing Data

### Modify Data Connections

# Join, Union & Blend- Right Join

Join Type	Result	Description
Right	<p>When you use a right join to combine tables, the result is a table that contains all values from the right table and corresponding matches from the left table.</p> <p>When a value in the right table doesn't have a corresponding match in the left table, you see a null value in the data grid.</p>	

## 1. Connecting & Preparing Data

### Modify Data Connections

# Join, Union & Blend- Full Outer Join

Join Type	Result	Description
Full outer	<p>When you use a full outer join to combine tables, the result is a table that contains all values from both tables.</p> <p>When a value from either table doesn't have a match with the other table, you see a null value in the data grid.</p>	

## 1. Connecting & Preparing Data

### Modify Data Connections

# Join, Union & Blend- Union

- Union: <https://help.tableau.com/current/pro/desktop/en-us/union.htm>
- Blending and working across multiple blended data sources and links  
[https://help.tableau.com/current/pro/desktop/en-us/multiple\\_connections.htm](https://help.tableau.com/current/pro/desktop/en-us/multiple_connections.htm)
- Cross Database Joins  
<https://www.tableau.com/about/blog/2016/7/integrate-your-data-cross-database-joins-56724>

# 1. Connecting & Preparing Data

## Manage Data Properties

### Assign an alias to a data value

The screenshot shows a data grid with columns for Order ID, Order Date, Ship Date, and Ship Mode. A context menu is open over the 'Ship Mode' column, listing options like Rename, Copy Values, Hide, Aliases..., Create Calculated Field..., Create Group..., Split, Custom Split..., Pivot (select multiple fields), and Describe... . The 'Aliases...' option is highlighted with a blue selection bar. To the right, a modal dialog titled 'Edit Aliases [Ship Mode]' displays a table with three rows: First Class (Has Alias: \* Value (Alias): 1), Second Class (Has Alias: \* Value (Alias): 2), and Same Day (Value (Alias): Same Day). The 'Standard Class' row is selected. The 'OK' button at the bottom right of the dialog is also highlighted with a blue selection bar.

Abc Orders Order ID	Orders Order Date	Orders Ship Date	Abc Orders Ship Mode
CA-2017-152156	11/8/2017	11/11/2017	Second Class
CA-2017-152156	11/8/2017	11/11/2017	Second Class
CA-2017-138688	6/12/2017	6/16/2017	Second Class
US-2016-108966	10/11/2016	10/18/2016	Standard Class
US-2016-108966	10/11/2016	10/18/2016	Standard Class
CA-2015-115812	6/9/2015	6/14/2015	Standard Class
CA-2015-115812	6/9/2015	6/14/2015	Standard Class

Sort fields Data source order

Show

Abc  
Orders  
Ship Mode

- Rename
- Copy Values
- Hide
- Aliases...**
- Create Calculated Field...
- Create Group...
- Split
- Custom Split...
- Pivot (select multiple fields)
- Describe...

Edit Aliases [Ship Mode]

Member	Has Alias	Value (Alias)
First Class	*	1
Second Class	*	2
Same Day		Same Day
Standard Class		Standard Class

**OK**      **Cancel**

# 1. Connecting & Preparing Data

## Manage Data Properties

### Assign a geographic role to a data field

Orders	Country	Postal Code	Region
United States		42420	South
United States		42420	South
United States			
United States			
United States	Los Angeles	California	
United States	Los Angeles	California	

A screenshot of a data management interface showing a context menu for a "Country" field. The menu includes options like Number (decimal), Number (whole), Date & Time, Date, String, Boolean, Default, and Geographic Role. The "Geographic Role" option is selected and highlighted in blue. A secondary dropdown menu for "Geographic Role" lists City, Congressional District (U.S.), CBSA/MSA (U.S.), Area Code (U.S.), Airport, and None. The "City" option is also highlighted in blue and has a cursor arrow pointing towards it.

# 1. Connecting & Preparing Data

## Manage Data Properties

### Change data type for a data field (number, date, string, boolean, etc.)

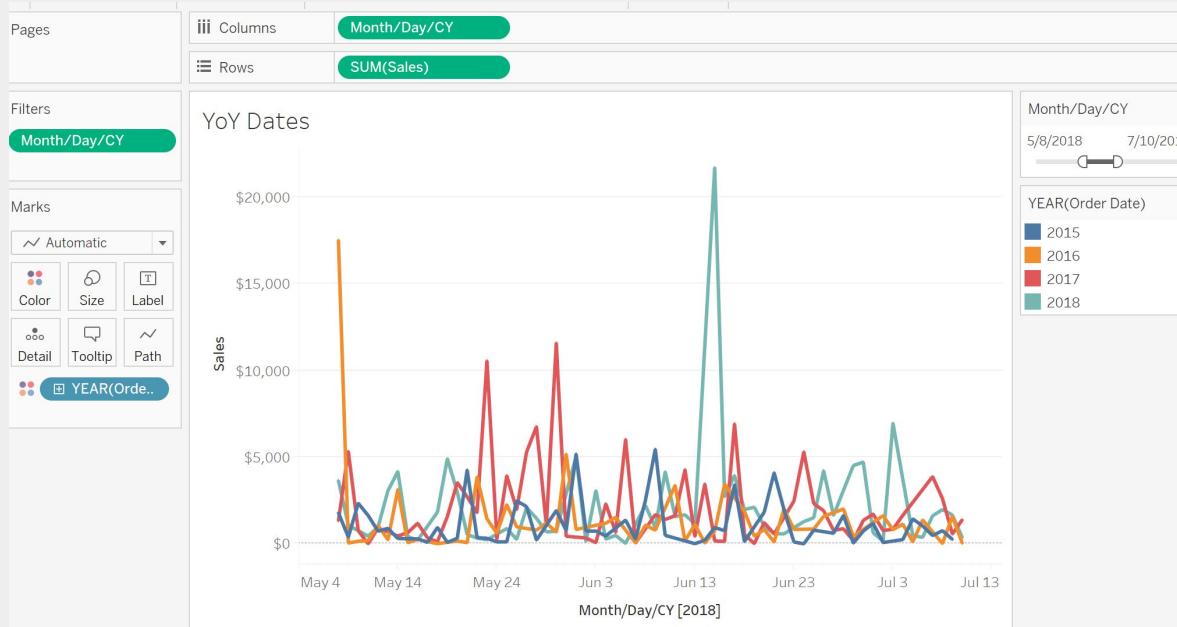
Abc Orders <b>Order ID</b>	Date	Date	Abc Orders <b>Ship Mode</b>
CA-2017-152156	1/2017		Second Class
CA-2017-152156	1/2017		Second Class
CA-2017-138688	/2017		Second Class
US-2016-108966	8/2016		Standard Class
US-2016-108966	10/11/2016	10/18/2016	Standard Class
CA-2015-115812	6/9/2015	6/14/2015	Standard Class
CA-2015-115812	6/9/2015	6/14/2015	Standard Class

A screenshot of a Microsoft Excel-like application showing a data table. The 'Order ID' column is selected, indicated by a dashed red border around its cells. A context menu is open over the first cell in this column, listing several data types: 'Number (decimal)', 'Number (whole)', 'Date & Time', 'Date', 'String', and 'Boolean'. The 'Date' option is highlighted with a blue selection bar and a black dot. Below the menu, there is a checked checkbox labeled 'Default'. The rest of the table contains various order IDs and their corresponding dates and ship modes.

# 1. Connecting & Preparing Data

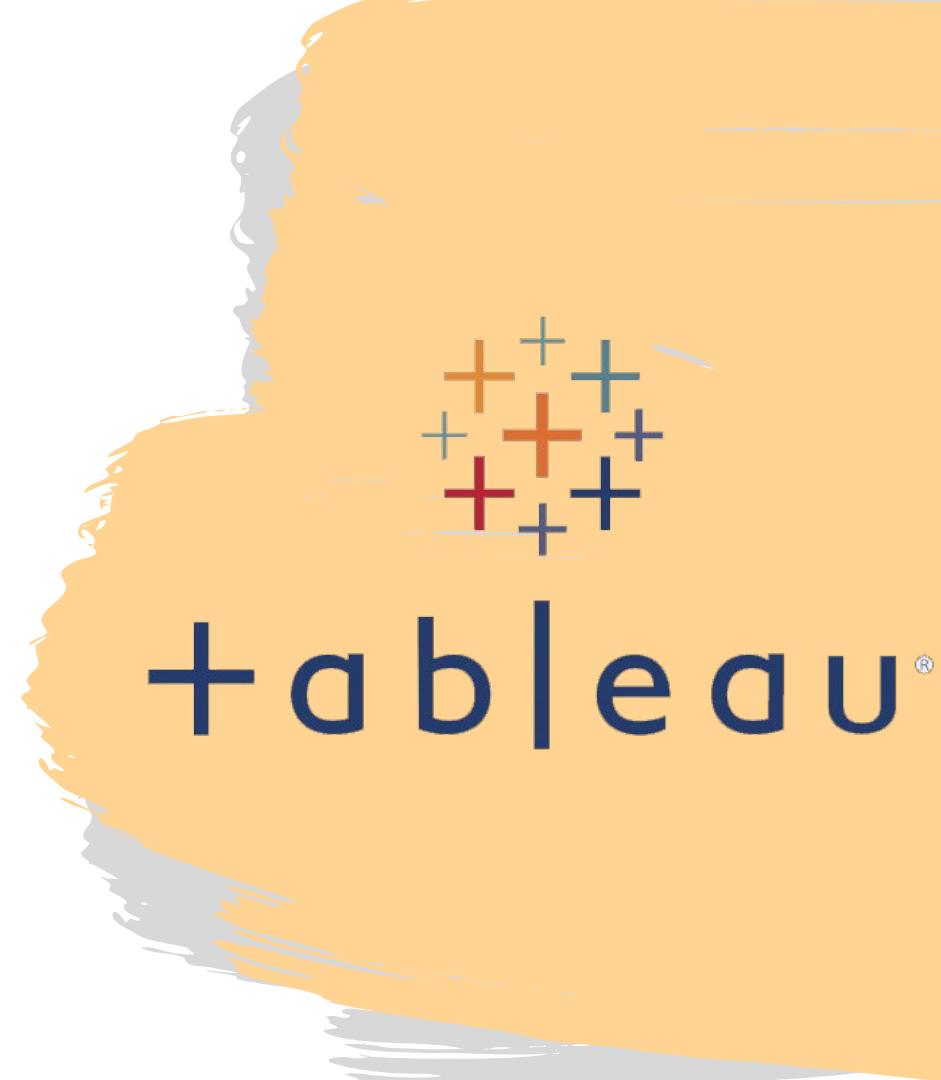
## Manage Data Properties

### Year over Year Dates



**Create Calculated Field: Month/Day/CY=**  
DATE(STR(MONTH([Order Date]))+"/"+STR(DAY([Order Date]))+"/2018")

## 2) Exploring and Analyzing Data



## 2. Exploring & Analyzing Data

### Create Basic Charts

- Create a bar chart
- Create a line chart
- Create a scatter plot
- Create a map using geographic data
- Create a combined axis chart
- Create a dual axis chart
- Create a stacked bar
- Create a chart to show specific values (crosstab, highlight tables)

### Organize data and apply filters

- Create a visual group
- Create a group using labels
- Create a set**
- Organize dimensions into a hierarchy
- Add a filter to the view
- Add a context filter
- Add a date filter

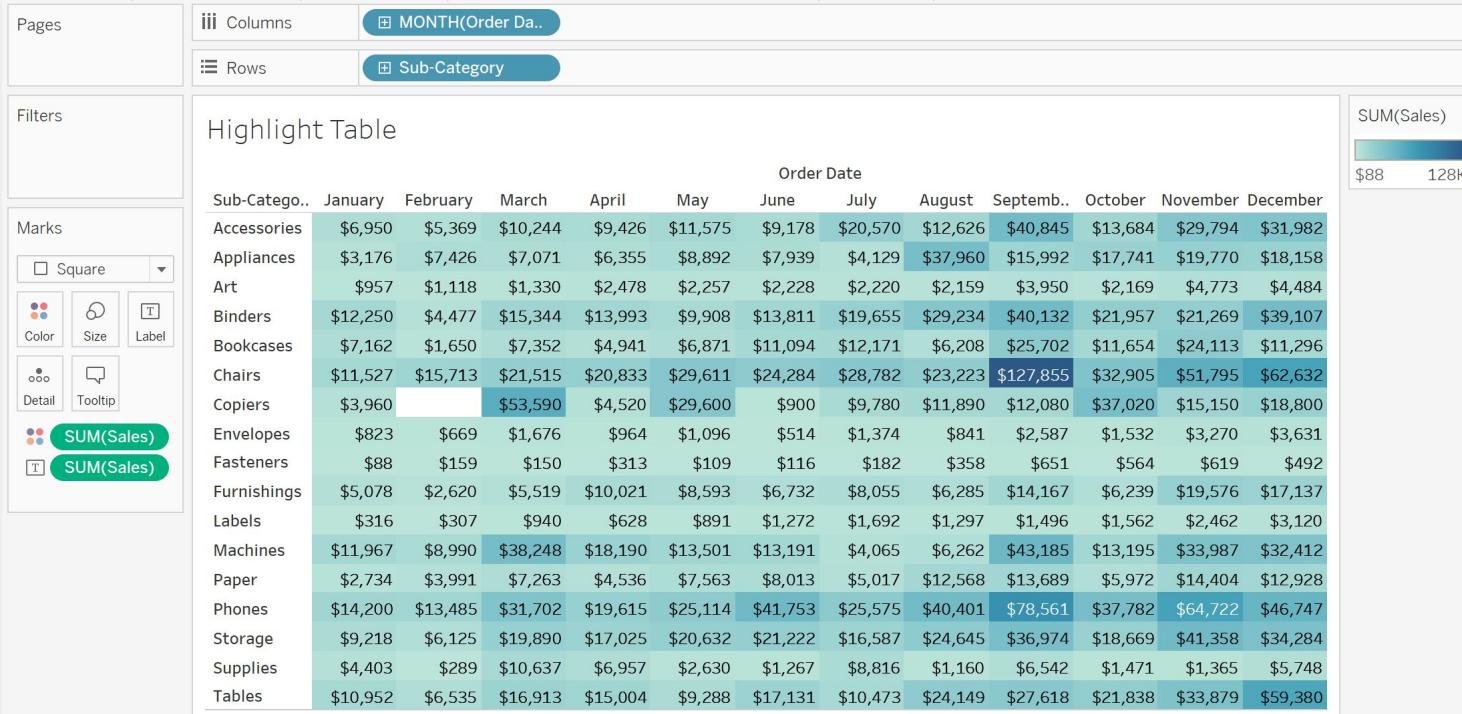
### Apply Analytics to a worksheet

- Add a manual or a computed sort
- Add a reference line or trend line**
- Use a table calculation
- Use bins and histograms
- Create a calculated field (e.g. string, date, simple arithmetic)
- Add a parameter

## 2. Exploring & Analyzing Data

### Create Basic Charts

# Highlight Tables



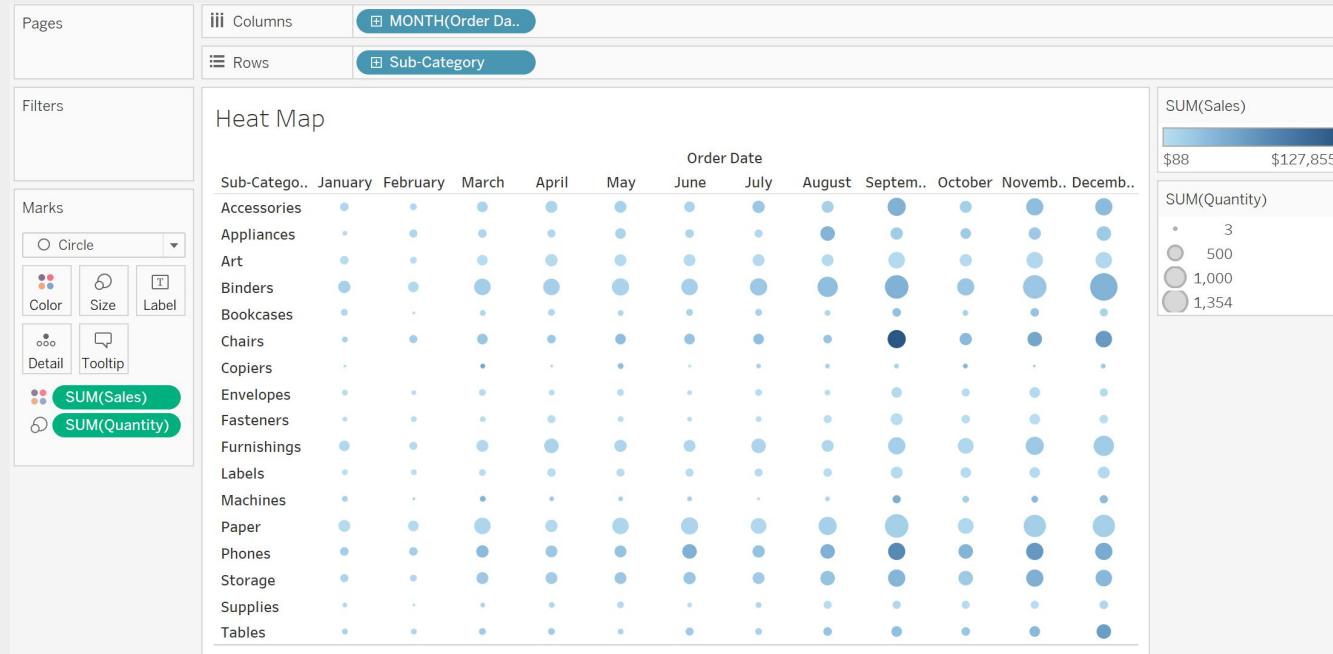
## 2. Exploring & Analyzing Data

### Create Basic Charts

**Advantage of using Heatmaps: Allows for extra encoding.**

**Example:** Large and light circles mean that the sub-category sold a large quantity but made low revenue: low sales per item. Conversely, small and dark circles mean the sub-category sold a small quantity, but made high revenue: high sales per item.

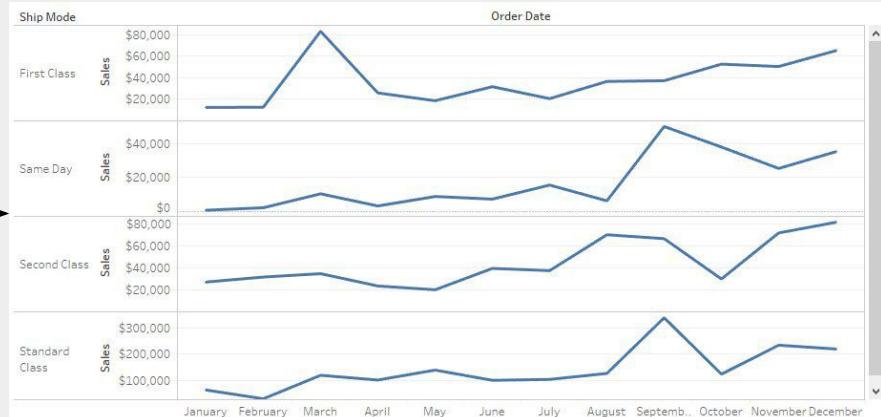
## Heat Maps



## 2. Exploring & Analyzing Data

### Create Basic Charts

# Independent Axis Ranges

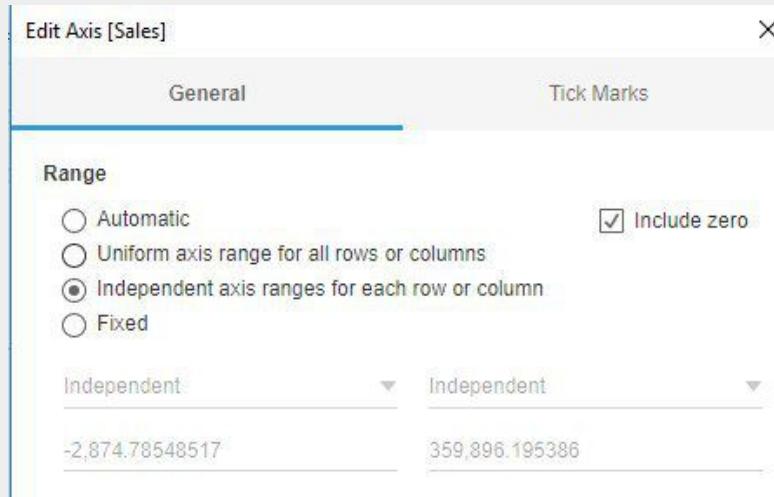


By default, each row shares the same axis range, which is the largest range across all four ship modes. This provides an apples-to-apples comparison across the four rows. However, it can be difficult to see the trends for each individual row.

## 2. Exploring & Analyzing Data

### Create Basic Charts

# Independent Axis Ranges



If you want the axes to have their own axis range, right-click any of the axes and choose “Edit axis.”

## 2. Exploring & Analyzing Data

### Create Basic Charts

# Dual Axis Ranges



## 2. Exploring & Analyzing Data

### Create Basic Charts

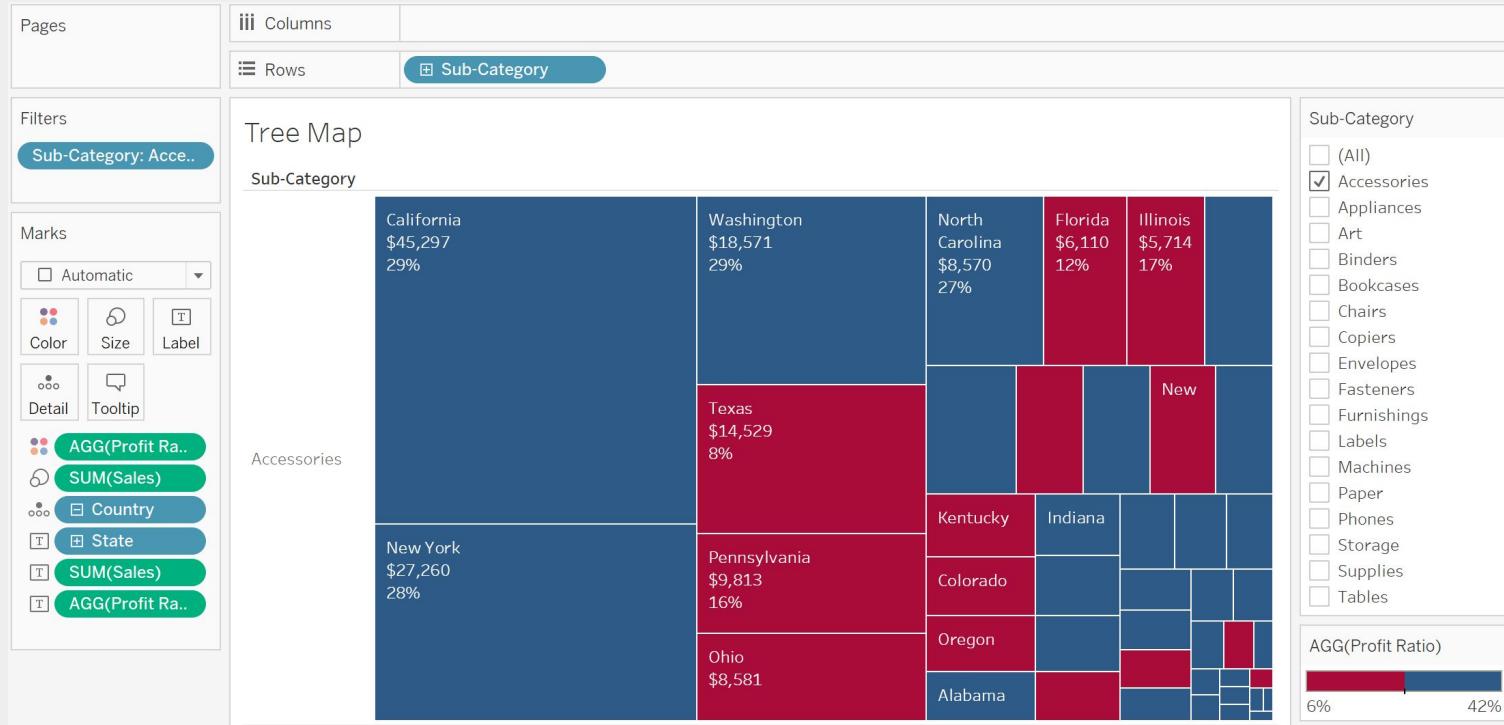
# Tree Maps



## 2. Exploring & Analyzing Data

### Create Basic Charts

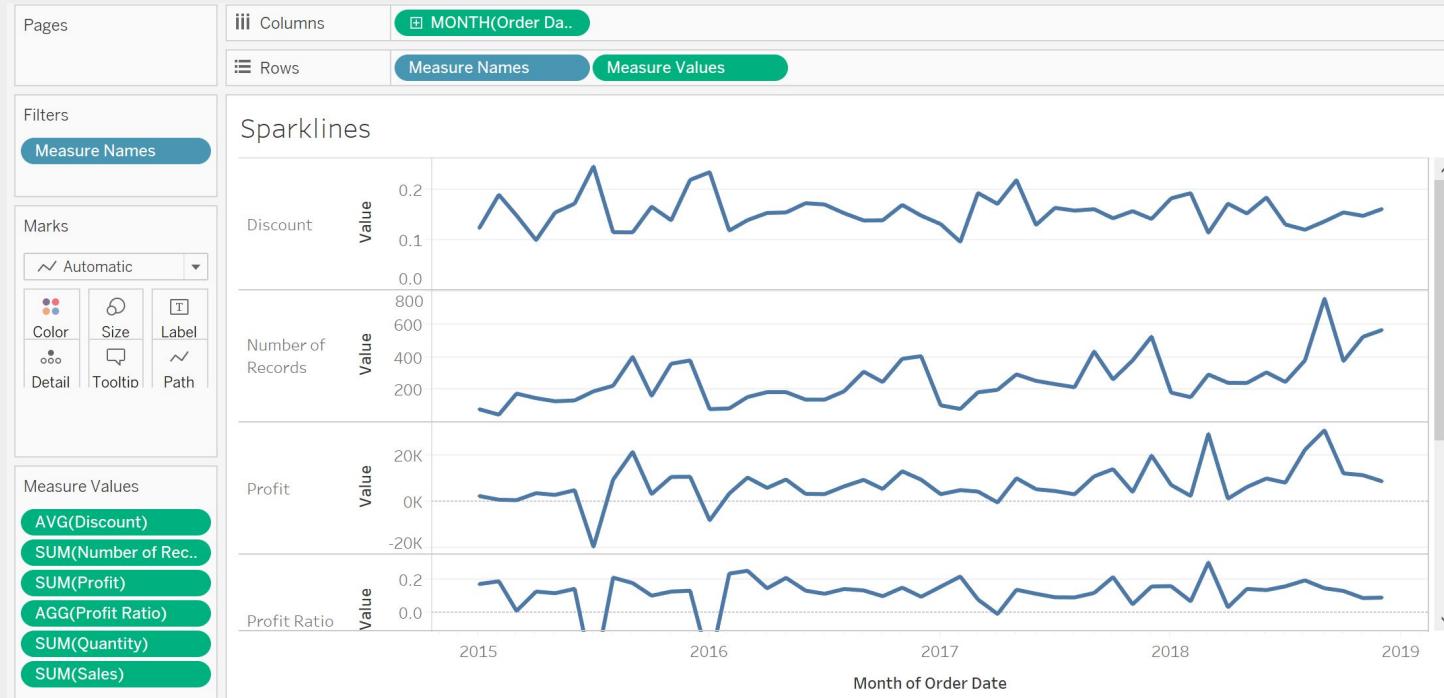
# Tree Maps- more granular



## 2. Exploring & Analyzing Data

### Create Basic Charts

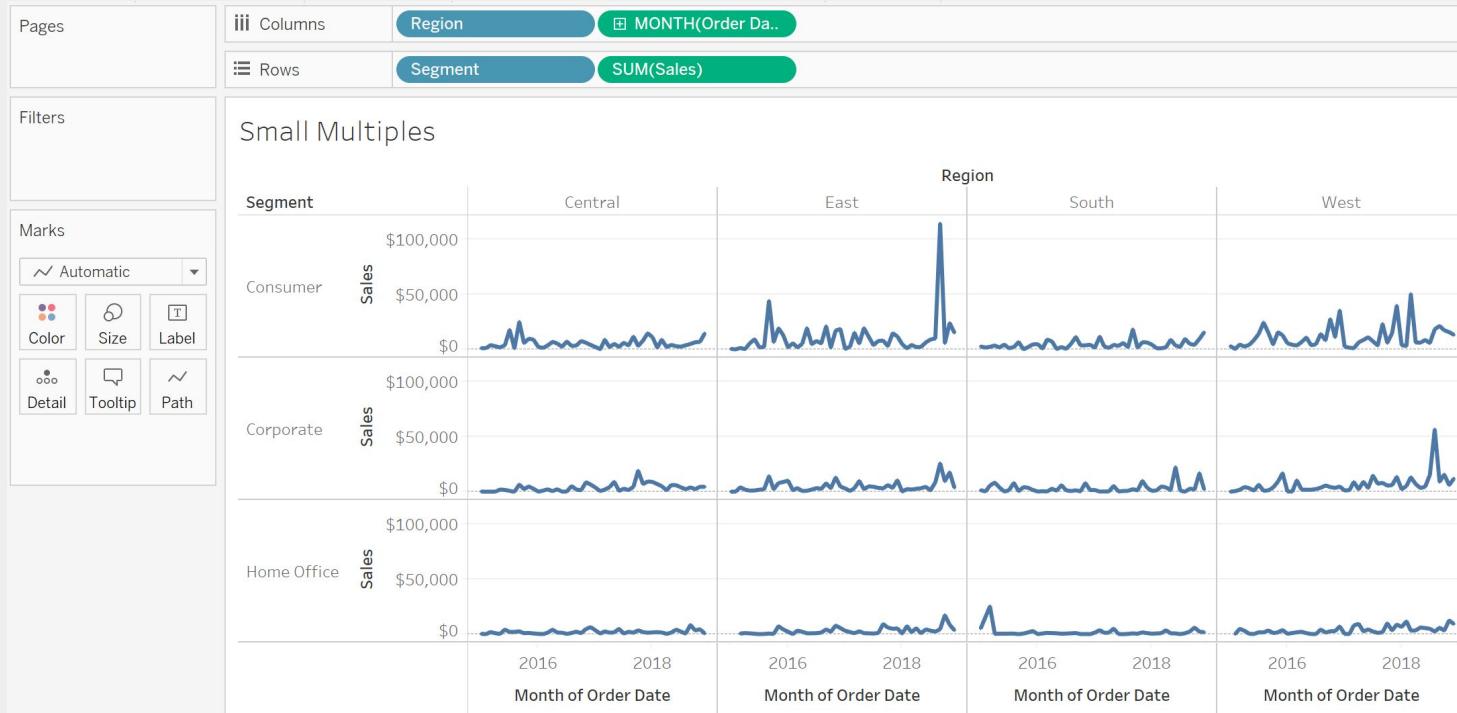
# Sparklines



## 2. Exploring & Analyzing Data

### Create Basic Charts

# Create Small Multiples



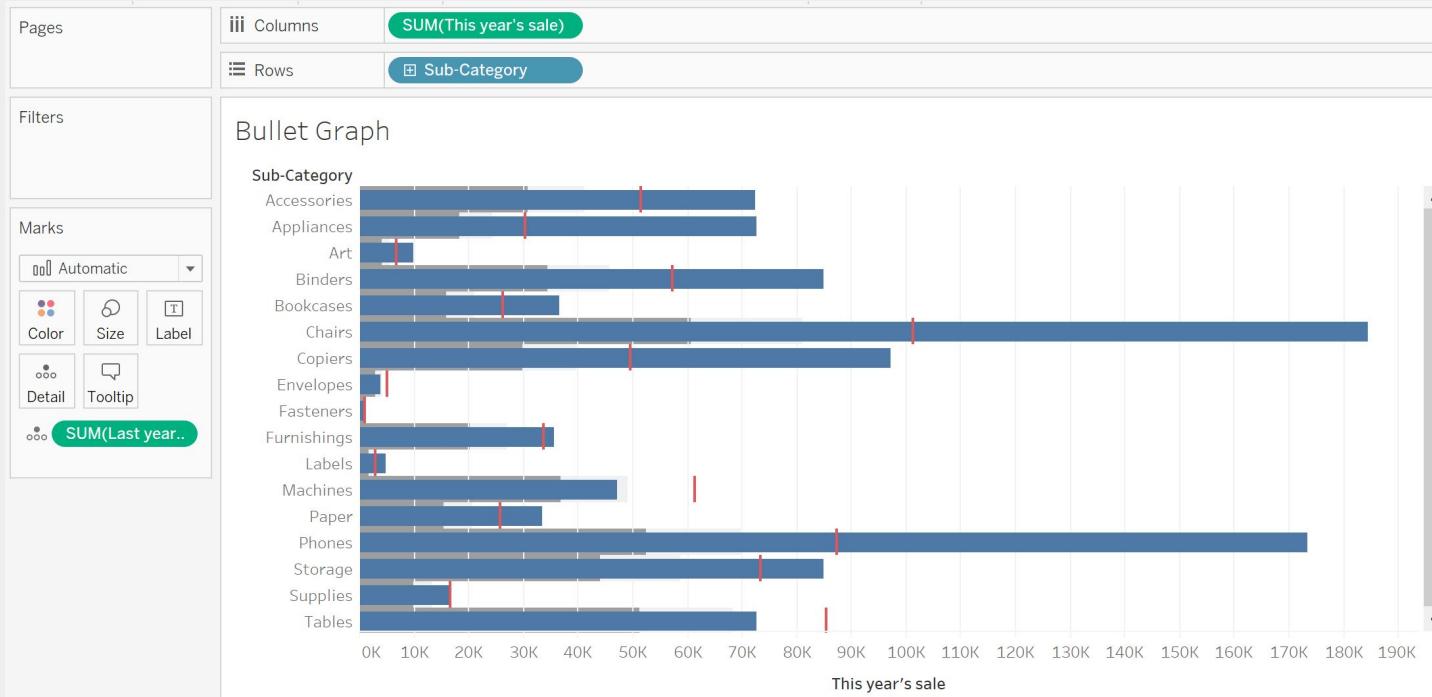
## 2. Exploring & Analyzing Data

### Create Basic Charts

# Bullet Graphs

Create two fields:

- This year's sale= IF  
YEAR([Order Date]) = 2018  
THEN [Sales]  
END
- Last year's sale



## 2. Exploring & Analyzing Data

### Create Basic Charts

# Bullet Graphs- Steps

Edit Reference Line, Band, or Box



Scope  Entire Table  Per Pane  Per Cell

Line

Value:   Label:

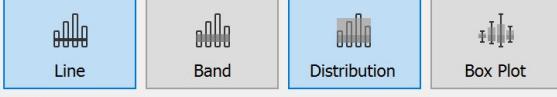
Line only

Formatting

Line:  Fill Above:  Fill Below:

Show recalculated line for highlighted or selected data points

Edit Reference Line, Band, or Box



Scope  Entire Table  Per Pane  Per Cell

Computation

Value:  Label:

Formatting

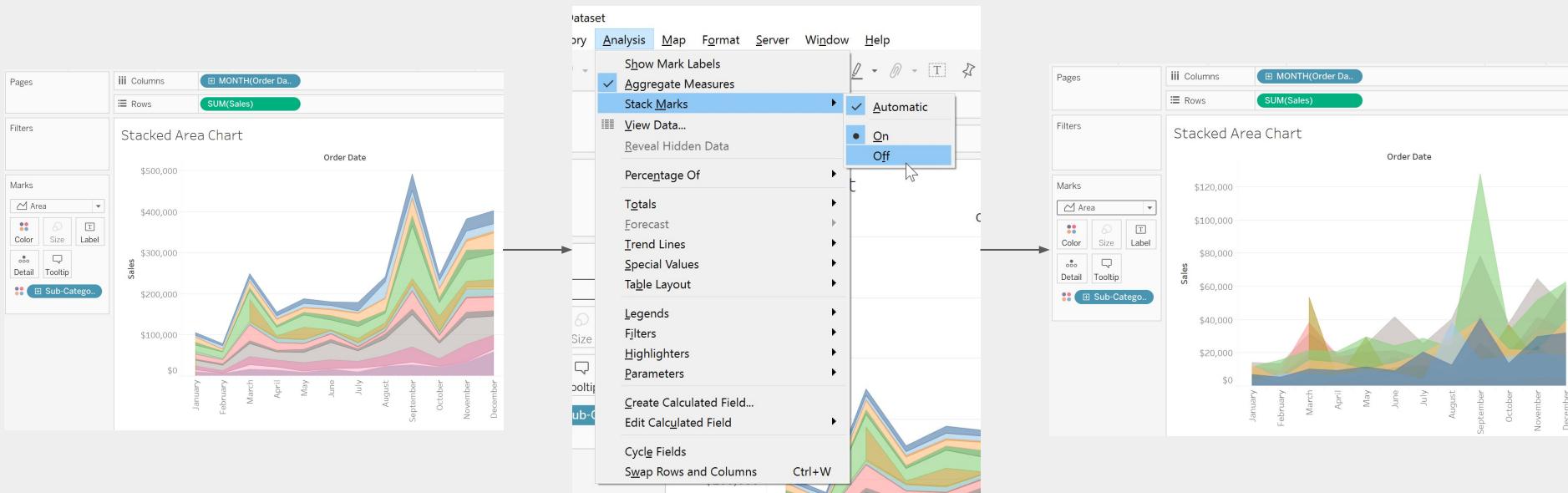
Line:  Fill Above:  Fill Below:  Gray Dark  Symmetric  Reverse

Show recalculated band for highlighted or selected data points

## 2. Exploring & Analyzing Data

### Create Basic Charts

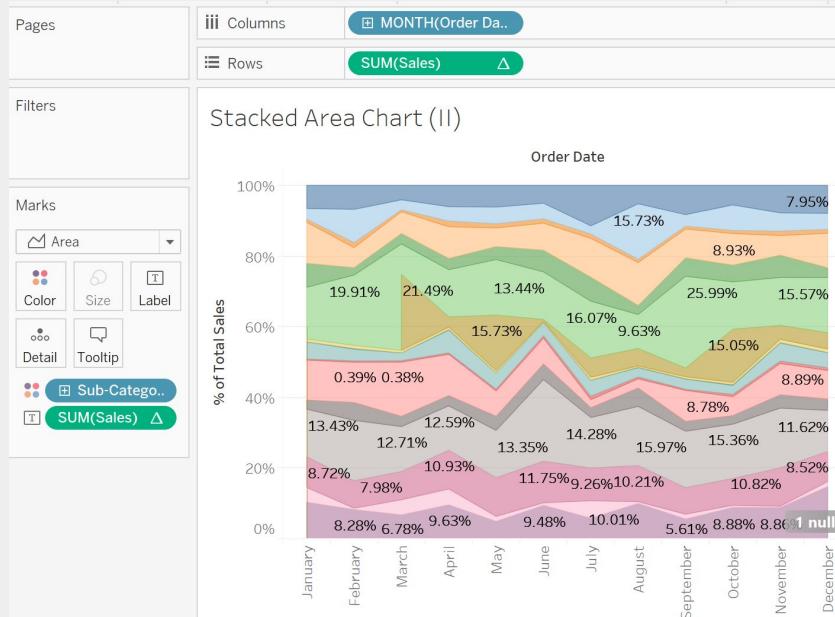
# Stacked Area Chart



## 2. Exploring & Analyzing Data

### Create Basic Charts

#### Stacked Area Chart- % of whole



By default, Tableau computes table calculations across the table. For the axis to total 100% and the areas to represent each dimension member's contribution to each month's total, the table calculation needs to be changed to using Table (down)

## 2. Exploring & Analyzing Data

### Create Basic Charts

# Stacked Area Chart- When to use them?

## When to use?

- When the total axis equals 100% and each individual dimension member is displayed as a percentage of the total.
- This can be achieved by adding a quick table calculation for “Percent of total” to the measure being displayed.

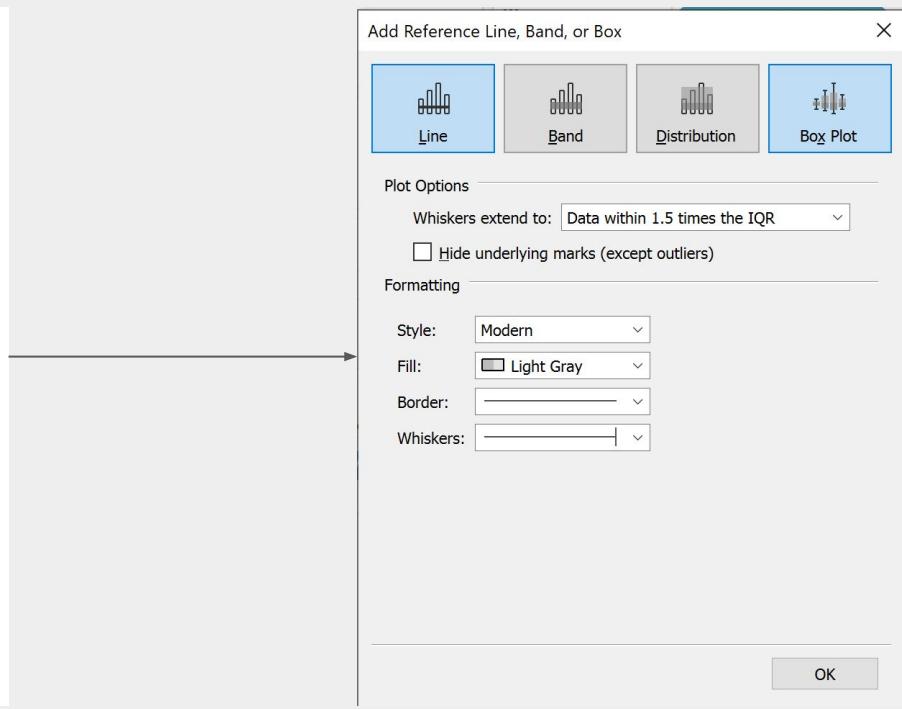
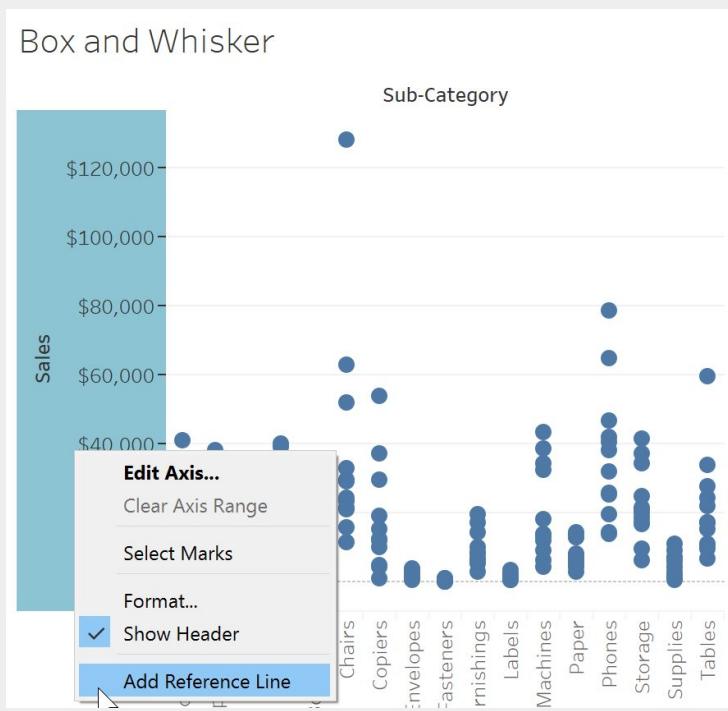
## When to not use?

- Never use them to stack rates, such as a click-through rate, open rate, or another type of conversion that divides a numerator by a denominator.
- This is because the trends are stacked on top of each other, so if you have three dimension members, each with a conversion rate of 5%, the slice on top would display a value of 15%, far from its true 5% performance.

## 2. Exploring & Analyzing Data

### Create Basic Charts

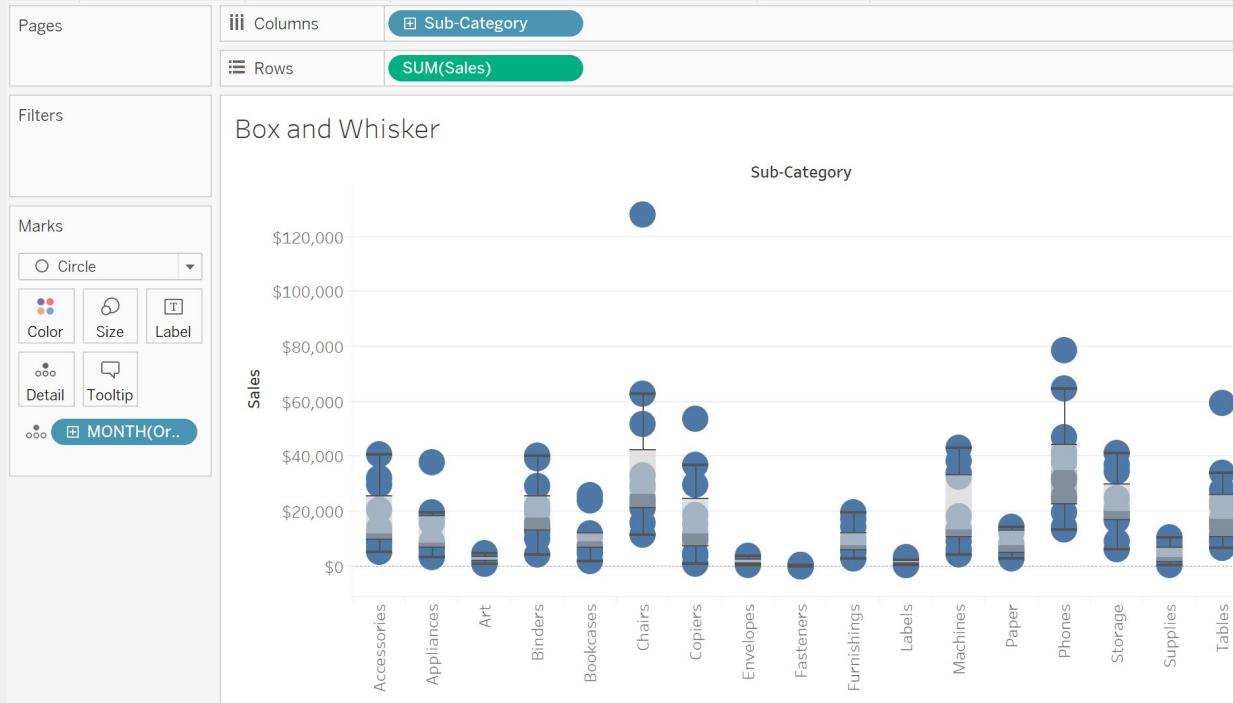
# Box and Whisker Chart- Steps



## 2. Exploring & Analyzing Data

### Create Basic Charts

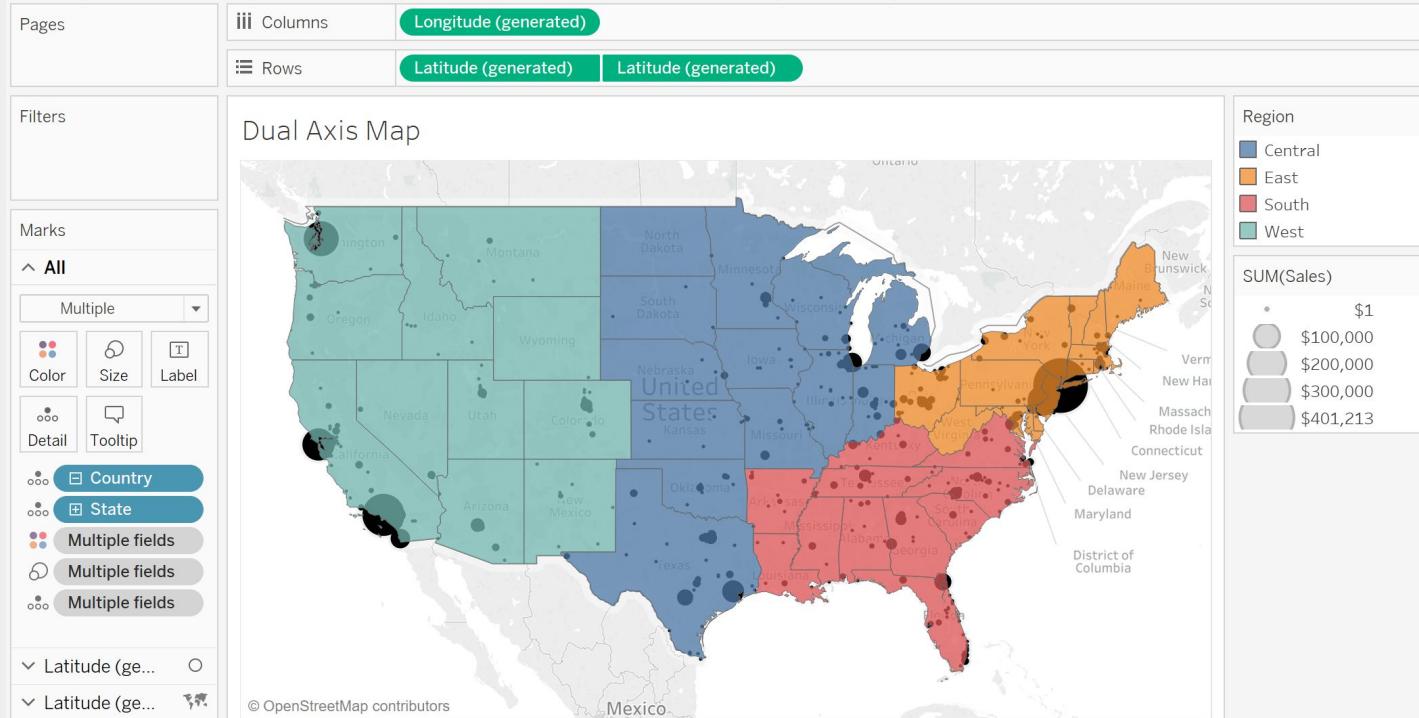
# Box and Whisker Chart



## 2. Exploring & Analyzing Data

### Create Basic Charts

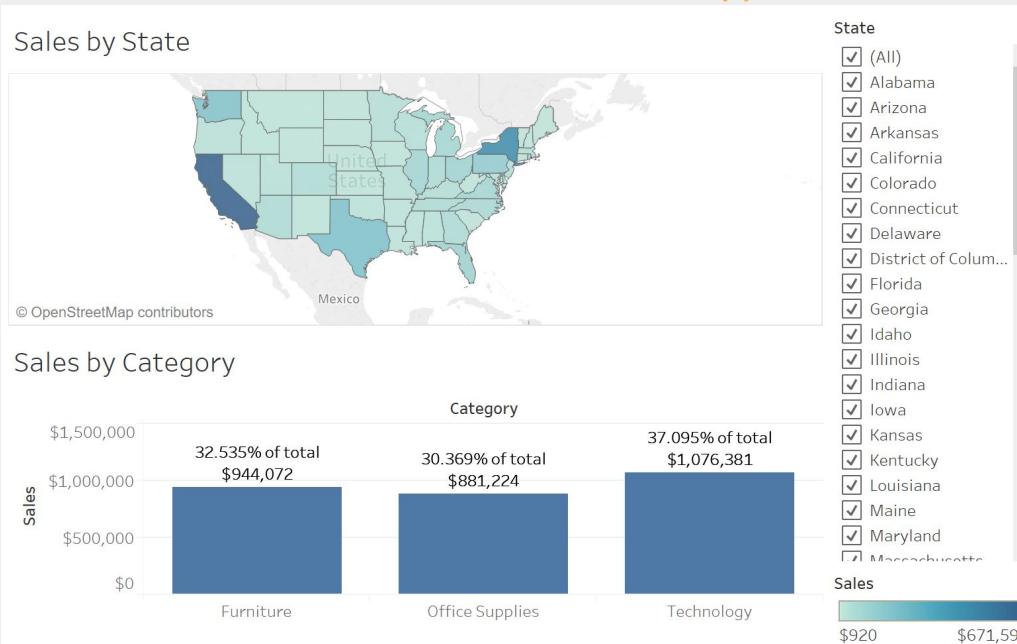
# Dual Axis Maps



## 2. Exploring & Analyzing Data

### Create Basic Charts

# Alternatives to Pie Charts (I)- Bar Charts

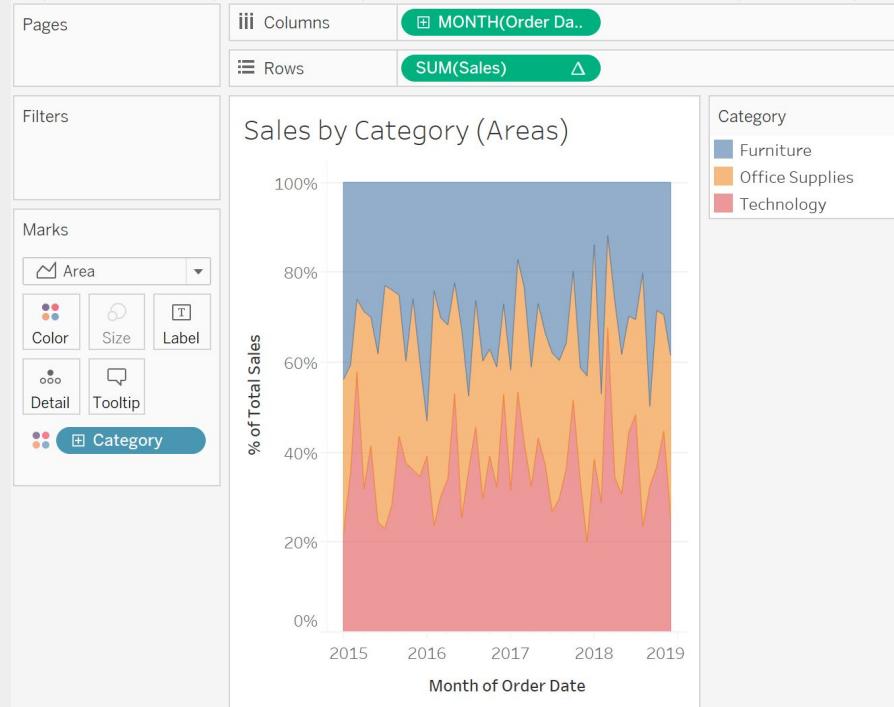
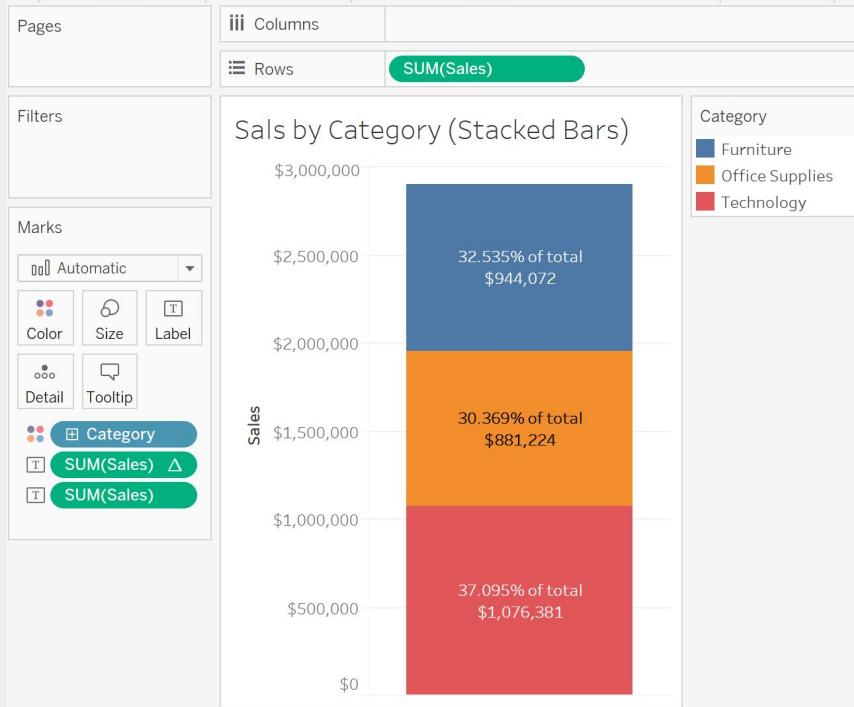


Pie charts should never be used in a time series analysis.

## 2. Exploring & Analyzing Data

### Create Basic Charts

# Alternatives to Pie Charts (II)- Stacked Bars or Areas



## 2. Exploring & Analyzing Data

### Create Basic Charts

# Waterfall Charts



## 2. Exploring & Analyzing Data

### Create Basic Charts

# Pareto Charts- Steps

**Hint:** Create Calculated Field  
Returns = COUNT([Returned] = 'Yes')

Table Calculation  
% of Total Running Sum of Returns X

**Primary Calculation Type**  
Running Total  
Sum

**Secondary Calculation Type**  
Percent of Total  
 Compute total across all pages

**Compute Using**

Table (across)
Cell
<b>Specific Dimensions</b>

<input checked="" type="checkbox"/> Sub-Category
--

Restarting every \_\_\_\_\_

**Compute Using**

Table (across)
Table (down)
Table
Cell
<b>Specific Dimensions</b>

<input checked="" type="checkbox"/> Sub-Category
--

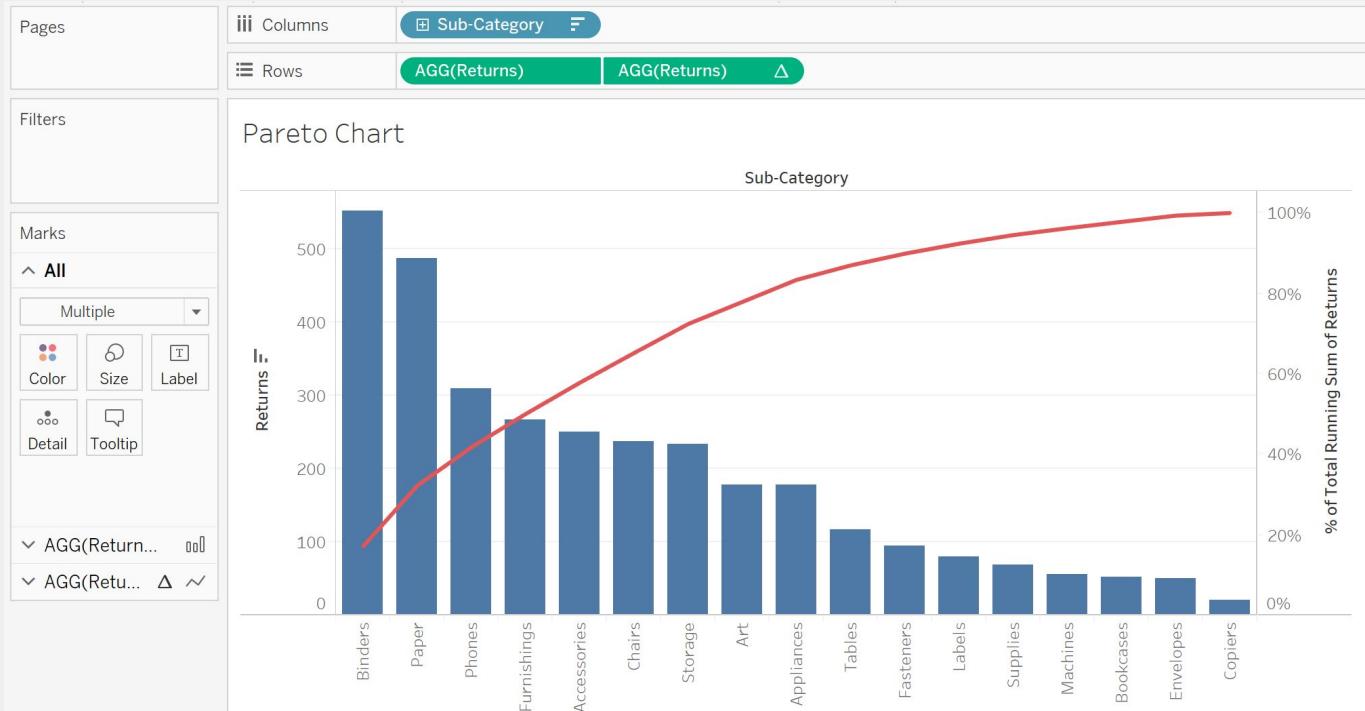
At the level \_\_\_\_\_

Add secondary calculation  
 Show calculation assistance

## 2. Exploring & Analyzing Data

### Create Basic Charts

# Pareto Charts



## 2. Exploring & Analyzing Data

### Create Basic Charts

# Control Charts

Edit Reference Line, Band, or Box X

Line  Band  Distribution  Box Plot

Scope  Entire Table  Per Pane  Per Cell

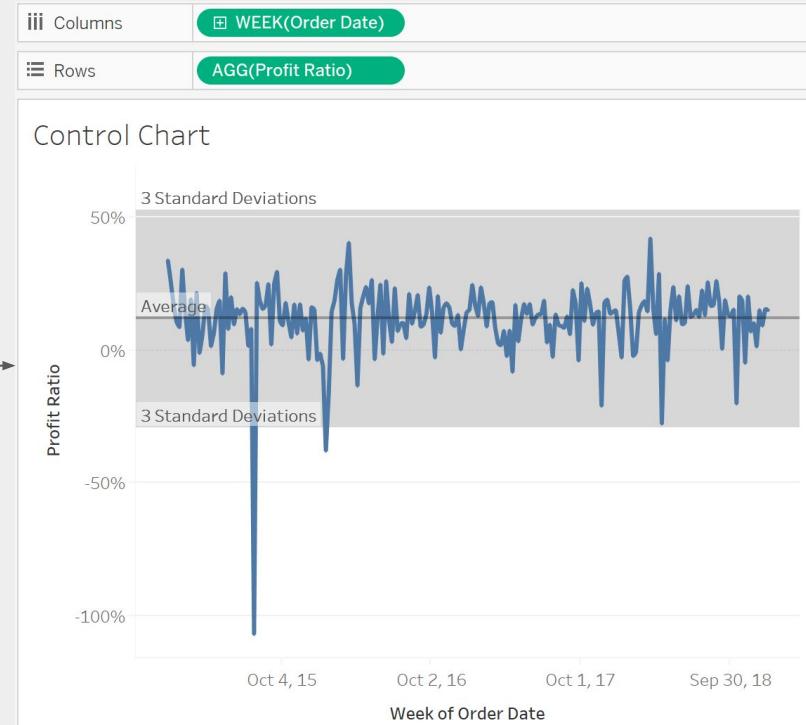
Computation  
Value: -3,3 Standard Deviation -3,3 Standard Deviation

Label: Computation Computation

Formatting  
Line: None None  Fill Above  
Fill: Grey  Fill Below  
 Symmetric

Show recalculated band for highlighted or selected data points

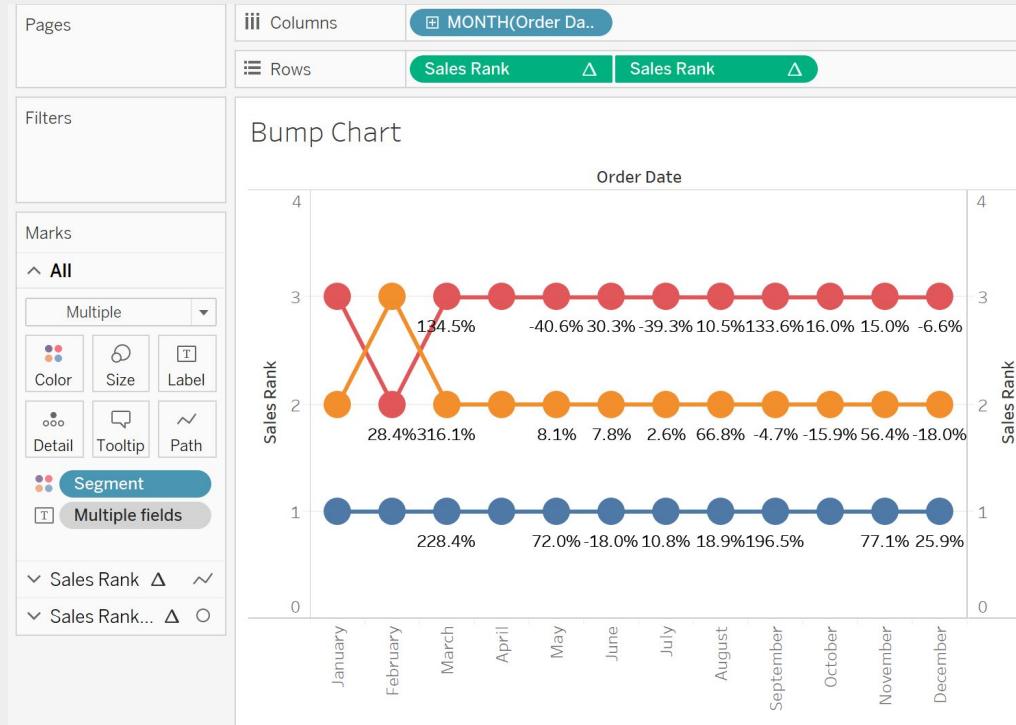
OK



## 2. Exploring & Analyzing Data

### Create Basic Charts

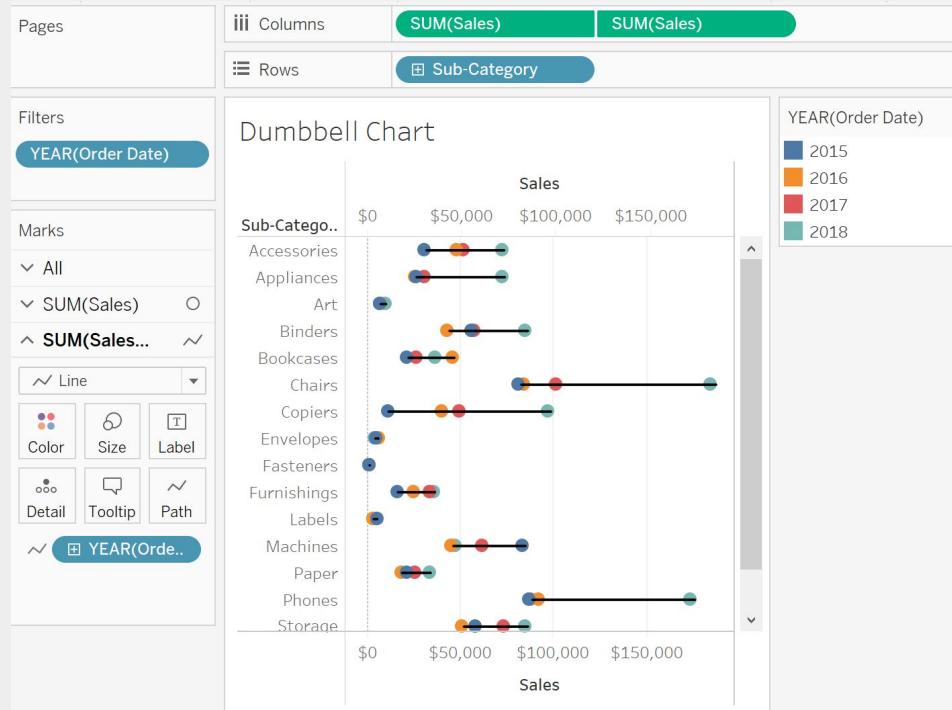
# Bump Charts



## 2. Exploring & Analyzing Data

### Create Basic Charts

# Dumbbell Charts



## 2. Exploring & Analyzing Data

### Create Basic Charts

# Crosstab

#### Uses of Crosstabs:

1. Crosstabs can be used to export raw data
2. Crosstabs can be used to create “**Callout Numbers**”
  - Callout numbers are created in a crosstab view, filtering it down to one number, and formatting the number so that is oversized. These numbers are then placed along the top or left side of a dashboard to provide a natural starting point of an analysis.
3. Crosstabs can be used to create dashboard filters or navigation

## 2. Exploring & Analyzing Data

### Create Basic Charts

#### Crosstab

Pages

Columns: SUM(Sales)

Rows: AGG(Profit Ratio)

Filters

Encoding

Marks

- Automatic
- Color
- Size
- Detail
- Tooltip
- Segment
- Category
- SUM(Sales)
- Customer Name

Detail

Color

Size

Text

Copy

Paste

Rename

Delete

Duplicate

Duplicate as Crosstab

Export...

Hide All Sheets

Unhide All Sheets

Copy Formatting

Paste Formatting

Color

Ratio Encoding

Sales by Customer AOV AOV by Product Sub Categories

Sales: \$2,901,677

Pages

Columns: Measure Names

Rows: Segment Category Customer Name

Filters

Measure Names

Segment Category Customer Name Profit R.. Sales

Segment	Category	Customer Name	Profit R..	Sales
Consumer	Furniture	Aaron Bergman	15%	\$391
		Adam Shillingsburg	14%	\$2,077
		Adrian Barton	-6%	\$1,280
		Aimee Bixby	-88%	\$16
		Alan Barnes	29%	\$131
		Alan Shonely	12%	\$64
		Alejandro Grove	29%	\$1,351
		Alex Avila	43%	\$15
		Alex Grayson	-74%	\$183
		Allen Arnold	39%	\$28
		Allen Goldenen	42%	\$20
		Amy Hunt	-31%	\$1,423
		Andrew Allen	23%	\$475
		Andy Reiter	26%	\$356
		Anemone Ratner	30%	\$52
		Angele Hood	9%	\$303
		Anna Andreadi	17%	\$3,751
		Anna Chung	-4%	\$183
		Anna Gayman	-9%	\$3,272

Detail

Tooltip

Measure Values

AGG(Profit Ratio)

SUM(Sales)

Ratio Encoding

Sales by Customer AOV AOV by Product Sub Categories

Encoding (Crosstab)

Sales

## 2. Exploring & Analyzing Data

Organize data and apply filters

### Sets

**Sets** allow you to isolate specific segments of a dimension, which can then be used in several different ways to find insights in your data.

**They can be thought of as custom segments, but unlike dimension fields, they are always binary.** In other words, you are either in the set or not. Other than that one restriction, sets can be created for just about anything. You can pick individual dimension members to place in a set, have sets be based on quantitative thresholds, created with the top or bottom performing dimension members, and more.

**Question:** Create a set to represent the top 20 customers by highest Sales.

## 2. Exploring & Analyzing Data

Organize data and apply filters

### Use cases of Sets

- 1) As a filter
- 2) To encode marks (**Try:** Show top 20 customers by sale on a scatter plot of Profit ratio and Quantity)
- 3) In calculated fields
- 4) As dimension fields (Used to **slice and dice**)
- 5) Within a custom hierarchy

## 2. Exploring & Analyzing Data

Organize data and apply filters

### Date Hierarchies

The screenshot illustrates the creation of a date hierarchy in Tableau. At the top, under 'Columns', a blue pill labeled 'YEAR(Order Date)' is selected. Below it, under 'Rows', a green pill labeled 'SUM(Sales)' is selected. A downward arrow points from the top interface to the bottom interface, indicating the progression of steps. In the bottom interface, the 'Columns' shelf now contains four blue pills: 'YEAR(Order Date)', 'QUARTER(Order ..)', 'MONTH(Order Da..)', and 'DAY(Order Date)'. The 'Rows' shelf still contains the green 'SUM(Sales)' pill.

The **blue** YEAR(Order Date) pill shows that date is aggregated by year and is used as a discrete field. Dates in Tableau automatically receive a hierarchy in this order: Year > Quarter > Month > Day.

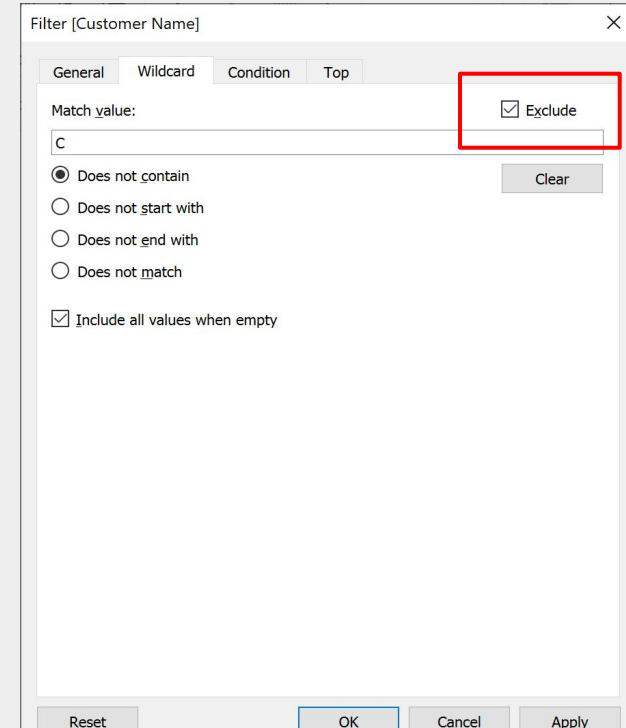
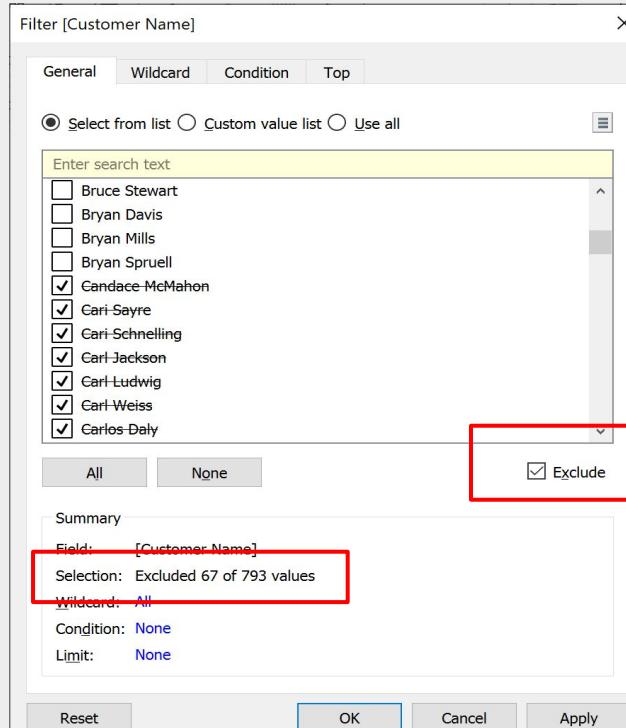
## 2. Exploring & Analyzing Data

Organize data and apply filters

### Dimension Filters

**Question:** Show sales for all the customers whose names do not start with the letter “C”.

- Select the marks, and then choose to keep or exclude them (tedious).
- Manually set up the Customer Name filter and choose Edit Filter- manual selection (tedious).
- Navigate to the “Wildcard” tab on Edit Filter and leverage the “Does not start with” function.



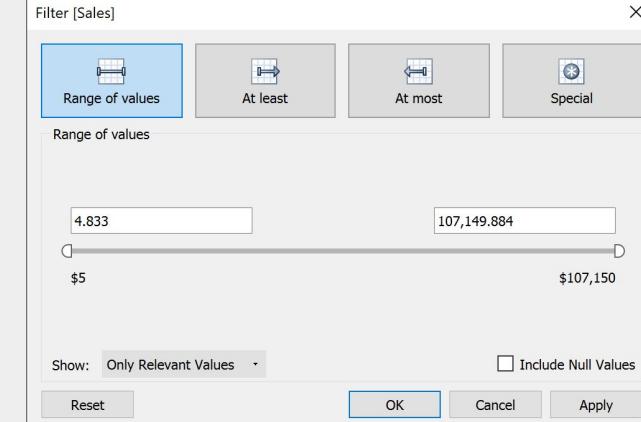
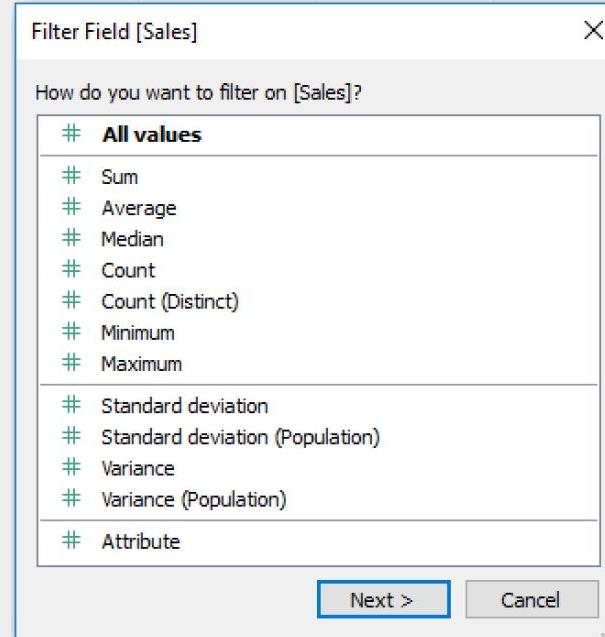
## 2. Exploring & Analyzing Data

Organize data and apply filters

# Measure Filters

**How is the Measure Filter different from the Dimension Filter?**

- You must select the measure filter criteria and choose the aggregation of the measure.
- After making the choice of aggregation, you can choose to filter on a range of values, a minimum threshold, or a maximum threshold.



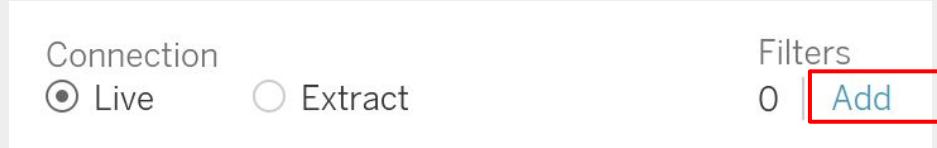
## 2. Exploring & Analyzing Data

### Organize data and apply filters

## Macro Filters

Occasionally, you may want to apply a filter at a higher level, such as the data source or extract. **This type of “macro” filter provides the benefit of reducing the size of the dataset, one of the top five efficiency tips for working with data in Tableau.** To add this type of filter, navigate to the data source editor by doing one of the following:

- Right-click the “Add” option under “Filters” at the top right corner of the “Data Source” Window



- After you choose a dimension or measure to use as a filter, the filter dialogs will look very familiar to the filters introduced till this point, only now, the filters will be applied to the entire data source before you create individual views.

## 2. Exploring & Analyzing Data

Organize data and apply filters

### Context Filters

#### Use context filters

This is a way to limit the data that Tableau is visualizing. Context filters are processed before anything else and can be thought of as temporary tables for your view. When a context filter is used, Tableau creates a subset of the dataset limited to the filter selection; then all subsequent filters hit only the subset of the data. Any dimension filter can be used as a context filter by right-clicking the filter from the Filters Shelf and choosing “Add to context.”

## 2. Exploring & Analyzing Data

### Apply Analytics to a Worksheet

# Table Calculation

Sales by Category

Month of Order Date	Furniture	Category	
		Office Supplies	Technology
January	\$34,719	\$33,966	\$37,077
February	\$26,518	\$24,561	\$27,844
March	\$51,299	\$64,300	\$133,785
April	\$50,798	\$53,249	\$51,750
May	\$54,364	\$53,978	\$79,790
June	\$59,241	\$56,381	\$65,021
July	\$59,482	\$59,671	\$59,989
August	\$59,866	\$110,223	\$71,179
September	\$195,343	\$122,014	\$174,671
October	\$72,636	\$71,638	\$101,681
November	\$129,363	\$109,291	\$143,653
December	\$150,446	\$121,952	\$129,941

Sales by Category

Month of Order Date	Furniture	Category	
		Office Supplies	Technology
January	\$34,719	\$68,684	\$105,761
February	\$26,518	\$51,079	\$78,923
March	\$51,299	\$115,598	\$249,383
April	\$50,798	\$104,047	\$155,797
May	\$54,364	\$108,342	\$188,131
June	\$59,241	\$115,622	\$180,643
July	\$59,482	\$119,153	\$179,142
August	\$59,866	\$170,089	\$241,268
September	\$195,343	\$317,356	\$492,028
October	\$72,636	\$144,274	\$245,955
November	\$129,363	\$238,654	\$382,307
December	\$150,446	\$272,397	\$402,338

## 2. Exploring & Analyzing Data

### Apply Analytics to a Worksheet

# Table Calculation

Table calculations are defined by how they are:

- (a) partitioned (or grouped), and
- (b) addressed (or how they are computed).

Here, the running total is being computed from left to right, which is the **default addressing**. This would mean that, by default, the table calculation is being addressed by the Product Category dimension.

This leaves the Month dimension as the partitioning field.

***Does this make sense?***

## 2. Exploring & Analyzing Data

### Apply Analytics to a Worksheet

# Table Calculation

Sales by Category

Month of Order Date	Category		
	Furniture	Office Supplies	Technology
January	\$34,719	\$68,684	\$105,761
February	\$26,518	\$51,079	\$78,923
March	\$51,299	\$115,598	\$249,383
April	\$50,798	\$104,047	\$155,797
May	\$54,364	\$108,342	\$188,131
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November	\$129,363	\$238,654	\$382,307
December	\$150,446	\$272,397	\$402,338

Sales by Category

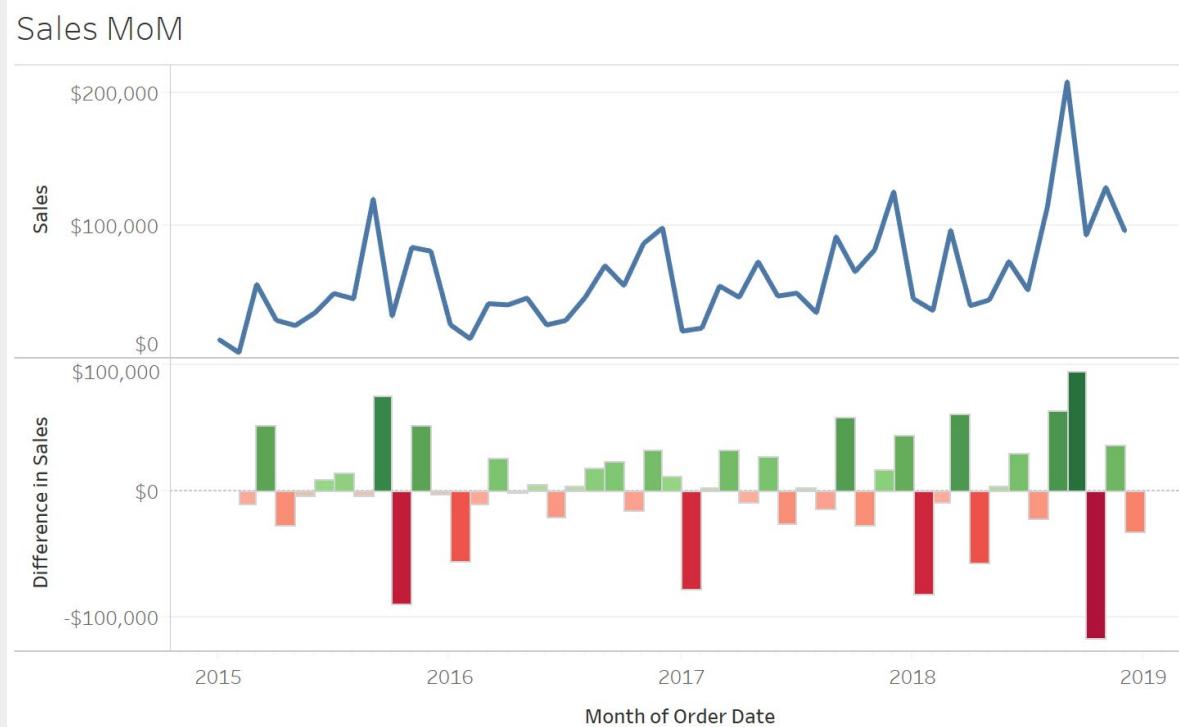


Month of Order Date	Category		
	Furniture	Office Supplies	Technology
January	\$34,719	\$33,966	\$37,077
February	\$61,236	\$58,527	\$64,921
March	\$112,535	\$122,827	\$198,705
April	\$163,333	\$176,076	\$250,456
May	\$217,697	\$230,054	\$330,245
June	\$276,937	\$286,435	\$395,267
July	\$336,419	\$346,106	\$455,256
August	\$396,285	\$456,330	\$526,435
September	\$591,628	\$578,343	\$701,106
October	\$664,263	\$649,981	\$802,787
November	\$793,626	\$759,272	\$946,440
December	\$944,072	\$881,224	\$1,076,381

## 2. Exploring & Analyzing Data

Apply Analytics to a Worksheet

### Table Calculation- Try it Out



## 2. Exploring & Analyzing Data

### Apply Analytics to a Worksheet

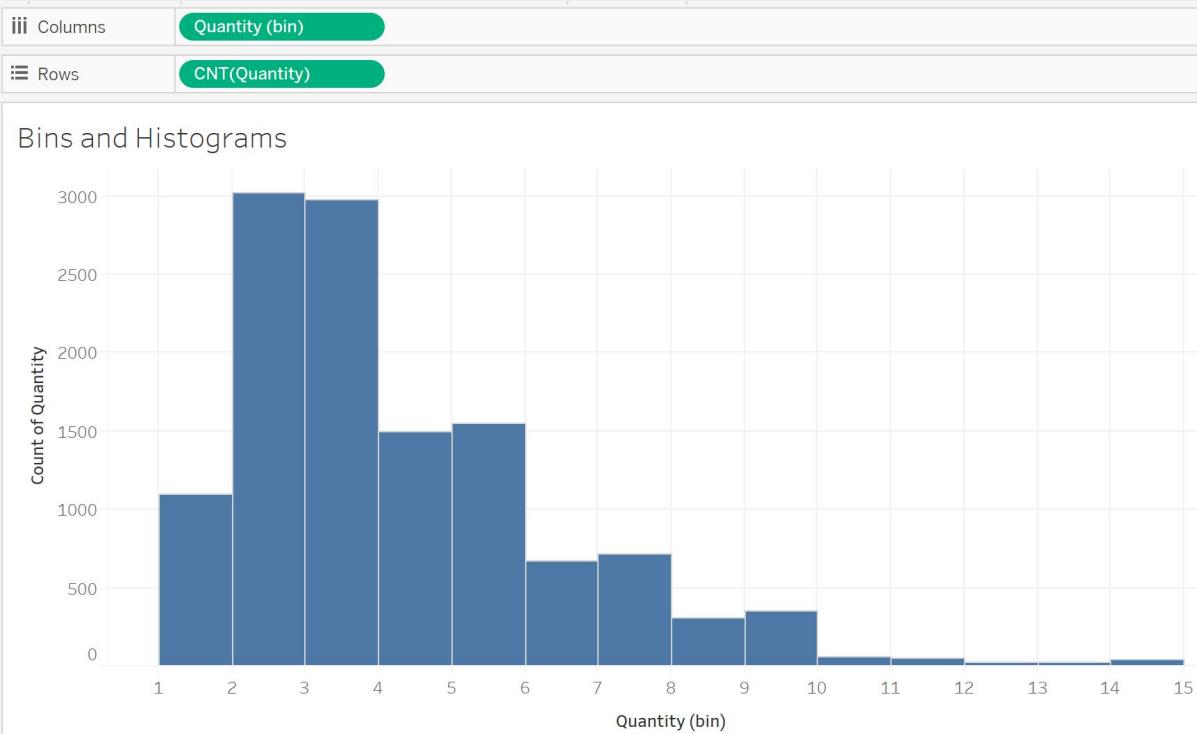
# Use Bins & Histogram

- Histograms are one of the most effective chart types for showing a distribution of quantitative data at one point in time.
- What is the difference between histograms and bar charts?
  - Histograms are used to plot continuous, numerical data while the bar chart is used to plot discrete, categorical data.
- Bins can be thought of as the dimension that you slice and dice the count of records by to create the histogram.
- To create a histogram, pre-select the measure that you want to visualize the distribution for by clicking it in the Measures Shelf.

## 2. Exploring & Analyzing Data

Apply Analytics to a Worksheet

### Use Bins & Histogram



## 2. Exploring & Analyzing Data

### Apply Analytics to a Worksheet

## Calculated Fields

There are many reasons to leverage the calculated fields functionality in Tableau:

- To segment your data in new ways on the fly
- To prove a concept such as a new dimension or measure before making it a permanent field in the underlying data
- To filter out unwanted results for better analyses
- To take advantage of the power of parameters, putting choice in the hands of your end users
- To calculate ratios across many different variables in Tableau, saving valuable database processing and storage resources

## 2. Exploring & Analyzing Data

### Apply Analytics to a Worksheet

# Calculated Fields- Example

**Question:** Evaluate Average Order Value (AOV)= total sales revenue divided by the number of orders for a given Order ID.

**Note:** Tableau does not allow you to mix an aggregate and a non-aggregated field within a calculated field. In the calculation for AOV, Orders does not have any aggregation because it is already an aggregation of COUNTD.

Orders

COUNTD([Order ID])

The calculation is valid.

Apply OK

AOV

SUM([Sales])/[Orders]

The calculation is valid.

Apply OK

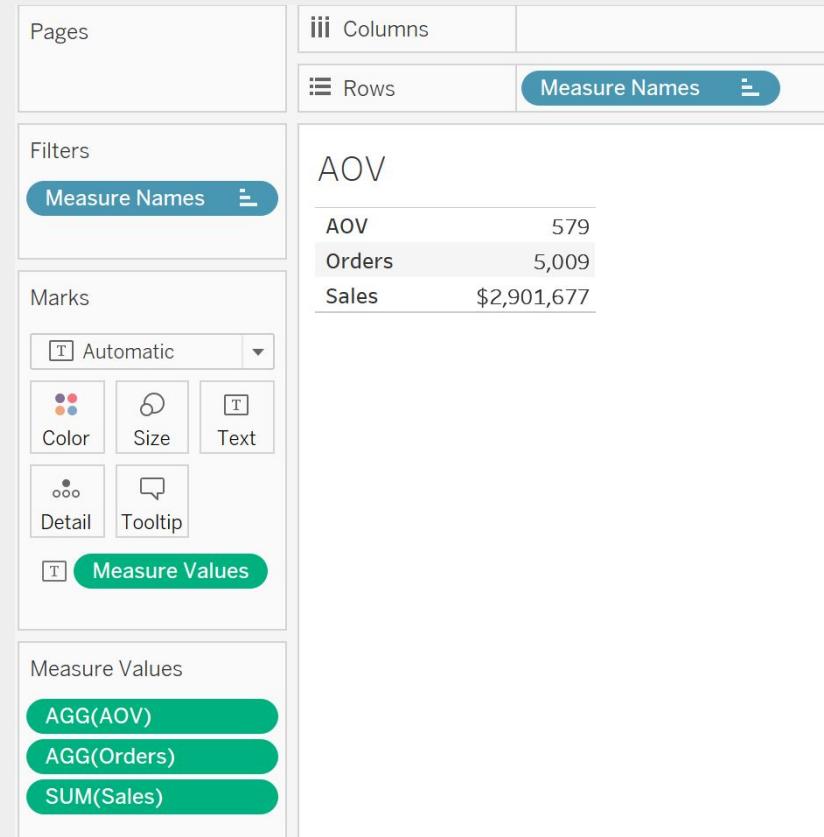
## 2. Exploring & Analyzing Data

### Apply Analytics to a Worksheet

# Calculated Fields- Example

### Quick Manual Check- Create a Table

AOV= Sales/Orders



## 2. Exploring & Analyzing Data

### Apply Analytics to a Worksheet

# Calculated Fields- Example

**Question:** What is the AOV of the product subcategories I manage compared to everything else? Assume: I manage the Copiers, Machines, and Supplies subcategories.

Sub-Category Segment

```
IF [Sub-Category] = "Copiers"  
OR [Sub-Category] = "Machines"  
OR [Sub-Category] = "Supplies"  
THEN "My Sub-Categories"  
ELSE "Other"  
END
```

The calculation is valid.

Sheets Affected ▾      Apply      OK

AOV by Product Sub Categories

Sub-Catego..	Sub-Category Seg..	
Accessories	Others	Abc
Appliances	Others	Abc
Art	Others	Abc
Binders	Others	Abc
Bookcases	Others	Abc
Chairs	Others	Abc
Copiers	My Sub-Categories	Abc
Envelopes	Others	Abc

AOV by Product Sub Categories

Sub-Category Segment	
My Sub-Categories	1,349.3
Others	490.6

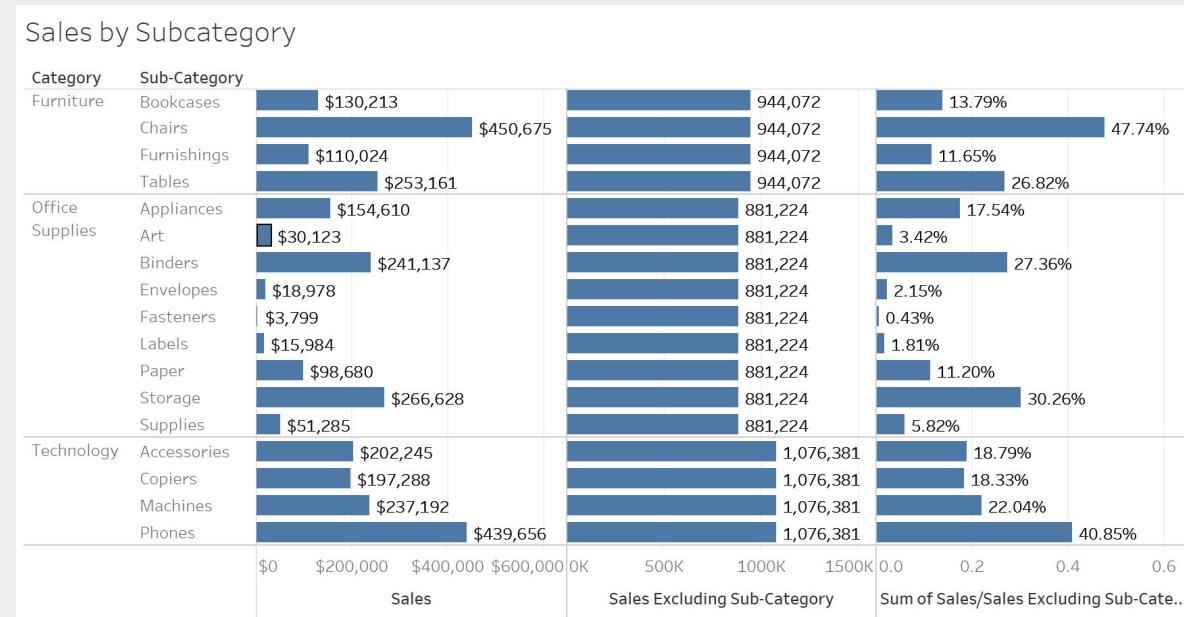
## 2. Exploring & Analyzing Data

### Apply Analytics to a Worksheet

# Level of Detail- Calculated Fields

**Question:** Show the sales per sub-category in one column, the sales per category in a second column, and even divide the two by each other to determine how much each sub-category is contributing to its respective category.

**Hint:** Use Calculated Field as  
{EXCLUDE [Sub-Category]:  
SUM([Sales])}



## 2. Exploring & Analyzing Data

### Apply Analytics to a Worksheet

# Parameters

**Parameters** are dynamic values that can replace constant values in calculations, filters, and reference lines. For example:

- You can create a calculated field that returns true if Sales are greater than \$500,000 and otherwise return false.
- You can replace the constant value of “500000” in the formula with a parameter. Then using the parameter control you can dynamically change the threshold in your calculation.
- Alternatively, you can have a filter to show the top 10 products by profit. You can replace the fixed value “10” in the filter to by a dynamic parameter so you can quickly look at the top 15, 20, and 30 products.

**Parameter actions** let your audience change a parameter value through direct interaction with a viz, such as clicking or selecting a mark

## 2. Exploring & Analyzing Data

### Apply Analytics to a Worksheet

# Parameters- Example

Edit Parameter [Algebra Parameter] X

Name:  Comment >>

#### Properties

Data type:

Current value:

Display format:

Allowable values:  All  List  Range

#### Range of values

Minimum:

Maximum:

Step size:

Algebra Equation

$\text{MIN}(2) * [\text{Algebra Parameter}]$

OK

Cancel

## 2. Exploring & Analyzing Data

### Apply Analytics to a Worksheet

#### Parameters- Try it Out

Try to create a Parameter called “Split Parameter” which gives the user an option to split the Sum(Sales) across the different Years by the following:

- Customer Segment
- Ship Mode
- Region

## 2. Exploring & Analyzing Data

### Apply Analytics to a Worksheet

# Parameters and Sets Combined- Example

**Question:** Show the top 5,10,15,20 customers by highest profits based on the needs of the user.



## 2. Exploring & Analyzing Data

### Apply Analytics to a Worksheet

# Parameters- Try it Out- What If Analysis

Create Parameter

Name:  Comment >>

Properties

Data type:

Current value:

Display format:

Allowable values:  All  List  Range

Range of values

Minimum:  Set from Parameter

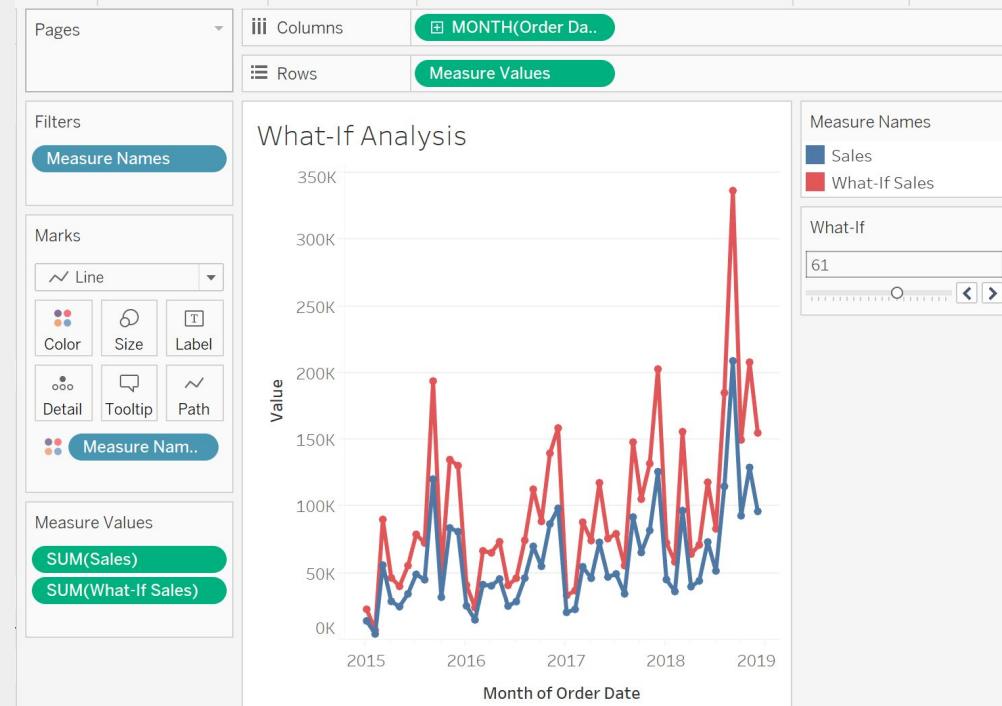
Maximum:  Set from Parameter

Step size:  Measure Nam..

OK Cancel

What-If Sales

[Sales] \* (1+[What-If]/100)



## 2. Exploring & Analyzing Data

### Apply Analytics to a Worksheet

# Parameters- Create and Compare Segments

Create Parameter X

Name: Segment 1 [Comment >>](#)

Properties

Data type: String ▼

Current value: Segment ▼

Display format: ▼

Allowable values:  All  List  Range

List of values

Value	Display As
Segment	Segment
Ship Mode	Ship Mode
State	State
Category	Category
Sub-Category	Sub-Category
Region	Region
Add	

[Add from Parameter](#) ▾  
[Add from Field](#) ▾  
[Paste from Clipboard](#)

[Clear All](#)

[OK](#) [Cancel](#)

Segment 1

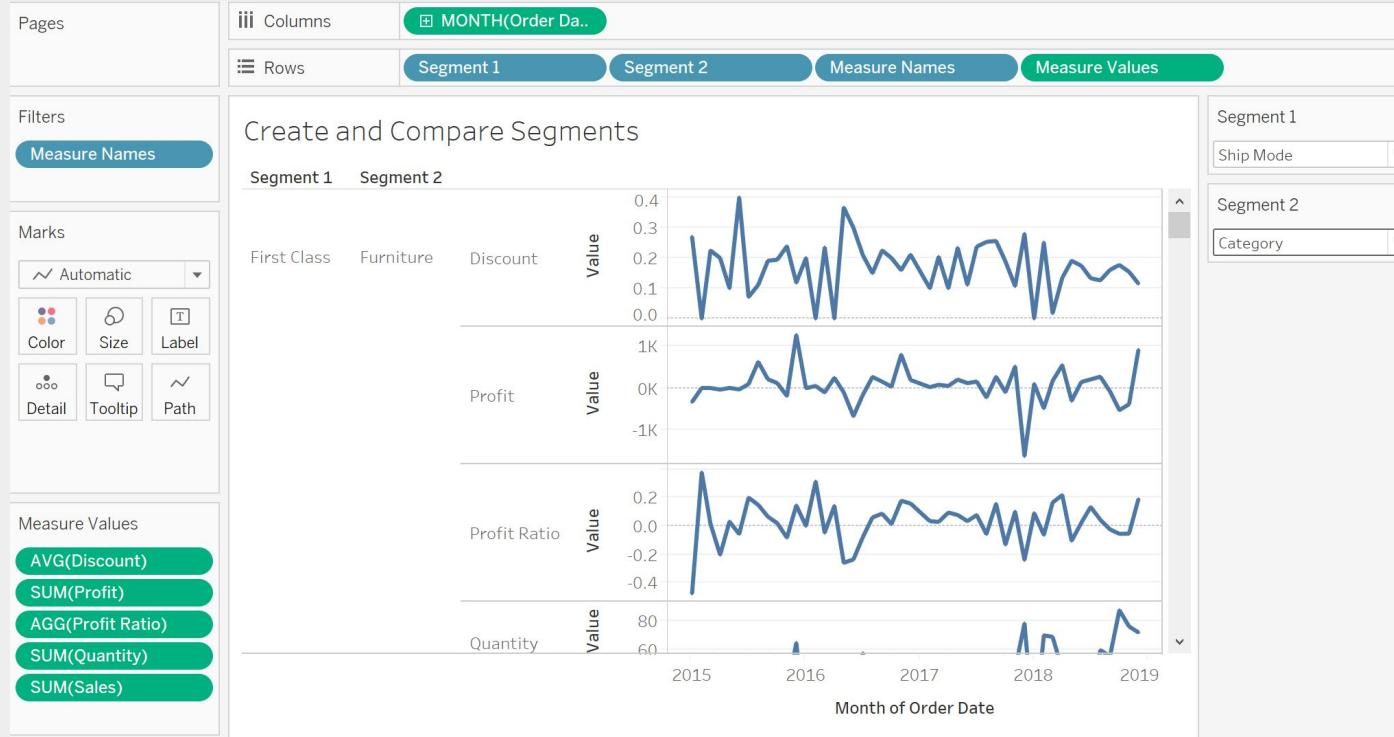
---

```
CASE [Parameters].[Segment 1]
WHEN "Segment" THEN [Segment]
WHEN "Ship Mode" THEN [Ship Mode]
WHEN "State" THEN [State]
WHEN "Category" THEN [Category]
WHEN "Ship Mode" THEN [Ship Mode]
WHEN "Sub-Category" THEN [Sub-Category]
WHEN "Region" THEN [Region]
END
```

## 2. Exploring & Analyzing Data

### Apply Analytics to a Worksheet

# Parameters- Create and Compare Segments





## 3) Sharing Insights

### 3. Sharing Insights

#### Format view for presentation

- Use color**
- Use bolding**
- Use shapes**
- Change size of marks**
- Select fonts**

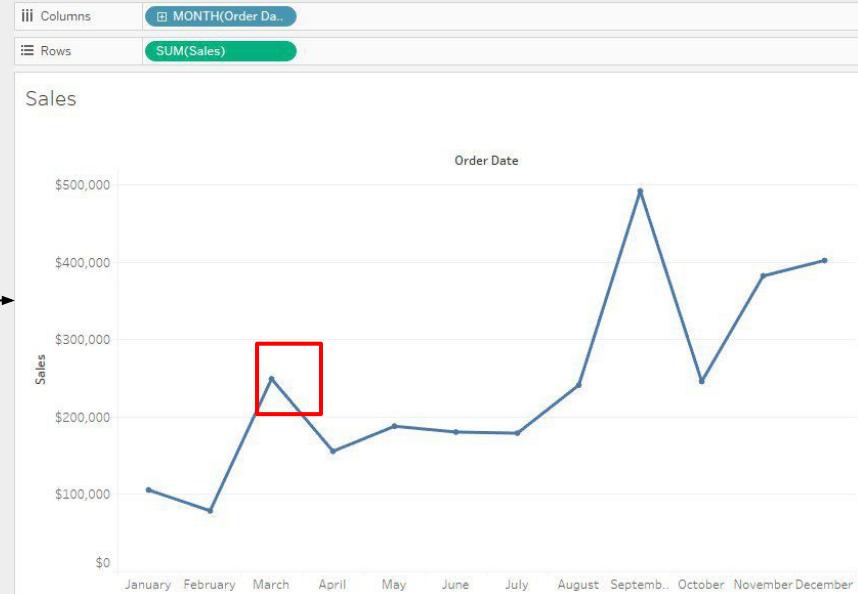
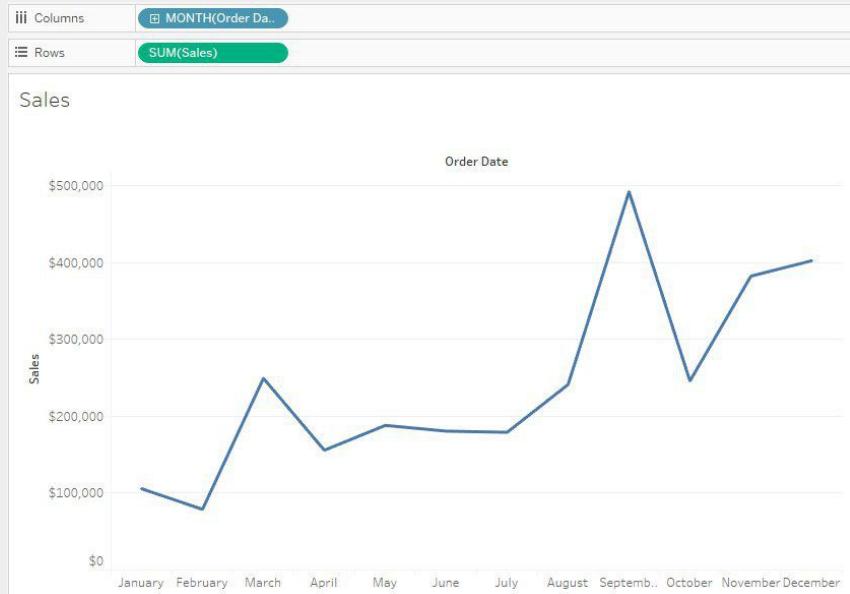
#### Create & Modify a Dashboard

- Create a dashboard layout**
- Add interactive or explanatory elements**
- Add dashboard actions**
- Modify existing dashboard layout for mobile devices**
- Create a story using dashboards or views**
- Share a twbx as a PDF**
- Share a twbx as an image**

### 3. Sharing Insights

#### Format View for Presentation

## Markers

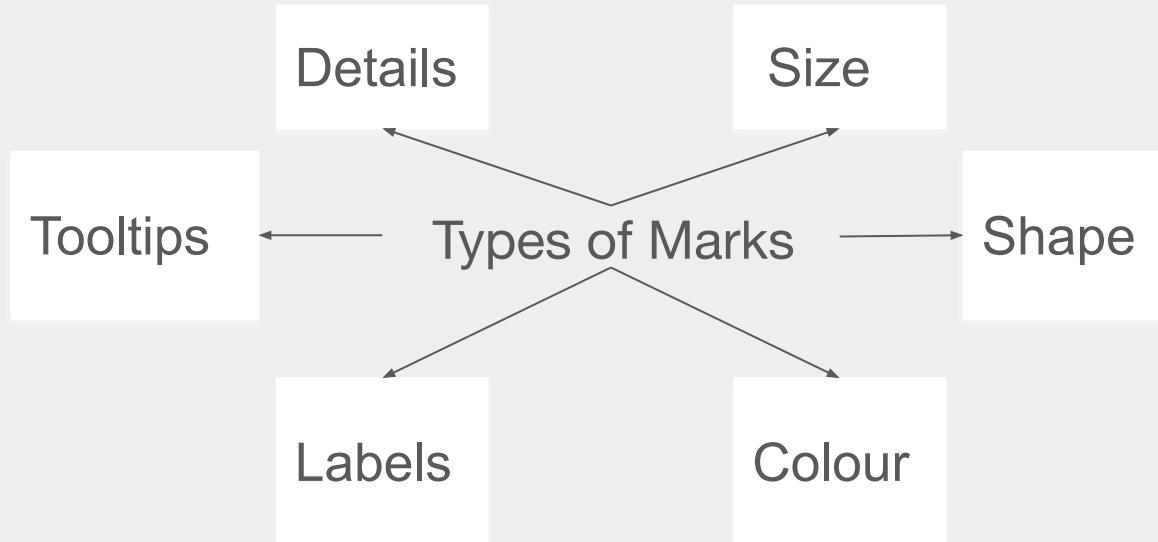


The small circles on each data point are called “markers” can be added by clicking on the Color Marks Card and choosing one of the “Markers:” options under Effects.

### 3. Sharing Insights

Format View for Presentation

## Granularity

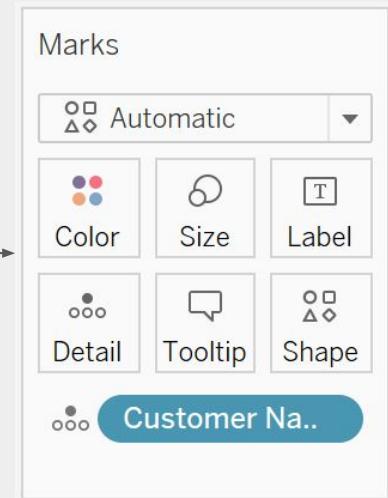
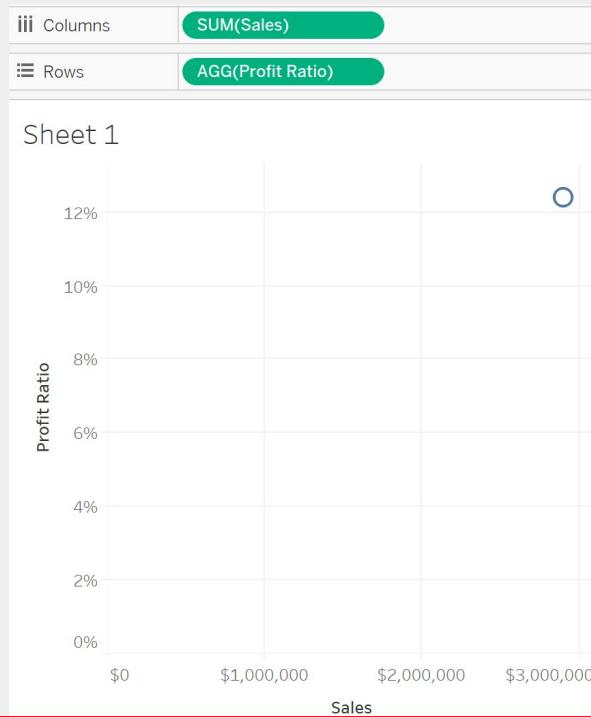


Another handy feature of Tableau is you can look in the lower-left corner of the worksheet for a summary of the view. When we changed the level of detail for this scatter plot, the mark count changed from 1 (the entire file) to 793 (the number of customers).

### 3. Sharing Insights

Format View for Presentation

## Granularity



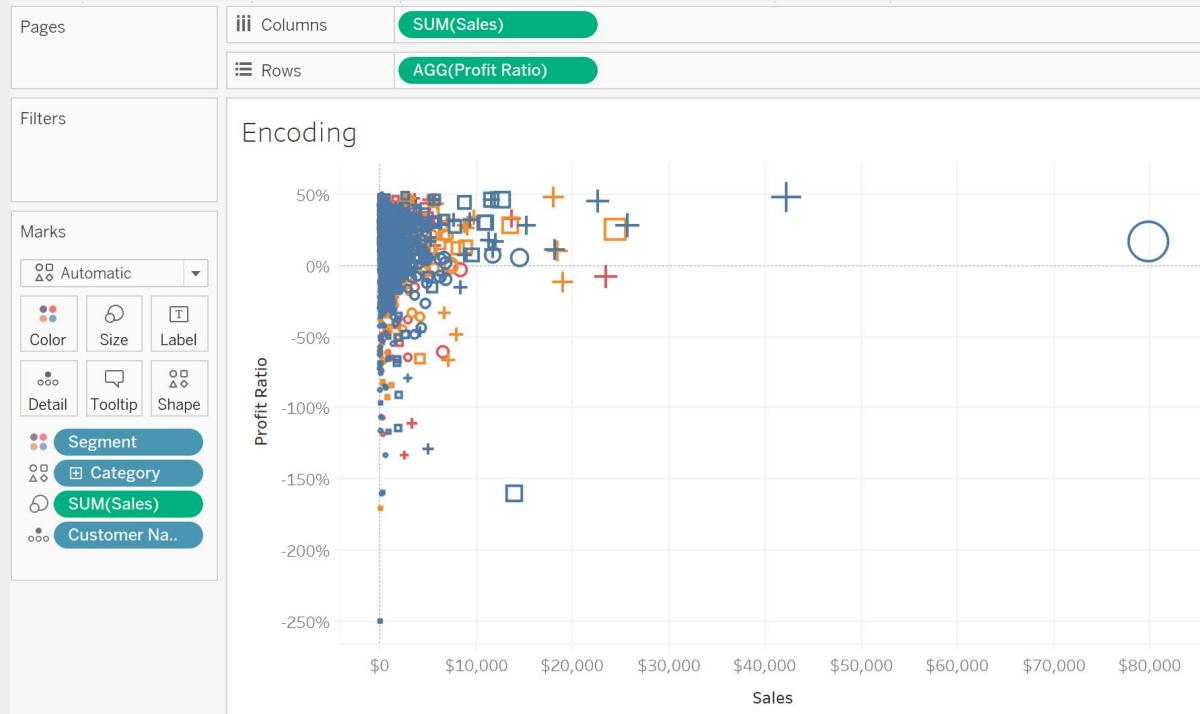
1 mark    1 row by 1 column    SUM(Sales): \$2,901,677

→ 793 marks    1 row by 1 column    SUM(Sales): \$2,901,677

### 3. Sharing Insights

Format View for Presentation

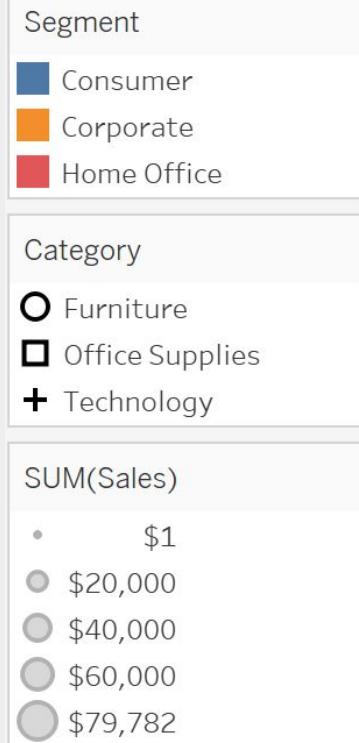
## Encoding



2182 marks

1 row by 1 column

SUM(Sales): \$2,901,677



### 3. Sharing Insights

#### Format View for Presentation

## Encoding

### Labels

- Used to add written information to a view itself.

### Tooltips

- Any information added to tooltips will only show up when end users hover over the marks on the view.

This is an important distinction. If your visualization will be printed or copied and pasted as a screenshot, you would want to add the information to Label to ensure the information is shown on the view. On the other hand, if you know your end users will be interacting with Tableau, you may opt to save some on-screen real estate by providing the information through tooltips.

### 3. Sharing Insights

#### Create and Modify a Dashboard

## Dashboards vs Stories

### Dashboards

- Dashboards are a way to present one or more views, often with filters, legends, and interactivity tying the views together.
- Dashboards can include sheets, text, images, and webpages.

### Stories

- Stories in Tableau are narrated walkthroughs of one or more sheets or dashboards, for example leading the audience through a discovery you made as you were analyzing the data.
- Each view or dashboard in a story is called a story point.

### 3. Sharing Insights

#### Create and Modify a Dashboard

## Dashboards vs Stories

### Dashboards

- Changes made on one sheet – whether it's a view or a dashboard, will carry through to the other places that content is in use.
- Any changes made on dashboards reach back and update the underlying content.

### Stories

- Once content has been added to a story, it only tracks changes if it has been unmodified on the story.
- Any changes made to content in a story do not reach back and update the underlying content.

### 3. Sharing Insights

#### Create and Modify a Dashboard

## Duplicating Sheets and Hiding Sheets

### Duplicating Sheets

- Duplicating sheets that are used in dashboards and stories can be useful if a view is used in multiple places and we want to maintain control of any changes.
- We could now use a separate copy on the story and the dashboard.

### Hiding Sheets

- To hide a sheet, it must be in use in either a dashboard or a story because if the sheet isn't in use, you can't get it back after hiding.
- If modifications need to be made on a hidden sheet, go to the dashboard or story where that sheet is in use.

### 3. Sharing Insights

#### Create and Modify a Dashboard

## Tiled versus Floating Dashboards

### Tiled

- When dashboard elements are tiled, they fill all available space in their respective tiles.
- Tiled is the default layout option.

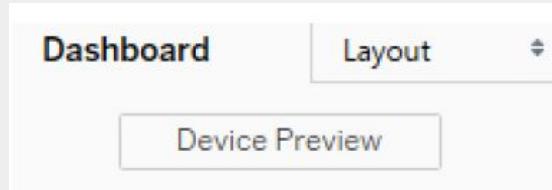
### Floating

- When dashboard elements are floating, you control their exact size and location on the dashboard.

### 3. Sharing Insights

#### Create and Modify a Dashboard

## Dashboard- Layout



### Objects

	Horizontal		Web Page
	Vertical		Blank
	Text		Button
	Image		Extension

**Device Preview-** allows you see what the dashboard will look like on different devices and you can even save different versions of the dashboard so that it looks different depending on what device it is displayed on.

**Horizontal/Vertical-** Adds a horizontal or vertical layout container that additional objects can be added to.

**Text-** You can add and format any text you wish.

**Image-** Adds an image from your computer.

**Web Page-** Embeds a web page in the dashboard.

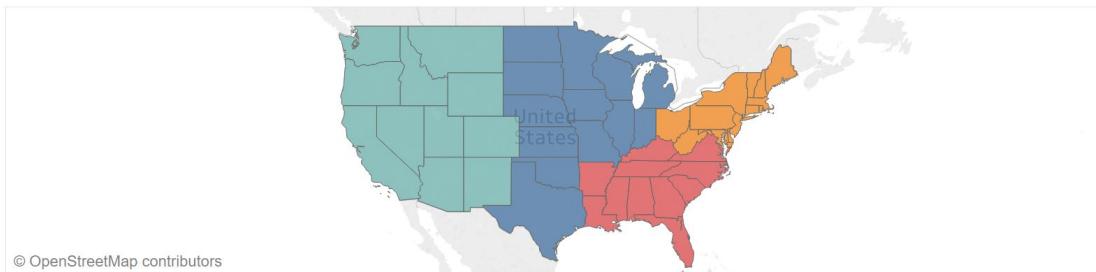
**Blank-** Adds blank space to the dashboard.

### 3. Sharing Insights

#### Create and Modify a Dashboard

## Dashboard- Example

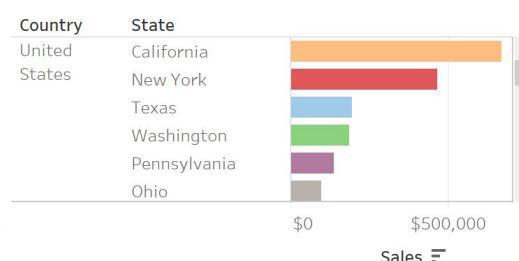
Map (Dashboard 1)



Trends (Dashboard 2)



Bar Chart (Dashboard 3)



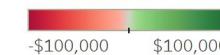
#### Region

- Central
- East
- South
- West

#### Sales

- \$920
- \$200,000
- \$400,000
- \$671,595

#### Difference in Sales



#### State

- Alabama
- Arizona
- Arkansas
- California
- Colorado
- Connecticut
- Delaware
- District of Colum..
- Florida
- Georgia
- Idaho

### 3. Sharing Insights

#### Create and Modify a Dashboard

## Story- Example

**Story**      Layout

New story point

Blank    Duplicate

- Dynamic Labels
- Sales by State
- Sales by Category (Bars)
- Alternatives to Pie Cha...
- Sales by Category (Sta...
- Sales by Category (Are...
- Create and Compare S...
- YoY Dates
- Clustering

A Drag to add text

Show title

Size  
Story (1016 x 964)

### Superstore Overview

Map Analysis    Date Granularity    Create and Compare Segments    Clustering

#### Map (Dashboard 1)

Region

- Central
- East
- South
- West

Sales

- \$920
- \$200,000
- \$400,000
- \$671,595

Difference in Sales

Country	State	Sales
United States	Wyoming	\$1,500,000

State

- Wyoming

Trends (Dashboard 2)

### 3. Sharing Insights

#### Create and Modify a Dashboard

## Distributing Dashboards

### 1. Packaged Workbooks

- ◆ You can package the workbook for offline distribution.
- ◆ Navigate to File > click Export Packaged Workbook.
- ◆ Packaged workbooks do not automatically update so the data within the workbook will only be as recent as the last update.

### 2. Tableau Public

- ◆ Any dashboard built in Tableau Desktop or Tableau Public can be published to the web for public consumption. This is not a realistic option for sensitive business data,
- ◆ Navigate to Server > hover over Tableau Public > Choose Save to Tableau Public As.

### 3. Tableau Server/Tableau Online

- ◆ Tableau Server requires incremental licenses for you and your end users, but is the most scalable Tableau solution for distributing your business-related workbooks.
- ◆ Navigate to Server > Choose Publish Workbook.
- ◆ Tableau Online works similarly, but it is hosted by Tableau in the cloud.

### 4. PDF: File > Print to PDF.

### 5. Image: Dashboard > Export Image

### 3. Sharing Insights

#### Create and Modify a Dashboard

## Add Alerts to Dashboards

### Alert 1: Date Settings

This alert serves two key purposes: (a) It communicates how current the dataset is, and (b) helps avoid confusion in case the dataset has not updated or a view doesn't look as expected due to the aggregation.

### Alert 2: Dynamic Labels

This allows you to code the logic in the calculated field to alert you when anything important to you occurs. Example: You want to know when a goal is met or if any marks are outside one or two standard deviations from the mean.

### Alert 3: Heat Map Dashboard with Optional Tableau Server Email

A high-level dashboard like this can be subscribed to in Tableau Server, dropping the most current overview in your or your executive's inbox every morning or week.

### 3. Sharing Insights

#### Create and Modify a Dashboard

## Date Alerts- Try it Out- Part I

Create Parameter

Name: Date Granularity Comment >>

Properties

Data type: String ▼

Current value: Day ▼

Display format: ▼

Allowable values:  All  List  Range

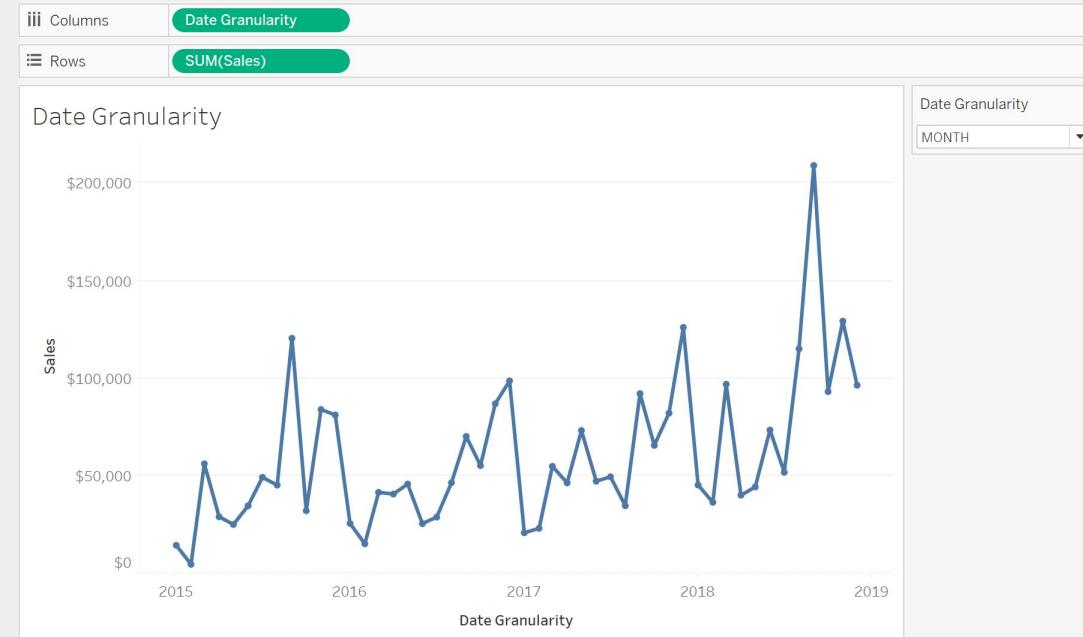
List of values

Value	Display As
Day	Day
Week	Week
Month	Month
Quarter	Quarter
Year	Year
Add	

Add from Parameter ▾  
Add from Field ▾  
Paste from Clipboard

Clear All

OK Cancel



### 3. Sharing Insights

#### Create and Modify a Dashboard

## Date Alerts- Try it Out- Part II

The screenshot shows a Tableau dashboard titled "Date Alerts". The dashboard has a light gray background and features a central white area for the visualization.

**Left Panel (Marks Shelf):**

- Shows the "Marks" shelf with "Line" selected.
- Includes buttons for "Color", "Size", "Label", "Detail", "Tooltip", "Path", "MIN(Order Dat.)", "MAX(Order Da.)", and "Date Granulari..".

**Central Area:**

- The title "Date Alerts" is displayed at the top left of the main area.
- A descriptive text below states: "This dashboard shows data from 1/3/2015 to 12/30/2018, aggregated by MONTH".

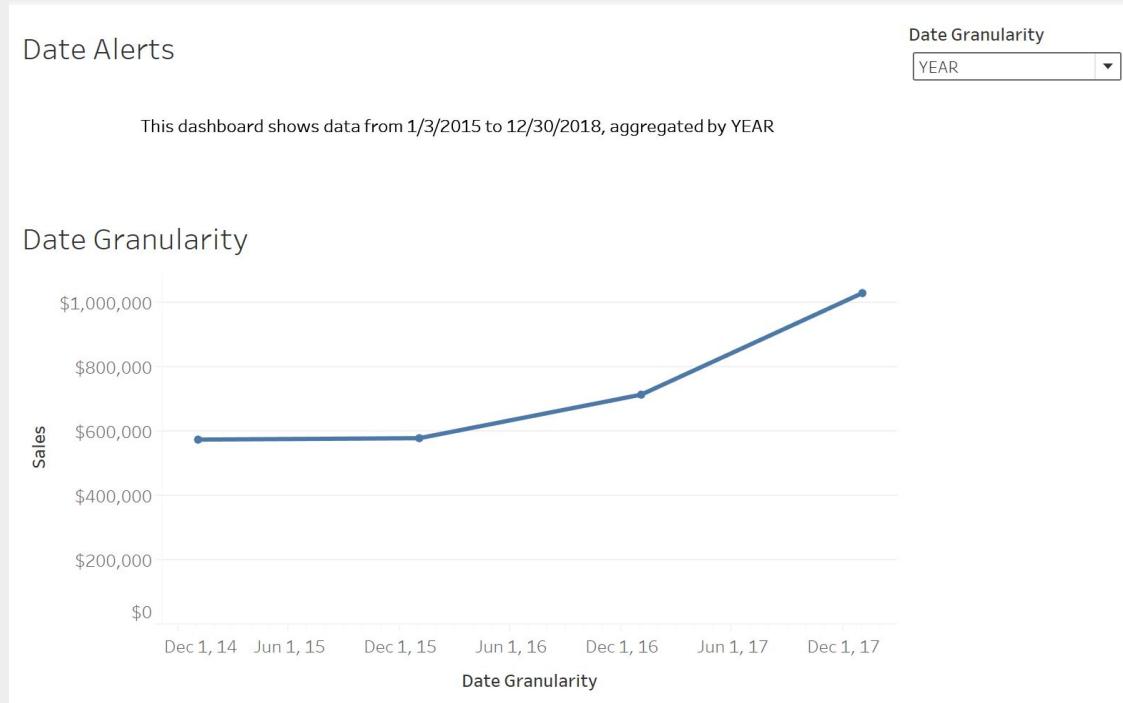
**Right Panel (Date Granularity):**

- A section titled "Date Granularity" with a dropdown menu.
- The dropdown menu is set to "MONTH".

### 3. Sharing Insights

#### Create and Modify a Dashboard

## Date Alerts- Try it Out- Part III



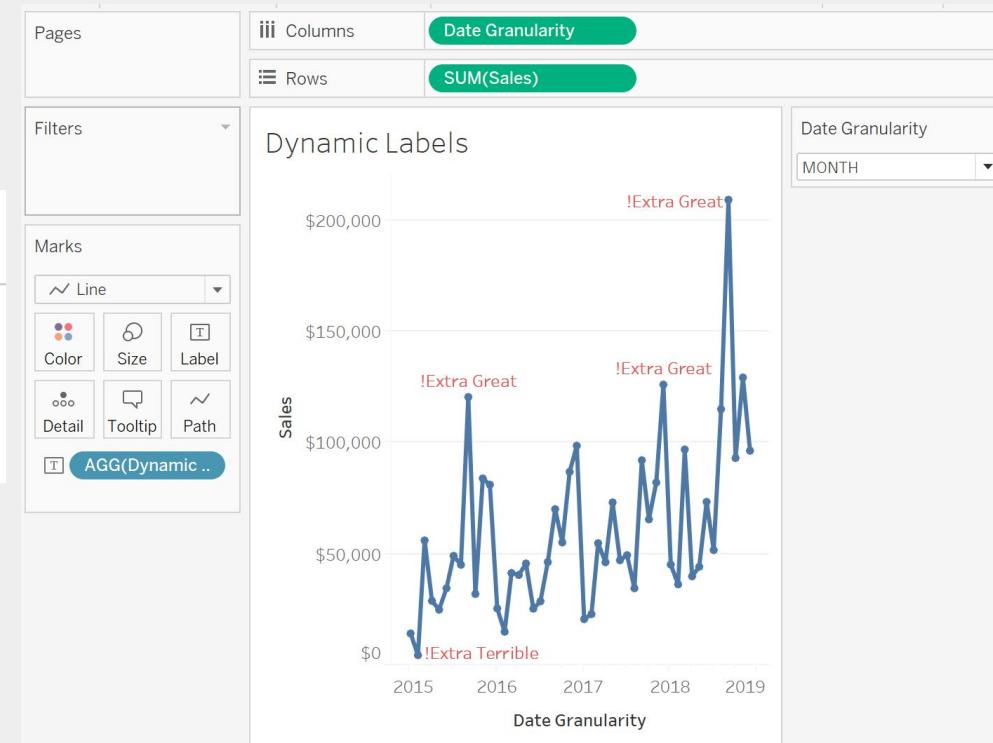
### 3. Sharing Insights

#### Create and Modify a Dashboard

## Dynamic Labels

Dynamic Label Alert

```
If SUM([Sales])>100000 THEN "!Extra Great"
ELSEIF SUM([Sales])<=12000 THEN "!Extra Terrible"
ELSE NULL
END
```



### 3. Sharing Insights

#### Create and Modify a Dashboard

## Dashboard Actions

**Dashboard actions** in Tableau allow you to add logic to dashboard components that create actions somewhere else.

**For example**, you can add logic that says, “If a user clicks on Dashboard Sheet 1, I want something to happen on Dashboard Sheet 2.”

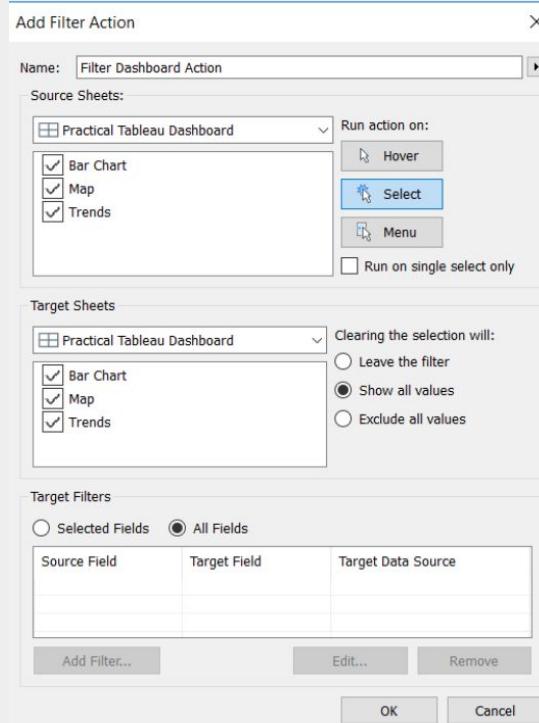
Navigate to Dashboard → Actions in the top navigation from any dashboard view. A dialog box will appear, and when you click the button “Add Action >” in the lower-left corner, you will be presented with three options for the type of dashboard action that you want to add:

- **Filter:** If you click sheet 1, sheet 2 is filtered to what you click on sheet 1.
- **Highlight:** If you click sheet 1, sheet 2 is highlighted by what you click on sheet 1.
- **URL:** If you click sheet 1, open a URL (this can either be opened on a web page dashboard object or in a new browser window).

### 3. Sharing Insights

#### Create and Modify a Dashboard

## Dashboard Actions



- **The Source Sheets** list shows all the sheets on the dashboard where you are adding the action. Any sheets in this list will cause the dashboard action to execute.
- **The Target Sheets** list shows all the sheets in the dashboard where you want the action to take place.
- **Hover:** If you hover over the source sheet, the action will take place on the target sheet.
- **Select:** If you click the source sheet, the action will take place on the target sheet.
- **Menu:** If you hover over the source sheet, a menu of actions appears in the tooltip. Clicking one of the menu items will execute the action on the target sheet.

### 3. Sharing Insights

#### Create and Modify a Dashboard

## Dashboard Actions- Use Every Sheet as a Filter

Sales

Difference

© OpenStreetMap contributors

Region

- Central
- East
- South
- West

Map (Dashboard 1)

Trends (Dashboard 2)

Bar Chart (Dashboard 3)

Country	State	Sales
United States	California	\$150,000
	New York	\$120,000
	Texas	\$80,000
	Washington	\$60,000
	Pennsylvania	\$40,000

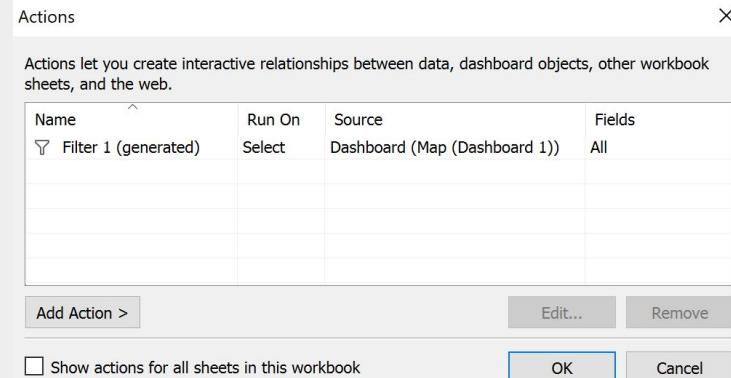
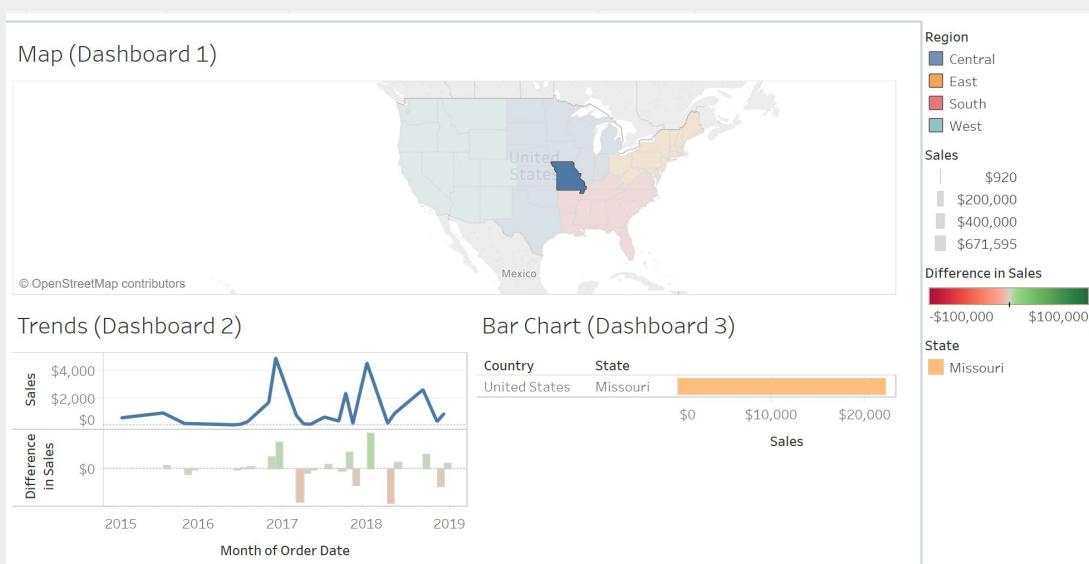
Show Me

- Go to Sheet
- Duplicate Sheet
- Title
- Caption
- Legends
- Filters
- Highlighters
- Parameters
- Show Page Control
- View Toolbar
- Use as Filter
- Ignore Actions
- Floating
- Fix Height

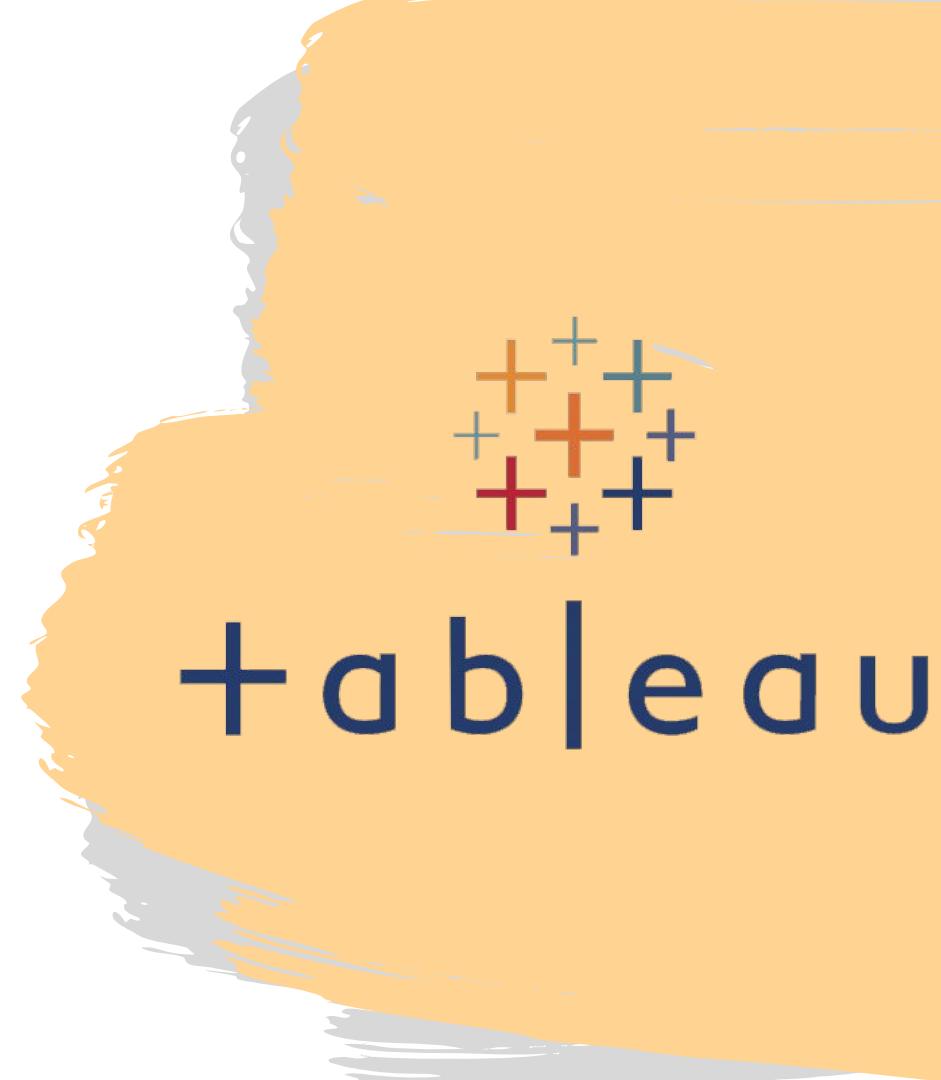
### 3. Sharing Insights

#### Create and Modify a Dashboard

## Dashboard Actions- Use Every Sheet as a Filter



## 4) Understanding Tableau Concepts



## 4. Understanding Tableau Concepts

### Dimensions and Measures

- Explain what kind of information dimensions usually contain
- Explain what kind of information measures usually contain

### Discrete & Continuous Fields

- Explain how discrete fields are displayed in Tableau
- Explain how continuous fields are displayed in Tableau
- Explain the difference between discrete date parts and continuous date values in Tableau

### Aggregation

- Explain why Tableau aggregates measures
- Describe how an aggregated measure changes when dimensions are added to the view

## 4. Understanding tableau Concepts

### Dimensions and Measures

# Measures versus Dimensions

## Measures

A measure is a field that is a dependent variable; its value is a function of one or more dimensions. Tableau treats any field containing numeric (quantitative) information as a measure.

## Dimensions

A dimension is a field that can be considered an independent variable. By default, Tableau treats any field containing qualitative, categorical information as a dimension.

- Measure is the number; dimension is what you “slice and dice” the number by.
- Rule of Thumb: I follow is that if it doesn’t make sense to sum up a number, it is likely a dimension.

## 4. Understanding tableau Concepts

### Dimensions and Measures

# Discrete and Continuous Fields

## Discrete

- Blue (small icon next to the field) indicates that a field is discrete.
- Discrete fields can be sorted.

## Continuous

- Green (small icon next to the field) indicates that a field is continuous.
- Continuous fields cannot be sorted.

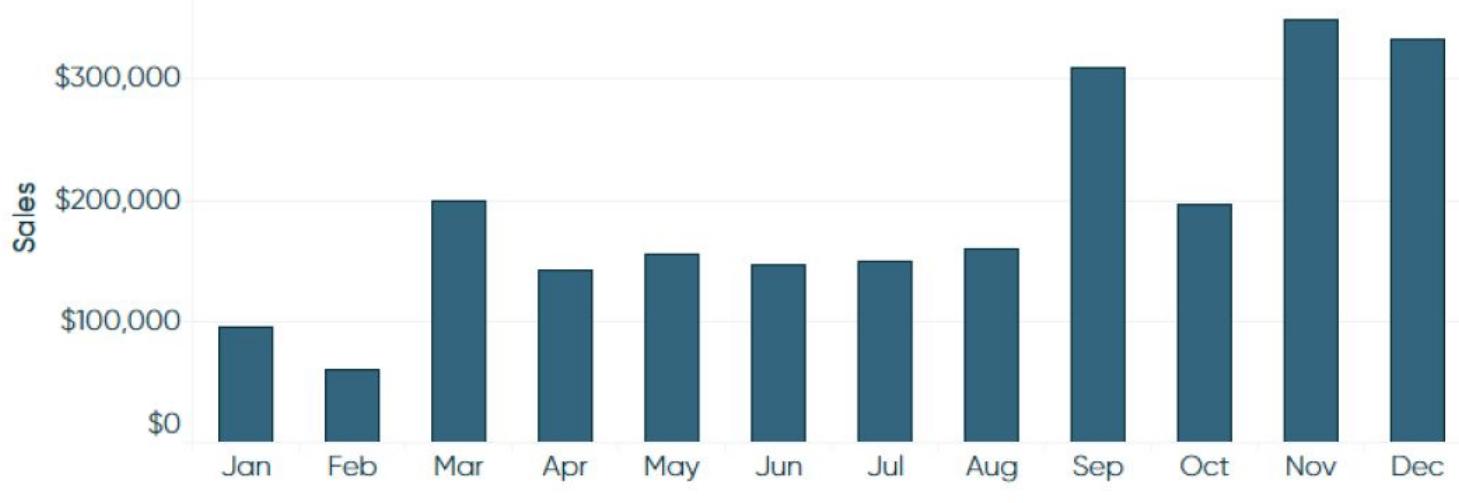
Rule of Thumb: Discrete fields draw headers; continuous fields draw axes.

## 4. Understanding tableau Concepts

### Discrete and Continuous Fields

#### Example

Sales by Month: Discrete

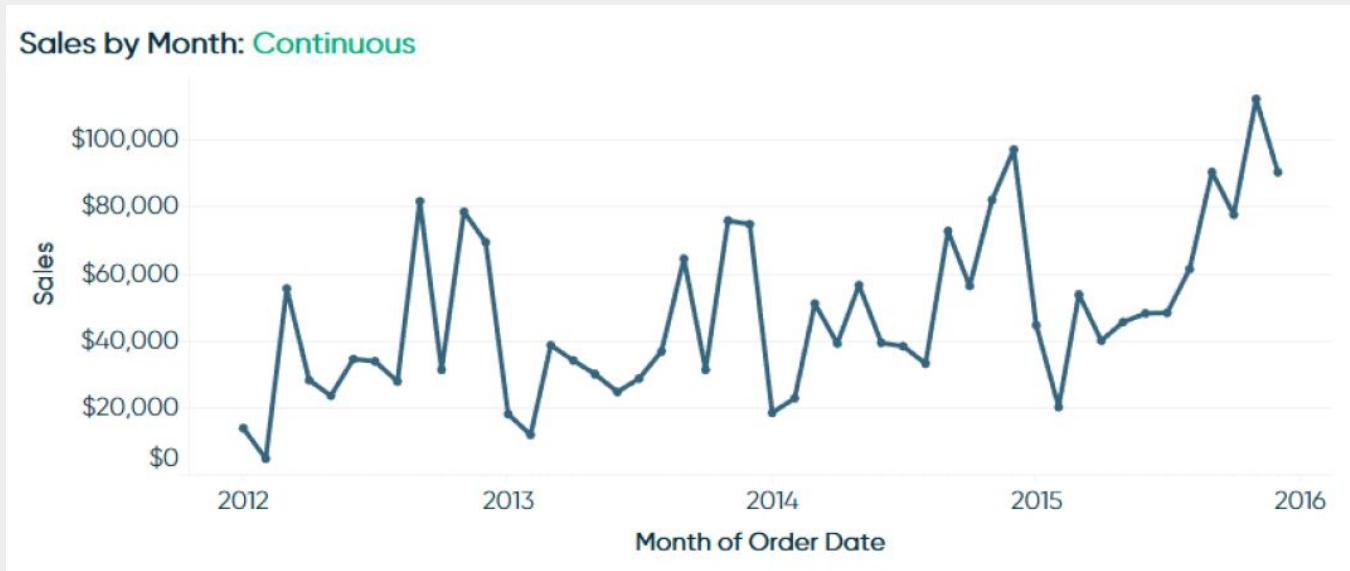


There is a *discrete* header for each month. I can sort the axis in any order- ascending, descending. Hence, discrete fields can be sorted.

## 4. Understanding tableau Concepts

### Discrete and Continuous Fields

#### Example



There is a **continuous** axis for time, hence it follows a chronological order- oldest to most recent.

## 4. Understanding tableau Concepts

### Discrete and Continuous Fields

## Examples

- Every measure on a view in Tableau is aggregated in some way.
- The default aggregation is SUM, and that works for most situations.
- Other aggregation options: Average, Median, Count (CNT), Count Distinct (CNTD), Minimum, Maximum



## 5) Timeliness

## Timeliness

### Exam Format

Time Limit: 60 minutes

Question Format: Multiple choice, multiple response, hands-on

Number of Questions: 30

Scoring: Automatically scored; point value varies per question type with hands-on worth more

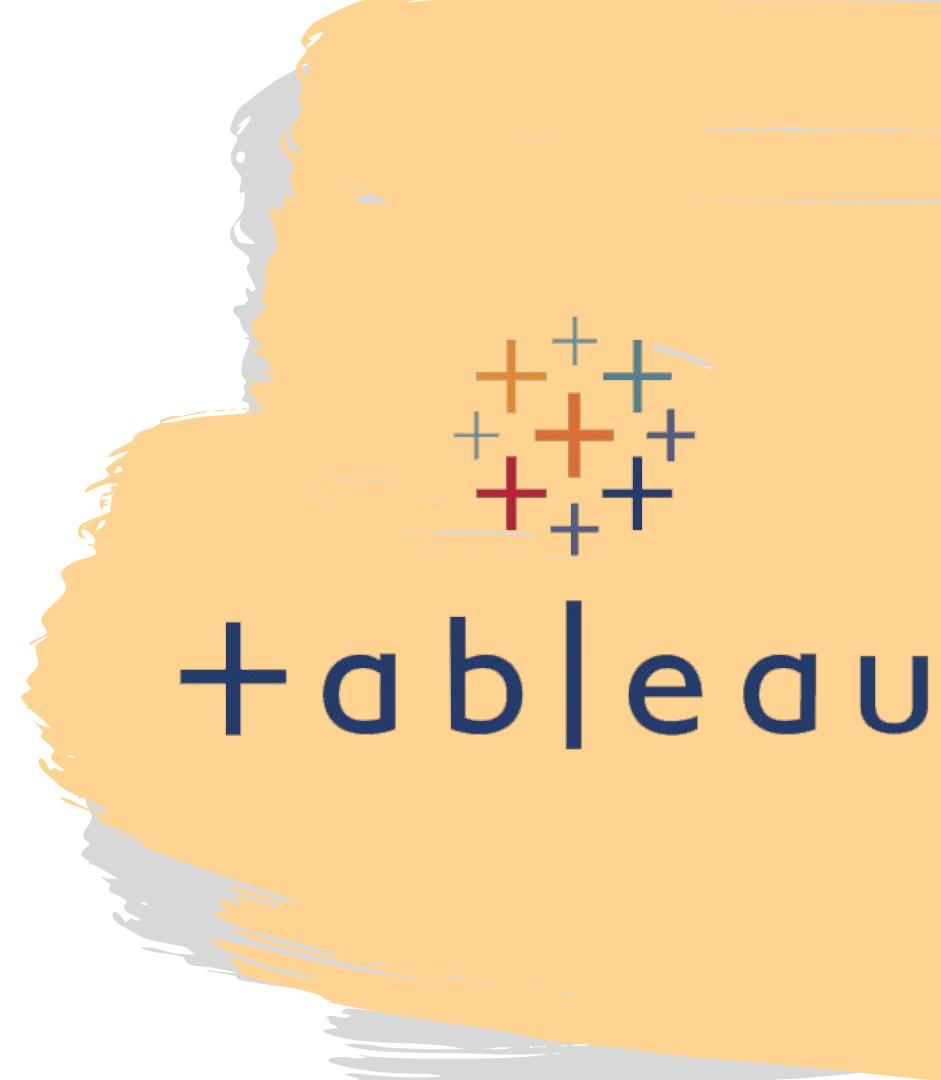
Passing Score: 70%

Language(s) Offered: English, Japanese, Simplified Chinese, German, French, Brazilian Portuguese, International Spanish

Delivery Platform: Windows Virtual Machine containing Tableau Desktop

Completing a task effectively and efficiently has become a standard that organizations expect from employees. This exam is timed because we view time as a critical competency needed to be successful.

## Some Extra Information



## Some Extra Information

### K-means clustering

- Clustering simply means to group

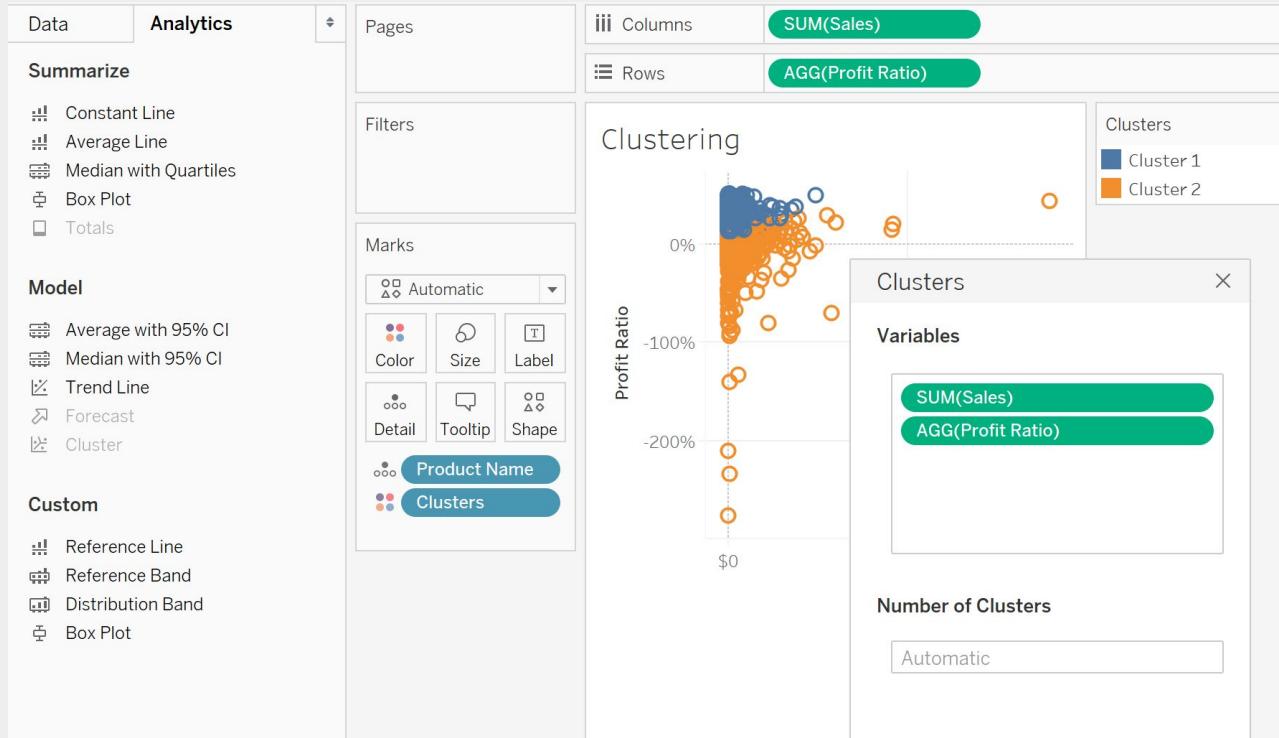
### Fit of the model

- A good fit is when
  - $r$  is between 0 and 1
  - $P\text{-value} < 0.05$

# Some Extra Information

## K-Means Clustering

# Clustering





Visual Analysis

# VISUAL ANALYSIS

## Best Practices

**Step 1:**  
**Start with the**  
**Question**

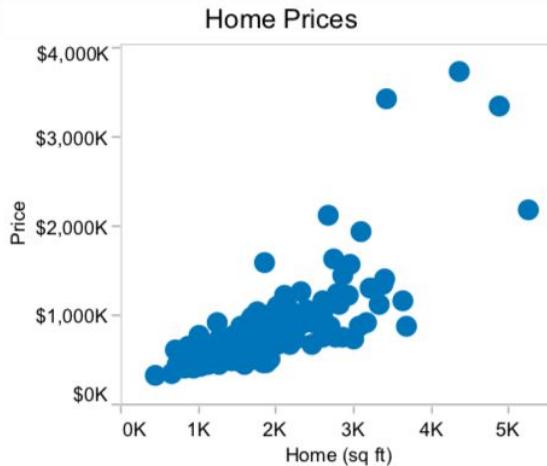
**Step 2:**  
**Choose the right**  
**chart type**

**Step 3:**  
**Create effective**  
**views**

# VISUAL ANALYSIS

## Best Practices

Good visualization



**Step 1:**  
**Start with the**  
**Question**

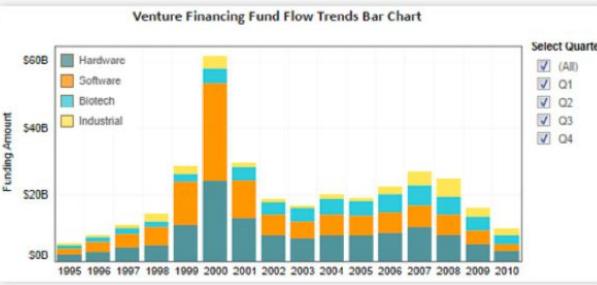
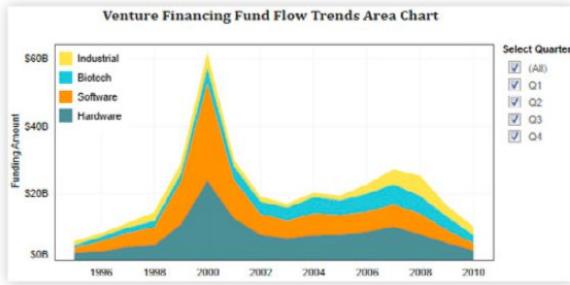
What is the purpose of  
your visualisation?

Great visualization



*What are some insights you can draw from these charts?*

# Trends over Time



*With the stacked bar chart, you can see which sector the venture financing fun is flowing to, and the amount flowing.*

**Protip 1:** line charts, area charts & bar charts are some of the best viz for showing trends over time are

**Protip 2:** X-axis: Time, Y-axis: other measure

## Step 2: Choose the right chart type

Trends over Time

Comparison & Ranking

Correlation

Distribution

Part to Whole

Geographic Data

# Comparison & Ranking

Top 10 Oil Consuming Countries

Tons per capita



**Protip 1:** bar charts are most suitable for comparison because it encodes quantitative values as length on the same baseline.

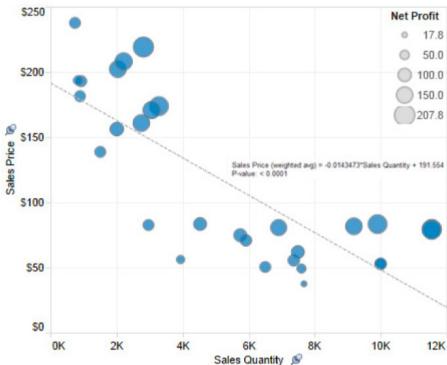
**Protip 2:** for effective presentation, arrange your charts in descending order.

## Step 2: Choose the right chart type

Trends over Time  
Comparison & Ranking  
Correlation  
Distribution  
Part to Whole  
Geographic Data

# Correlation

Sales Price, Quantity and Profit Correlation Scatter Plot



Sales Price, Quantity and Profit Correlation Combo Chart



**Protip 1:** Scatterplots are useful. Overlay with other chart types to see the full picture.

**Protip 2:** Identify relationships between measures

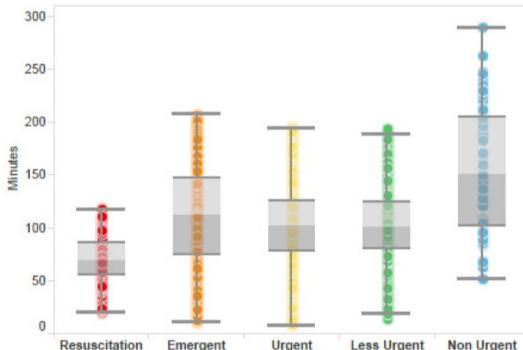
**Protip 3:** Correlation is not causation; & it does not guarantee a relationship.

## Step 2: Choose the right chart type

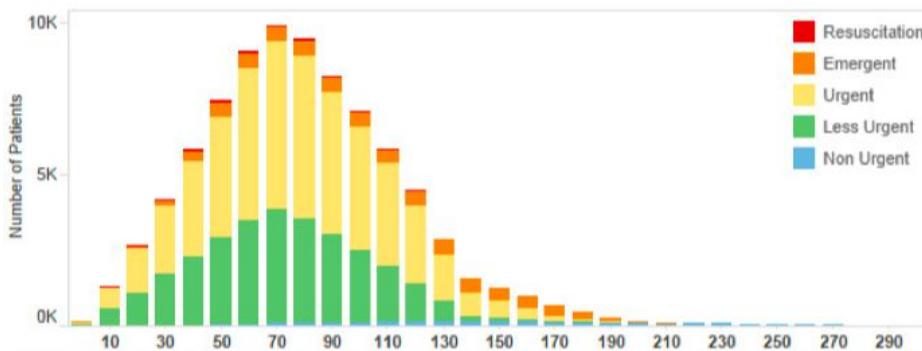
- Trends over Time
- Comparison & Ranking
- Correlation
- Distribution
- Part to Whole
- Geographic Data

# Distribution

Patient Treatment Length by Triage Acuity Box Plot



Patient Treatment Length by Triage Acuity Histogram



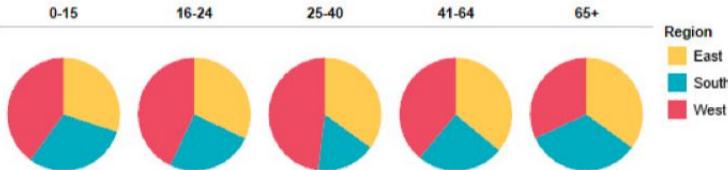
**Protip 1:** Commonly used: Box plot (for multiple distributions), histogram (break data up into bins, and count the number of people for each segment).

## Step 2: Choose the right chart type

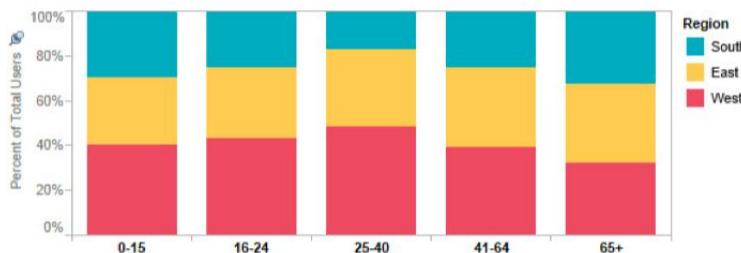
- Trends over Time
- Comparison & Ranking
- Correlation
- Distribution
- Part to Whole
- Geographic Data

# Part to Whole

User Demographics by Age Group and Region Pie Chart



User Demographics by Age Group and Region Bar Chart



## Protip 1: PIE CHART

ARE THE WORST  
CHARTS TO USE

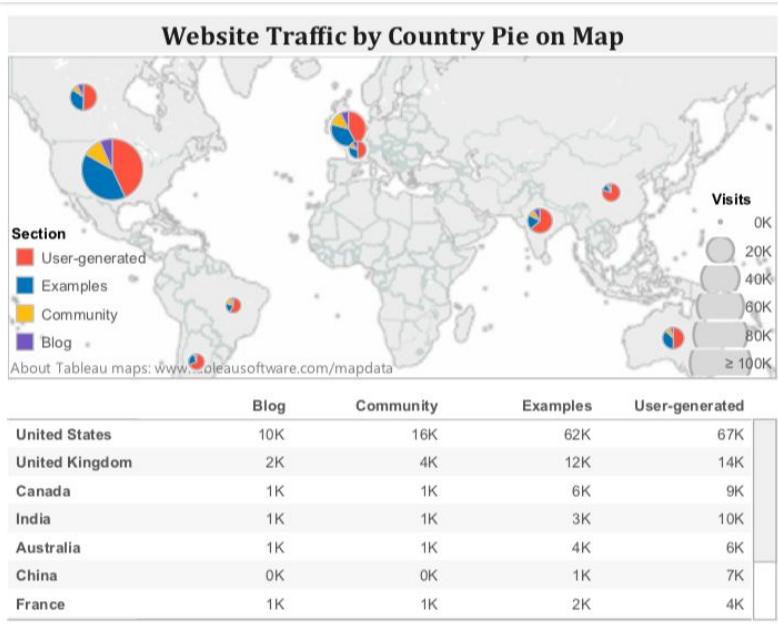
1. Human visual system are not very good at estimating 2D areas
2. You can only compare slices next to each other.

Protip 2: use percent-total bar charts instead

## Step 2: Choose the right chart type

Trends over Time  
Comparison & Ranking  
Correlation  
Distribution  
Part to Whole  
Geographic Data

# Geographic Data



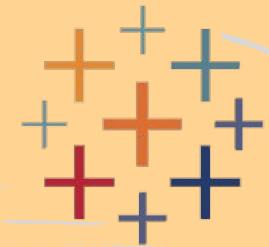
**Protip 1:** Maps are best when paired with another chart that details what the map displays.

## Step 2: Choose the right chart type

Trends over Time  
Comparison & Ranking  
Correlation  
Distribution  
Part to Whole  
Geographic Data

## Additional Information

+ a b | e a u



# ADDITIONAL INFO

## Colour theory, Typography, JUST FYI!

**TYPEFACES**  
Knowing the difference.

Not mentioned are: Blackletters, Gaelic, Dingbats, Non-Western and many others.

**COMMON STYLES**

**PROTIP #1**  
Limit yourself to a maximum of 3 well contrasting typefaces.

*The Quick*  
**BROWN FOX**  
Jumps over the lazy dog\*

\* A PANGRAM is a sentence using every letter of the alphabet at least once.

Letters: a, 8  
Numerals: 1, 2  
Typefaces can contain a myriad of different symbols.  
Punctuation: !  
Icons: heart

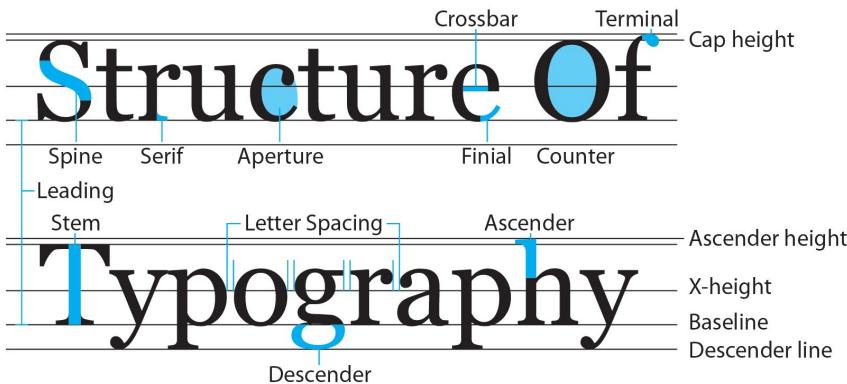
**WHAT'S IT SAYING?**  
Conveying the right message.

SANS-SERIF	SERIF	SCRIPT, HANDWRITING
<b>Neutral</b> Arial	<b>TIMELESS</b> Trajan	<b>Casual</b> Rage Italic
<b>LET'S GO</b> Gill Sans Bold Italic	<b>"QUOTE"</b> Garamond Italic	<b>ELEGANT</b> Bickham Script
SLAB-SERIF	BLACK, EXTRA BOLD	GEOMETRIC, ART DECO
<b>CONFIRMED</b> Rockwell	<b>BOLD!</b> Elephant	<b>RETRO</b> Geomancy Extra Bold
<b>AUTHORITY</b> Akzidenz Grotesk Condensed	<b>GLAMOUR</b> Bodoni Bold	<b>SOURCE CODE</b> Orator Std
<b>USER FRIENDLY</b> Arial Rounded	<b>FAUX PAS</b> Comic Sans	<b>OH GOD PLEASE DON'T</b>

## Typefaces & Common Styles

# ADDITIONAL INFO

Colour theory, Typography, JUST FYI!



Structure of Typography

Friendly

MONTSERRAT

Fancy

CYGNET ROUND

Serious

GARAMOND

Silly

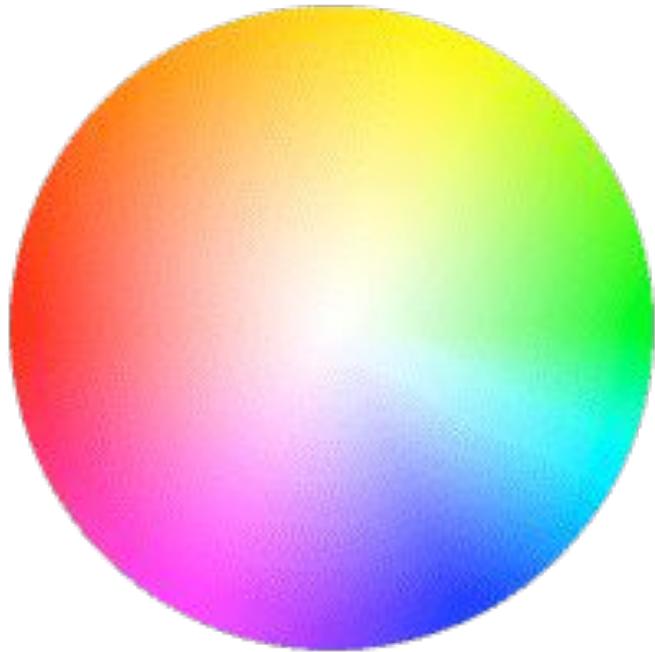
KLEIN SLAB SERIF

Font & Moods

Canya original

# ADDITIONAL INFO

Colour theory, Font-families, JUST FYI!



Colour-wheel



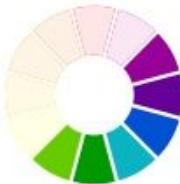
Warm colors



Split complementary colors



Analogous colors



Cool colors



Triad colors



Monochromatic colors



Complementary colors



Tetradic colors



Hues, tints, tones & shades