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GROUND UP SERIES

tableau

(V-10.x)

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Original Series

Syed Awase earned his PhD from University of Zurich in GIS, supported by EU V Framework Scholarship from SPIRIT Project (www.geo-spirit.org). He currently provides consulting services through his startup www.territorialprescience.com and www.sycliq.com . He empowers the ecosystem by sharing his technical skills worldwide, since 2008. He provides training in Java Technology Stack, .Net Technology Stack, R, DataScience, Client Side frameworks (Angular,KnockOut,Aurelia,Vue,Ember, Backbone etc..), Node Stack, Machine Learning, Python Stack, Php Stack.

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Slide Version Updates

Last Updated	Version	Release Date	Updated by	Code Plays Done @
	8.0		Syed Awase	
	8.3	June 2014	Syed Awase	
	9.0	Sep2015	Syed Awase	
	9.3	Jan 2017	Syed Awase	
	10.	Sep 2017	Syed Awase	

Pre-requisites

- Basic understanding of SQL programming.
- Basics of Microsoft Excel.
- R Programming Basics.

Structure of Program

- Exploratory Data Analysis
- Workflow based
- Visualization

SYED AWASE

DATA VISUALIZATION FUNDAMENTALS

Visualizations are more than just data,

at best they are about **Story**

It should be about what story needs to be told

and not what charts to show!

30-50% of the human brain

is devoted to visual processing.

70% of sensory receptors

are processed through the eyes

Learning through visual images

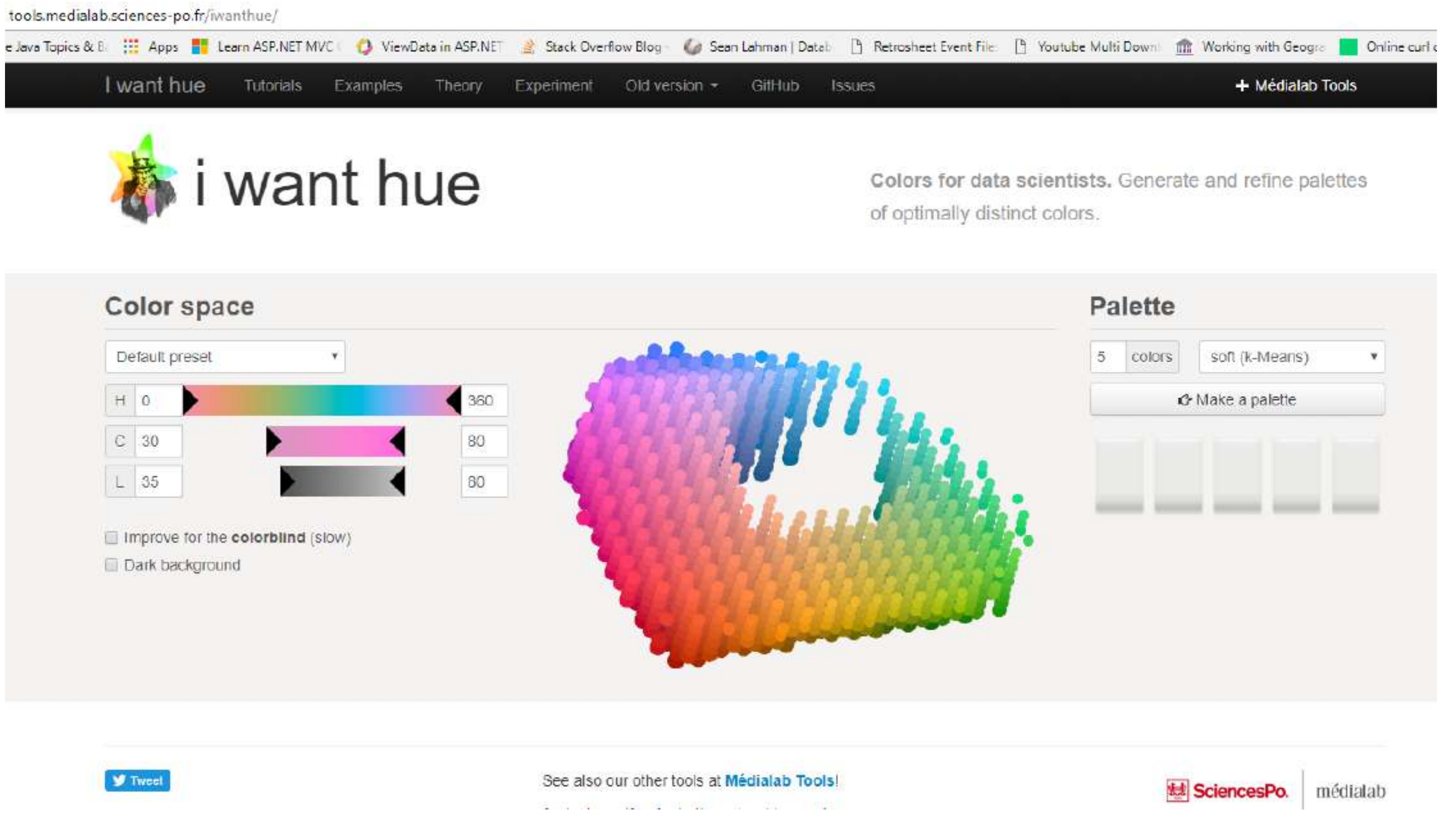
Increases human performance by 323%

How Visual Information is Processed?: Gestalt Principles

1. Figure/Ground
2. Proximity
3. Similarity
4. Parallelism
5. Common fate(going together)
6. Closure
7. Continuity

Selecting an appropriate color palette

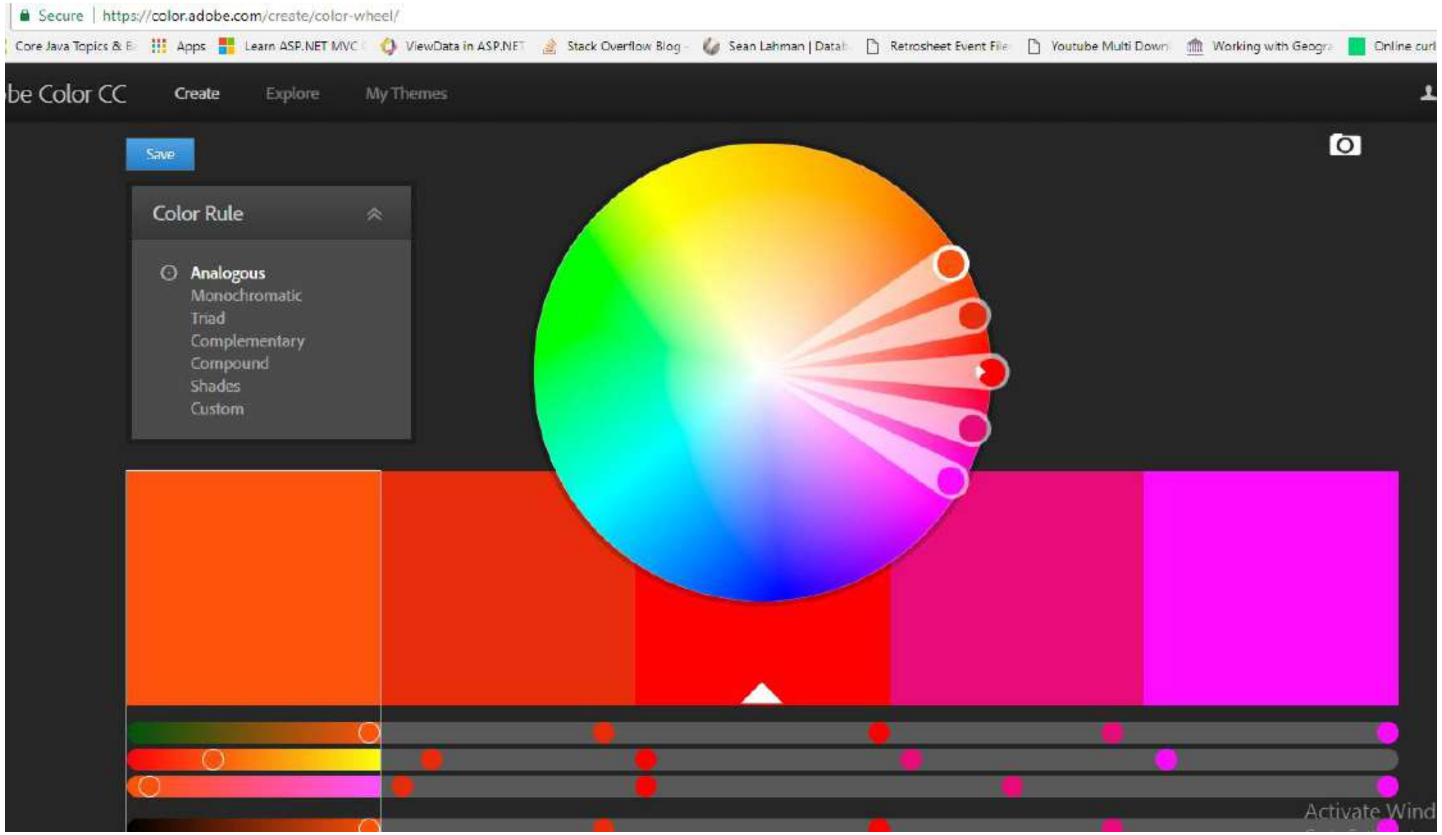
- Colors help us define how **variations stand out**
- Colors help us in **categorization**
- I want hue generating color palette for data visualization



http://tools.medialab.sciences-po.fr/iwanthue/

Selecting an appropriate color palette

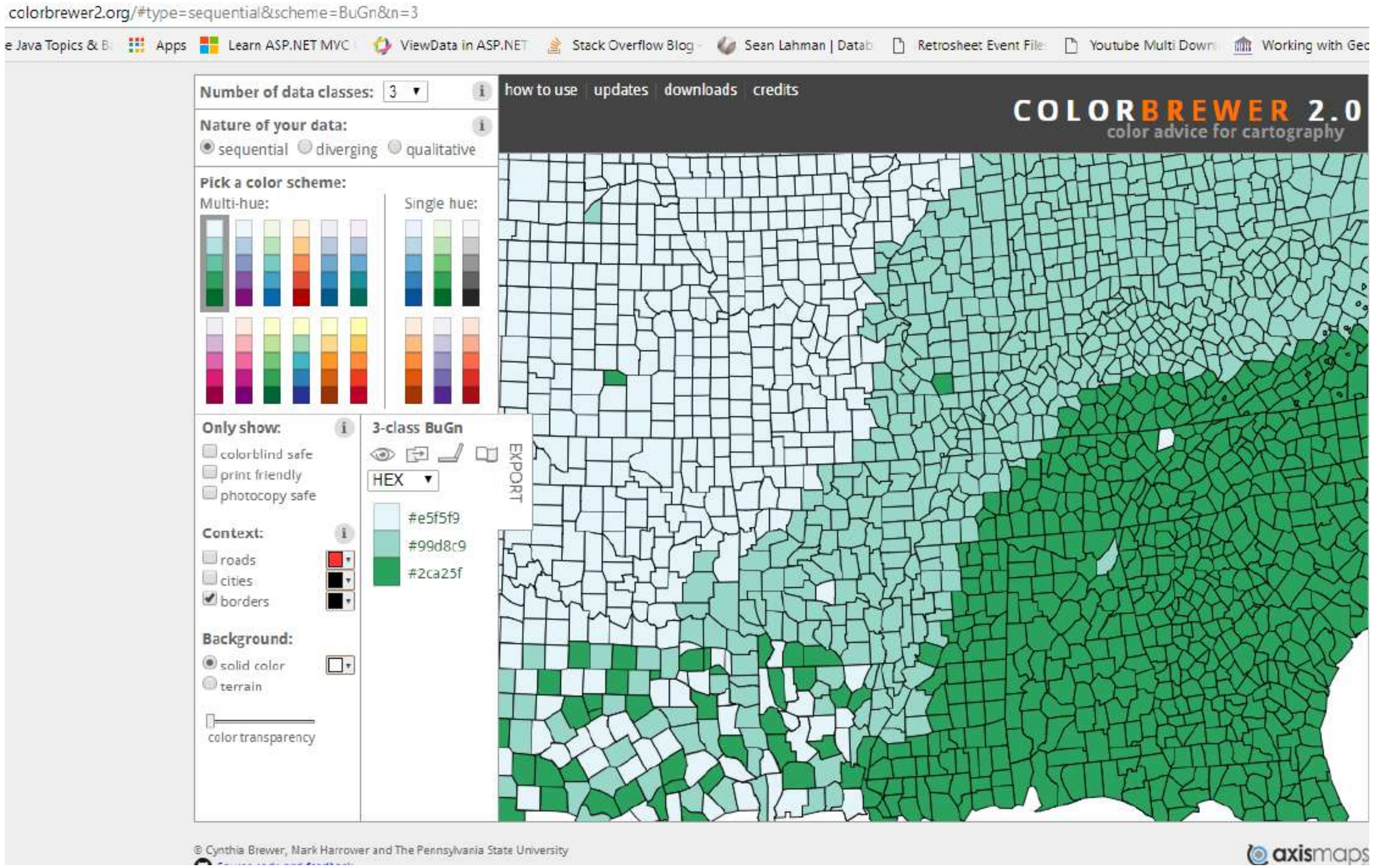
- Analogous
- Monochromatic
- Triad
- Complementary
- Compound
- Shades
- Custom



https://color.adobe.com/create/color-wheel/

Selecting an appropriate color palette

- Color brewer 2.0



http://colorbrewer2.org/#type=sequential&scheme=BuGn&n=3

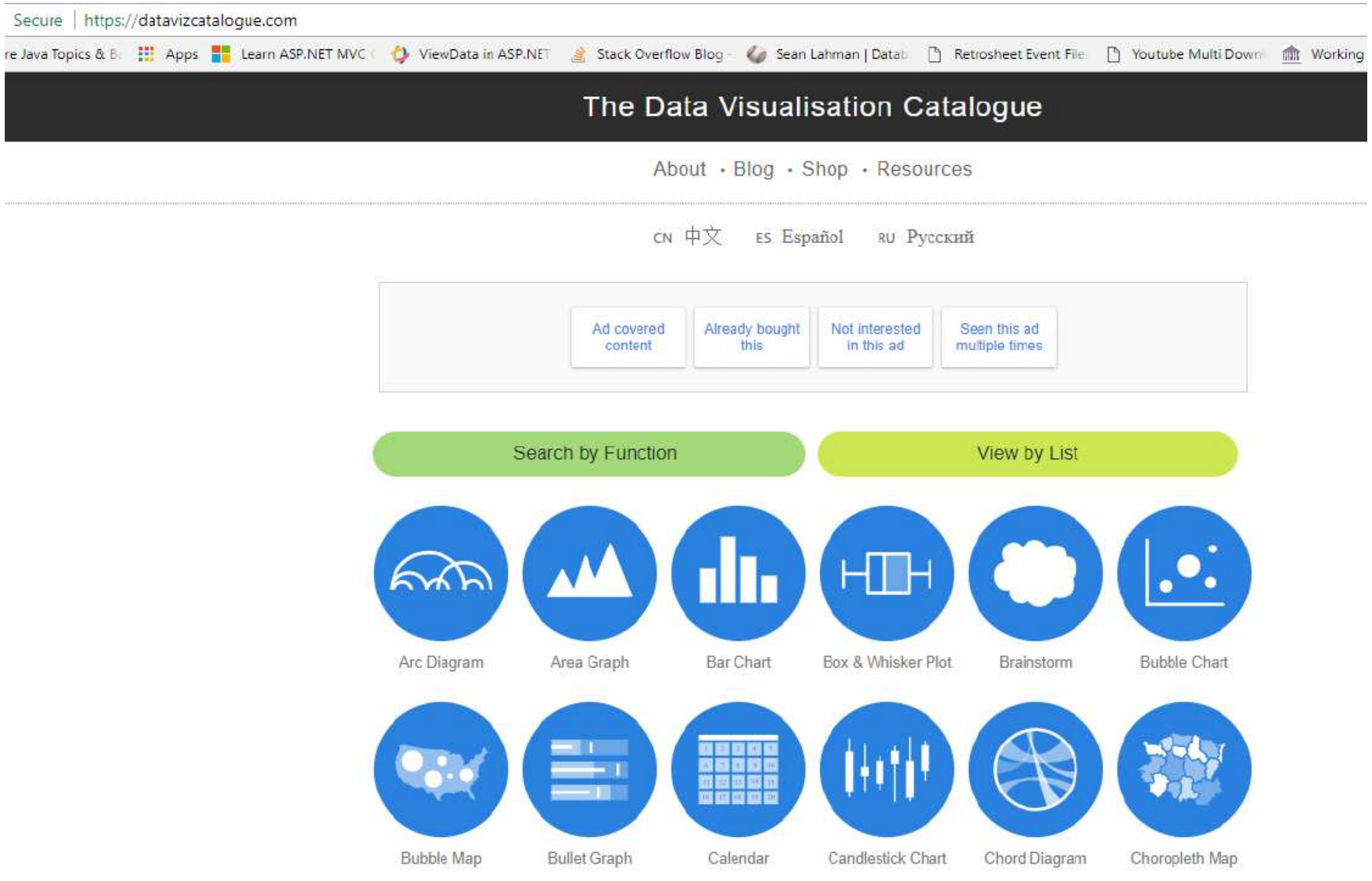
SYED AWASE

CRITERIA FOR PICKING THE RIGHT CHART FOR THE STORY?

THE GRAPHIC CONTINUUM

- *Jon Schwabish and Severino Ribecca*

https://datavizcatalogue.com/



COMPARISONS

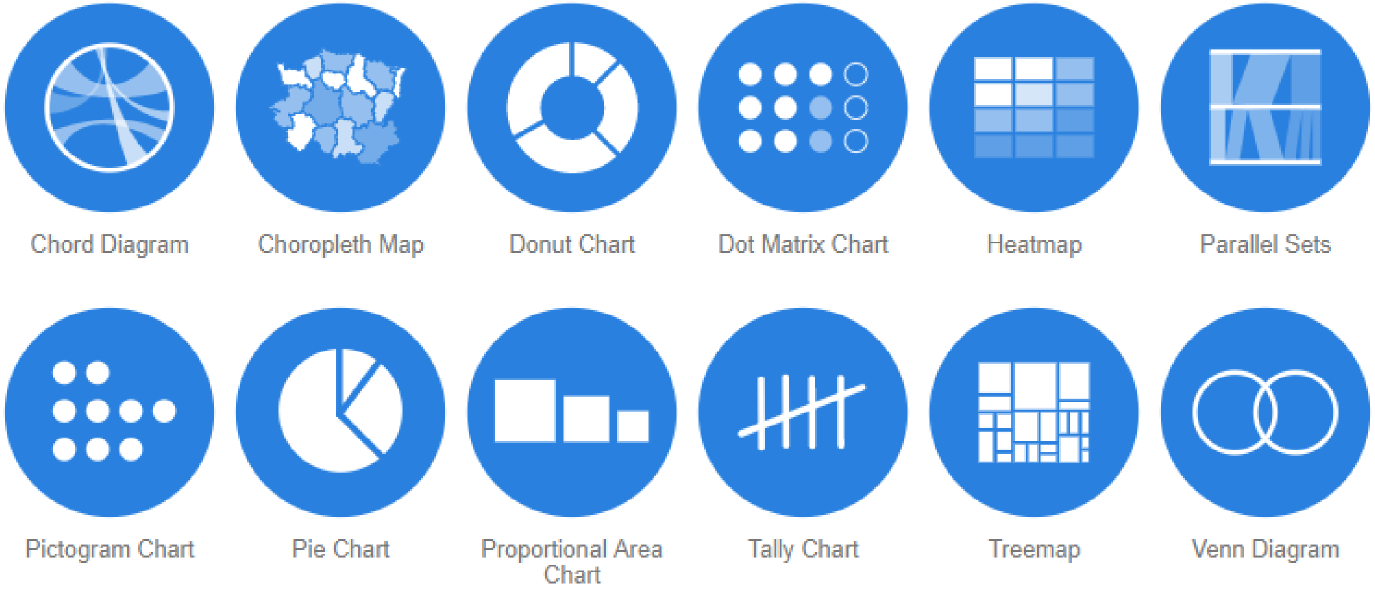
• with an axis

•Visualization methods that help show the differences or similarities between values

Source: https://datavizcatalogue.com/search/comparisons.html

COMPARISONS

- **without an axis**
- Visualization methods that help show the differences or similarities between values



Source: https://datavizcatalogue.com/search/comparisons.html

PROPORTIONS

- Visualization methods that use size or area to show differences or similarities between values or for parts to a whole

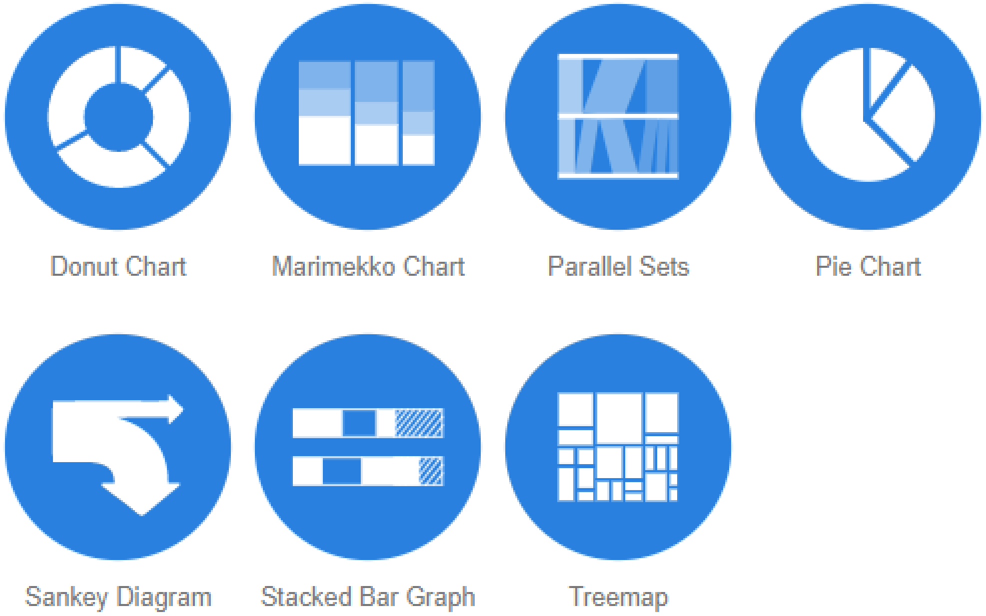
Proportions between values

Source: https://datavizcatalogue.com/search/proportions.html

PROPORTIONS

- Visualization methods that use size or area to show differences or similarities between values or for parts to a whole

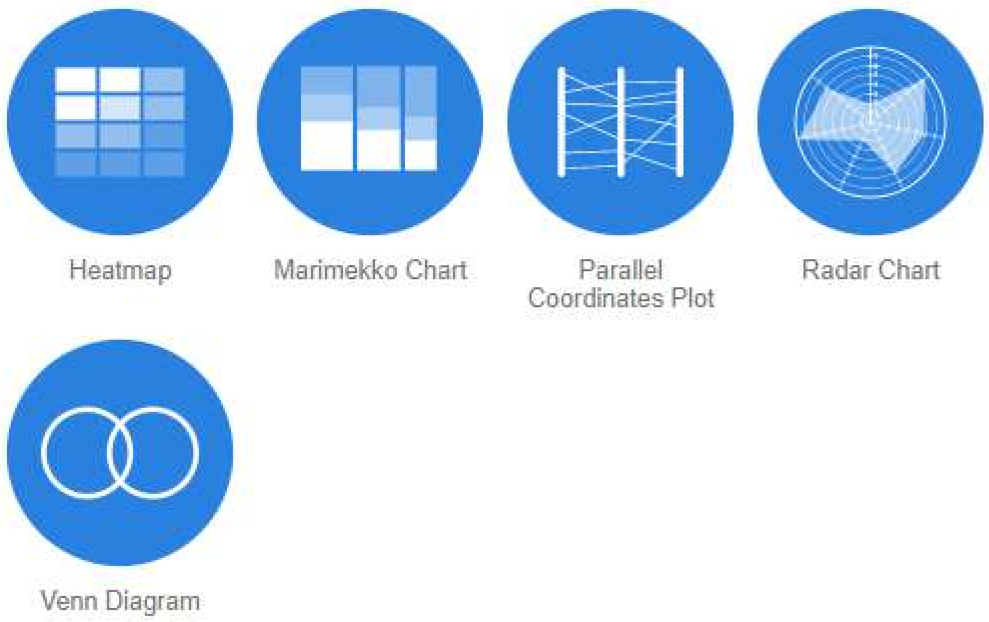
Proportions in parts-to-a-whole relationships



Source: https://datavizcatalogue.com/search/proportions.html

RELATIONSHIPS

- Visualization methods that show relationships and connections between the data or show connections between two or more variables.



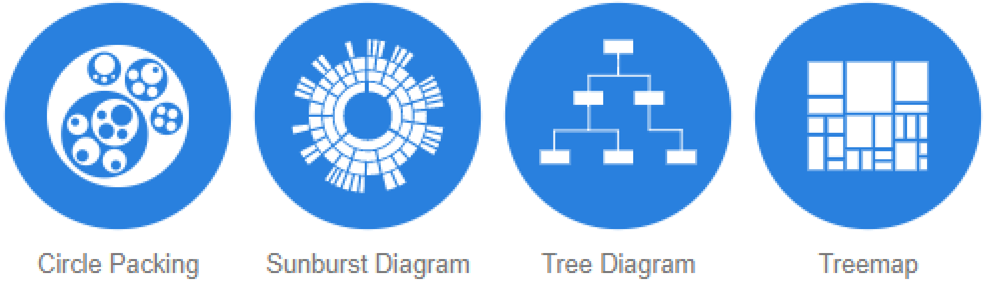
Source: https://datavizcatalogue.com/search/proportions.html

RELATIONSHIPS

- Visualization methods that show relationships and connections between the data or show connections between two or more variables.

HIERARCHY

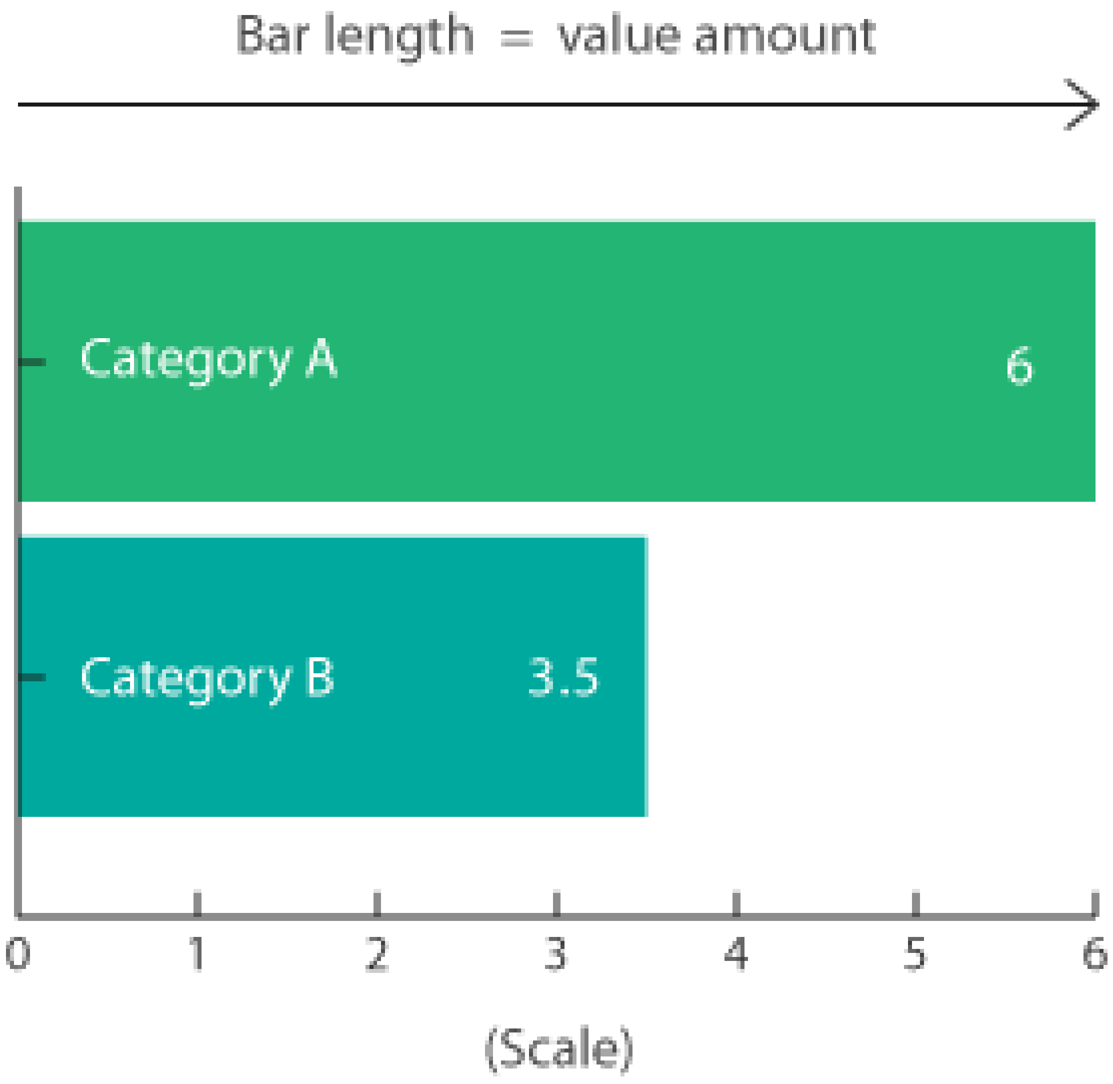
- Visualization methods that show how data or objects are ranked and ordered together in an organization or system.



Comparisons Pattern

Bar Chart

- can be either horizontal or vertical bars
- To show discrete, numerical comparisons across categories being compared
- They do not display continuous developments over an interval.
- **Challenge: labeling for huge data**

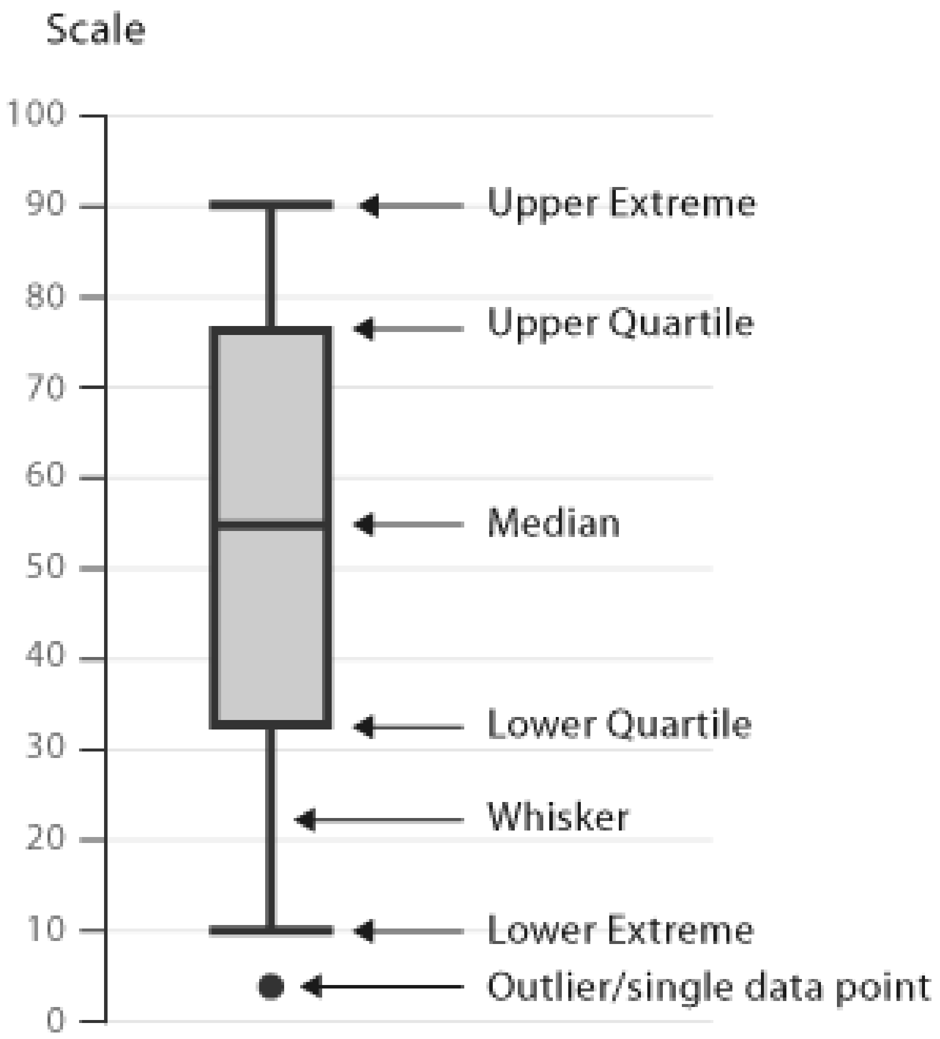


Distribution

Range

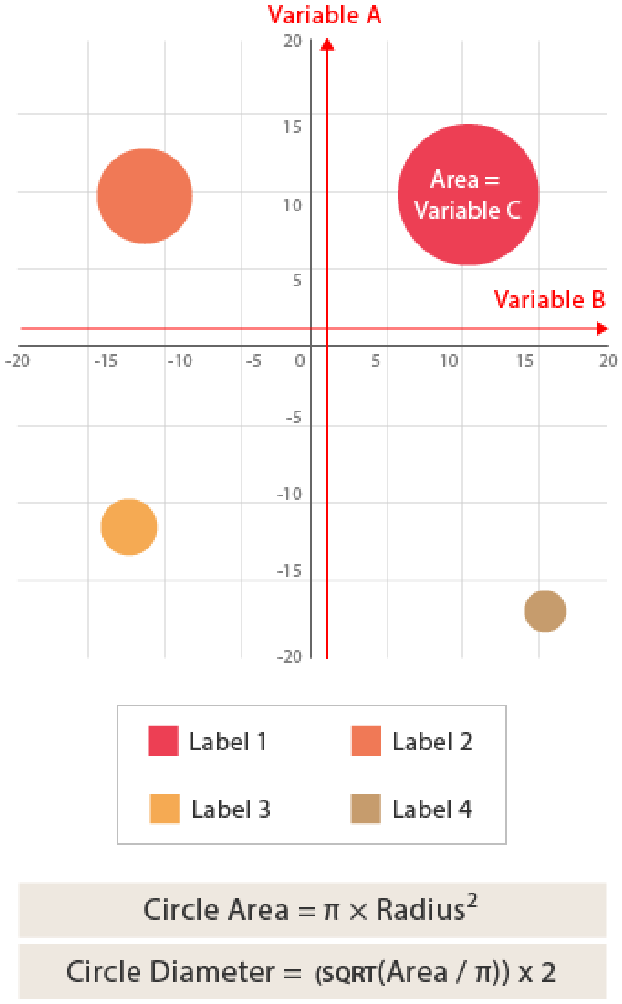
Box and Whisker Plot

- Used for depicting data through their quartiles.
- Whiskers indicate variability outside the **upper and lower quartiles.**
- **Box plot can be drawn either vertically or horizontally.**
- **Challenge:**



Bubble Chart

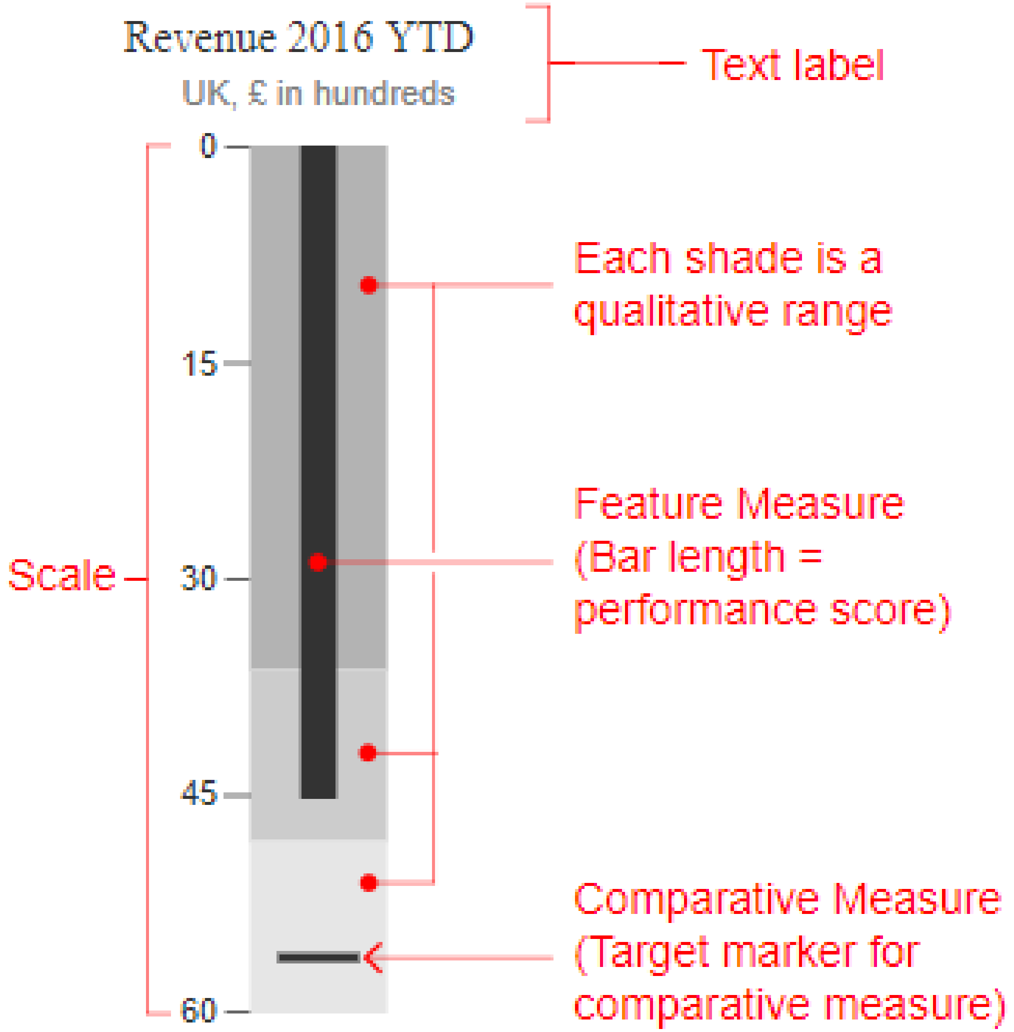
- A multi-variable graph which is a cross between a Scatter plot and Proportional Area Chart
- Used to compare and show the relationships between categorized circles, by using position and proportion.
- **Challenge: too many bubbles can make the chart hard to read.**



Comparisons | Range

Bullet Graphs

- used to display performance data.
- Feature Measure is encoded by a length of the main bar in the middle of the chart.
- Comparative Measure is perpendicular line marker to the orientation of the graph and is used as a target marker to compare with feature measure.
- **Challenge: sometimes hard to read.**



Distribution | Range | Data Over time | Proportions | Comparisons

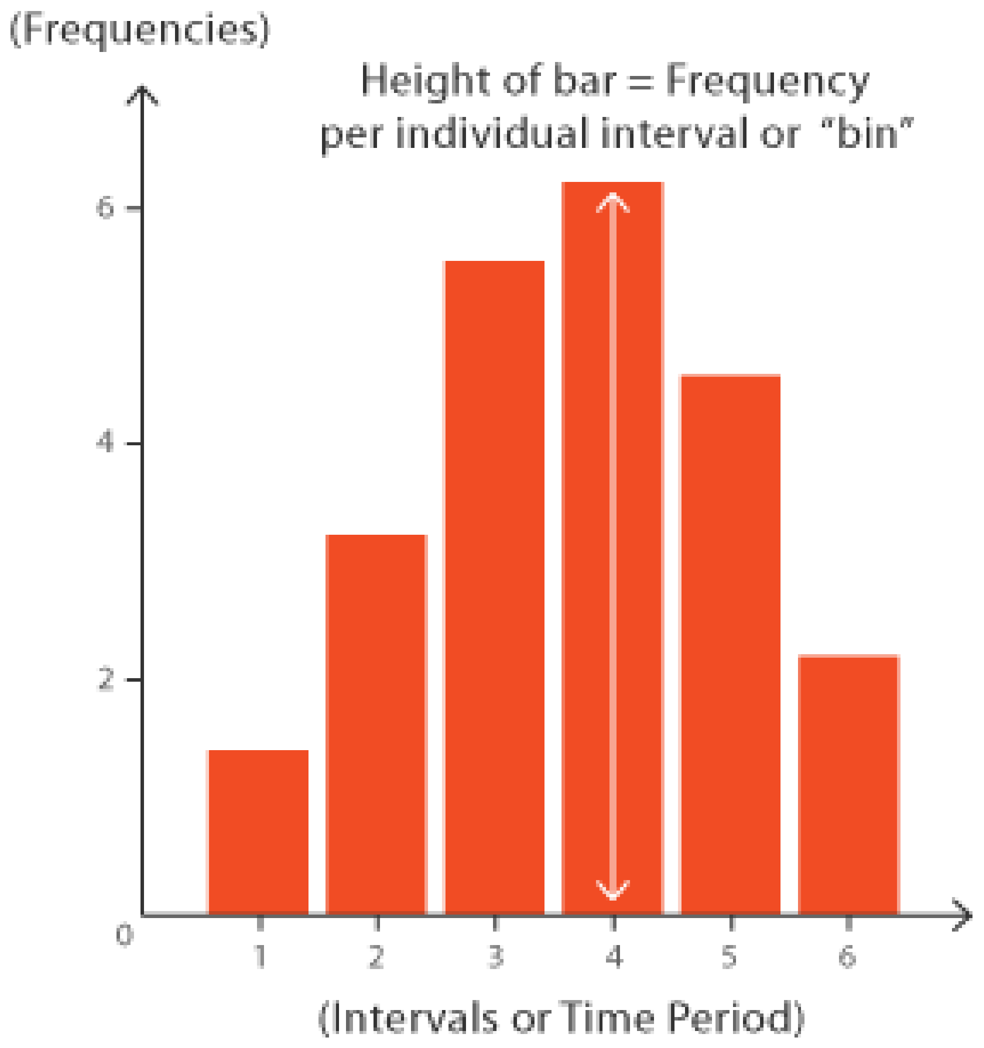
Histograms

• used to visualize the distribution of data over a continuous interval or certain time period.

•Tabulated frequency at each interval/bin.

•Give an estimate as to where values are concentrated, what the extremes are and where there are any gaps or unusual values.

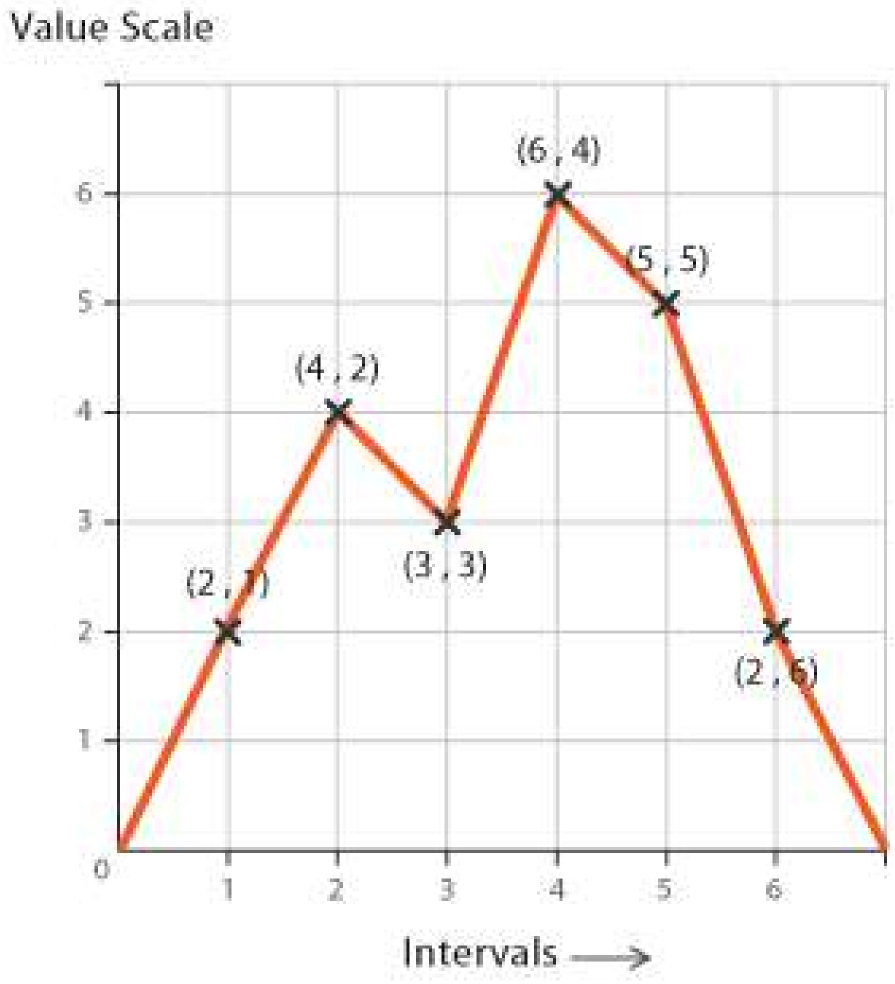
•Challenge: sometimes hard to read.



Distribution | Range | Data Over time | Proportions | Relationships

Line Graph

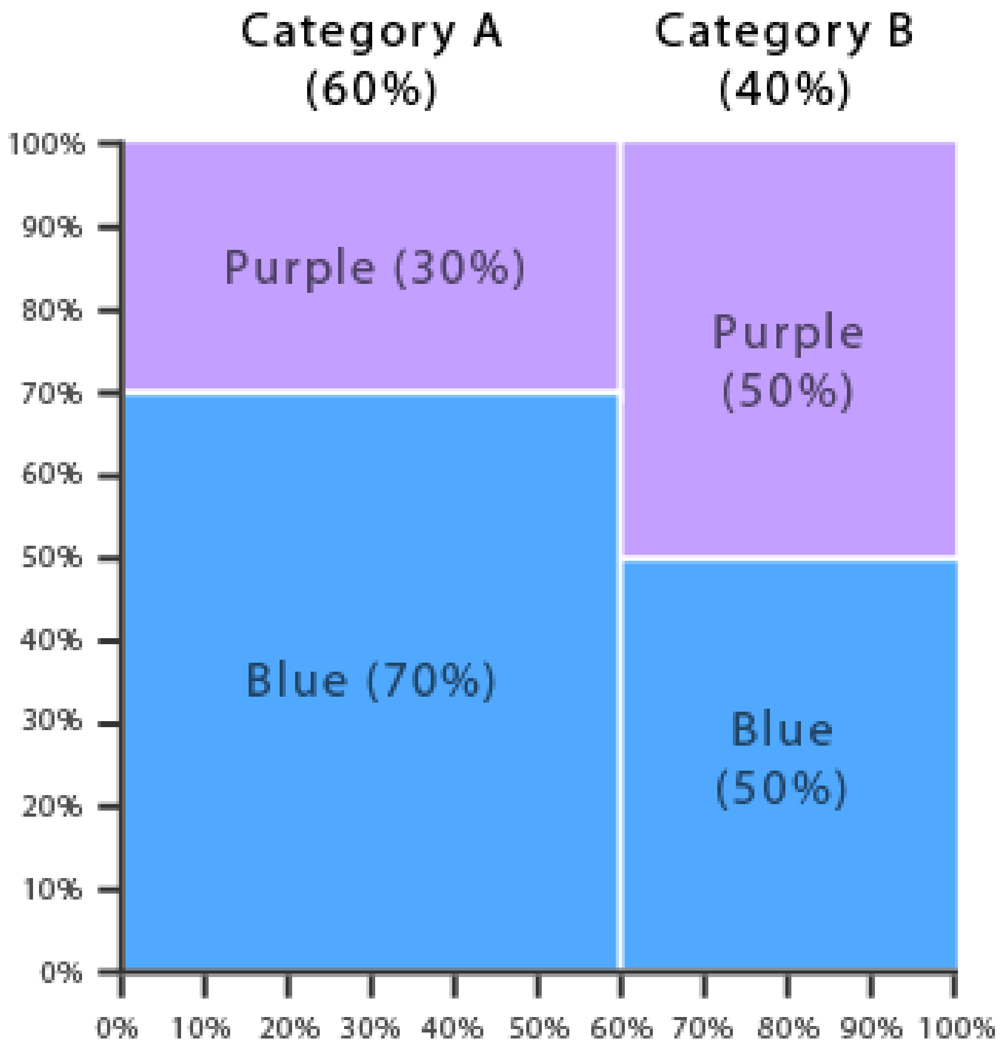
- used to display quantitative values over a continuous interval or time period.
- show trends and analyse how the data has changed over time.
- Uses Cartesian coordinate grid.
- **Challenge:**



Comparisons | Part-to-a-whole | Proportions | Relationships

MOSAIC PLOT

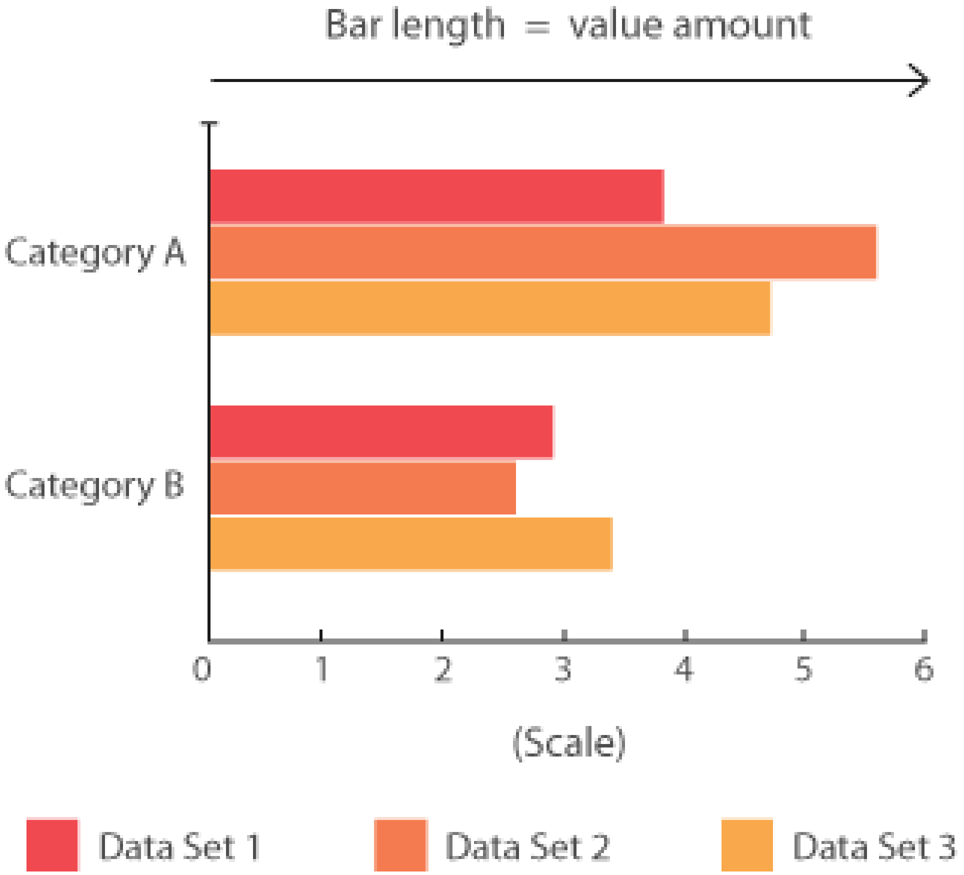
- used to visualize categorical data over a pair of variables.
- Both axes are variable with percentage scale, that determines both the width and height of each segment.
- Easy to detect relationships between categories and their sub-categories.
- **Challenge: sometimes hard to read, when there are many segments.**



Comparisons | Distribution | Patterns | Relationships

GROUPED BAR CHART

- used when two or more data series are plotted side-by-side and grouped together under categories, all on the same axis.
- To show, discrete, numerical comparisons amongst categories.
- **Challenge: harder to read the more bars we have in one group.**

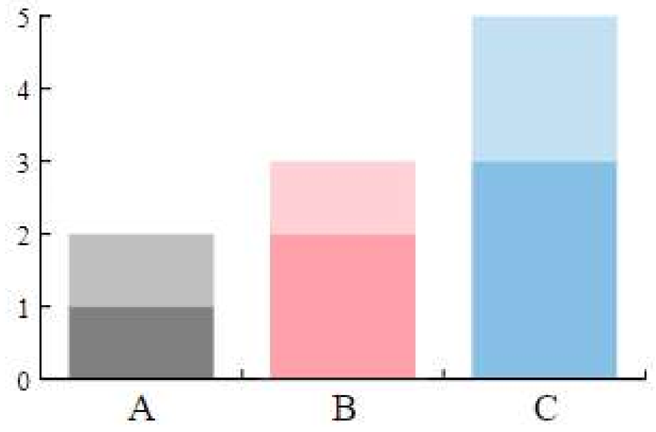


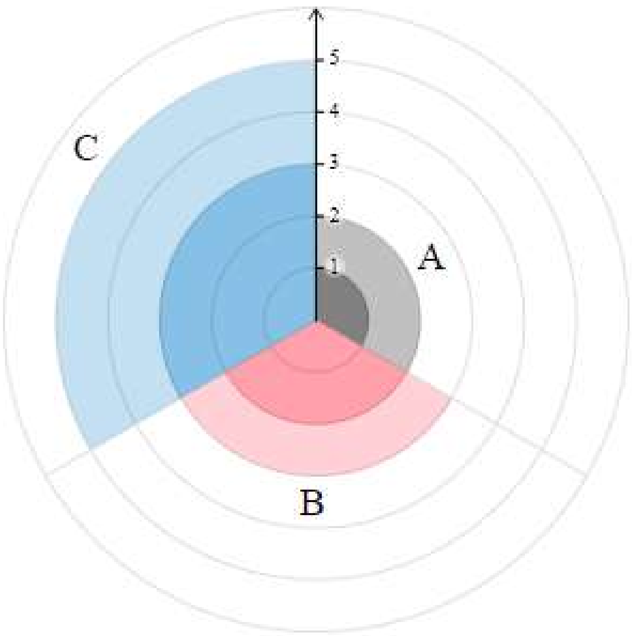
Comparisons | Data over time | Proportions

POLAR AREA DIAGRAM

- COXCOMB CHART/ NIGHTINGALE ROSE CHART
- drawn on polar coordinate grid. Each category or interval in the data is divided into equal segments on this radial chart.

•Challenge: The outer segments are given more emphasis due to their larger area size, which disproportionately represents increases in value.



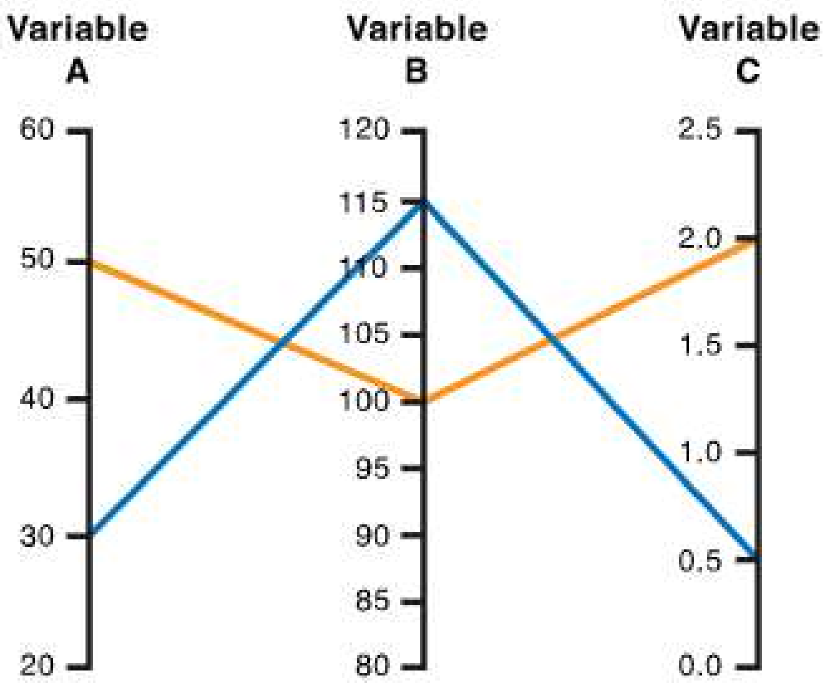


Original Series

Comparisons | Patterns | Relationships

PARALLEL COORDINATES PLOT

- used for plotting multivariate, numerical data.
- Ideal for comparing many variables together and seeing the relationships between them.
- Each variable is given its own axis and all the axes are placed in parallel to each other.
- **Challenge: can become over-cluttered/ dense**

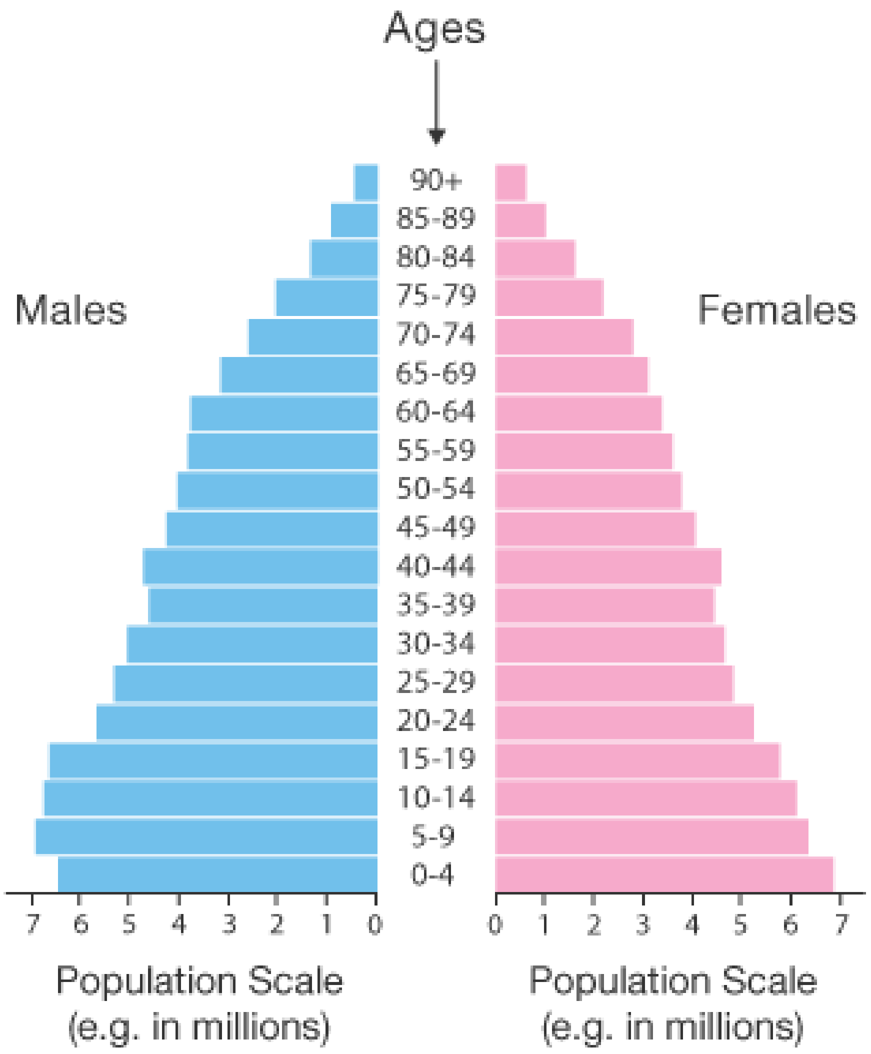


Data			
	Variable A	Variable B	Variable C
Item 1	50	100	2.0
Item 2	30	115	0.5

Comparisons | Patterns | Distributions

POPULATION PYRAMID

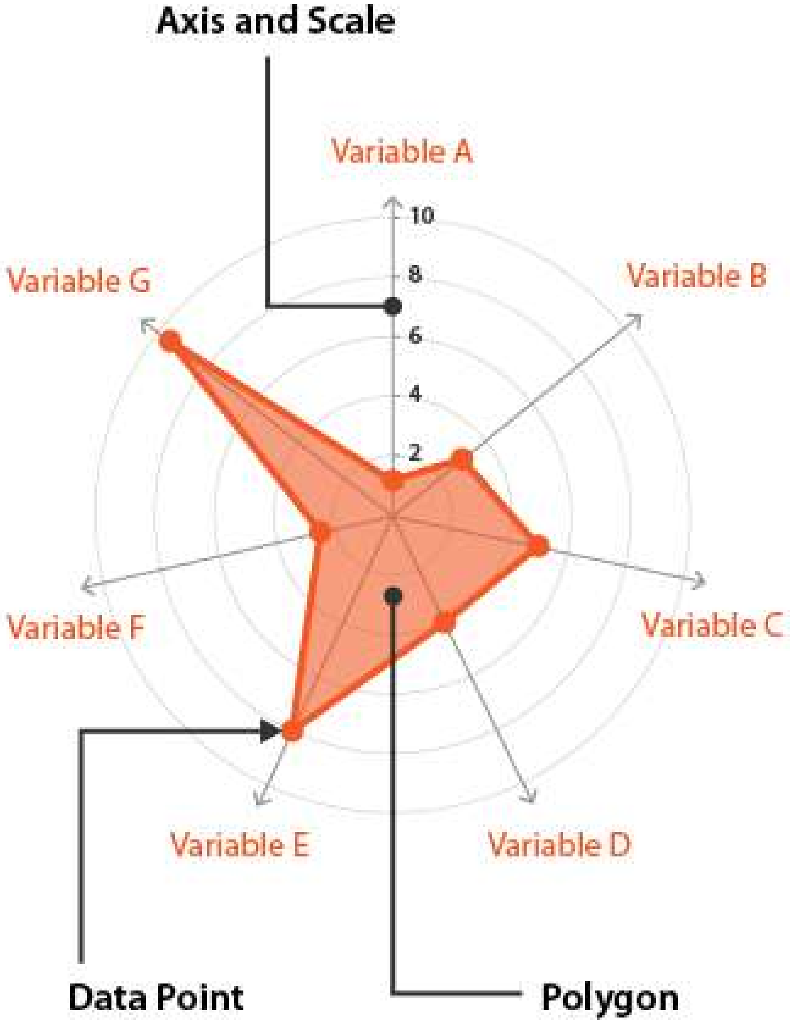
- they are a pair of back-to-back histograms that displays the distribution of a population in all age groups and in both sexes.
- For detecting changes or difference in population patterns.
- Used to speculate a population's future development.
- **Challenge:**



Comparisons | Patterns | Relationships

RADAR CHART

- A way of comparing multiple quantitative variables.
- Useful for visualizing which variables are scoring high or low within a dataset.
- **Challenge: not so good for comparing values across each variable.**



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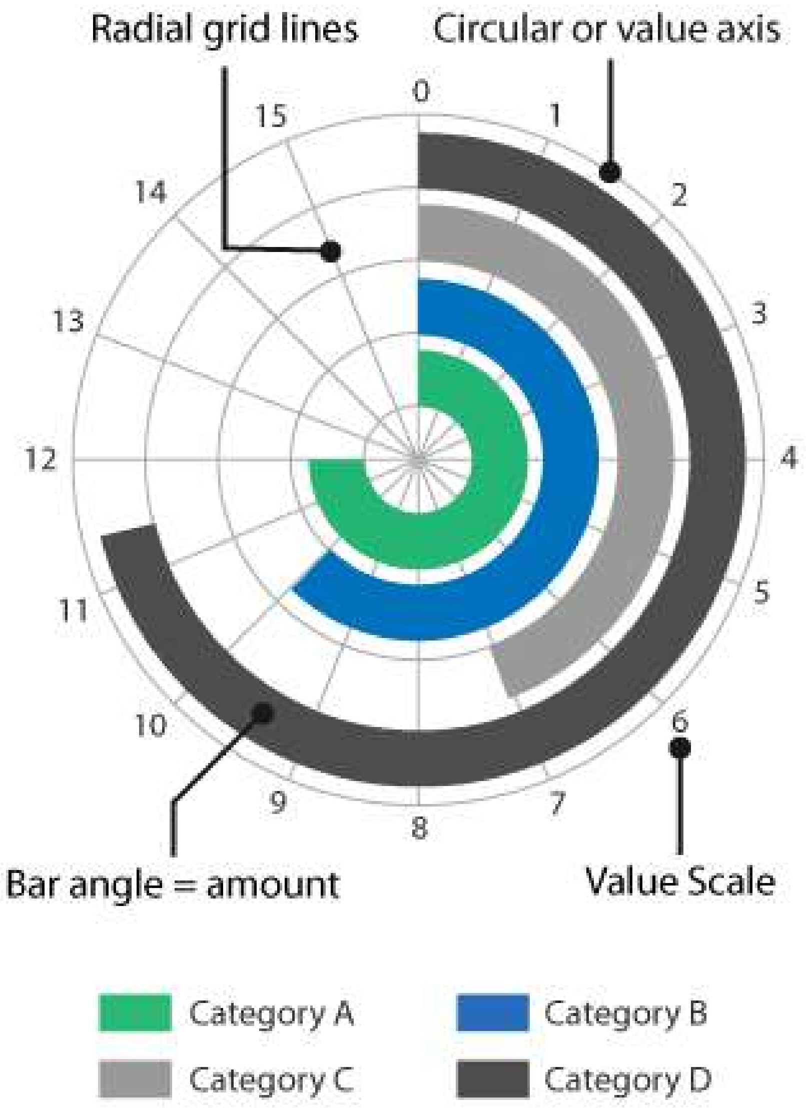
Original Series

Comparisons

RADIAL BAR CHART

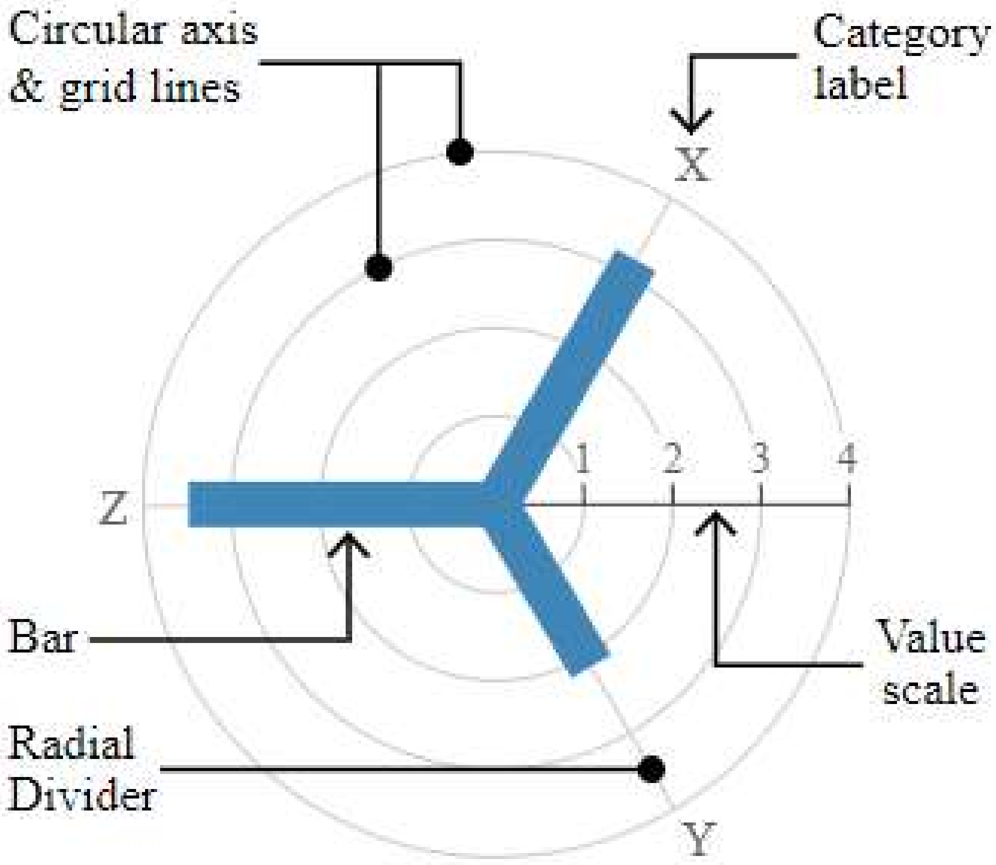
- A bar chart plotted on a polar coordinate system, rather than a cartesian coordinate.
- Used for aesthetic reasons.
- **Challenge:**



Comparisons

RADIAL COLUMN CHART

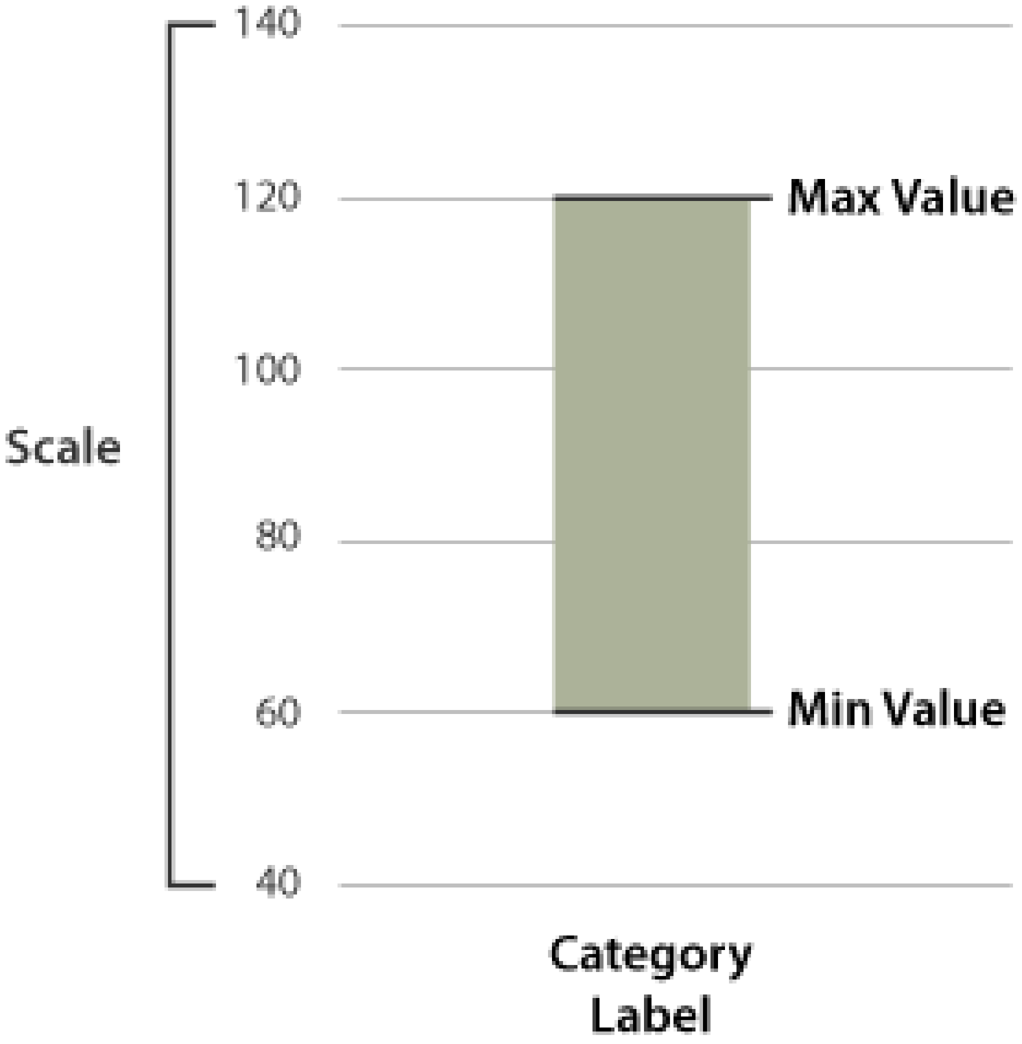
- uses a grid of concentric circles to plot bars on them. Each circle on the graph represents a value on a scale.
- Radial dividers are used for each category or interval.
- **Challenge:**



Comparisons | Ranges

SPAN CHART

- Range Bar/Column Graph/Floating Bar Graph.
- Used to display dataset ranges between a minimum value and a maximum value.
- Ideal for comparing ranges/categorized ranges.
- **Challenge: focus is on the extreme values and give no information on the values in between the min and max value or on averages or data distribution.**

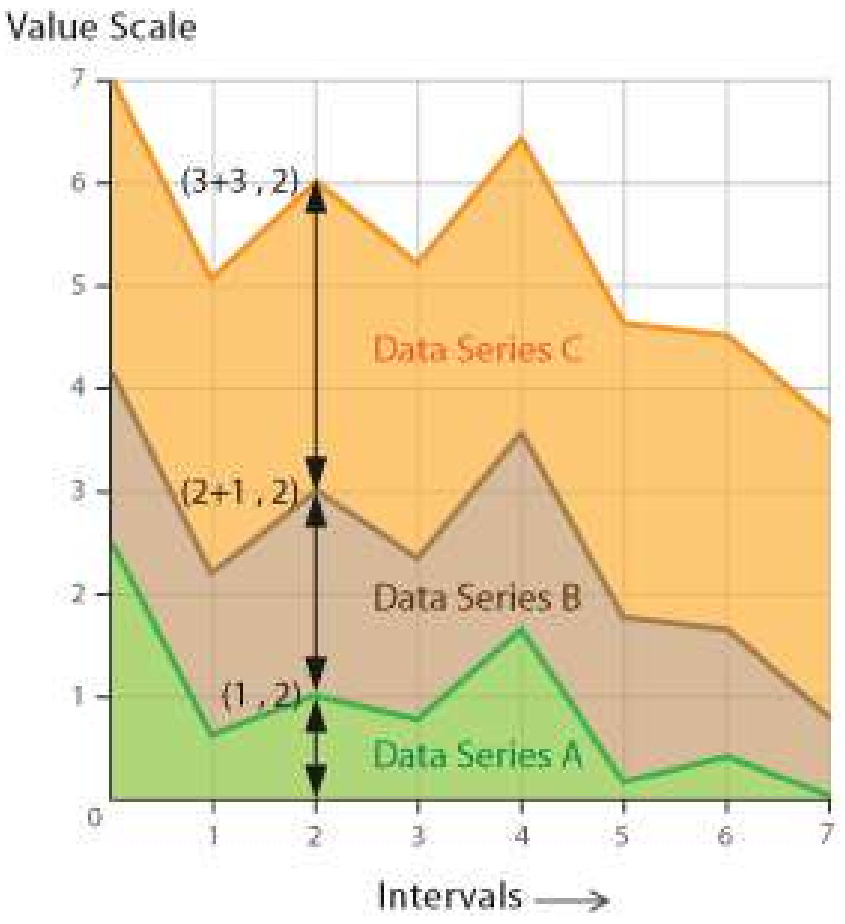


Original Series

Comparisons | Data over time | Patterns

STACKED AREA GRAPH

- used to represent the total of all the data plotted.
- Used for comparing multiple variables changing over an interval.
- **Challenge: they do not work for negative values.**



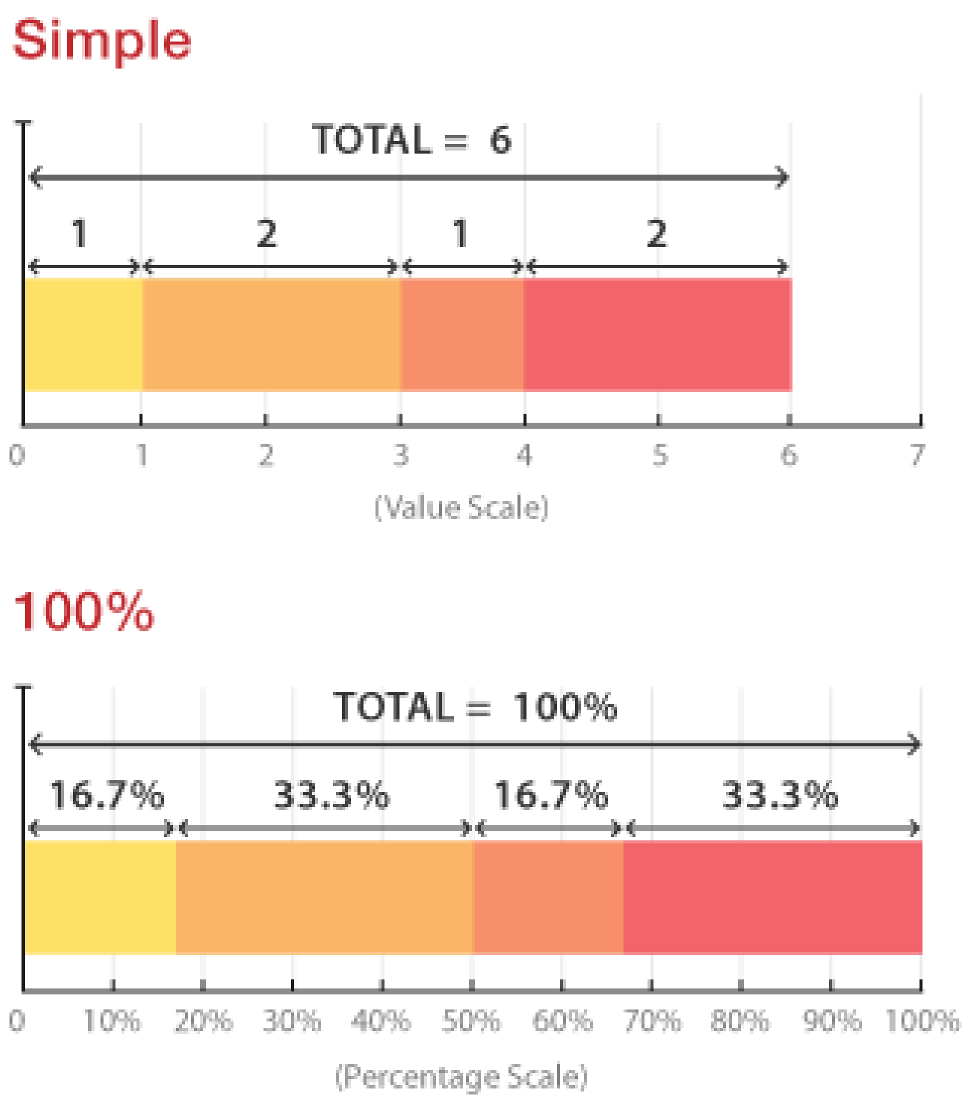
Original Series

Comparisons

Proportions

STACKED BAR GRAPH

- They stack the bars of multiple datasets on top of each other.
- Used to show how a larger category is divided into smaller categories
- Used to show the relationship of each part has on the total **amount.**
- **Challenge: harder to read when more segments each bar has. Comparison also becomes difficult.**

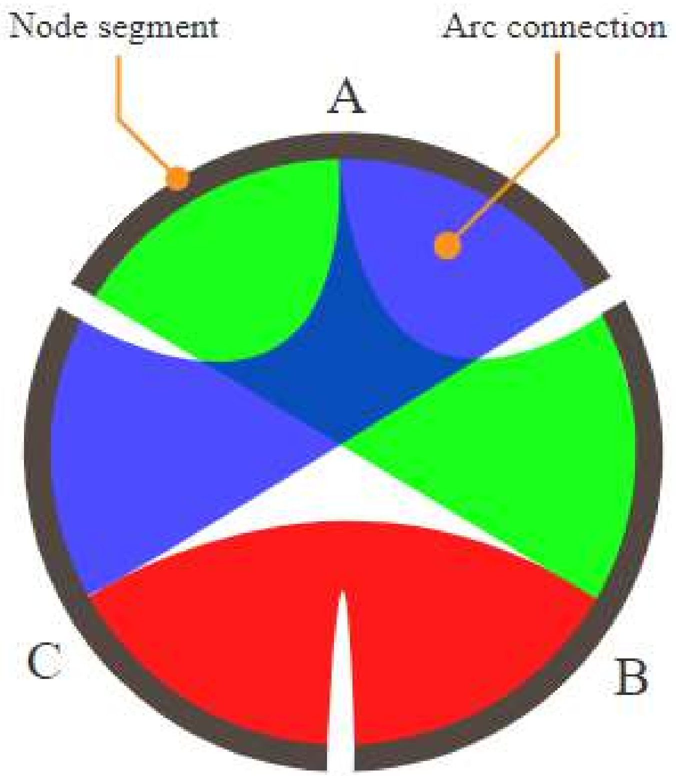


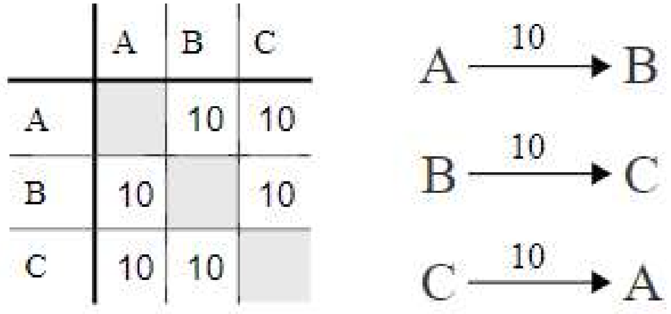
Original Series

Comparisons | Relationships

CHORD DIAGRAM

- used to visualize the inter-relationships between entities.
- The connections between entities are used to display that they share something in common.
- Ideal for comparing the similarities within a dataset or between different groups of data
- **Challenge: over cluttering**

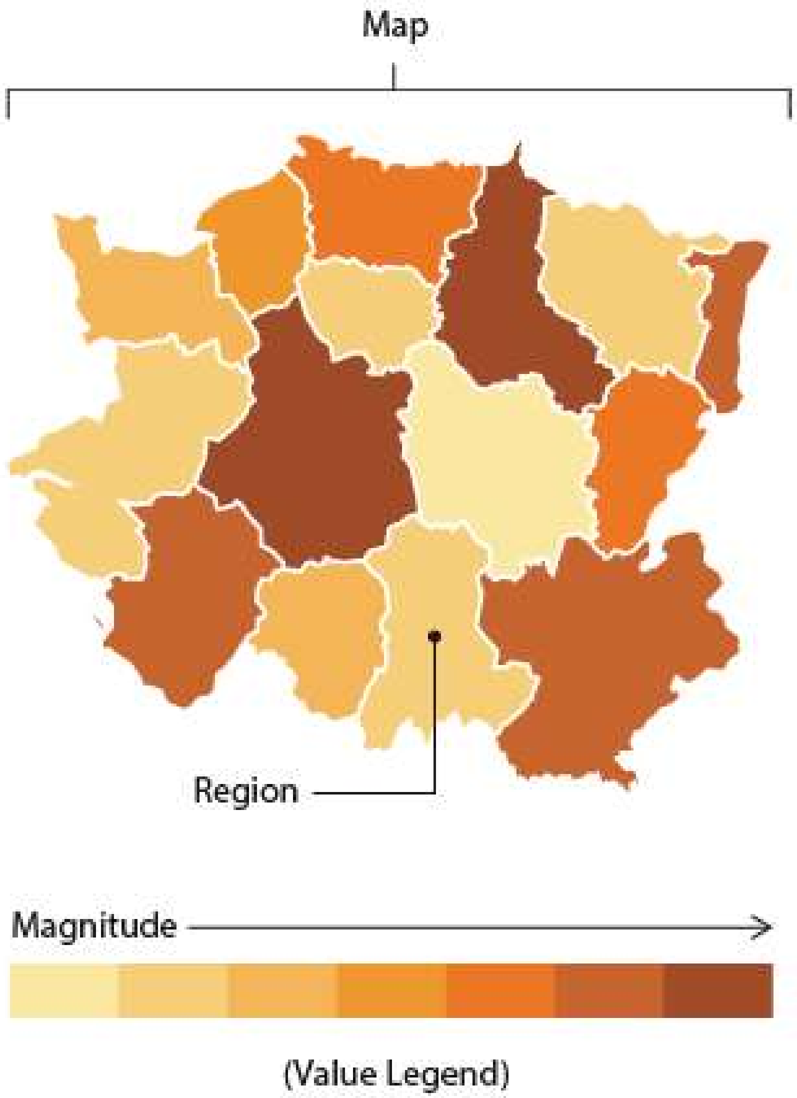




Comparisons | Location | Patterns

CHOROPLETH MAP

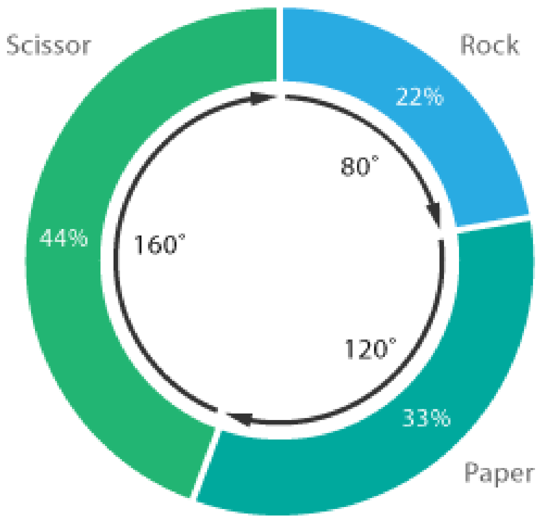
- used to display geographical areas or regions shaded in relation to a specific data variable.
- Visualizes values over a geographic region, which can show variation or patterns across the displayed location.
- The data variable uses colour progression to represent itself in each region of the map
- **Challenge: only abstract density of occurrence over a geographic region**



Comparisons | Part-to-whole | Proportions

DONUT CHART

- Used to chart the proportions
- **Challenge:**

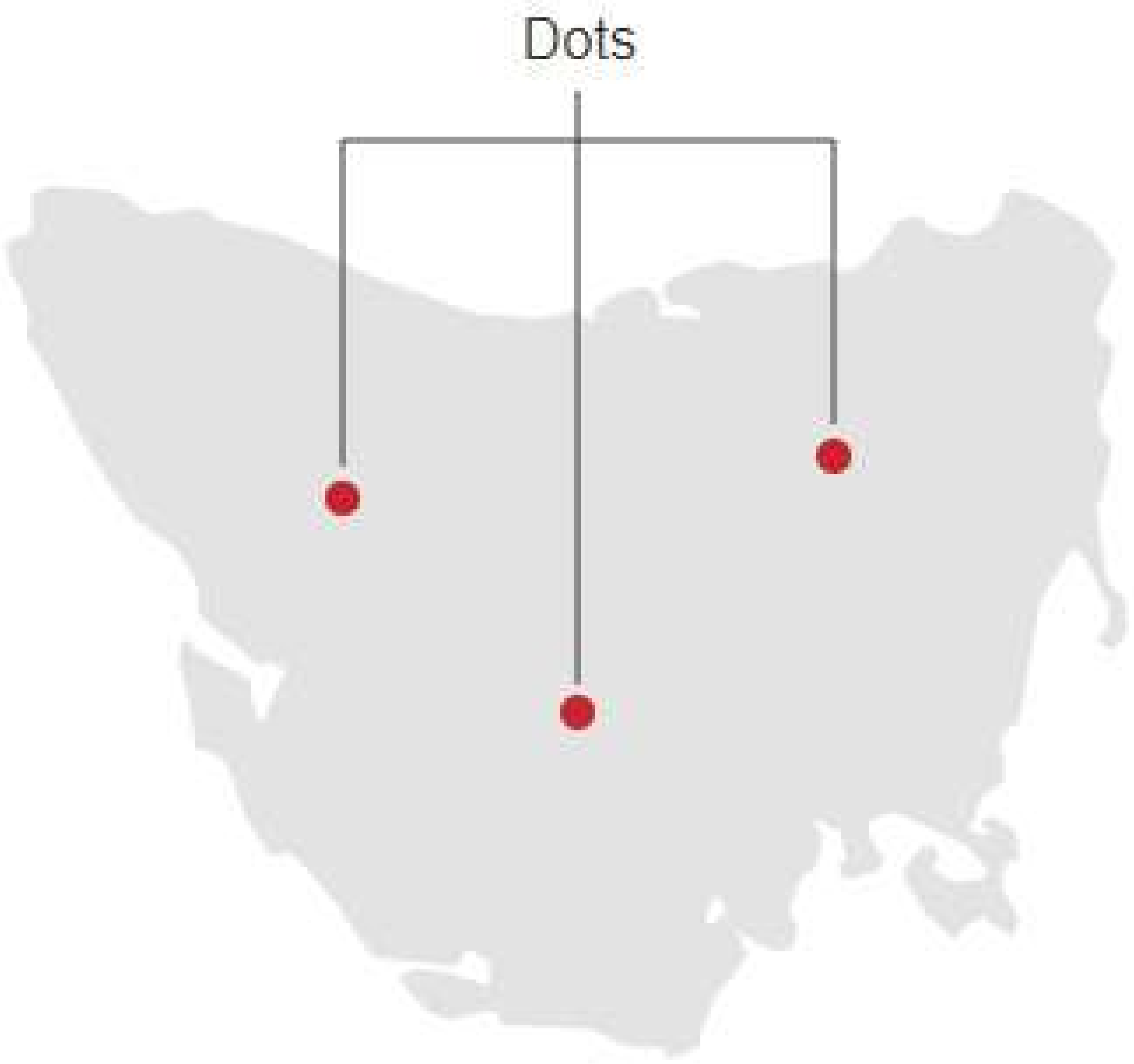


Data			
Rock	Paper	Scissor	TOTAL
2	3	4	9
To calculate percentages			
2/9 = **22%**	3/9 = **33%**	4/9 = **44%**	100%
Degrees for each "donut slice"			
(2/9) x 360 = **80˚**	(3/9) x 360 = **120˚**	(4/9) x 360 = **160˚**	360˚

Comparisons | Location | Patterns

DOT DENSITY MAP

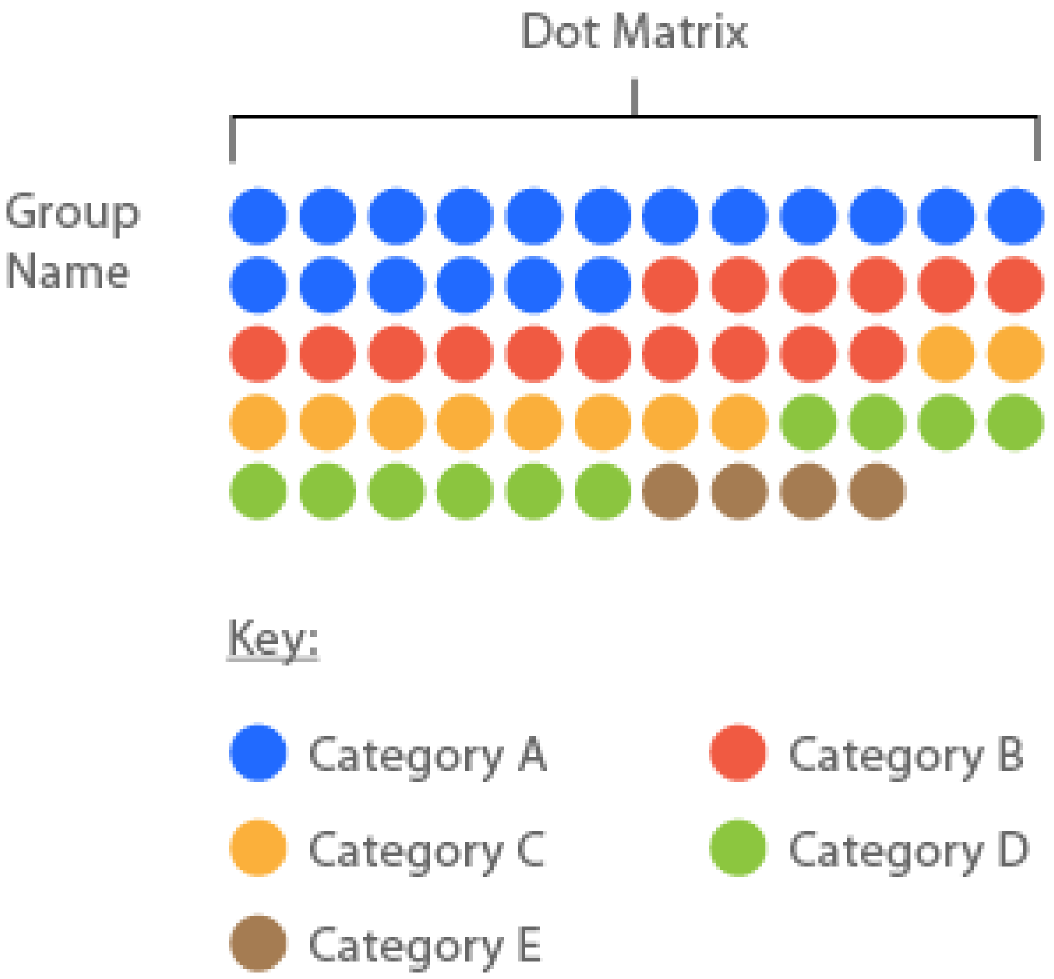
- A way of detecting spatial patterns or the distribution of data over a geographical region, by placing equal sized points over a geographical region.
- Ideal for visualizing data distributed over a geographic region and can reveal patterns when the points cluster on the map.
- **Challenge:**



Comparisons | Patterns | Distribution | Proportions

DOT MATRIX CHART

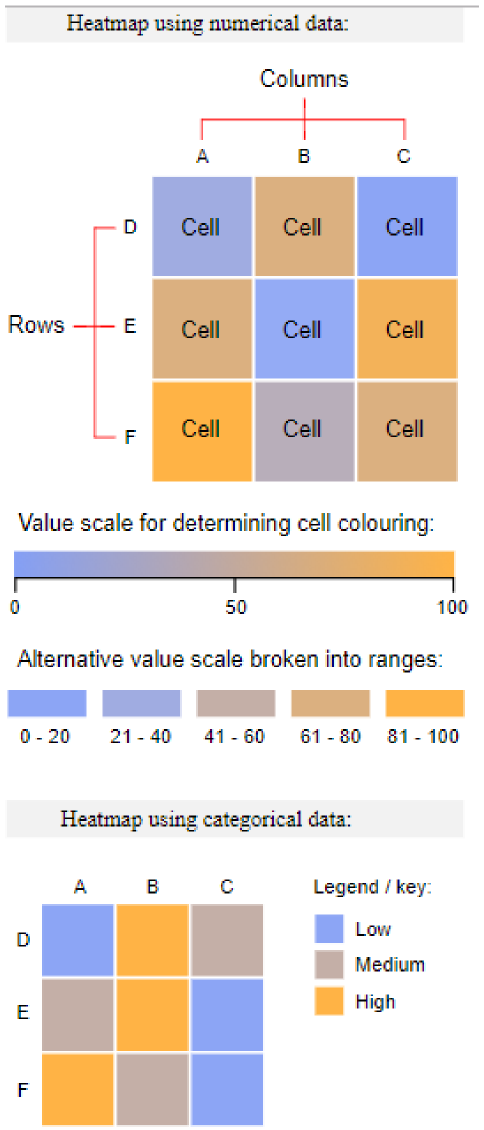
- Used to display discreet data in units of dots, each colored to represent a particular category and grouped together in a matrix.
- Provides a quick overview of the distribution and proportions of each category in a dataset and to compare distribution and proportions across other datasets.
- **Challenge: to read when only one variable/category is used in the dataset.**



Comparisons | Patterns | Data over time | Relationships

HEAT MAP

- Visualizes data through variations in colouring.
- Useful for cross-examining multivariate data
- Used for showing variance across multiple variables, revealing any patterns, displaying whether any variables are similar to each other.



- **Challenge:**

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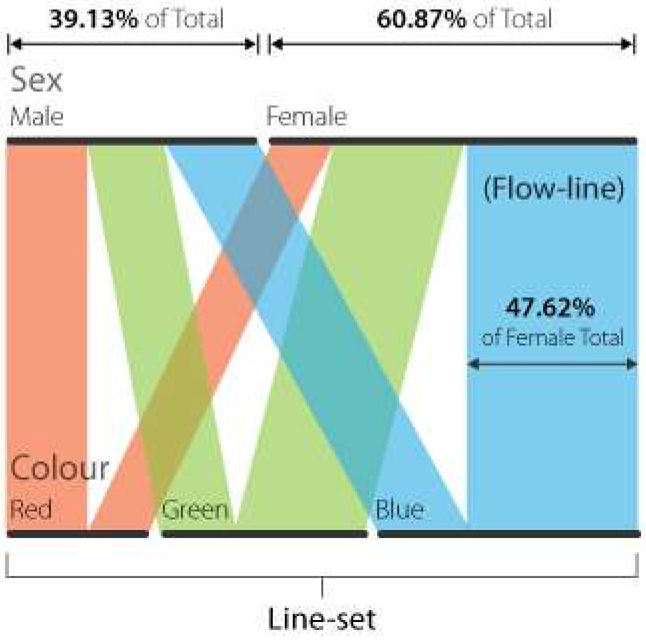
Original Series

Comparisons | Proportions | Flow | Distribution | Processes and Methods

PARALLEL SET CHARTS

- Parallel sets don't use arrows and they divide the flow-path at each displayed line-set.
- Each line-set corresponds to a dimension/dataset, which its values/categories are represented in each line divide in that line-set.

- **Challenge:**



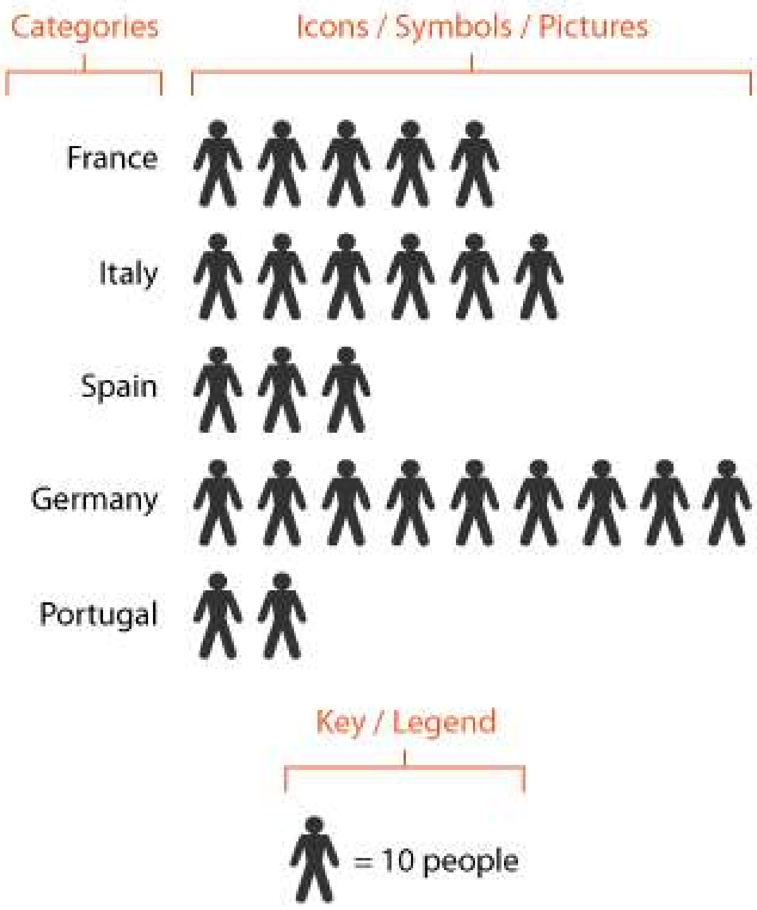
Sex	Colour	Count	% of Sex TOTAL
Male	Red	35	32.41
	Green	33	30.56
	Blue	40	37.04
Female	Red	28	16.67
	Green	60	35.71
	Blue	80	47.62

Comparisons | Distribution

PICTOGRAM CHART

- They use icons to give a more engaging overall view of small set of discrete data.
- The icons represent the data's subject or category

- **Challenge: difficult to visualize large data sets.**

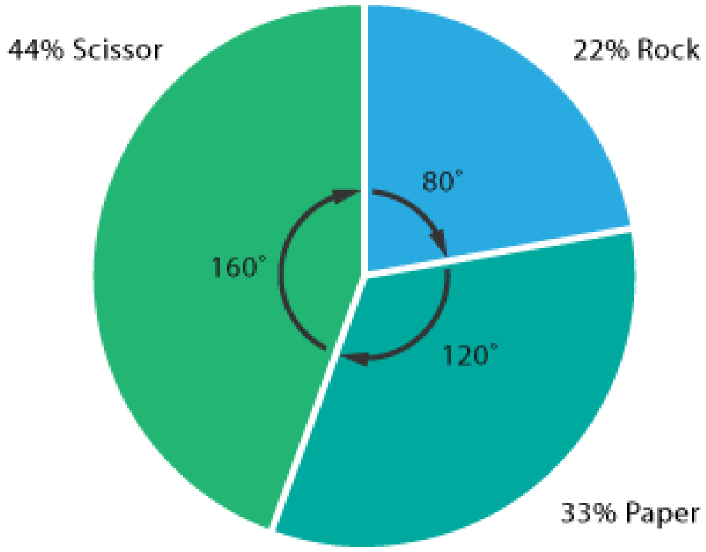


Comparisons | Part-to-a-whole | Proportions

PIE CHART

•Used to represent proportional distribution of data.

•Challenge:.



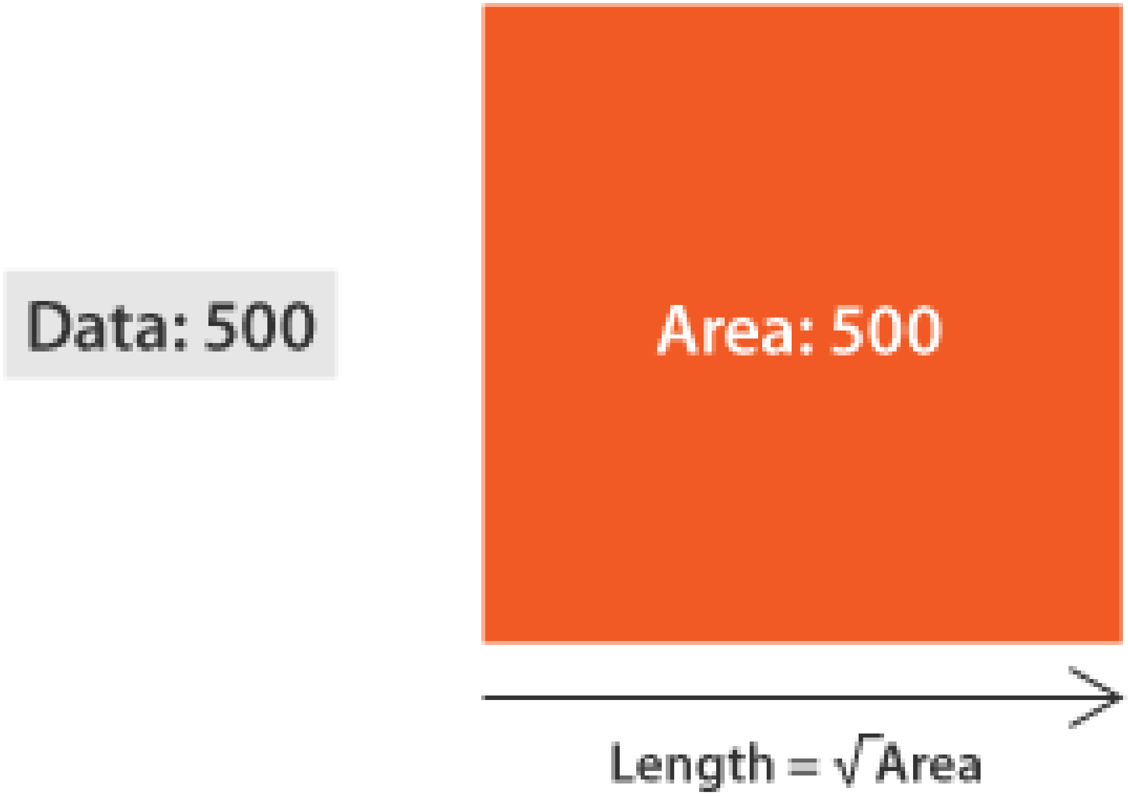
Data			
Rock	Paper	Scissor	TOTAL
2	3	4	9
To calculate percentages			
2/9=22%	3/9=33%	4/9=44%	100%
Degrees for each "pie slice"			
(2/9) x 360 = 80˚	(3/9) x 360 = 120˚	(4/9) x 360 = 160˚	360˚

Comparisons | Proportions

PROPORTIONAL AREA CHART

- Used for comparing values and showing proportions to give a quick, overall view of the relative sizes of the data, without the use of scales.

- **Challenge:.**

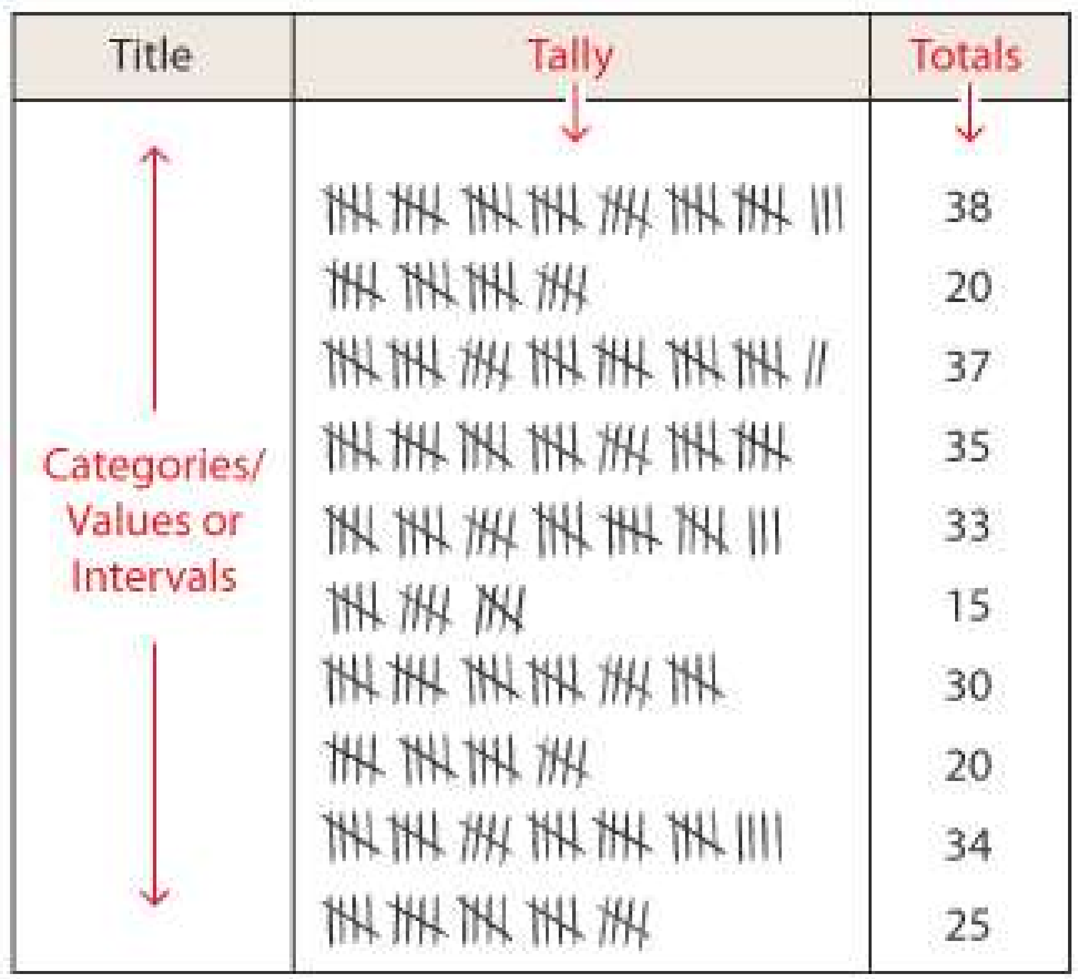


Comparisons | Distribution

TALLY CHART

- Used for recording and graphically showing the frequency of the distribution of data by using the tally mark numeral system.

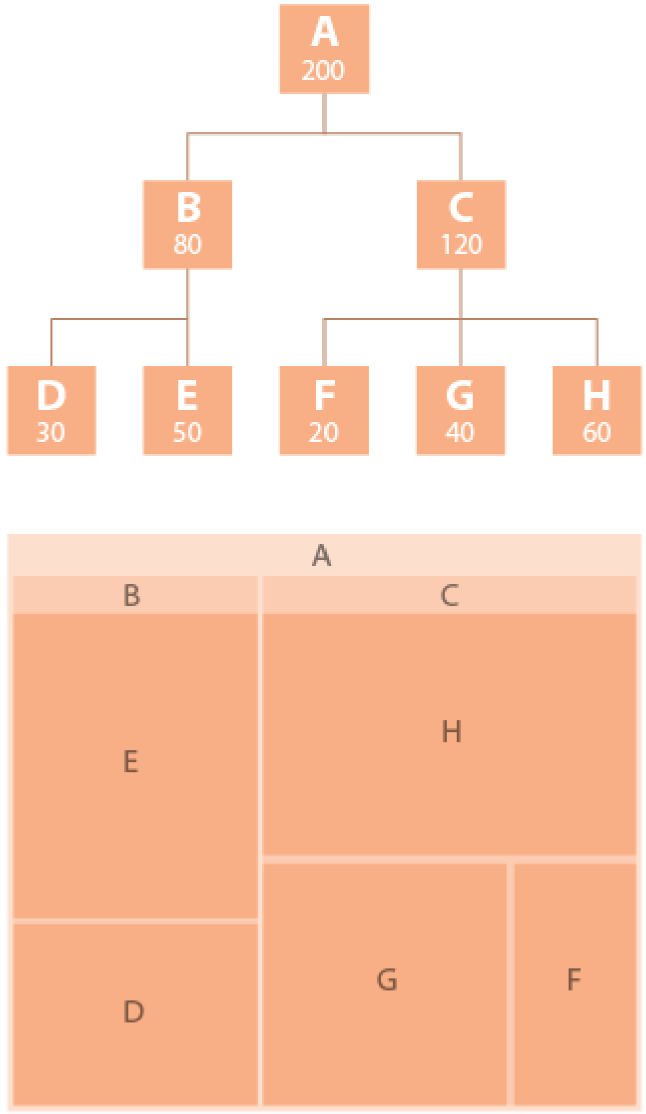
- **Challenge:.**



Comparisons | Hierarchy | Part-to-a-whole | Proportions

TREE MAPS

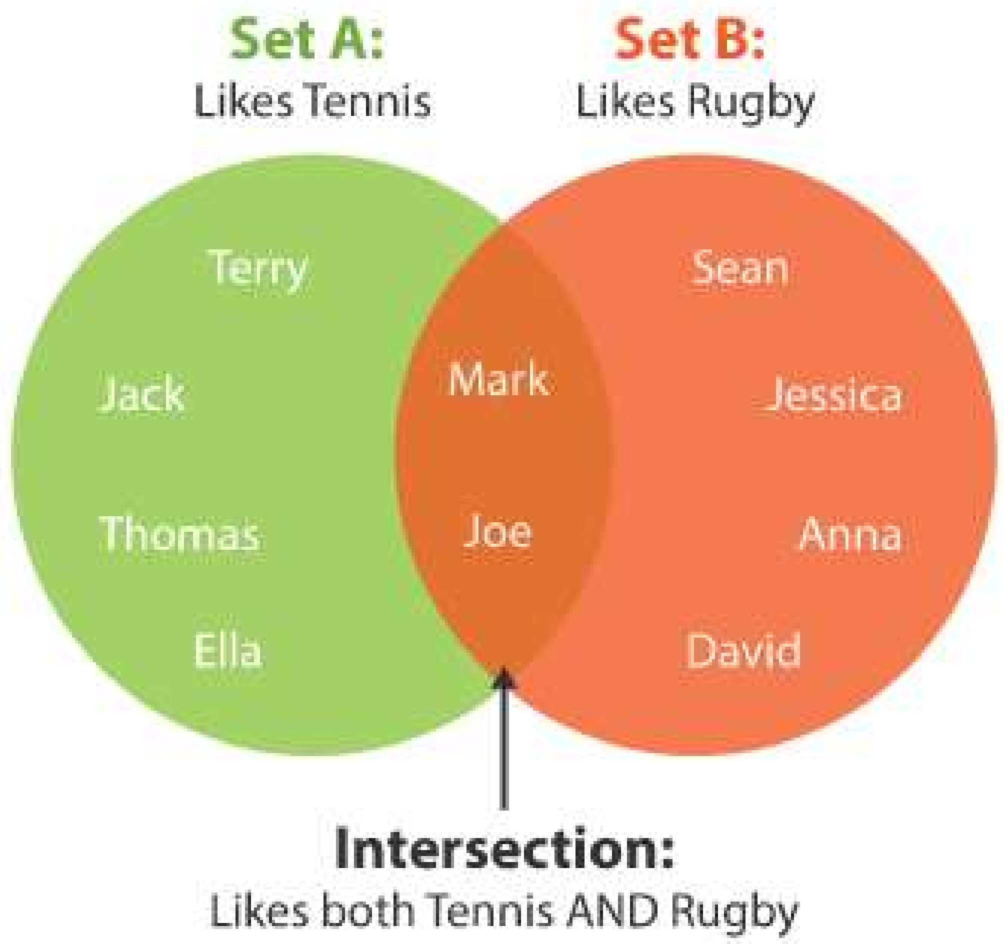
- a way of visualizing the hierarchical structure of a tree diagram, while also displaying quantities for each category via area size.
- Each category is assigned a rectangle area with their subcategory rectangles nested inside of it.
- **Challenge:.**



Comparisons | concepts | Relationships

VENN DIAGRAM

- It visually displays all the possible logical relationships between a collection of sets.
- Each set is typically represented with a circle.
- **Challenge:.**



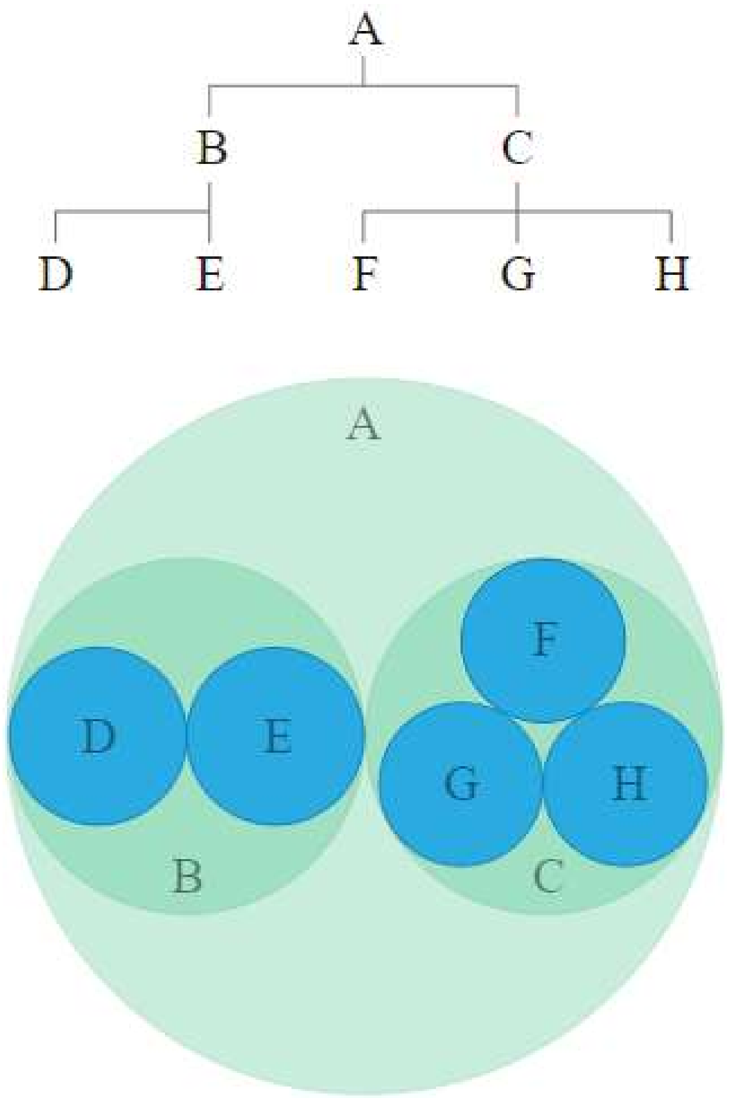
hierarchy

Proportions

CIRCULAR TREEMAP

• A variation of treemap that uses circle instead of rectangles.

•Challenge:.

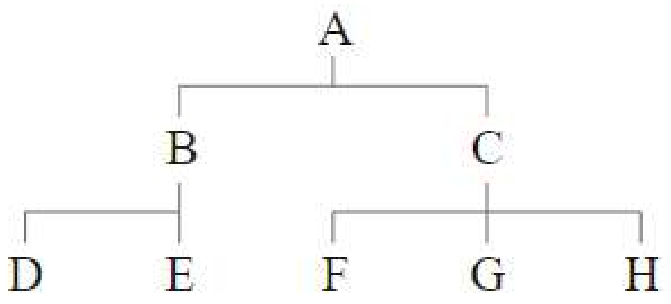


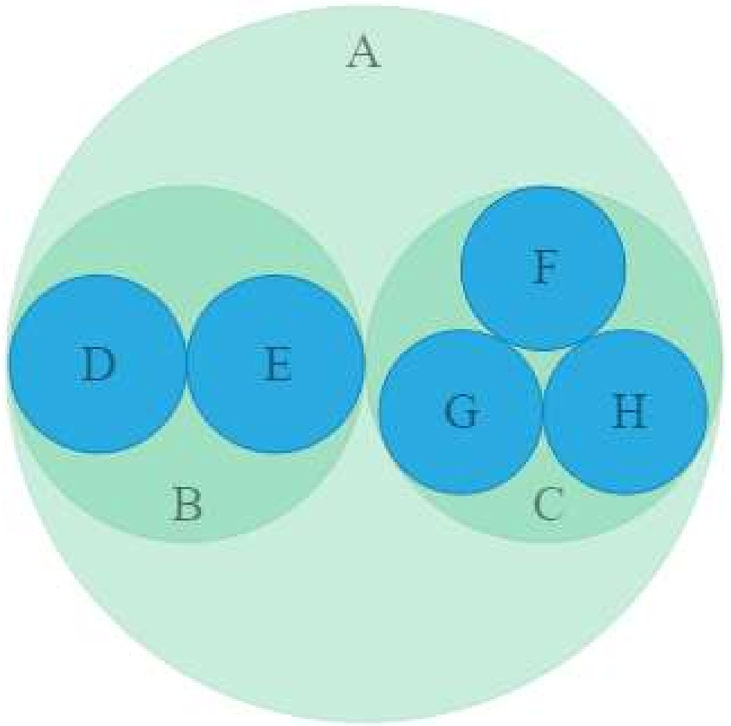
hierarchy | Proportions

CIRCULAR TREEMAP

- A variation of treemap that uses circle instead of rectangles.

•Challenge:.

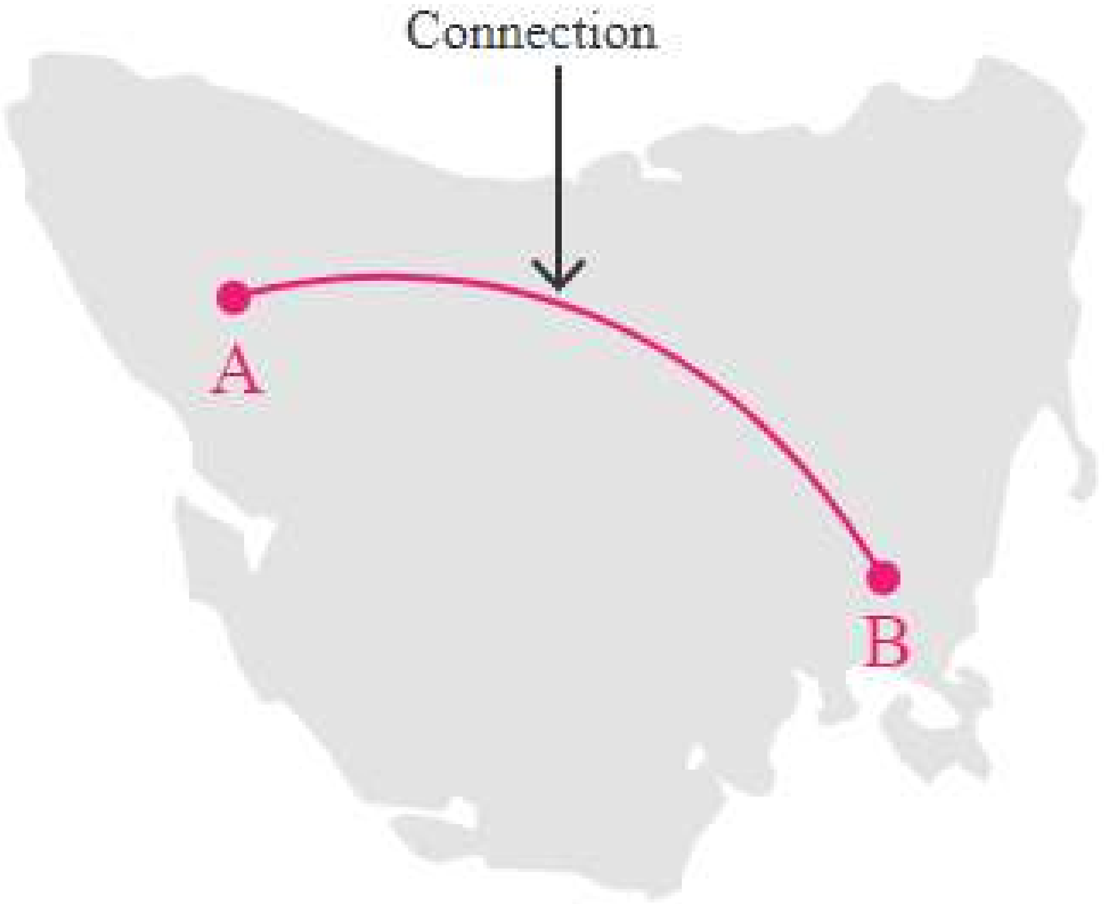




Distribution | Location | Movement | Patterns | Relationships

CONNECTION MAP

- They are drawn by connecting points placed on a map by straight or curved lines.
- Good for showing connections and relationships geographically.
- Used to display map routes through a single chain of links.
- **Challenge:.**

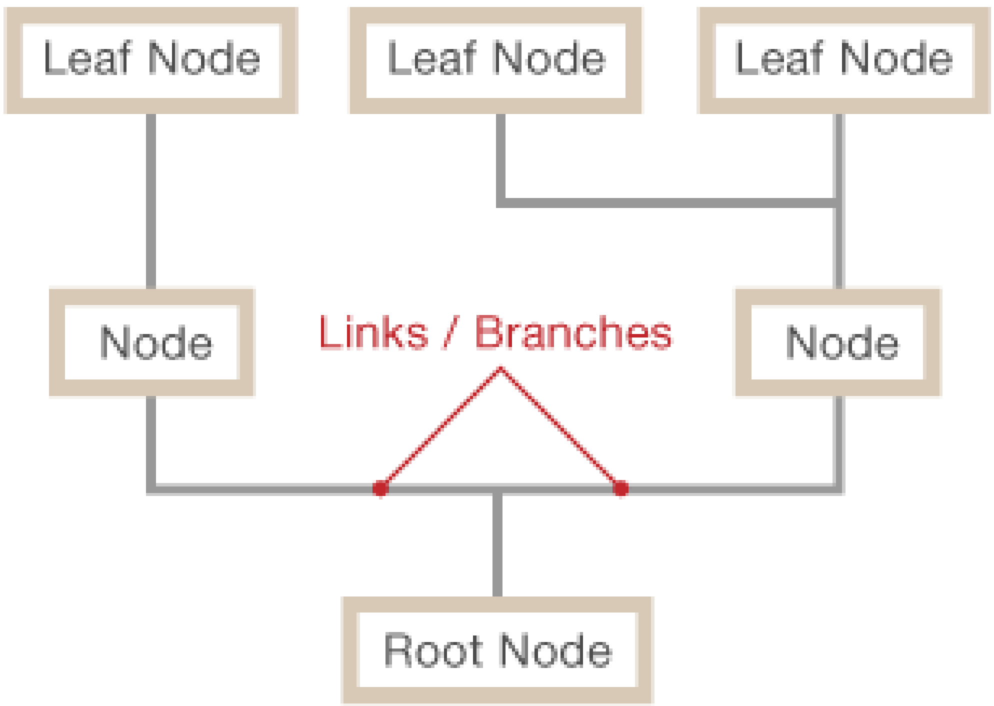


Hierarchy | Reference Tool | Relationships

TREE DIAGRAM

- used to visualize hierarchy in a tree-like structure.
- Used to show family relations and descent
-

•Challenge:.

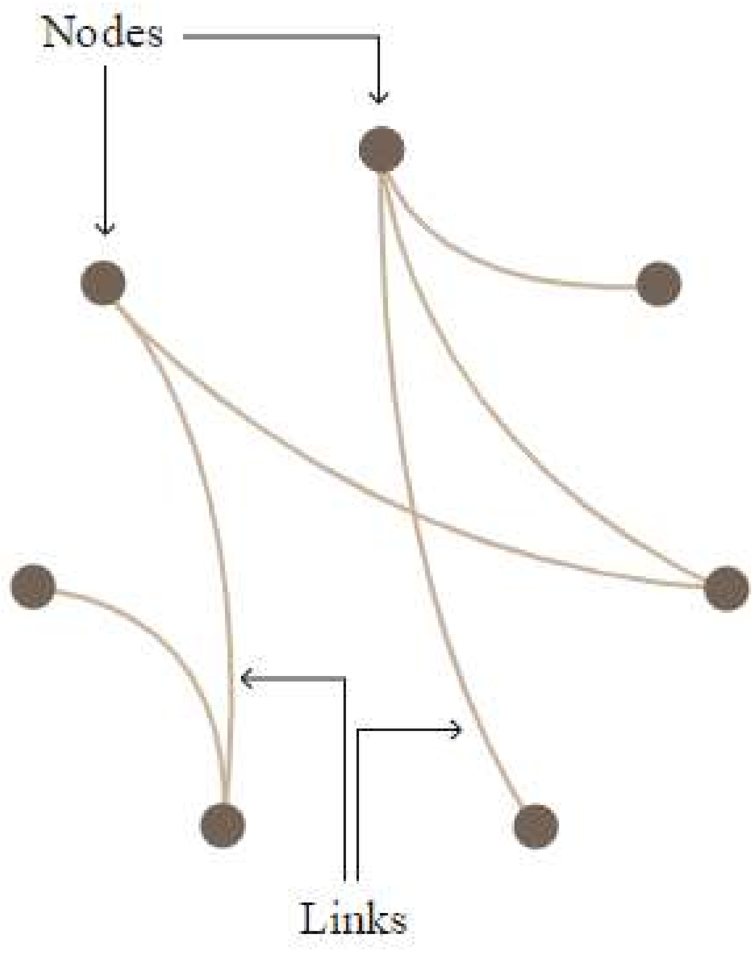


Relationships

NON-RIBBON CHORD DIAGRAM

- it is a stripped-down version of chord diagram with only nodes and connection lines showing their relationships.
- Provides more emphasis on the connections within the data
-

•Challenge:.

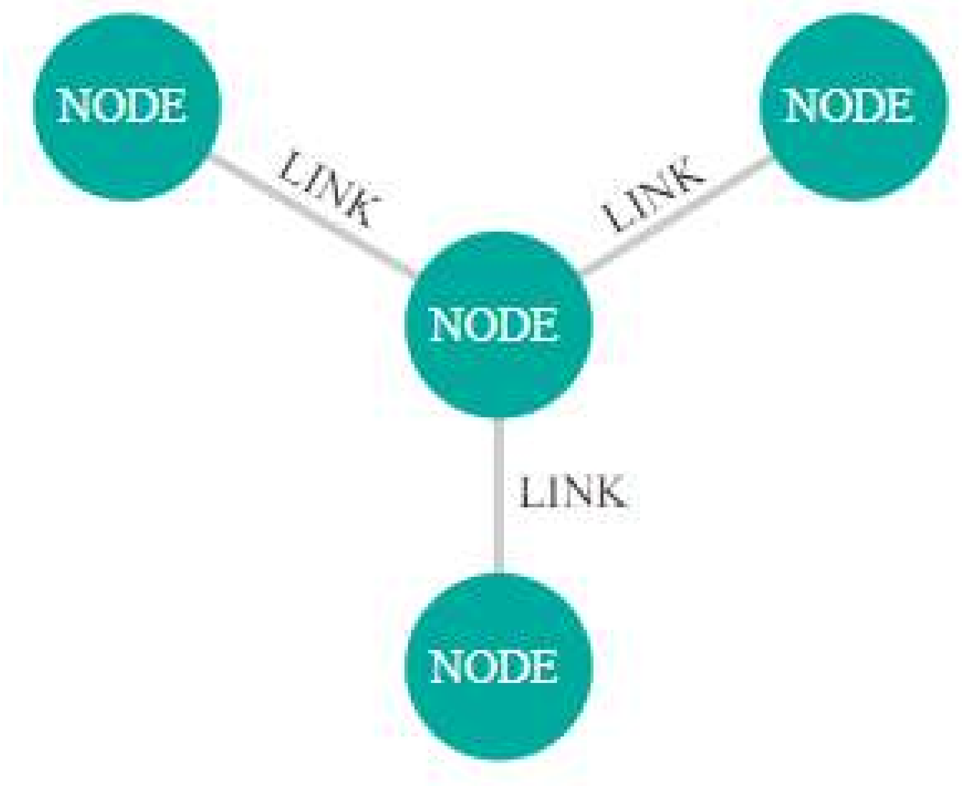


Relationships

NETWORK MAP

- displays how the variables are interconnected through the use of nodes/vertices and link lines to represent their connections and help illuminate the type of relationships between a group of entities.
- directed and undirected

•Challenge:.

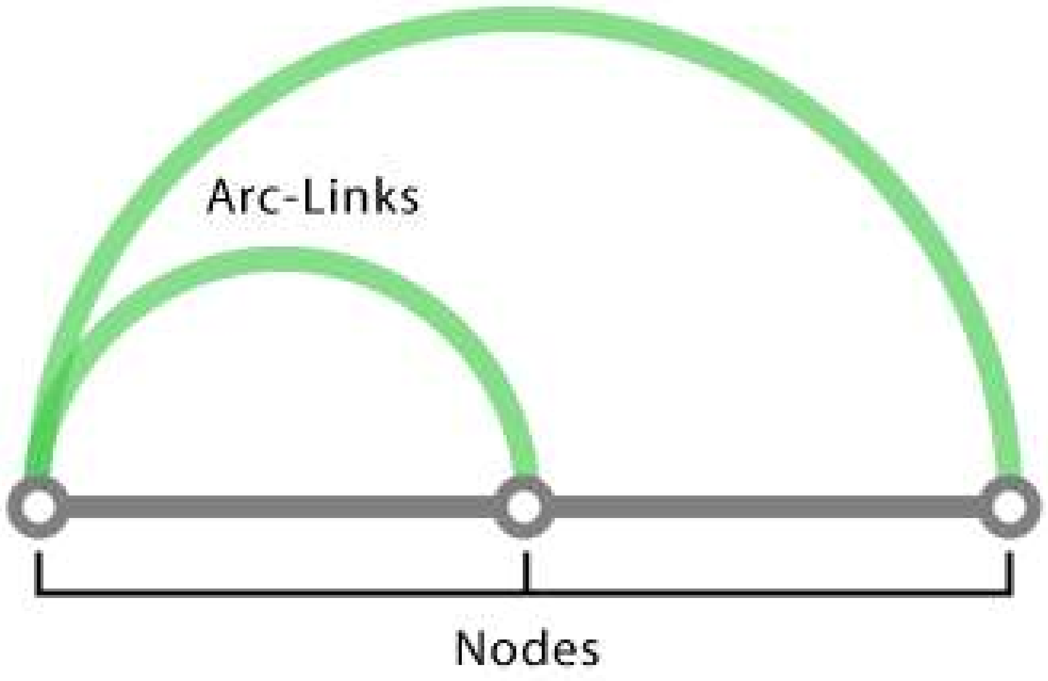


Relationships

Patterns

ARC DIAGRAM

- an alternate way of representing two-dimensional network diagrams.
- Nodes are placed along a single line and arcs are used to show connections between these nodes.
- **Challenge:.**

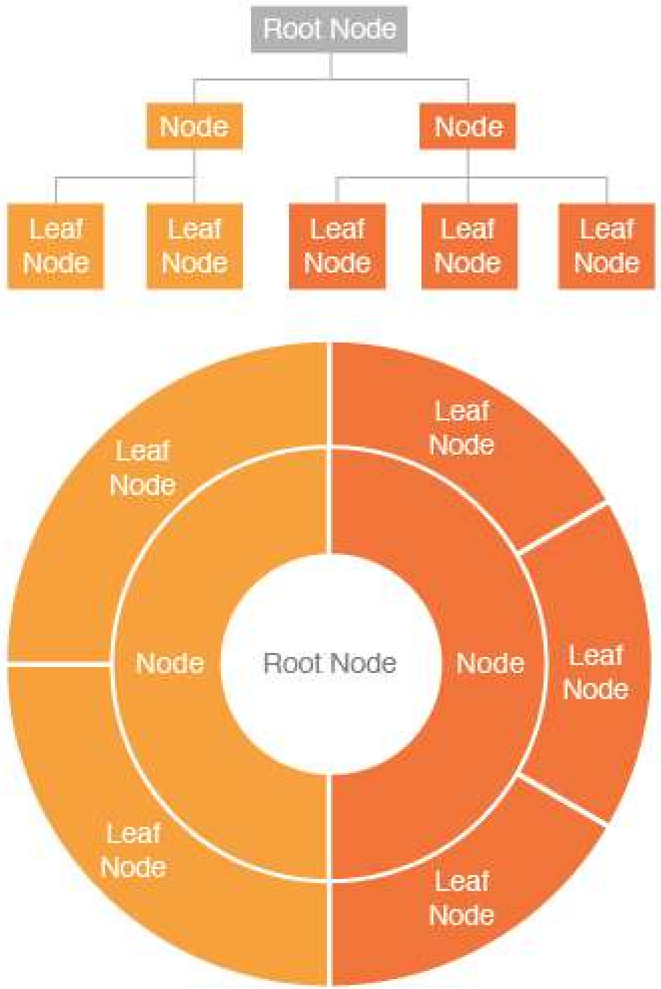


Hierarchy

Part-to-a-whole

SUNBURST CHART

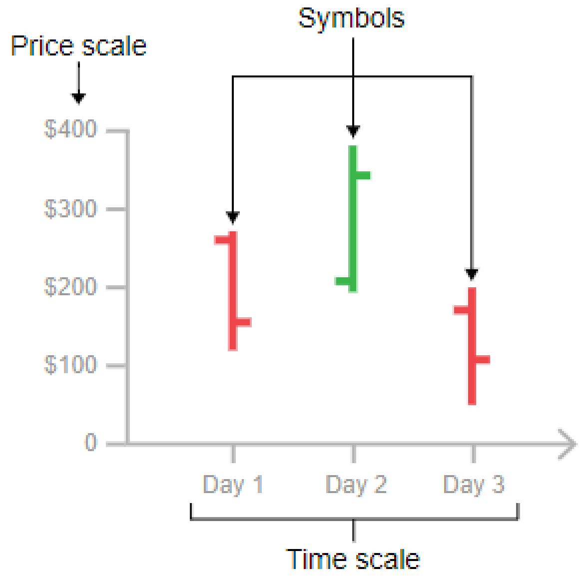
- It shows hierarchy through a series of rings that are sliced for each category node.
- Each ring corresponds to a level in the hierarchy with the central circle representing the root node and the hierarchy moving outwards from it.
- Rings are sliced up and divided based on their hierarchical relationship to the parent slice.
- **Challenge:.**

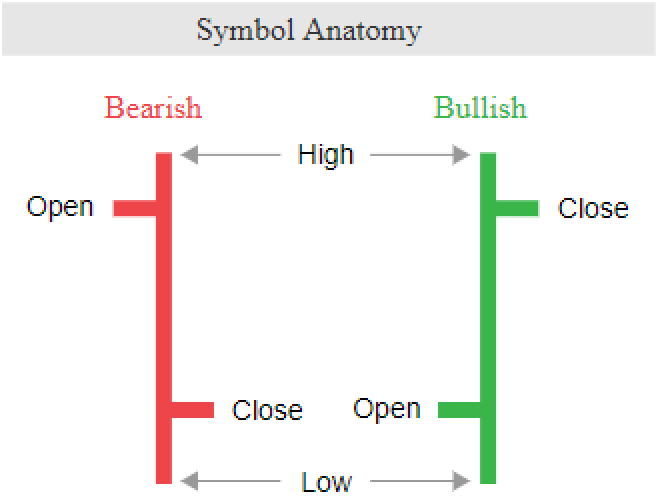


Data over time | Patterns | Ranges

OPEN-HIGH-LOW-CLOSE CHART

- It is used as a trading tool to visualize and analyze the price changes over time for securities, currencies, stocks, bonds, commodities.
- Useful for interpreting the day-to-day sentiment of the market and forecasting any future price changes through the patterns produced.
- **Challenge:.**

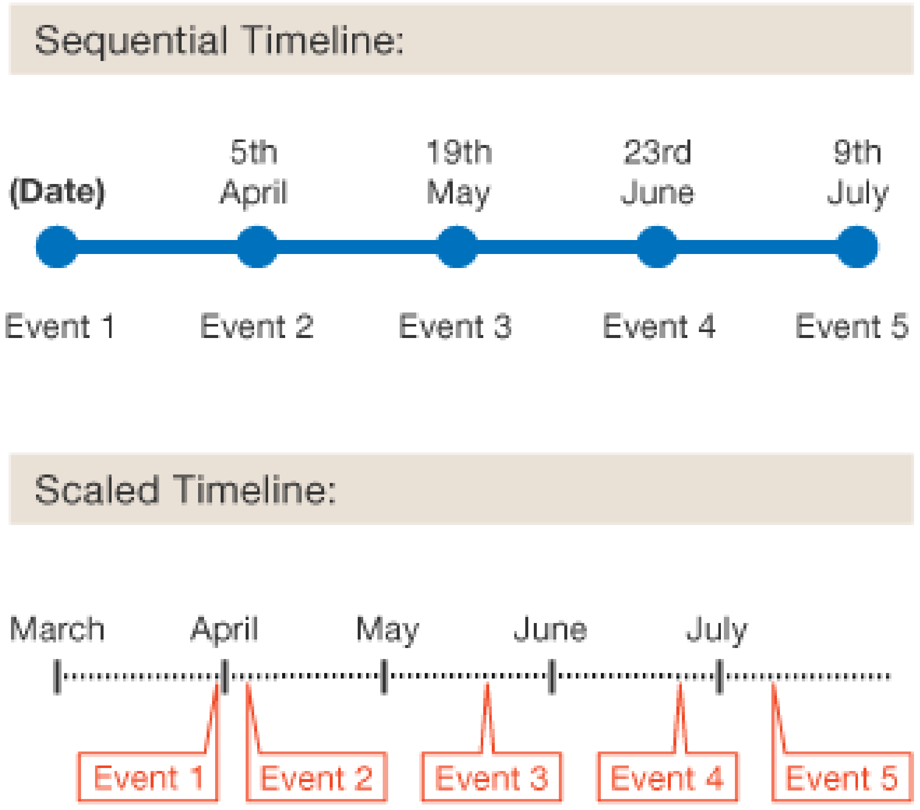




Data over time | Patterns

TIMELINE

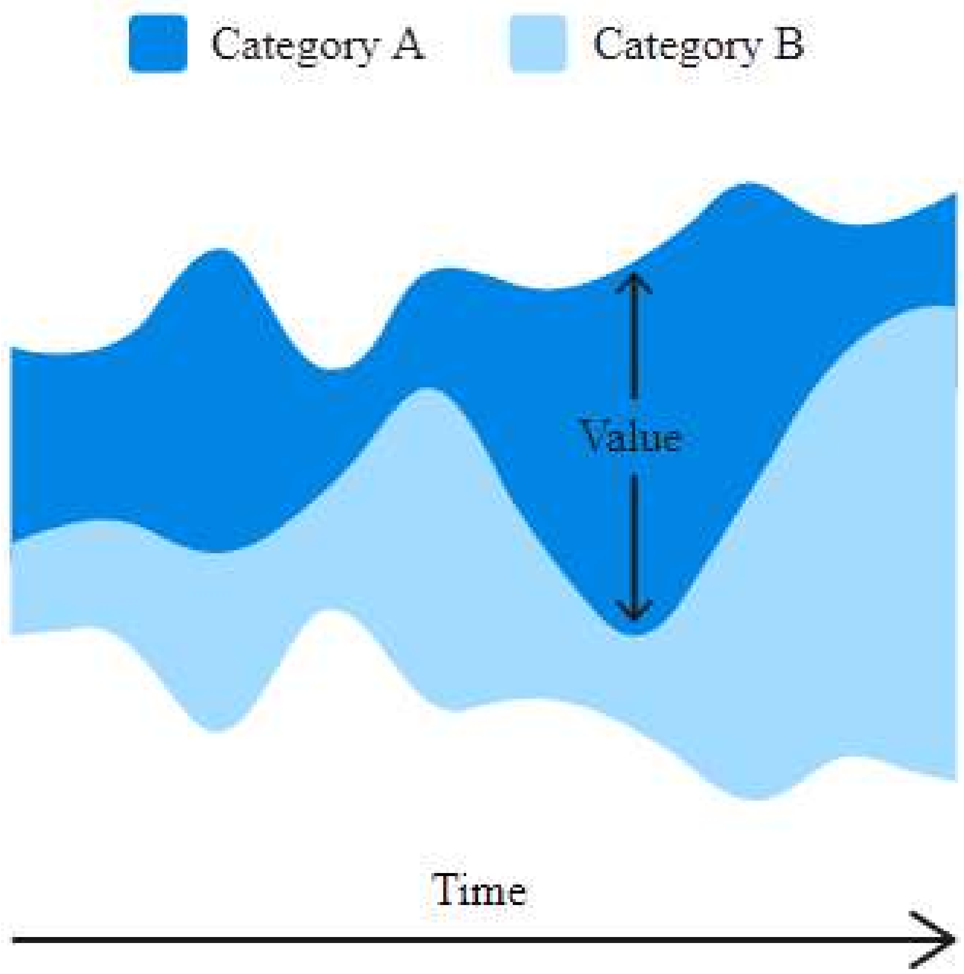
- Used to display a list of events in chronological order.
- Used to communicate time-related information
- **Challenge:.**



Data over time | Patterns

THEMERIVER

- Values displaced around a varying central baseline.
- It displays the changes in data over time of different categories through the use of flowing, organic shapes that somewhat resemble a river-like stream.
- **Challenge:.**



Data over time | Patterns

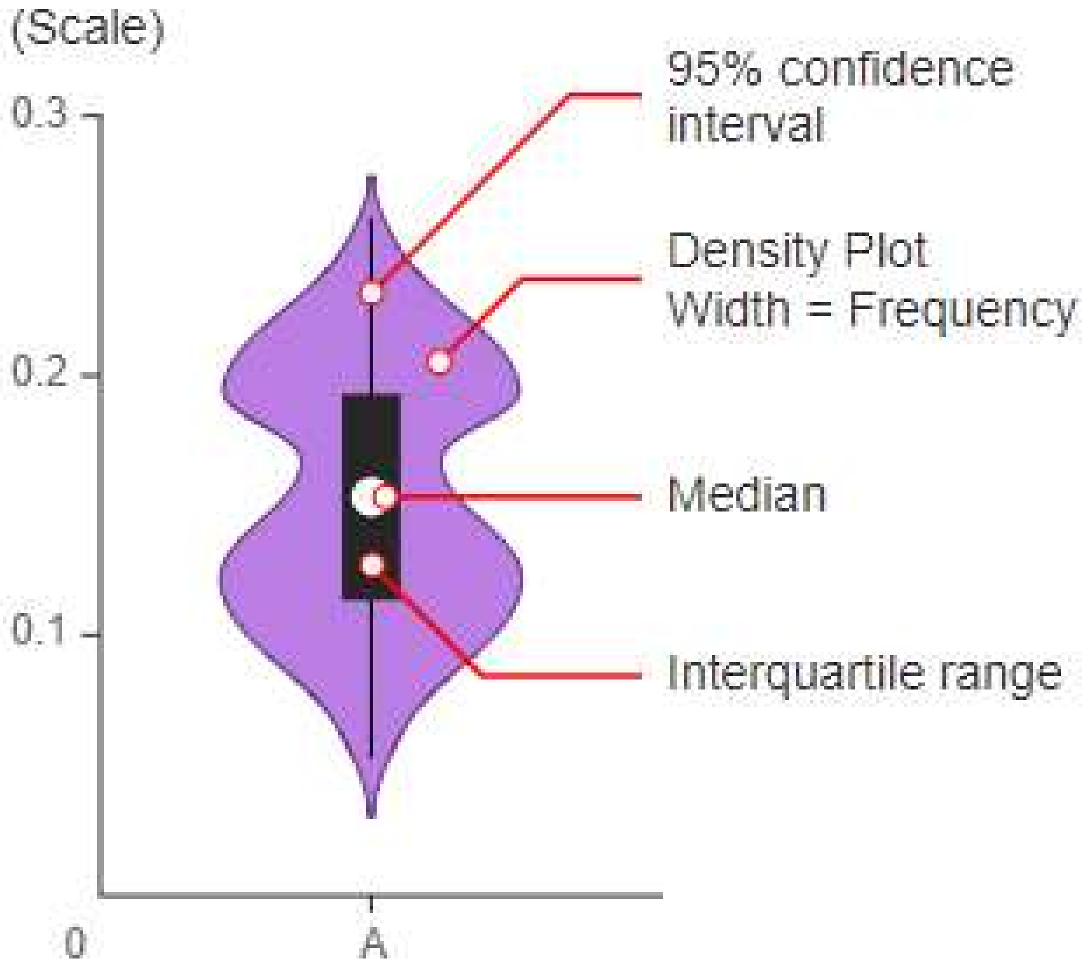
POINT & FIGURE CHART

- Used to depict relationship between supply and demand of a particular asset through a series of coloumns made up of X's and O's.
- They are time-independent and focus primarily on an asset's filtered price actions.
- Share price fluctuations of a listed company.
- **Challenge:.**

Distribution | Patterns | Ranges

VIOLIN PLOT

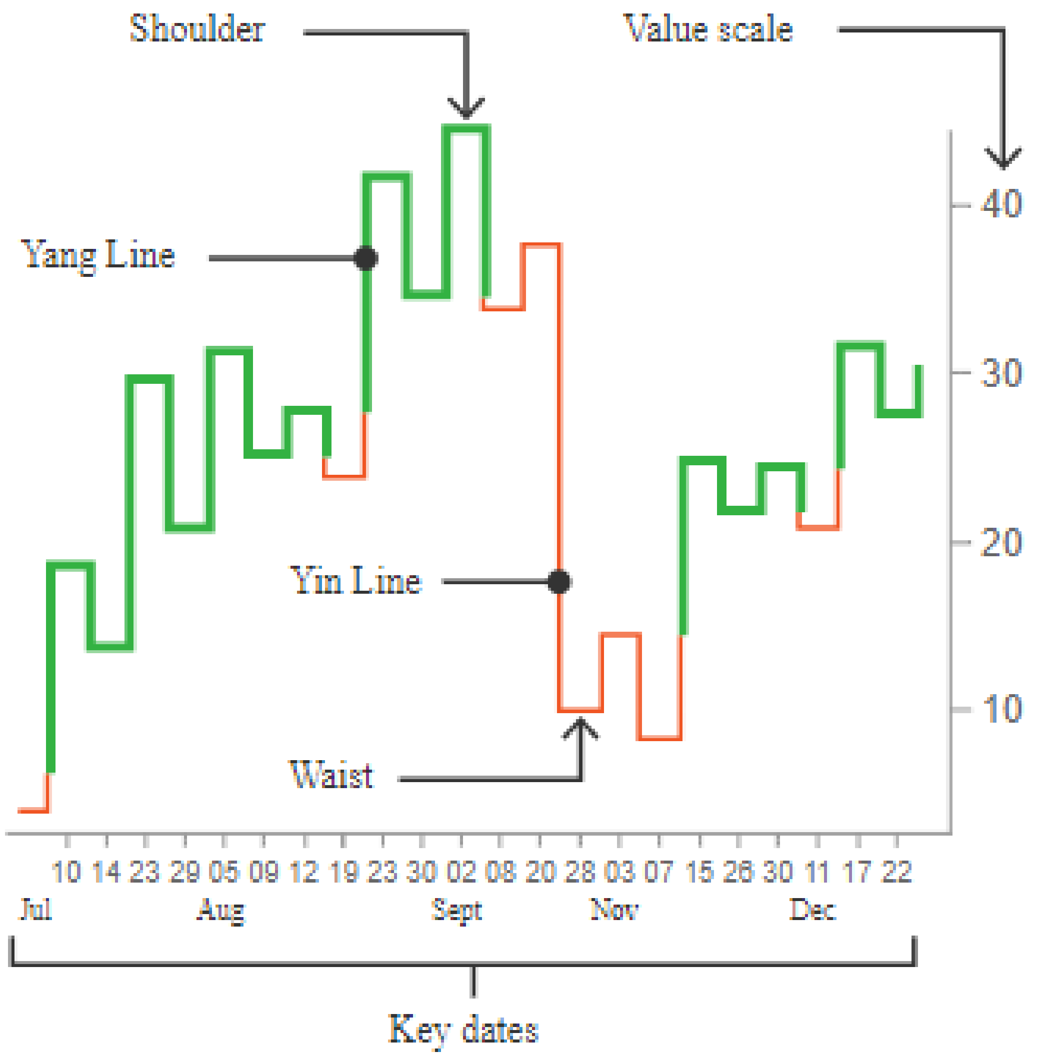
- Used to visualize the distribution of data and its probability density.
- It is combination of box plot and density plot.
- **Challenge:.**



Patterns Ranges

KAGI CHART

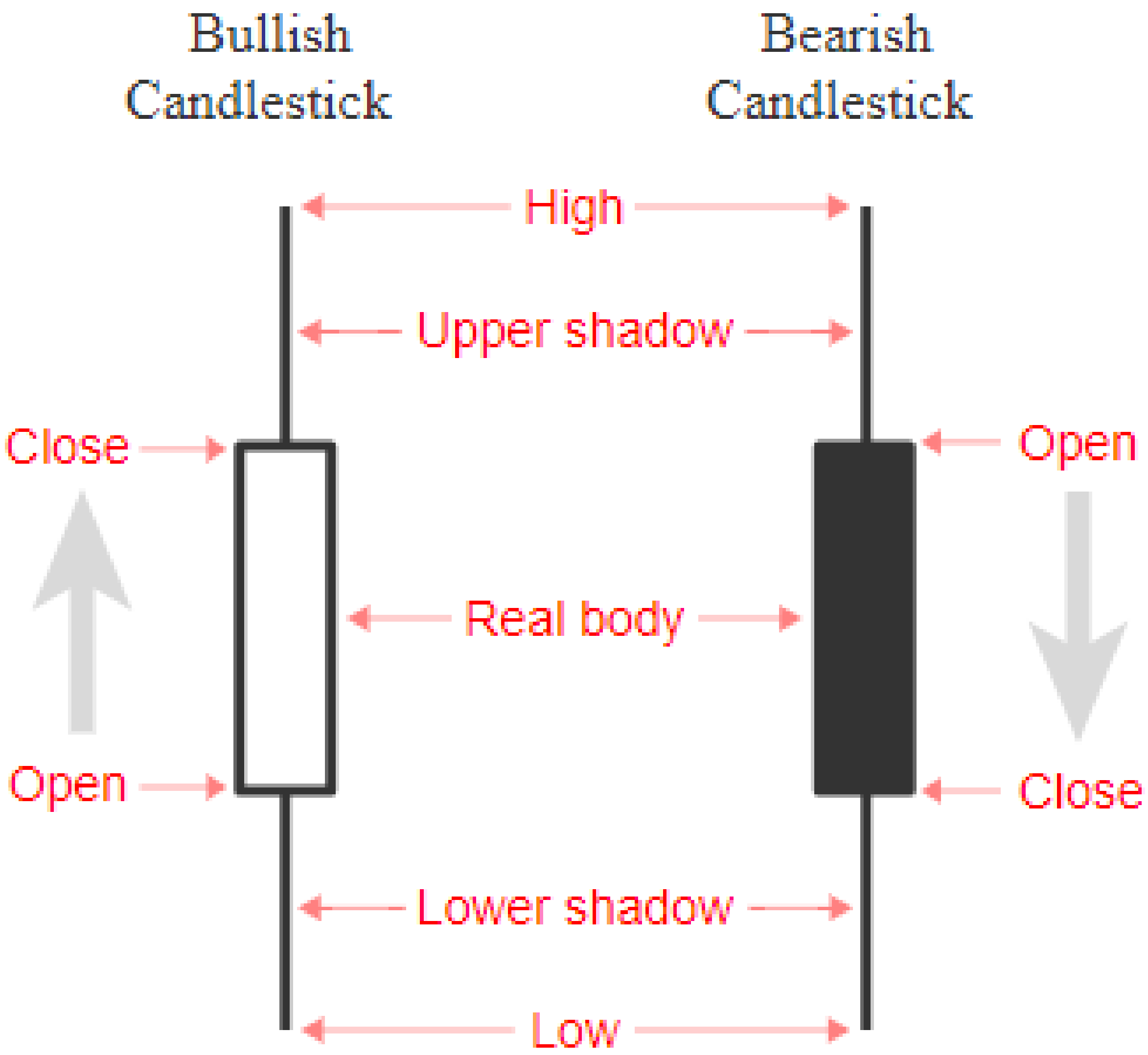
- Used to display the energy levels of supply and demand of a particular asset by visualizing the price actions through a series of line patterns.
- They are time-independent and help filter out the noise that can occur on other financial charts
- **Challenge:.**



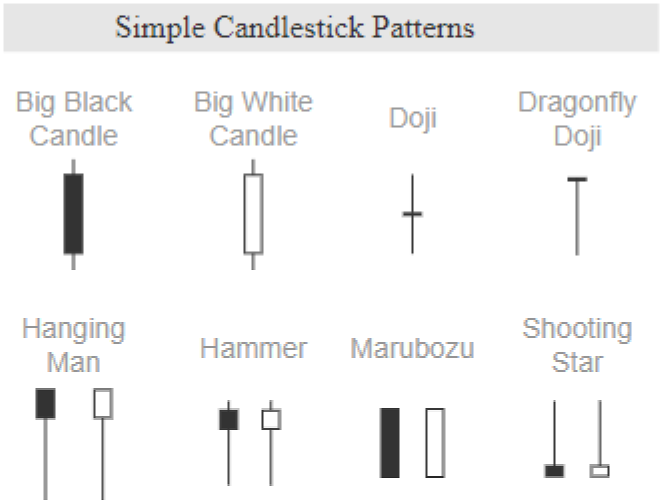
Patterns | Ranges | Data over time

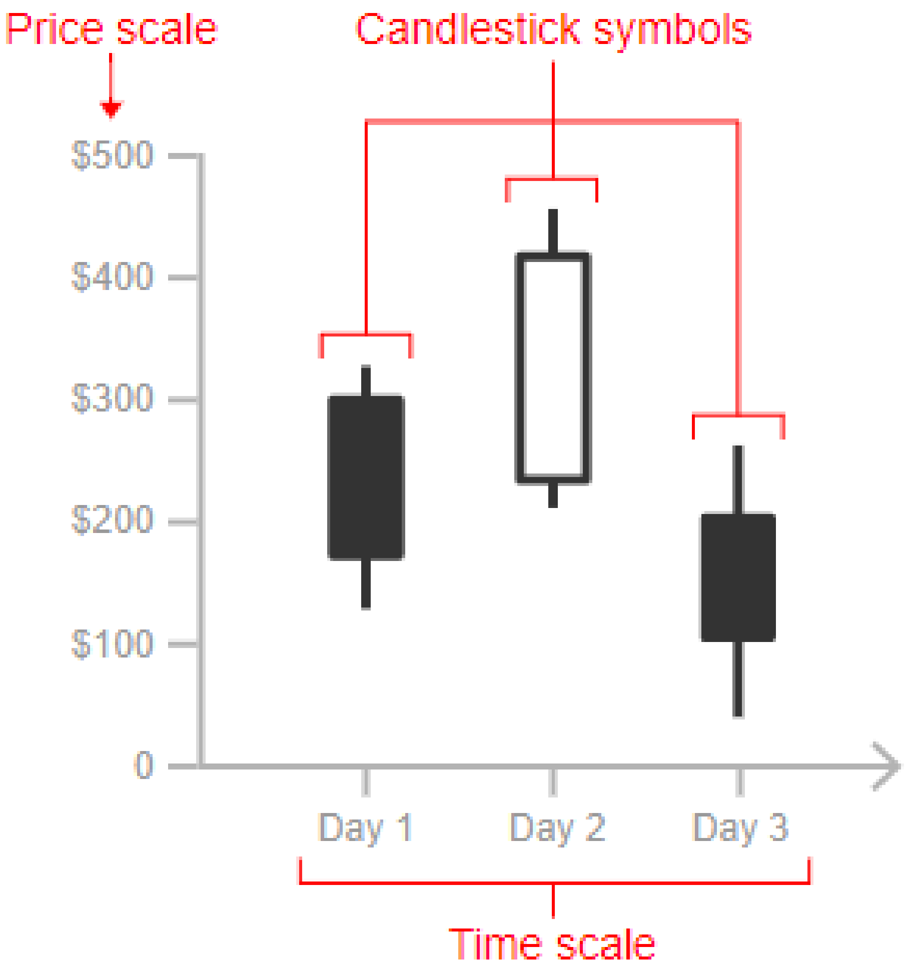
CANDLESTICK CHART

- Used as a trading tool to visualize and analyze the price movements over time for securities, derivatives, currencies, stocks, bonds, commodities, etc..
- They display multiple bits of price information such as the open price, close price, highest price and lowest price through the use of candlestick-like symbols.
- **Challenge:.**



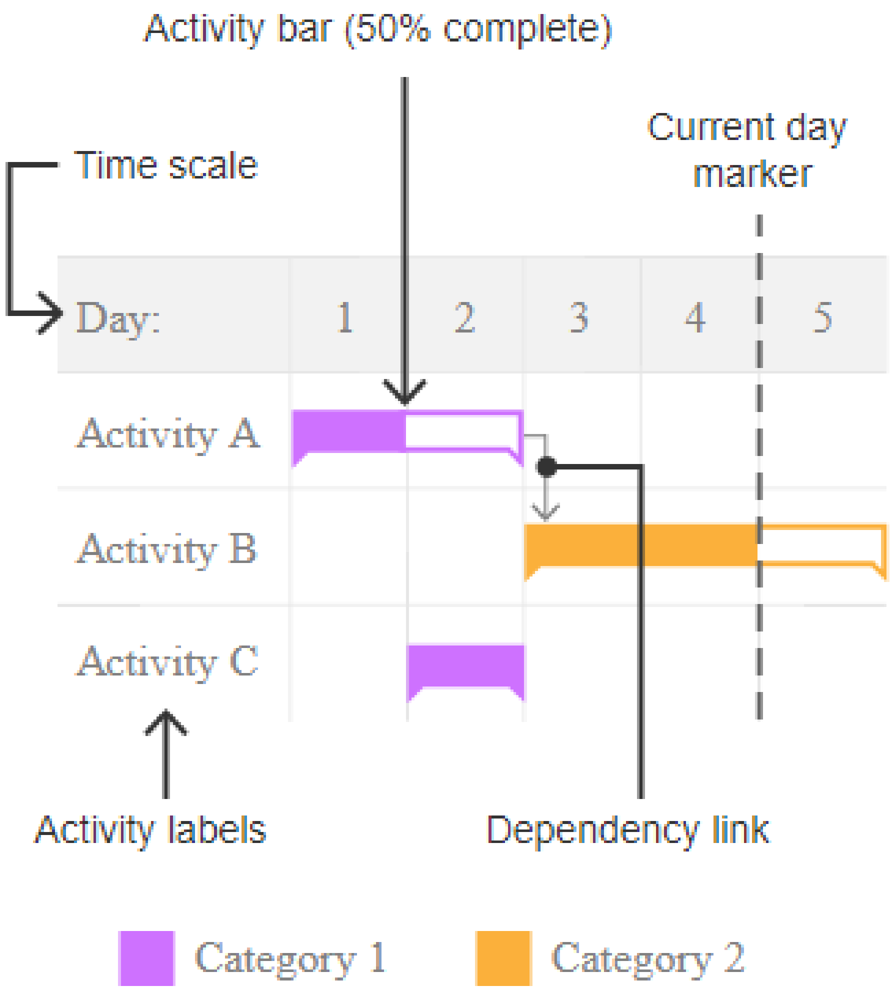
CANDLE STICK CHART





GANTT CHART

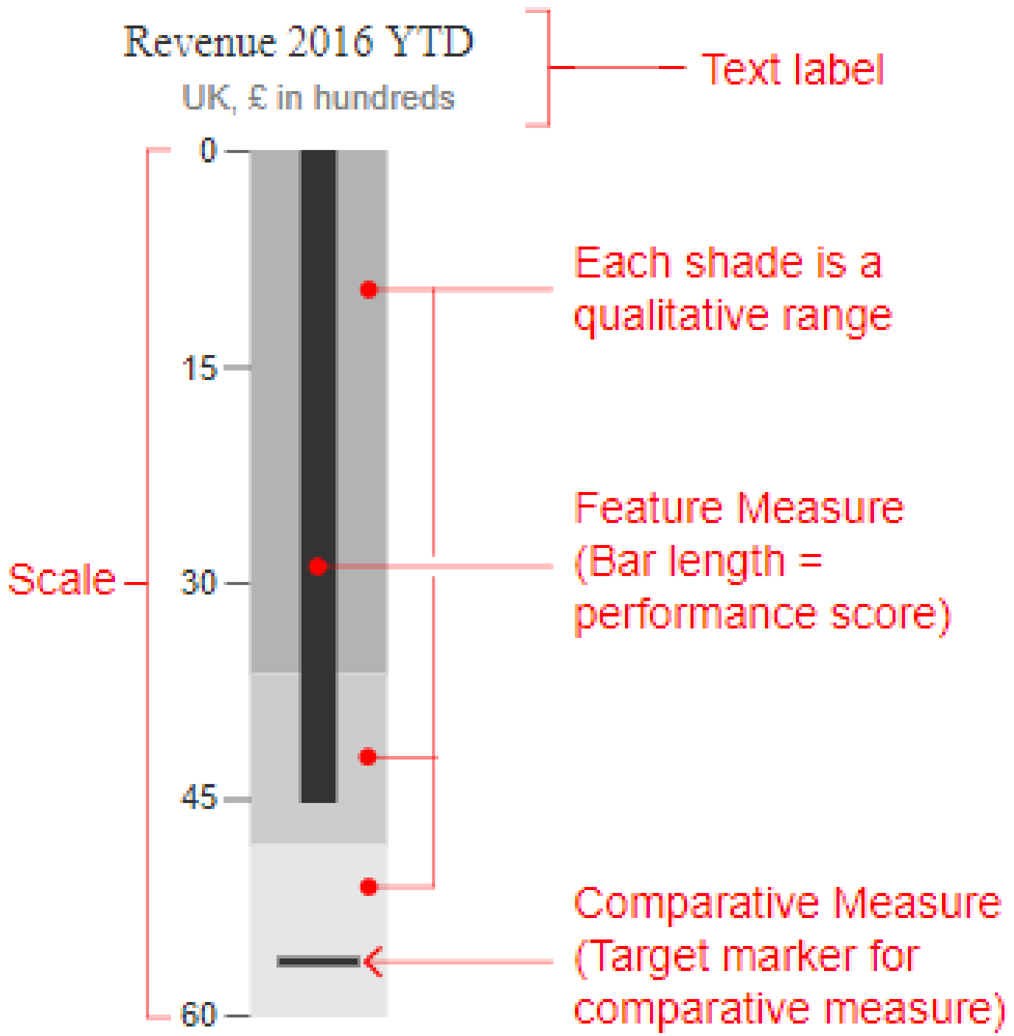
- Displays a list of activities/tasks with their duration over time, showing when each activity starts and ends.
- **Challenge:.**



Comparisons | Range

Bullet Graphs

- used to display performance data.
- Feature Measure is encoded by a length of the main bar in the middle of the chart.
- Comparative Measure is perpendicular line marker to the orientation of the graph and is used as a target marker to compare with feature measure.
- **Challenge: sometimes hard to read.**



Bullet chart

- Used to track progress of a variable against predefined goals defined.
- They compare a primary measure to one or more other measures and presents it in the context of defined metrics.
- Evaluating the performance of a metric against a goal.

Gantt chart

- Used to demonstrate schedule of events, projects which vary over time.
- Color can be used to differentiate progress of various variables in time.
- Can be used with other chart types to filter and explore data.

Bubble chart

- A technique to define the frequency or concentration of variables on scatter plots or maps.
- By using bubbles, of varying size and color of data points, a scatter plot can be transformed into a rich visualization.
- When used with maps, it provides a relative concentration of data over a region.

Heat maps

- Used to compare data across two categories using color.
- It is used to demonstrate the intersection of the categories the strongest and weakest.
- Used to show the relationship between two factors.
- By adding a size variation, heat maps let you know the concentration of two intersecting factors

Matching Data Types to Visual Elements

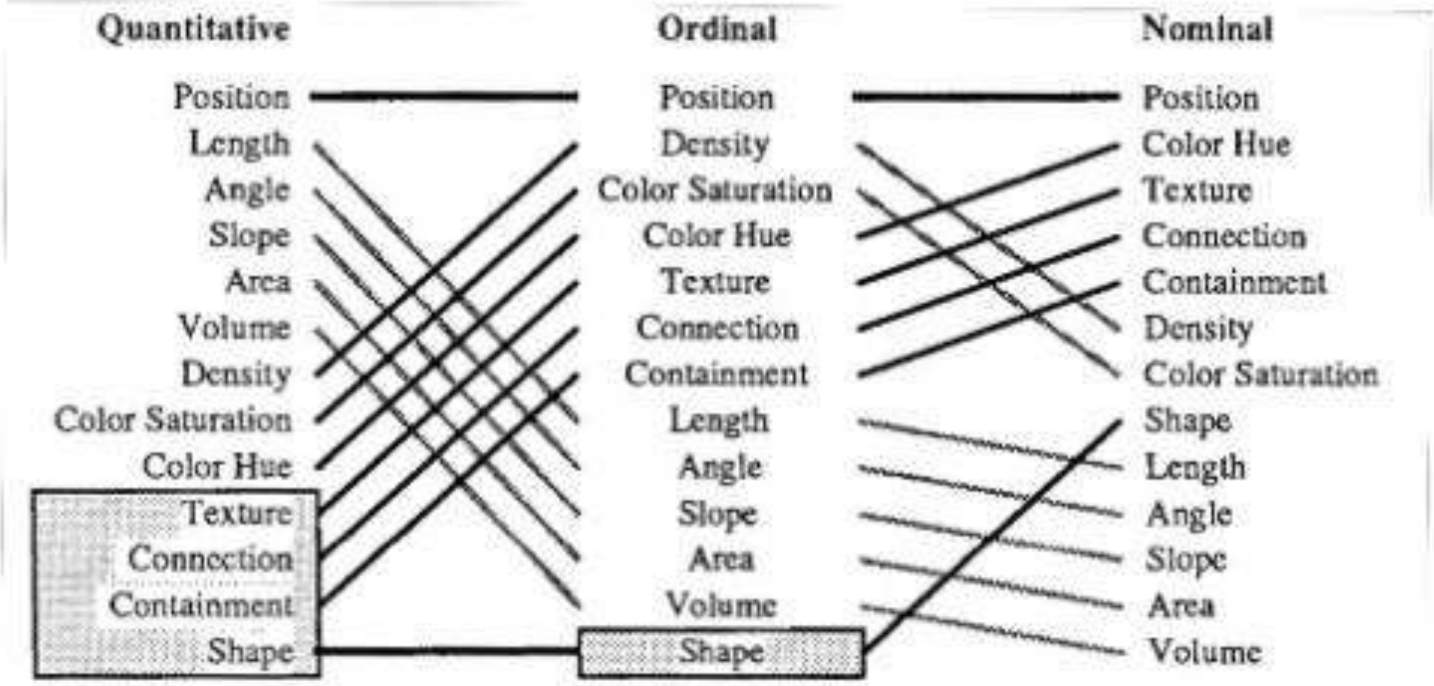
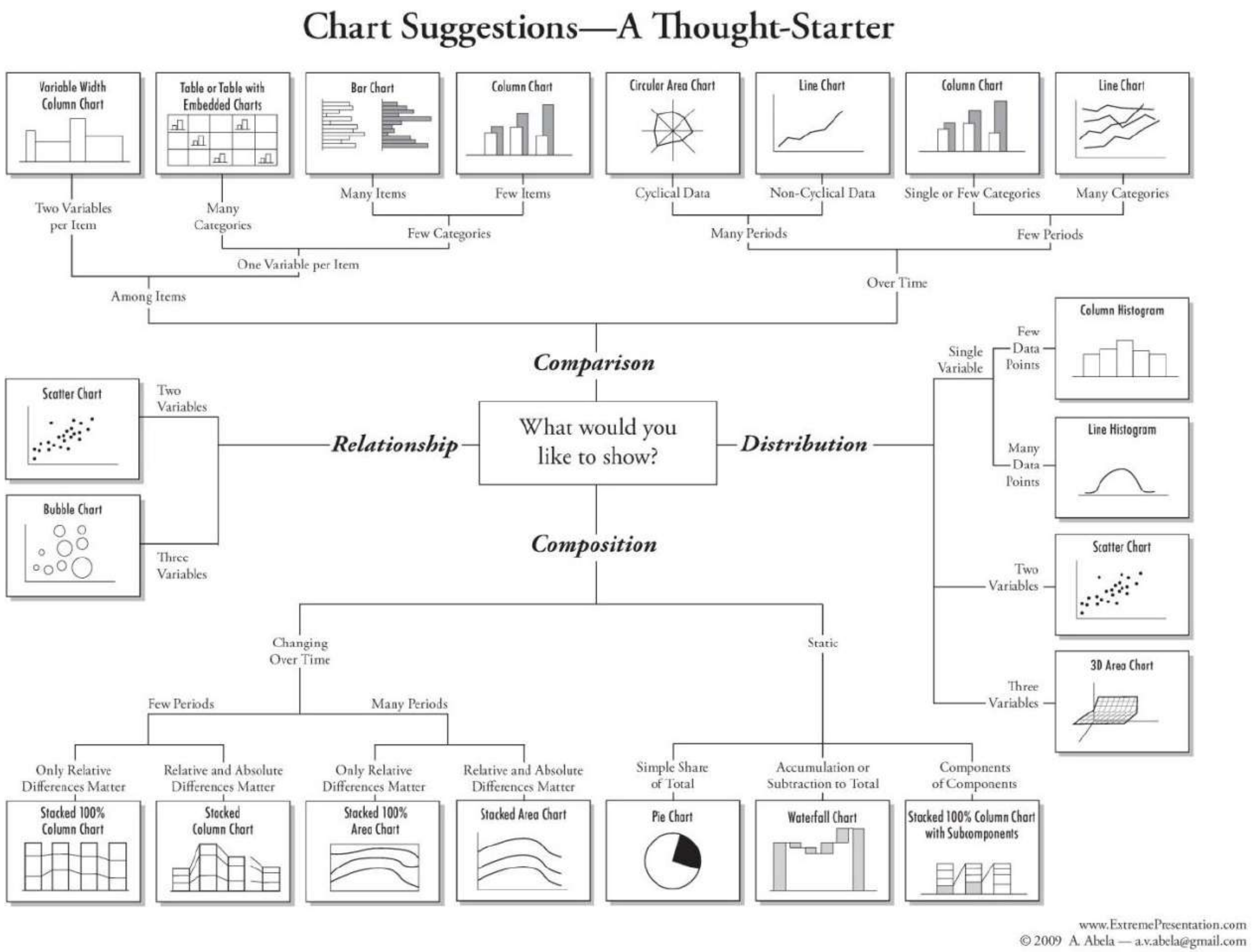


Fig. 15. Ranking of perceptual tasks. The tasks shown in the gray boxes are not relevant to these types of data.

Mackinlay, J. (1986). Automating the design of graphical presentations of relational information. *ACM Transactions on Graphics*, 5(2), 110-141.
http://dx.doi.org.proxy.lib.duke.edu/10.1145/22949.22950



Original Series

Visualization tooling choice

- We can use various tools for visualization
  - D3JS/NVD3.js
  - Highcharts.js
  - Qlikview
  - Tableau

- D3.js
  - When we need unusual, highly customized chart types (http://bl.ocks.org/mbostock)
  - Relatively low number of data points or visible elements (SVG vs HTML5 Canvas)
  - Impressive visualization tooling to be integrated with existing frameworks like Angular, React, KnockoutJS, Aurelia, EmberJS, VueJS
- Tableau
  - Predefined set of visualization, exploratory data analysis and visualization
  - Large amount of data visualization
  - Stand-alone visualization.

Properties and Best Uses of Visual Encodings

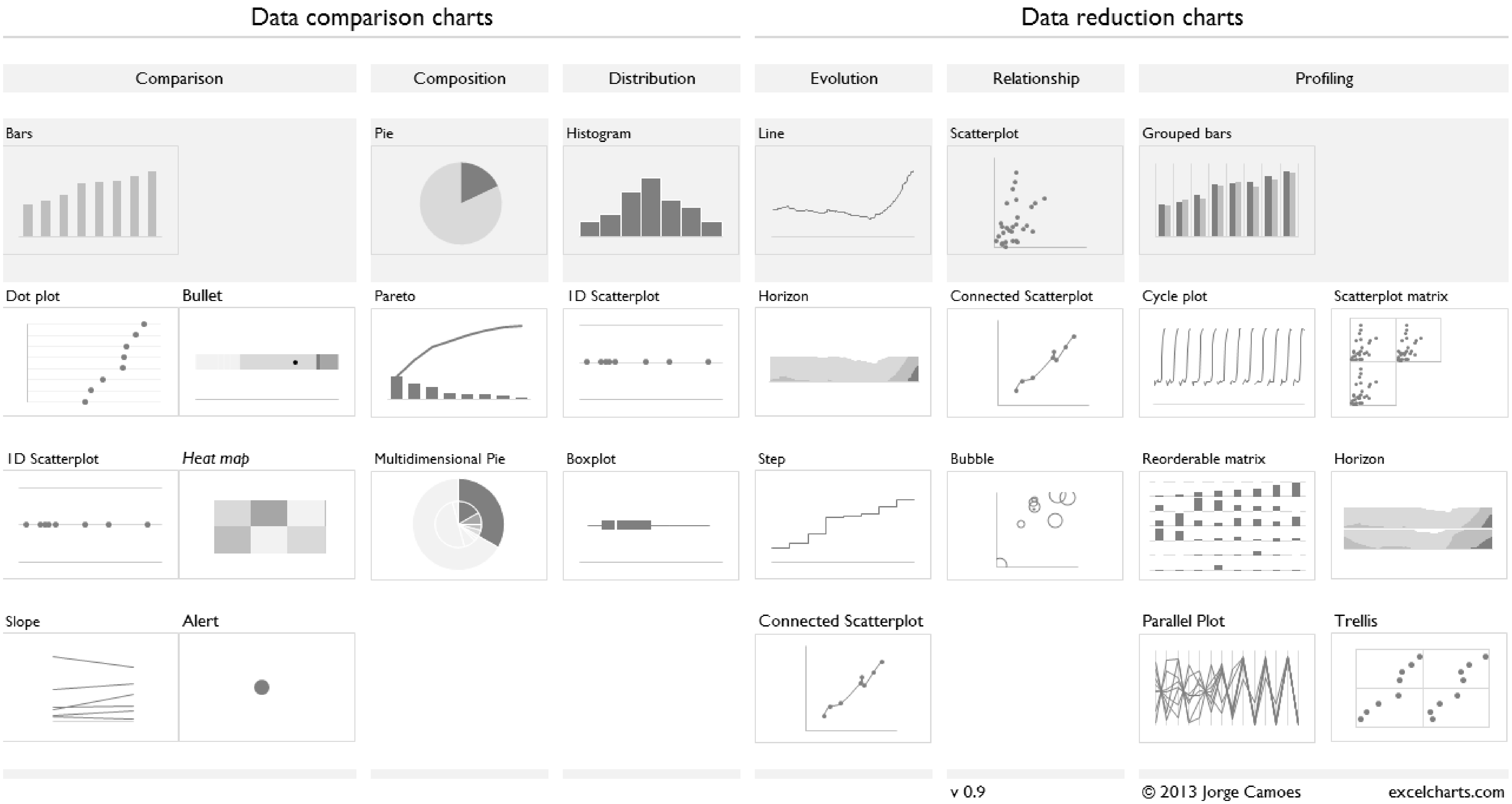
Example	Encoding	Ordered	Useful values	Quantitative	Ordinal	Categorical	Relational
	position, placement	**yes**	**infinite**	Good	Good	Good	Good
1, 2, 3; A, B, C	text labels	**optional** (alphabetical or numbered)	**infinite**	Good	Good	Good	Good
	length	**yes**	**many**	Good	Good		
	size, area	**yes**	**many**	Good	Good		
	angle	**yes**	medium/few	Good	Good		
	pattern density	**yes**	few	Good	Good		
	weight, boldness	**yes**	few		Good		
	saturation, brightness	**yes**	few		Good		
	color	no	few (< 20)			Good	
	shape, icon	no	medium			Good	
	pattern texture	no	medium			Good	
	enclosure, connection	no	**infinite**			Good	Good
	line pattern	no	few				Good
	line endings	no	few				Good
	line weight	**yes**	few		Good		

Source:http://complexdiagrams.com/properties

Ecosystem


Grid℠ for Business Intelligence | Fall 2014
G2 CROWD
Contenders
Leaders
Business Objects
Oracle BI
Hyperion
SAS BI
Tableau Desktop
MicroStrategy
IBM Cognos
TIBCO Jaspersoft
TIBCO Spotfire
QlikView
Scale
Birst
Pentaho
GoodData BI
Alteryx
Niche
High Performers
Satisfaction

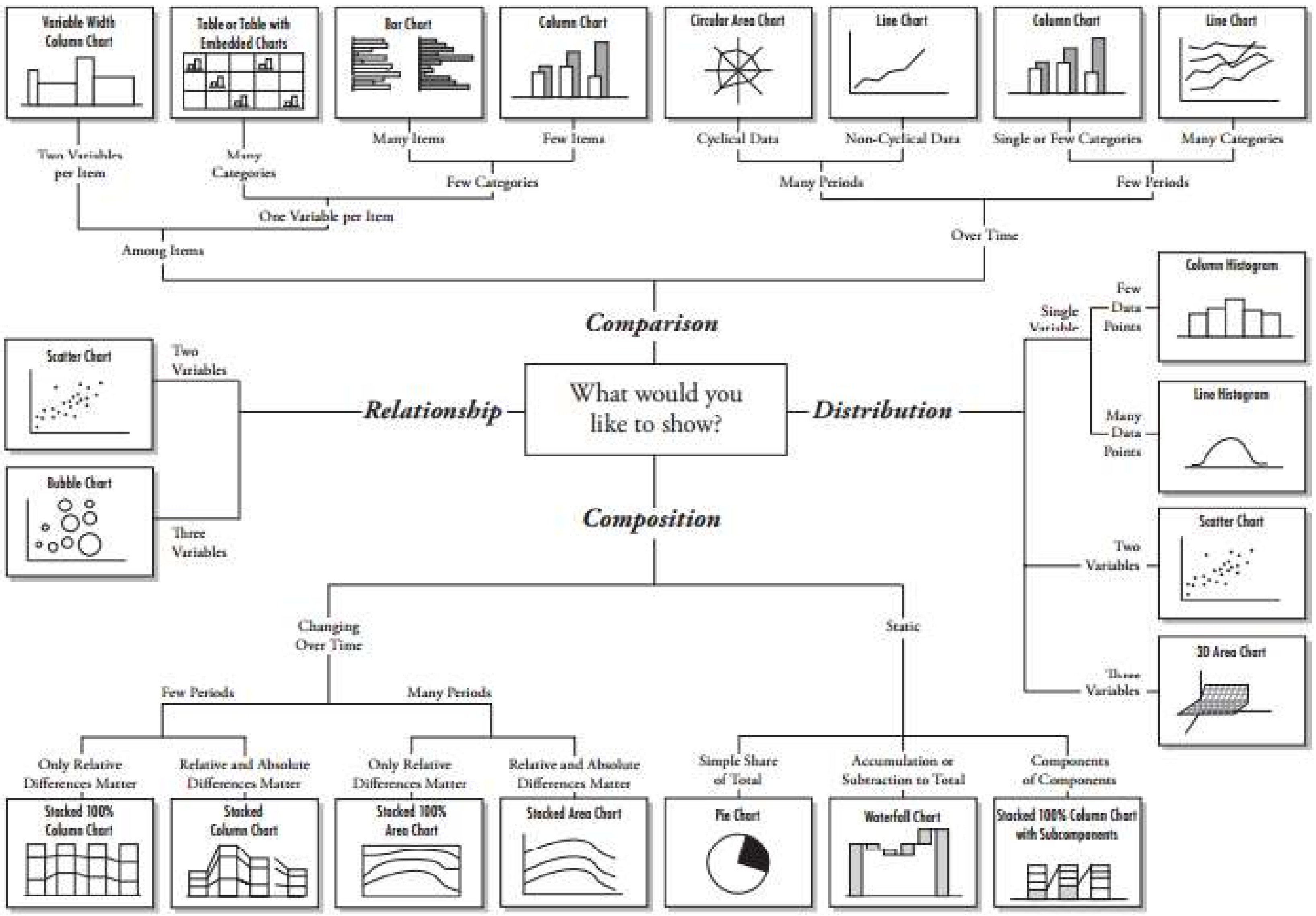
A CLASSIFICATION OF CHART TYPES



Tableau's offering?

- Maps(symbol,filled)
- Text tables
- Heat maps
- Highlight tables
- Treemap
- Horizontal bars
- Stacked bars
- Side-by-side bars.
- Line/Area charts
- Lines/Area Charts(discrete)
- Dual lines
- Pie Charts
- Scatter plots
- Circle views
- Side-by-side circles
- Bullet graphs
- Gantt charts
- Histograms
- Dashboards
- Ability to connect to various data source
- Presentation mode

Chart Suggestions—A Thought-Starter



Picture Superiority Effect:

60% increase in memory

When learning through images.

Repeatedly running images on

television registers perceptions broadcasted

" A Story is 22 times more memorable than facts alone"

• **Jennifer Aaker**

SYED AWASE KHIRNI

THE DATA STORY

How do we make data tell a story

Does a picture pass the right info?

Moving from raw text/numbers

to narrative

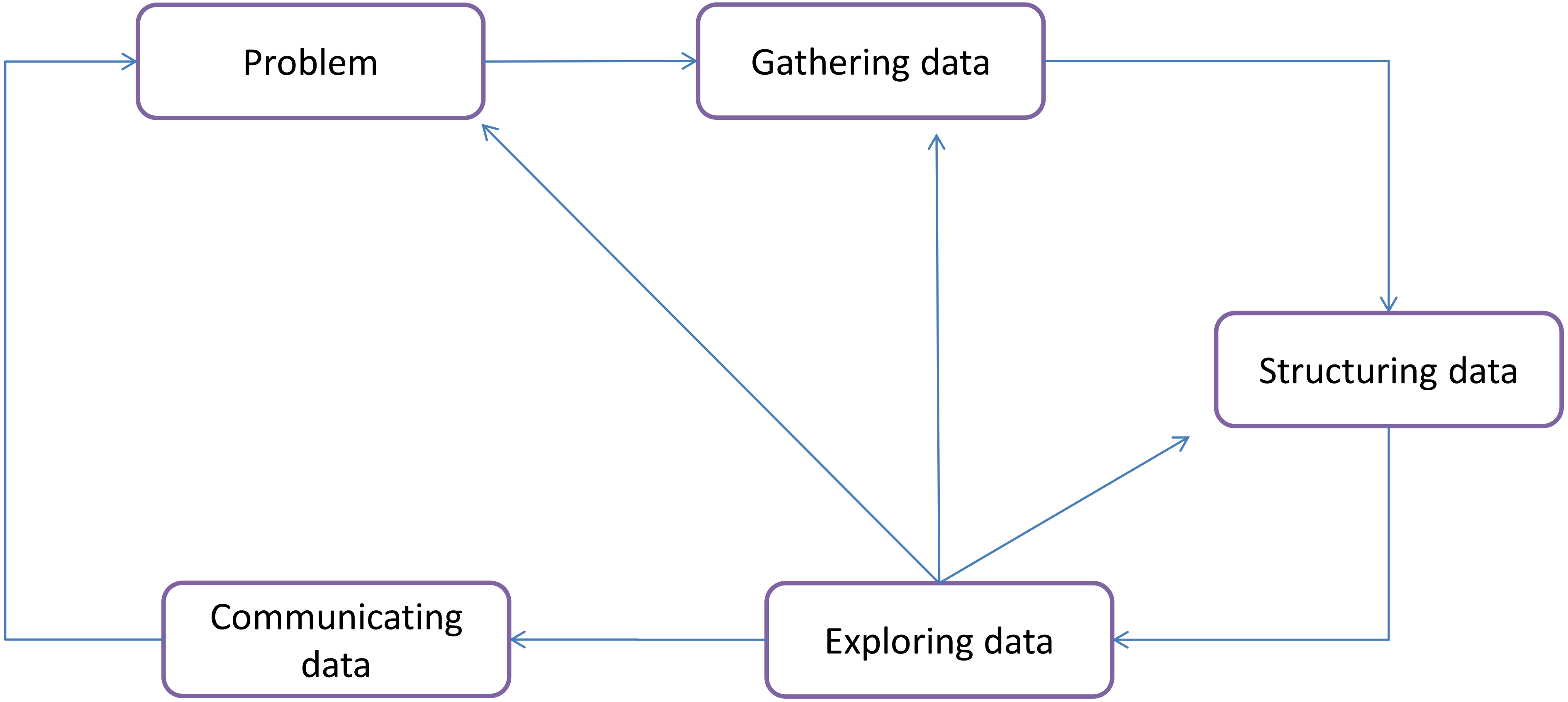
Author driven data story telling

- They have constrained interaction at various checkpoints within a narrative, allowing the user to explore the data without steering way from essence of the story.
- They are not exploration tools.

Reader driven data story telling

- No prescribed ordering of data, supporting images and demands a higher degree of interactivity.
- Not data stories at all
- They are purely exploration and analytical tools
- They are purely dashboards allowing users to sift through explore/sift through data directly.

Data Discovery Process



Six principles of communicating data

1. Identify the Objective/Goal
2. Select the right data
3. Choosing the right visualization based on data characteristics
4. Design for aesthetics
5. Choose an effective medium and channel to communicate
6. Checking the outcome/result or repeat step 1-6.

1. Identify the objective

- Who are the target audience?
- What is the information, intended to communicate.
- Why? What do you want them to do with/about it? (desired effect)

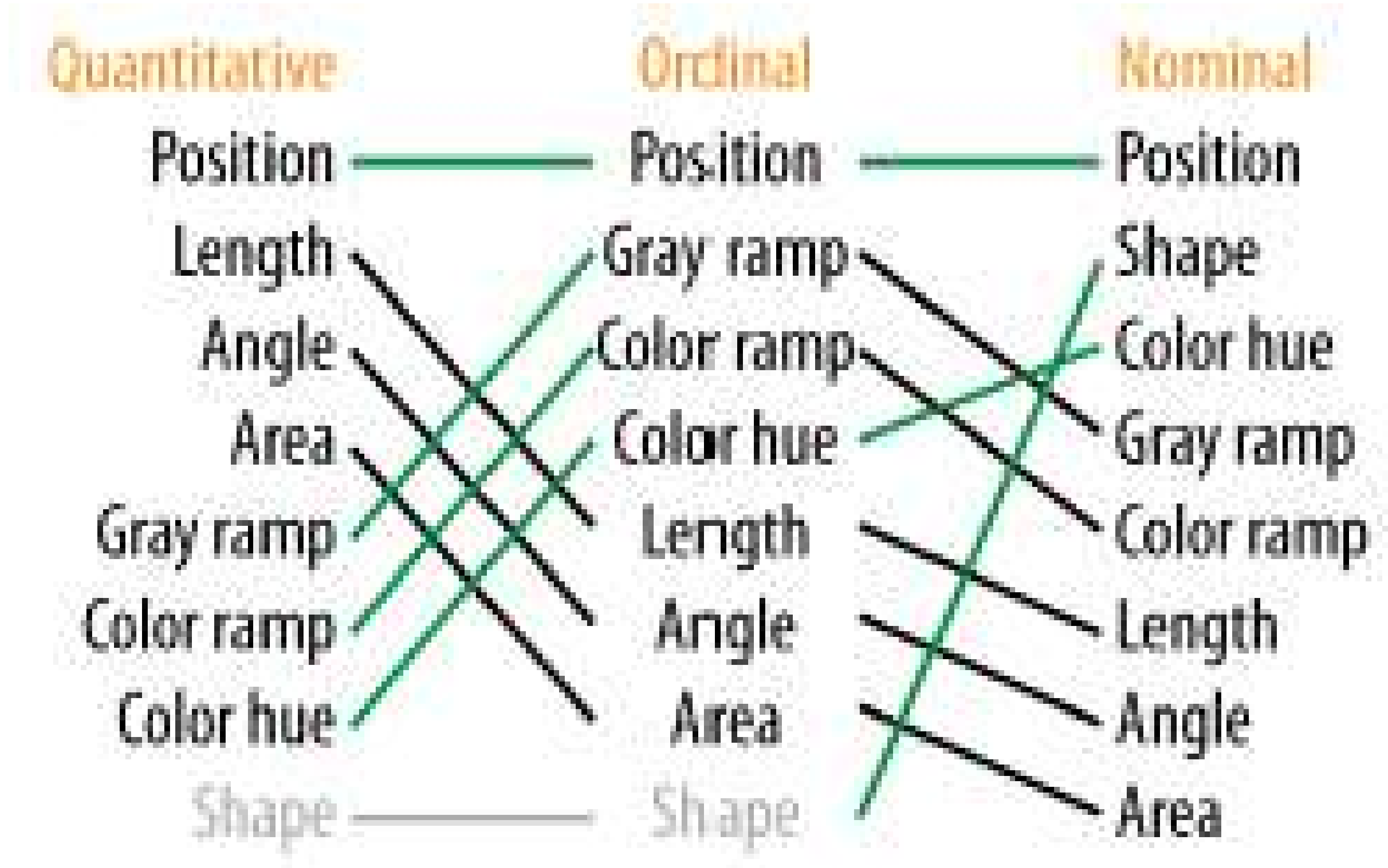
2. Choosing the right data

- Selecting the right data is vital for analysis.
- Perform Design of Experiments
- Design the right survey to collect data.
- Check for data quality and consistency.

3. Right visualization based on data characteristic

QUANTITATIVE	ORDINAL	NOMINAL
• Precise numerical values •Ex: 10.54	• Elements related by order •[first,second,third]	•Members of a group or a class •[male,female]

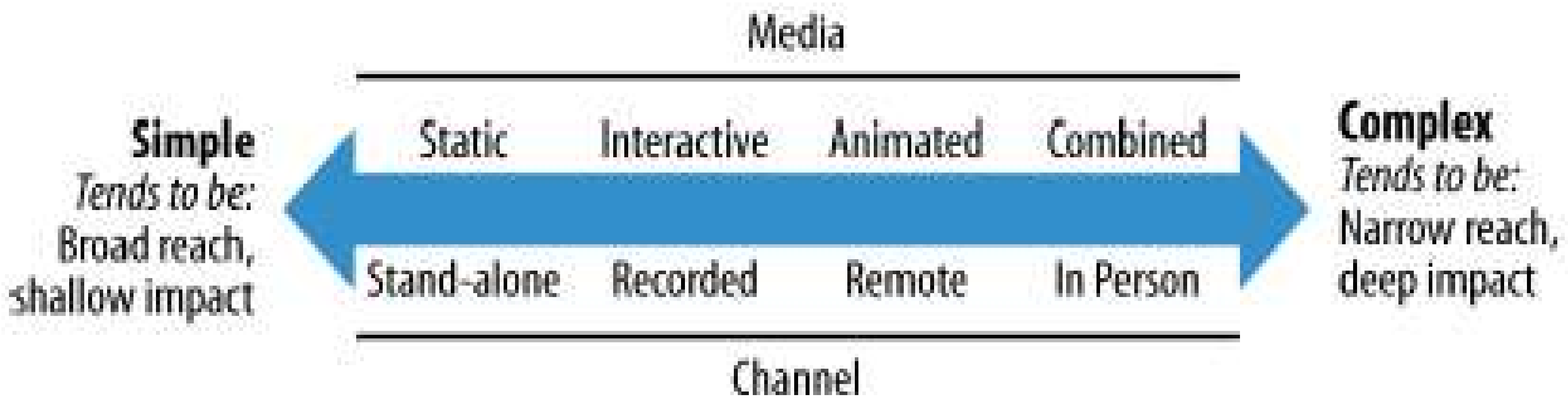
3. Choose effective visualization type for data type.



4. Design for aesthetics

- Labeling
- Color coding
- Legend
- Title

5. Choosing an effective communication medium



Source: Fig1-9: A spectrum of data communication types (Ben Jones, 2014, Communicating Data with Tableau, O'Reilly Media Inc., fig1.9 page:13)

SYED AWASE KHIRNI

TABLEAU VS QLIKVIEW

OVERVIEW

TABLEAU

- User driven BI-focused interactive visualization tool that helps businesses analyze large quantities of data intuitively with pre-defined visualization sets to choose from.

QLIKVIEW

- A BI-tool that allows users to keep tabs on all business related information in an intuitive and easy access to database.

DATA ACCESS

TABLEAU

- HAS LOCAL FILES
- SUPPORT FOR RDBMS
- SUPPORT FOR OLAP CUBES
- LIMITED FEATURES TO ACCESS ONLINE DATA SOURCES
- ACCESS TO ONLINE RESOURCES

QLIKVIEW

- HAS LOCAL FILES
- SUPPORT FOR RDBMS
- NO SUPPORT FOR OLAP CUBES
- SUPPORT FOR ONLINE DATA SOURCES
- ACCESS TO ONLINE RESOURCES

DEVELOPMENT APPROACH

TABLEAU

- MENU BASED
- LIMITED SUPPORT FOR ETL OPERATIONS
- IDE SUPPORT FOR CALCULATIONS
- DATA AGGREGATION MONITORING
- BUSINESS USER DRIVEN
- UI DRIVEN DEVELOPMENT

QLIKVIEW

- WIZARD BASED SCRIPTING
- SUPPORT FOR ETL SCRIPTING
- SUPPORT FOR CALCULTION SCRIPTING
- DATA AGGREGATION MONITORING
- PROGRAMMER DRIVEN
- SYNTAX AND SCRIPTING LANGUAGE

USER INTERFACE

TABLEAU

- LIMITED DRAG AND DROP SUPPORT
- LIMITED FEATURES ON DESIGN AND PLACEMENT OF FILTERS
- STANDARD SET OF VISUALIZATION TECHNIQUES
- SUPPORT FOR STATISTICAL ANALYSIS
- SUPPORT OF INSERTING IMAGES AND TEXT
- SUPPORT FOR CARTOGRAPHIC VISUALIZATIONS
- WEB BROWSER SUPPORT

QLIKVIEW

- DRAG AND DROP SUPPORT
- SUPPORT FOR DESIGN AND PLACEMENT OF FILTERS
- STANDARD SET OF VISUALIZATION TECHNIQUES
- DIAL, SPARKLINE, RADAR AND MINICHART SUPPORT
- SUPPORT FOR STATISTICAL ANALYSIS
- SUPPORT FOR INSERTING IMAGES AND TEXT.
- LIMITED SUPPORT FOR CARTOGRAPHIC VISUALIZATIONS
- WEB BROWSER SUPPORT

USAGE

TABLEAU

- SUPPORT FOR ADHOC ANALYTICS
- SUPPORT FOR ATYPICAL REPORTING
- SUPPORT FOR DASHBOARDS
- SUPPORT FOR STANDARD REPORTING
- LIMITED SUPPORT FOR COMMUNICATION AND COLLABORATION BETWEEN USERS.

QLIKVIEW

- LIMITED SUPPORT FOR ADHOC ANALYTICS
- SUPPORT FOR ATYPICAL REPORTING
- SUPPORT FOR DASHBOARDS
- SUPPORT FOR STANDARD REPORTING
- SUPPORT FOR COMMUNICATION AND COLLABORATION BETWEEN USERS.

HANDLING

TABLEAU

- SUPPORT FOR SERVER AND DESKTOP ENVIRONMENTS
- SUPPORT FOR USER GROUP SECURITY BASED ON ROLES
- SUPPORT FOR AUTOMATED REPORT PUBLISHING
- FREE PREVIEW SUPPORT
- MULTIMODAL PLATFORM SUPPORT

QLIKVIEW

- SUPPORT FOR SERVER AND DESKTOP ENVIRONMENTS
- SUPPORT FOR USER GROUP SECURITY BASED ON ROLES
- SUPPORT FOR AUTOMATED REPORT PUBLISHING
- FREE PREVIEW SUPPORT
- MULTIMODAL PLATFORM SUPPORT

LICENSING

TABLEAU

- UNLIMTED
- 20% FROM COST OF LICENSES PER YEAR
- SINGLE USER DESKTOP VERSION
- NAMED USER SERVER LICENSE
- SESSION/DOCUMENT SERVER LICENSE

QLIKVIEW

- UNLIMTED
- 20% FROM COST OF LICENSES PER YEAR
- SINGLE USER DESKTOP VERSION
- NAMED USER SERVER LICENSE
- SESSION/DOCUMENT SERVER LICENSE

SYED AWASE KHIRNI

TABLEAU : DATASETS

Datasets

- http://www.retrosheet.org/game.htm#
- http://www.opensourcesports.com/baseball/
- http://www.seanlahman.com/baseball-archive/statistics/
- https://www.rotowire.com/

Canadian Datasets

- http://open.canada.ca/en
- http://data.vancouver.ca/datacatalogue/index.htm
- https://data.gov.bc.ca/
- http://data.surrey.ca/
- http://www.statcan.gc.ca/eng/start

USA Datasets

- https://opendata.cityofnewyork.us/data/
- https://www.timeanddate.com/holidays/us/
- https://data.sfgov.org/City-Infrastructure/311-Cases/vw6y-z8j6
- https://data.cityofchicago.org/Public-Safety/Crimes-2001-to-present/ijzp-q8t2
- https://data.seattle.gov/
- https://data.nola.gov/browse?limitTo=datasets&utf8=%E2%9C%93
- https://socrata.com/
- https://data.ny.gov/Transportation/Annual-Average-Daily-Traffic-AADT-Beginning-1977/6amx-2pbv
- https://data.cityofchicago.org/Public-Safety/Crimes-2001-to-present/ijzp-q8t2
- https://opendata.socrata.com/dataset/The-White-House-Nominations-Appointments/n5m4-mism
- https://www.federalreserve.gov/datadownload/
- https://catalog.data.gov/dataset

Sports Data sets

- https://www.rotowire.com/
- http://www.opensourcesports.com/basketball/
- http://www.seanlahman.com/baseball-archive/statistics/
- http://www.opensourcesports.com/hockey/
- http://www.tennis-data.co.uk/alldata.php
- http://www.retrosheet.org/gamelogs/index.html#
- http://www.exploredata.net/Downloads/Baseball-Data-Set
- http://content.usatoday.com/sportsdata/football/nfl/salaries/team
- http://content.usatoday.com/sportsdata/baseball/mlb/salaries/team
- http://www.opensourcesports.com/

Movie Data sets

- http://grouplens.org/datasets/movielens/
- http://www.boxofficemojo.com/
- http://www.imdb.com/interfaces/

Music Data sets

- https://musicbrainz.org/doc/MusicBrainz_Database
- https://opendata.socrata.com/Fun/Top-1-000-Songs-To-Hear-Before-You-Die/ed74-c6ni
- https://labrosa.ee.columbia.edu/millionsong/pages/getting-dataset
- http://www.dtic.upf.edu/~ocelma/MusicRecommendationDataset/lastfm-1K.html

Airport/Airline Data sets

- https://openflights.org/data.html
- https://github.com/fivethirtyeight/data/tree/master/airline-safety

Weather Data sets

- https://www.ncdc.noaa.gov/ibtracs/index.php?name=wmo-data
- http://climate.weather.gc.ca/
- https://www.wunderground.com/history/

Stock Data sets

- http://eoddata.com/download.aspx
- http://www.stockhistoricaldata.com/daily-download

Ip Address Data sets

- https://lite.ip2location.com/database-ip-country
- https://db-ip.com/db/download/country
- https://www.maxmind.com/en/free-world-cities-database
- https://code.google.com/archive/p/worlddb/

Social Media Data sets

- https://gnip.com/
- https://developer.twitter.com/en/enterprise
- http://datasift.com/

Other Data sets

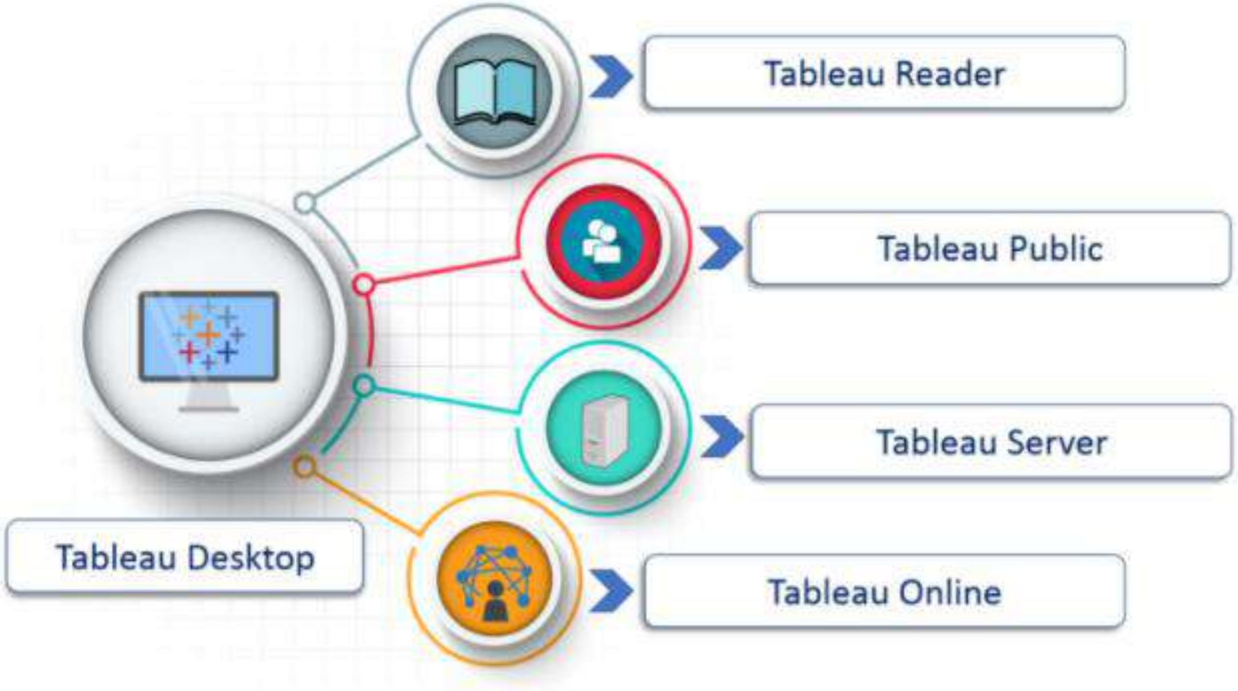
- http://www.gapminder.org/data/
- http://flowingdata.com/
- http://www.visualisingdata.com/
- https://datamarket.azure.com/browse/data
- https://opendata.socrata.com/
- https://www.quora.com/Where-can-I-find-large-datasets-open-to-the-public
- https://www.kaggle.com/competitions
- http://snap.stanford.edu/data/
- http://dataportals.org/
- https://www.quandl.com/
- https://giphy.com/gifs/cat-lol-VXdsfku3cKtcQ
- https://www.google.com/publicdata/directory
- http://datahub.io/search
- https://www.reddit.com/r/dataisbeautiful/
- https://datacatalog.worldbank.org/
- https://knoema.com/
- https://developers.google.com/freebase/

Other Data sets

- http://www.generatedata.com/
- www.mockaroo.com
- https://opendata.socrata.com/dataset/World-s-Largest-Cathedrals/sfaz-u3mt
- https://www.kaggle.com/competitions
- http://64px.com/instagram/
- https://stackoverflow.blog/tags/cc-wiki-dump/
- http://portals.broadinstitute.org/cgi-bin/cancer/datasets.cgi
- http://www.ieor.berkeley.edu/~goldberg/jester-data/
- http://www2.informatik.uni-freiburg.de/~cziegler/BX/
- https://www.cs.cmu.edu/~enron/
- http://www.publicwhip.org.uk/proiect/data.php

Other Data sets

- https://github.com/fivethirtyeight/data/tree/master/airline-safety
- https://github.com/fivethirtyeight/data/tree/master/alcohol-consumption
- https://github.com/fivethirtyeight/data/tree/master/comic-characters
- https://github.com/fivethirtyeight/data/tree/master/bad-drivers
- https://chinookdatabase.codeplex.com/
- http://msftdbprodsamples.codeplex.com/releases/view/93587
- https://github.com/fivethirtyeight/data/tree/master/most-common-name
- https://github.com/fivethirtyeight/data/tree/master/classic-rock
- https://github.com/fivethirtyeight/data/tree/master/college-majors
- https://github.com/fivethirtyeight/data
- http://msftdbprodsamples.codeplex.com/releases/view/93587
- http://www.eclipse.org/birt/documentation/sample-database.php



SYED AWASE KHIRNI

TABLEAU SETUP

Tableau

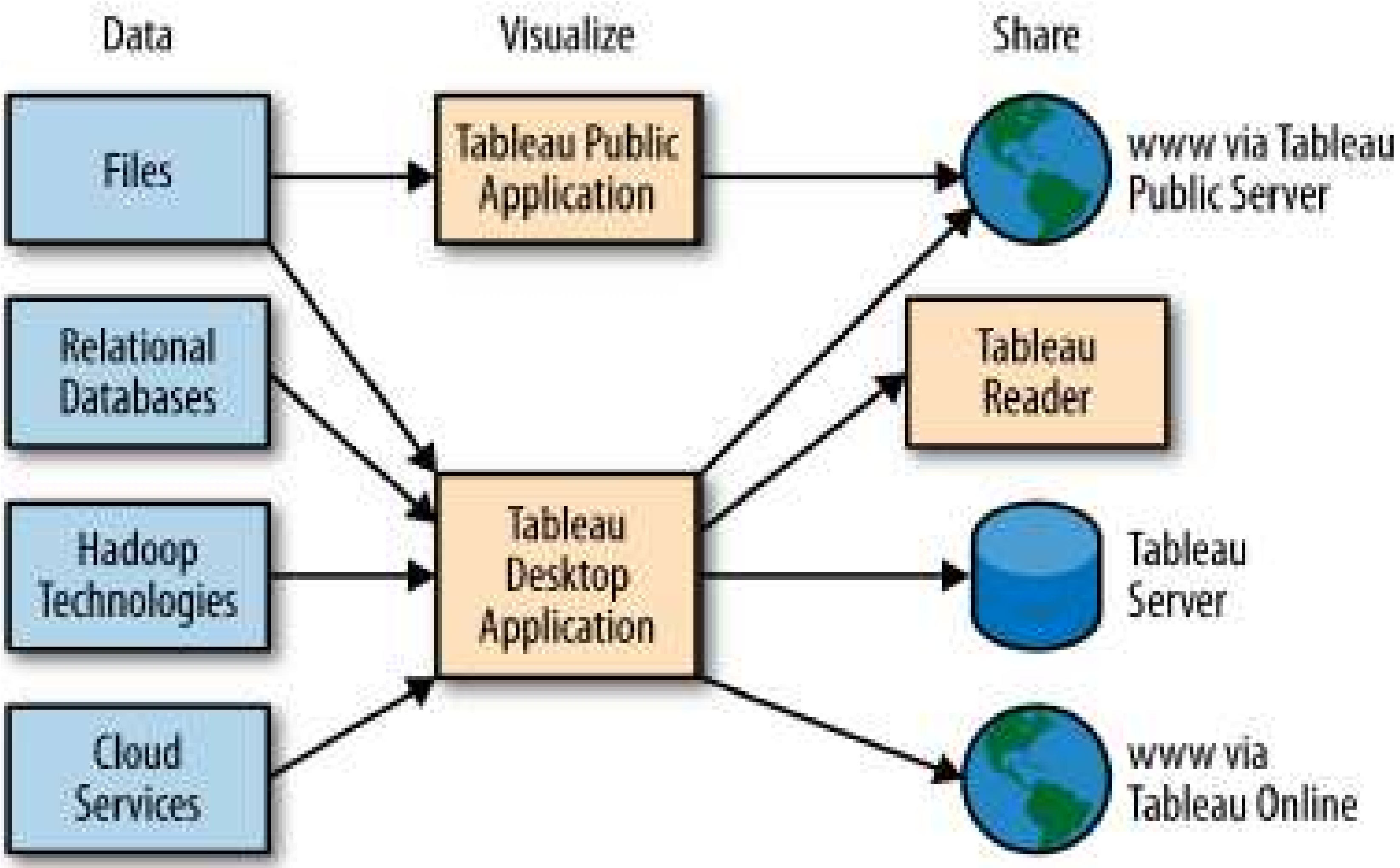


Tableau Product Diagram (Ben Jones, 2014, Communicating Data with Tableau, O'Reilly Media Inc., fig:2.1 page:18)

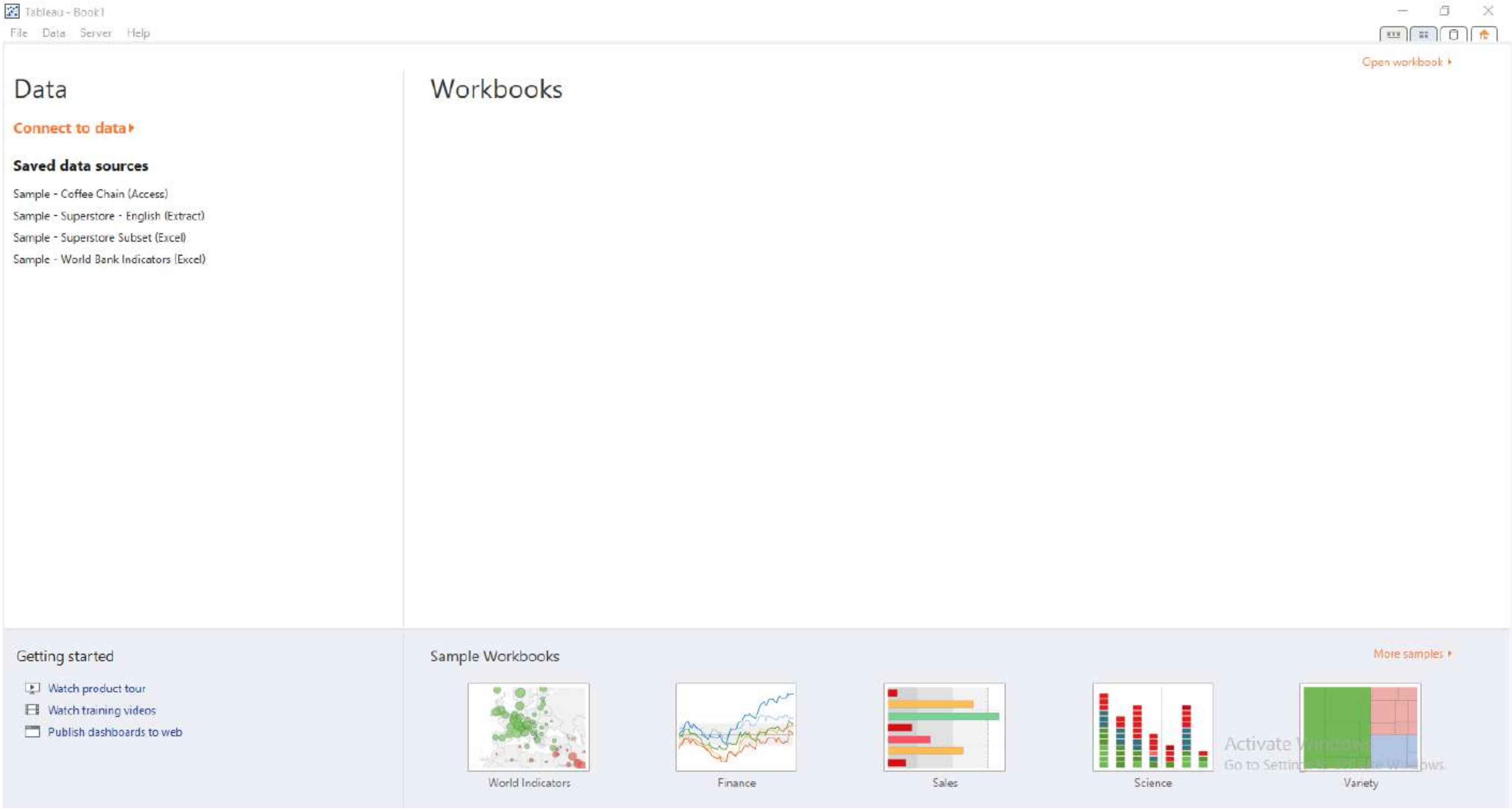
Tableau Software

Created by Christian Chabot, Chris Stolte ,Pat Hanrahan

Tableau Desktop	Tableau Server	Tableau Online	Tableau Public
FAST ANALYTICS FOR EVERYONE	COLLABORATION FOR ANY ORGANIZATION	BUSINESS INTELLIGENCE IN THE CLOUD	FOR PUBLIC DATA
With Tableau Desktop you can explore and visualize any data in minutes.	Tableau Server is an online & mobile business intelligence solution.	Tableau Online is a hosted version of Tableau Server, no setup required.	Tableau Public is for journalists or anyone to publish interactive data online.
LEARN MORE | FREE TRIAL	LEARN MORE | FREE TRIAL	LEARN MORE | FREE TRIAL	LEARN MORE

Tableau 8.3

- Tableau Dashboard



Tableau

- Drivers to connect to various databases
- https://www.tableau.com/support/drivers

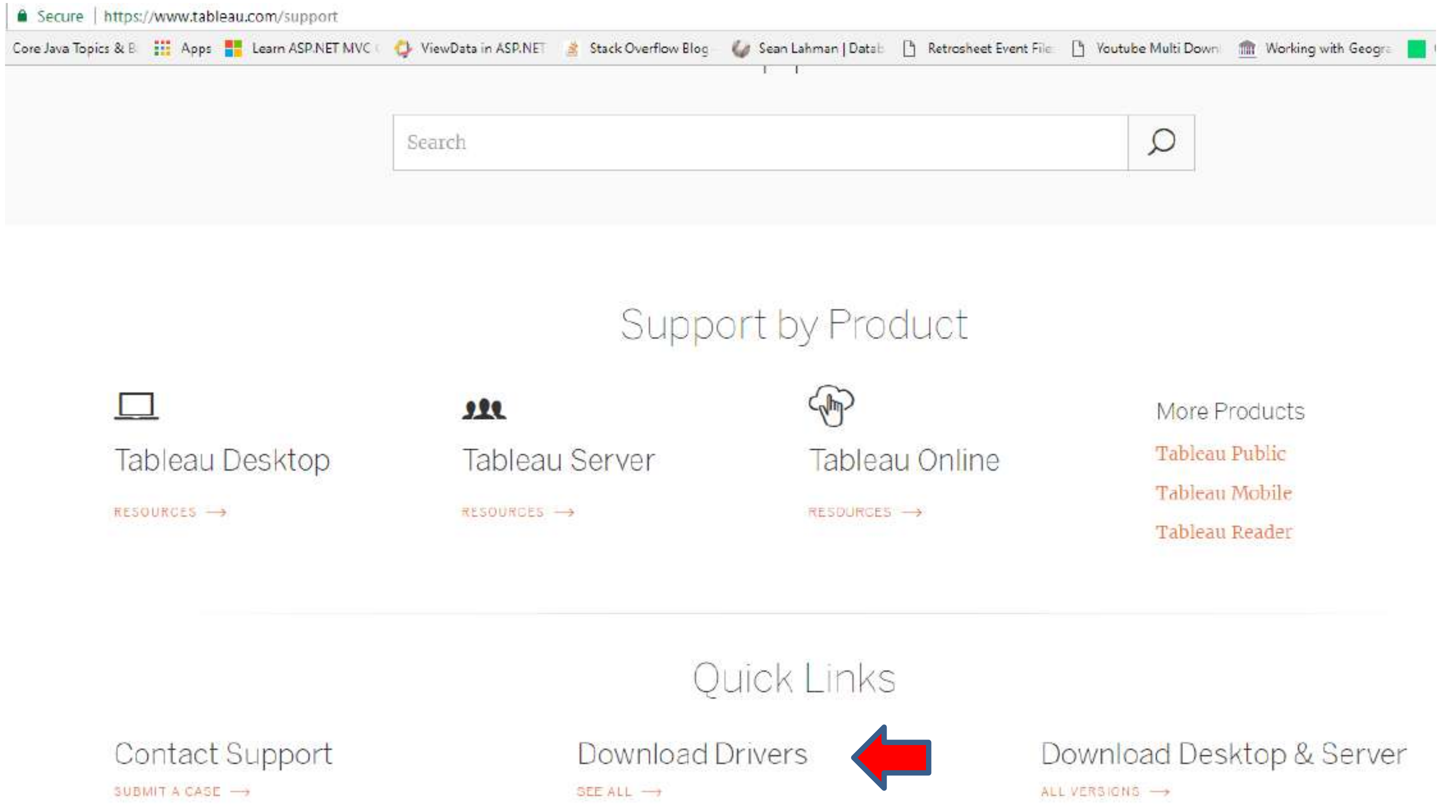
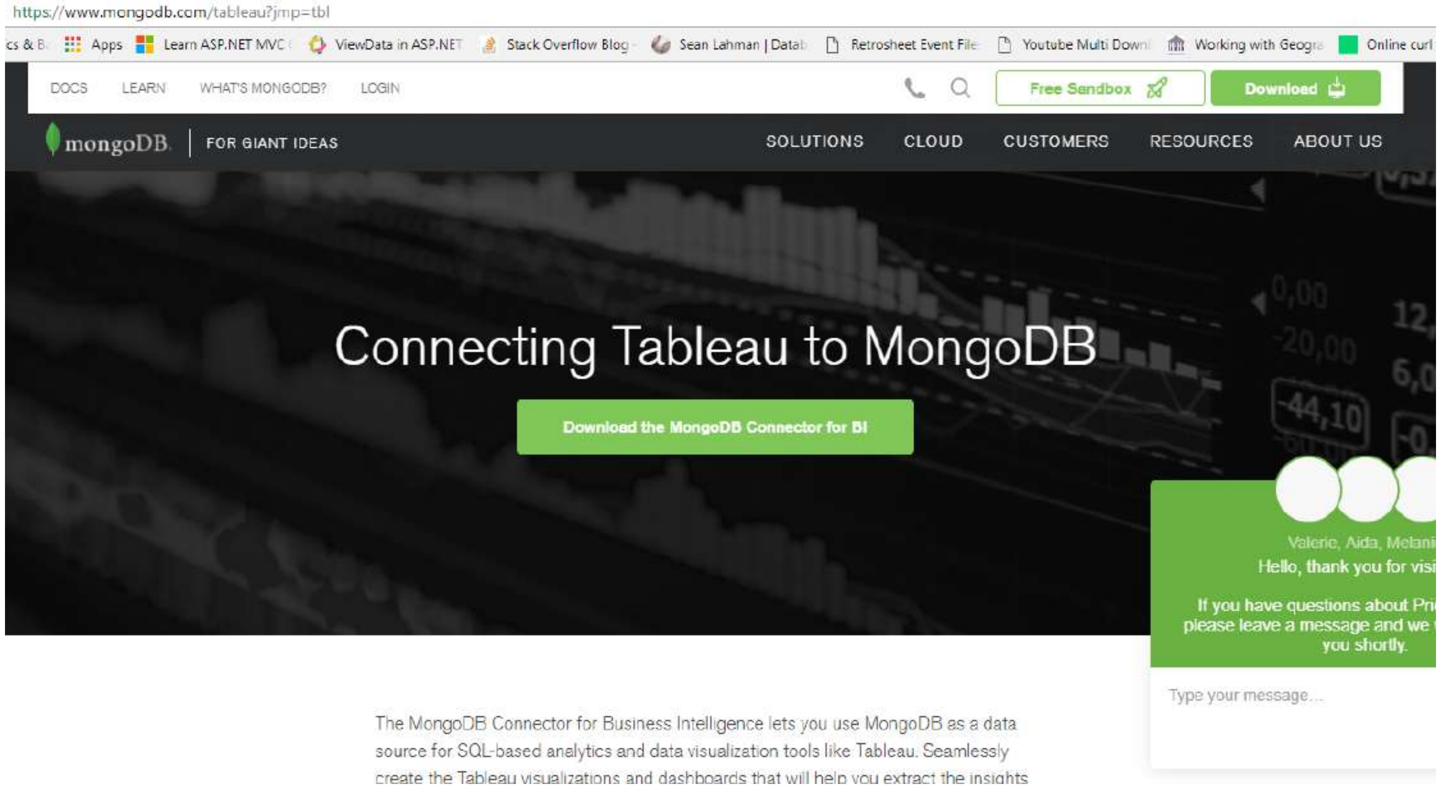


Tableau MongoDB Drivers

- https://www.mongodb.com/tableau?jmp=tbl



Connecting to Data Sources

- connecting to various data sources

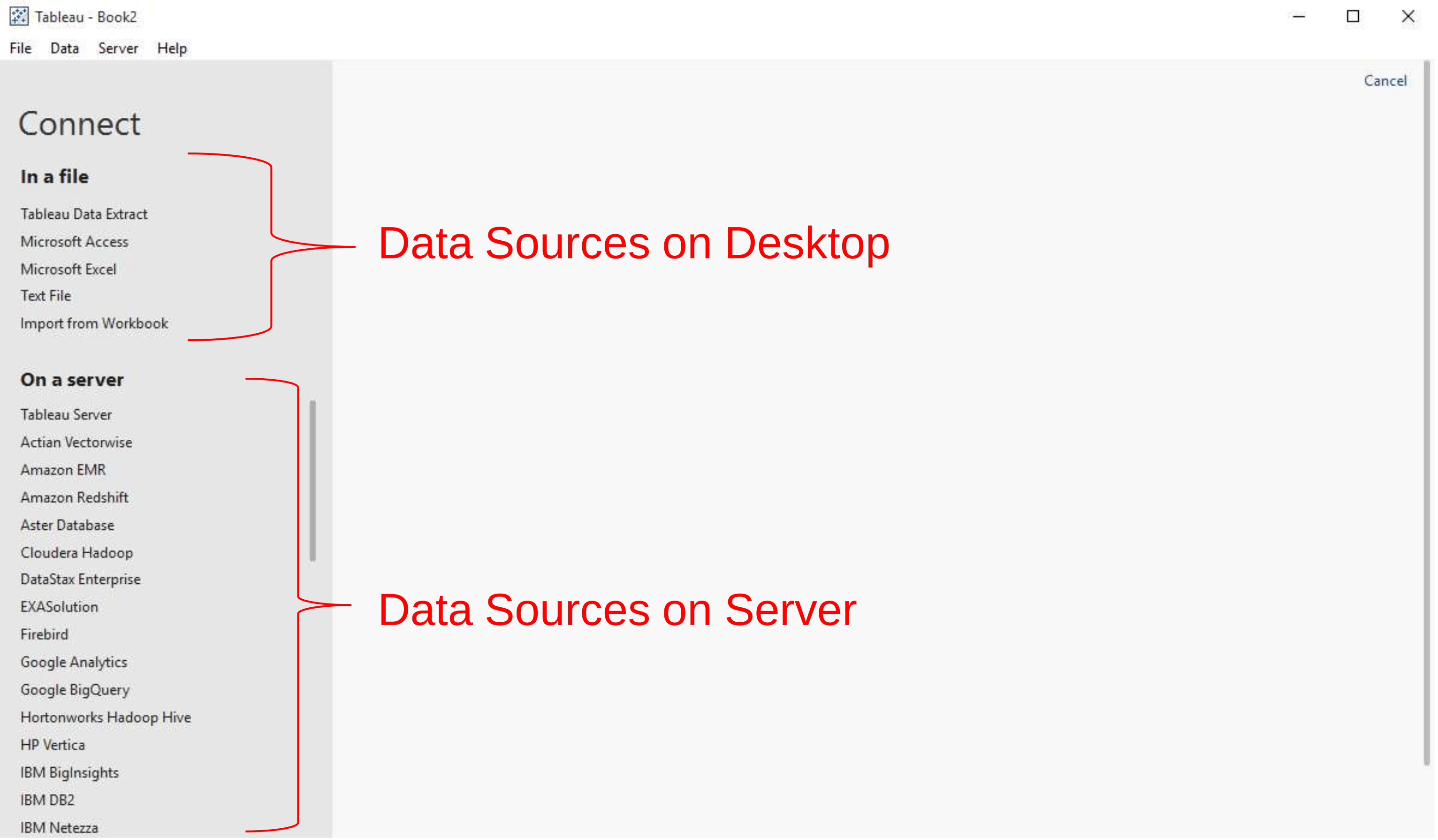


Tableau File Types

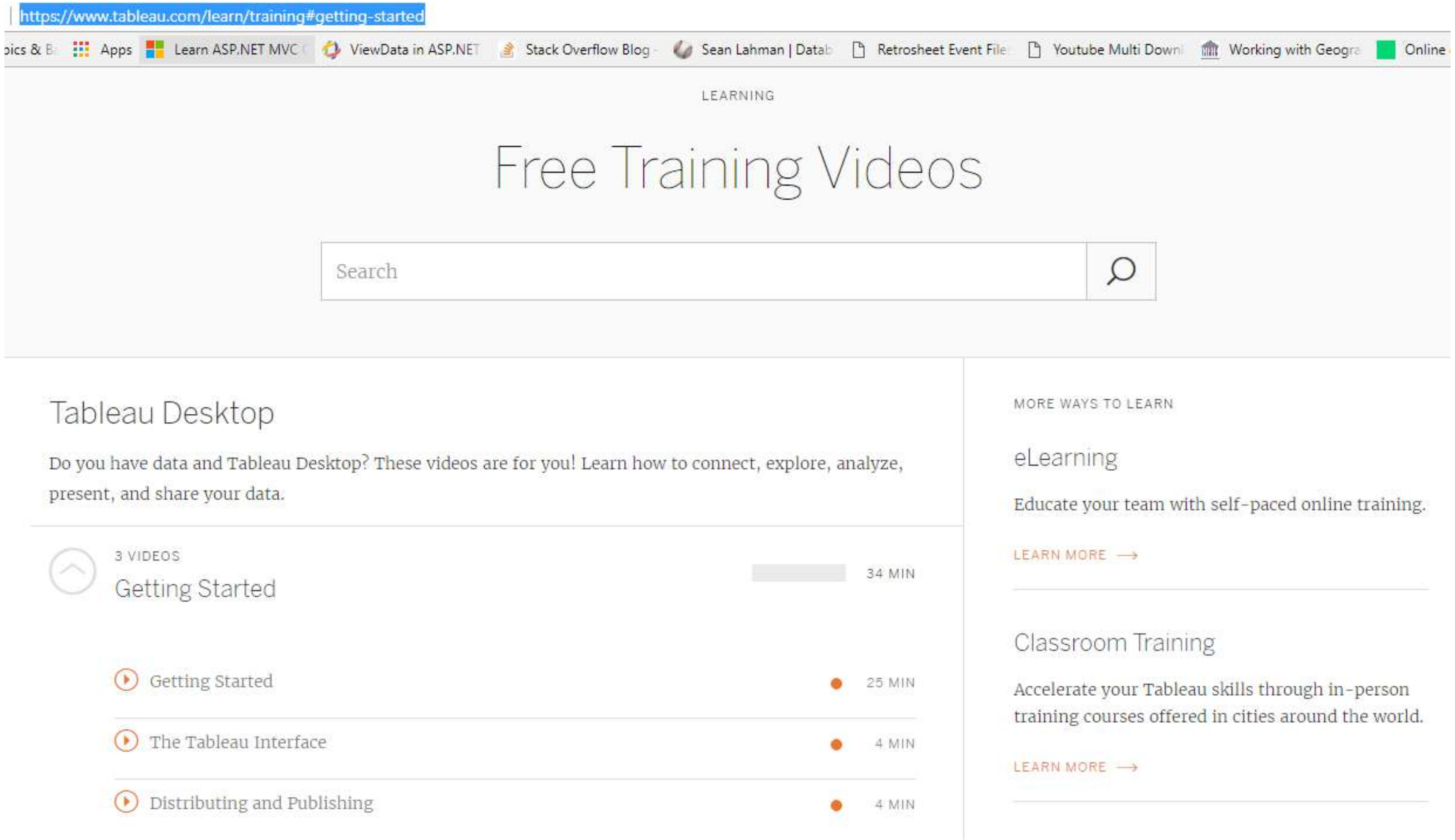
- Tableau workbook(.twb)
  - Stores a visualization without source data.
- Tableau bookmark (.tbm)
  - Stores a connection to a worksheet in another Tableau workbook
- Tableau data extract (.tde)
  - Stores tableau data as a filtered and aggregated extract
- Tableau datasource (.tds)
  - Stores the server address, password, and other information required to access a data source.
- Tableau packaged workbook (.twbx)
  - Stores extracted data and visualizations for viewing in Tableau or Tableau Reader

Data Types Supported by Tableau

- Boolean
- Date
- Date & Time
- Geographical Values
- Text/String
- Number(Decimal)
- Number(Whole)

Tableau Help

https://www.tableau.com/learn/training#getting-started



https://www.tableau.com/learn/tutorials/on-demand/getting-started-data?edition=unlicensed&version=9.3.0&__full-version=9300.16.0315.0125&platform=windows&status=buy&reg-delay=true

Problem Description:	
Data set used:	

SYED AWASE KHIRNI

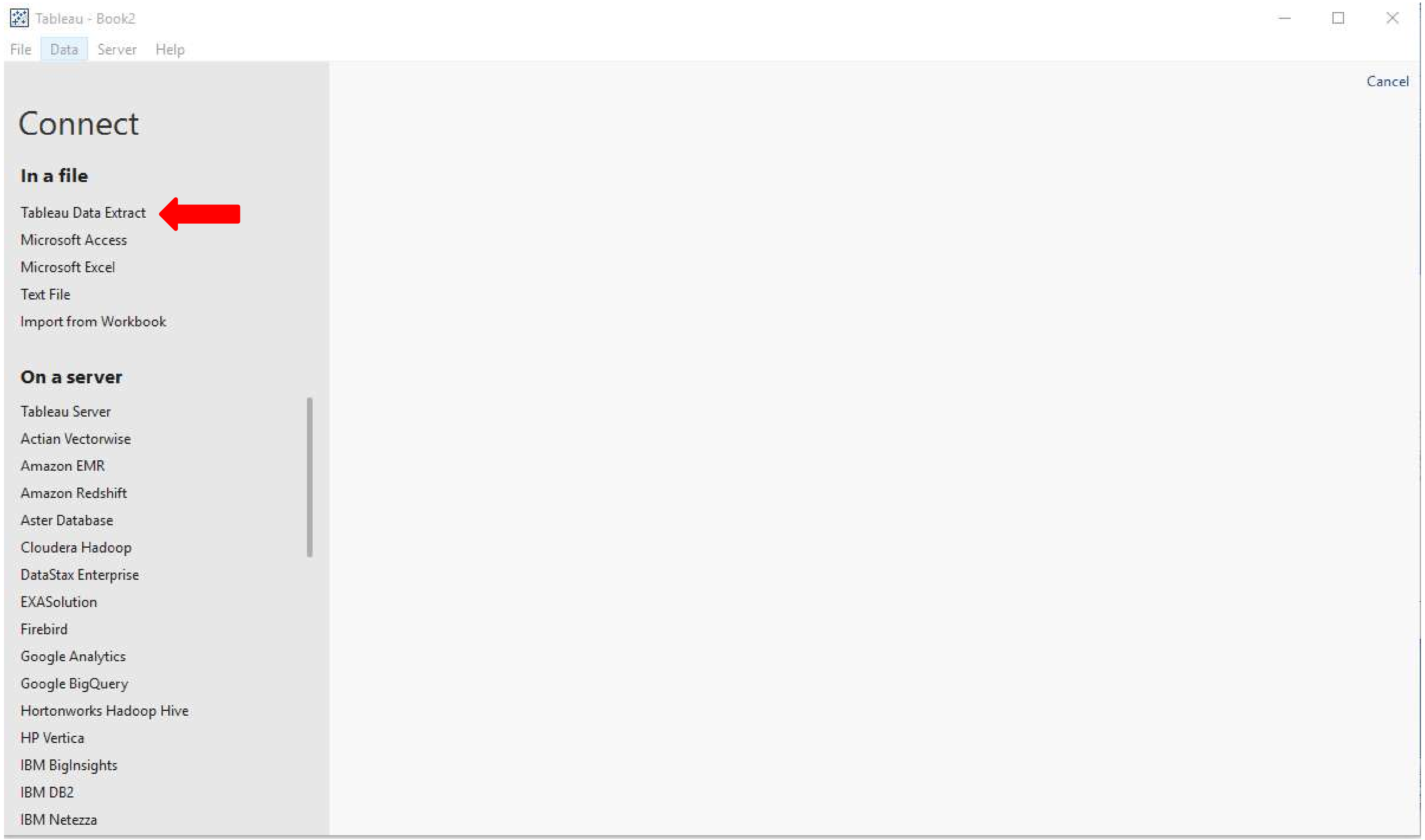
TABLEAU : CONNECTION TYPES

TABLEAU

PLAY BOOK : SETTING UP WORKSHEET BY CONNECTING TO TABLEAU DATA EXTRACT

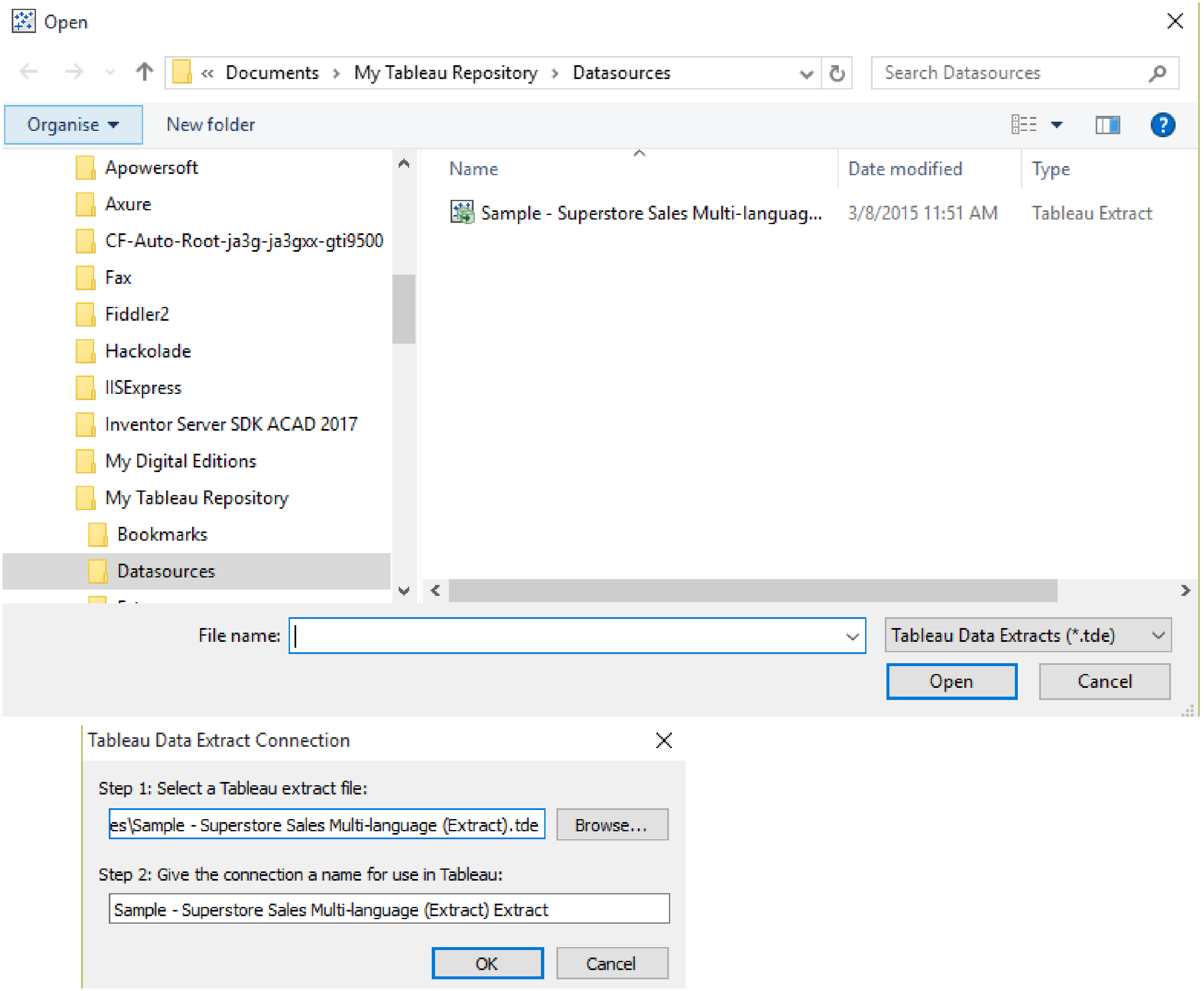
Step 1:

- Connecting to TABLEAU DATA EXTRACT



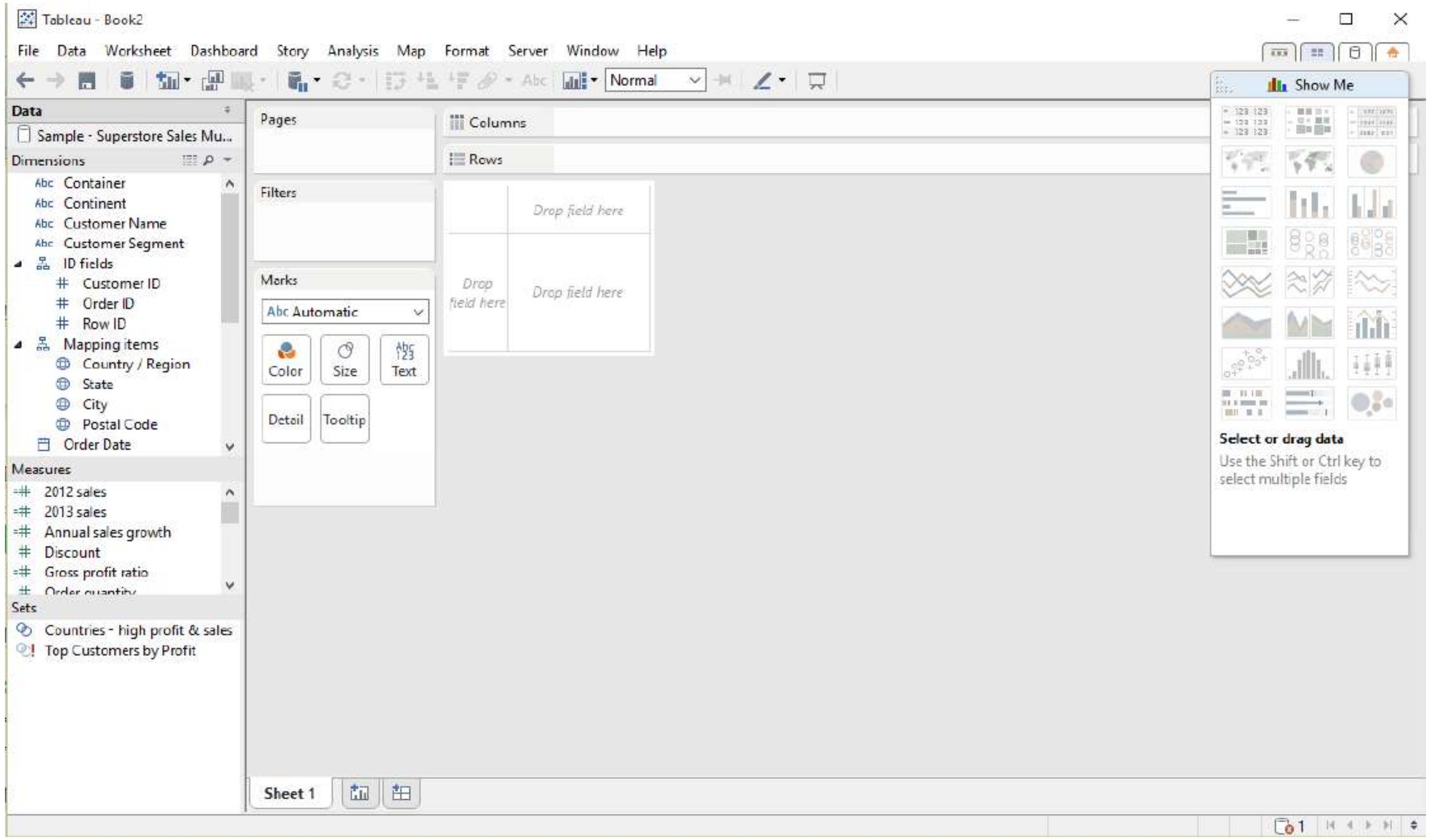
Step 2:

- select tableau data extract file



Step 3:

- creates a worksheet panel. With Dimensions, Measures, Sets and Data on the side bar.
- Tableau provides a set of predefined visualization toolbox on the right side bar.



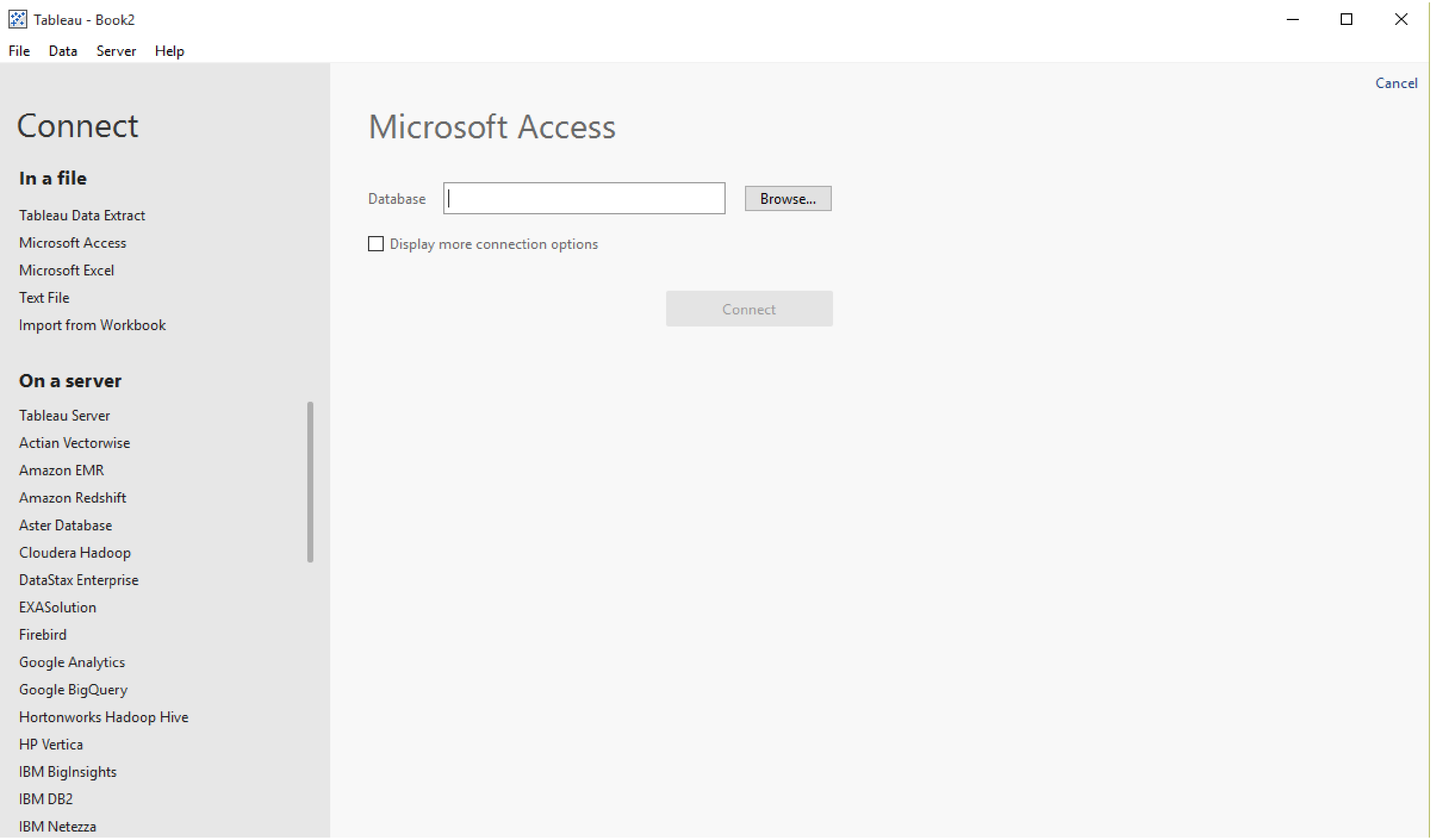
TABLEAU

PLAY BOOK : SETTING UP WORKSHEET BY CONNECTING TO MICROSOFT ACCESS

Original Series

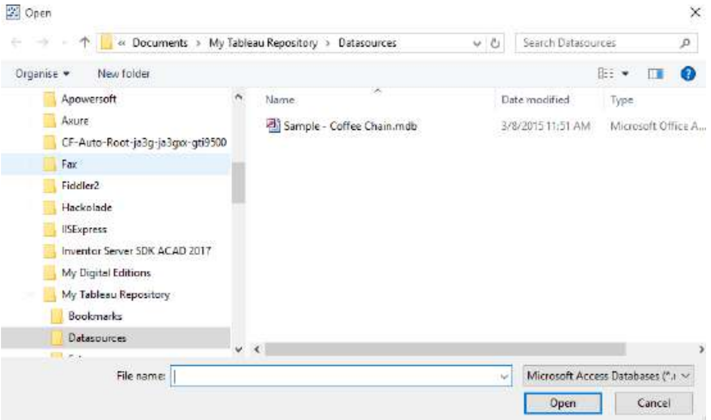
Step 1:

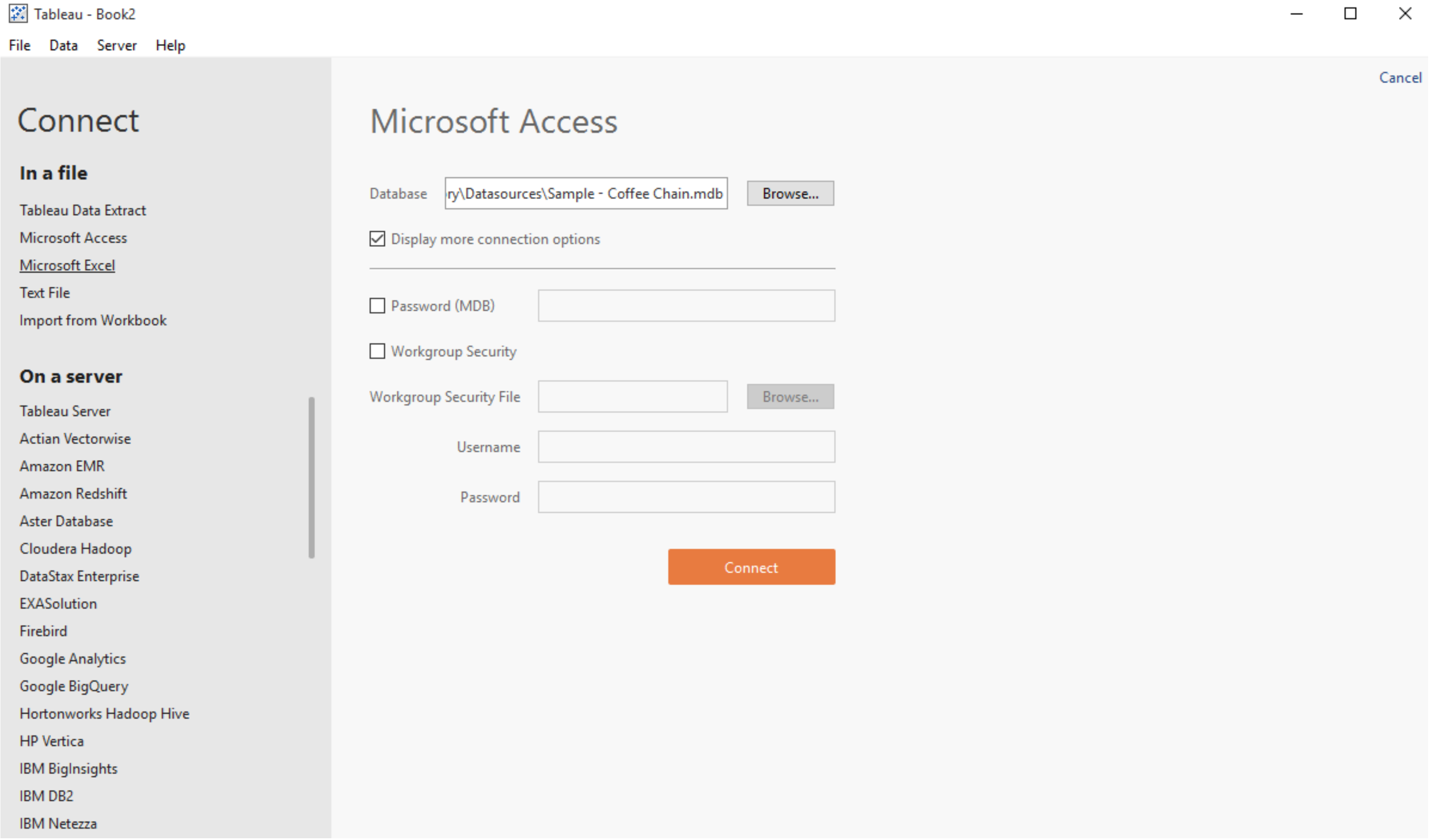
- Connecting to TABLEAU DATA EXTRACT



Step 2:

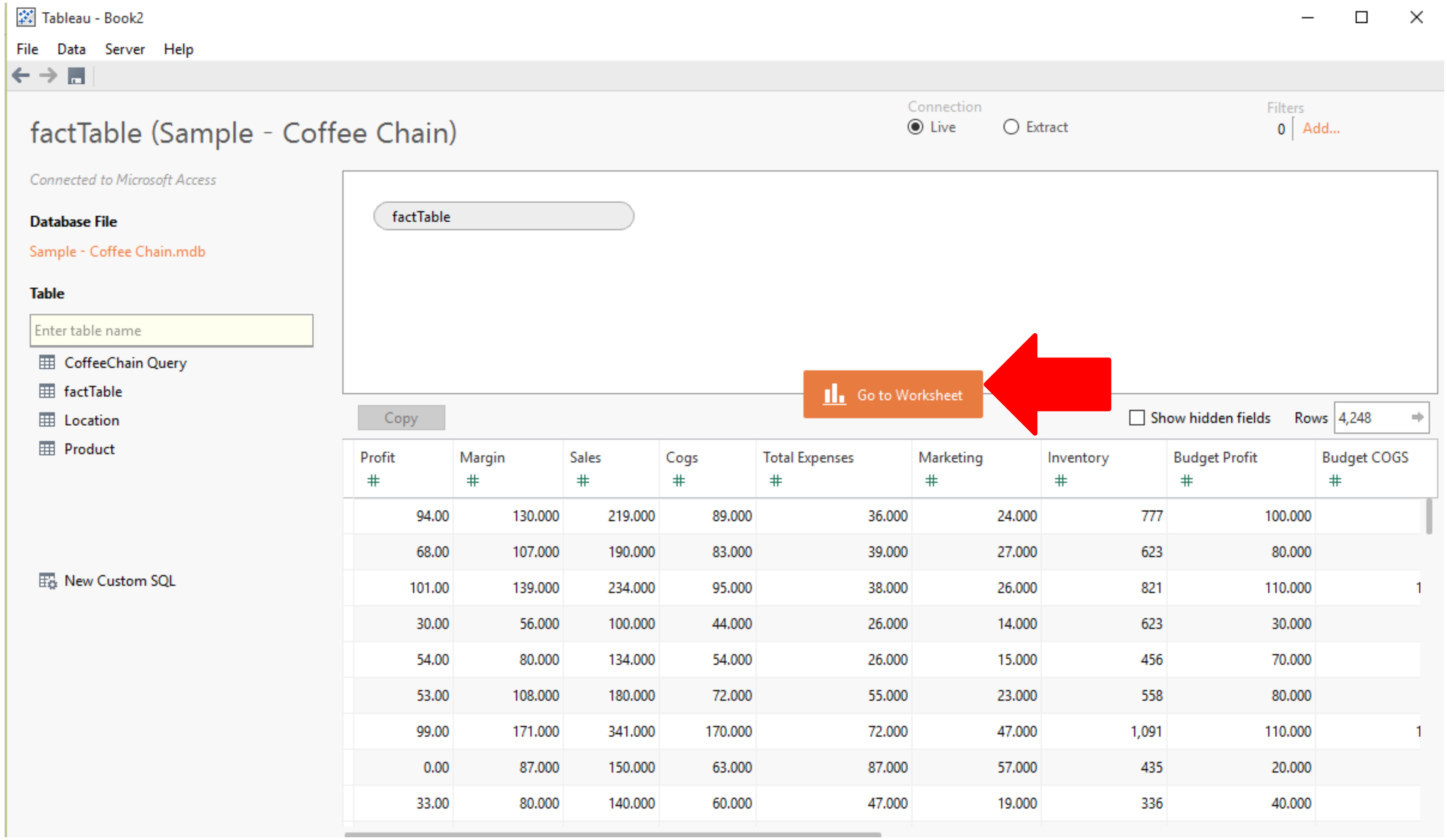
- connecting to Microsoft Access Database.





Step 3:

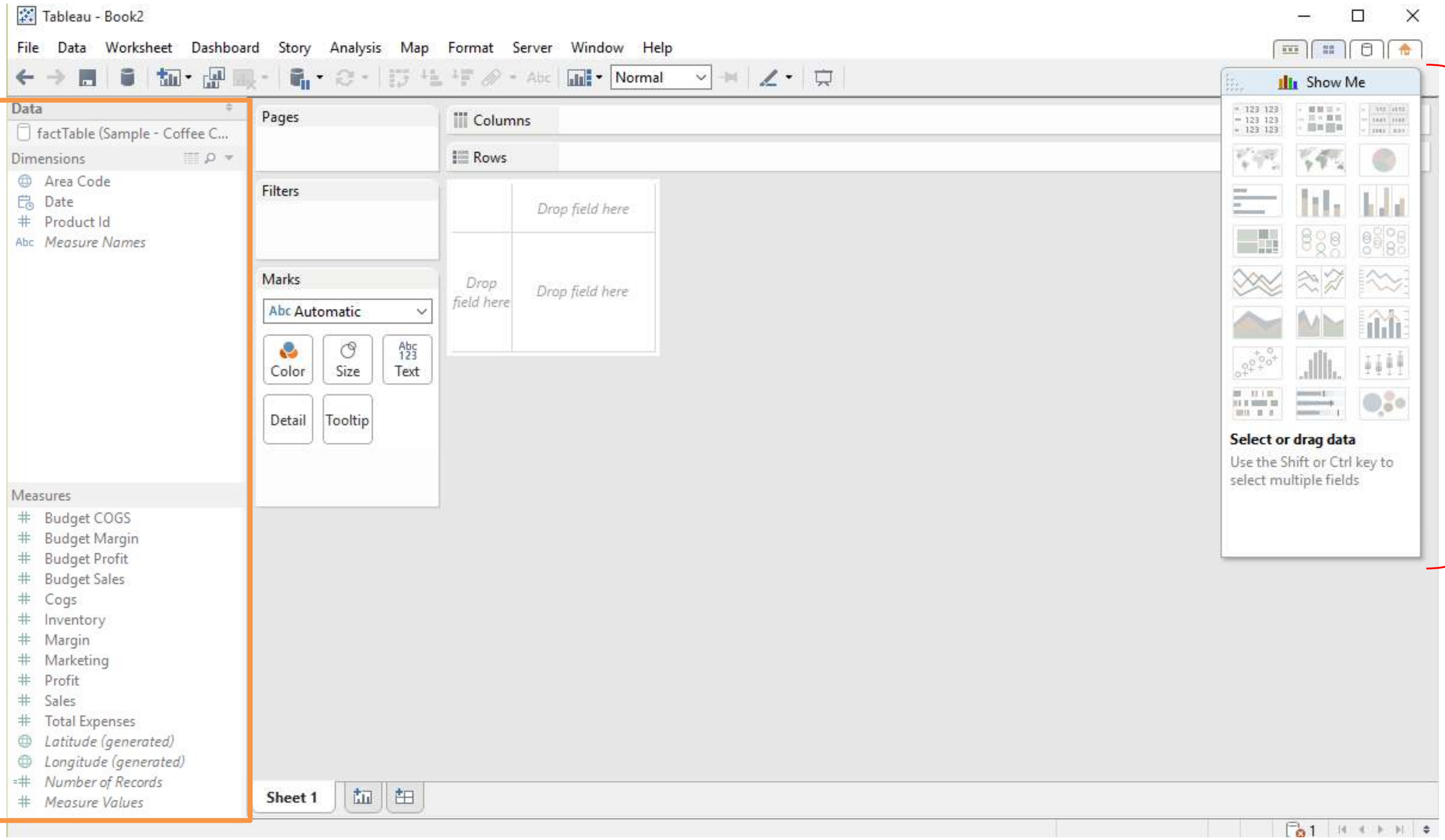
- Select tables to work with in worksheet



Step 4:

- prompts you for worksheet.

DATA PANEL



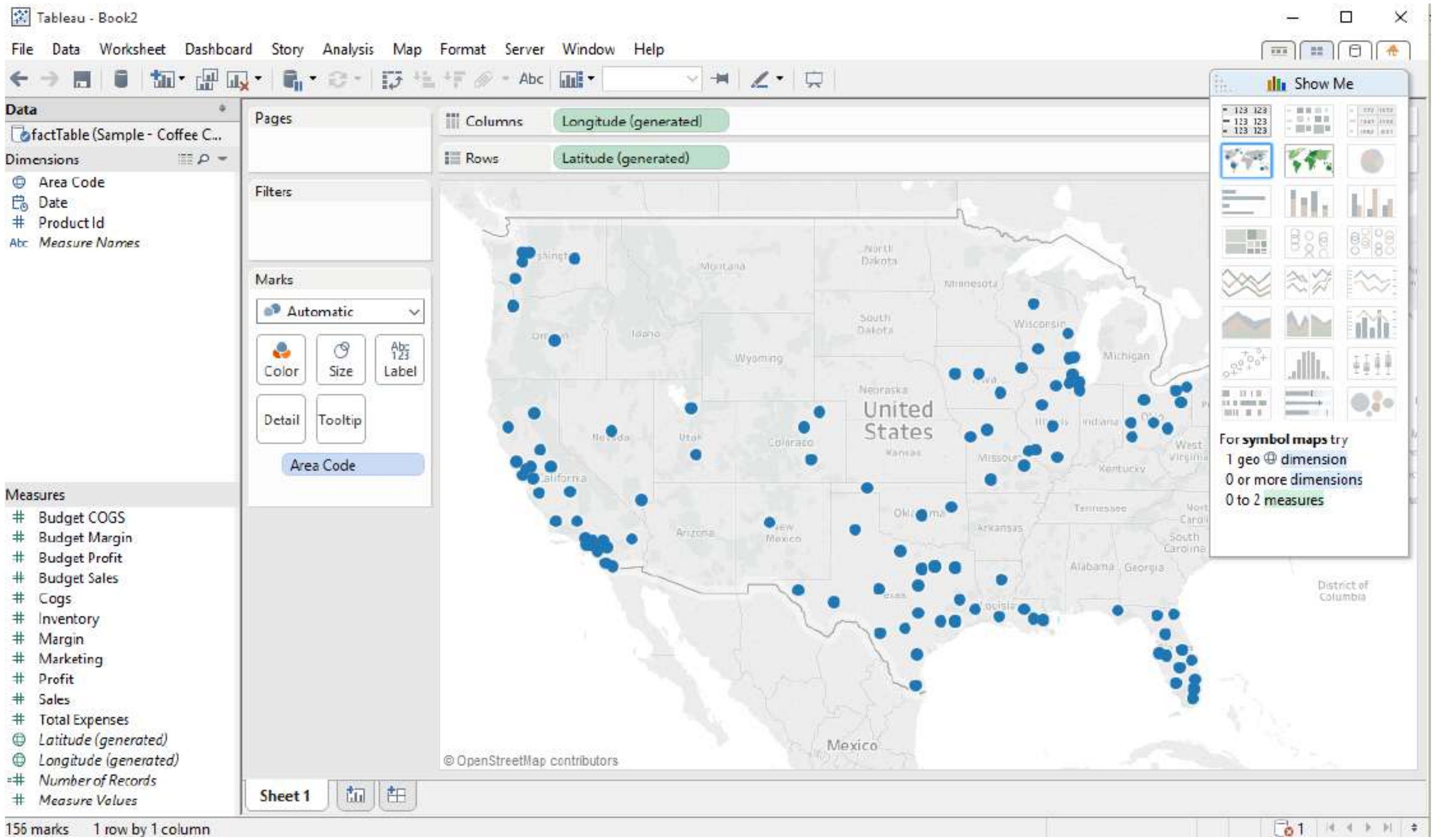
visualization

Please read terms of use for authorized access

Original Series

Step 5:

- Select an appropriate dimension to visualize your data based on the pre-defined sets of visualizations.

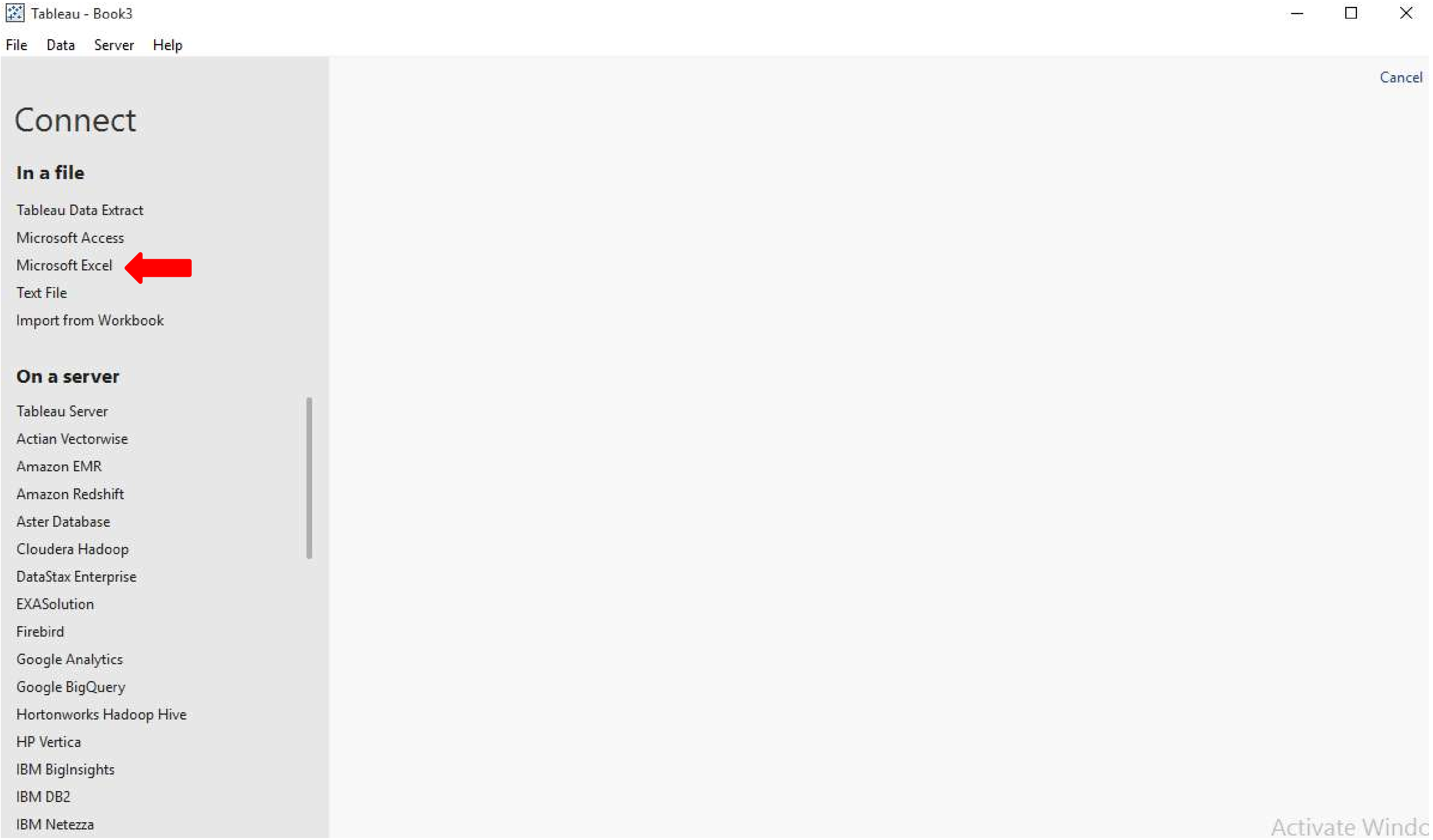


TABLEAU

PLAY BOOK : SETTING UP WORKSHEET BY CONNECTING TO MICROSOFT EXCEL

Step 1:

- Connecting to Microsoft Excel

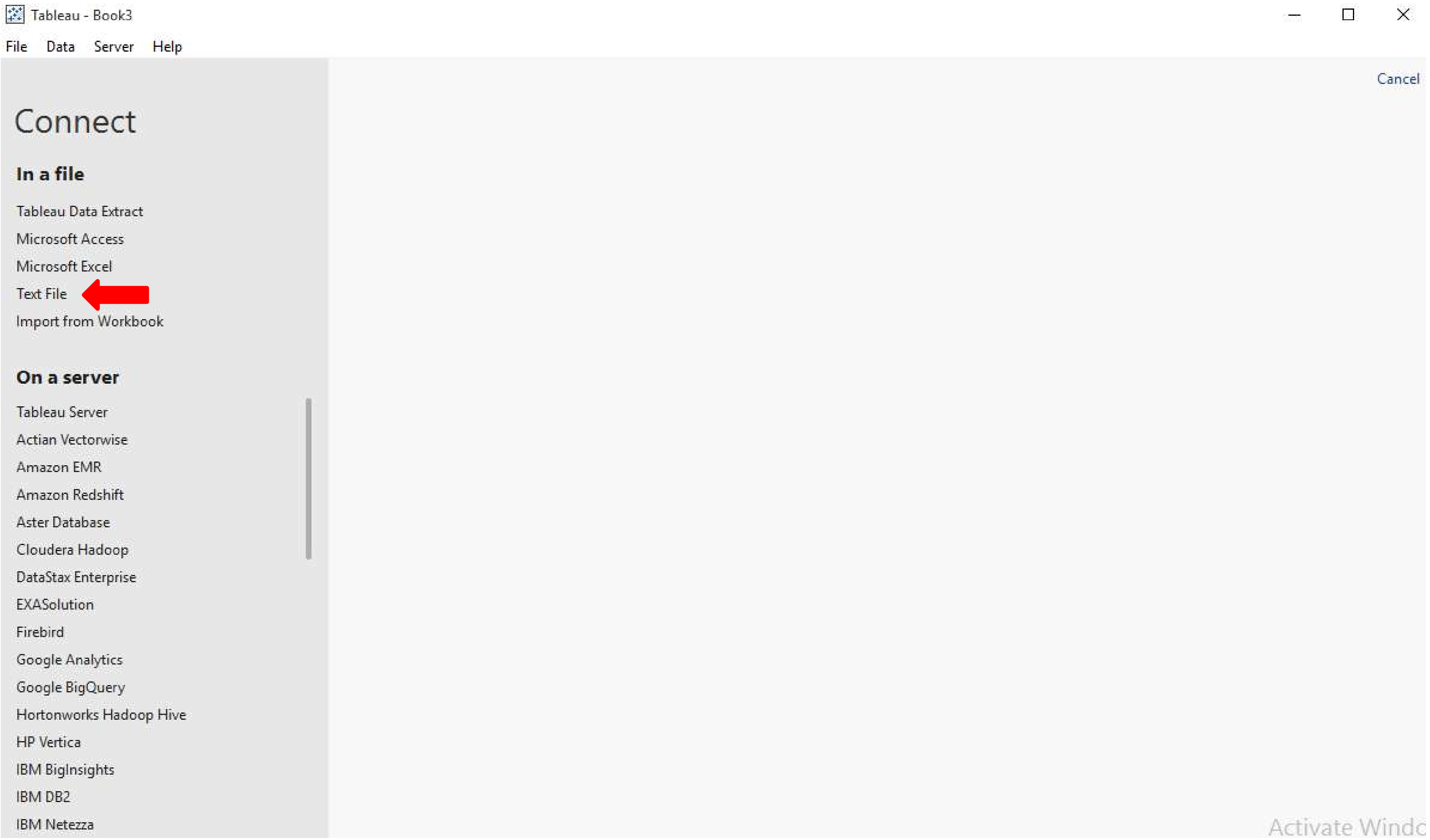


TABLEAU

PLAY BOOK : SETTING UP WORKSHEET BY CONNECTING TO TEXT FILE

Step 1:

- Connecting to Text File



SYED AWASE KHIRNI

TABLEAU : ORGANIZING YOUR DATA

SYED AWASE KHIRNI

TABLEAU : BASIC VISUALIZATIONS

Original Series

Problem Description:
Data set used:

TABLEAU

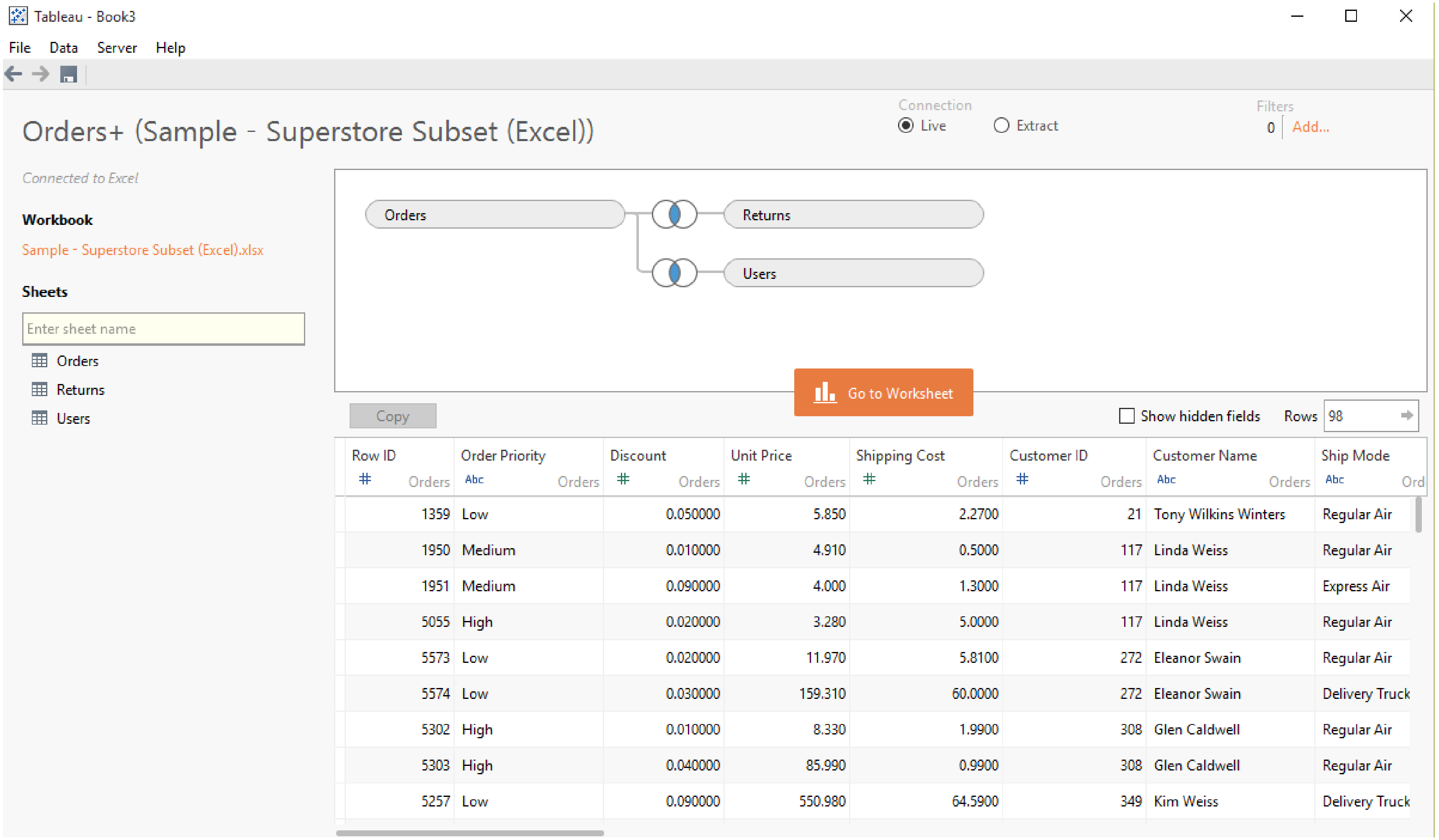
PLAY BOOK : GENERATING VISUALIZATION USING MICROSOFT EXCEL DATA SOURCE

Data: C:\Users\SyedAwase\Documents\My Tableau Repository\Datasources

Please read terms of use for authorized access

Step 1:

- Connecting to Super Store Subset Excel Sheet.
- Drag the sheets into the selection panel to visualize the relationship between the variables



Original Series

Measures

- **Measures** are the numeric metrics or measurable quantities of the data, which can be analyzed by dimension table. Measures are stored in a table that contain foreign keys referring uniquely to the associated dimension tables.
- The table supports data storage at atomic level and thus, allows more number of records to be inserted at one time. For instance, a Sales table can have product key, customer key, promotion key, items sold, referring to a specific event.

Dimensions

- **Dimensions** are the descriptive attribute values for multiple dimensions of each attribute, defining multiple characteristics.
- A dimension table ,having reference of a product key form the table, can consist of product name, product type, size, color, description, etc.

Tableau Data

Data: Dimensions

- Dimensions are variables that are categorical data types/Qualitative data type.
- Dimensions are independent variables
- Tableau recognizes dimensions and color codes them in blue.
- Dimensions specify the level of granularity in tableau.

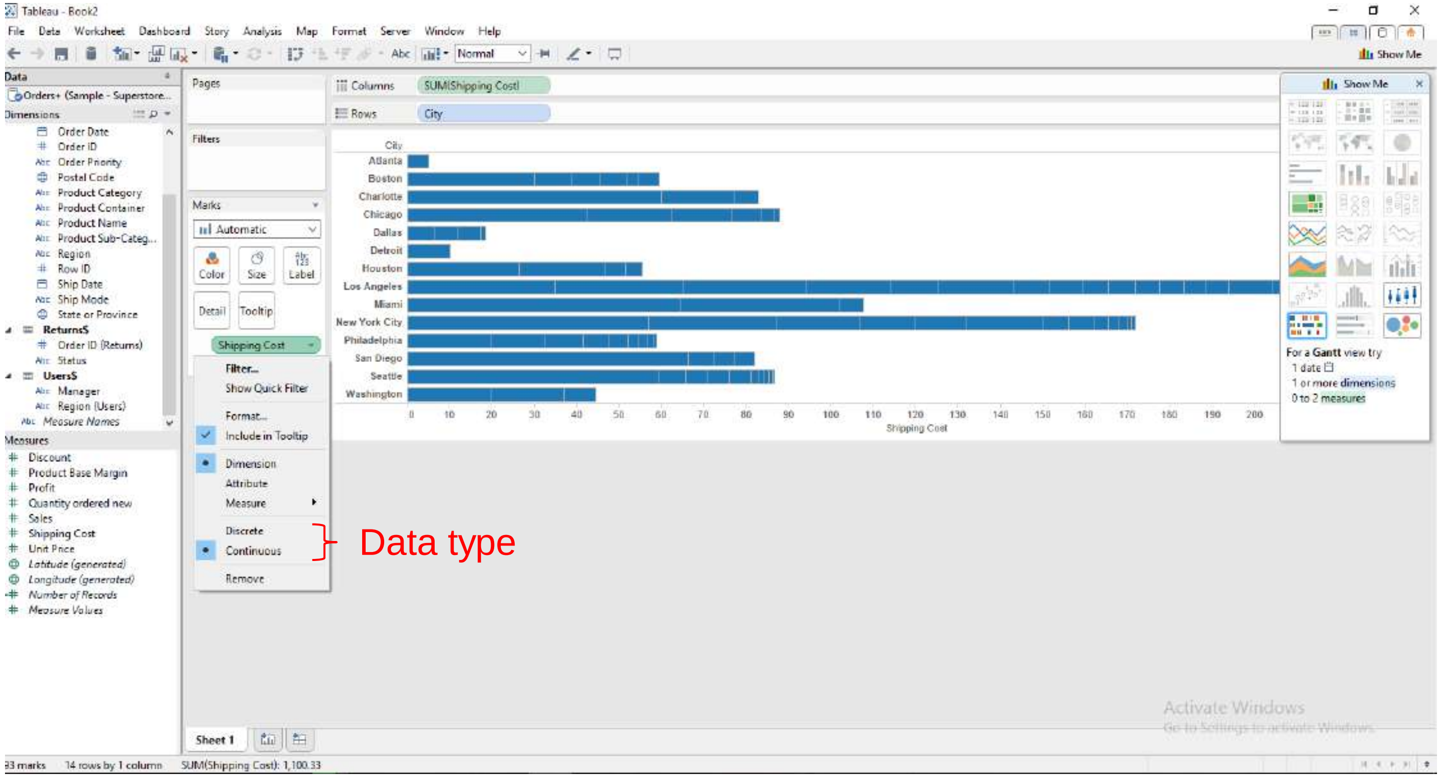
Data: Measures

- Measure are numerical data or quantitative data type.
- Measure are dependent variables.
- Tableau recognizes measures and color codes them in green.
- Measures are used for aggregation in tableau

COLUMNS:	ShippingCost
ROWS:	**Order$City**

Step 2:

- select from **Data Panel /Dimensions** Orders$City drag it to the visualization canvas on to Rows.
- **We would like to draw the relationship between city and shipping costs.**

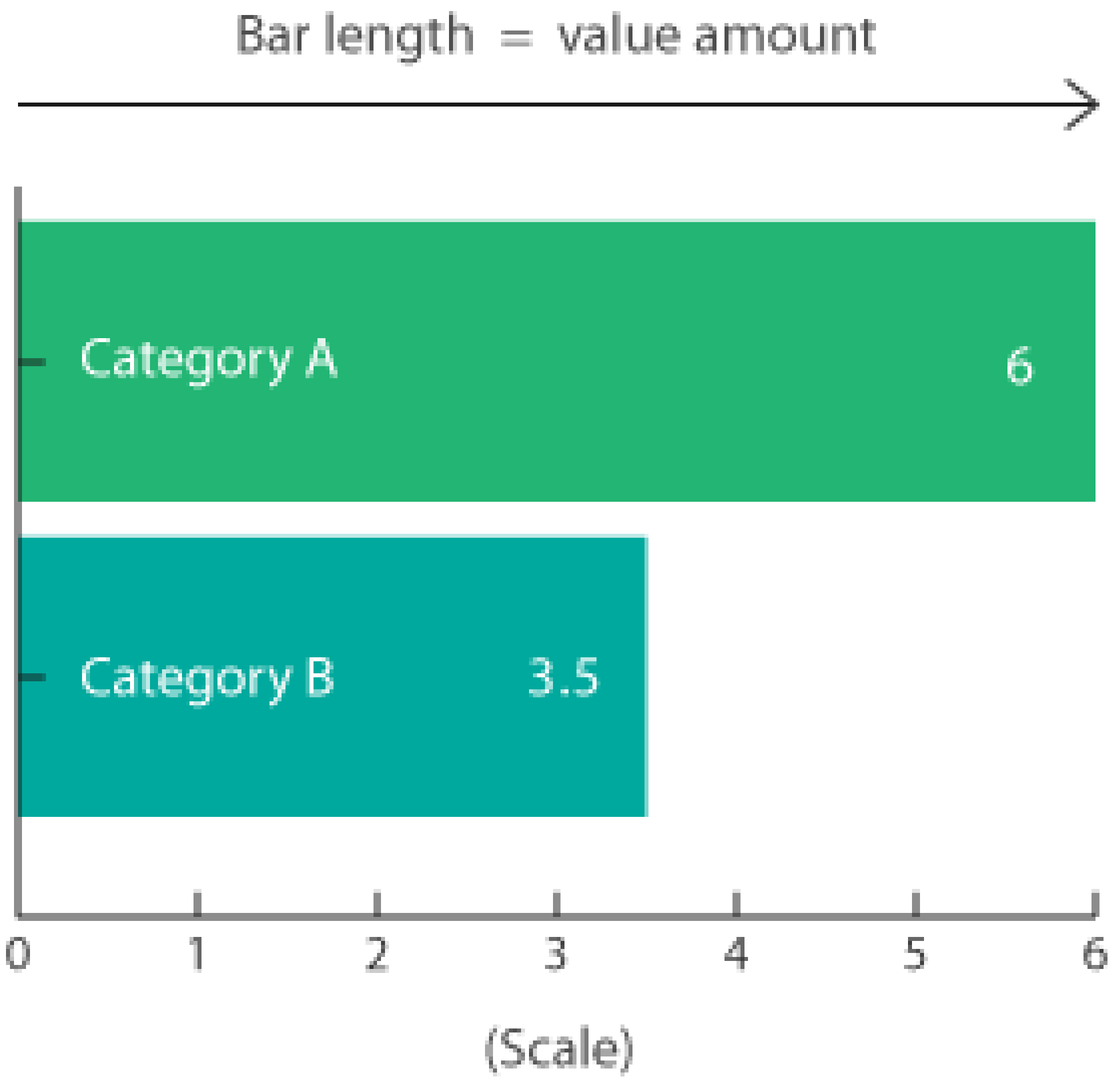


Data type

Comparisons | Pattern

Bar Chart

- can be either horizontal or vertical bars
- To show discrete, numerical comparisons across categories being compared
- They do not display continuous developments over an interval.
- **Challenge: labeling for huge data**



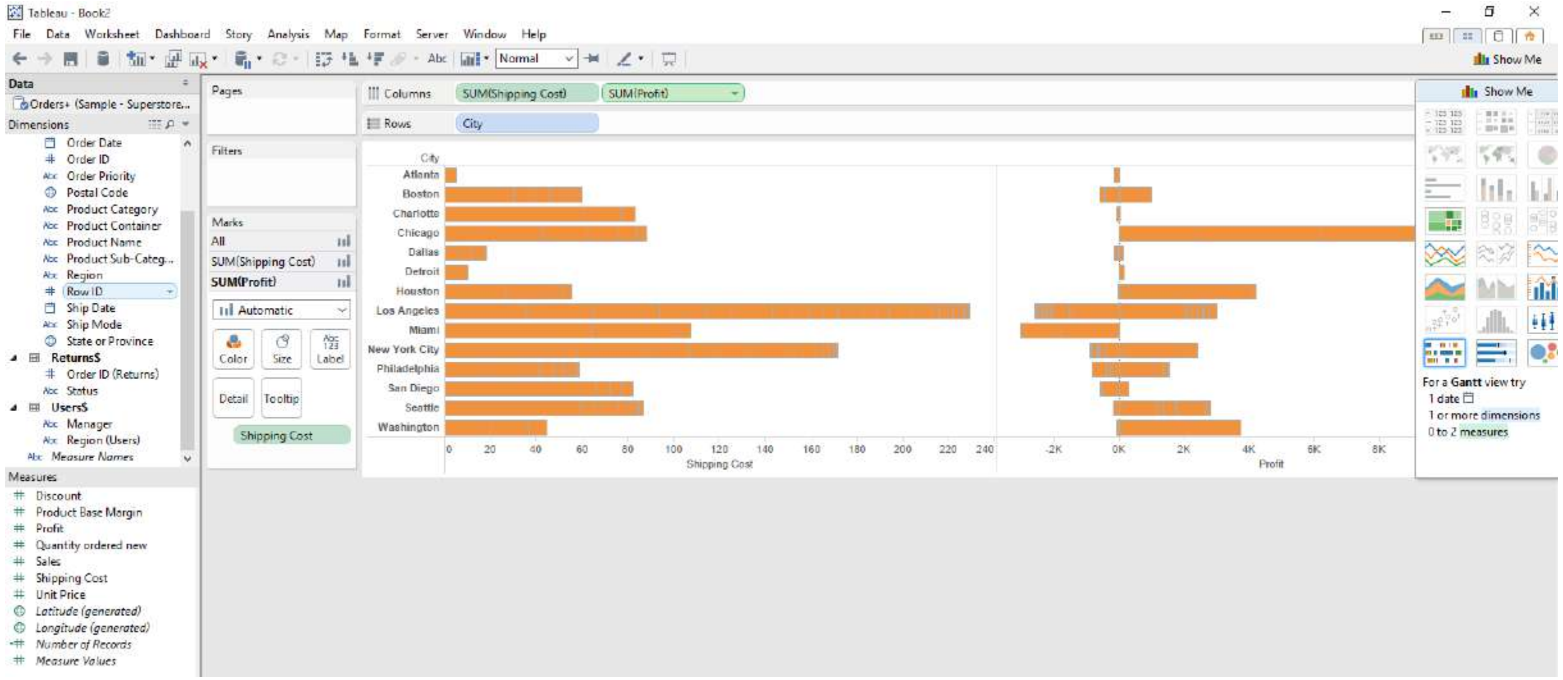
Bar Chart

- Bar charts reveal highs and lows at a glance.
- Effective for numerical data that splits nicely into different categories.
- Used for comparing data across categories.
- Add colors to bars for more impact.
- Displaying related data on top or next to each other gives depth to analysis and address multiple questions.
- Can be used to plot positive and negative data points along a continuous axis.
- Can be combined with bar charts with maps.

COLUMNS:	ShippingCost, Profit
ROWS:	**Order$City**

Step 3:

- select from **Data Panel /Dimensions** Orders$City drag it to the visualization canvas on to Rows.
- **We would like to draw the relationship between city and shipping costs.**
- **Adding additional variables to compare and visualize**



Problem Description:	
Data set used:	

TABLEAU

PLAY BOOK : GENERATING VISUALIZATION FOR PRODUCT CATEGORY, SUB-CATEGORY

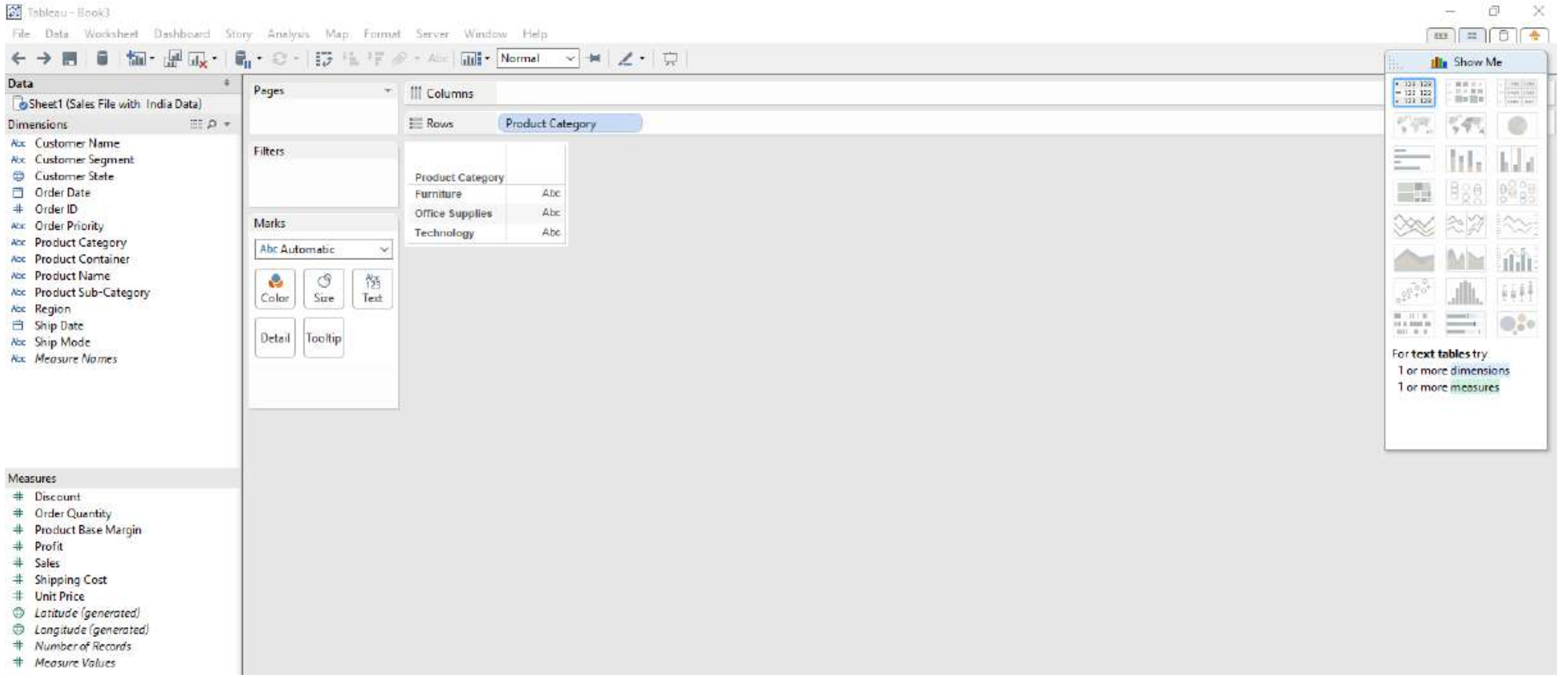
Original Series

TERRITORIAL PRESCIENCE
provoke thought, invoke action

COLUMNS:	
ROWS:	**ProductCategory**

Step 1:

- select **Product Category dimension and drag it to visualize on the canvas (ROWS)**

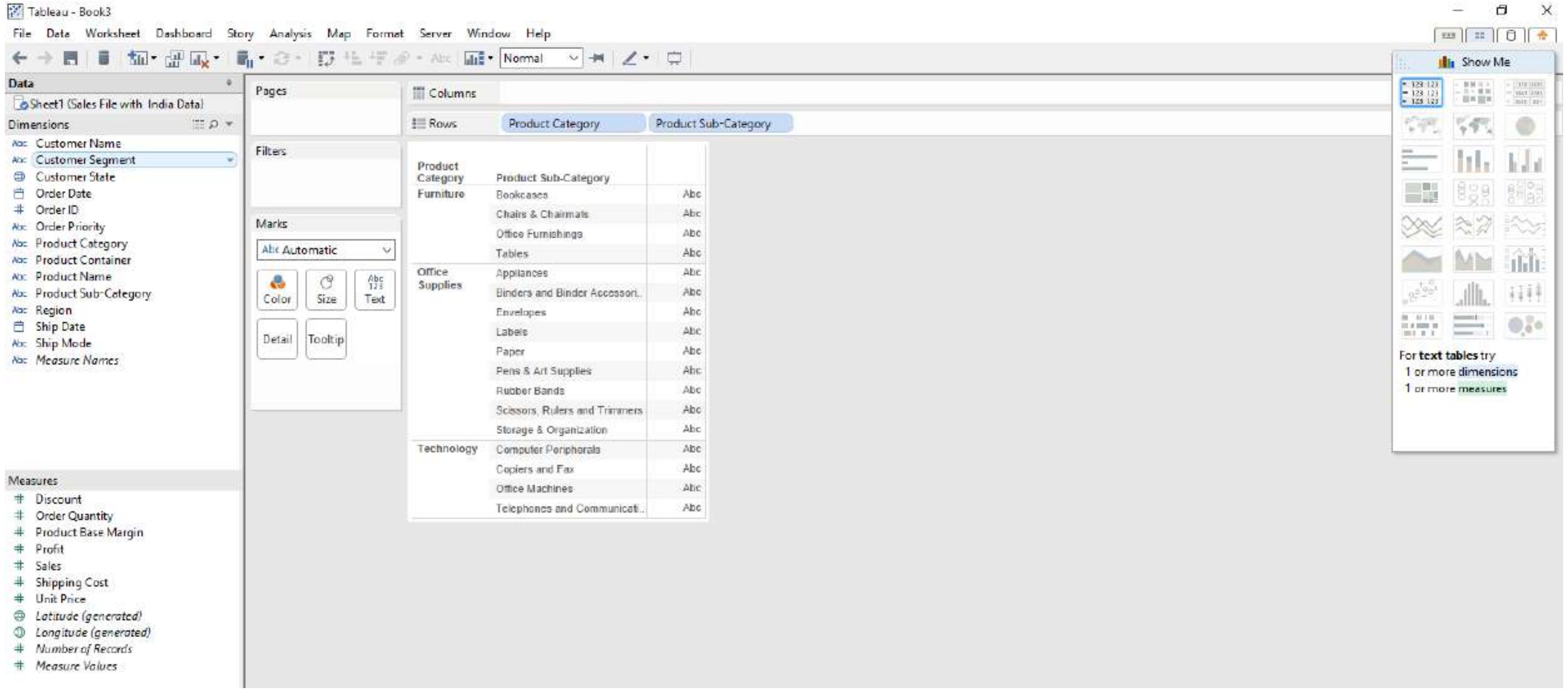


Data Source: India Sales Data

COLUMNS:	
ROWS:	**ProductCategory,Product Sub-Category**

Step 2:

- select **Product Sub-Category dimension and drag it to visualize on the canvas (ROWS)**

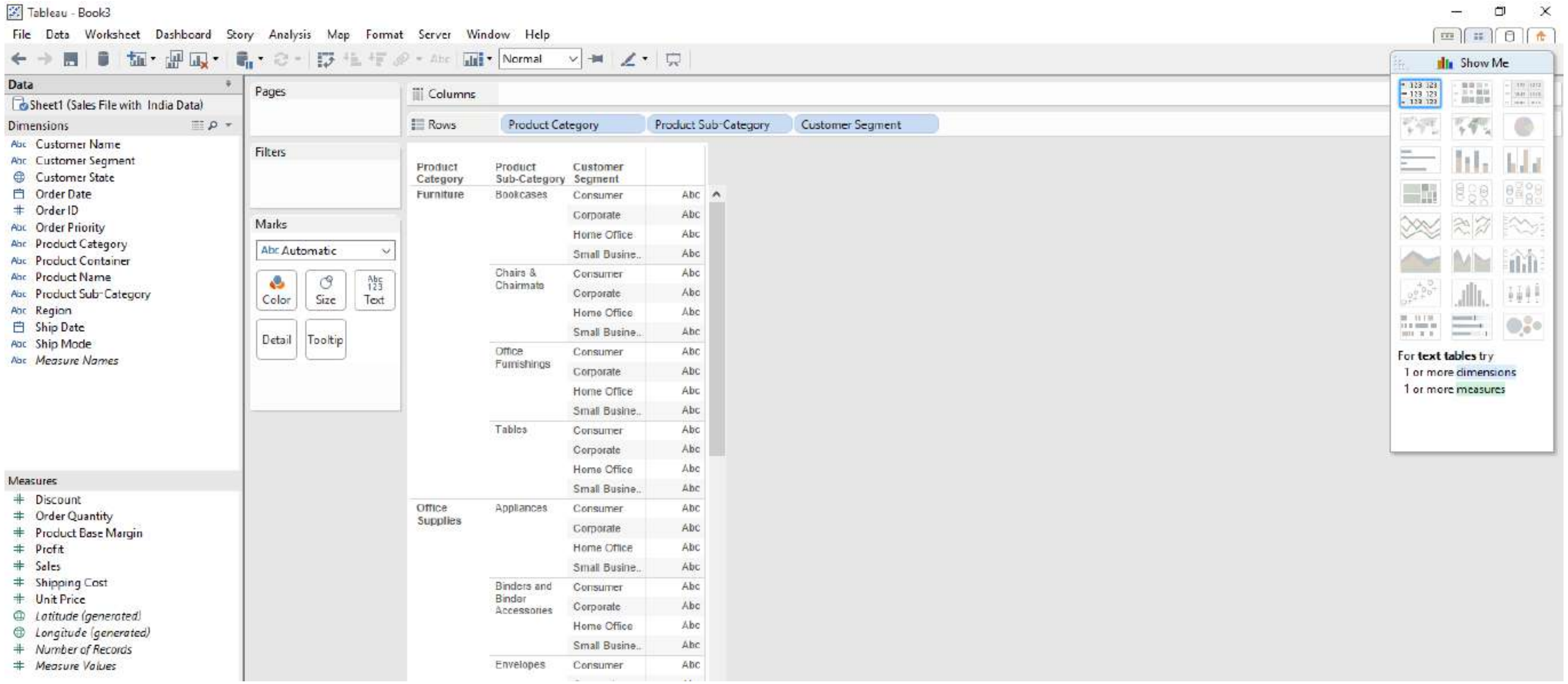


Data Source: India Sales Data

COLUMNS:	
ROWS:	**ProductCategory,Product Sub-Category**

Step 3:

- Now, we shall add additional dimension **CustomerSegment**



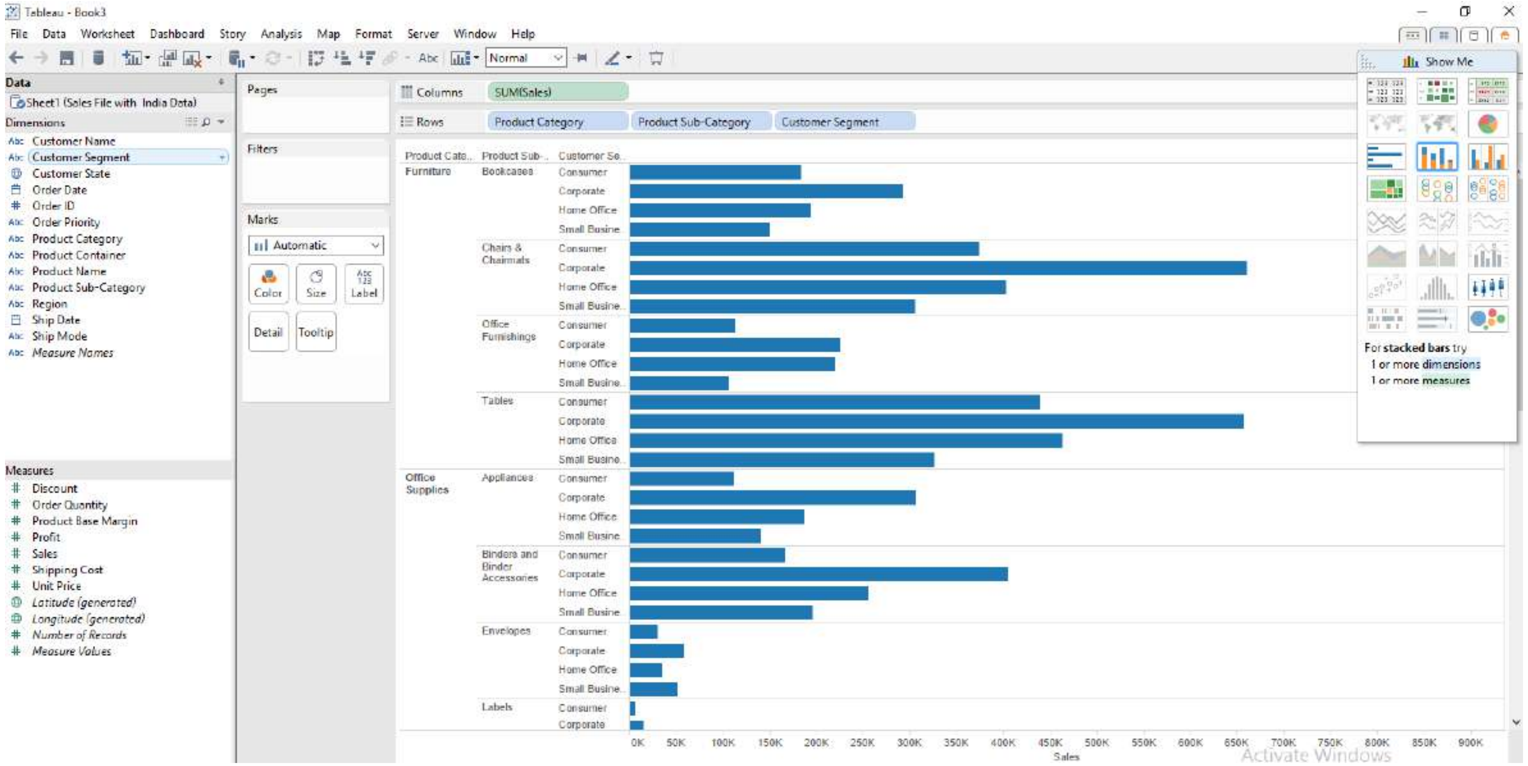
Data Source: India Sales Data

COLUMNS:	sales
ROWS:	ProductCategory,Product Sub-Category

Step 3:

- Now, we shall add **sales** measure

•Note that TABLEAU automatically highlights possible visualizations, outlined in the visualization toolbox panel.

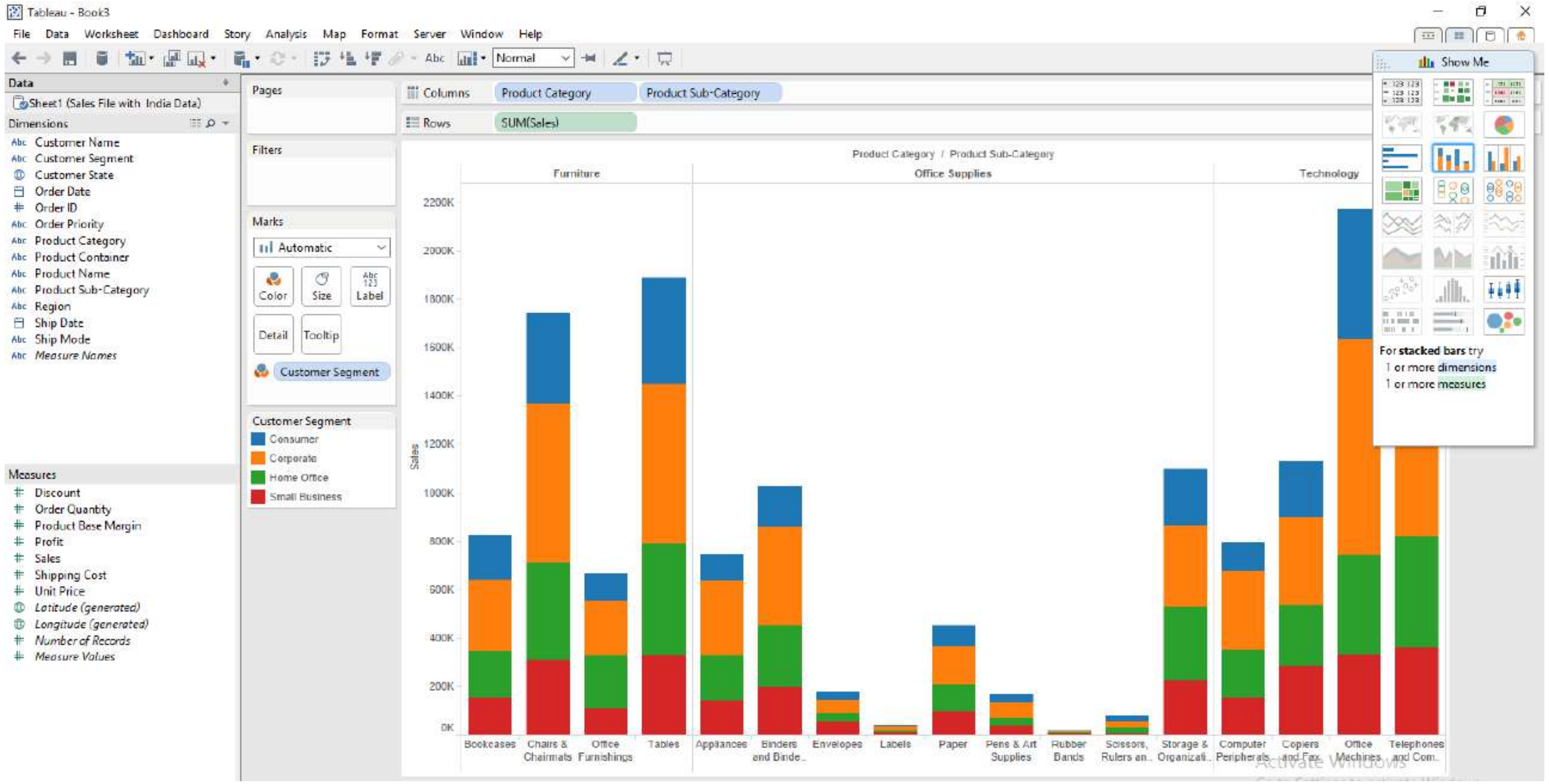


Data Source: India Sales Data

COLUMNS:	sales
ROWS:	ProductCategory,Product Sub-Category

Step 4:

- upon selection of one of the highlighted visualization, you can transform to the new visualization.



Data Source: India Sales Data

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Original Series

Problem Description:	
Data set used:	

TABLEAU

PLAY BOOK : TABLEAU 9.X DATA INTERPRETER DEMO

COLUMNS:	
ROWS:	**ProductCategory**

Step 1:

- Some times data is irregularly structured during the capture phase making it difficult to prune or import.
- Tableau provides **Data Interpreter functionality** to structure this kind of dataset and import it.

Year 2015						
null	id	first_name	last_name	email	gender	ip_address
null	1	Audie	Elgee	aelgee0@jugem.jp	Female	202.60.234.36
null	2	Charmain	Fantone	cfantone1@ocn.ne.jp	Female	62.72.74.99
null	3	Doug	Reed	dreed2@google.it	Male	8.240.219.4
null	4	Avie	Colerick	acolerick3@house.gov	Female	45.239.155.30
null	5	Kathryne	Berrane	kberrane4@qq.com	Female	131.120.216.180
null	6	Gilberta	Aulsford	gaulsford5@is.gd	Female	41.181.192.106
null	7	Bernice	Duckerin	bduckerin6@microsoft.com	Female	73.129.27.239
null	8	Ardyce	Sapey	asapey7@nifty.com	Female	0.70.242.40
null	9	Norrie	Panniers	npanniers8@newsvine.com	Male	96.19.220.79
null	10	Toiboid	Goodson	tgoodson9@tumblr.com	Male	41.70.165.218
null	11	Alfreda	Josowitz	ajosowitza@amazon.de	Female	174.54.54.143
null	12	Corny	Checchetelli	cchecchetellib@ted.com	Female	104.131.147.31
null	13	Angel	Ebbing	aebbingc@google.nl	Male	46.80.133.51
null	14	Ado	Hillyatt	ahillyattd@indiegogo.com	Male	118.210.76.148
null	15	Bradly	Downton	bdowntone@simplemachines.o	Male	225.219.71.1
null	16	Binni	Garnar	bgarnarf@shop-pro.jp	Female	192.90.127.152
null	17	Odille	Massot	omassotg@hhs.gov	Female	207.12.159.29
null	18	Cristine	Sliman	cslimanh@mlb.com	Female	140.34.69.29
null	19	Rikki	Matyatin	rmatyatini@tumblr.com	Male	243.155.156.163
null	20	Gill	Grayshon	ggrayshonj@goo.gl	Male	7.202.58.42
null	21	Jillayne	Petracek	jpetracekk@nba.com	Female	90.73.13.243
null	22	Susan	Grimme	sgrimmel@sfgate.com	Female	63.104.193.34
null	23	Paul	Beamish	pbeamishm@baidu.com	Male	93.67.140.168
null	24	Kessiah	Jost	kjostn@bbc.co.uk	Female	65.113.143.33
null	25	Doy	St. Leger	dstlegero@imgur.com	Male	215.240.42.93
null	26	Brunhilda	Topes	btopesp@ucla.edu	Female	59.3.123.172
null	27	Eula	Kilalea	ekilaleaq@stumbleupon.com	Female	250.103.237.235
null	28	Earl	Mottinelli	emottinellir@wikimedia.org	Male	227.123.161.125
null	29	Klaus	Goff	kgoffs@tuttocitta.it	Male	240.18.45.61
null	30	Agosto	MacKowle	amackowlet@weather.com	Male	59.15.253.32
null	31	Dona	Giacomi	dgiacomiu@acquirethisname.cc	Female	219.40.113.247

Snapshot of irregularly structured data

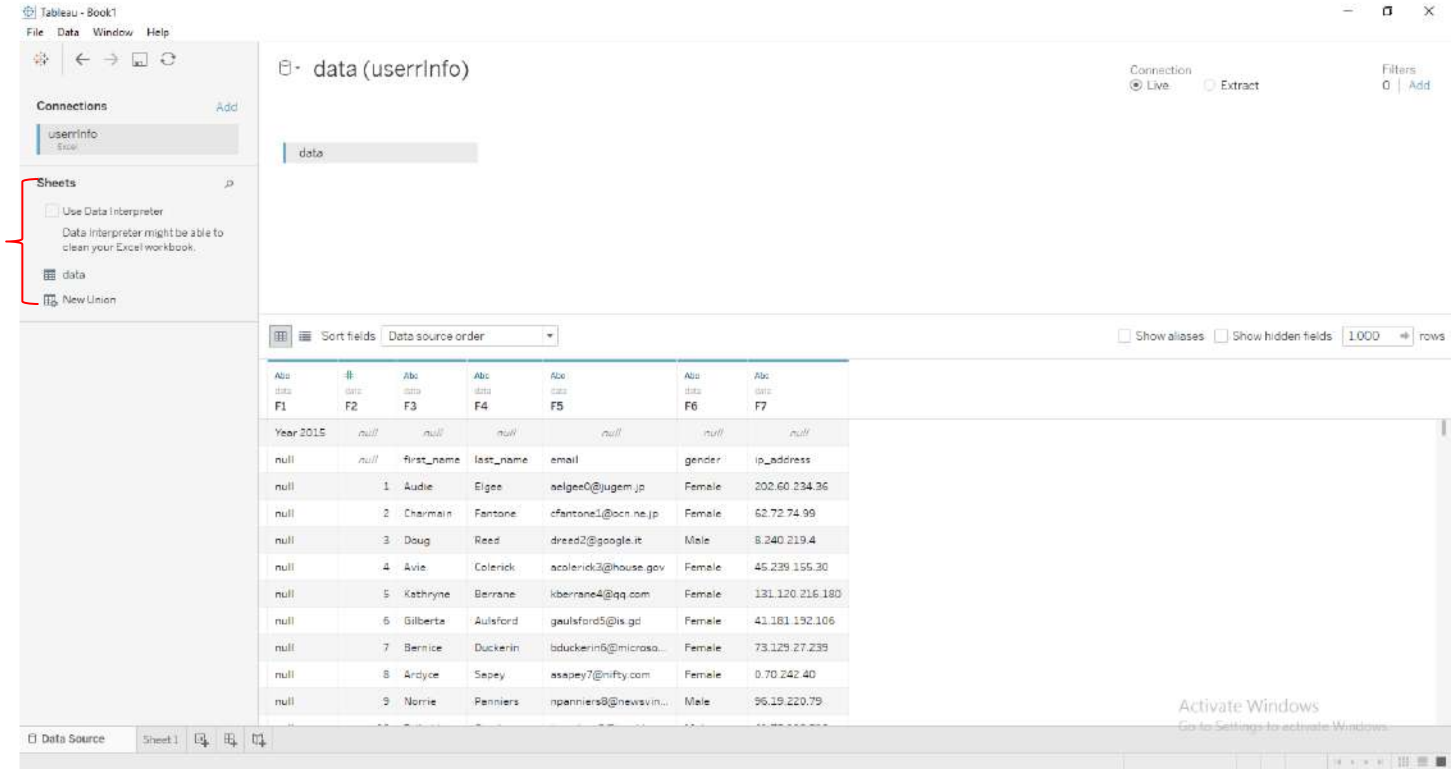
Data Source: userinfo.xlsx

Please read terms of use for authorized access

Original Series

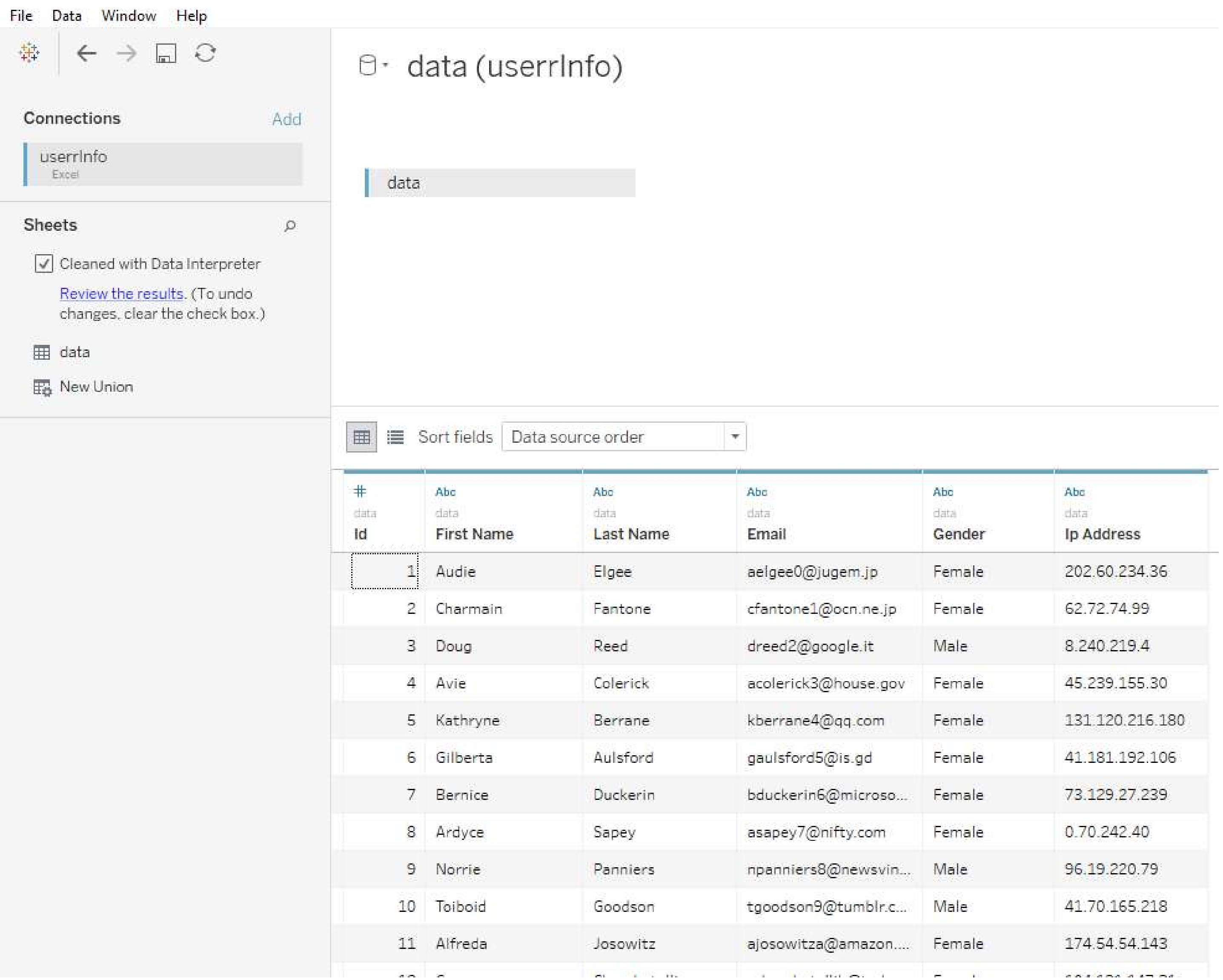
Step 2

- Using data interpreter to clean the irregularly structured data.



Step 3:

- cleaned with Data Interpreter, we eliminate a column with null data.



Data Source: demo1/userinfo.xlsx

Problem Description:	
Data set used:	

SYED AWASE KHIRNI

TABLEAU : MEASURE NAME AND MEASURE VALUES

Measure Name

- Measure names field always appears at the bottom of the dimensions area in the data pane and contains the names of all measures in your data, collected into a single field with discrete values.
- Can be used as a filter
- Can assign aliases to the values for measure names.

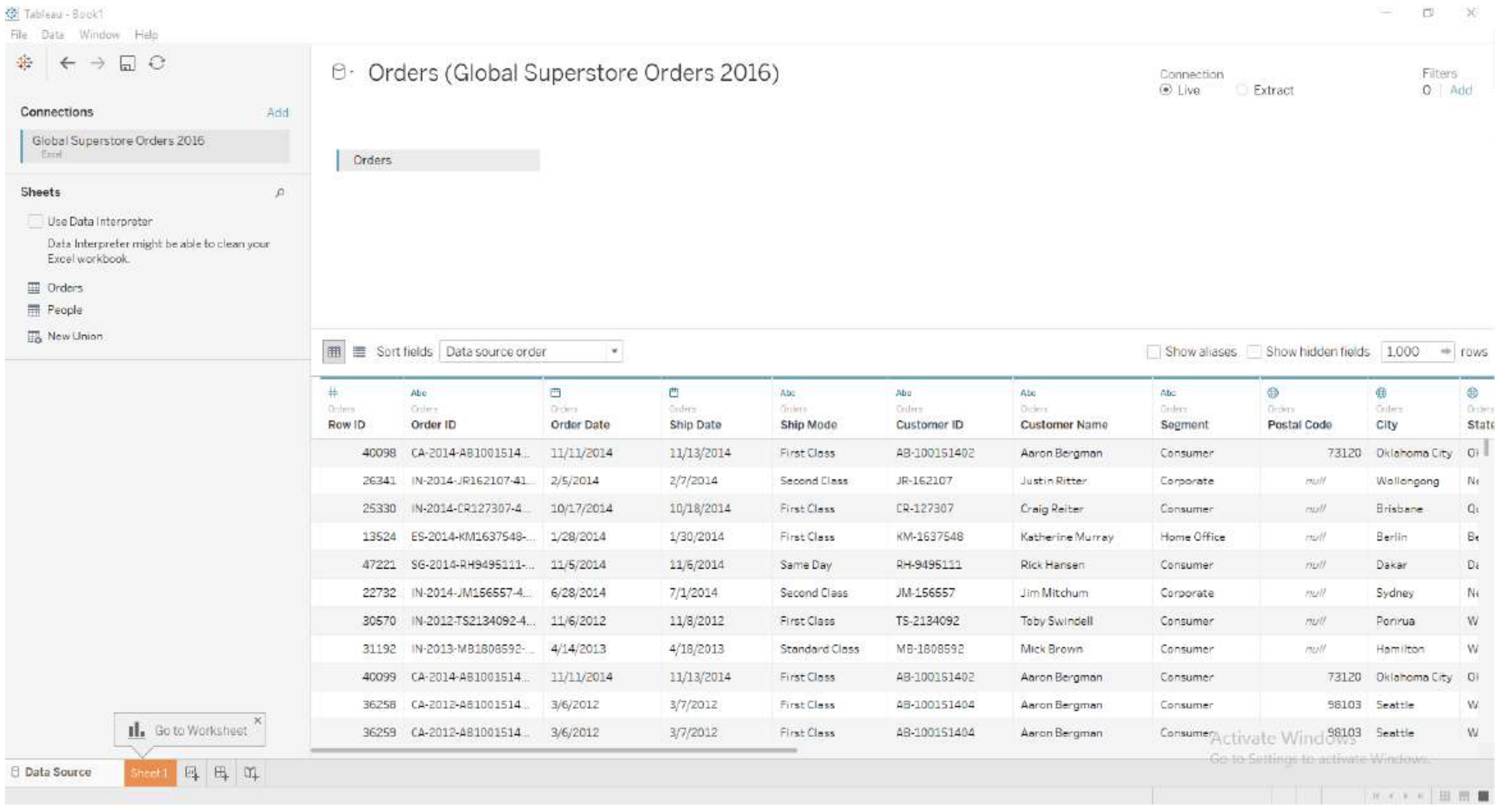
Measure Values

- Measure values field always appears at the bottom of the measures areas in the data pane and contains all the measures in your data, collected into a single field with continuous values.

COLUMNS:	SUM(UnitPrice)
ROWS:	SUM(Profit)

Step 1

- load GlobalSuperStore 2016.xlsx file and add the orders worksheet



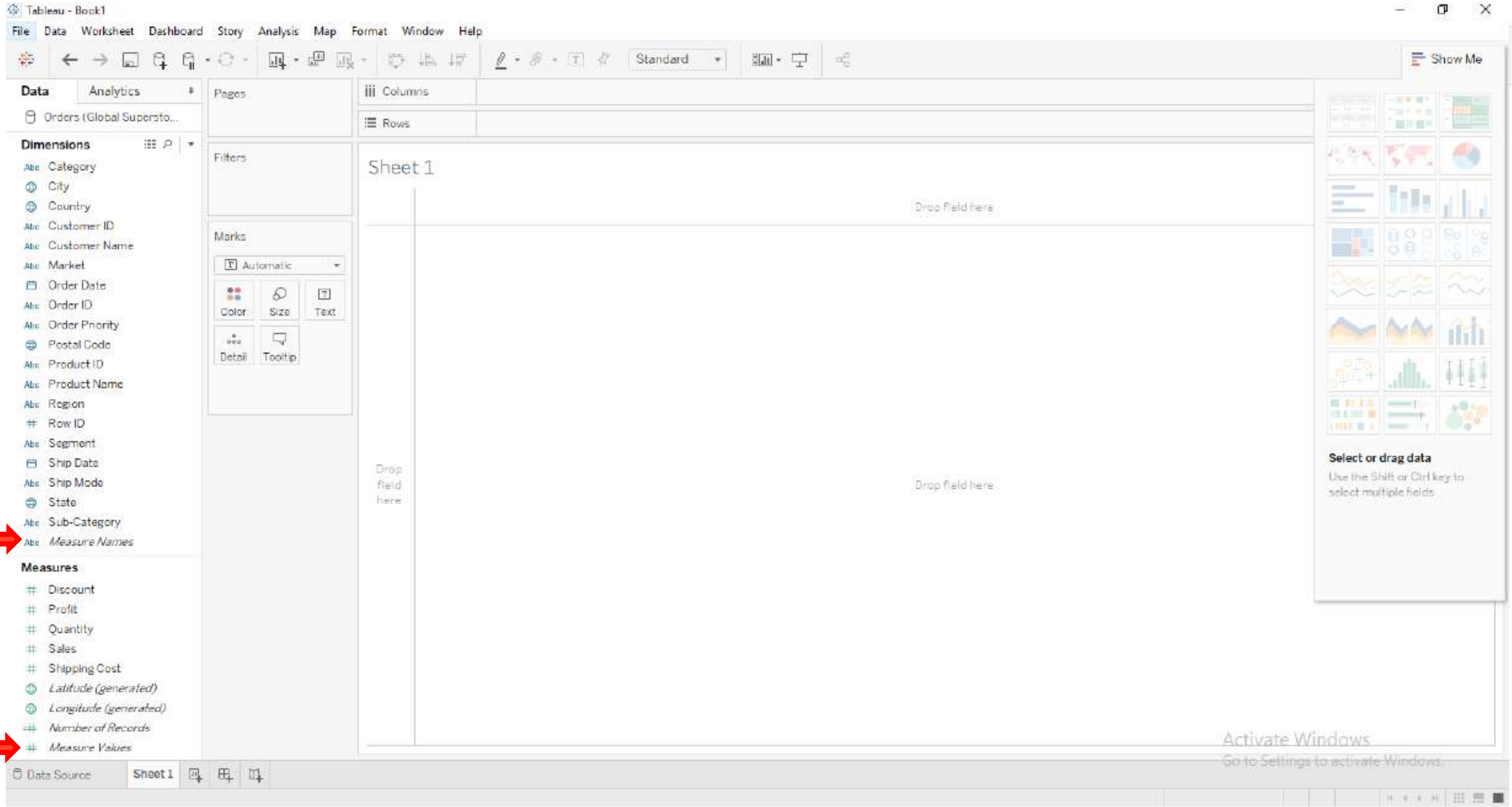
Data Source: demo1/ GlobalSuperStore2016.xlsx

Original Series

COLUMNS:	
ROWS:	

Step 2

- Measure Names and Measure Values are **tableau** generated fields containing the names of each measure to use with Measure Values to enable certain types of analysis.

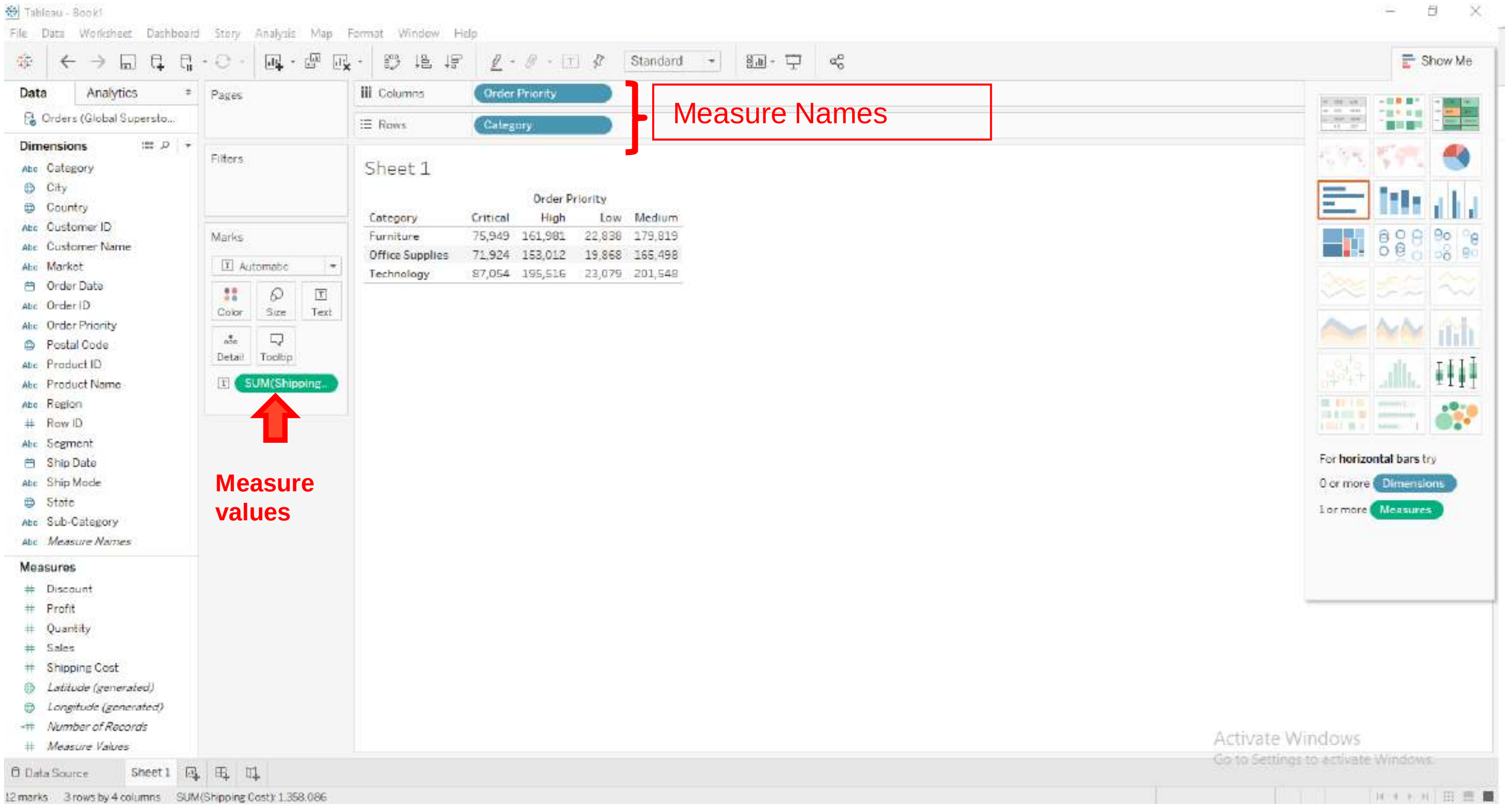


Data Source: demo1/ GlobalSuperStore2016.xlsx

COLUMNS:	Order Priority
ROWS:	Category

Step 3

- Measure Names and Measure Values are **tableau** generated fields containing the names of each measure to use with Measure Values to enable certain types of analysis.

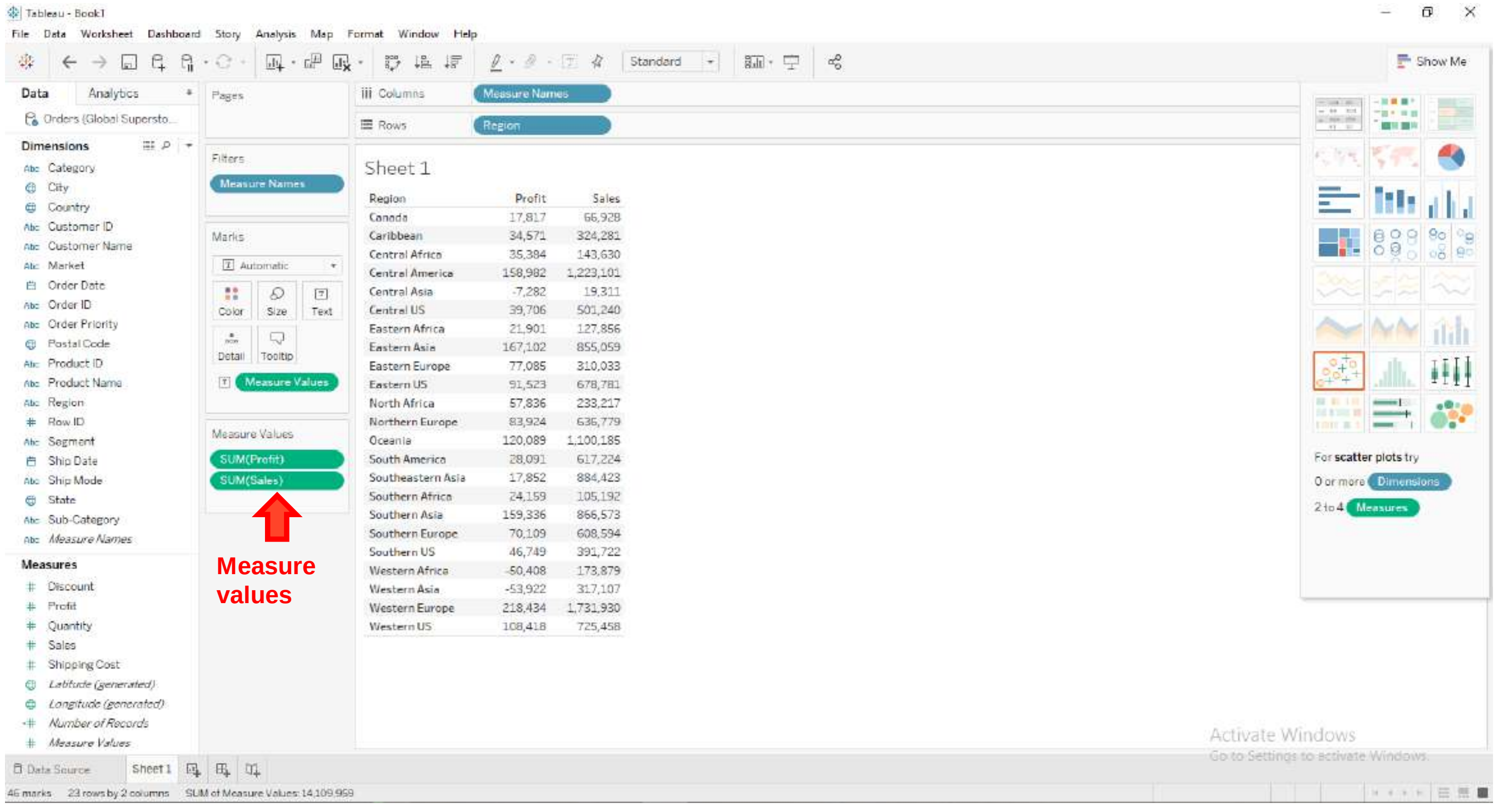


Data Source: demo1/ GlobalSuperStore2016.xlsx

COLUMNS:	Order Priority
ROWS:	Category

Step 4

- Functionality of Measure Names and Measure Values allows for greater flexibility when dealing with different data structures.

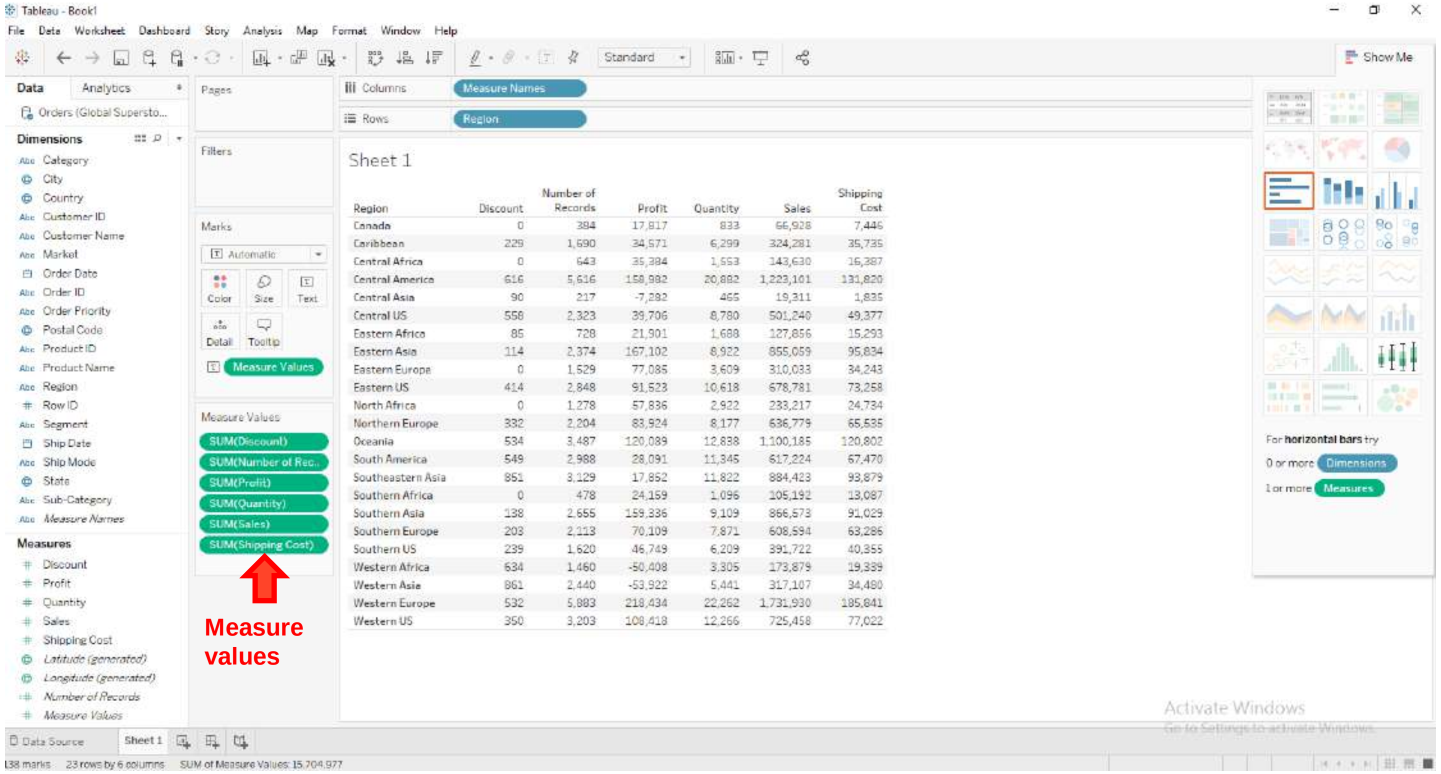


Data Source: demo1/ GlobalSuperStore2016.xlsx

COLUMNS:	Measure Names
ROWS:	Region

Step 5

- Let us try to plot Measure Names and Measure Values(Marks=>text) will generate table illustrating all the measures for names.
- Measure names are also used for field labels in your visualization.



Region	Discount	Number of Records	Profit	Quantity	Sales	Shipping Cost
Canada	0	384	17,817	833	66,928	7,446
Caribbean	229	1,690	34,571	6,299	324,281	35,735
Central Africa	0	643	35,384	1,553	143,630	16,387
Central America	616	5,616	158,982	20,882	1,223,101	131,820
Central Asia	90	217	-7,282	465	19,311	1,835
Central US	558	2,323	39,706	8,780	501,240	49,377
Eastern Africa	85	728	21,901	1,688	127,856	15,293
Eastern Asia	114	2,374	167,102	8,922	855,059	95,834
Eastern Europe	0	1,529	77,085	3,609	310,033	34,243
Eastern US	414	2,848	91,523	10,618	678,781	73,258
North Africa	0	1,278	57,836	2,922	233,217	24,734
Northern Europe	332	2,204	83,924	8,177	636,779	65,535
Oceania	534	3,487	120,089	12,838	1,100,185	120,802
South America	549	2,988	28,091	11,345	617,224	67,470
Southeastern Asia	851	3,129	17,852	11,822	884,423	93,879
Southern Africa	0	478	24,159	1,096	105,192	13,087
Southern Asia	138	2,655	159,336	9,109	866,573	91,029
Southern Europe	203	2,113	70,109	7,871	608,594	63,286
Southern US	239	1,620	46,749	6,209	391,722	40,355
Western Africa	634	1,460	-50,408	3,305	173,879	19,339
Western Asia	861	2,440	-53,922	5,441	317,107	34,480
Western Europe	532	5,883	218,434	22,262	1,731,930	185,841
Western US	350	3,203	108,418	12,266	725,458	77,022

Data Source: demo1/ GlobalSuperStore2016.xlsx

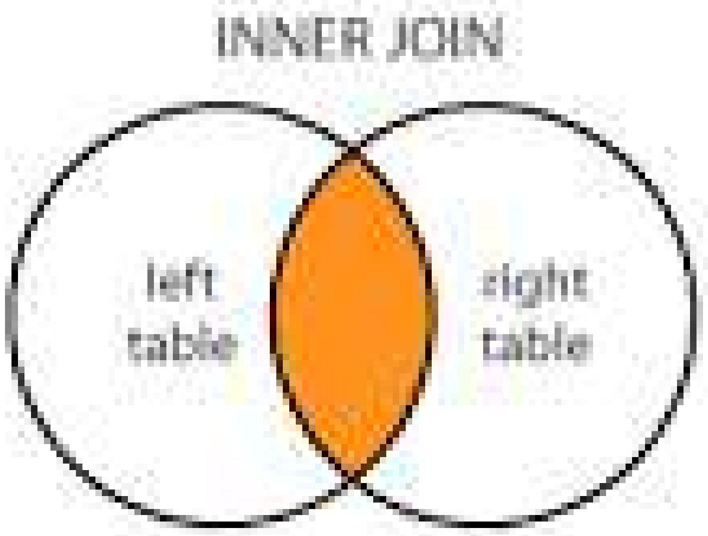
Problem Description:	
Data set used:	

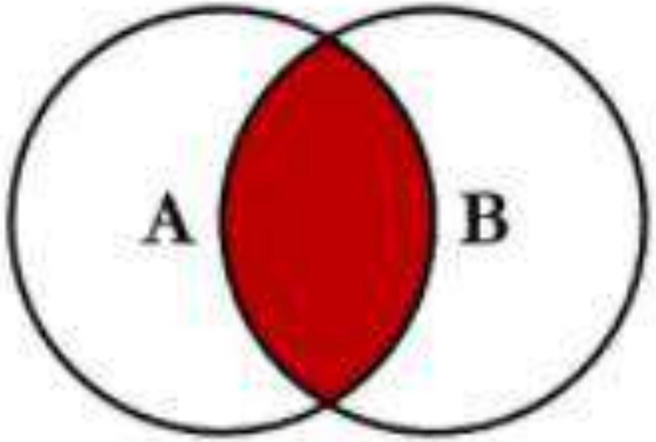
TABLEAU

PLAY BOOK : JOINING TWO TABLES AND VISUALIZING DATA

Joins: INNER JOIN

- Inner join: **Intersection** of records from two tables.

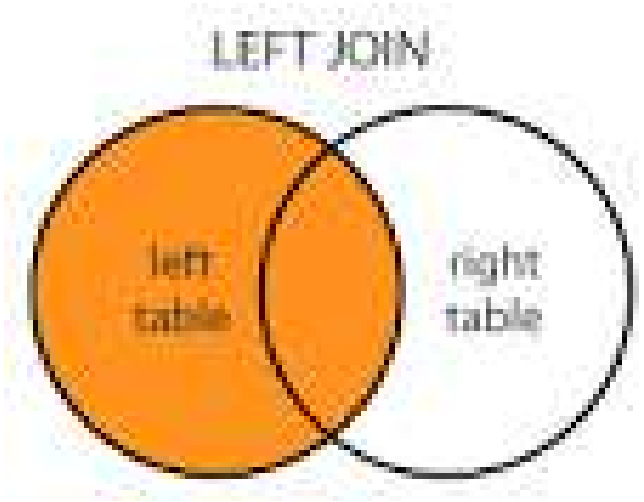


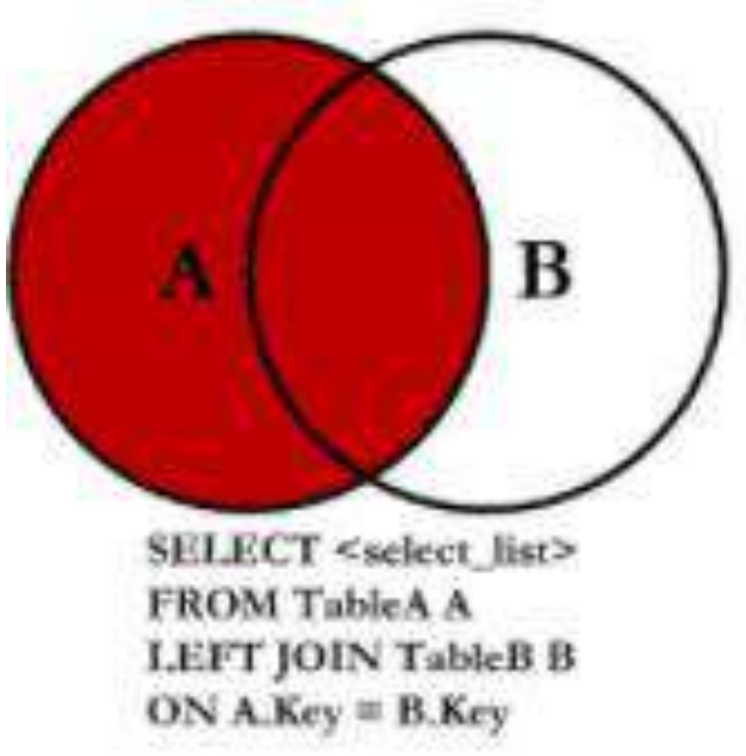


SELECT <select_list>
FROM TableA A
INNER JOIN TableB B
ON A.Key = B.Key

Joins: LEFT OUTER JOIN

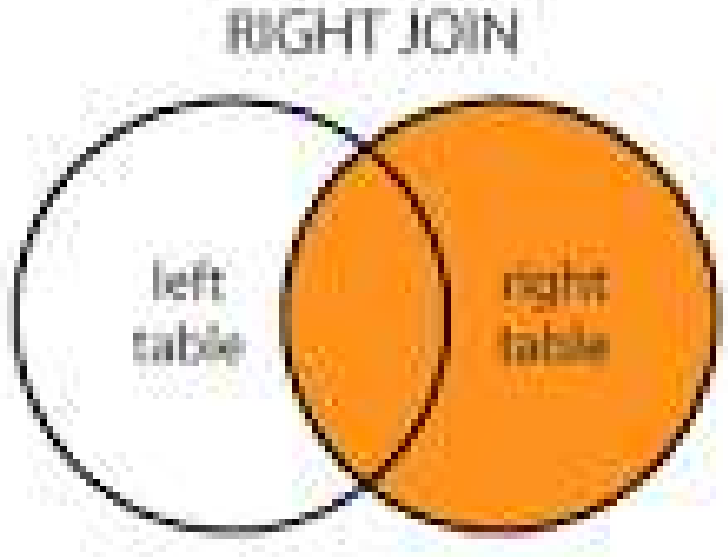
- Table on the left of the join is called the **primary table and matched for the records from the right table.**

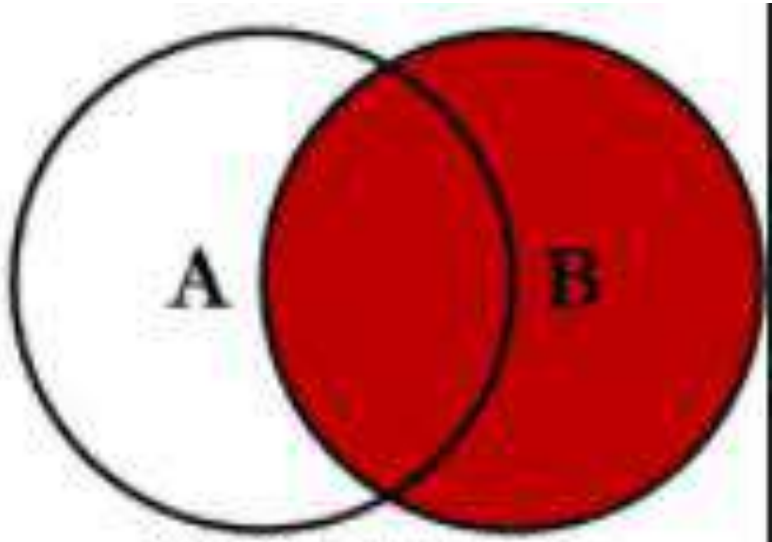




Joins: RIGHT OUTER JOIN

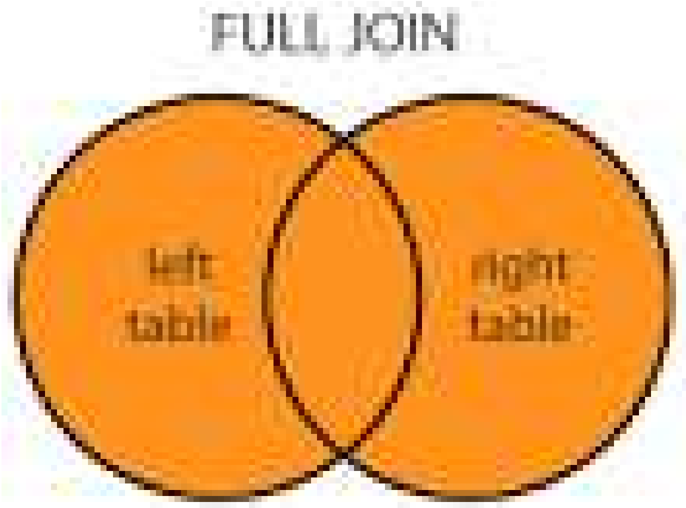
- Table on the rightof the join is called the **primary table and matched for the records from the left table.**

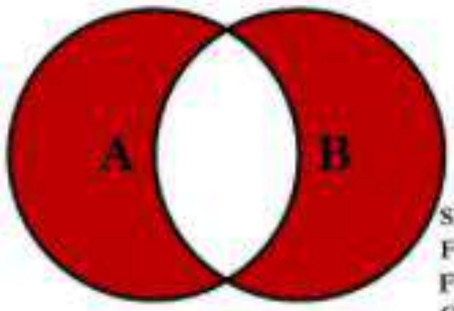




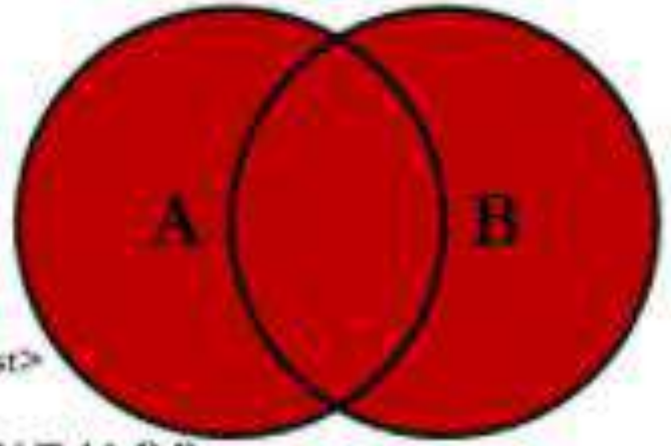

```
SELECT <select_list>
FROM TableA A
RIGHT JOIN TableB B
ON A.Key = B.Key
```

Joins: FULL JOIN



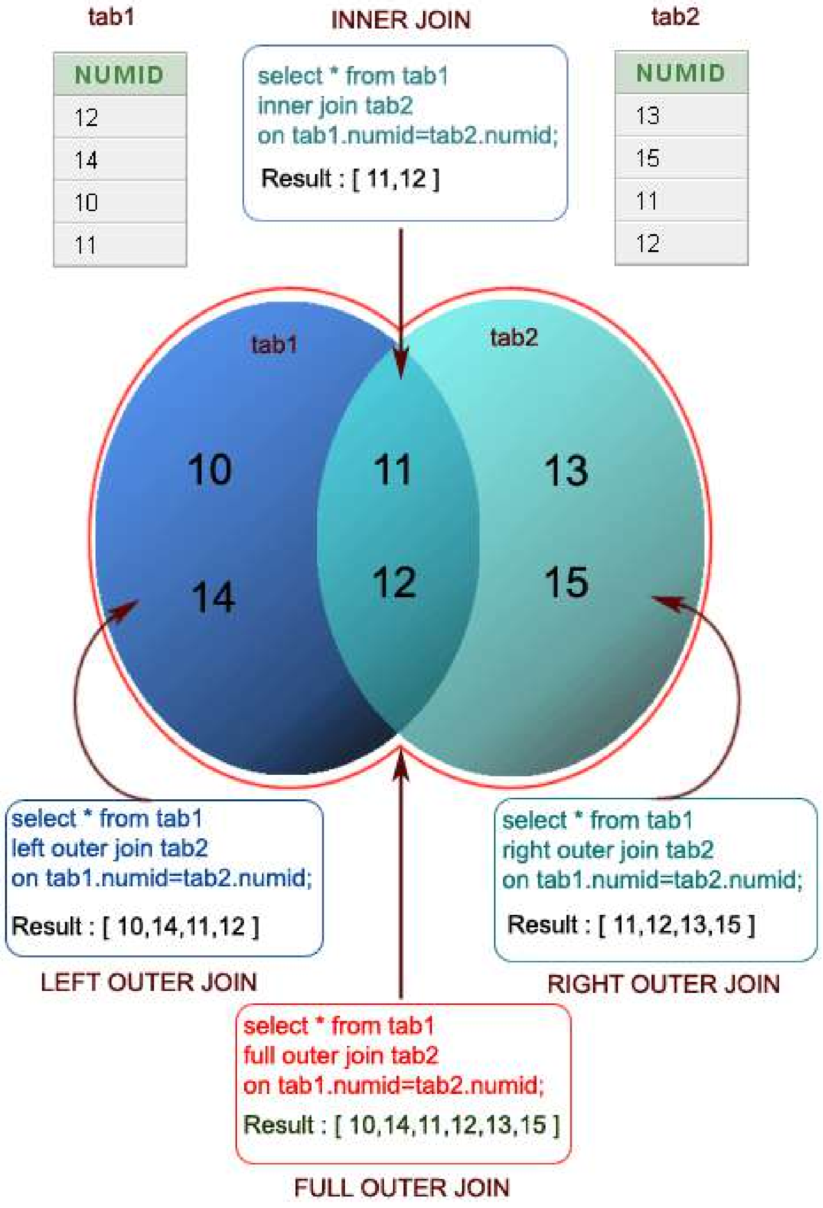


SELECT <select_list>
FROM TableA A
FULL OUTER JOIN TableB B
ON A.Key = B.Key
WHERE A.Key IS NULL
OR B.Key IS NULL



SELECT <select_list>
FROM TableA A
FULL OUTER JOIN TableB B
ON A.Key = B.Key

JOINS:DEMO

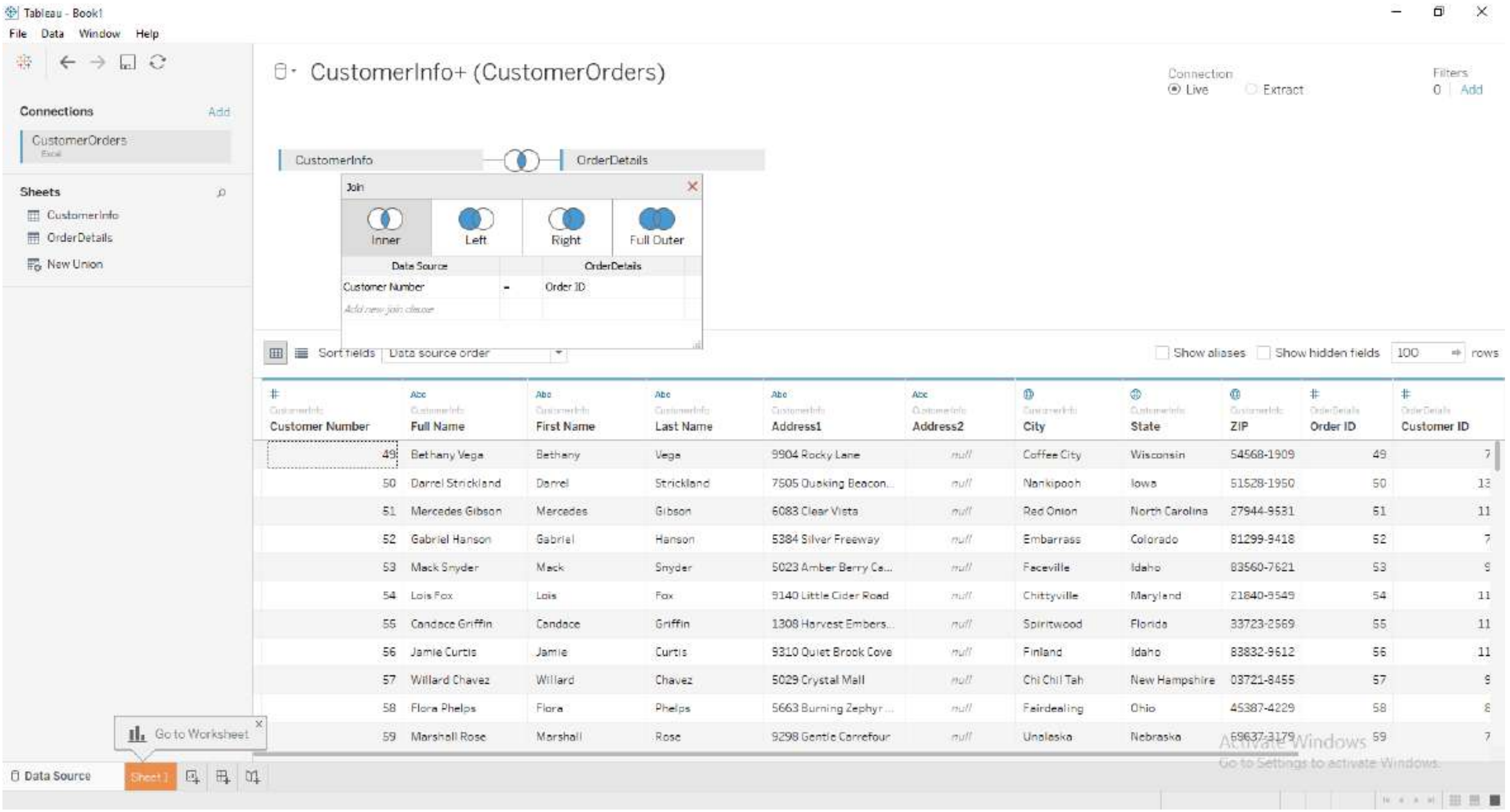


src: https://www.w3resource.com/sql/joins/sql-joins.php

COLUMNS:	
ROWS:	**ProductCategory**

Step 1:

- select **CustomerOrders.xlsx** load the data connections.
  - customer Info + **InnerJoin** + OrderDetails
  - CustomerNumber = OrderID

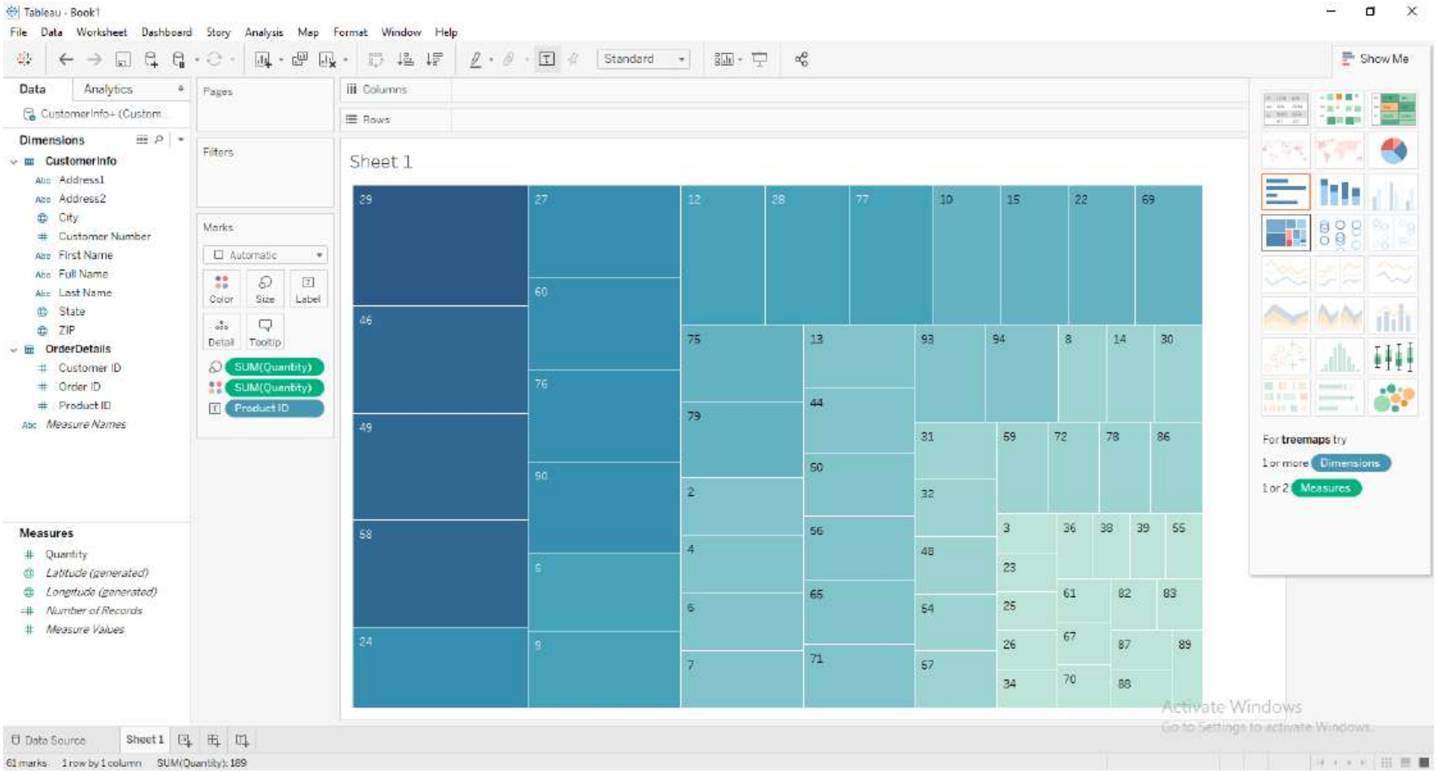


Data Source: demo1/CustomerOrders.xlsx

COLUMNS:	
ROWS:	

Step 2

- ctrl select **productID and Quantity, and select the appropriate visualization in showme data visualization tool box.**
- **To render to tree map as shown below.**



Data Source: demo1/CustomerOrders.xlsx

Problem Description:	
Data set used:	

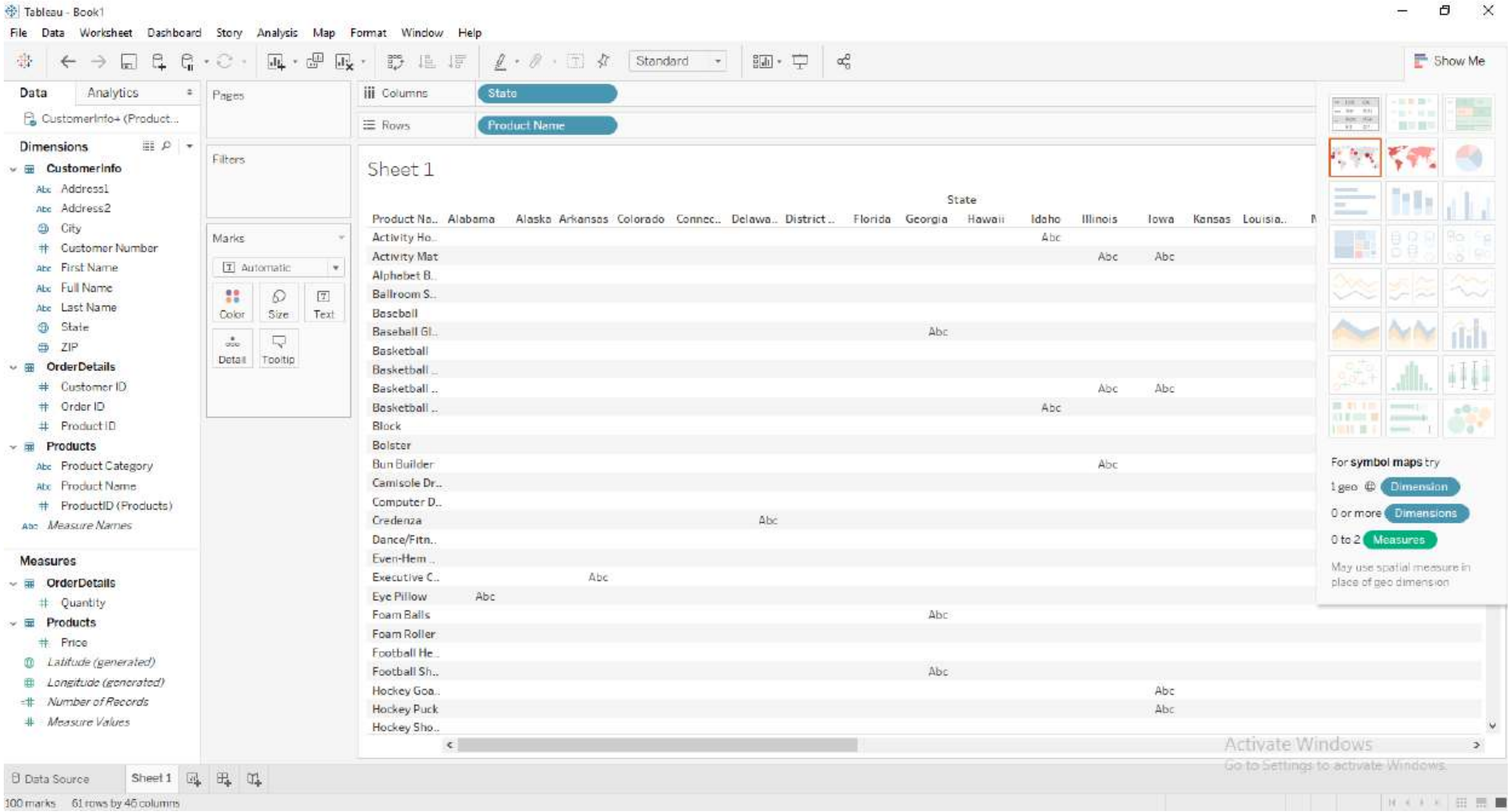
TABLEAU

PLAY BOOK : CORRELATING DATA VARIABLES IN TABLEAU AND CALCULATED FIELDS

COLUMNS:	**State**
ROWS:	**Product Name**

Step 1:

- select **ProductCustomersOrders.xlsx** load the data connections.

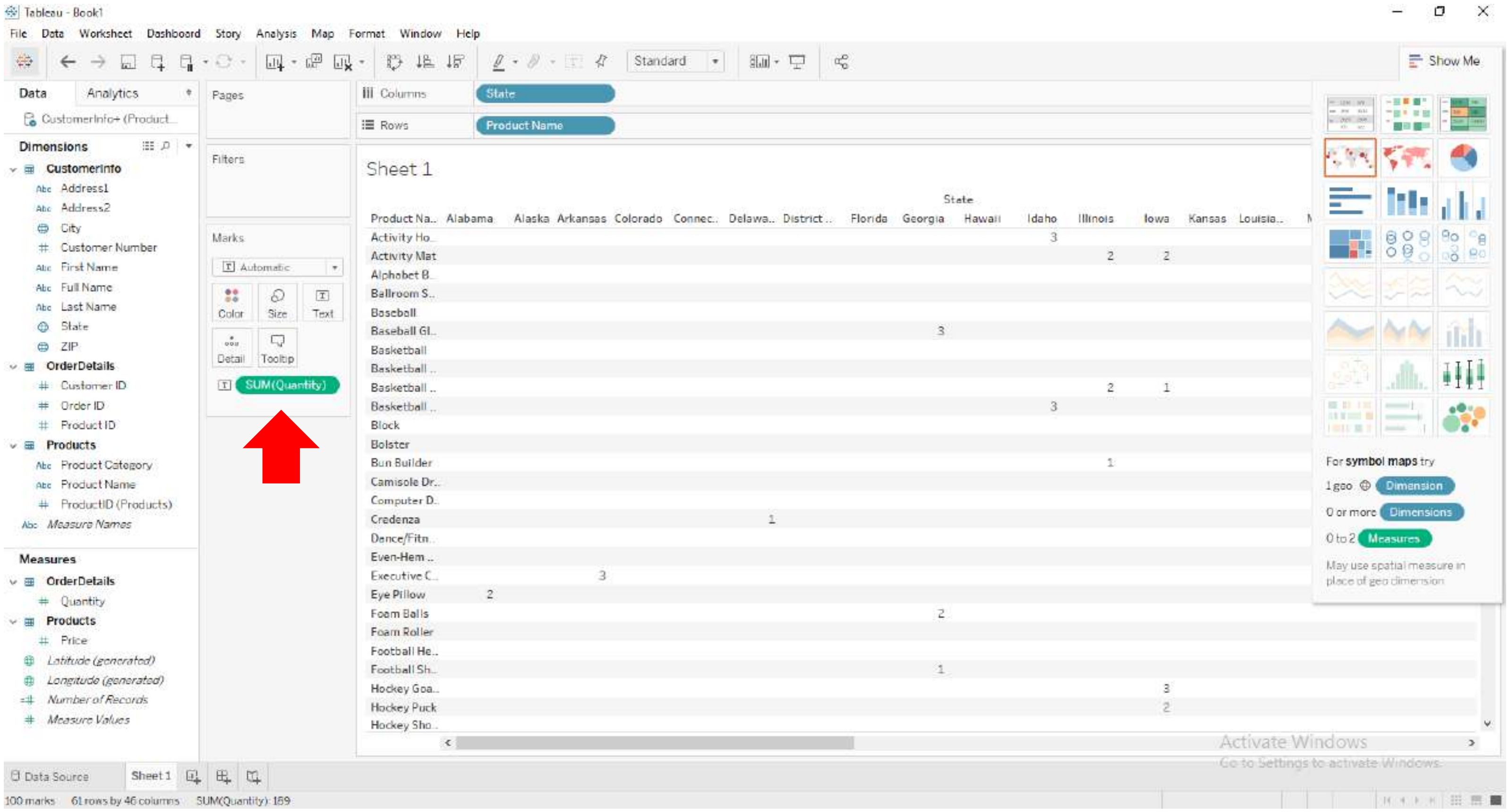


Data Source: demo2/ProductsCustomersOrders.xlsx

COLUMNS:	State
ROWS:	Product Name

Step 2:

- select **ProductCustomersOrders.xlsx** load the data connections.

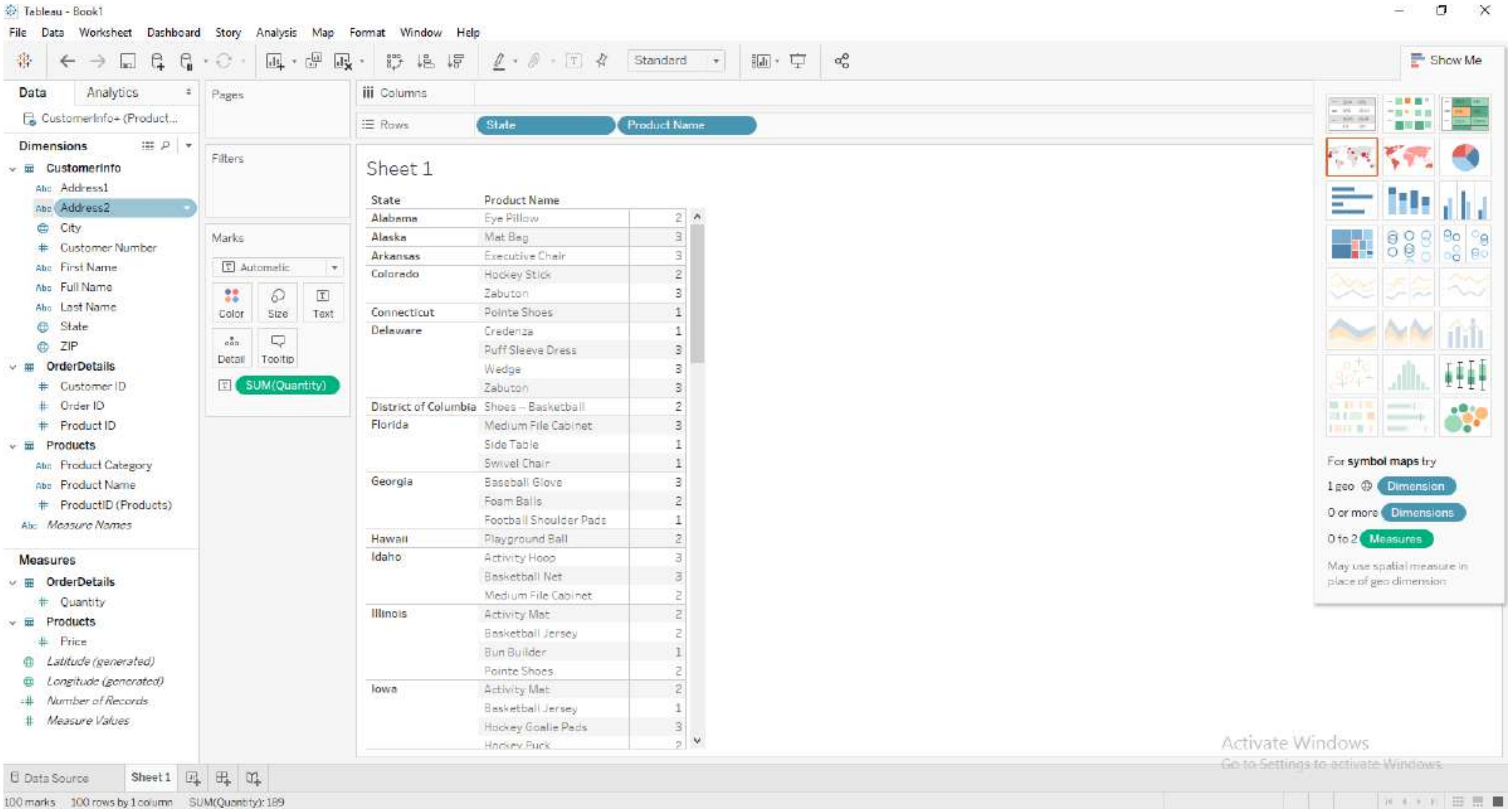


Data Source: demo2/ProductsCustomersOrders.xlsx

COLUMNS:	
ROWS:	**State,Product Name**

Step 3:

- select **ProductCustomersOrders.xlsx** load the data connections.



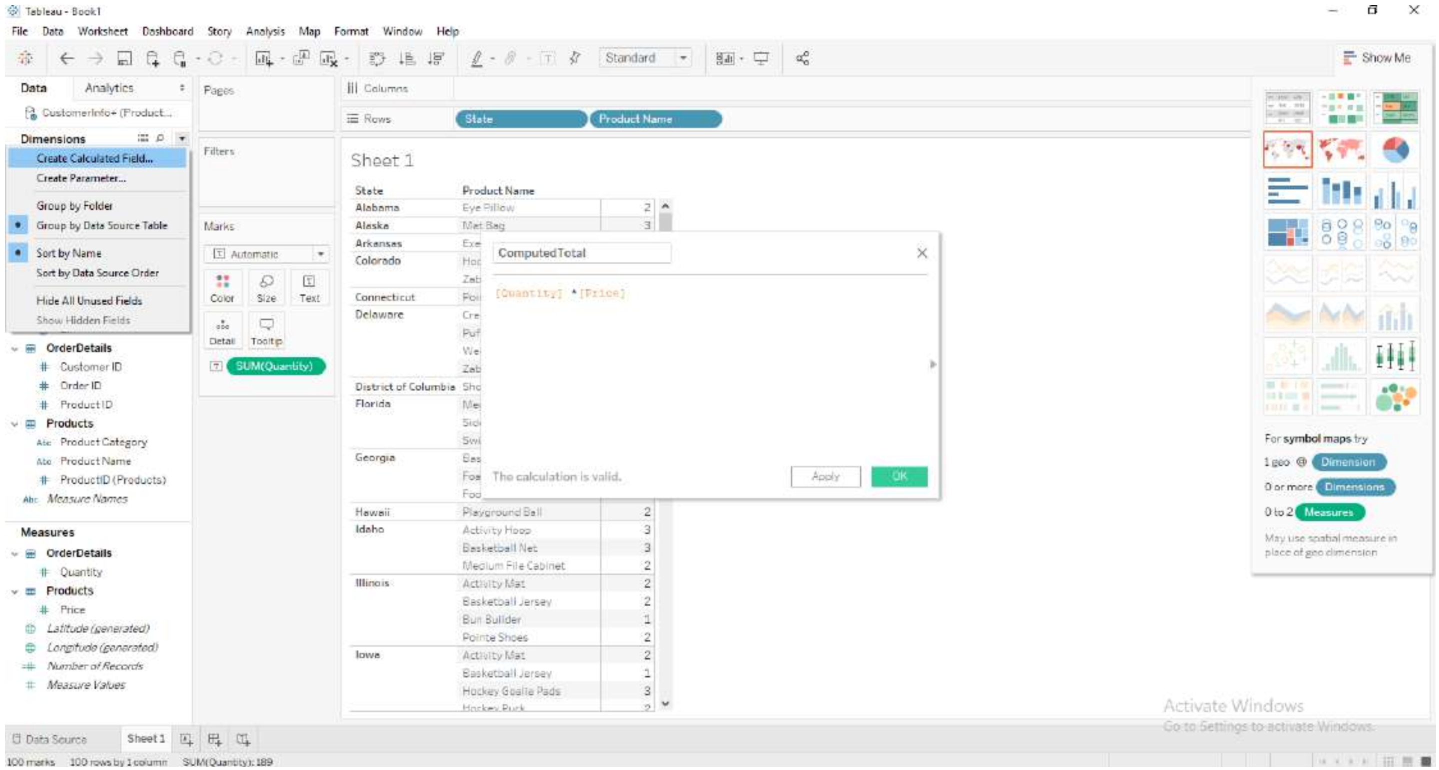
Data Source: demo2/ProductsCustomersOrders.xlsx

Please read terms of use for authorized access

COLUMNS:	
ROWS:	State,Product Name

Step 4:

- create **calculated field : Computed Total = [Quantity]*[Price]**



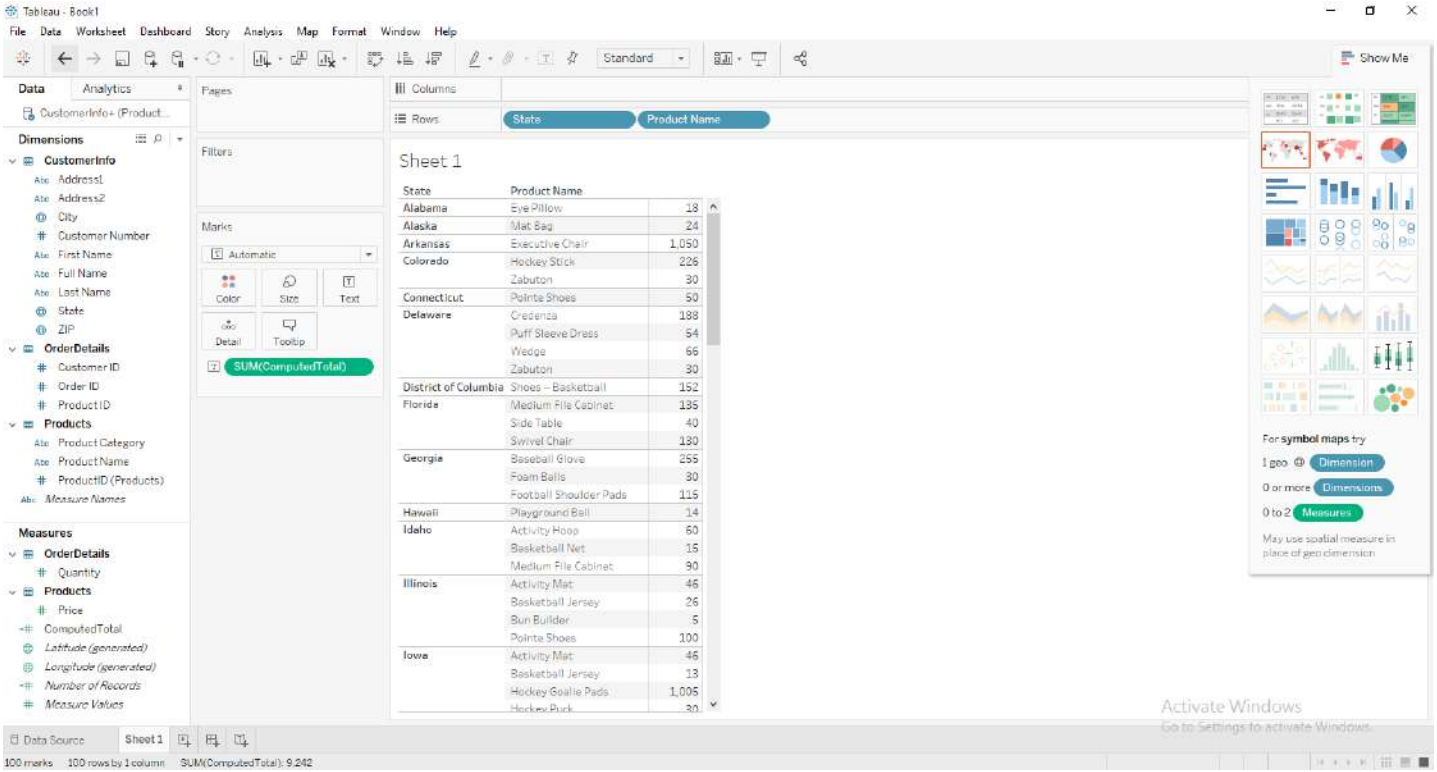
Data Source: demo2/ProductsCustomersOrders.xlsx

Original Series

COLUMNS:	
ROWS:	State,Product Name

Step 5

- remove the sum(Quantity) and add **Computed Total**

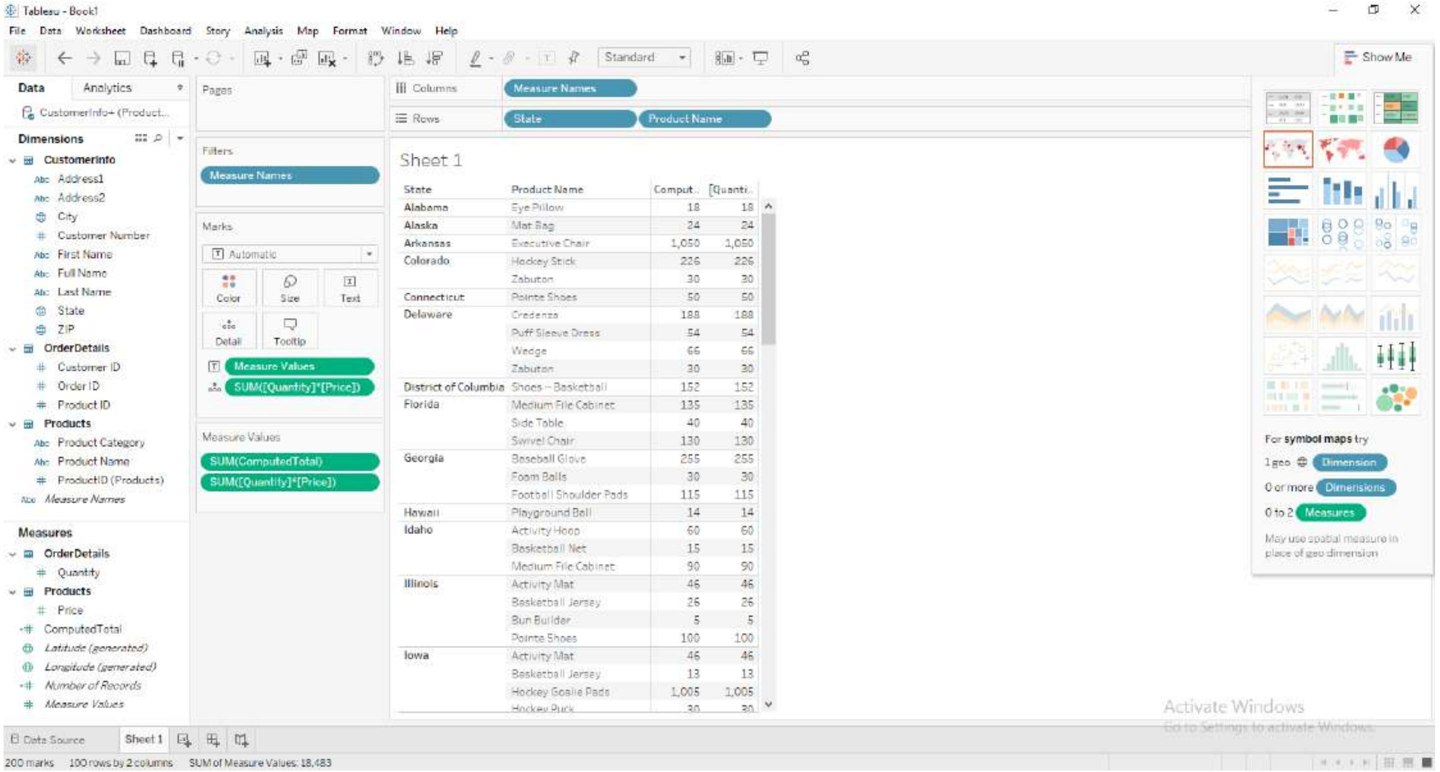


Data Source: demo2/ProductsCustomersOrders.xlsx

COLUMNS:	
ROWS:	State,Product Name

Step 6

- creating custom measured values => creating a quick calculation field off the shelf to enhance the data.



Data Source: demo2/ProductsCustomersOrders.xlsx

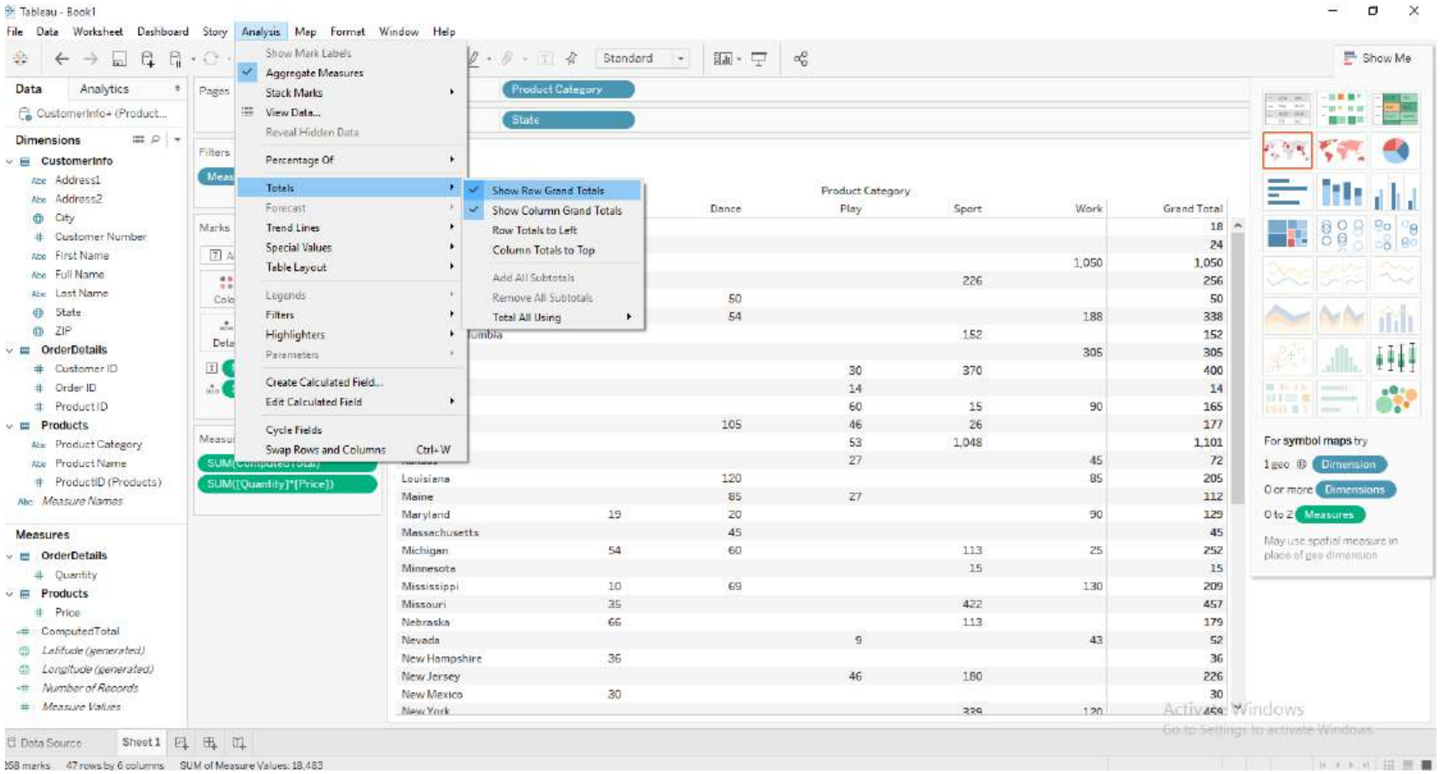
Please read terms of use for authorized access

Original Series

COLUMNS:	Product Category
ROWS:	State

Step 7

- select Product Category(Columns) and State(Rows)
- Choose Analysis menu option => totals to display “Show Row Grand Totals” and “Show Column Grand Totals”



Data Source: demo2/ProductsCustomersOrders.xlsx

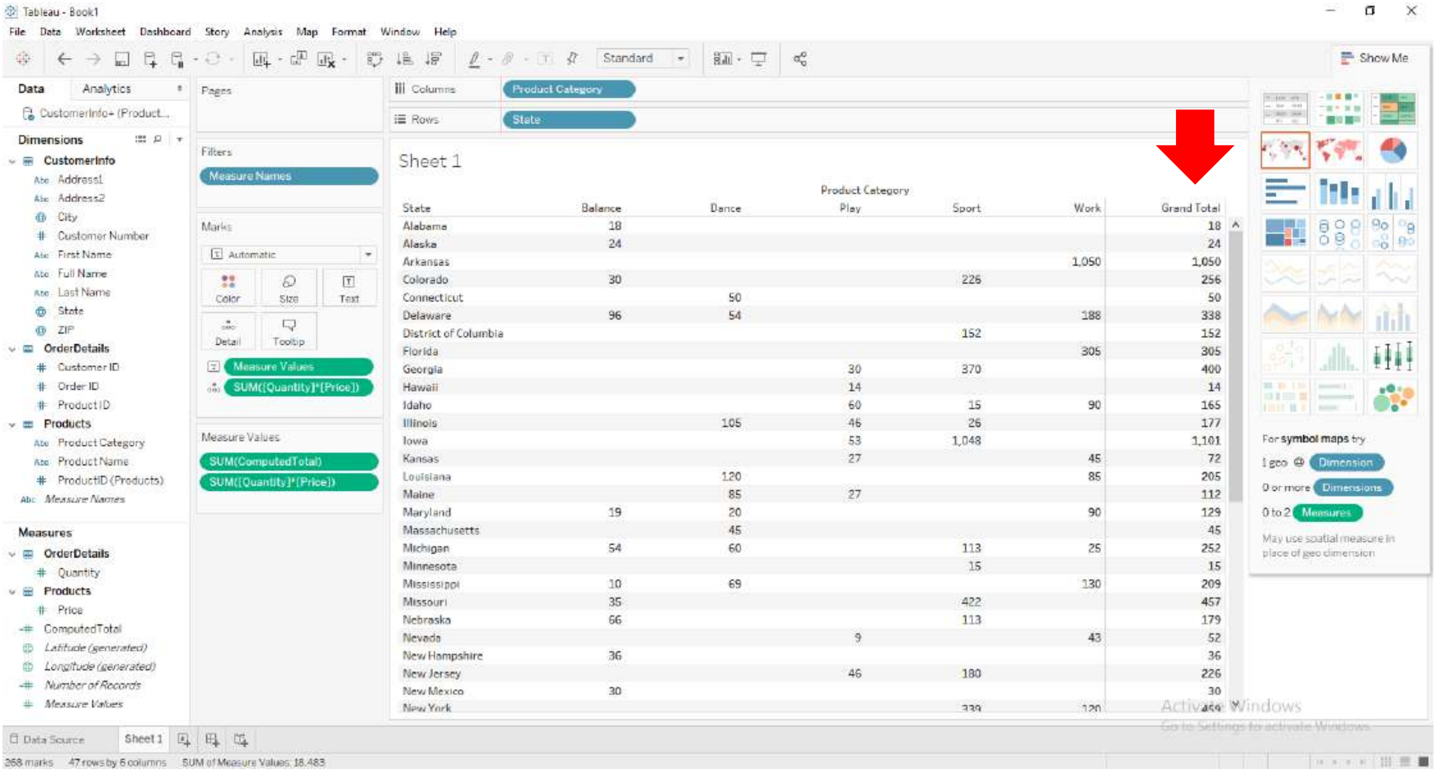
Please read terms of use for authorized access

Original Series

COLUMNS:	Product Category
ROWS:	State

Step 8

- Grand Totals for the Rows and Columns are displayed.

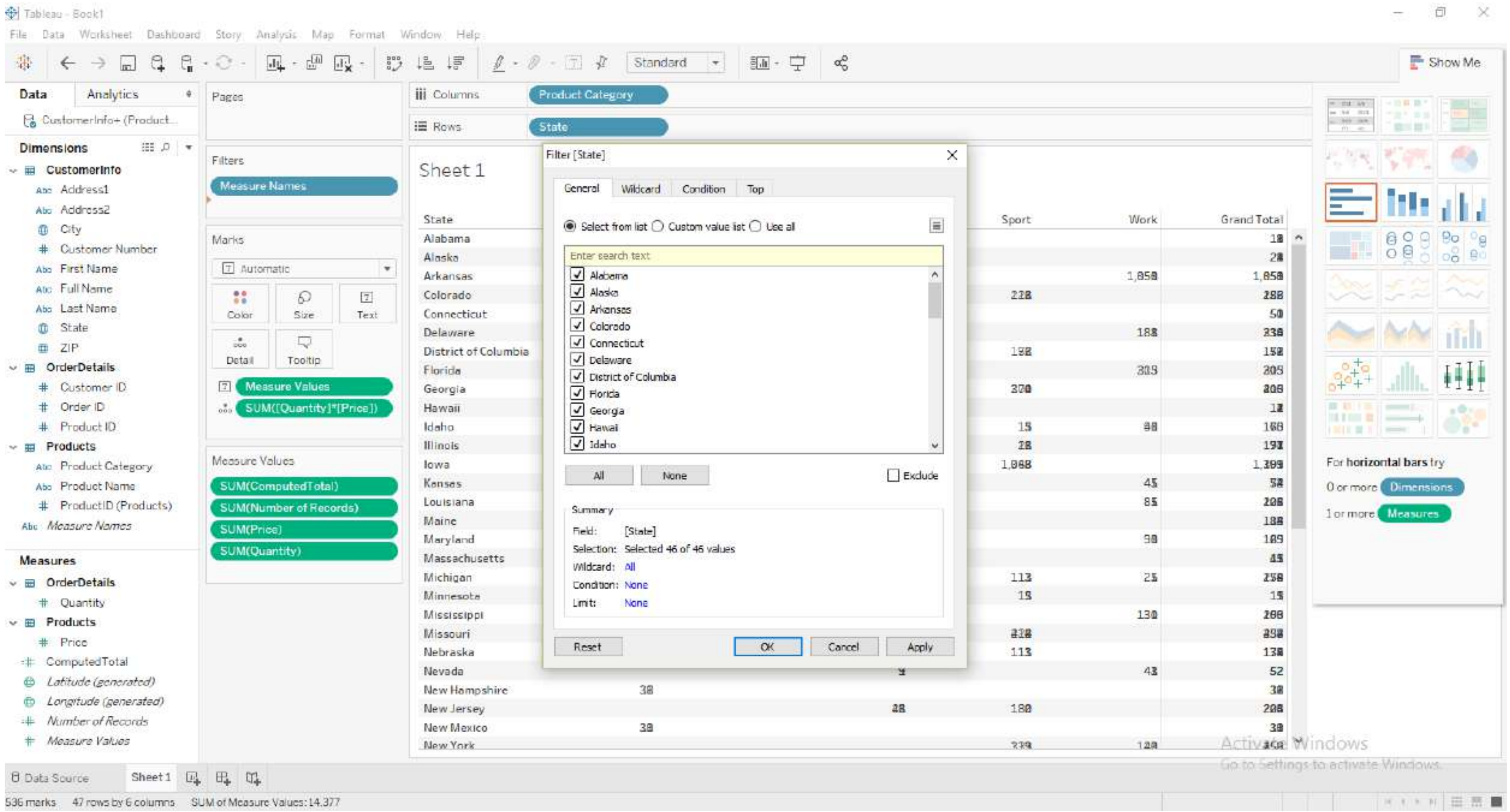


Data Source: demo2/ProductsCustomersOrders.xlsx

COLUMNS:	Product Category
ROWS:	State

Step 9

- adding filters to the current worksheet.



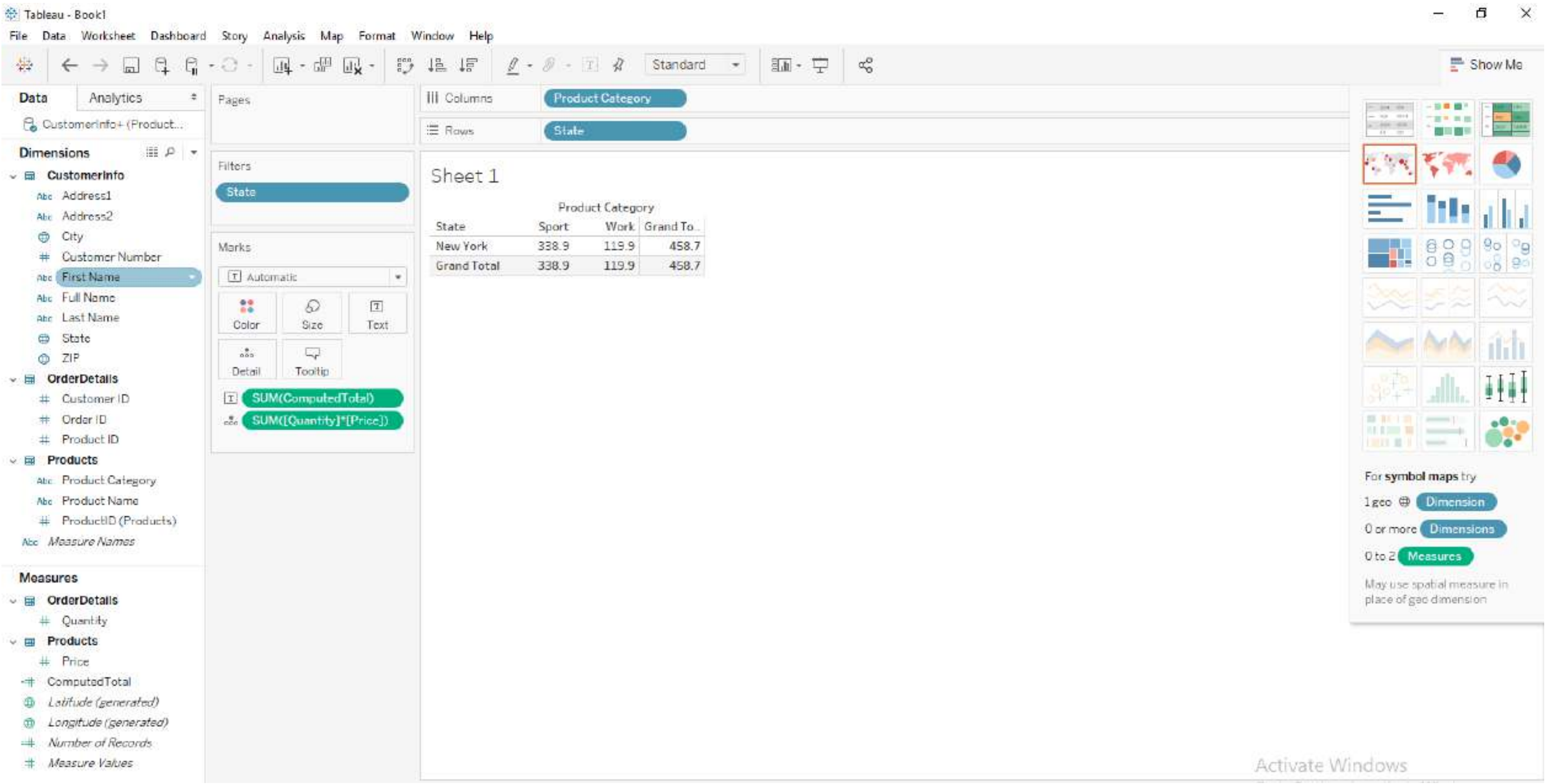
Data Source: demo2/ProductsCustomersOrders.xlsx

Original Series

COLUMNS:	Product Category
ROWS:	State

Step 10

- Post Application of filter.



Data Source: demo2/ProductsCustomersOrders.xlsx

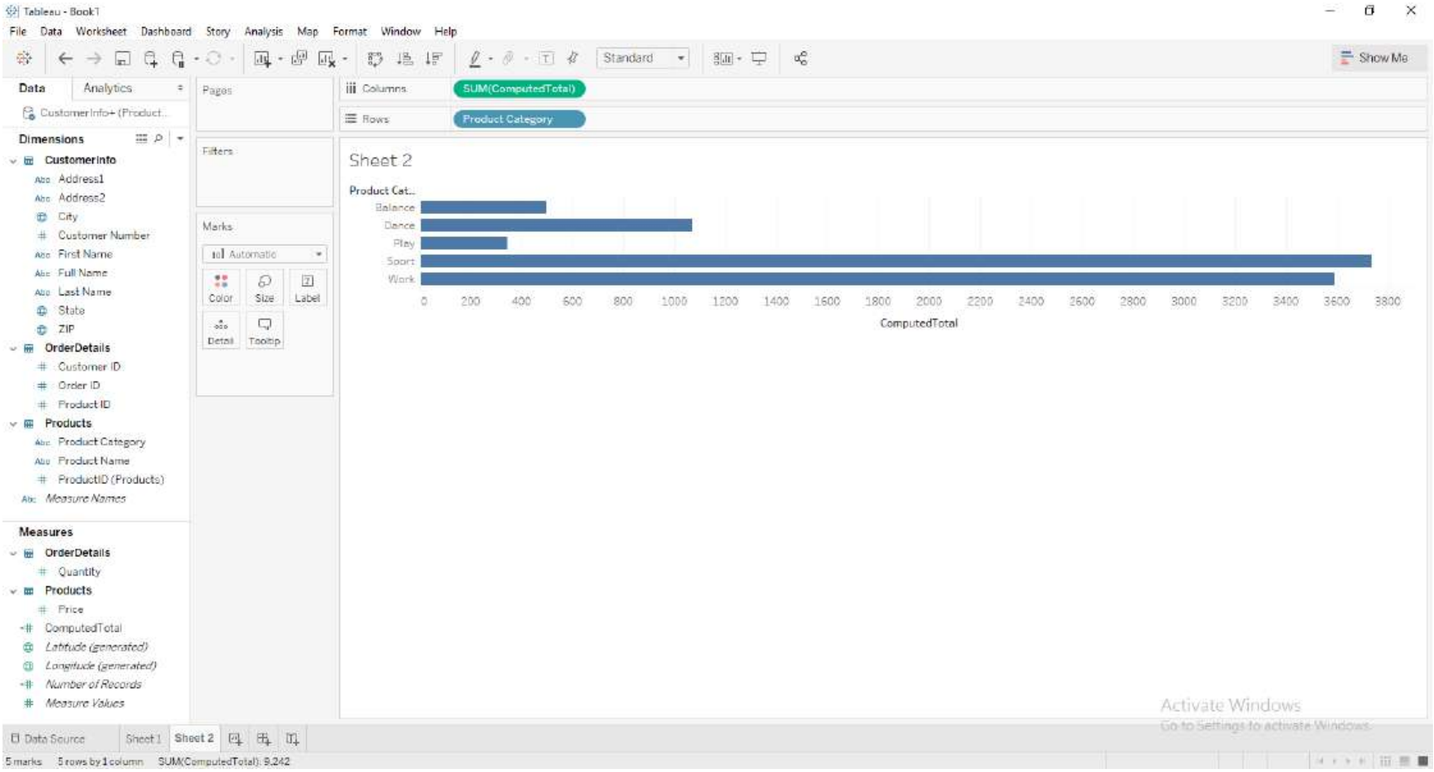
Please read terms of use for authorized access

Original Series

COLUMNS:	Product Category
ROWS:	State

Step 11

- creating bar chart with product category and pricing



Data Source: demo2/ProductsCustomersOrders.xlsx

Problem Description:	
Data set used:	

TABLEAU

PLAY BOOK : WORKING WITH TIMESERIES DATA::PLOTTING LINE GRAPH AND AREA CHART

Step 1:

- One Click Commission Sales data

Sales-Commission-By-Revenue_OneClick-Template.xls [Compatibility Mode]

OneClick COMMISSIONS

http://www.OneClickCommissions.com

Company	
Department	
Manager	
Start of Period	10/31/2017
End of Period	11/23/2017

Revenue based rate table

From	To	Rate
$ -	$ 999.99	4%
$ 1,000.00	$ 9,999.99	5%
$ 10,000.00	$ 49,999.99	6%
$ 50,000.00	$ 99,999.99	7%
$ 100,000.00	$ 999,999.99	10%

Date	Customer	Order / Invoice #	Revenue	Commissioned Salesperson	Commission Rate	Commission Amount	Deductions	Commission Payable
10/31/2017	Acme Widgets	#8999	$ 2,000.00	Edward Lee	5%	$ 100.00	$ -	$ 100.00
11/4/2017	Acme Widgets	#9000	$ 450.00	Erin Miller	4%	$ 18.00	$ -	$ 18.00
11/9/2017	Acme Widgets	#9001	$ 12,500.00	James Smith	6%	$ 750.00	$ -	$ 750.00
11/18/2017	Acme Widgets	#9002	$ 125,000.00	Linda Brady	10%	$ 12,500.00	$ -	$ 12,500.00
11/23/2017	Acme Widgets	#9003	$ 45,250.00	Edward Lee	6%	$ 2,715.00	$ -	$ 2,715.00
10/31/2017	Bravo Gizmos	#9004	$ 22,500.00	Erin Miller	6%	$ 1,350.00	$ -	$ 1,350.00
11/4/2017	Bravo Gizmos	#9005	$ 9,000.00	James Smith	5%	$ 450.00	$ -	$ 450.00
11/9/2017	Bravo Gizmos	#9006	$ 65,250.00	Linda Brady	7%	$ 4,567.50	$ -	$ 4,567.50
11/18/2017	Bravo Gizmos	#9007	$ 5,500.00	James Smith	5%	$ 275.00	$ -	$ 275.00
11/23/2017	Bravo Gizmos	#9008	$ 4,795.00	Linda Brady	5%	$ 239.75	$ -	$ 239.75
11/23/2017	Bravo Gizmos	#9009	$ 52,500.00	Edward Lee	7%	$ 3,675.00	$ -	$ 3,675.00
10/31/2017	Casey Bats	#9010	$ 4,900.00	Erin Miller	5%	$ 245.00	$ -	$ 245.00
11/4/2017	Casey Bats	#9011	$ 250.00	James Smith	4%	$ 10.00	$ -	$ 10.00
11/9/2017	Casey Bats	#9012	$ 357,000.00	Linda Brady	10%	$ 35,700.00	$ -	$ 35,700.00
11/18/2017	Casey Bats	#9013	$ 125,000.00	Edward Lee	10%	$ 12,500.00	$ -	$ 12,500.00
11/23/2017	Casey Bats	#9014	$ 68,500.00	Erin Miller	7%	$ 4,795.00	$ -	$ 4,795.00
10/31/2017	Delta Doors	#9015	$ 12,500.00	James Smith	6%	$ 750.00	$ -	$ 750.00
11/4/2017	Delta Doors	#9016	$ 2,500.00	Linda Brady	5%	$ 125.00	$ -	$ 125.00
11/9/2017	Delta Doors	#9017	$ 375.00	James Smith	4%	$ 15.00	$ -	$ 15.00
11/18/2017	Delta Doors	#9018	$ 22,500.00	James Smith	6%	$ 1,350.00	$ -	$ 1,350.00
11/23/2017	Delta Doors	#9019	$ 32,500.00	Edward Lee	6%	$ 1,950.00	$ -	$ 1,950.00
		Total	$ 970,770.00			$ 84,080.25	$ -	$ 84,080.25

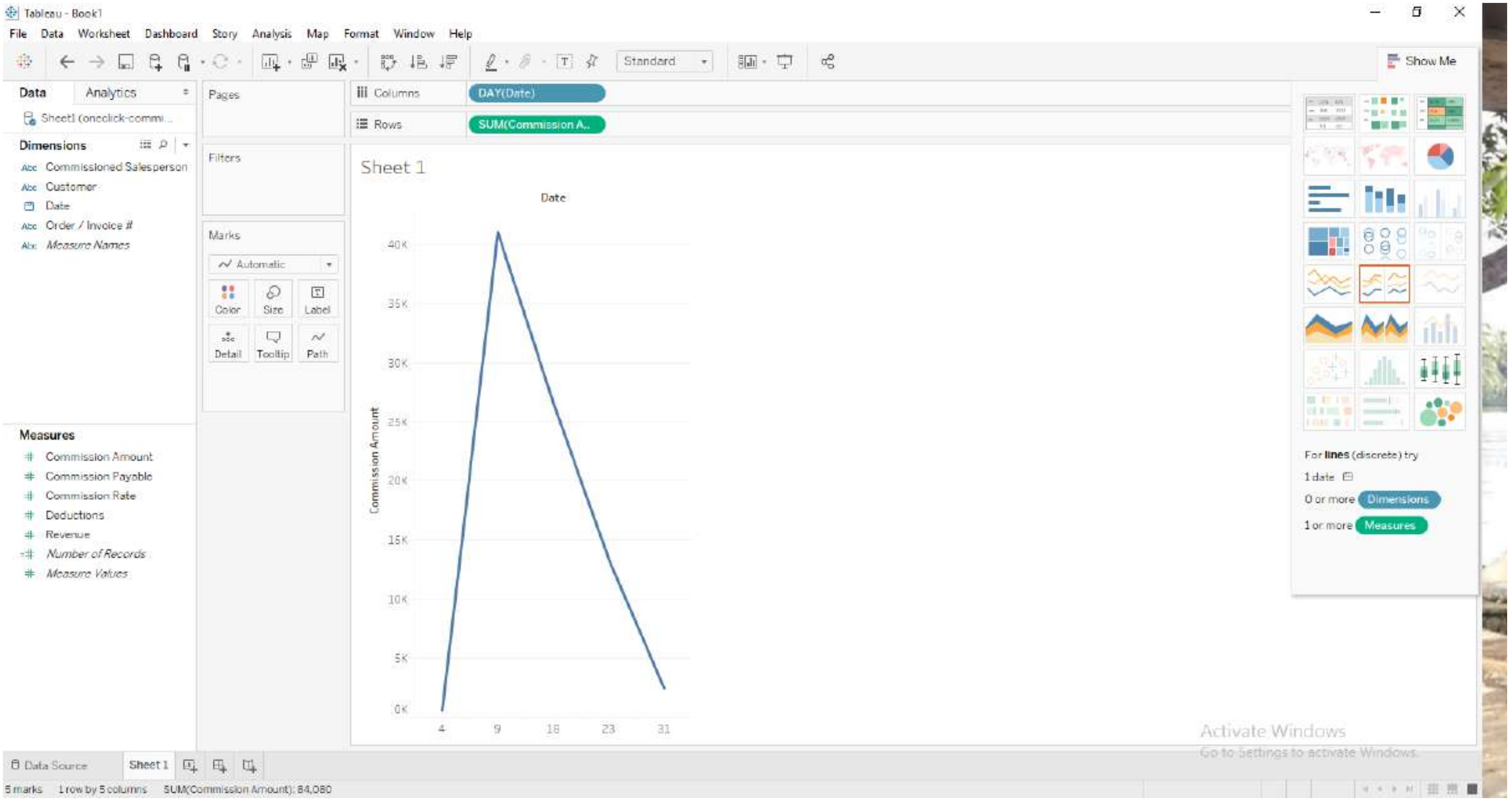
Data Source: demo2/Sales-Commission-By-Revenue_OneClick-Template.xlsx

Original Series

Step 2

- Refactor the data to create a new file oneclick-commission-sales.xlsx

COLUMNS:	DAY(DATE)
ROWS:	SUM(COMMISSION AMOUNT)

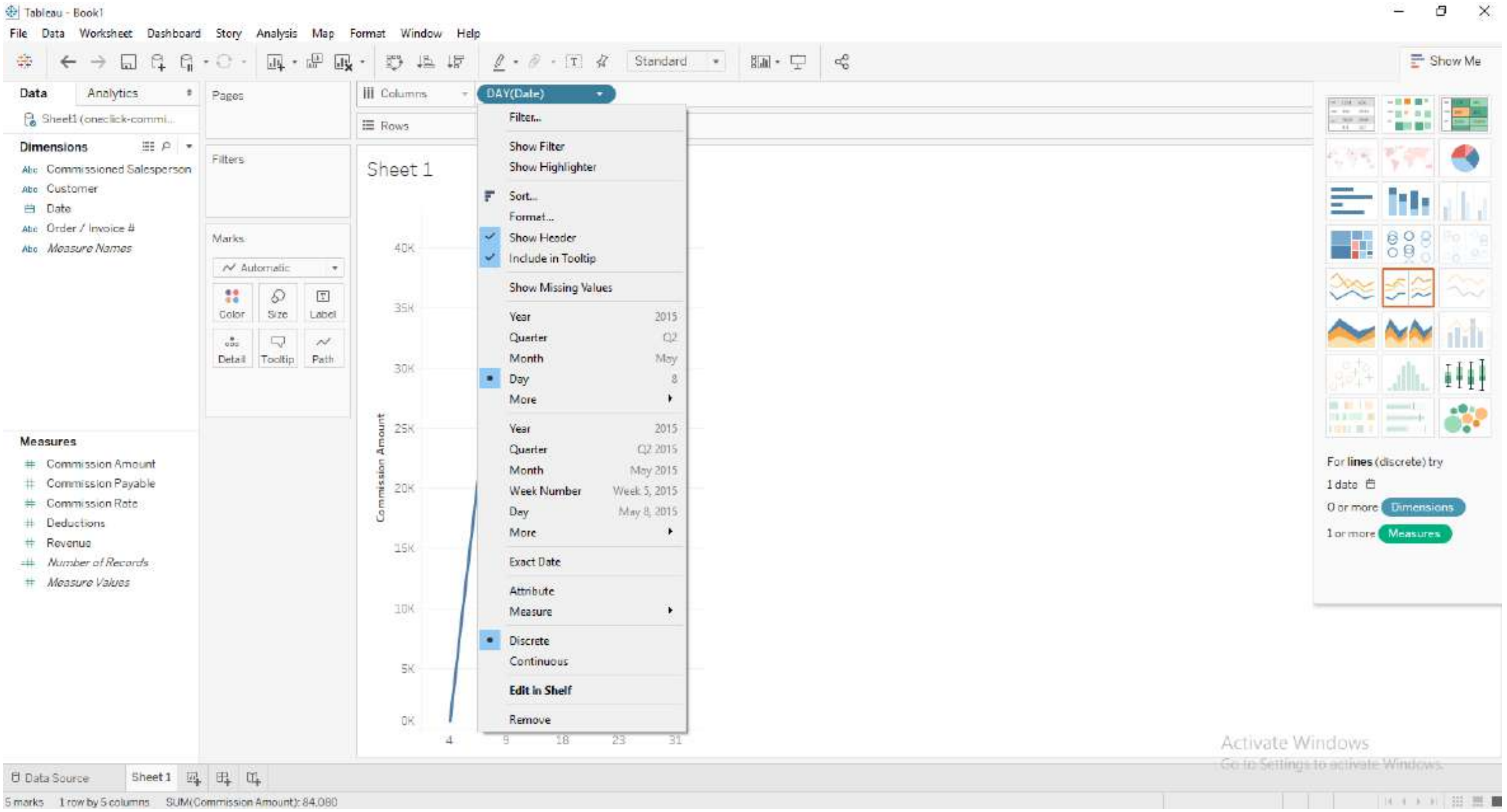


Data Source: demo2/ oneclick-commission-sales.xlsx

COLUMNS:	DAY(DATE)
ROWS:	SUM(COMMISSION AMOUNT)

Step 3

- Refactor the data to create a new file oneclick-commission-sales.xlsx
- Tableau provides you to select appropriate options on time series(year, quarter, month, day)

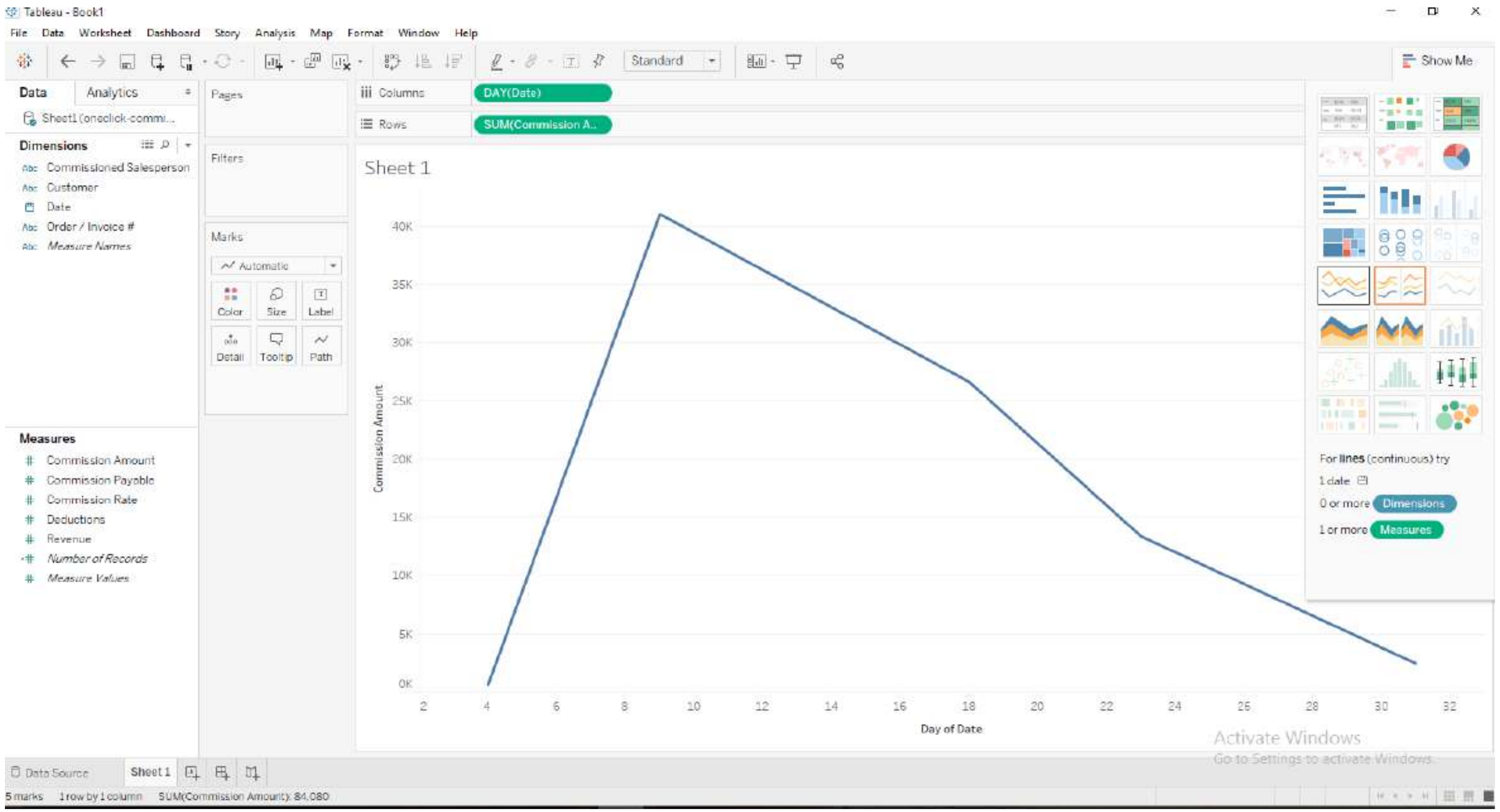


Data Source: demo2/ oneclick-commission-sales.xlsx

COLUMNS:	DAY(DATE)
ROWS:	SUM(COMMISSION AMOUNT)

Step 4

- On selecting an alternative line graph plot.

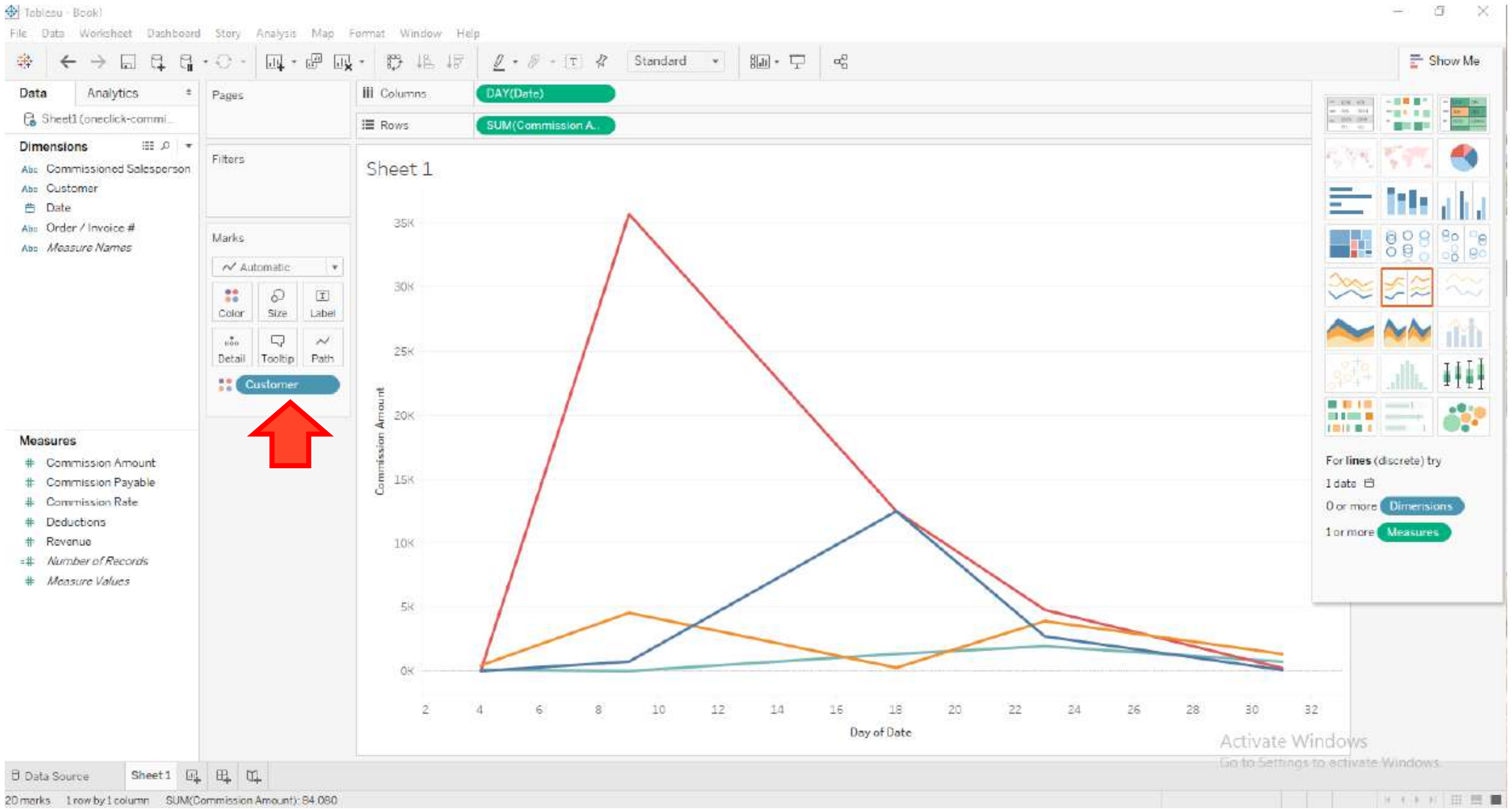


Data Source: demo2/ oneclick-commission-sales.xlsx

COLUMNS:	DAY(DATE)
ROWS:	SUM(COMMISSION AMOUNT)

Step 5

- Add the customer dimension to the marks pane to visualize comparison of date/Commission Amount based on customer



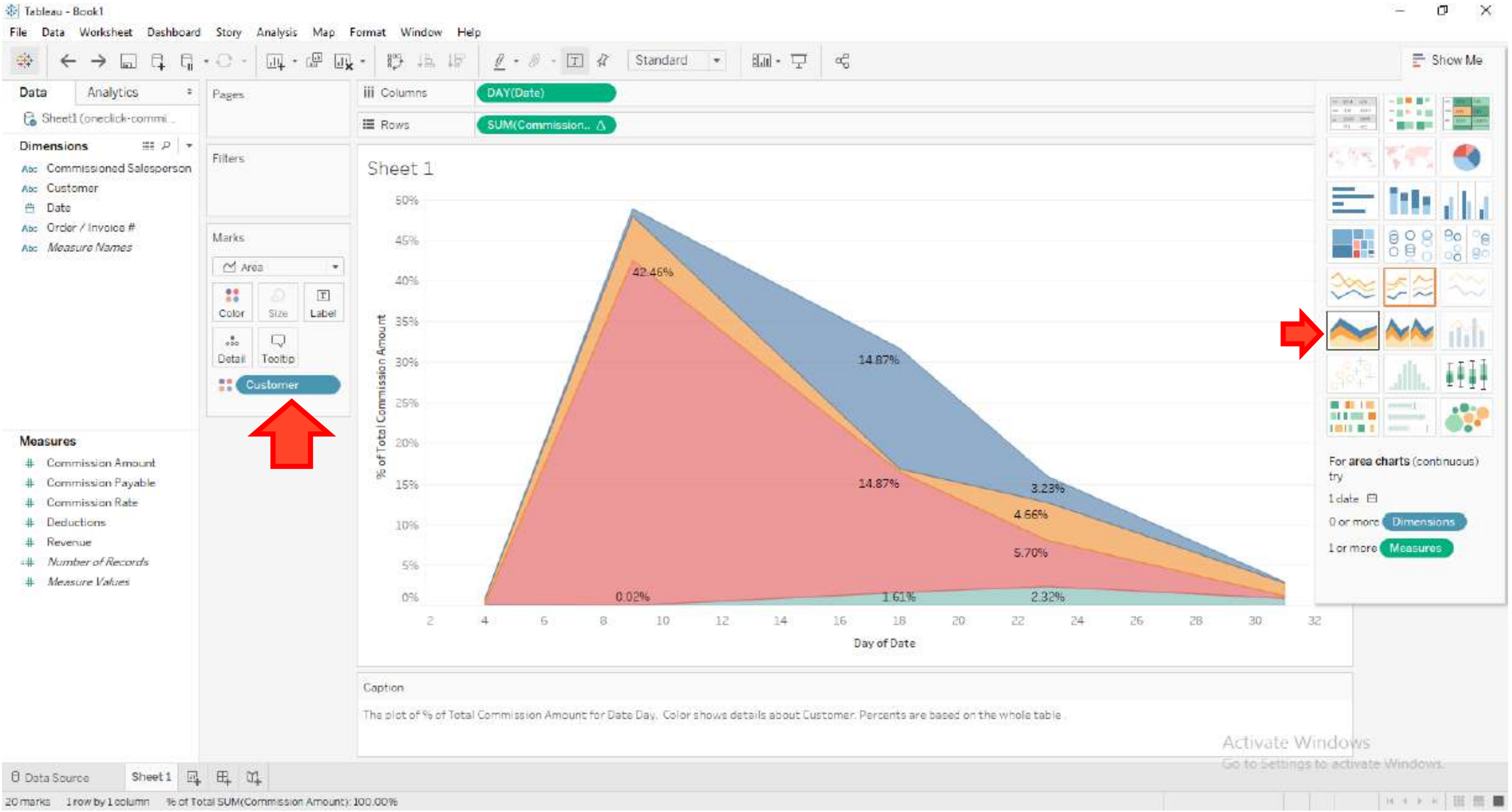
Data Source: demo2/ oneclick-commission-sales.xlsx

Please read terms of use for authorized access

COLUMNS:	DAY(DATE)
ROWS:	SUM(COMMISSION AMOUNT)

Step 6

- Select the area chart by selecting the visualization type to area chart to visualize how much each of the customer contributed to the commission amount.



Data Source: demo2/ oneclick-commission-sales.xlsx

Original Series

COLUMNS:	DAY(DATE)
ROWS:	SUM(COMMISSION AMOUNT)

Step 7

- On selecting the presentation mode, we can visualize an area chart with legends.

Data Source: demo2/ oneclick-commission-sales.xlsx

Problem Description:	
Data set used:	

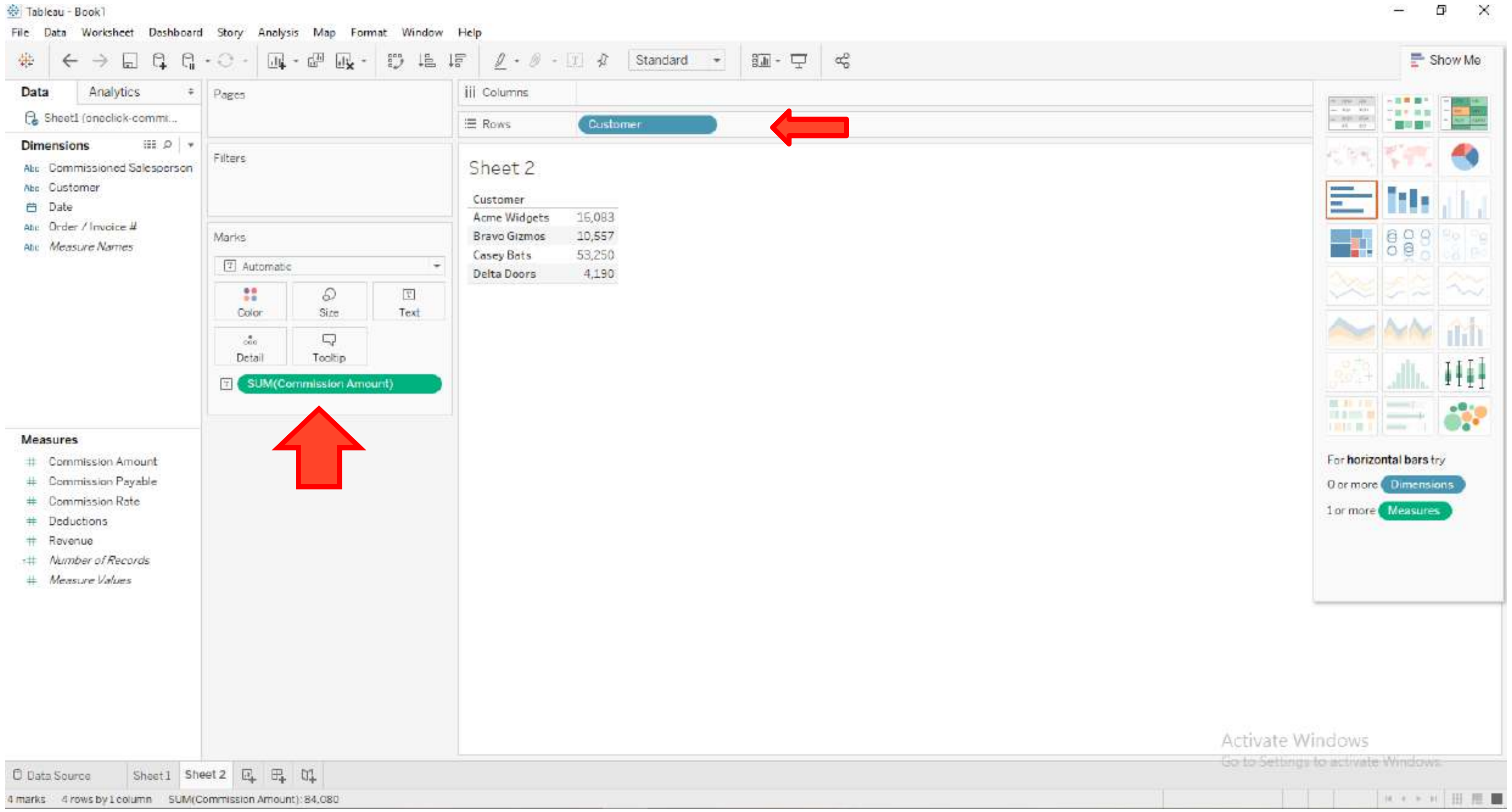
TABLEAU

PLAY BOOK : CREATING PIE CHART

COLUMNS:	
ROWS:	CUSTOMER

Step 1

- Using the oneclick-commission-sales.xlsx data
- Lets visualize the contribution amount per customer.
- This view provides me table summary of customer vs commission amount



Data Source: demo2/ oneclick-commission-sales.xlsx

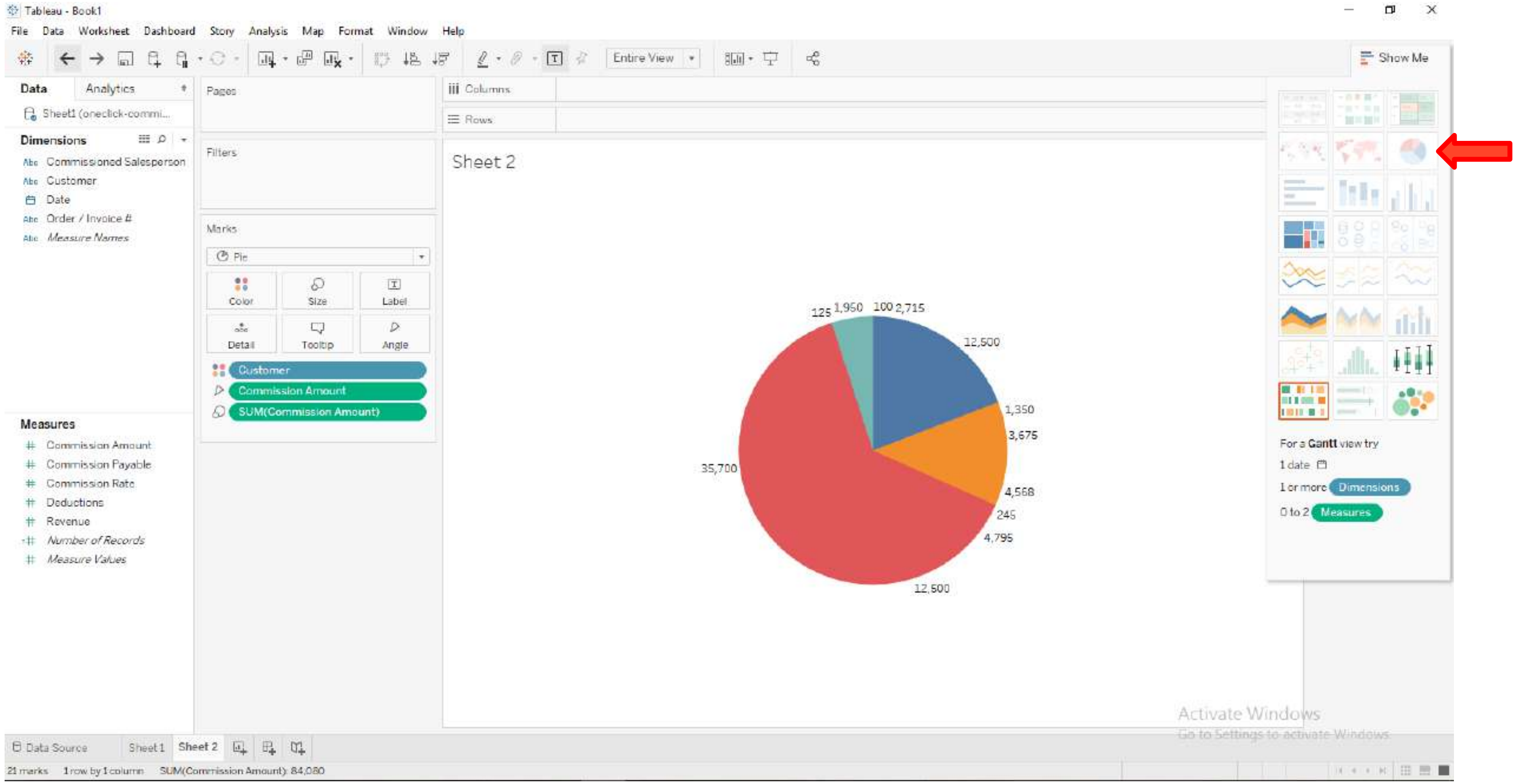
Pie chart

- Used to show relative proportions or percentages of information.
- Can be used to highlight geographical tends in the data using pies.

COLUMNS:	
ROWS:	CUSTOMER

Step 2

- Upon selection of appropriate pie chart icon from the “show me” visualization panel.
- We can visualize the percentage of contribution by each customer.

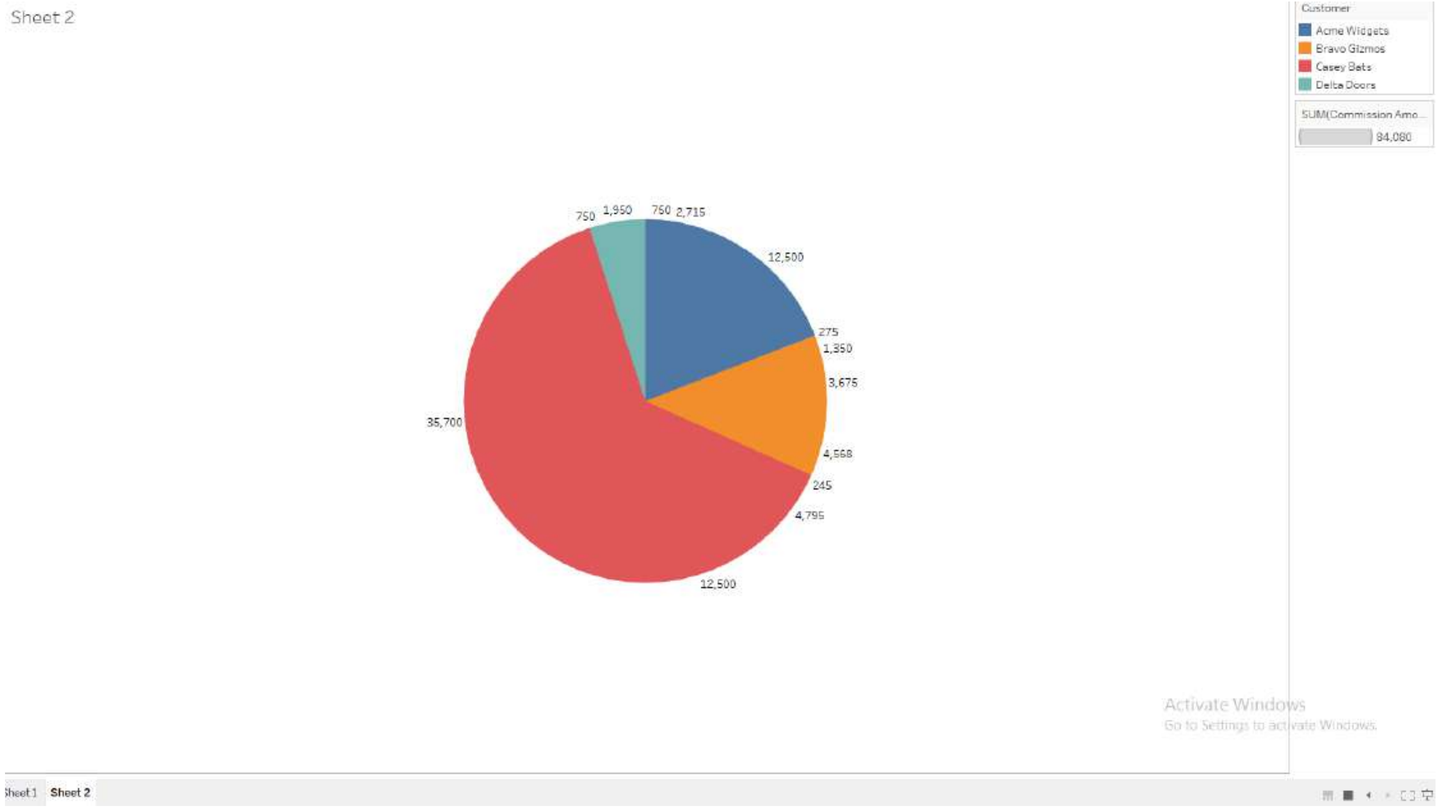


Data Source: demo2/ oneclick-commission-sales.xlsx

COLUMNS:	
ROWS:	CUSTOMER

Step 3

- on enabling the presentation mode, we can visualize the customer legend as shown in the figure.



Data Source: demo2/ oneclick-commission-sales.xlsx

Problem Description:	
Data set used:	

TABLEAU

PLAY BOOK : SCATTER PLOT

Step 1

- Scatter plots are used to plot measures on the number of occurrence to identify a pattern.
- Plotting temperature and rainfall measures would help us look at a pattern.

COLUMNS:	
ROWS:	

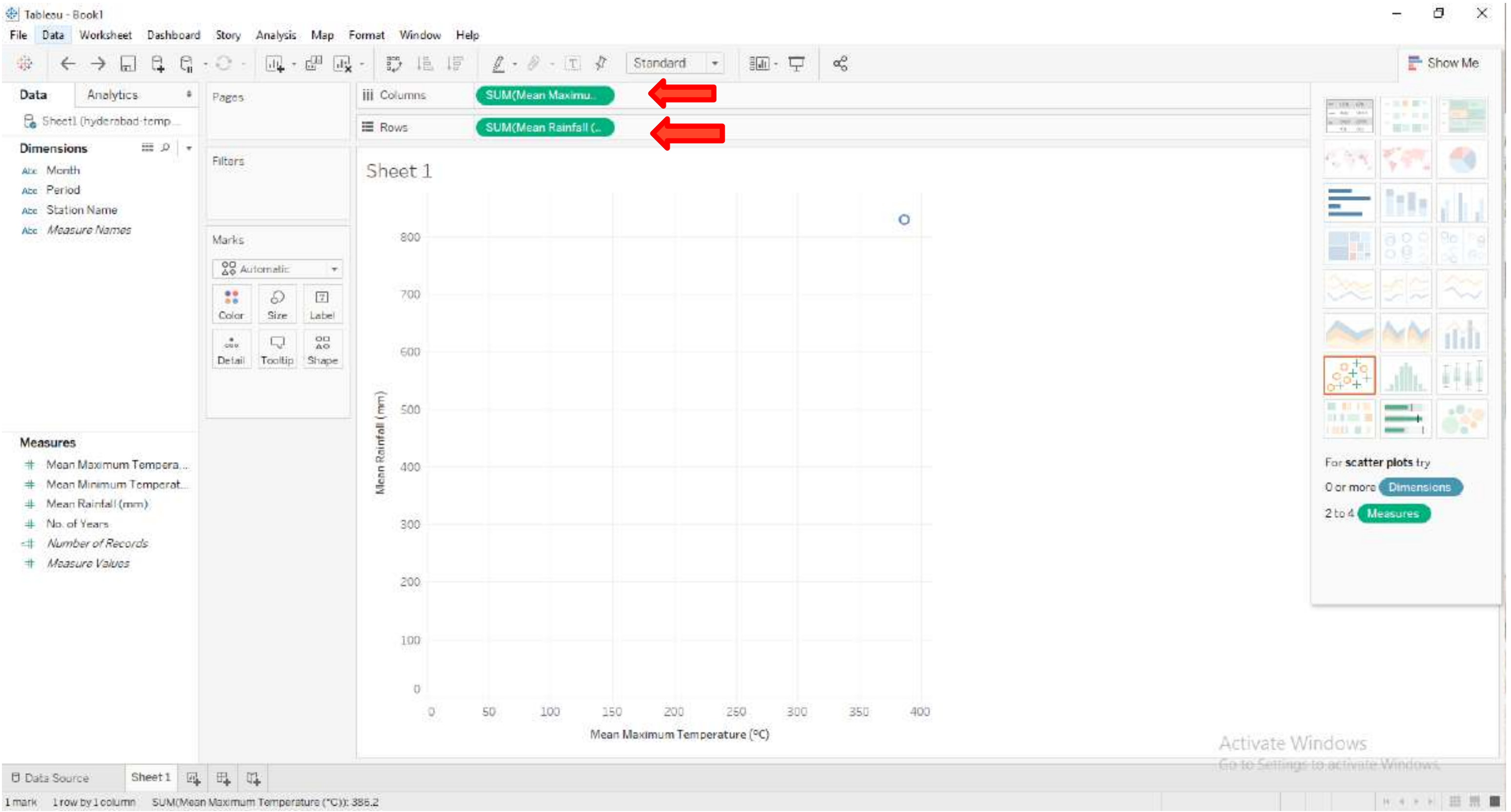
Station Name	Month	Mean Maximum Temperature (°C)	Mean Minimum Temperature (°C)	Mean Rainfall (mm)	Period	No. of Years
Hyderabad (A)	January	28.8	15.2	13.2	1951-2000	50
	February	31.9	17.6	7.9	1951-2000	50
	March	35.4	20.8	15.3	1951-2000	50
	April	37.9	24.3	20.2	1951-2000	50
	May	39.0	26.2	35.7	1951-2000	50
	June	34.5	24.0	103.8	1951-2000	50
	July	30.8	22.6	169.9	1951-2000	50
	August	29.8	22.1	178.7	1951-2000	50
	September	30.5	22.0	158.3	1951-2000	50
	October	30.6	20.3	97.2	1951-2000	50
	November	29.0	16.9	22.4	1951-2000	50
	December	28.0	14.5	5.9	1951-2000	50

Data Source: demo2/ india-climate-data.xlsx

Step 1

- Extracted sub-set of the data for the region of Hyderabad.
- Drawing relationships between temperature and rainfall using scatter plot.

COLUMNS:	Mean Maximum Temperature ©
ROWS:	Mean Rainfall (mm)

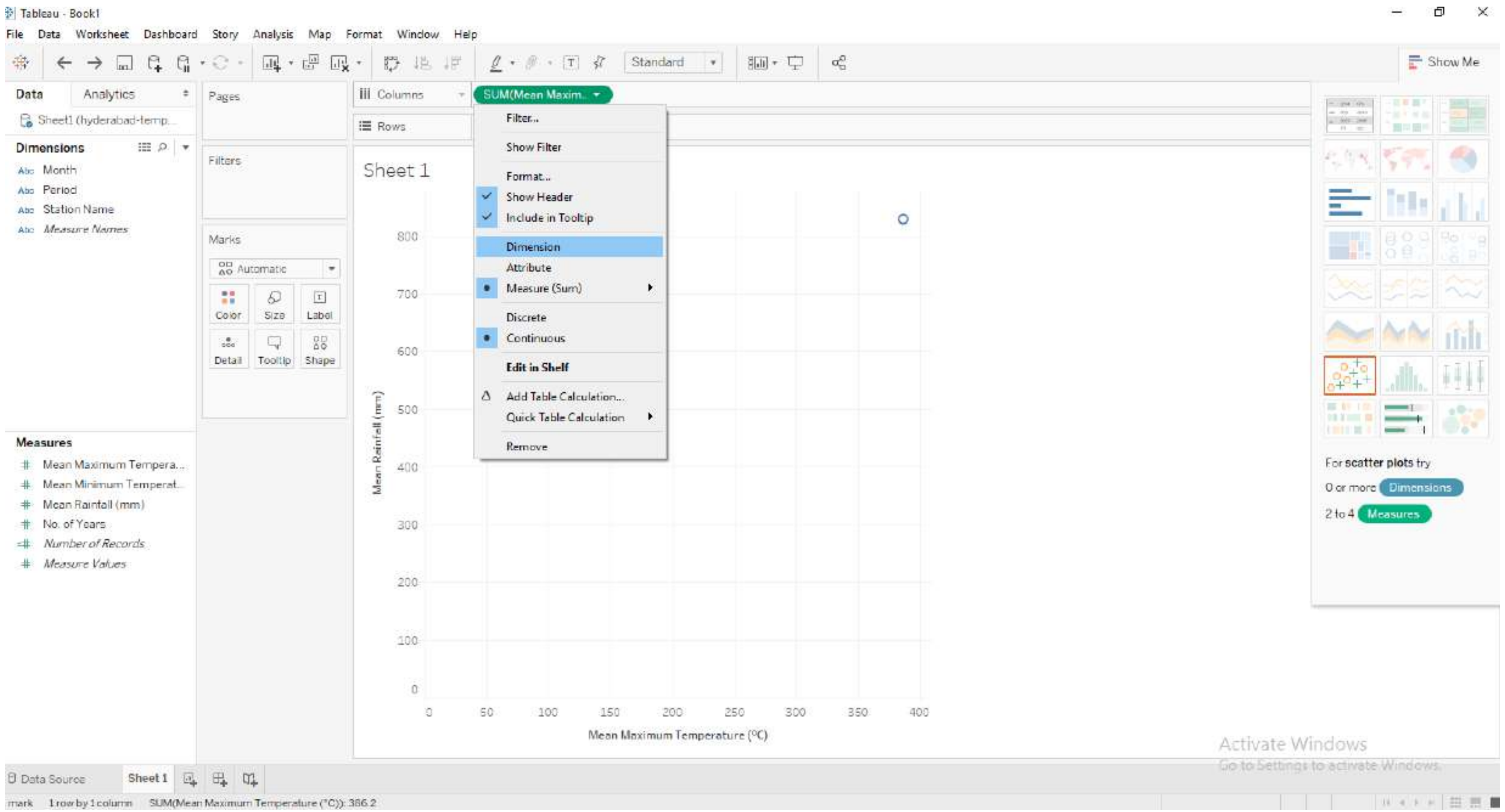


Data Source: demo2/ hyderabad-temp-rainfall.xlsx

COLUMNS:	Mean Maximum Temperature ©
ROWS:	Mean Rainfall (mm)

Step 2

- select Mean Maximum Temperature and change the **measure** to **dimension.**
- **Repeat this step for the row dimension as well.**



Data Source: demo2/ hyderabad-temp-rainfall.xlsx

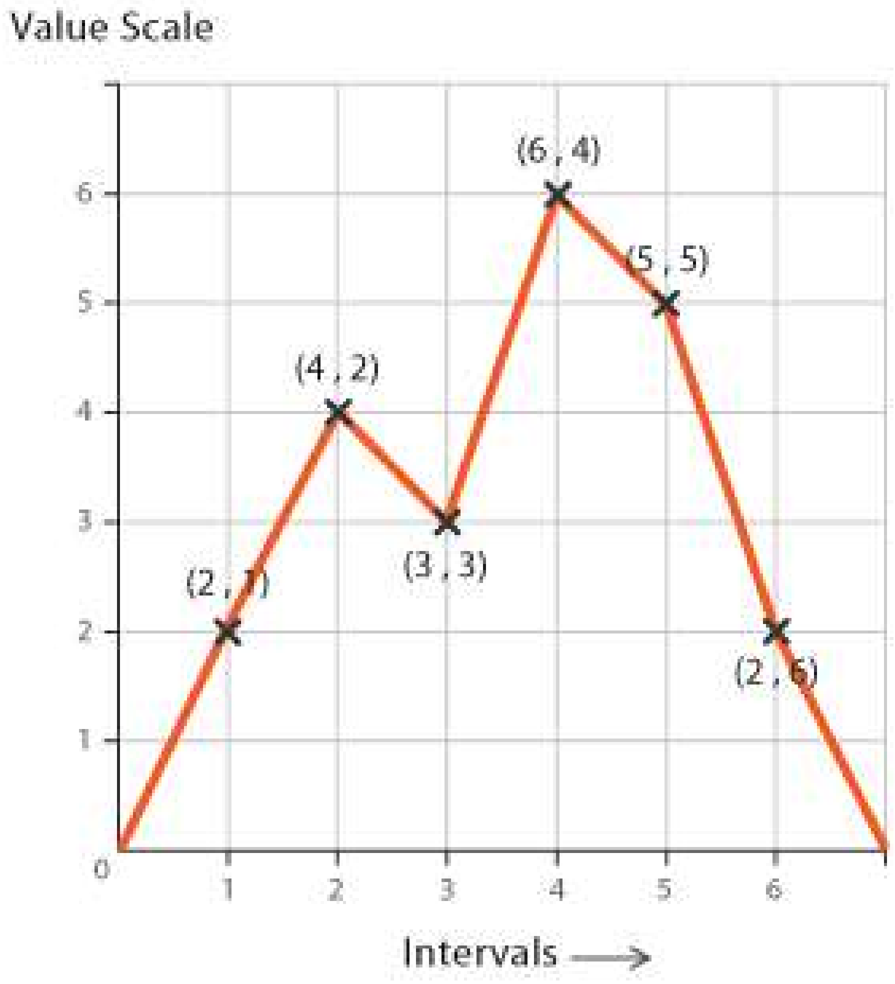
Original Series

TERRITORIAL PRESCIENCE
provoke thought, invoke action

Distribution | Range | Data Over time | Proportions | Relationships

Line Graph

- used to display quantitative values over a continuous interval or time period.
- show trends and analyse how the data has changed over time.
- Uses Cartesian coordinate grid.
- **Challenge:**



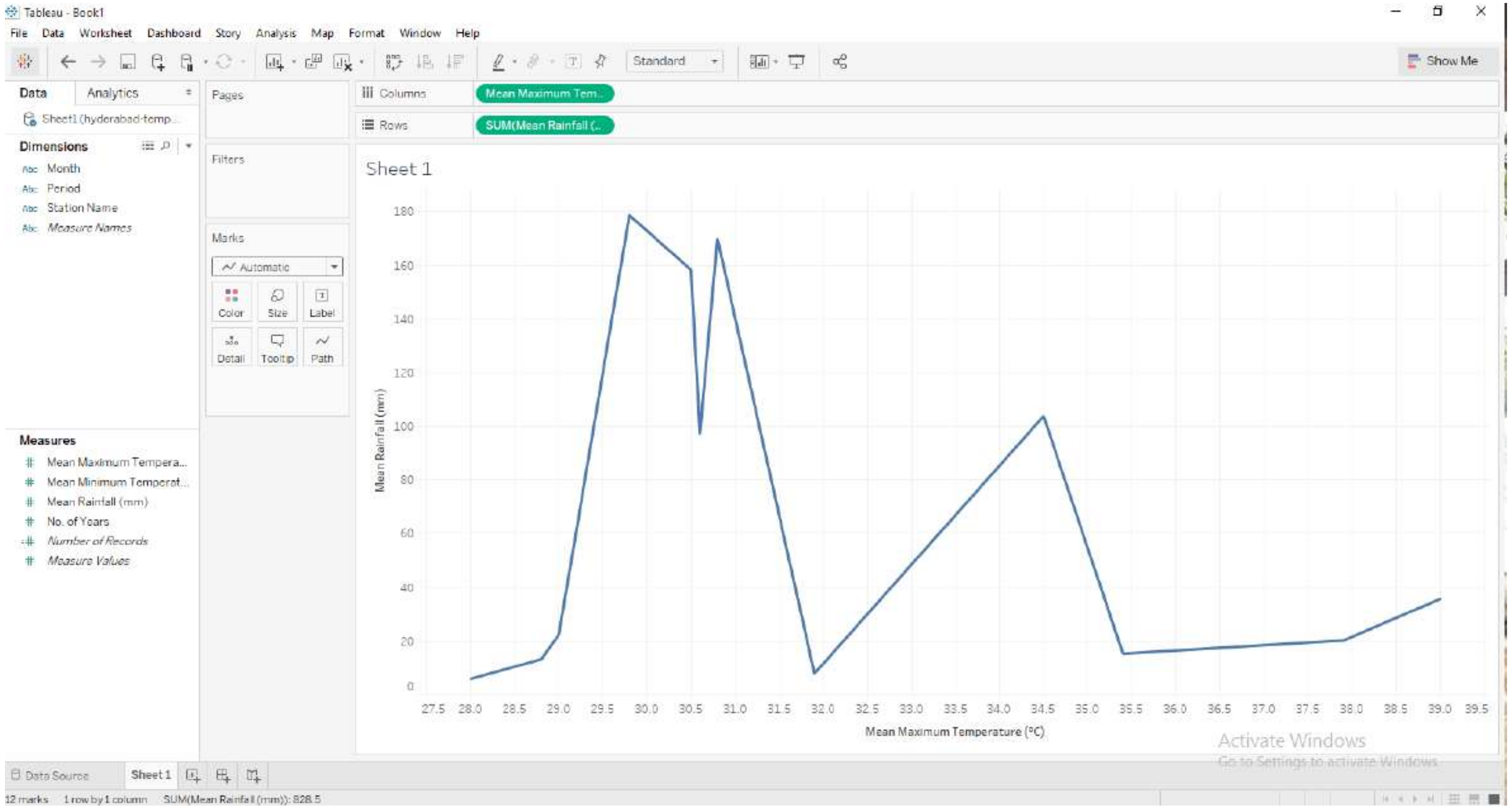
Line chart

- They are used to connect individual numerical data points.
- Used to display trends over a period of time.
- Can be combined with bar charts.
- When two or more line charts are present, filling the space under respective lines to create an area chart. It provides relative contribution that line contributes to the whole.

COLUMNS:	Mean Maximum Temperature ©
ROWS:	Mean Rainfall (mm)

Step 3

- select Mean Maximum Temperature and change the **measure** to **dimension.**
- **Repeat this step for the row dimension as well.**

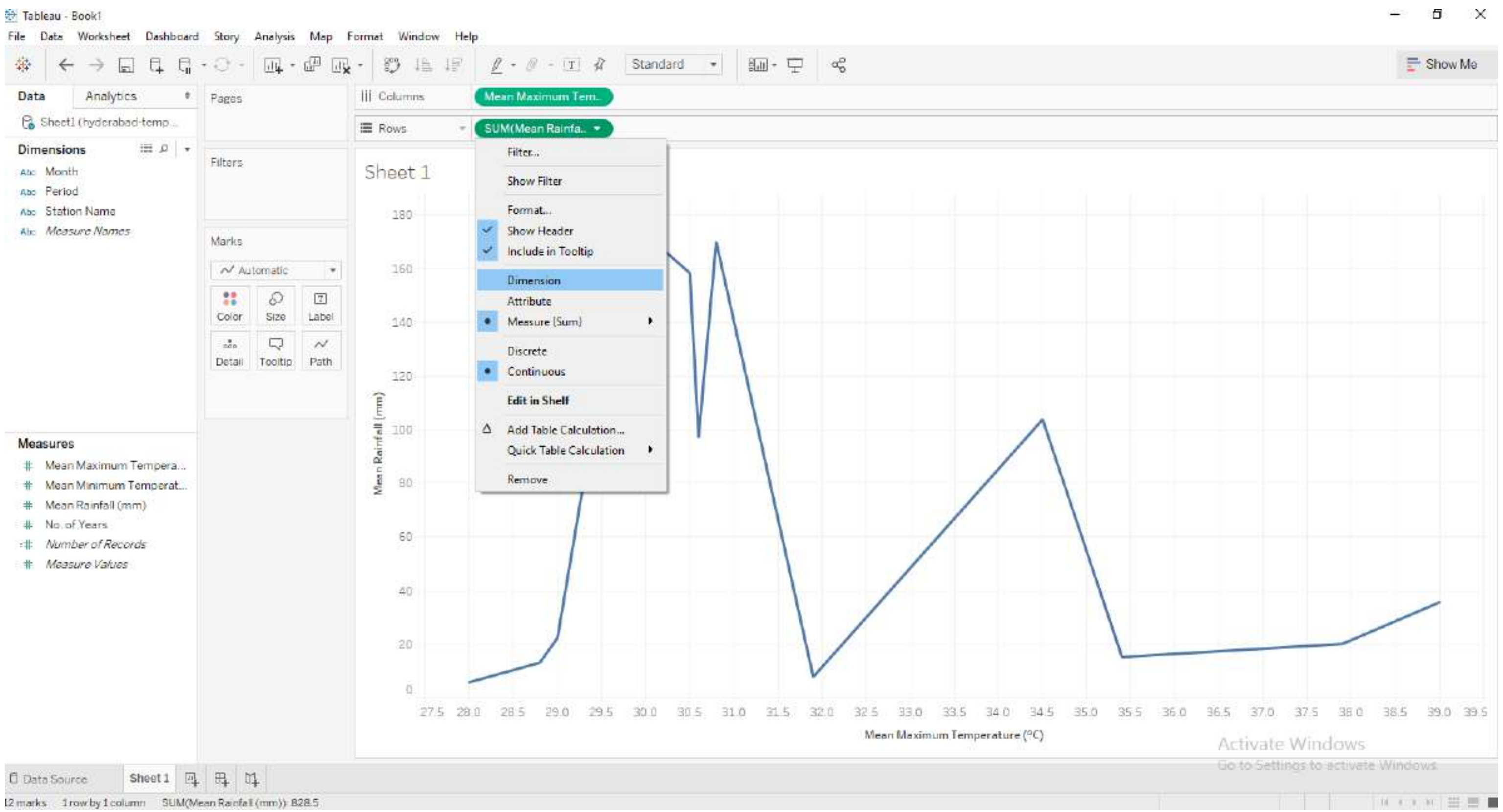


Data Source: demo2/ hyderabad-temp-rainfall.xlsx

COLUMNS:	Mean Maximum Temperature ©
ROWS:	Mean Rainfall (mm)

Step 3

- select Mean Maximum Temperature and change the **measure** to **dimension.**
- **Repeat this step for the row dimension as well.**



Data Source: demo2/ hyderabad-temp-rainfall.xlsx

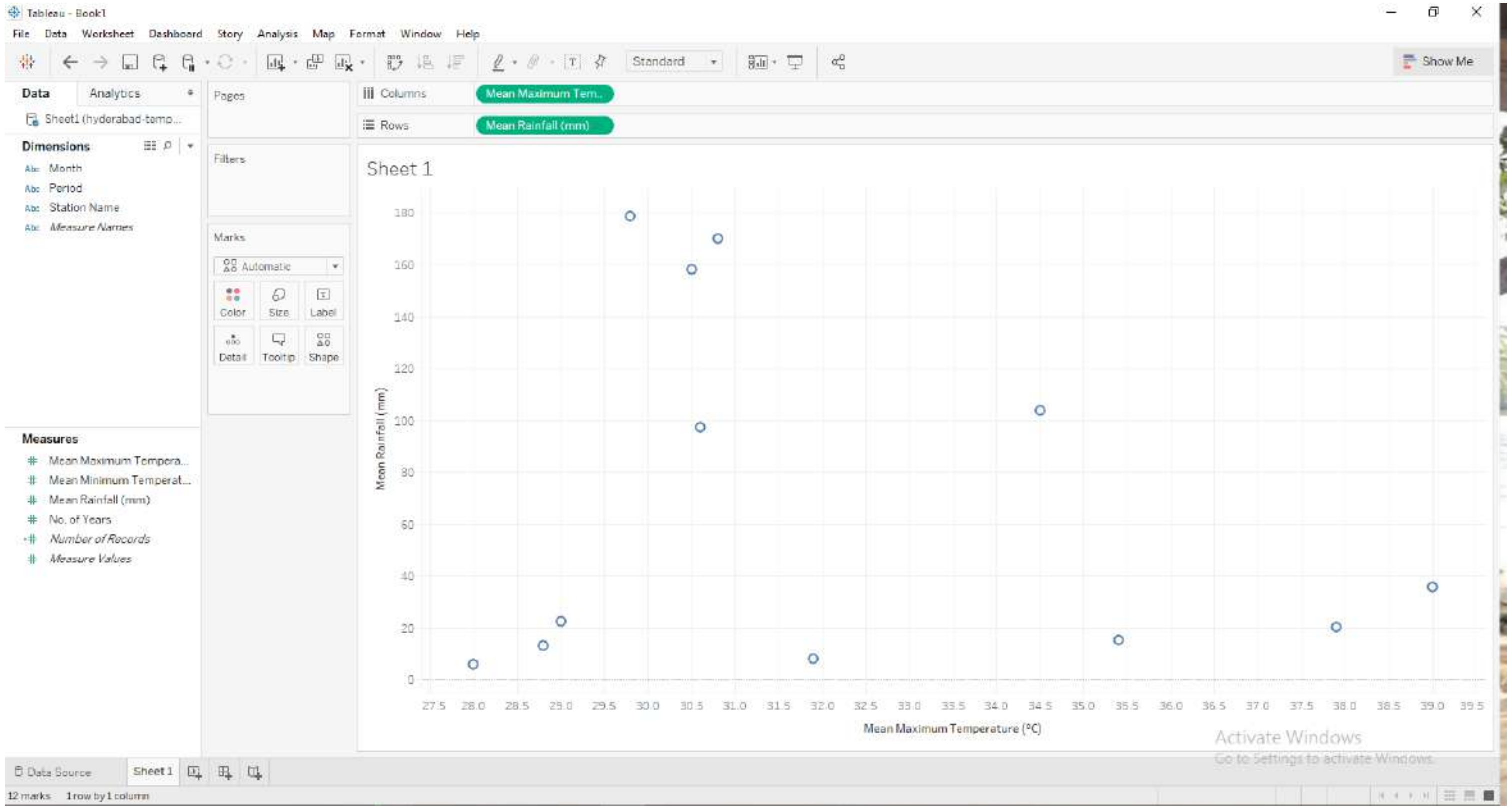
Scatter plot

- Used to demonstrate trends, concentrations and outliers that will direct users for further investigation/analysis.
- Used to investigate relationship between different variables.
- By adding a trend line the correlation among the data is clear.
- By incorporating filters, users can drill down into different perspectives and details to quickly identify patterns in the data.

COLUMNS:	Mean Maximum Temperature ©
ROWS:	Mean Rainfall (mm)

Step 4

- upon transformation from **measure** to dimension for both rows and columns, we have a scatter plot depicting the pattern/relationship between the temperature and rainfall



Data Source: demo2/ hyderabad-temp-rainfall.xlsx

Problem Description:	
Data set used:	

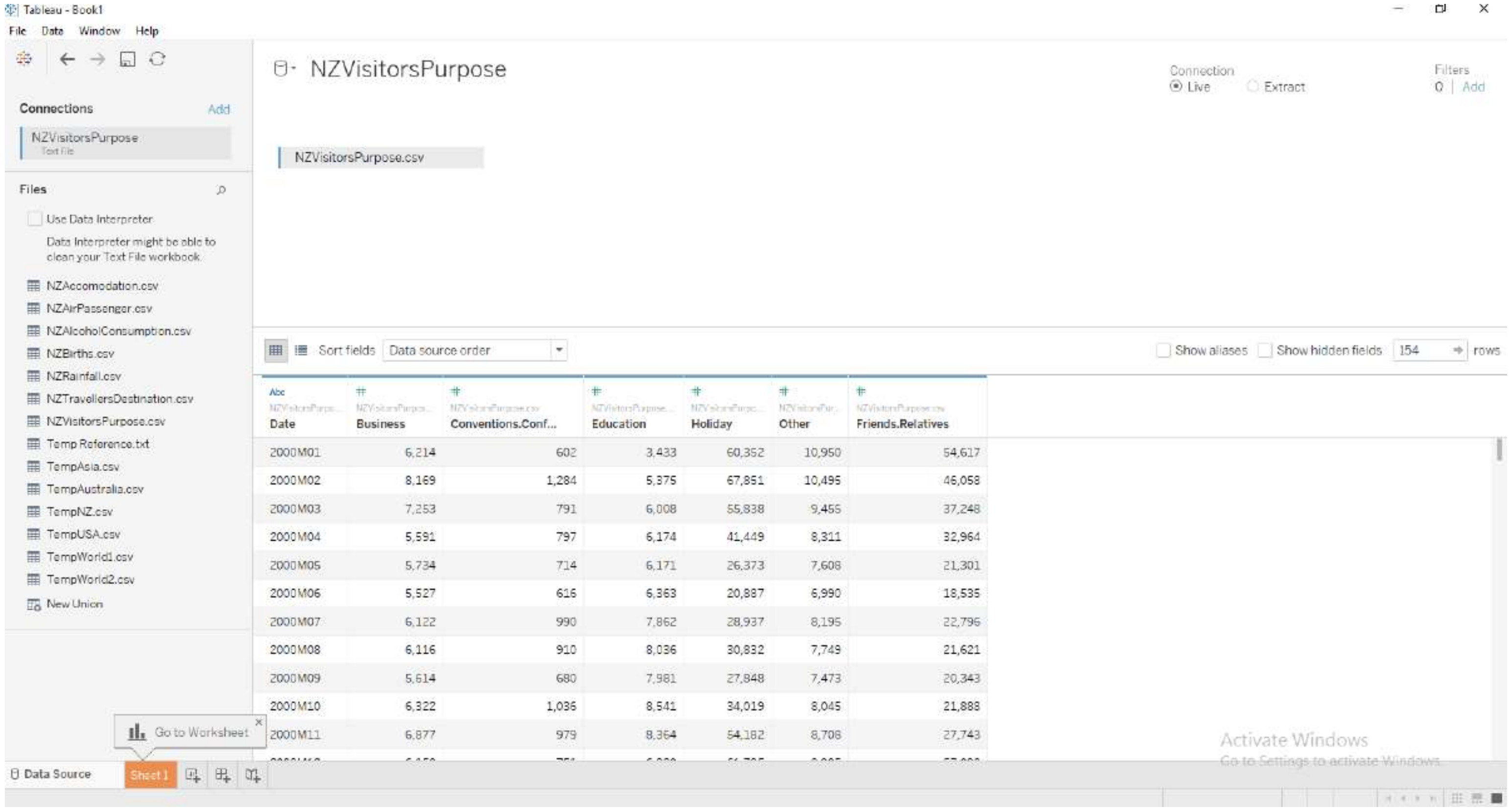
TABLEAU

PLAY BOOK : CREATING A HISTOGRAM

COLUMNS:	
ROWS:	

Step 1

- Histograms are a great way to look at the distribution of the data.
- Let's look at number of visitors to New Zealand by category.

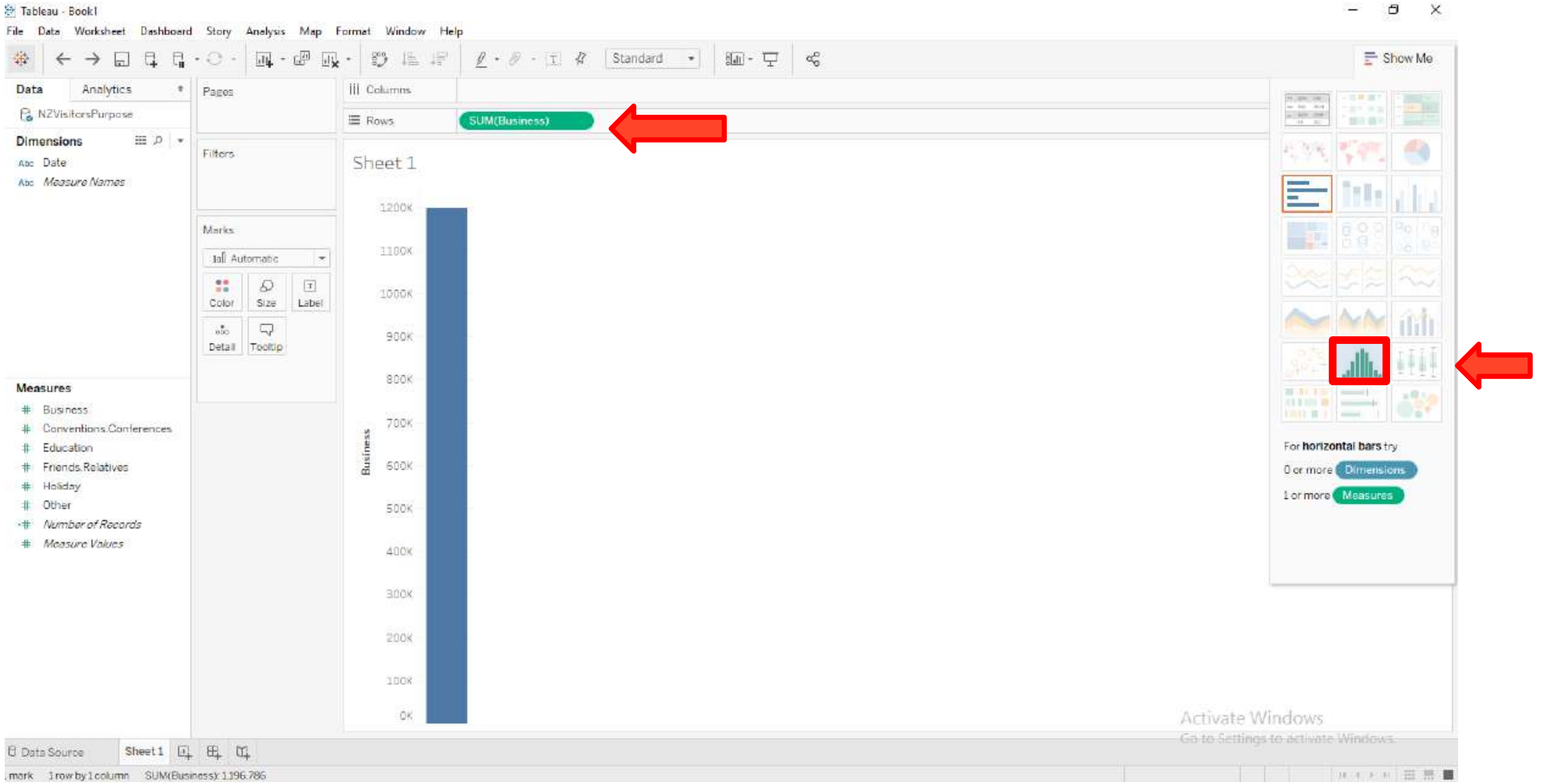


Data Source: demo2/ TimeSeriesDatasets_130207/NZVisitorsPurpose.csv

COLUMNS:	
ROWS:	SUM(BUSINESS)

Step 2

- We would like to see the distribution of Visitors to New Zealand in the **Business Category.**

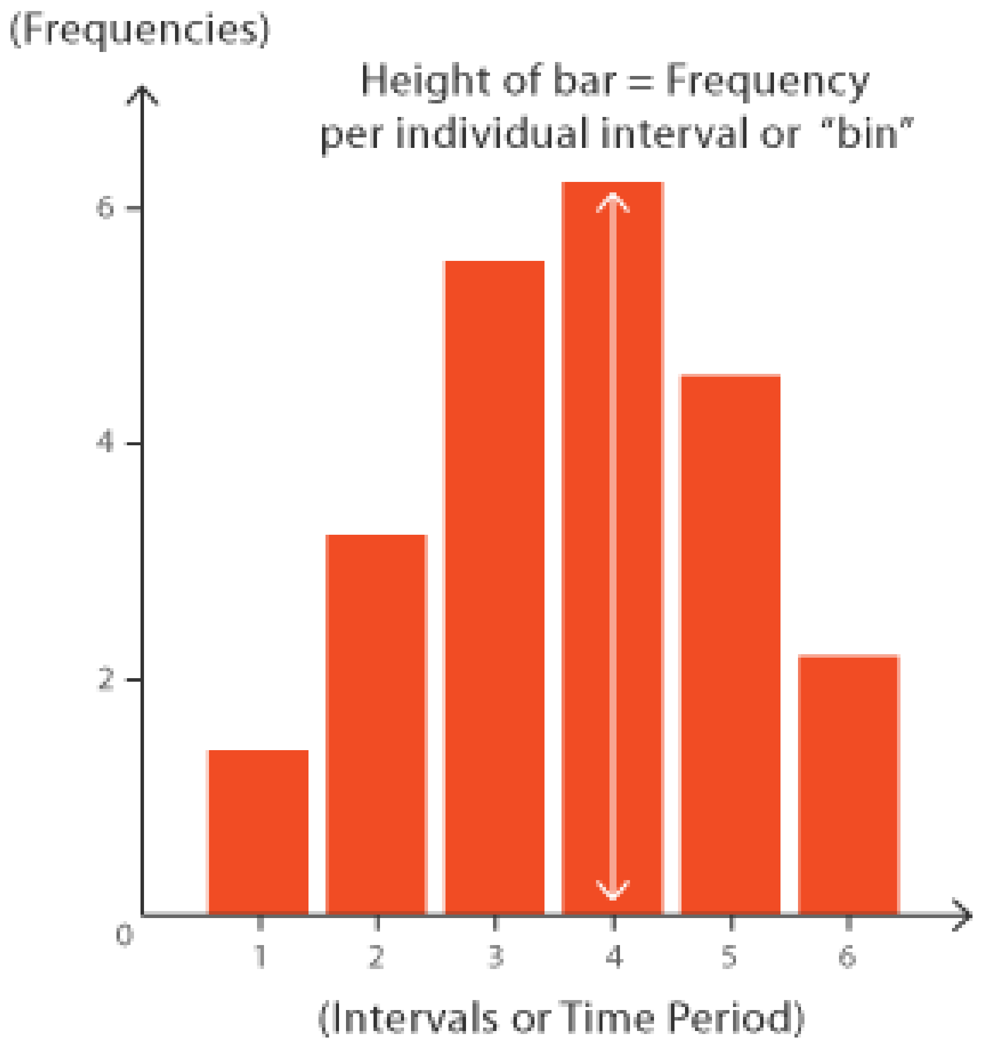


Data Source: demo2/ TimeSeriesDatasets_130207/NZVisitorsPurpose.csv

Distribution | Range | Data Over time | Proportions | Comparisons

Histograms

- used to visualize the distribution of data over a continuous interval or certain time period.
- Tabulated frequency at each interval/bin.
- Give an estimate as to where values are concentrated, what the extremes are and where there are any gaps or unusual values.
- **Challenge: sometimes hard to read.**



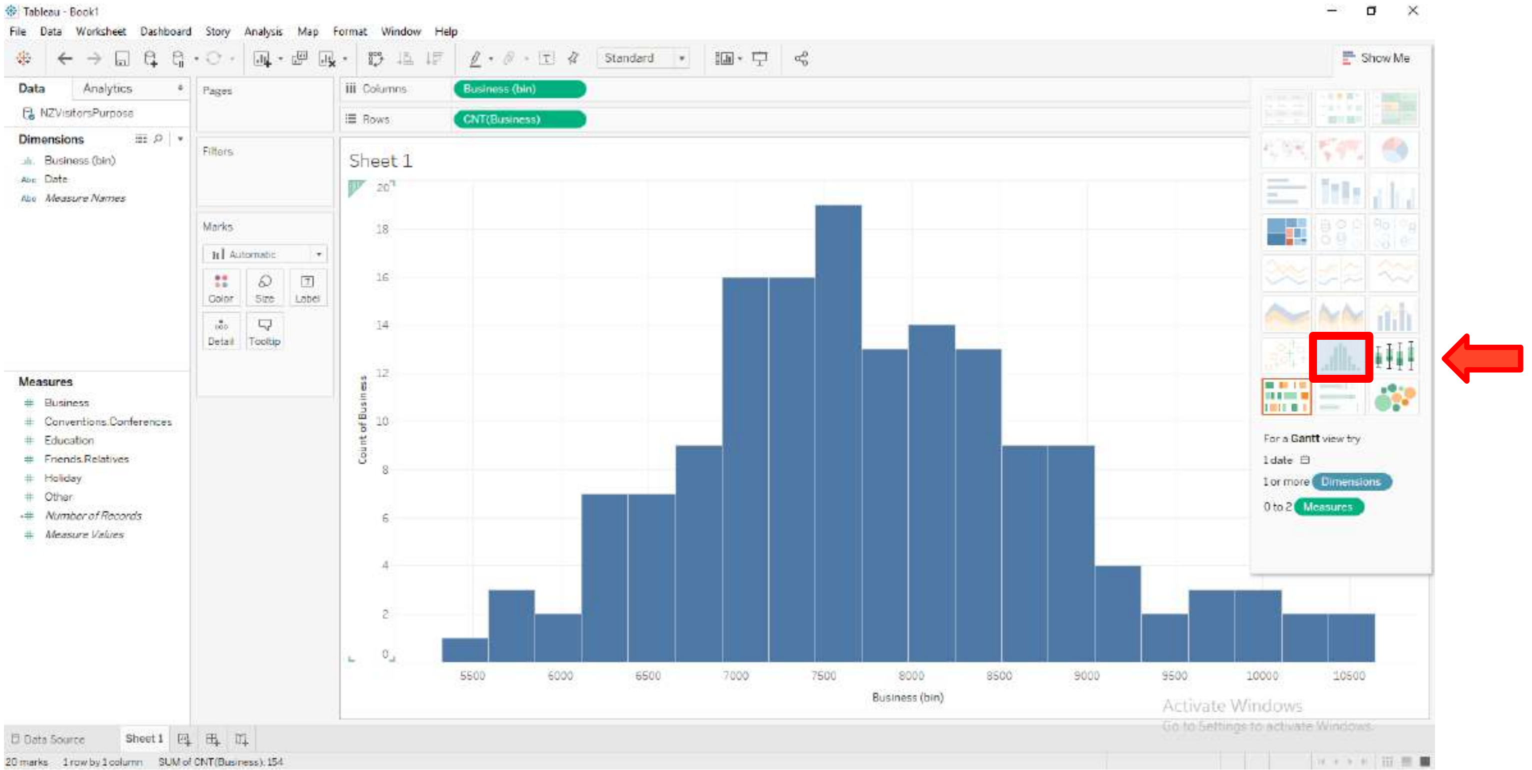
Histogram

- To display data distributed across group.
- Used to explore data for groupings, or “bins” that make sense.

COLUMNS:	
ROWS:	SUM(BUSINESS)

Step 3

- We would like to see the distribution of Visitors to New Zealand in the **Business Category.**
- **Upon selection of Histogram chart, it displays distribution of data**



Data Source: demo2/ TimeSeriesDatasets_130207/NZVisitorsPurpose.csv

Problem Description:	
Data set used:	

TABLEAU

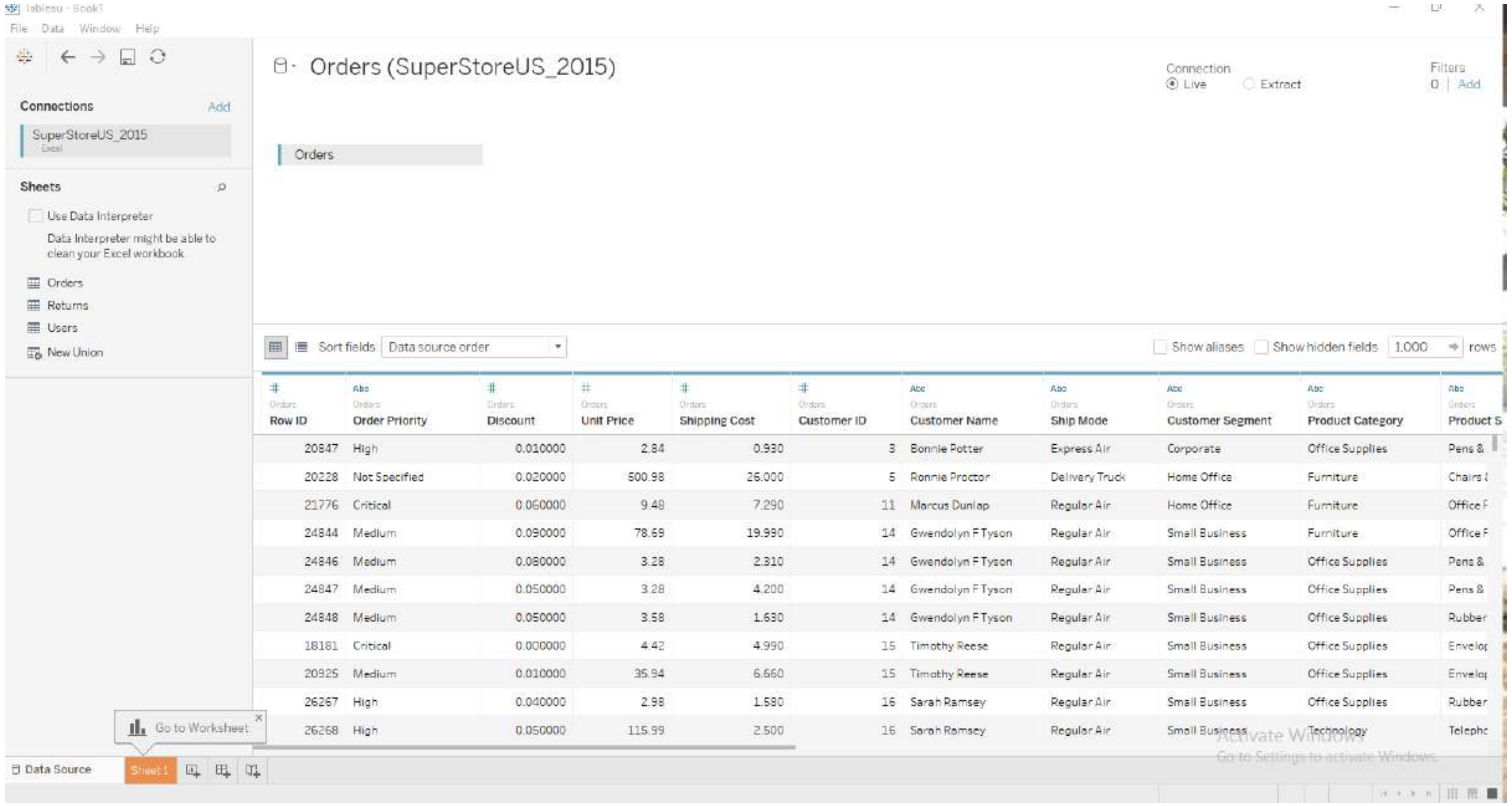
PLAY BOOK : CREATING TREE MAP

Step 1

- Tree maps , much like a pie chart , **<u>tree maps</u> show relative contribution of parts to a whole.**

- But unlike a pie chart, which uses color to distinguish the parts, a treemap uses both **shape and size and color shade to represent the part's contribution**

COLUMNS:	
ROWS:	

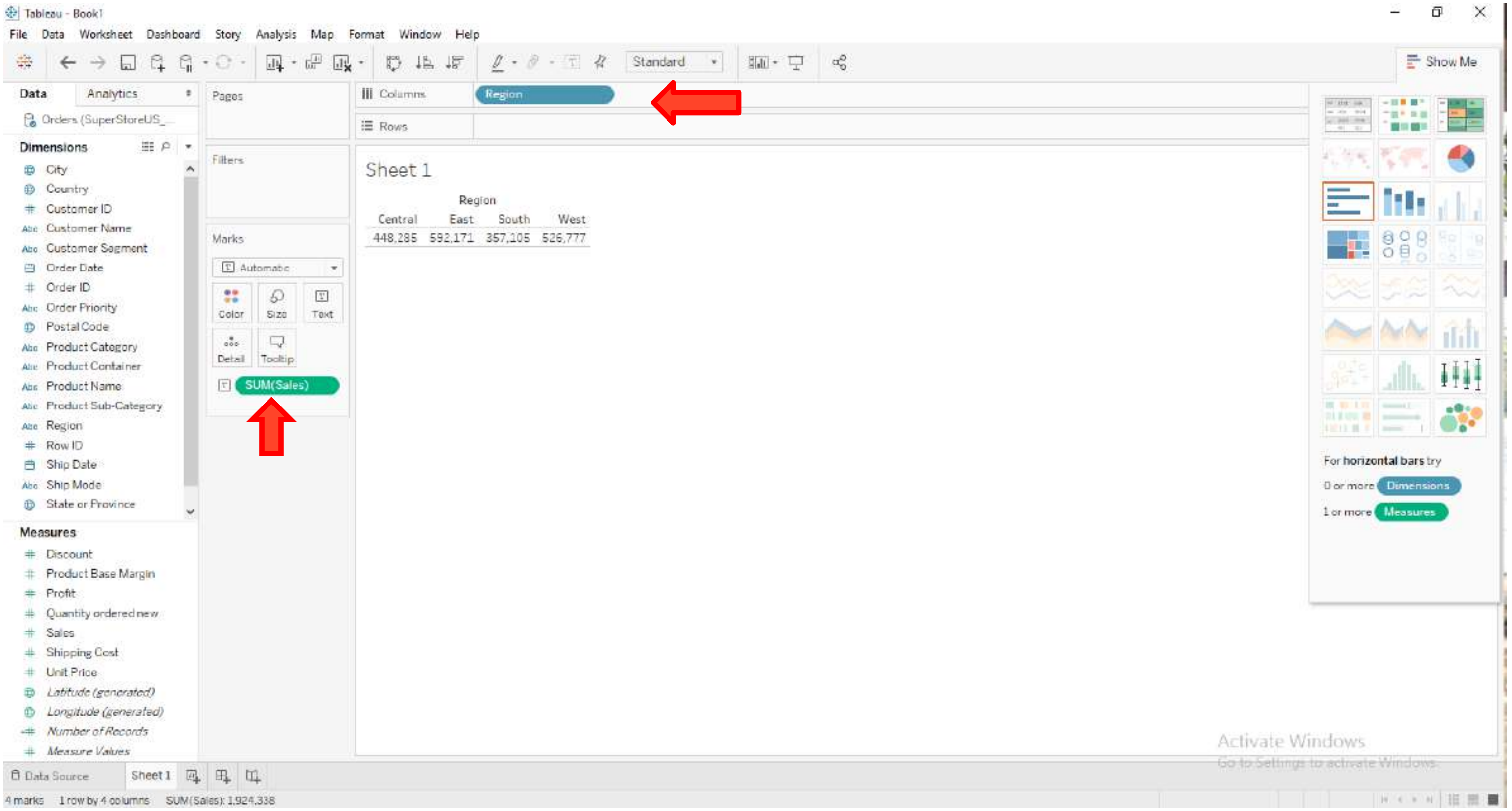


Data Source: demo2/ SuperStoreUS_2015.xlsx

COLUMNS:	Region
ROWS:	

Step 2

- Add **region** to the columns and **SUM(sales)** to the marks.

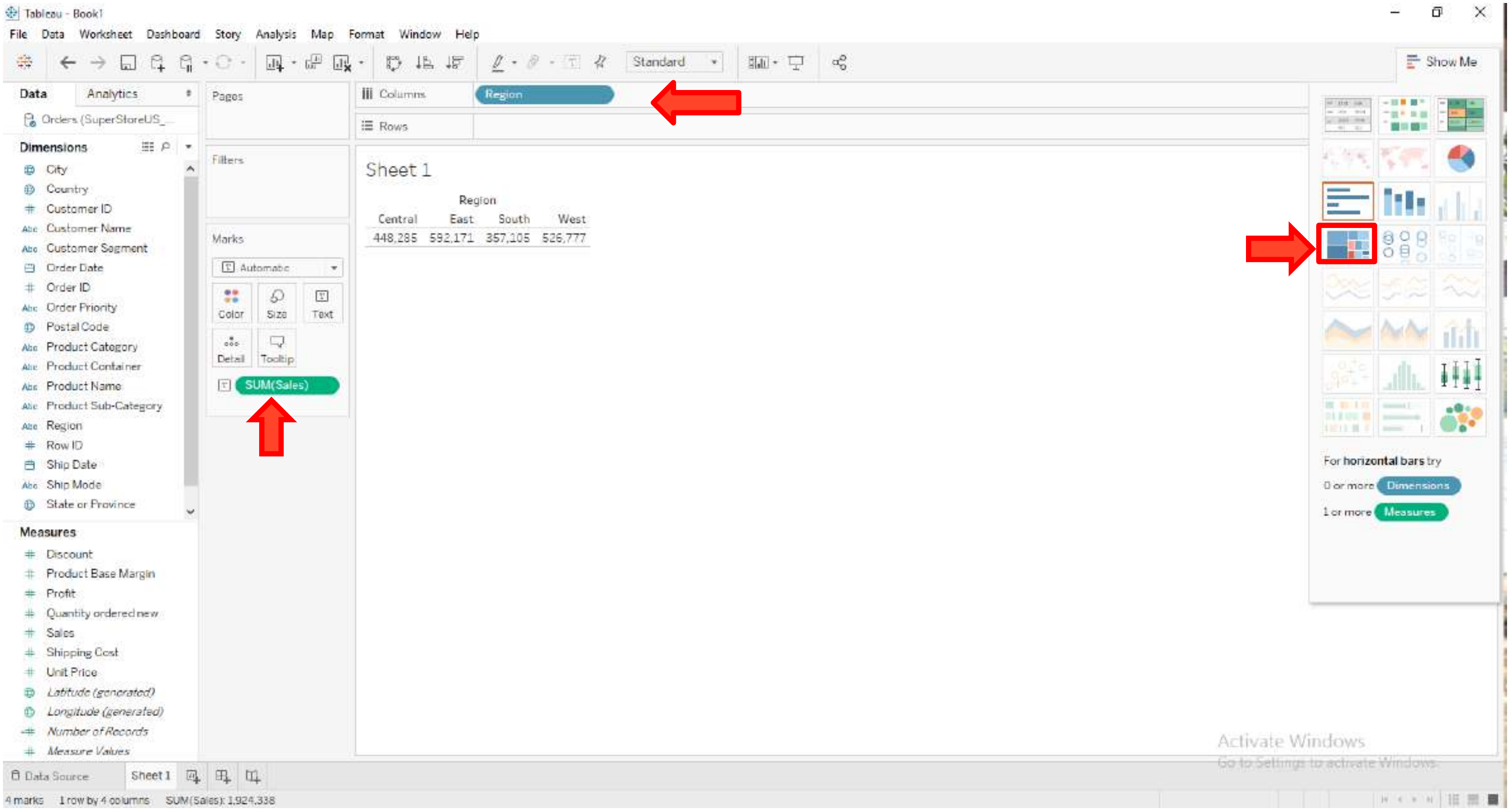


Data Source: demo2/ SuperStoreUS_2015.xlsx

COLUMNS:	Region
ROWS:	

Step 3

- Now select the “Show me” visualization pane to select “Tree Map” visualization.



Data Source: demo2/ SuperStoreUS_2015.xlsx

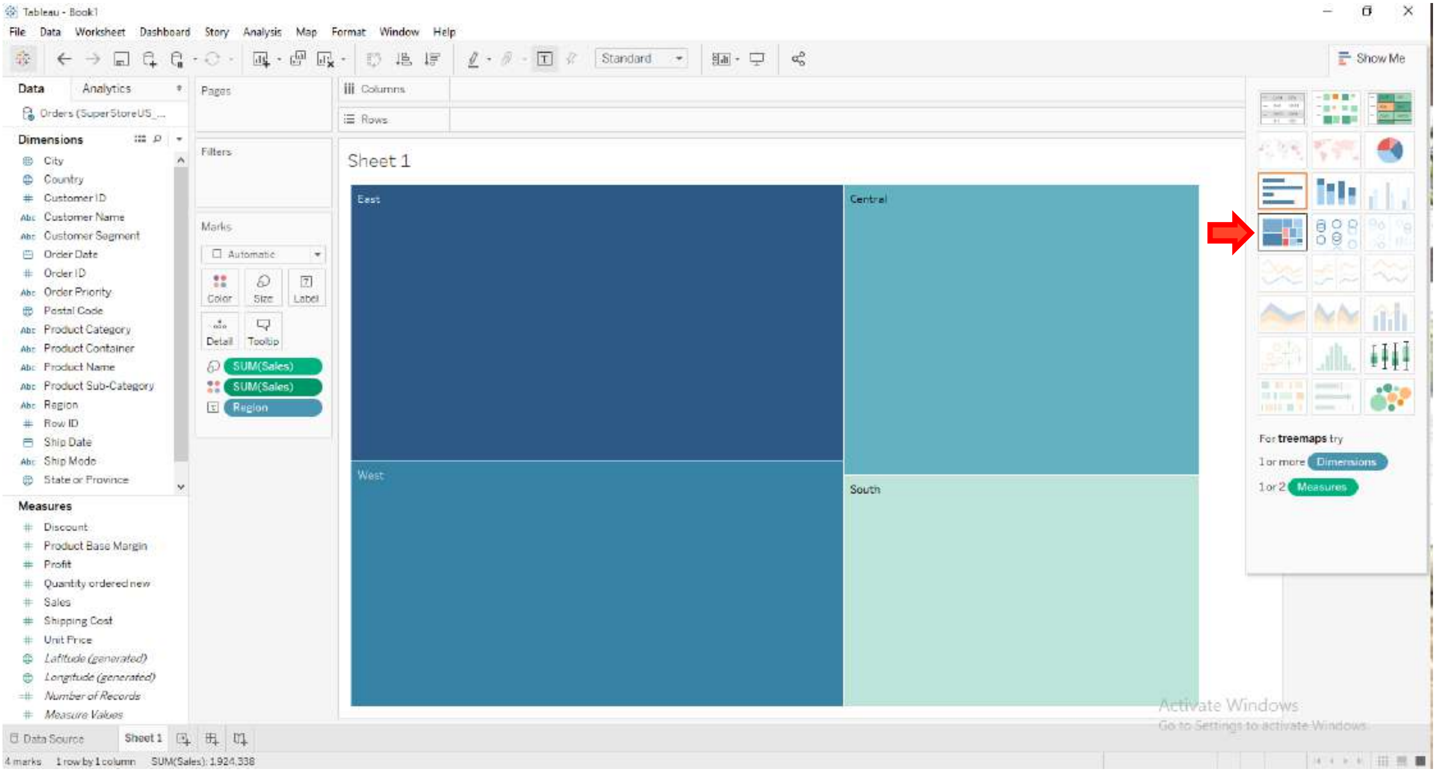
Treemap

- Used to display hierarchical data as a proportion of a whole.
- By coloring the rectangles by a category different from how they are hierarchically structured.

COLUMNS:	Region
ROWS:	

Step 4

- Tree map uses the intensity of the color, shape and size to determine the relative contribution of parts to the whole.

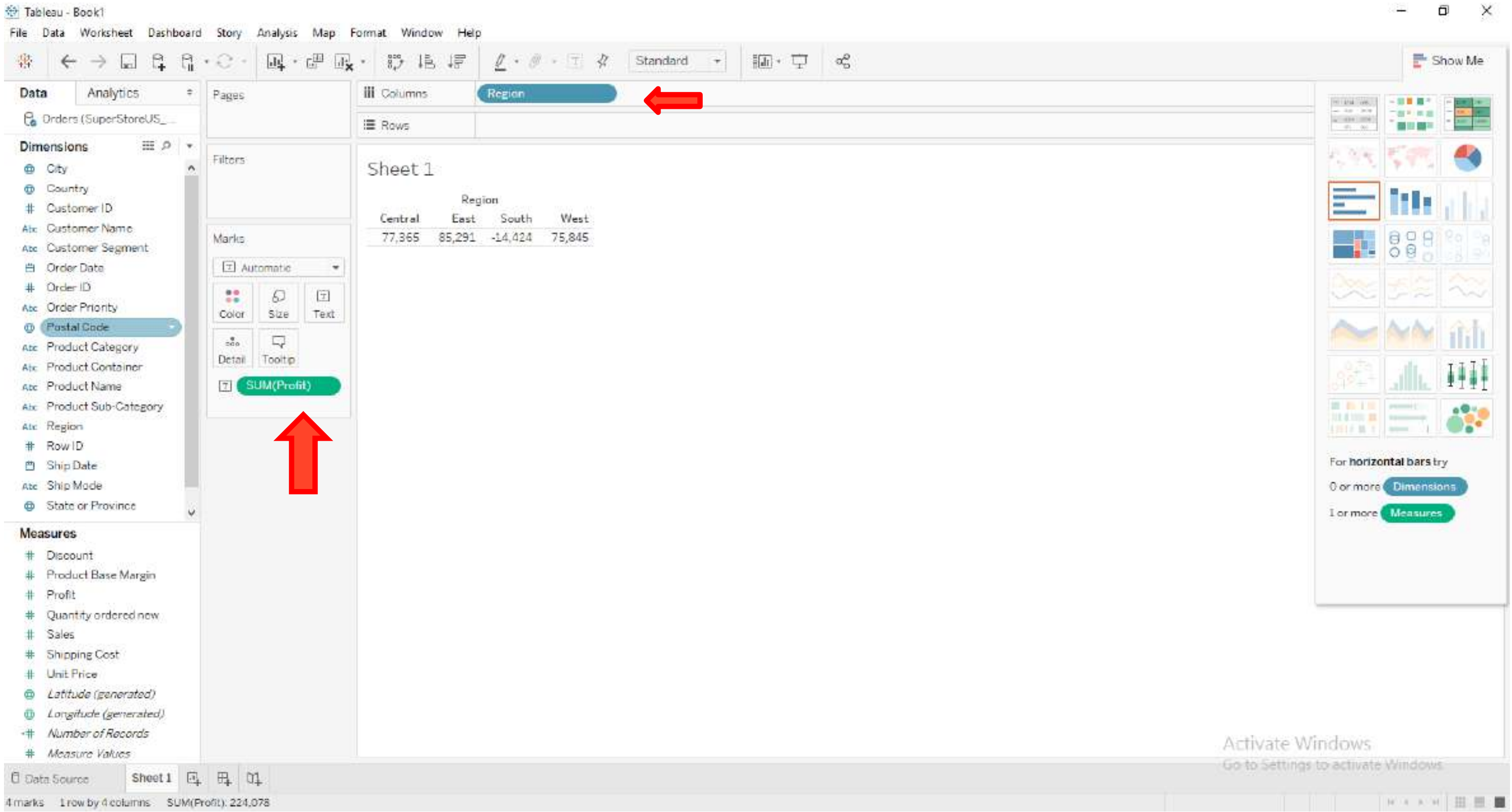


Data Source: demo2/ SuperStoreUS_2015.xlsx

COLUMNS:	Region
ROWS:	

Step 5

- Now let us look at relative contribution of profits to the regions in USA.
- We notice some negative values.

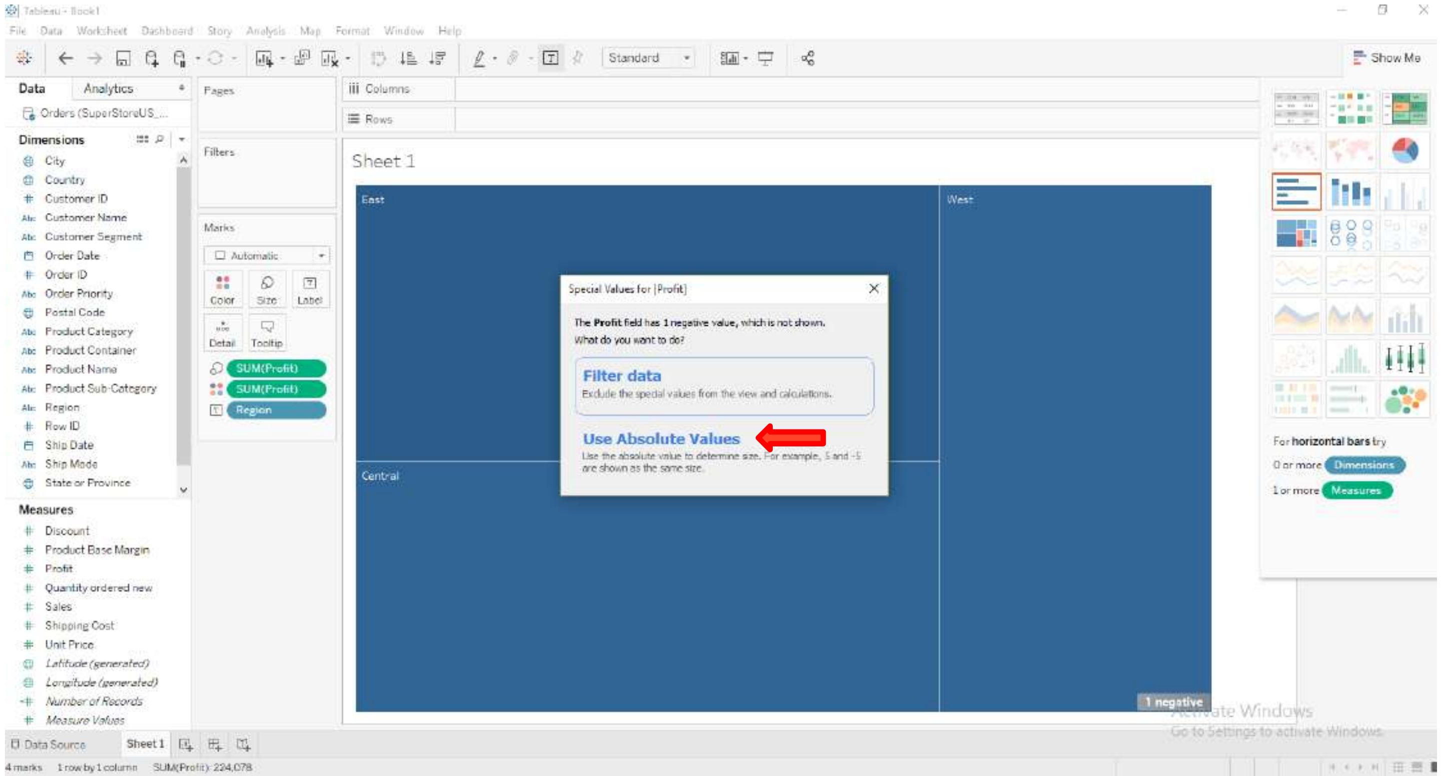


Data Source: demo2/ SuperStoreUS_2015.xlsx

COLUMNS:	Region
ROWS:	

Step 5

- Now let us look at relative contribution of profits to the regions in USA.
- We notice some negative values.
- Upon selecting Treemap visualization, you can see 1 negative value in tree map.
- Selecting it, prompts you for
    - Filter data
    - Use Absolute Values

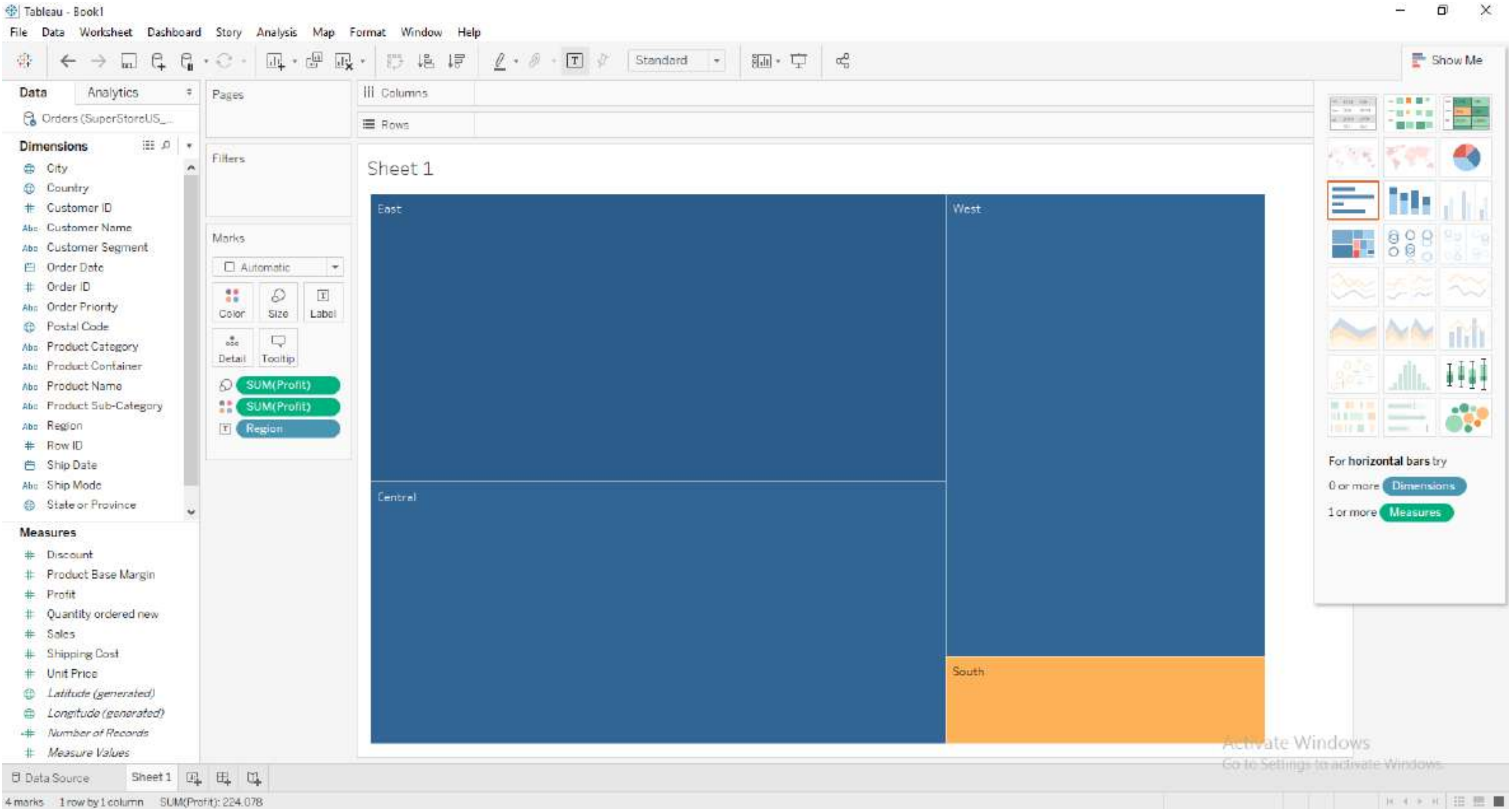


Data Source: demo2/ SuperStoreUS_2015.xlsx

COLUMNS:	Region
ROWS:	

Step 5

- Up on selection of Absolute values, we see the **negative tree map values with a different color code.**



Data Source: demo2/ SuperStoreUS_2015.xlsx

Problem Description:	
Data set used:	**demo2/ SuperStoreUS_2015.xlsx**

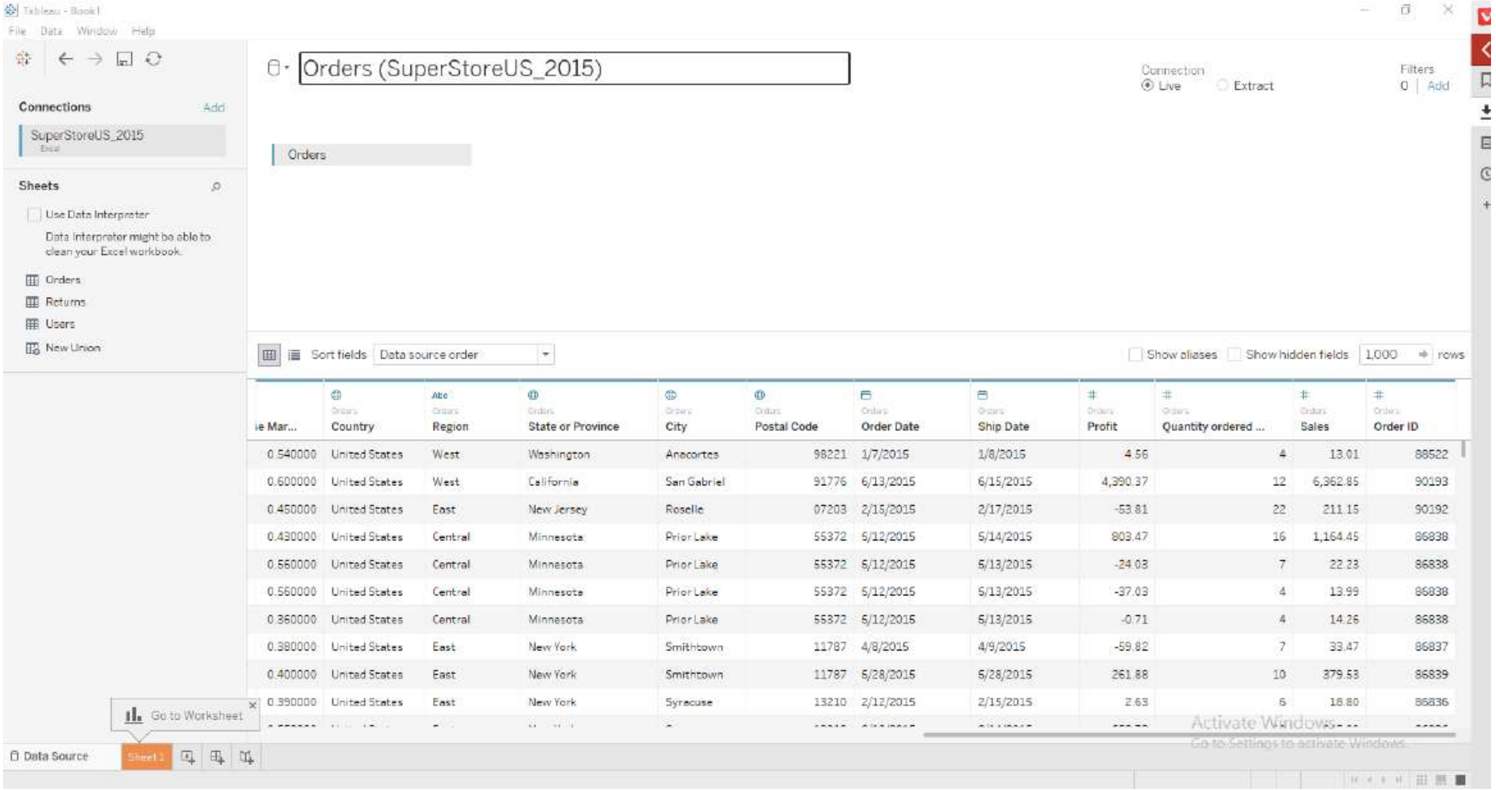
TABLEAU

PLAY BOOK : CREATING BOX PLOT

COLUMNS:	
ROWS:	

Step 1

- select the SuperStoreUS_2015.xlsx data set and load the orders worksheet.

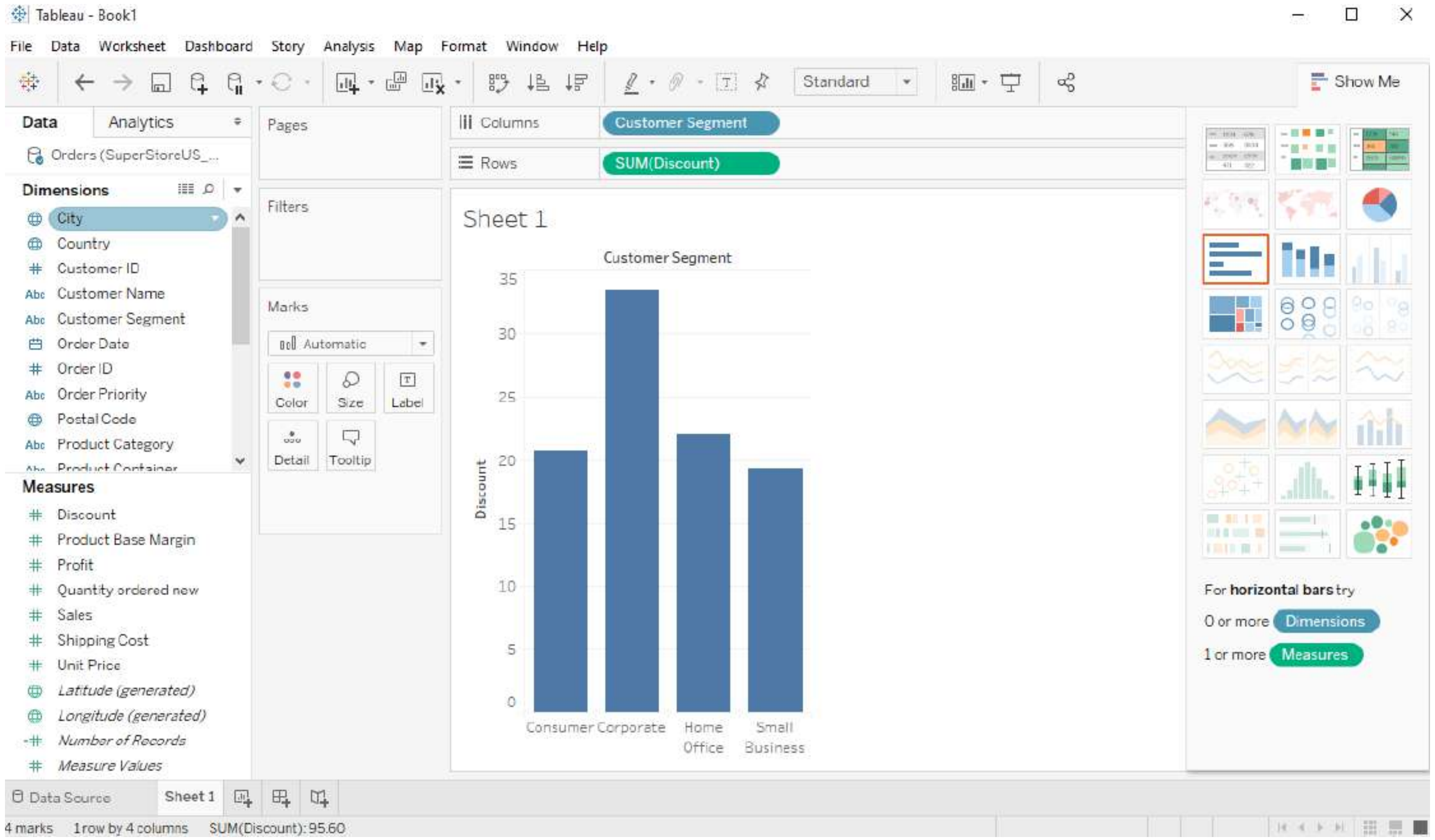


Data Source: demo2/ SuperStoreUS_2015.xlsx

COLUMNS:	Customer Segment
ROWS:	Discount

Step 2

- We would like to plot, the customer segment and discounts offered by region.
- **Lets choose "customer segment" for dimensions and "discount" for measure.**



Data Source: demo2/ SuperStoreUS_2015.xlsx

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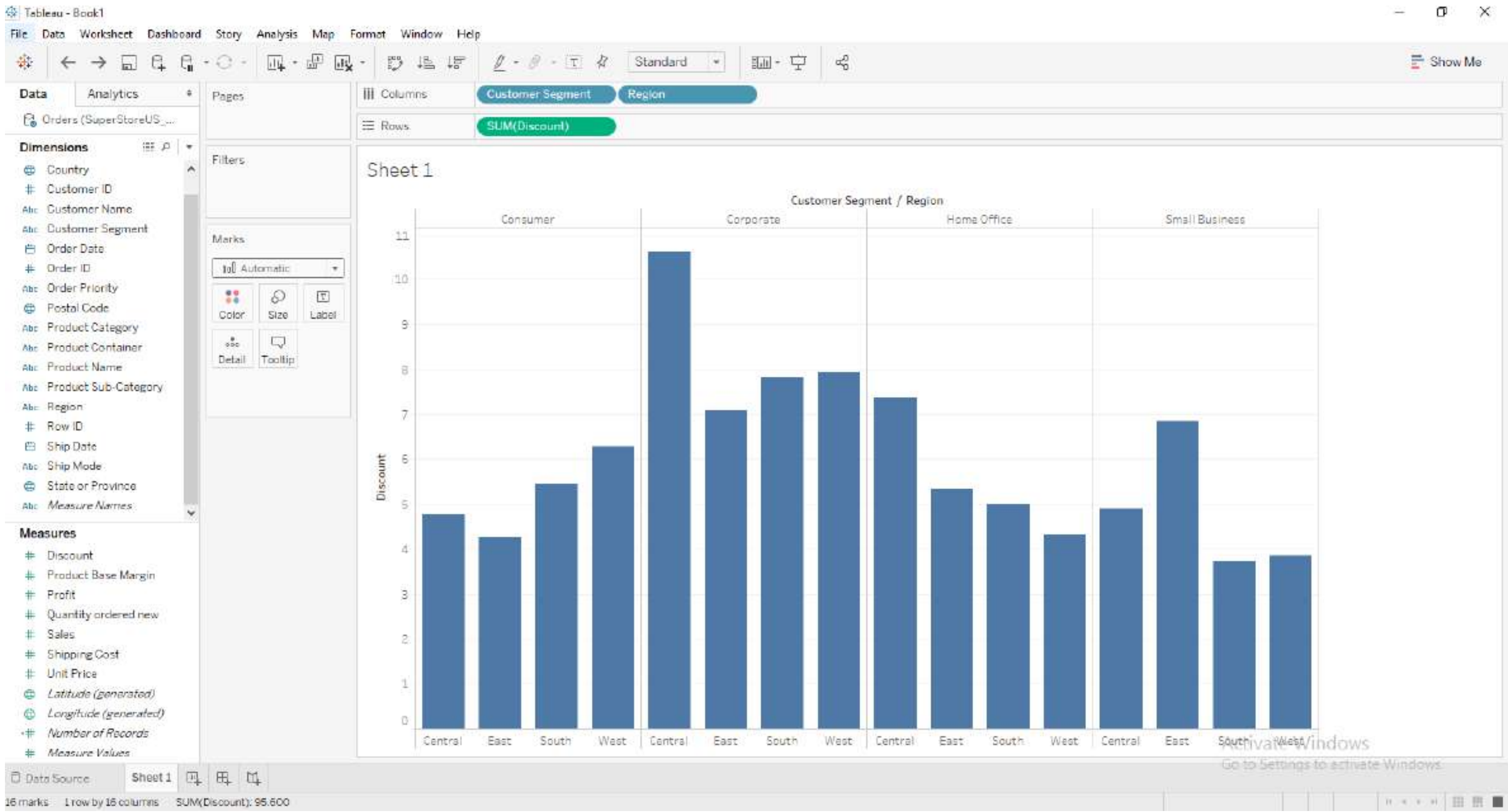
Original Series

TERRITORIAL PRESCIENCE
provoke thought, invoke action

Step 4

COLUMNS:	Customer Segment,Region
ROWS:	Discount

- Now let us add, “region” to the customer segment dimension to visualize and organize the results based on region as shown in the figure.
- The default bar chart provides a perspective classifying the data by region, we could choose to change the perspective from the “show me” visualization pane.



Data Source: demo2/ SuperStoreUS_2015.xlsx

Box-and-whisker plot

- Used to show distribution of data. The box contains the median of the data along the 1st and 3rd quartiles, and the whiskers, typically represent data within 1.5 times the inter-quartile range(the difference between the 1st and 3rd quartiles)
- Can be used to show the maximum and minimum points within the data.

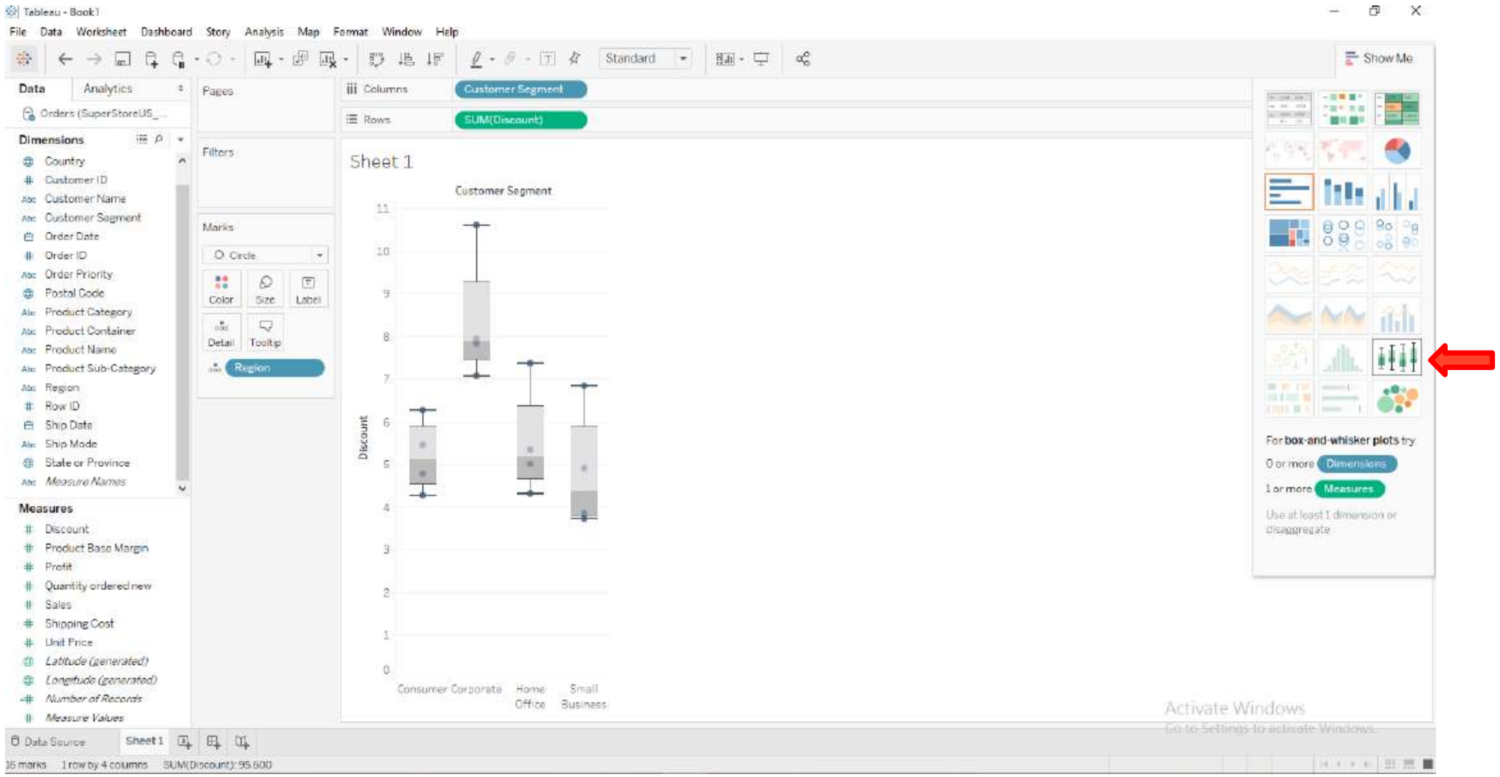
- Used to compare boxplots across categorical dimensions or to compare distributions between data sets.

COLUMNS:	Customer Segment
ROWS:	Discount

Step 5

• Upon selection of the box plot visualization from the “show me” visualization pane.

•**Tableau provides us with a box plot perspective as shown in the figure.**



Data Source: demo2/ SuperStoreUS_2015.xlsx

Problem Description:	
Data set used:	

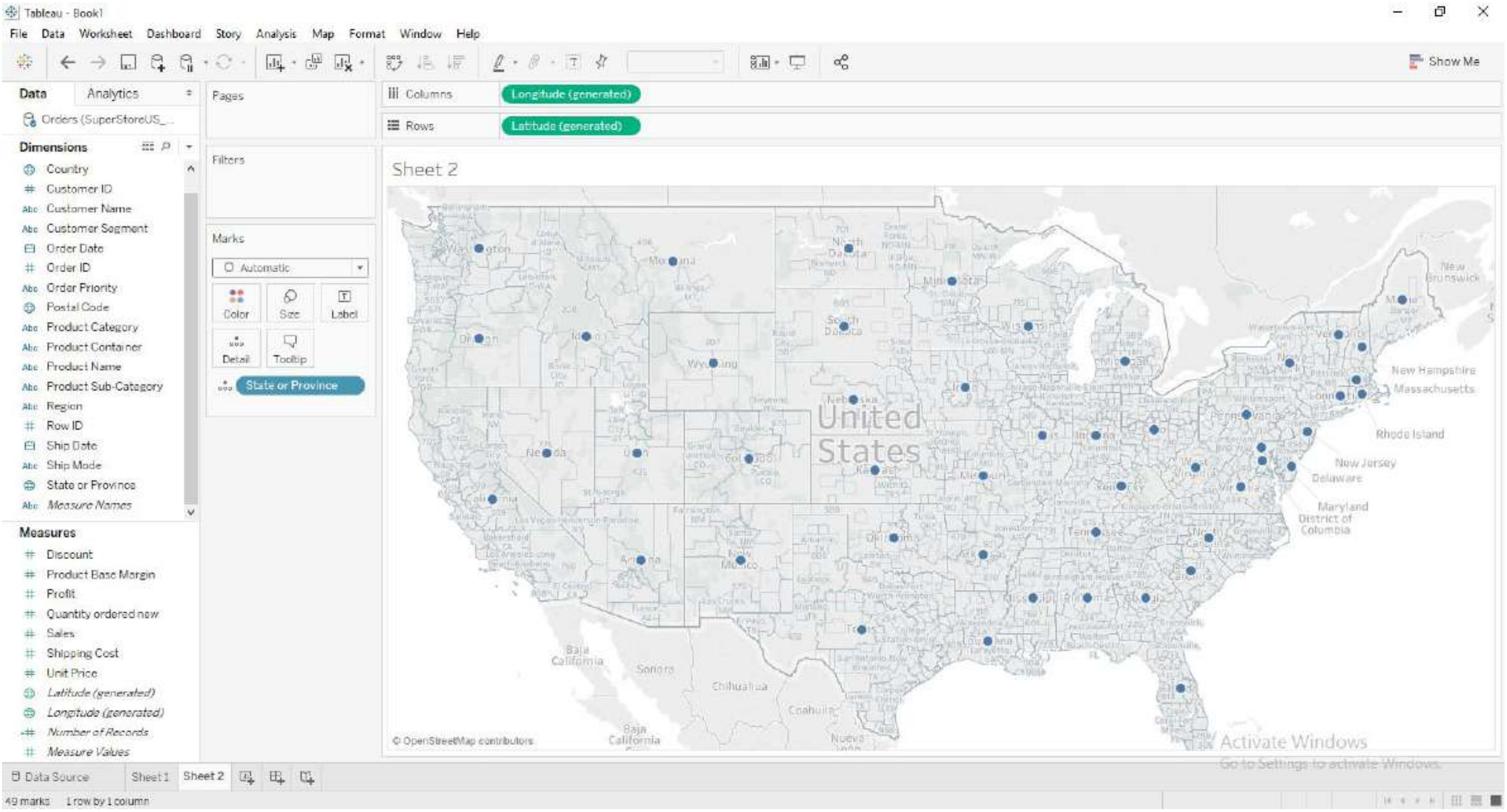
SYED AWASE KHIRNI

TABLEAU : MAPPING GEOGRAPHIC DATA

COLUMNS:	
ROWS:	

Step 1

- Select “State or Province” Measure name to plot a map with open source map data inside tableau.

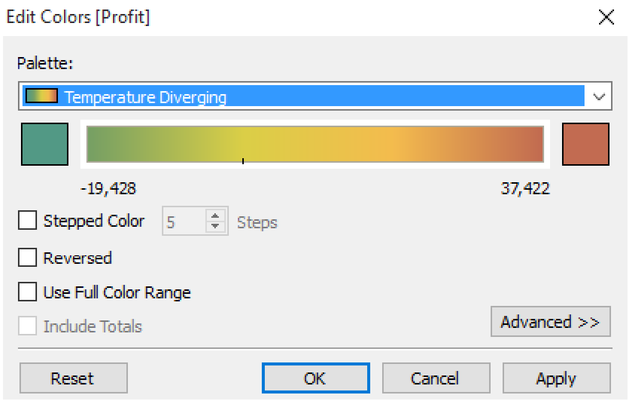


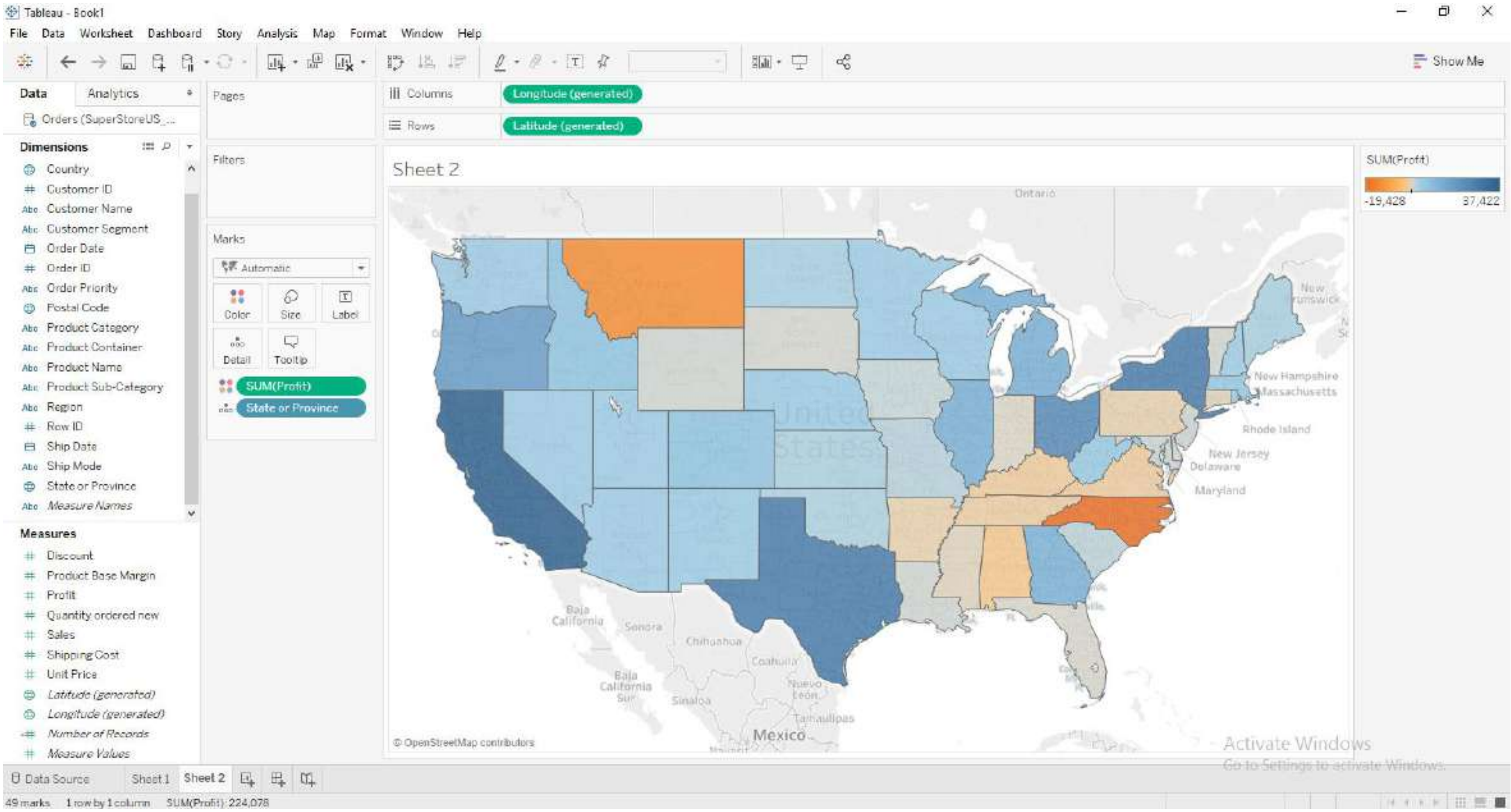
Data Source: demo2/ SuperStore2015.xlsx

COLUMNS:	
ROWS:	

Step 2

- select "profit" measure value to mark on to the colors by the state.





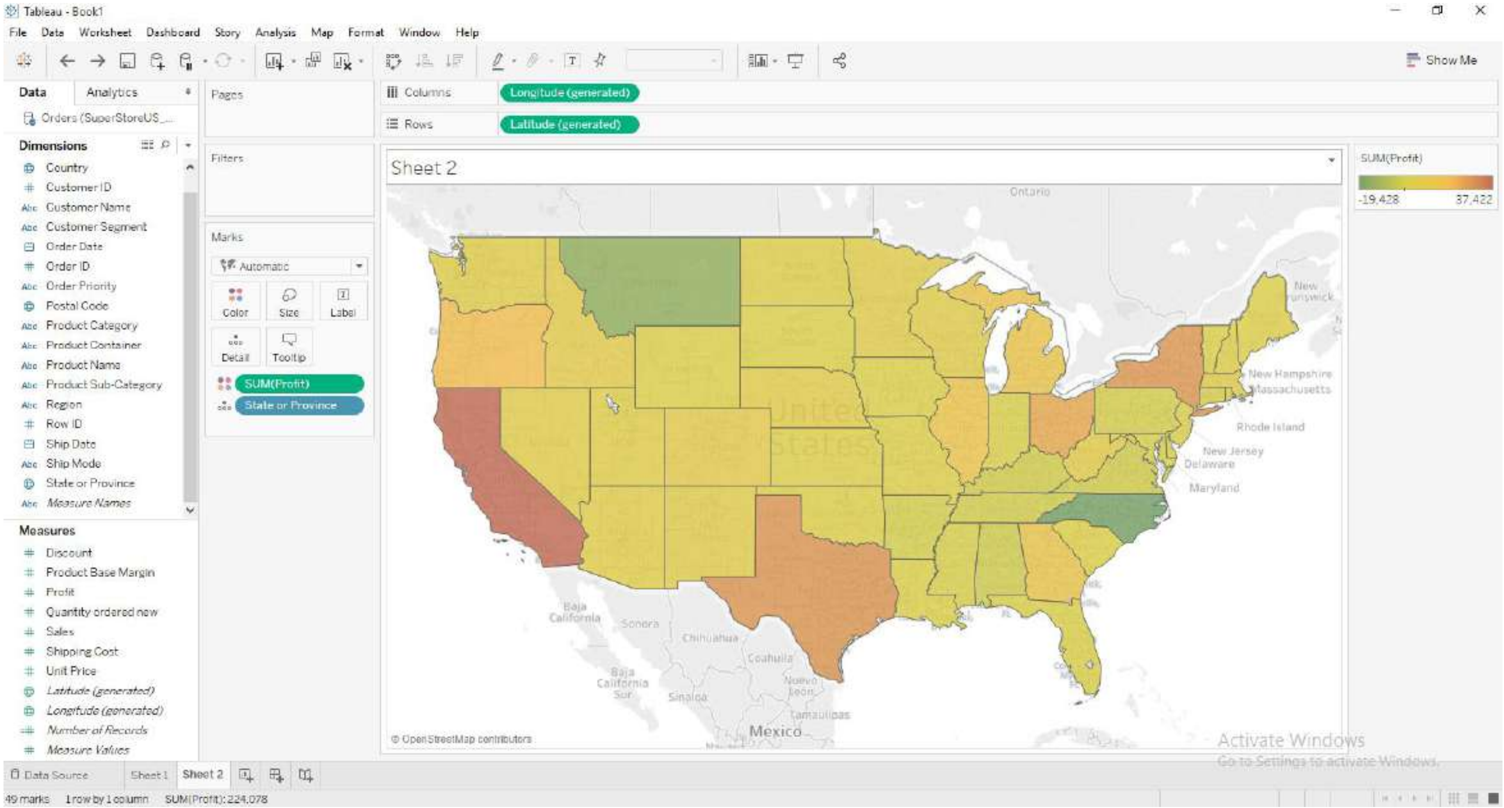
Data Source: demo2/ SuperStore2015.xlsx

COLUMNS:

ROWS:

Step 3

- Upon apply the color theme, we see profit by state.



Data Source: demo2/ SuperStore2015.xlsx

Problem Description:	
Data set used:	

SYED AWASE KHIRNI

TABLEAU : DUAL AXIS GRAPHS/COMBINATION CHARTS

Combination Charts/Dual Axis Chart

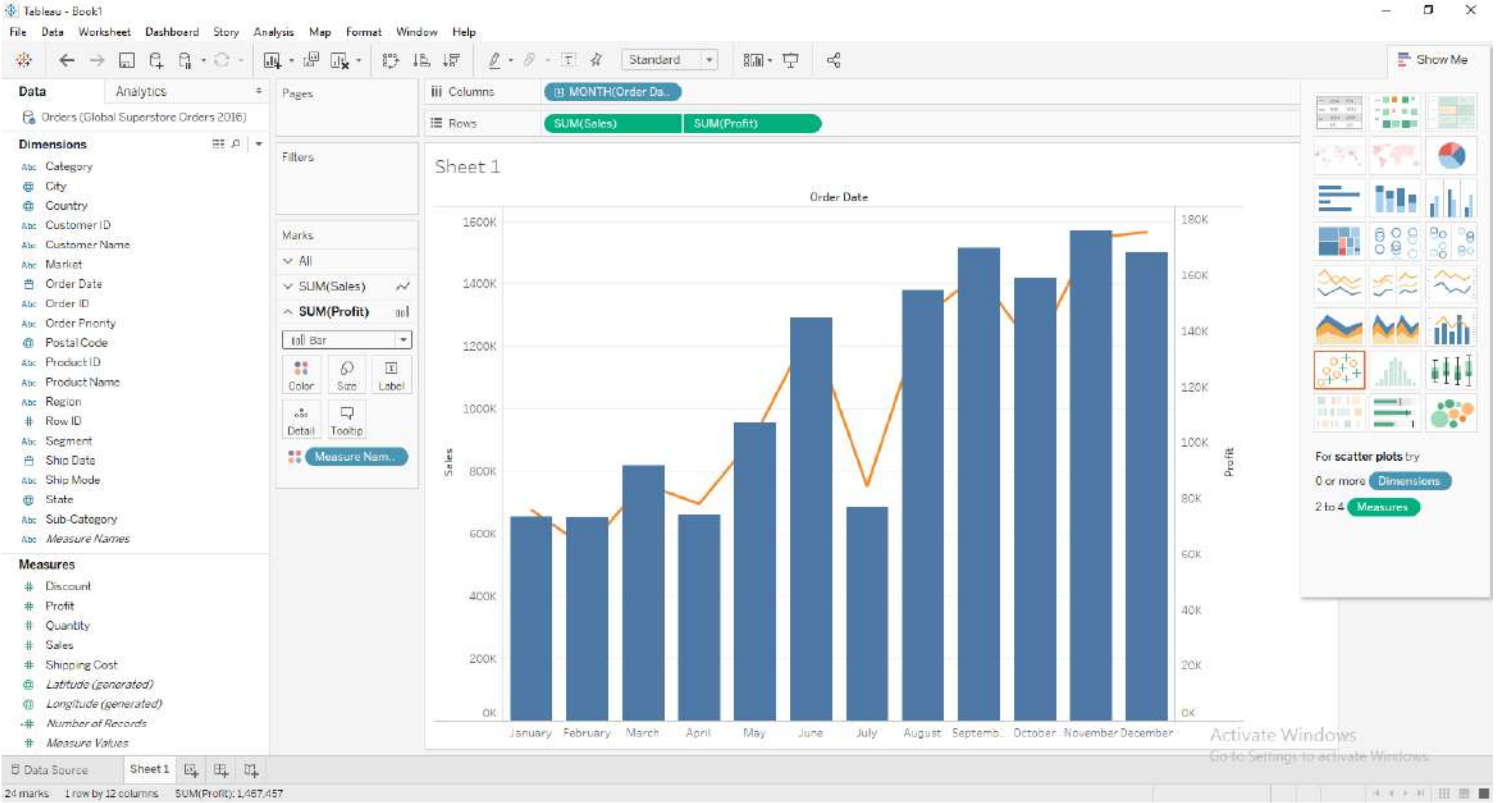
- A chart that combines two or more chart types into a single chart.
- They are similar to multi-series charts, they allow us to plot multiple datasets on the same chart.
- They can be rendered in either 2D or 3D can have single or dual y-axes and can be stacked or multi-series in nature.

- Dual Axis charts are used for comparing a variable across different timelines such as year 2013 and year 2014 for sales(Year over Year Sales).

COLUMNS:	Month(Order Date)
ROWS:	Sum(Sales) SUM(Profit)

Step 1

- We select OrderDate by Month and sales, subsequently let us drag profit to the right hand side axis to create a dual axis .
- We can select the profits in the marks pane and select visualization type to bar chart.

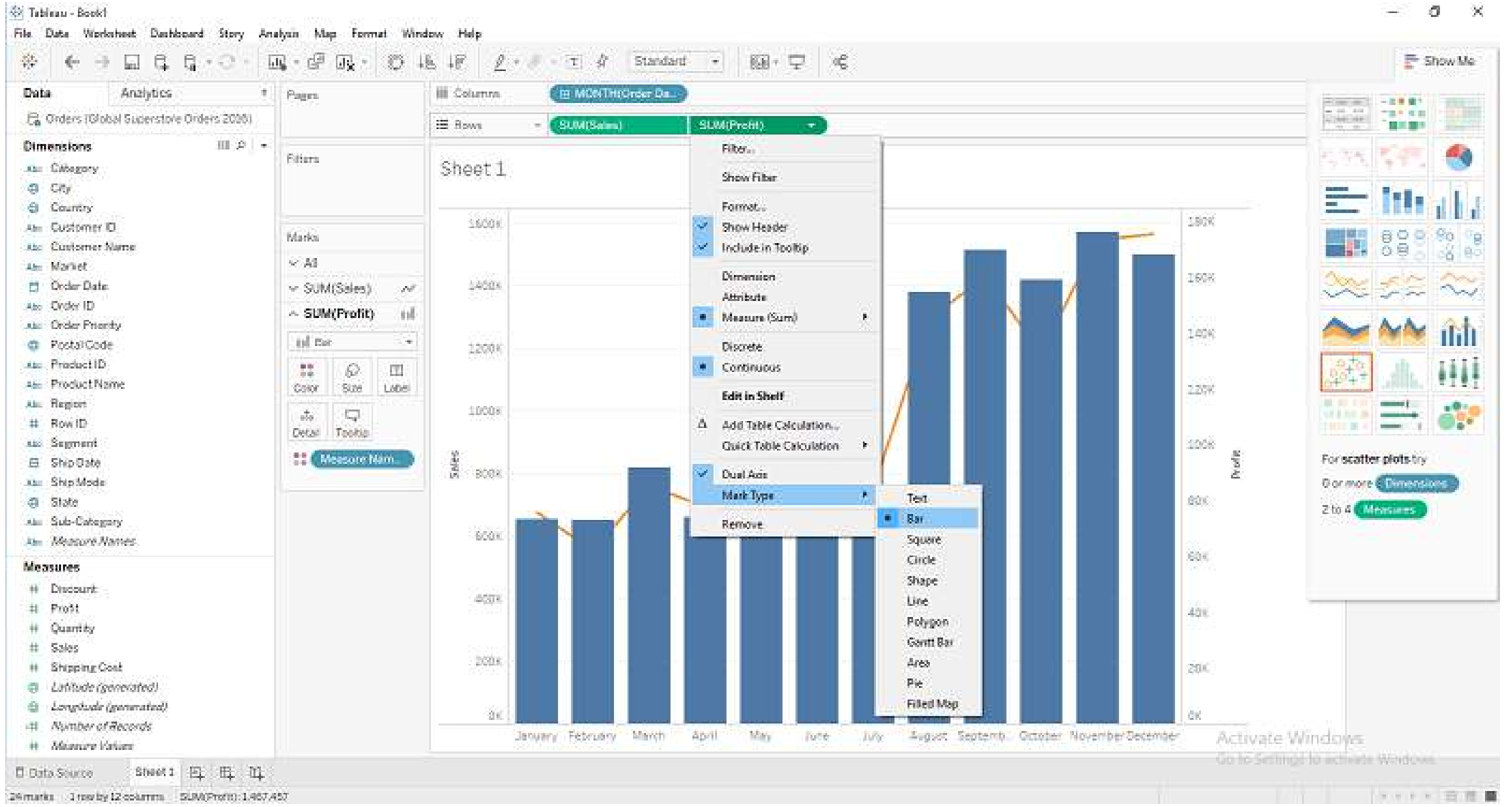


Data Source: demo1/ GlobalSuperStore2016.xlsx

COLUMNS:	Month(Order Date)
ROWS:	Sum(Sales) SUM(Profit)

Step 2

- Alternatively, you can switch the Sum(Profit) visualization type by selecting the rows pane and choosing appropriate mark type as shown in the figure.

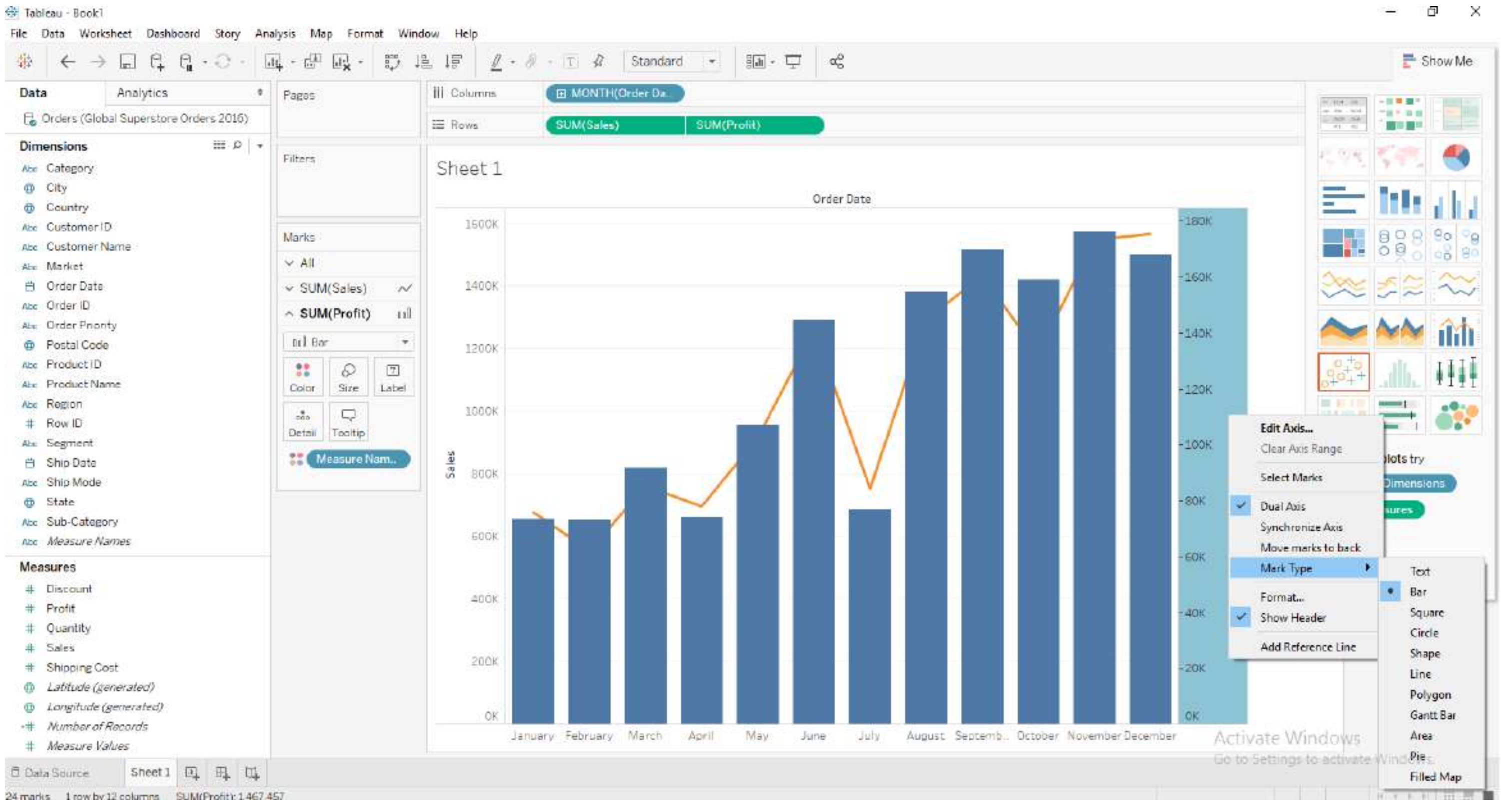


Data Source: demo1/ GlobalSuperStore2016.xlsx

COLUMNS:	Month(Order Date)
ROWS:	Sum(Sales) SUM(Profit)

Step 3

- Alternatively, you can click on the secondary axis to select appropriate mark type



Data Source: demo1/ GlobalSuperStore2016.xlsx

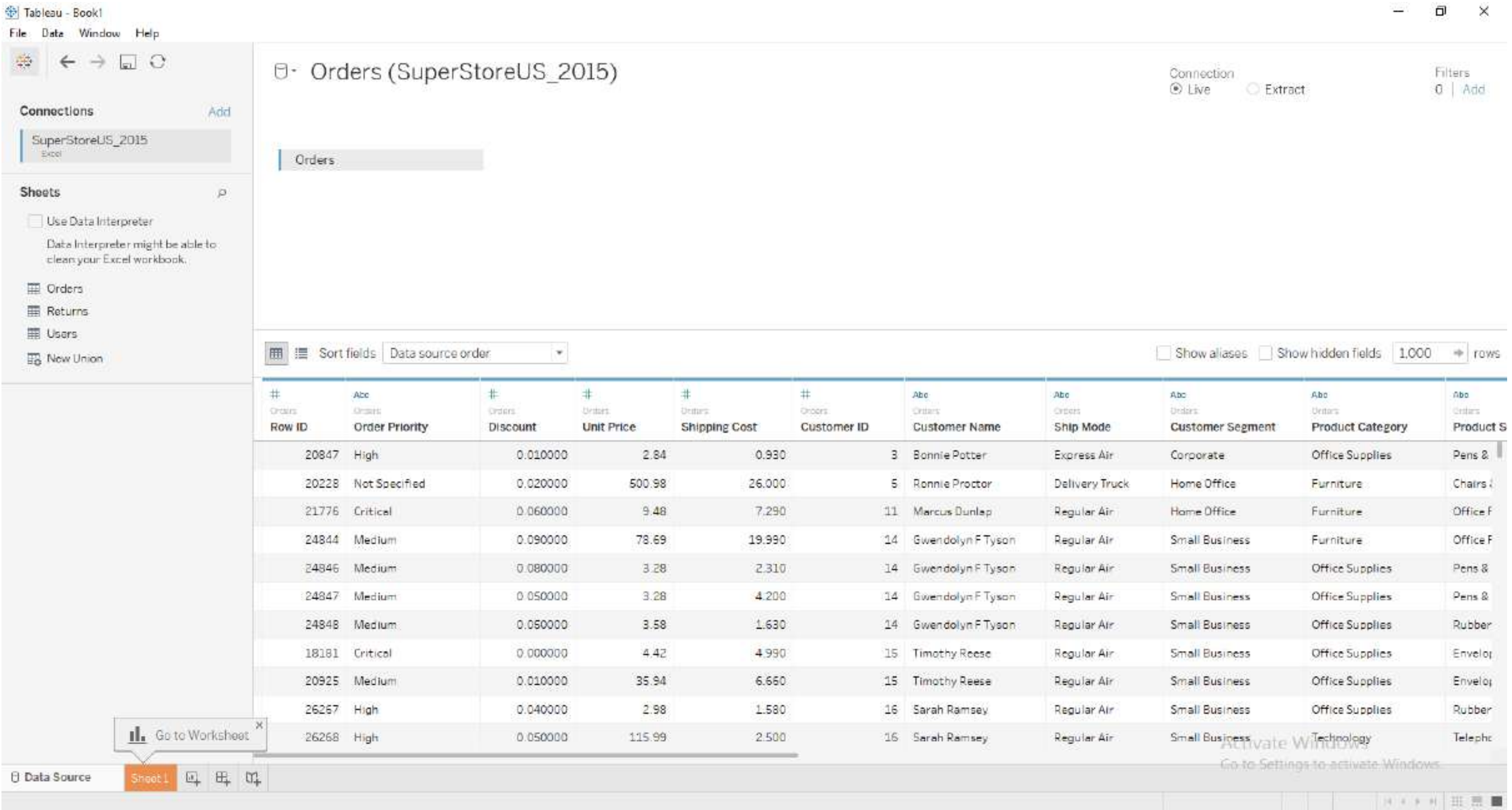
Example 2:

Step 1

- Load the superstore2015.xlsx files into tableau.

COLUMNS:

ROWS:



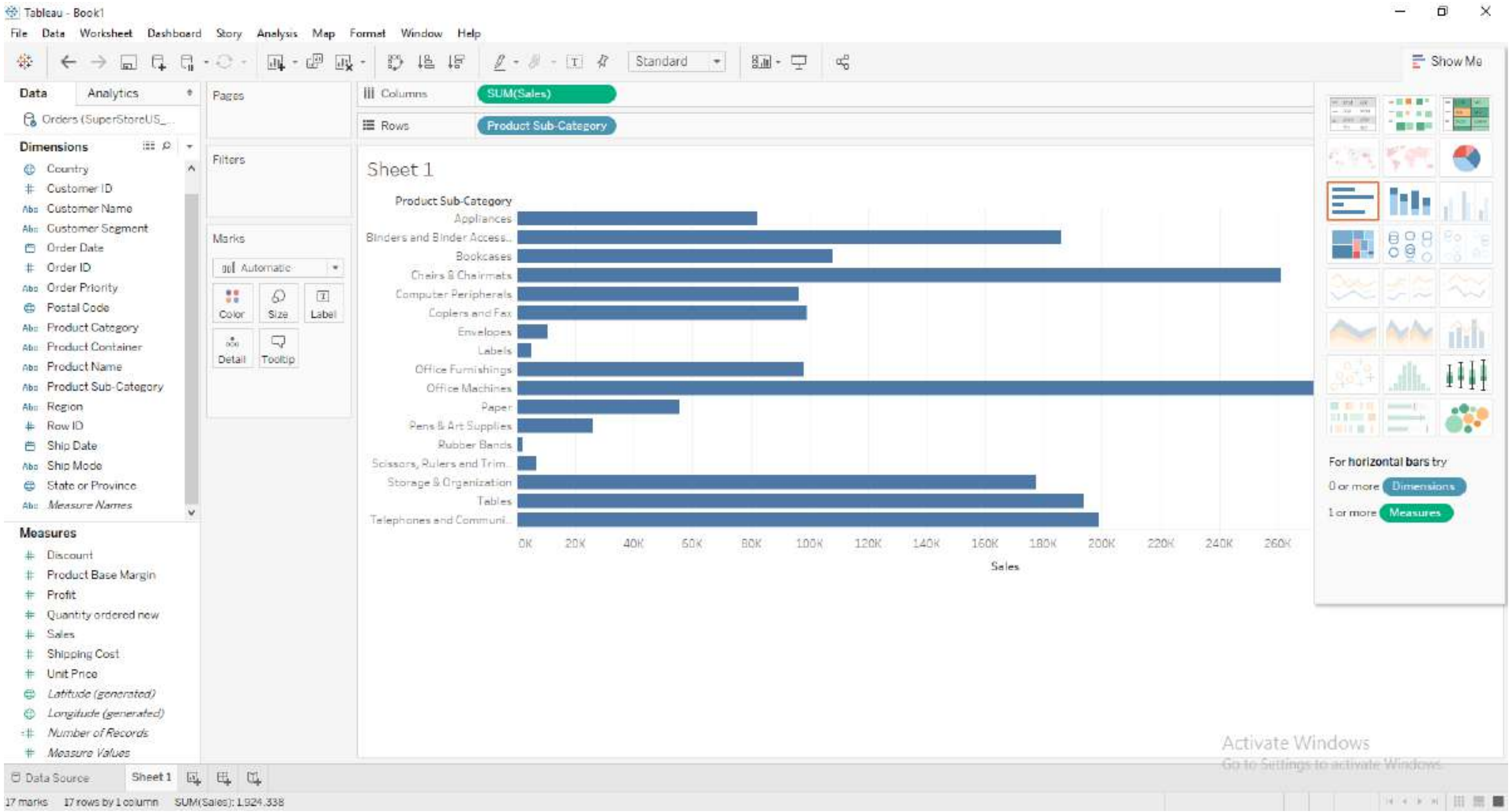
Data Source: demo2/ SuperStore2015.xlsx

Example 2:

Step 2

COLUMNS:	SUM(Sales)
ROWS:	Product Sub-category

•Select sales and product sub-category to visualize a bar chart.



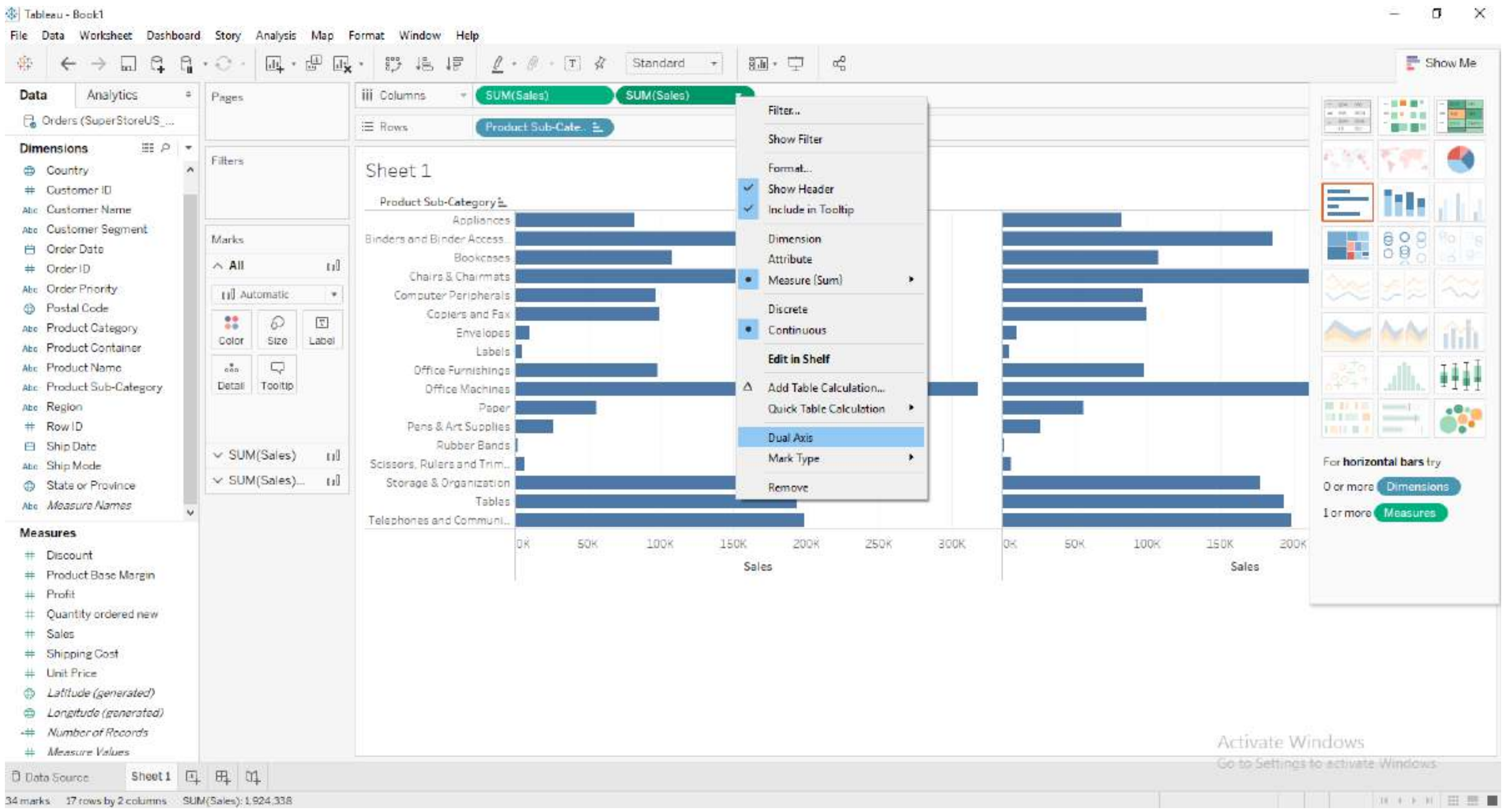
Data Source: demo2/ SuperStore2015.xlsx

Example 2:

Step 3

COLUMNS:	SUM(Sales),SUM(Sales)
ROWS:	Product Sub-category

- To create a dual axis chart, lets now add another SUM(sales) measure to the columns and in the options select dual axis chart.



Data Source: demo2/ SuperStore2015.xlsx

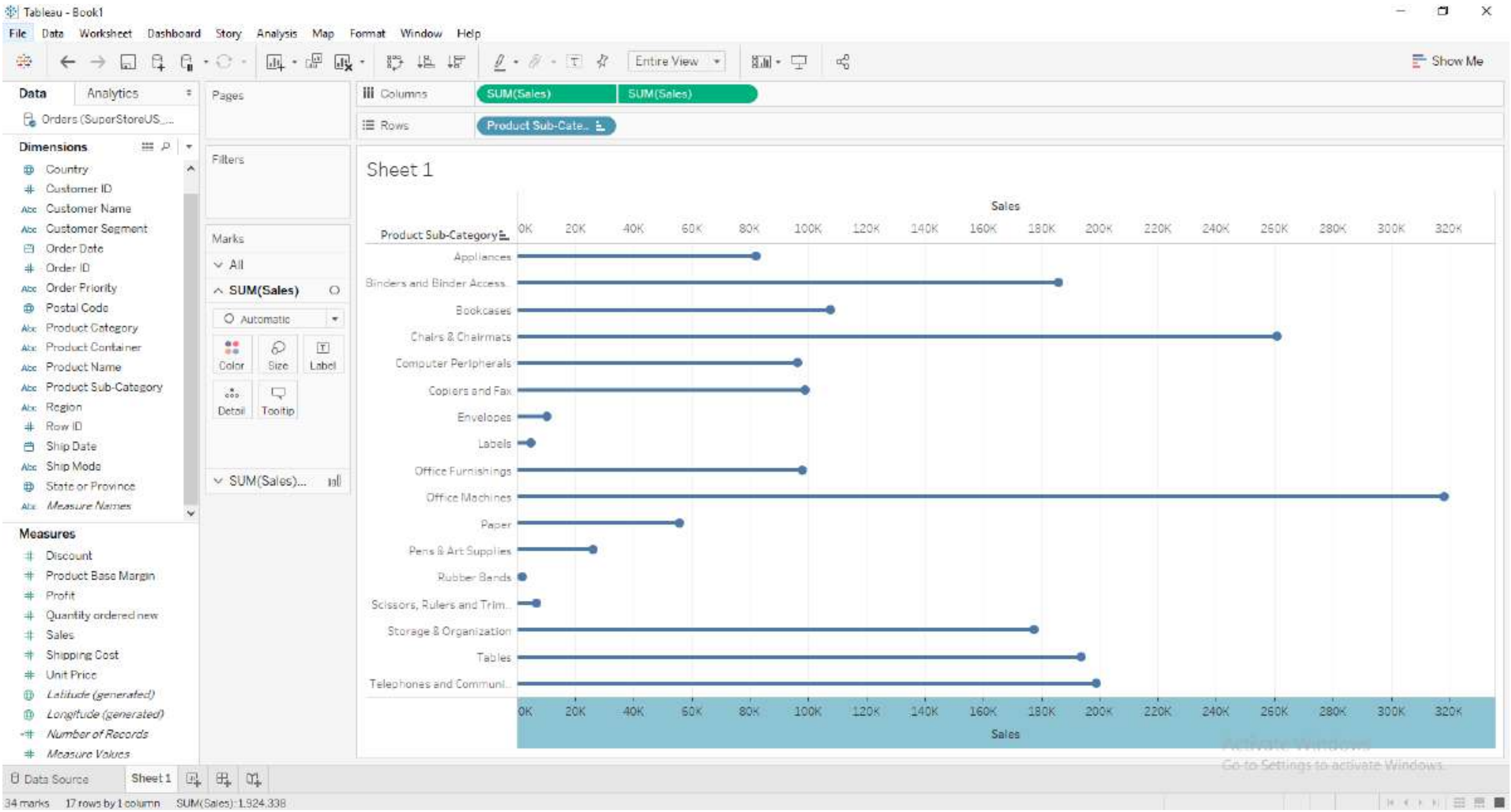
Original Series

Example 2:

Step 4

- Resize the marks for dual marks to make a lolipop chart and synchronize both the axis.

COLUMNS:	SUM(Sales)
ROWS:	Product Sub-category



Data Source: demo2/ SuperStore2015.xlsx

Original Series

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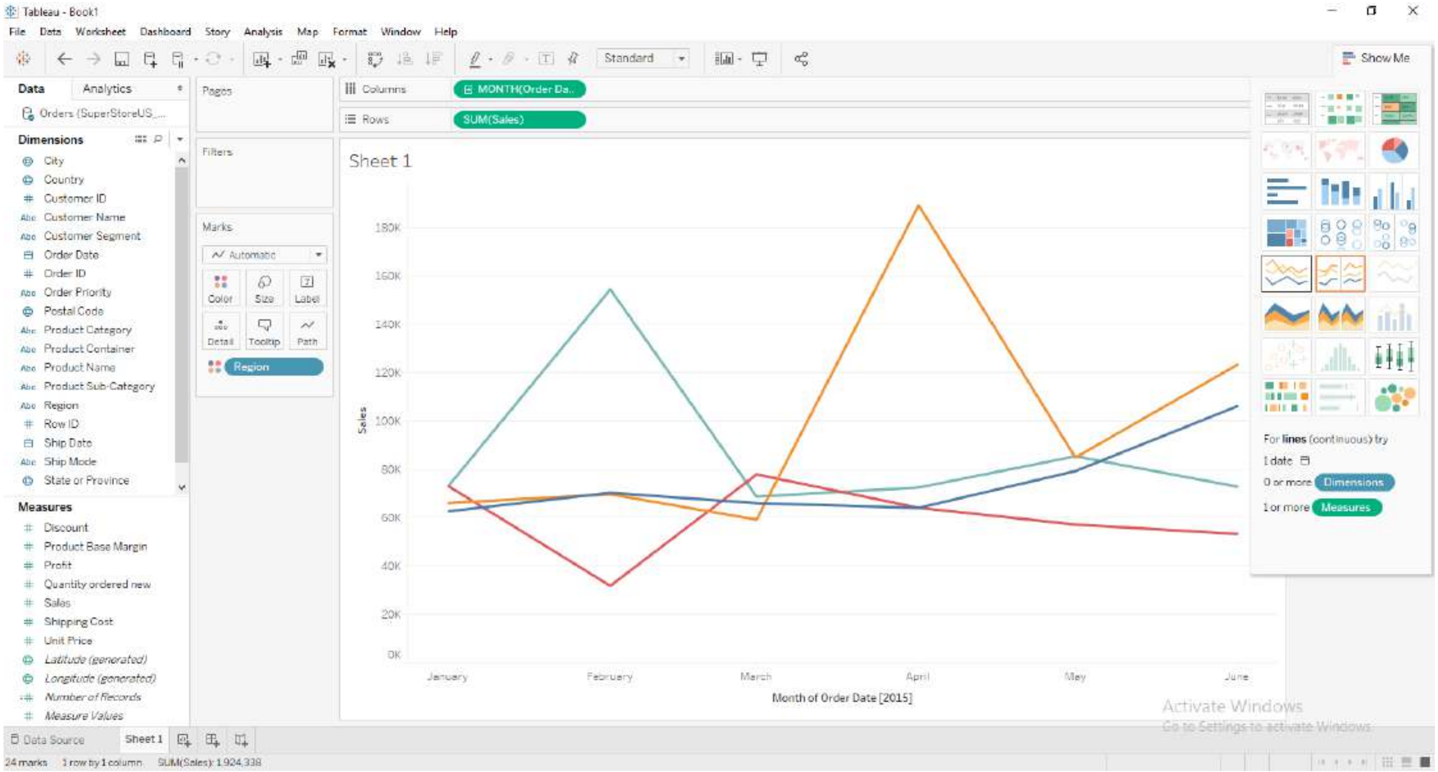
provoke thought, invoke action

Example 3:

Step 1

- plot Monthly(orderDate) to Sum(Sales), drag the region to color marks to visualize based on regions.

COLUMNS:	Monthly(OrderDate)
ROWS:	SUM(Sales)



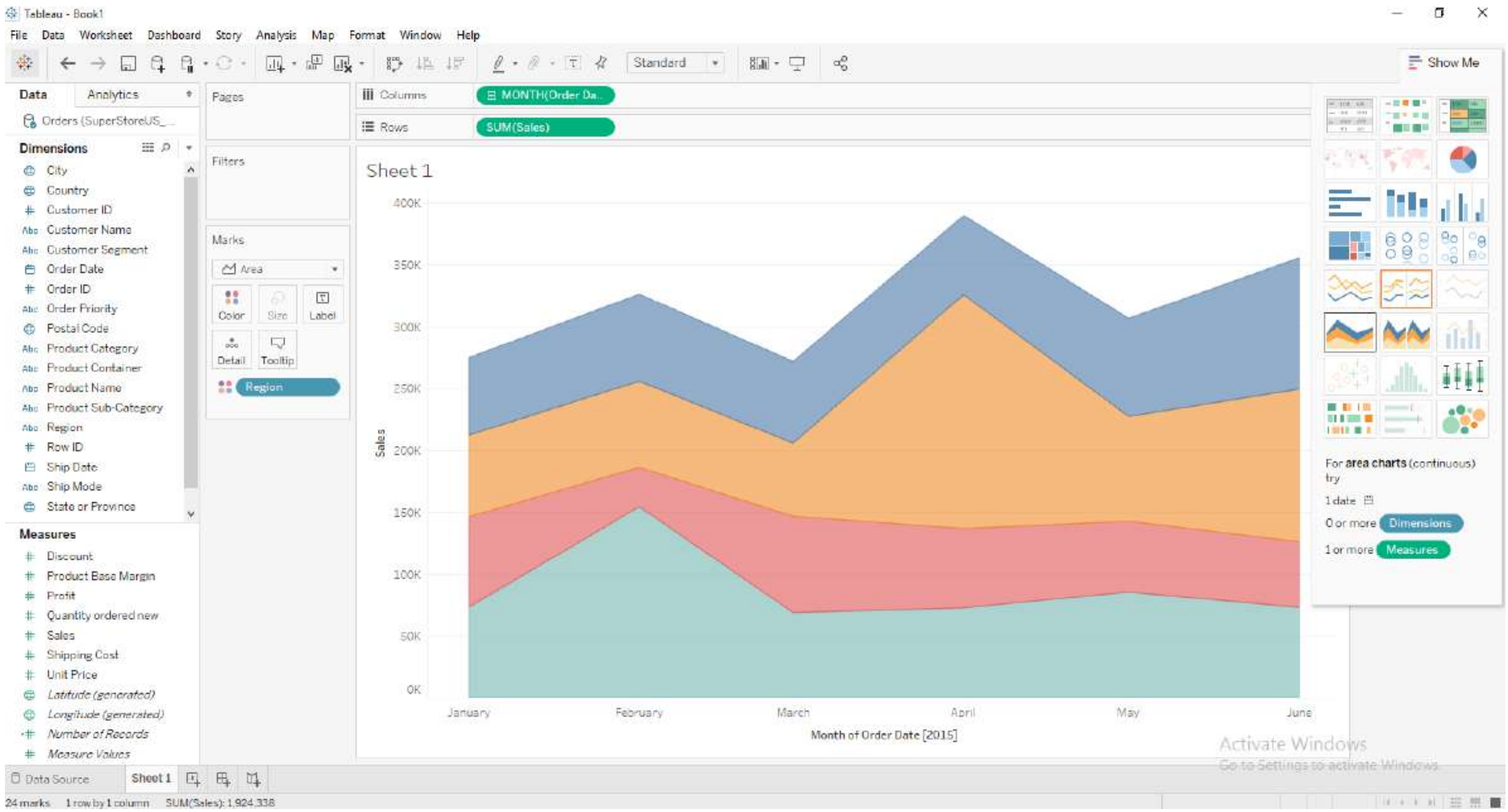
Data Source: demo2/ SuperStore2015.xlsx

Example 3:

Step 2

- now select “area chart” from showme visualization chart.

COLUMNS:	Monthly(OrderDate)
ROWS:	SUM(Sales)



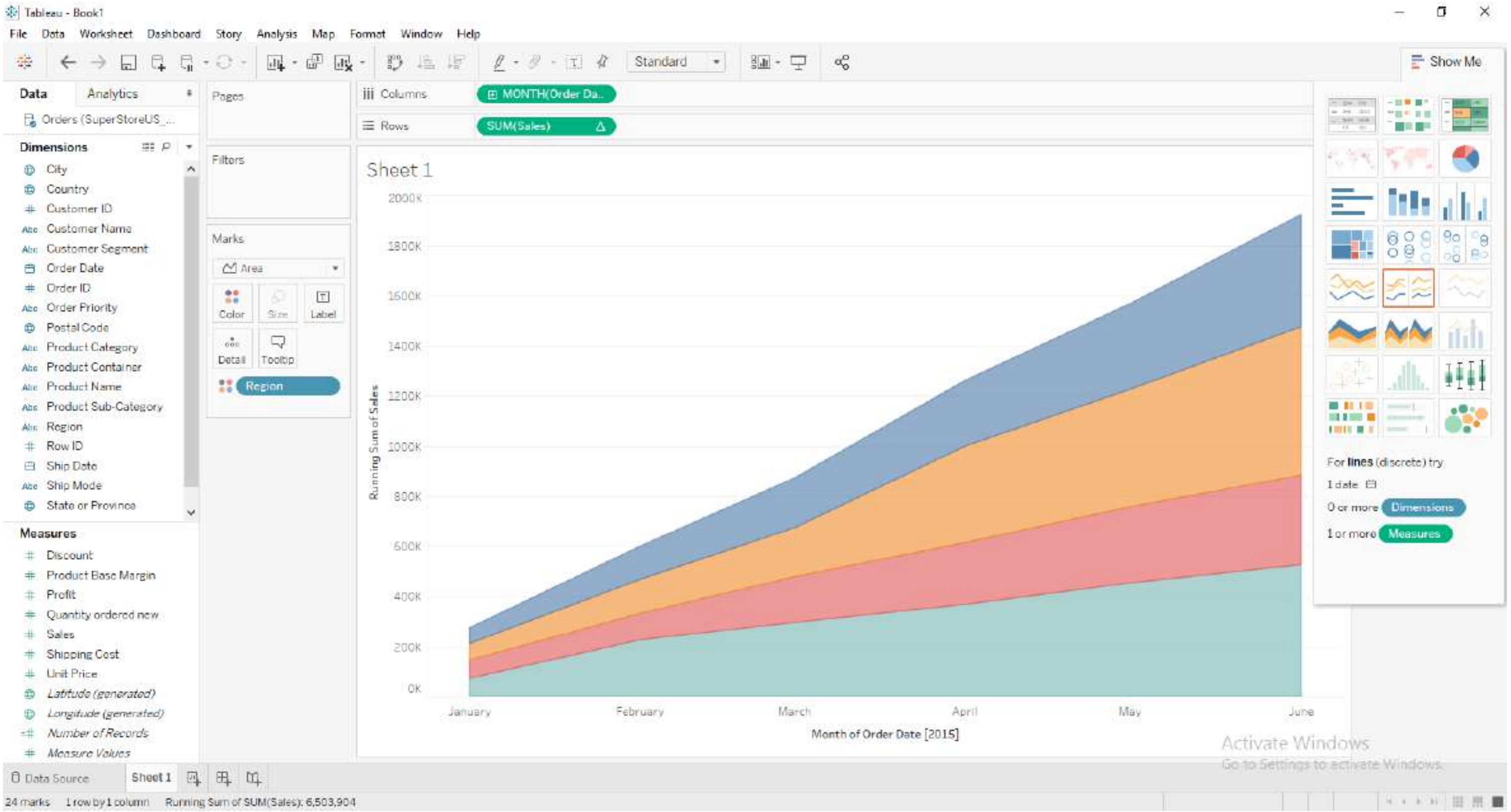
Data Source: demo2/ SuperStore2015.xlsx

Example 3:

Step 3

COLUMNS:	Monthly(OrderDate)
ROWS:	SUM(Sales)

- select from options of SUM(sales) running total to visualize a running total area chart visualization.



Data Source: demo2/ SuperStore2015.xlsx

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Original Series

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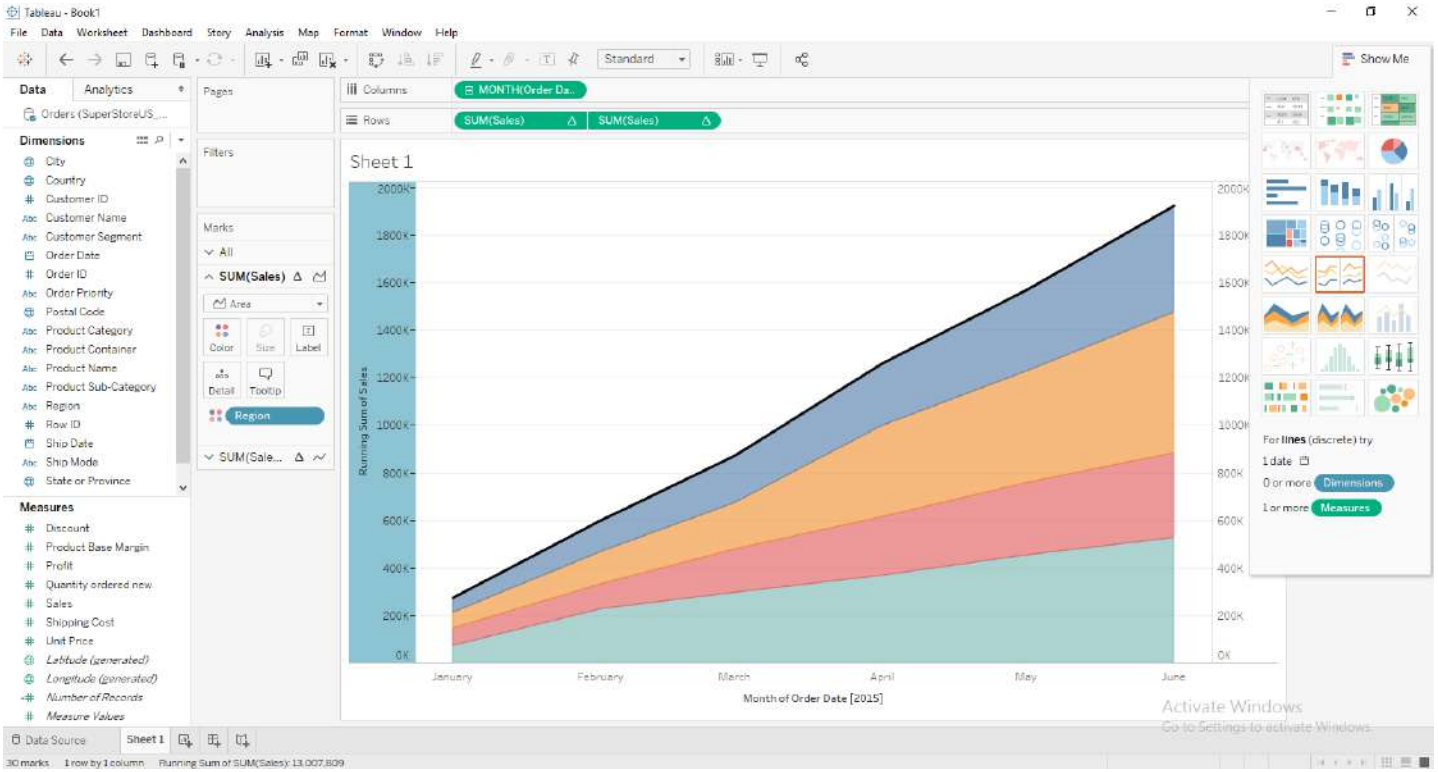
provoke thought, invoke action

Example 3:

Step 4

COLUMNS:	Monthly(OrderDate)
ROWS:	SUM(Sales), SUM(Sales)

- use ctrl+to drag to create SUM(sales) and select quick table calculation => running total.
- Select the SUM(sales) on the right as "dual axis" and overlay



Data Source: demo2/ SuperStore2015.xlsx

Problem Description:	
Data set used:	

SYED AWASE KHIRNI

TABLEAU : DATA SLICING BY TIME

Problem Description:	
Data set used:	

SYED AWASE KHIRNI

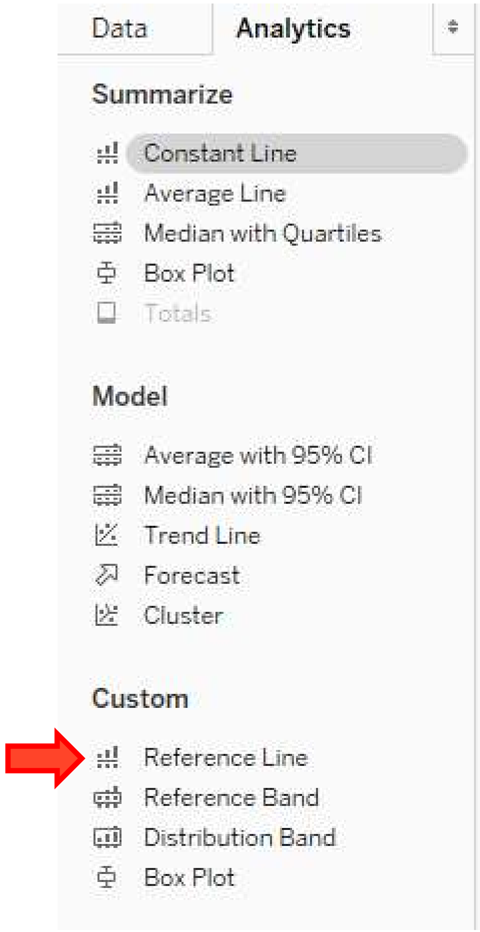
TABLEAU : USING PARAMETERS FOR DYNAMIC VALUES

Parameters?

- A parameter is a value that can be changed by the user interacting with a view, rather than a visualization using a constant value.
- Parameters allow us to give users control over the visualization.

- Usage of parameters
  - User-controlled thresholds
  - What-if analysis
  - Dynamic field, axis, titles, etc.
  - Filtering across disparate data sources
  - Top N analysis

How to use a parameter?



1

- Create a parameter

2

- Use the parameter in either a **calculated field, reference line, set or filter.**

• Parameters can be used across all sheets/data sources in a workbook.

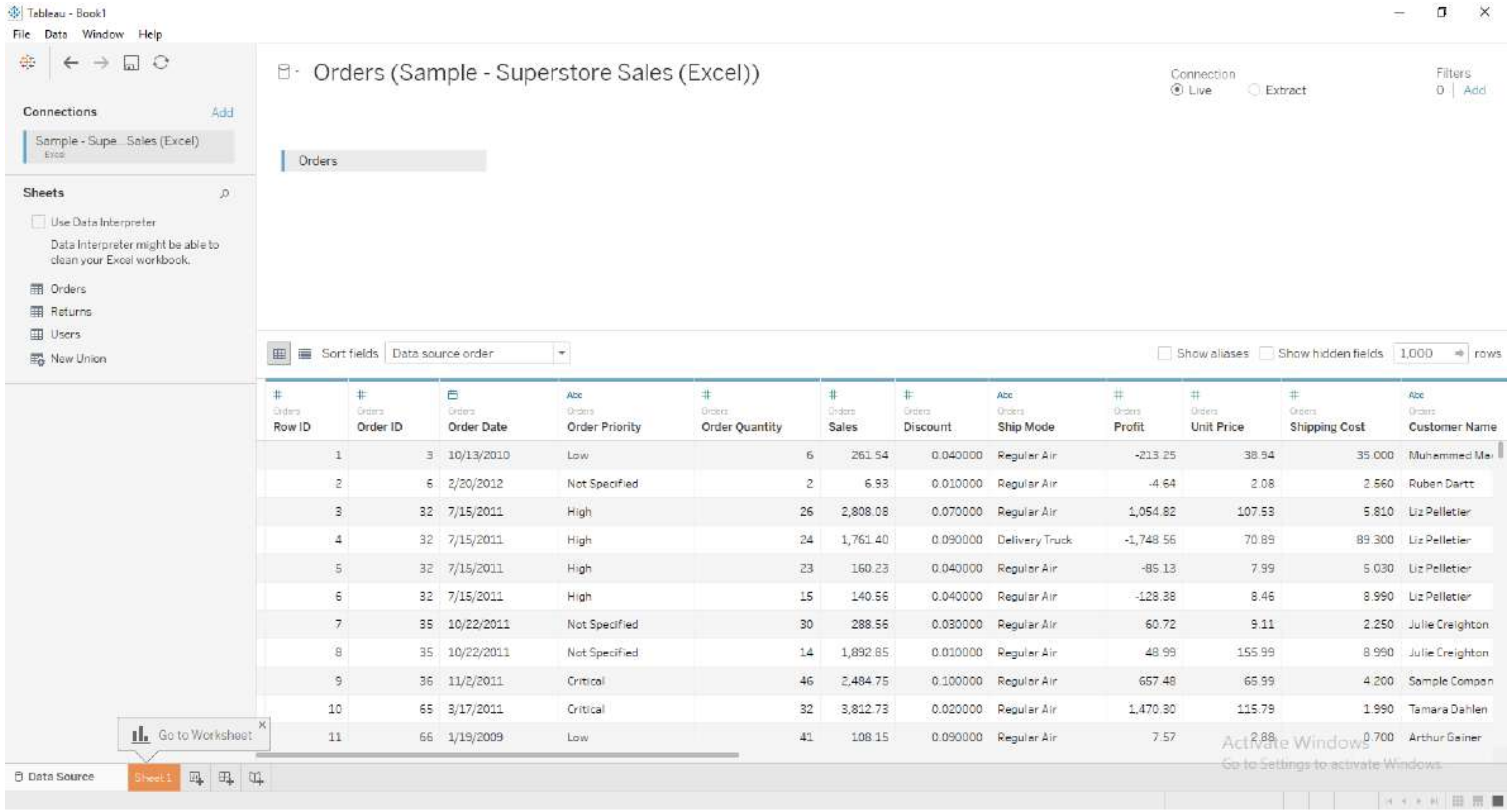
•Parameter controls can be used on Dashboards or Worksheets.

Use Case :Reference Line

Step 1

- load Sample-SuperStore Sales(Excel)-xlsx file into tableau

COLUMNS:	
ROWS:	



Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

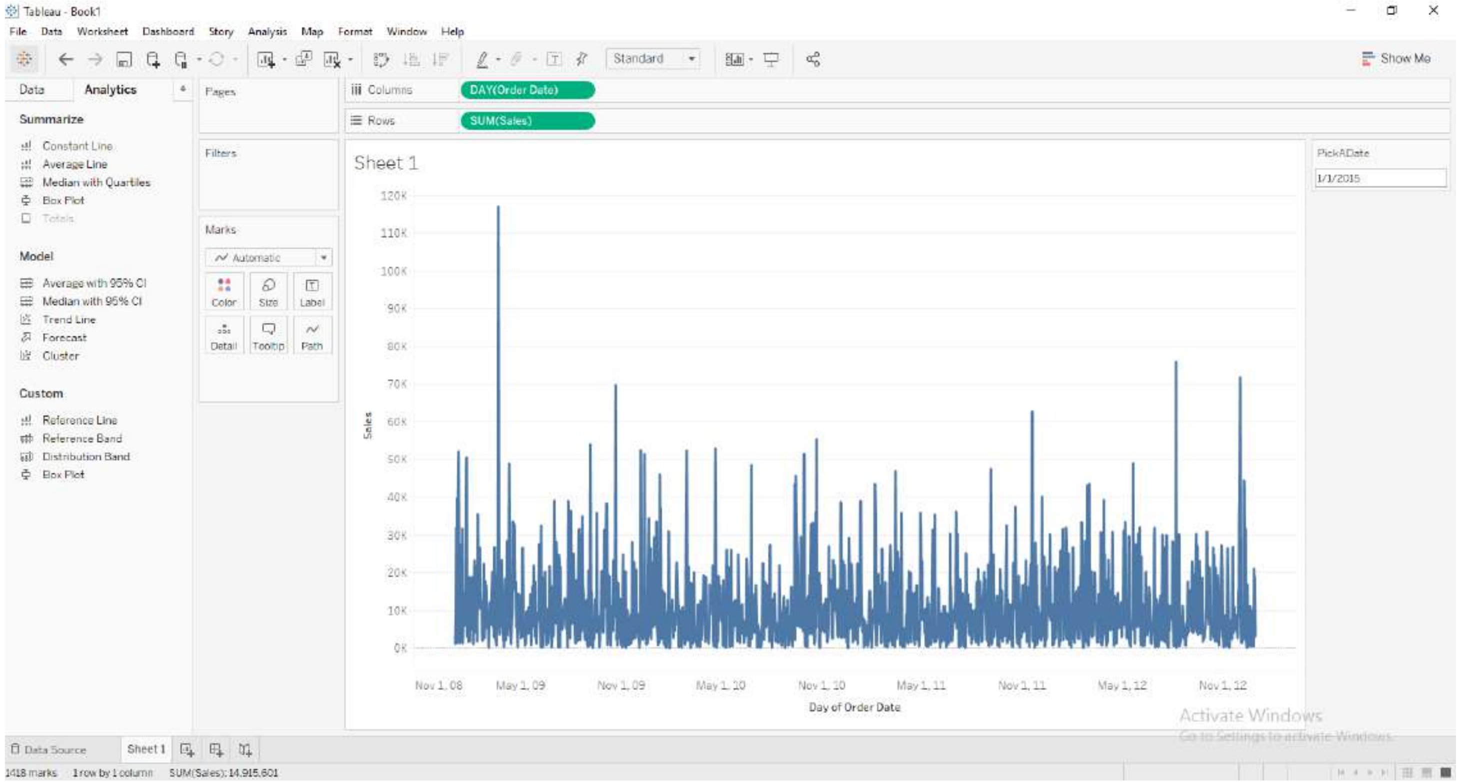
Original Series

Use Case :Reference Line

COLUMNS:	Day(OrderDate)
ROWS:	Sales

Step 2

- select orderDate and Sales to visualize a line chart as shown in the figure.
- We would like to create a parameter, where in user's can select/pick a date and draw insights about the sales on that specific date.



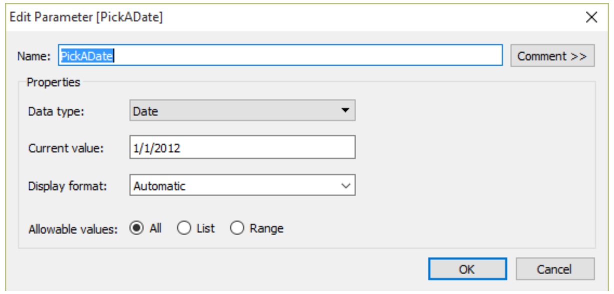
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

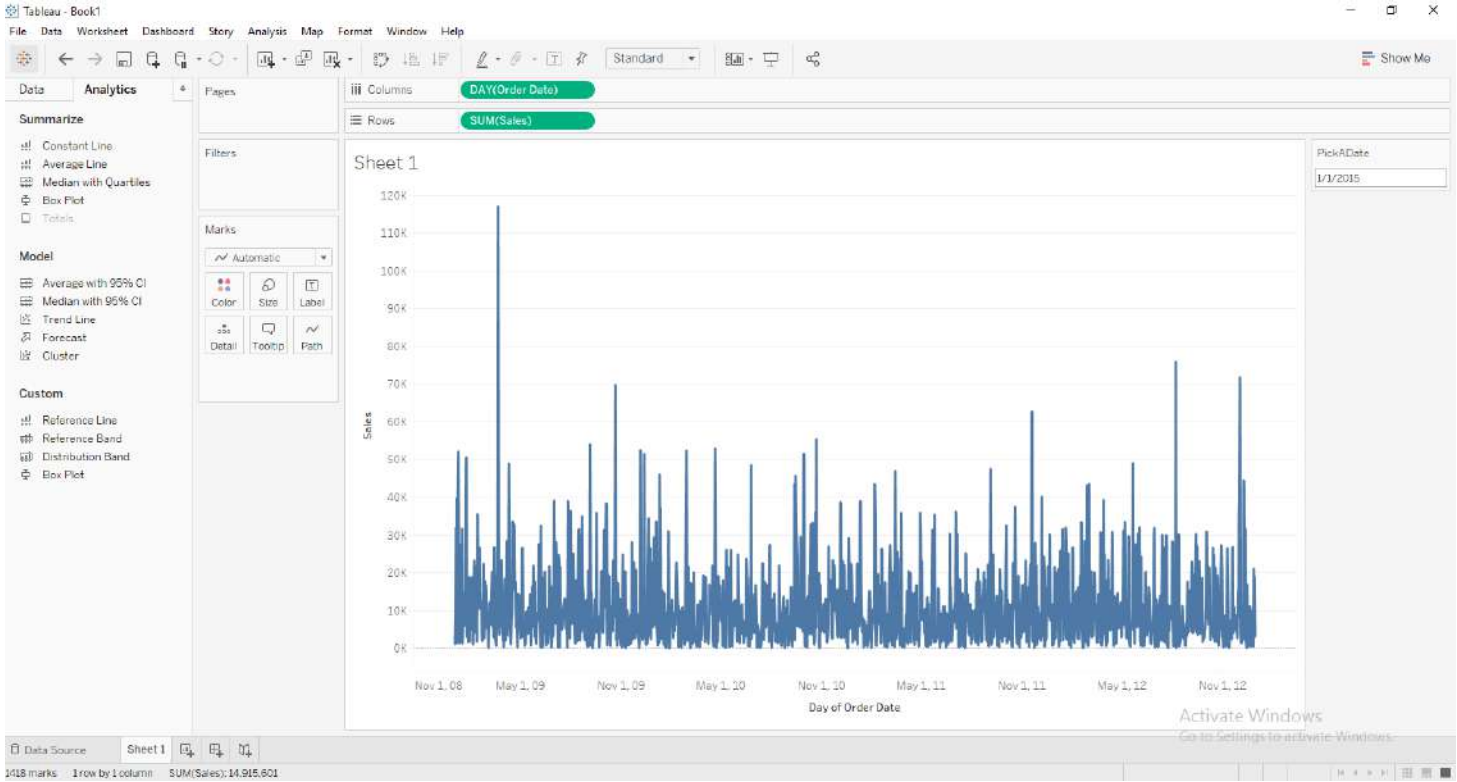
Use Case :Reference Line

Step 3

- create a parameter "PickADate" with data type "Date"

COLUMNS:	Day(OrderDate)
ROWS:	Sales





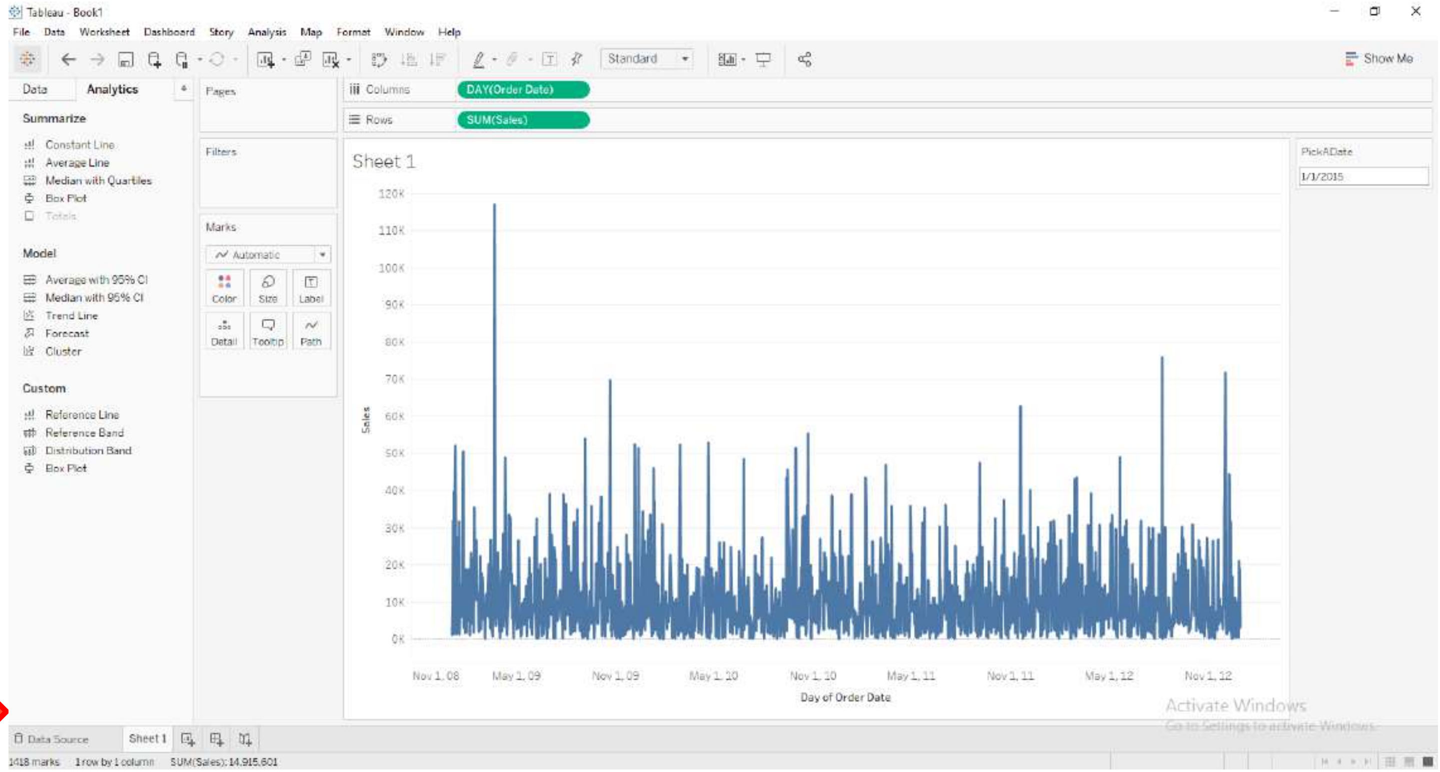
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Reference Line

Step 4

- •A parameter “PickADate” of data type “date” is created.
- We can enable to show the parameter control on the right hand side pane.

COLUMNS:	Day(OrderDate)
ROWS:	Sales



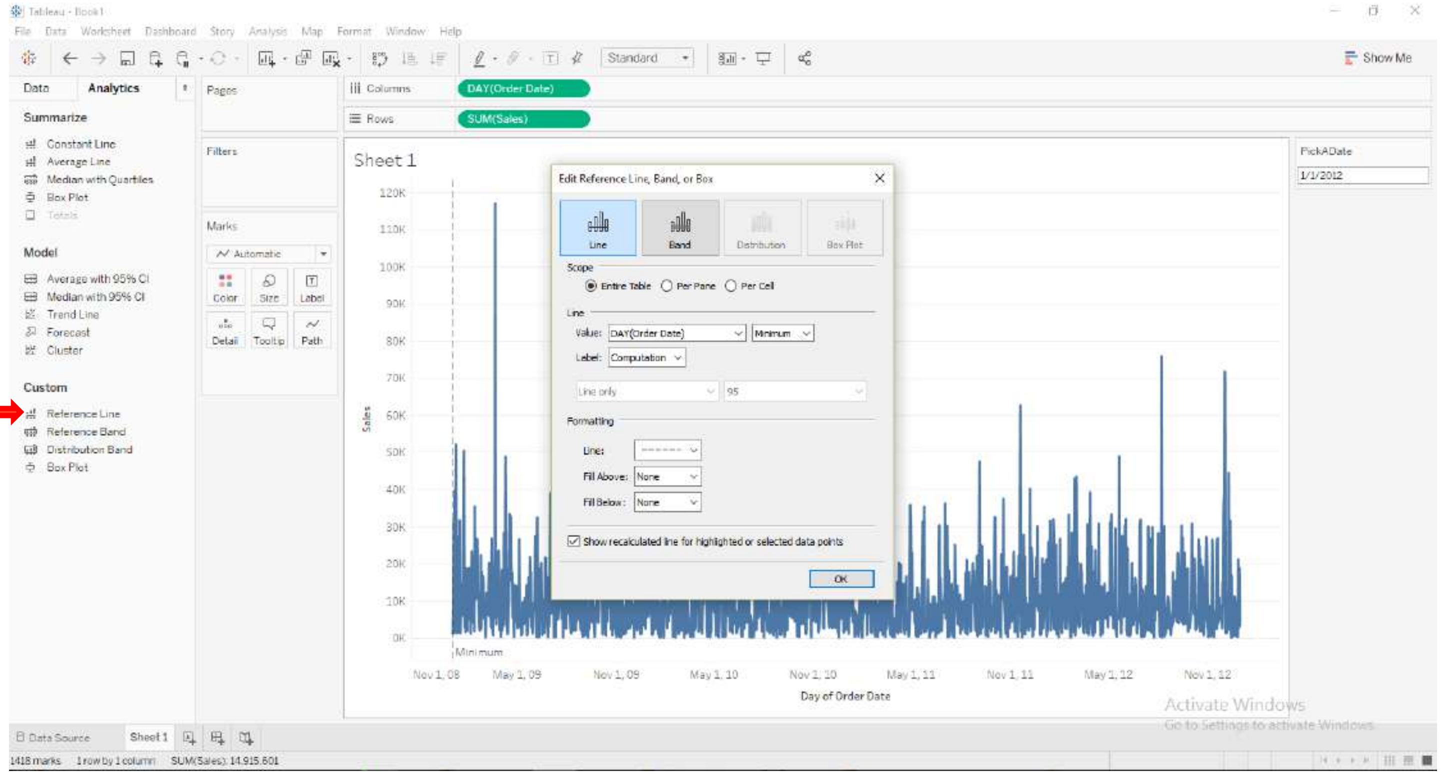
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Reference Line

Step 5

COLUMNS:	Day(OrderDate)
ROWS:	Sales

- Select Analytics pane and drag reference line on to the canvas panel, prompting you to select the parameter name “PickADate”



Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Reference Line

COLUMNS:	Day(OrderDate)
ROWS:	Sales

Step 6

- Select Analytics pane and drag reference line on to the canvas panel, prompting you to select the parameter name "PickADate"

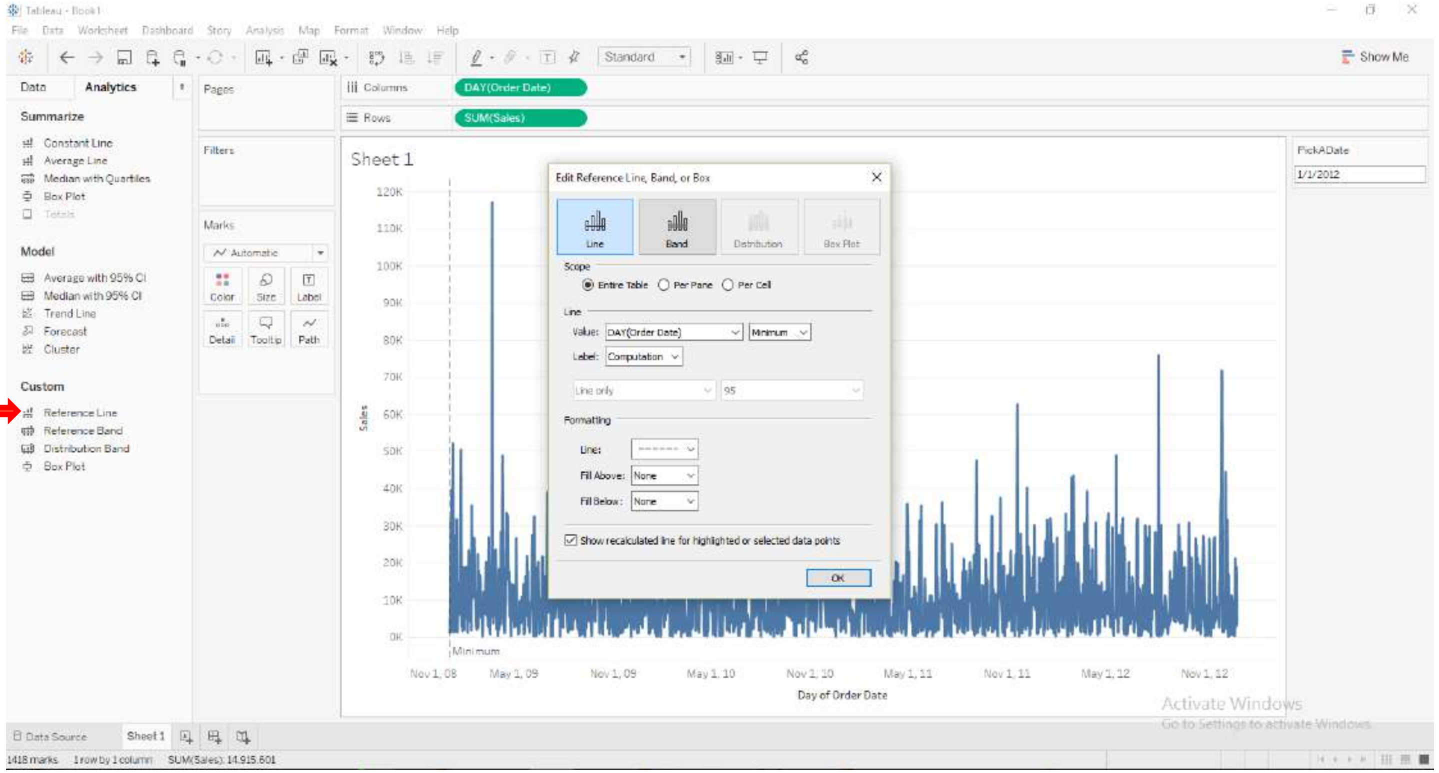
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Reference Line

COLUMNS:	Day(OrderDate)
ROWS:	Sales

Step 7

- Select parameter and line styling.



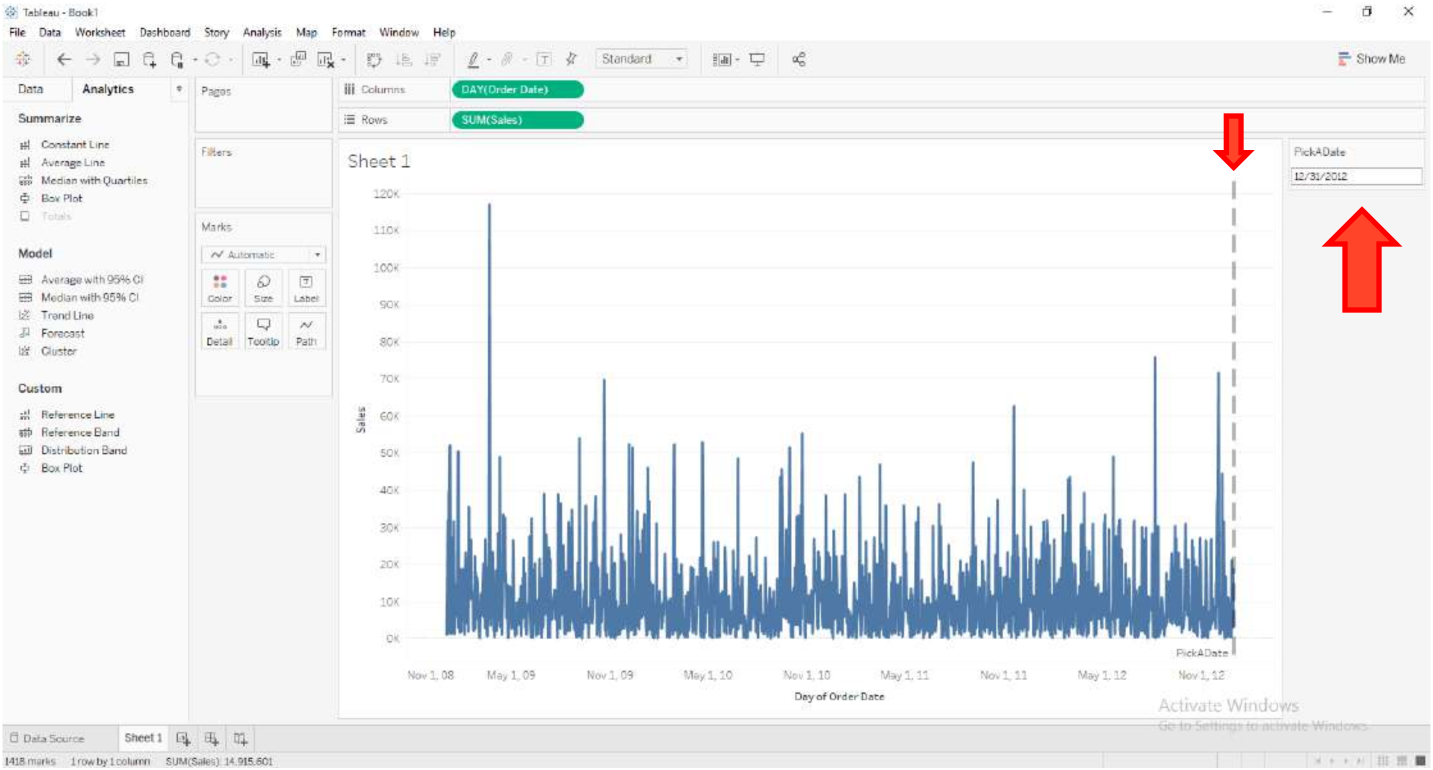
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Reference Line

COLUMNS:	Day(OrderDate)
ROWS:	Sales

Step 8

- Upon user interaction and user defined date 12/31/2012



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Original Series

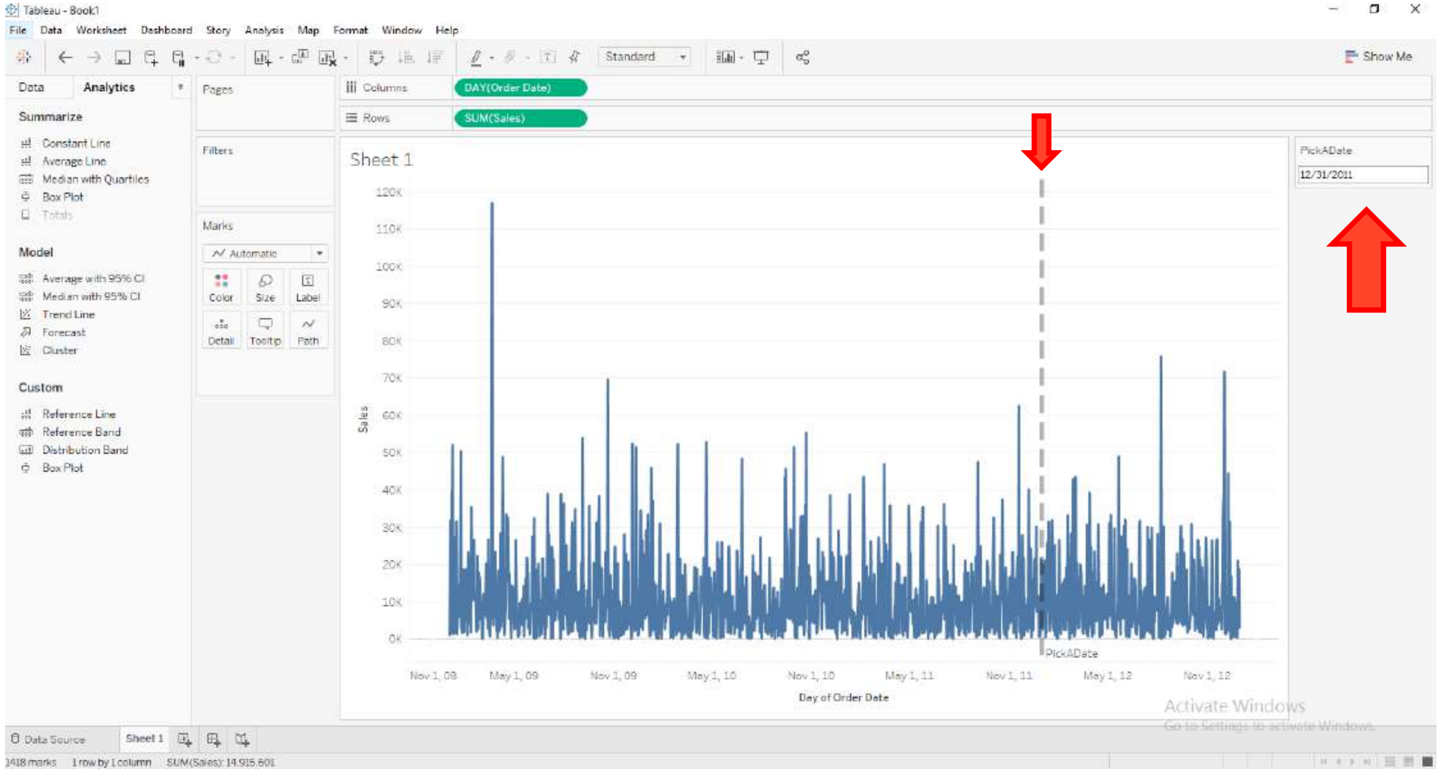
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Reference Line

Step 9

- Upon user interaction and user defined date 12/31/2011

COLUMNS:	Day(OrderDate)
ROWS:	Sales



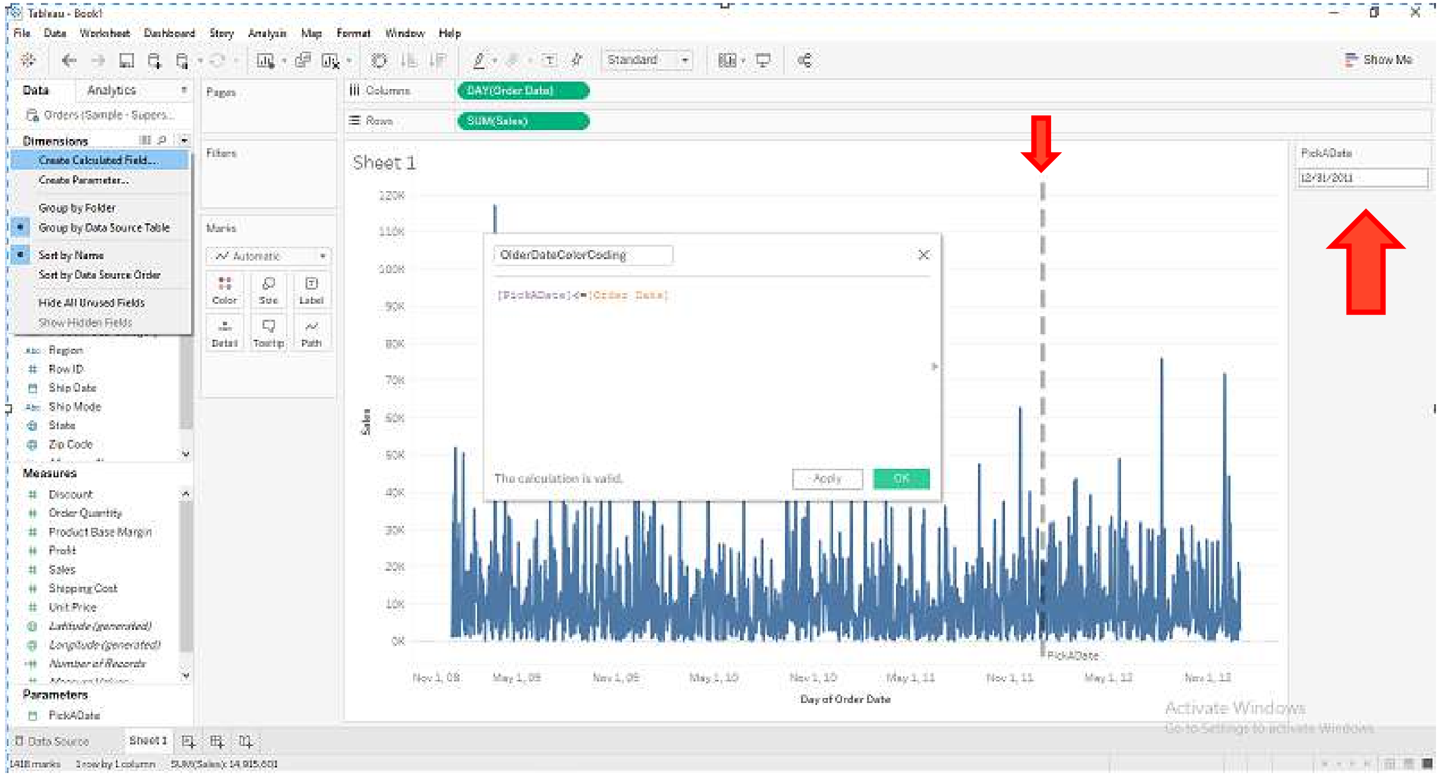
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Reference Line

COLUMNS:	Day(OrderDate)
ROWS:	Sales

Step 10

- Let us color code older dates than the **user defined parameter** by creating a calculated field.



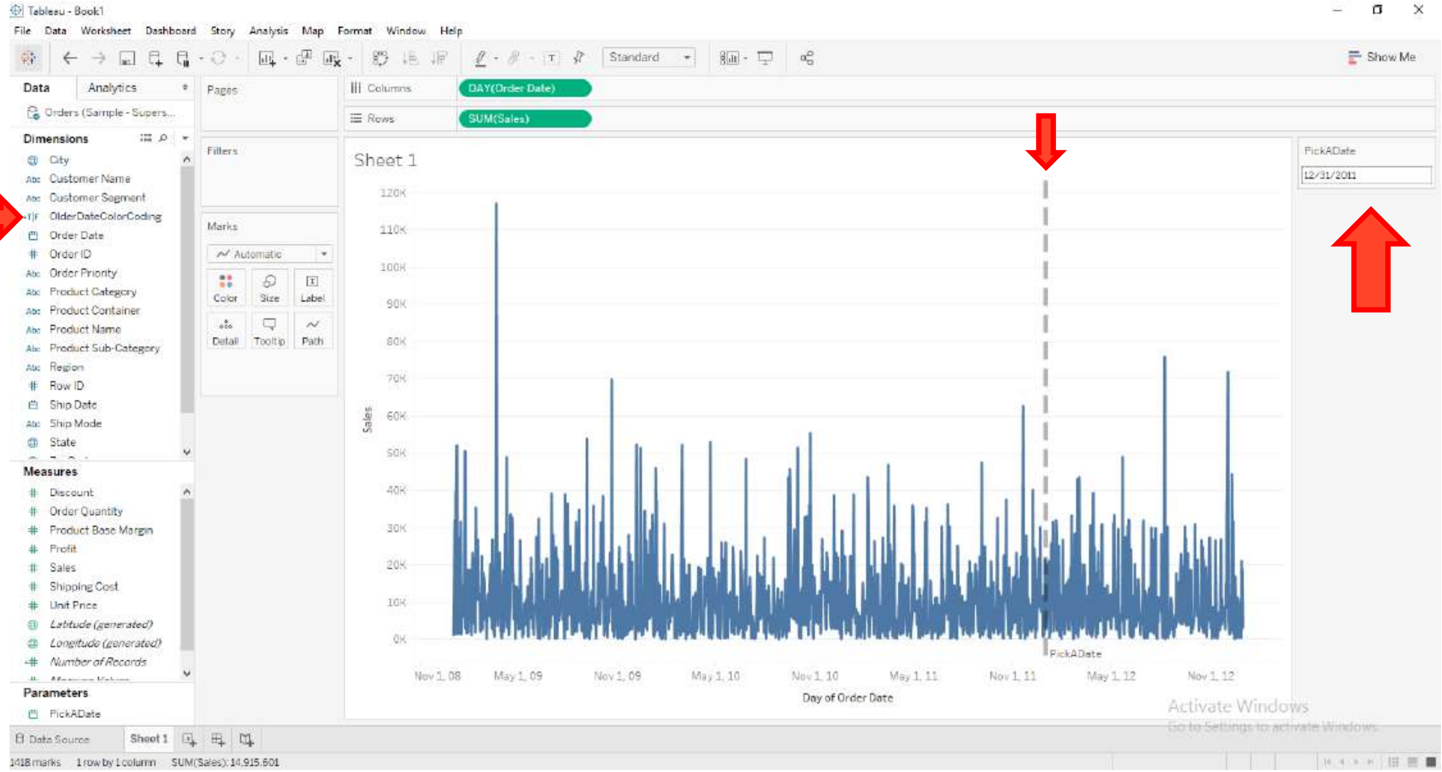
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Reference Line

COLUMNS:	Day(OrderDate)
ROWS:	Sales

Step 11

- We have created a **OlderDateColorCoding** calculated field, that returns a **boolean** type.
- Upon dragging the OlderDateColorCoding to the colors, older dates are color coded to selected color choice.



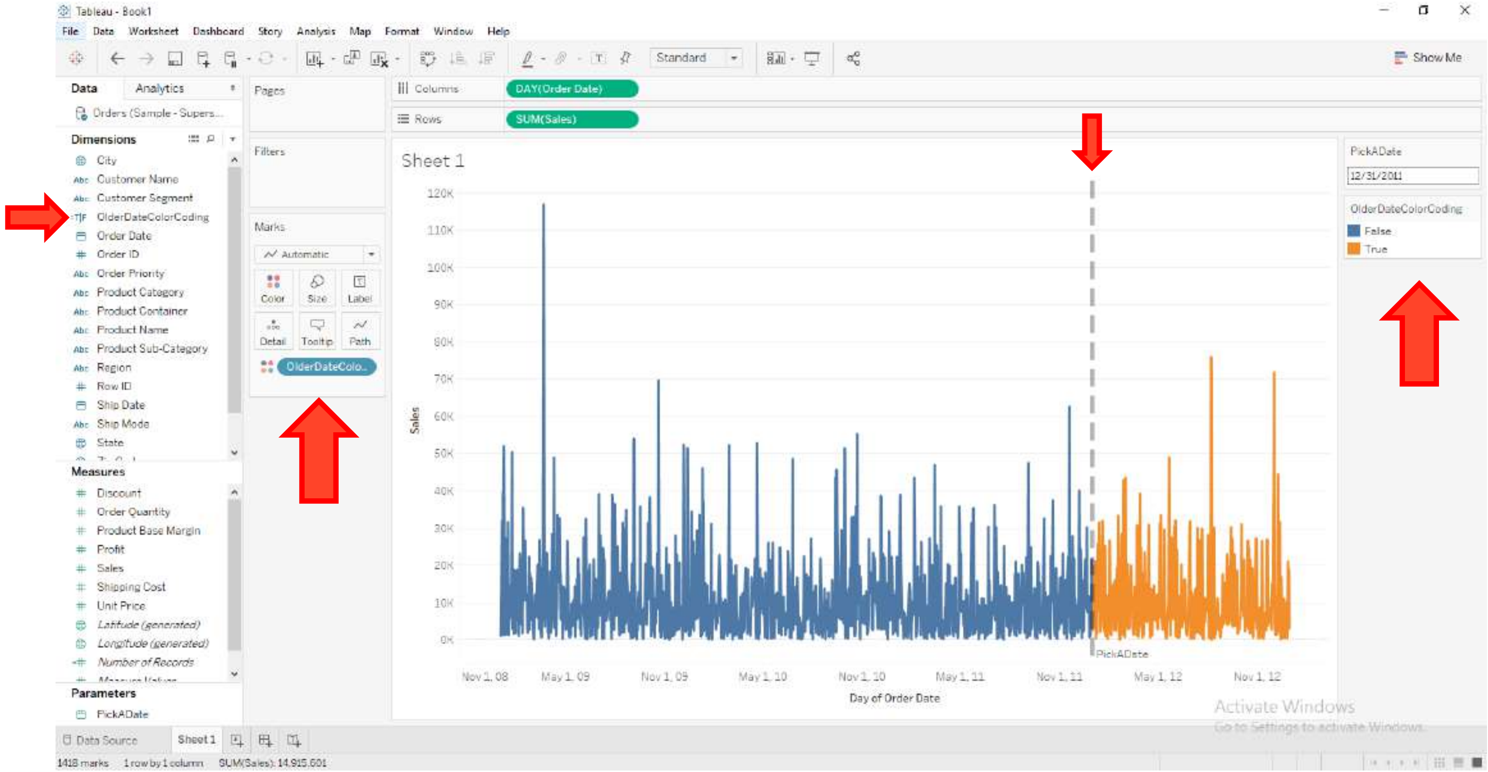
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Reference Line

Step 12

- Upon dragging the **OlderDateColorCoding** to the colors, older dates are color coded to selected color choice.

COLUMNS:	Day(OrderDate)
ROWS:	Sales



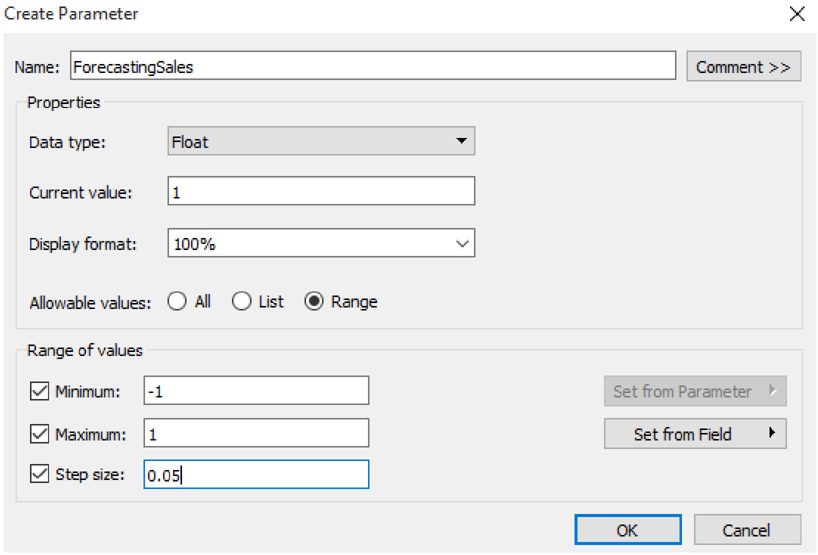
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

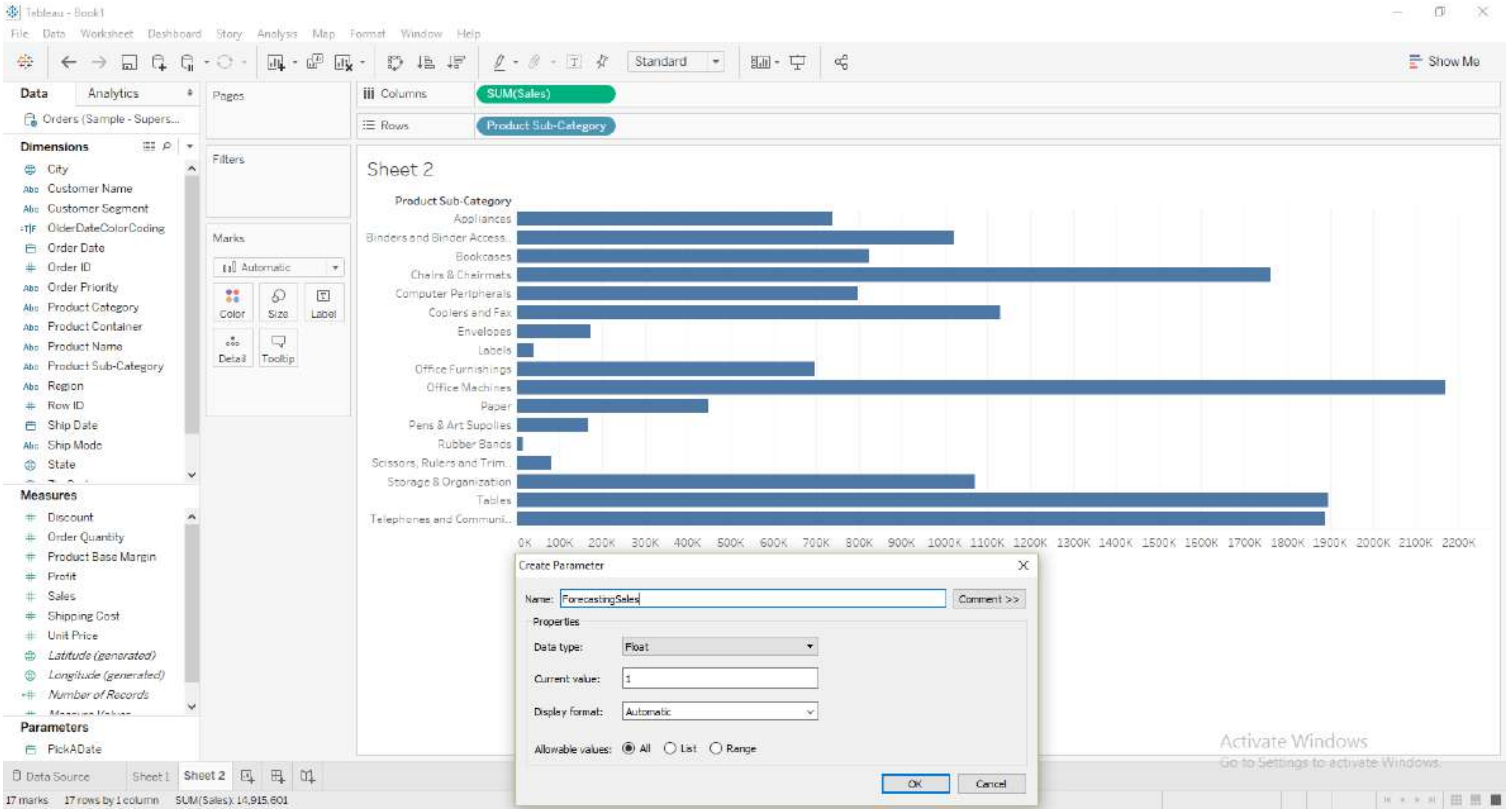
Use Case :Ref Date w/Calc

COLUMNS:	SUM(Sales)
ROWS:	Product sub-category

Step 1

- Create a parameter for forecasting sales for sales and product sub-category.





Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

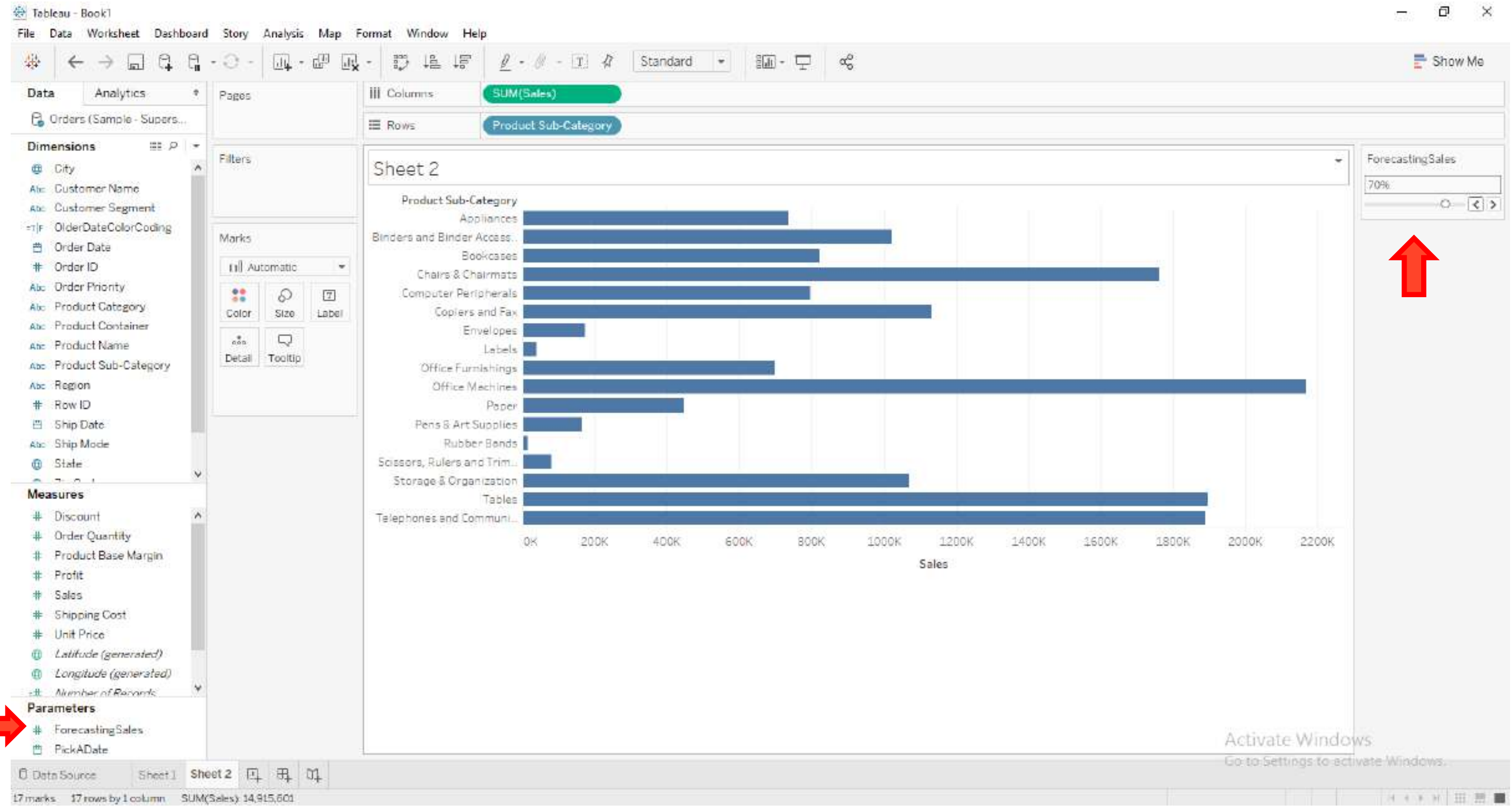
Original Series

Use Case :Ref Date w/Calc

Step 2

- We have created a **ForecastingSales** parameter as shown in the figure.

COLUMNS:	SUM(Sales)
ROWS:	Product sub-category



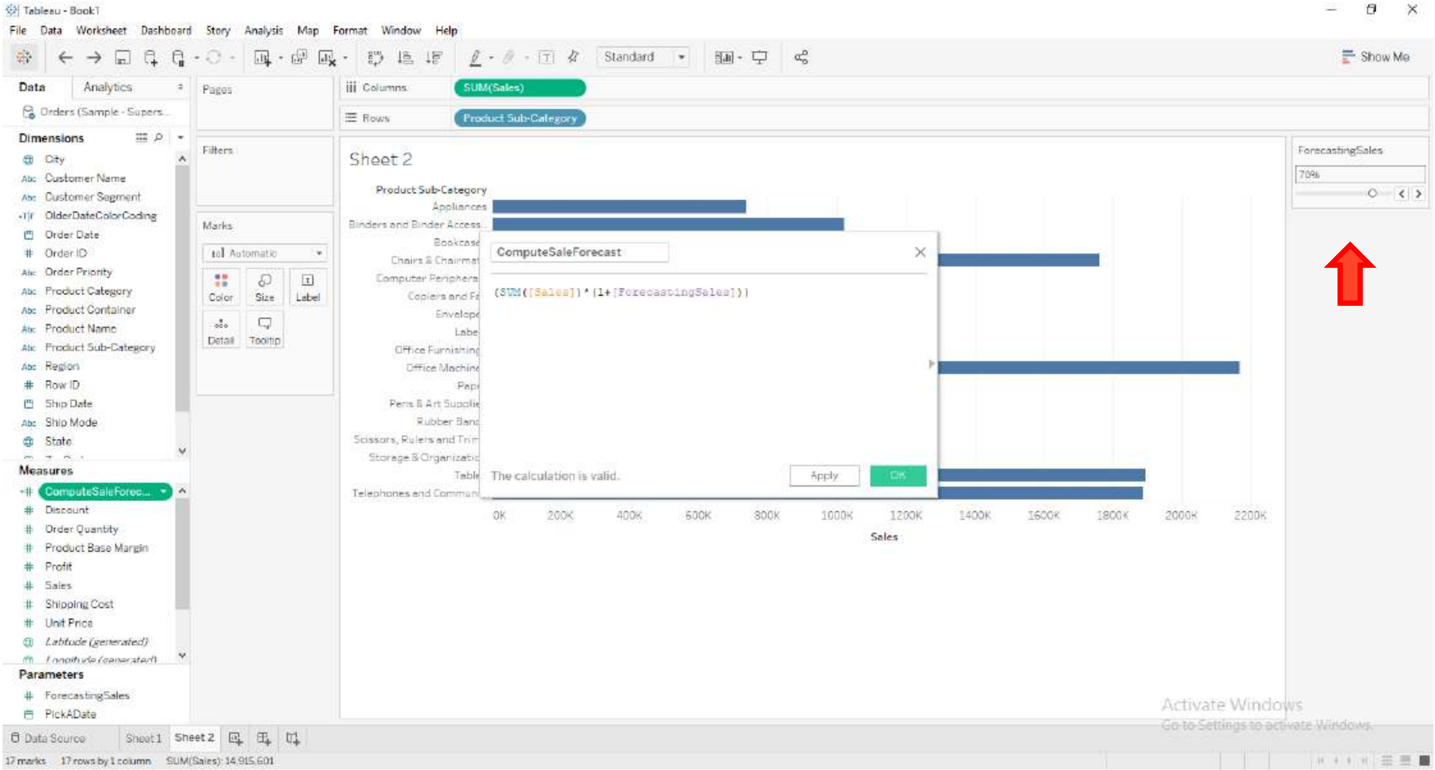
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Ref Date w/Calc

COLUMNS:	SUM(Sales)
ROWS:	Product sub-category

Step 3

- Now, we need to tie the **ForecastingSales** parameter with a calculated field.
- **ComputeSalesForecast** calculated field **=(SUM([Sales])*(1+[ForecastingSales]))**



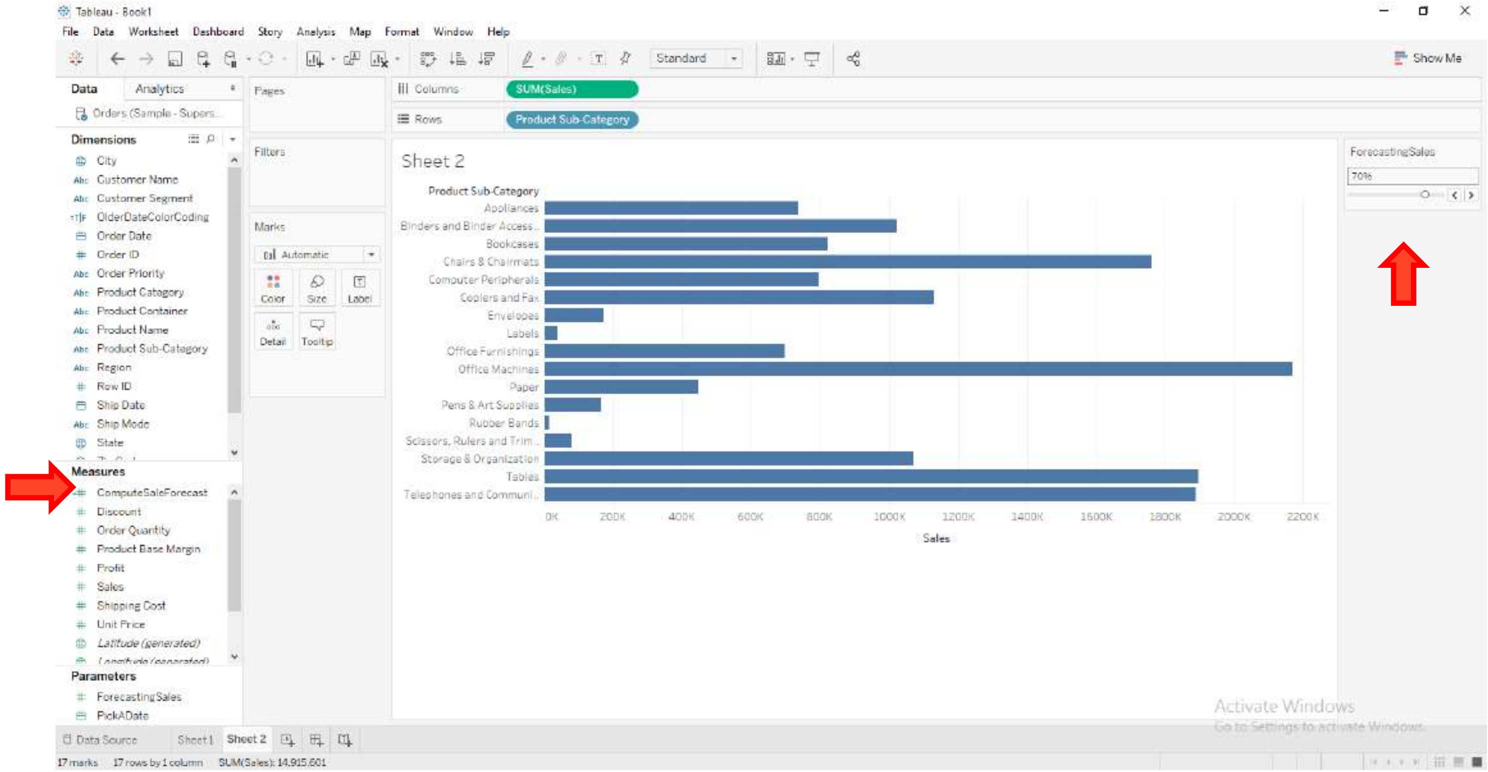
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Ref Date w/Calc

Step 4

- We have created a **ComputeSalesForecast** calculated field.

COLUMNS:	SUM(Sales)
ROWS:	Product sub-category



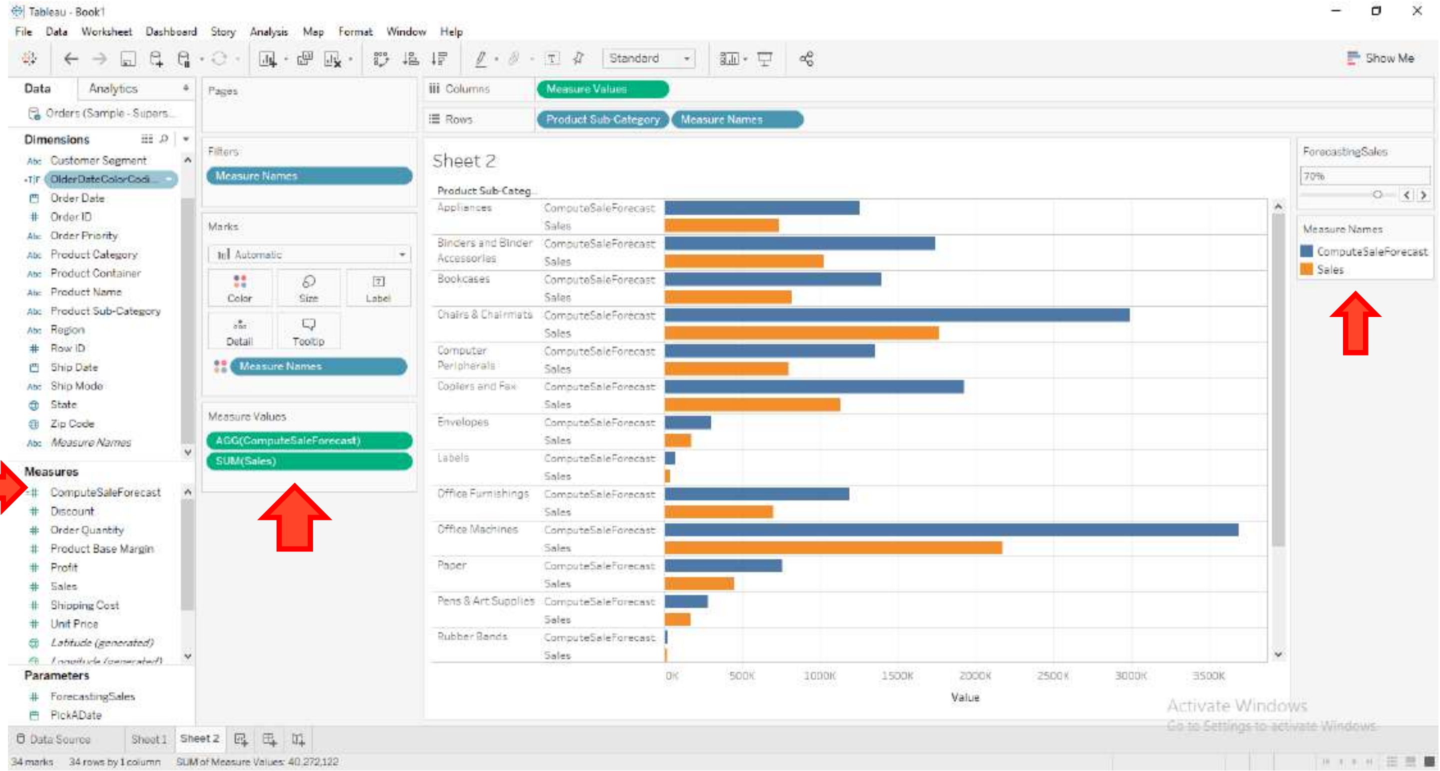
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Ref Date w/Calc

COLUMNS:	SUM(Sales)
ROWS:	Product sub-category

Step 5

- Drag the ComputeForecastSales on to the sales axis.
- Add measure names to color marks to visualize forecast with a different color as shown in the figure.



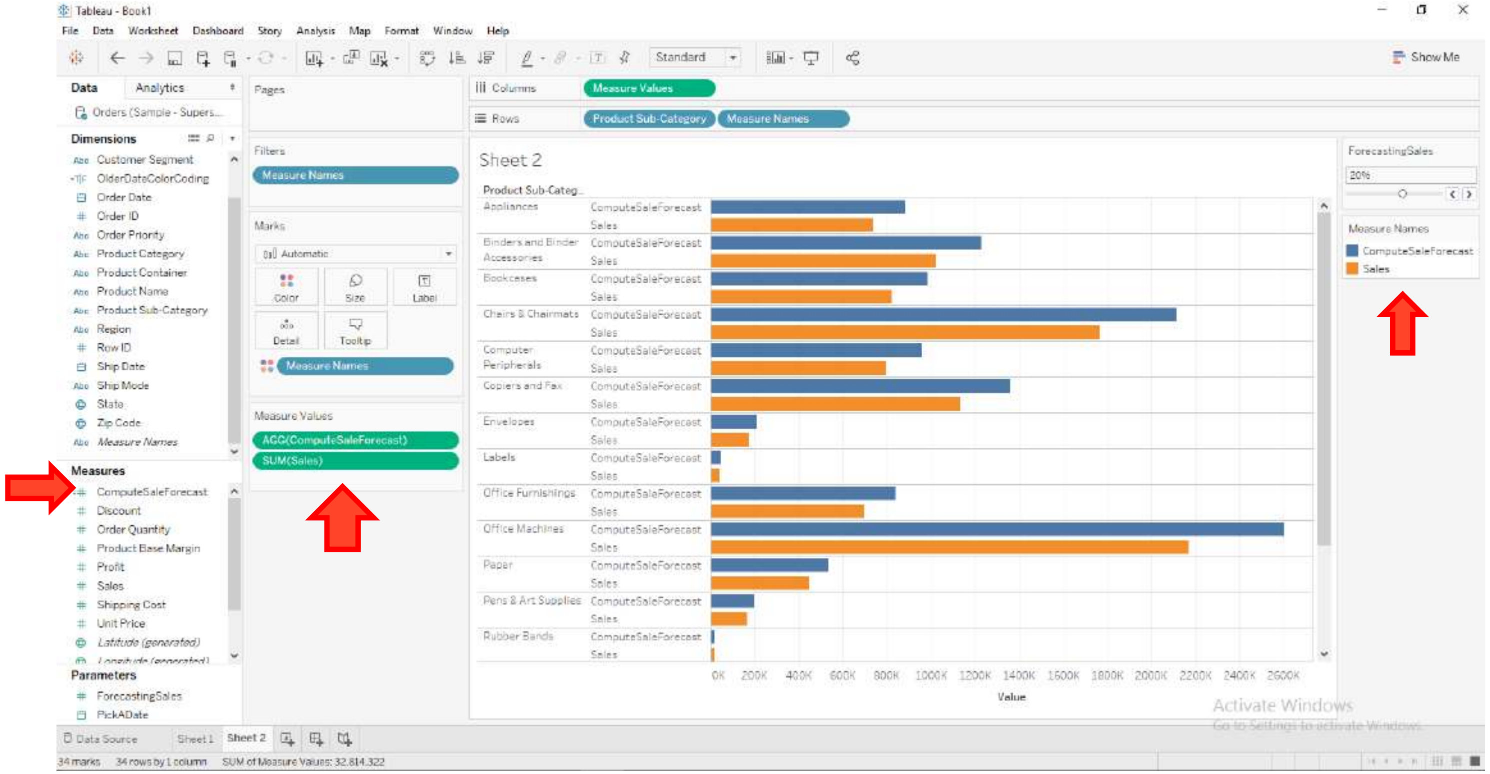
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Ref Date w/Calc

COLUMNS:	SUM(Sales)
ROWS:	Product sub-category

Step 6

- Upon user selection, we can see the sales forecast changing.



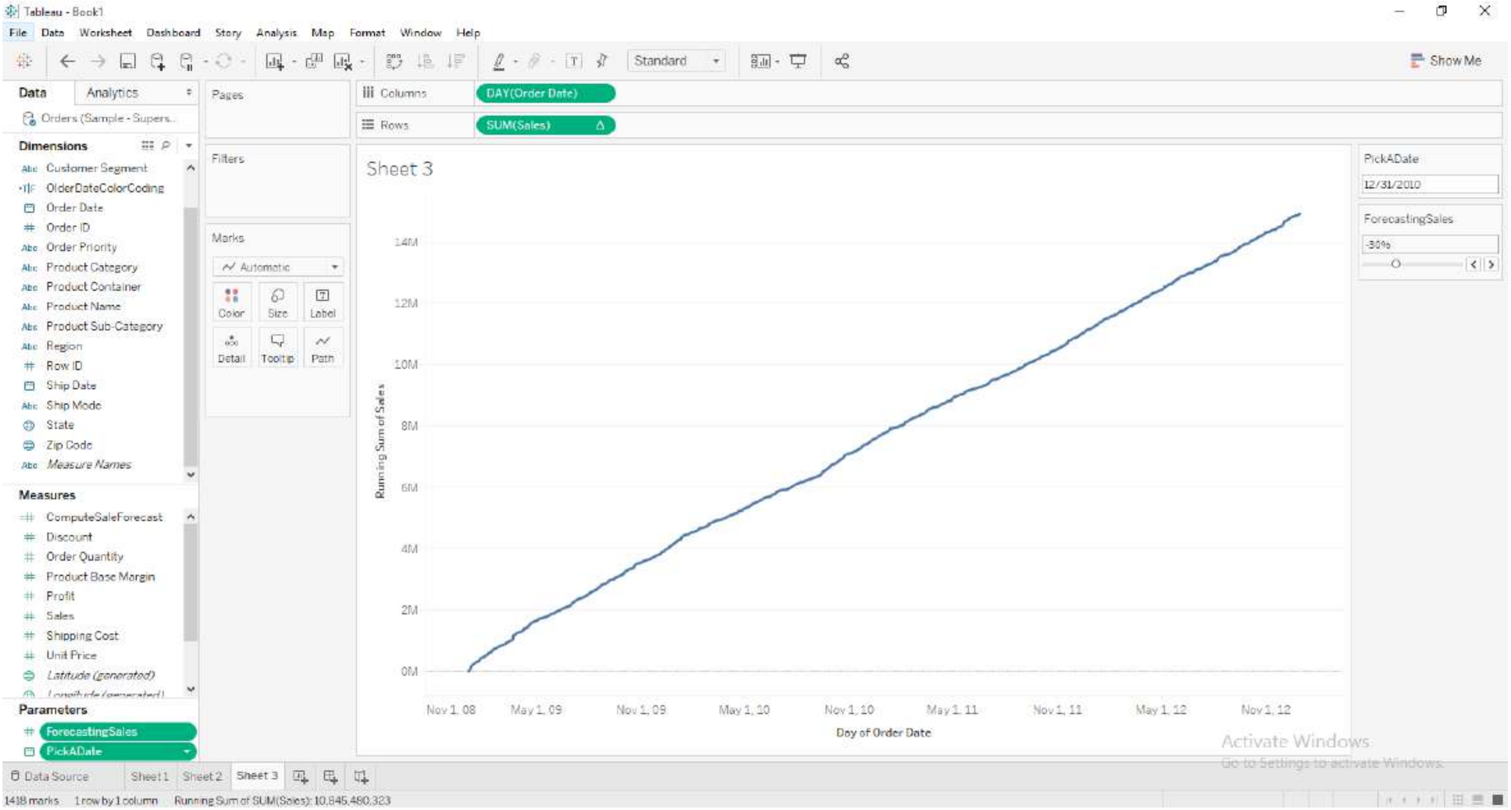
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Sales Forecast

Step 1

COLUMNS:	Day(OrderDate)
ROWS:	Sales

- Let's plot Day(OrderDate) vs Sales(RunningTotal)
- Let's show the parameters created earlier.



Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Please read terms of use for authorized access

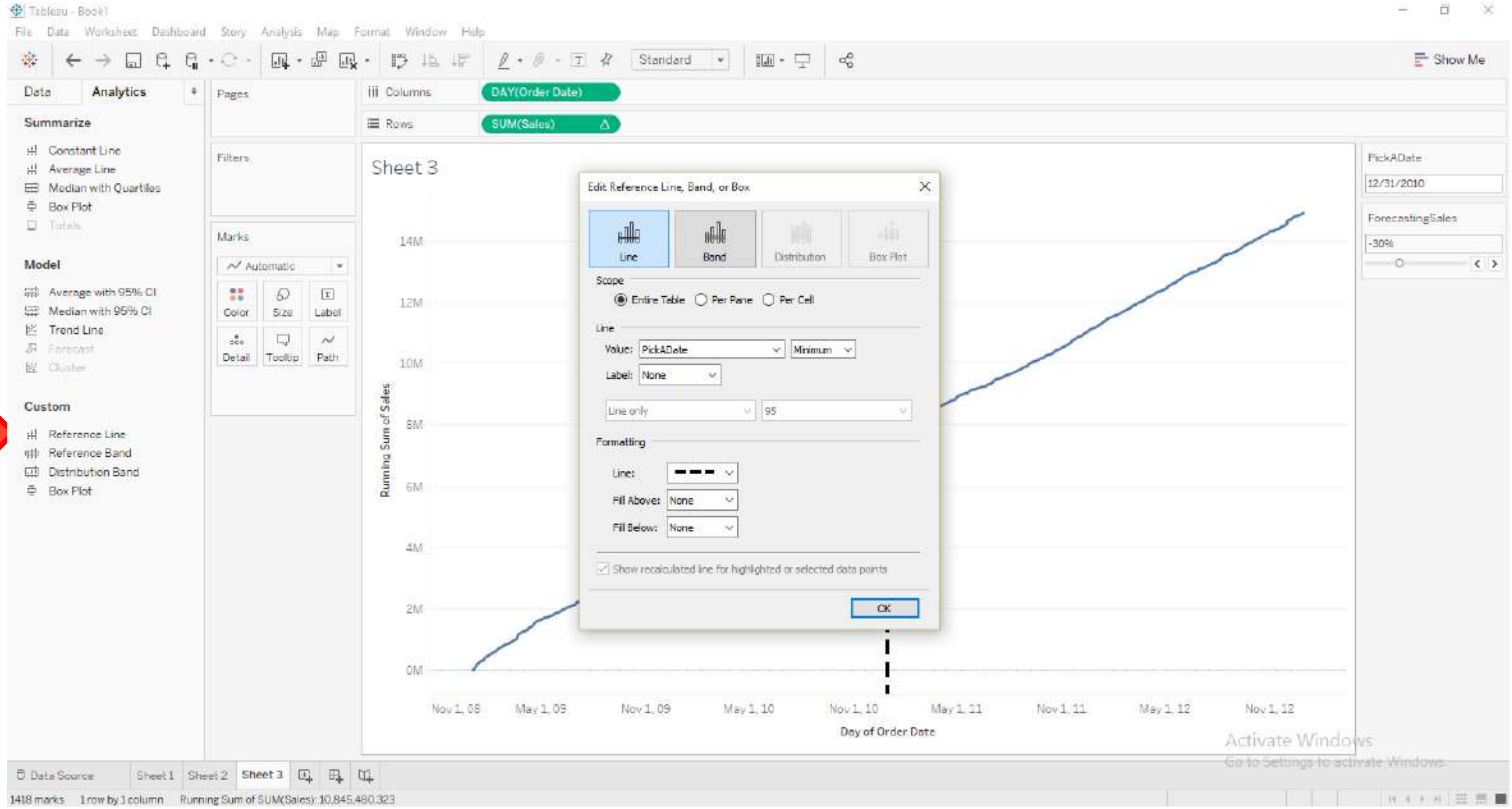
Original Series

Use Case :Sales Forecast

Step 2

COLUMNS:	Day(OrderDate)
ROWS:	Sales

- Let's add a reference line to the running total plot of sales vs orderDate.



Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Sales Forecast

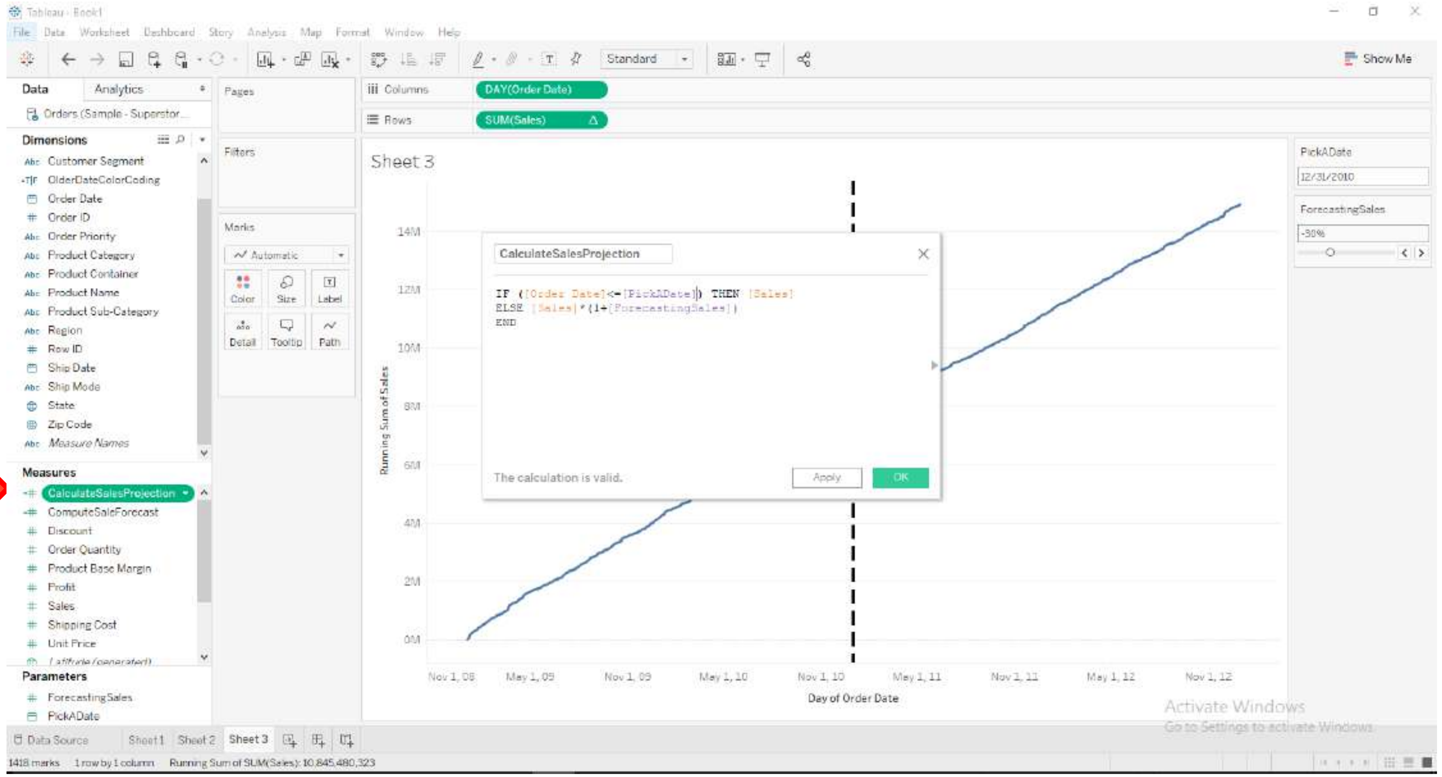
Step 3

COLUMNS:	Day(OrderDate)
ROWS:	Sales

•Lets add calculated field "ComputeSalesProjection" = IF ([PickADate]<=[Order Date]) THEN [Sales]

ELSE [Sales]*(1+[ForecastingSales])

END



Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Please read terms of use for authorized access

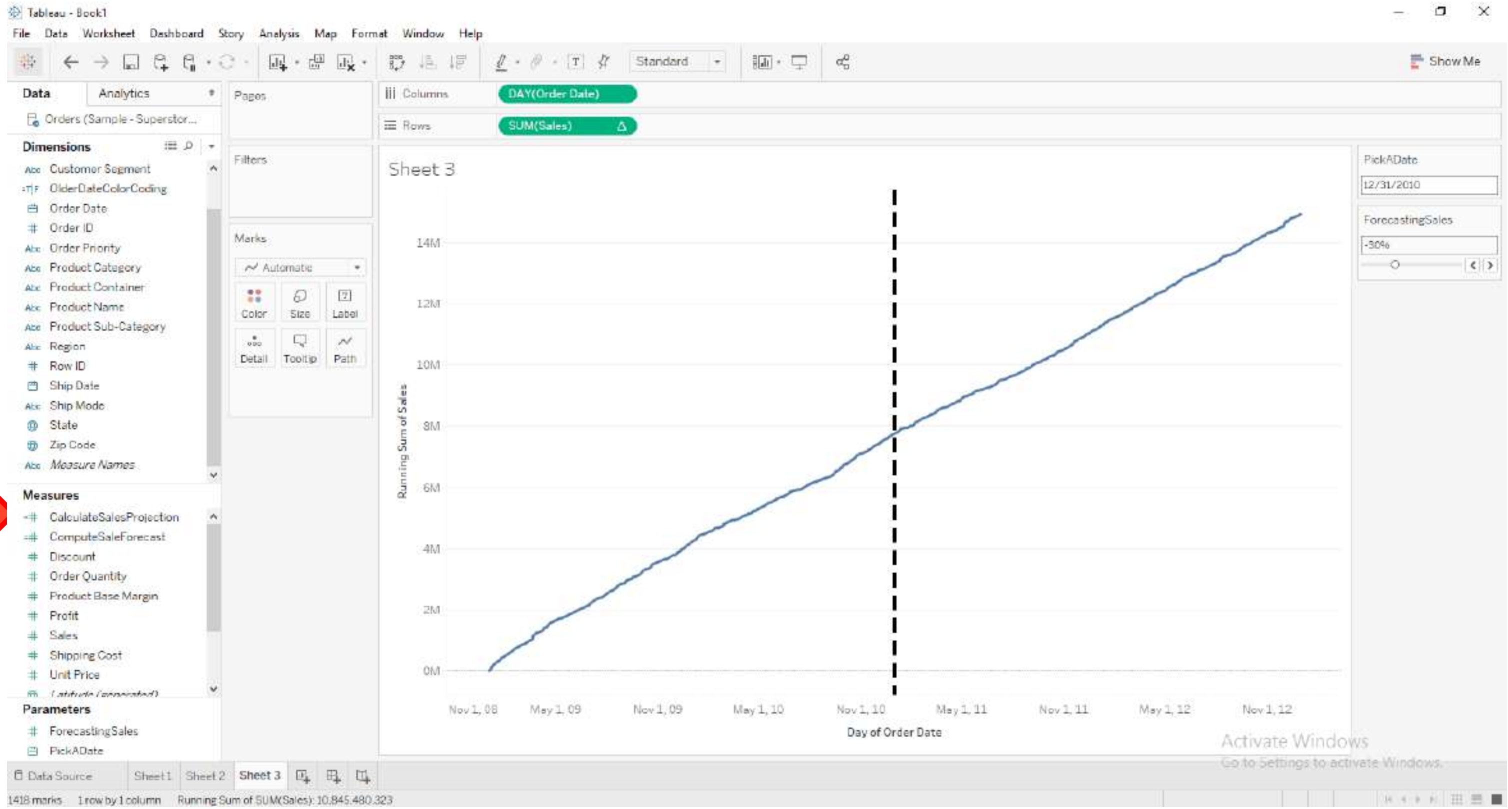
Original Series

Use Case :Sales Forecast

Step 4

- Now we have created a ComputeSaleProjection

COLUMNS:	Day(OrderDate)
ROWS:	Sales



Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Please read terms of use for authorized access

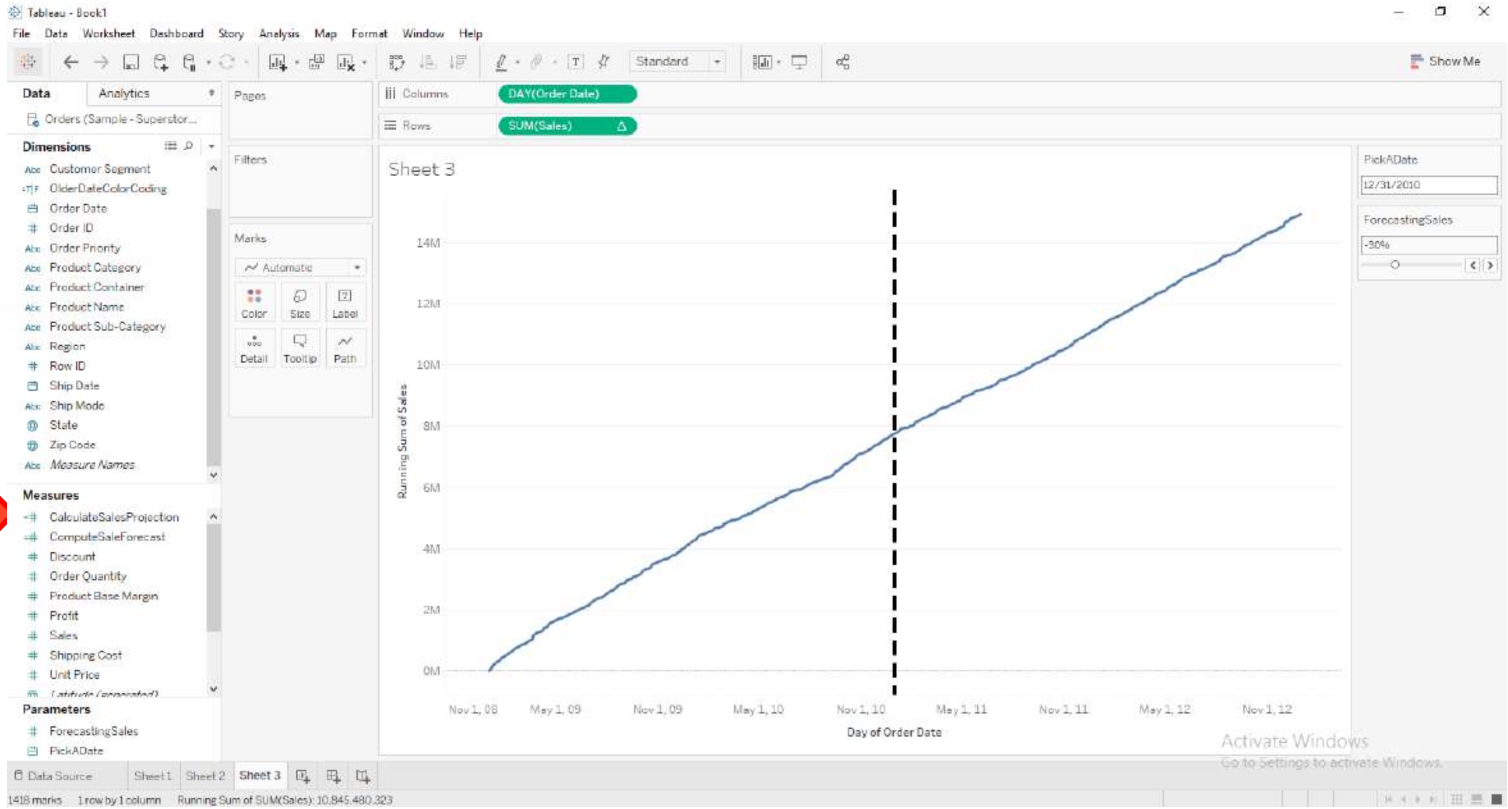
Original Series

Use Case :Sales Forecast

COLUMNS:	Day(OrderDate)
ROWS:	Sales

Step 5

- Now we have created a ComputeSaleProjection



Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Please read terms of use for authorized access

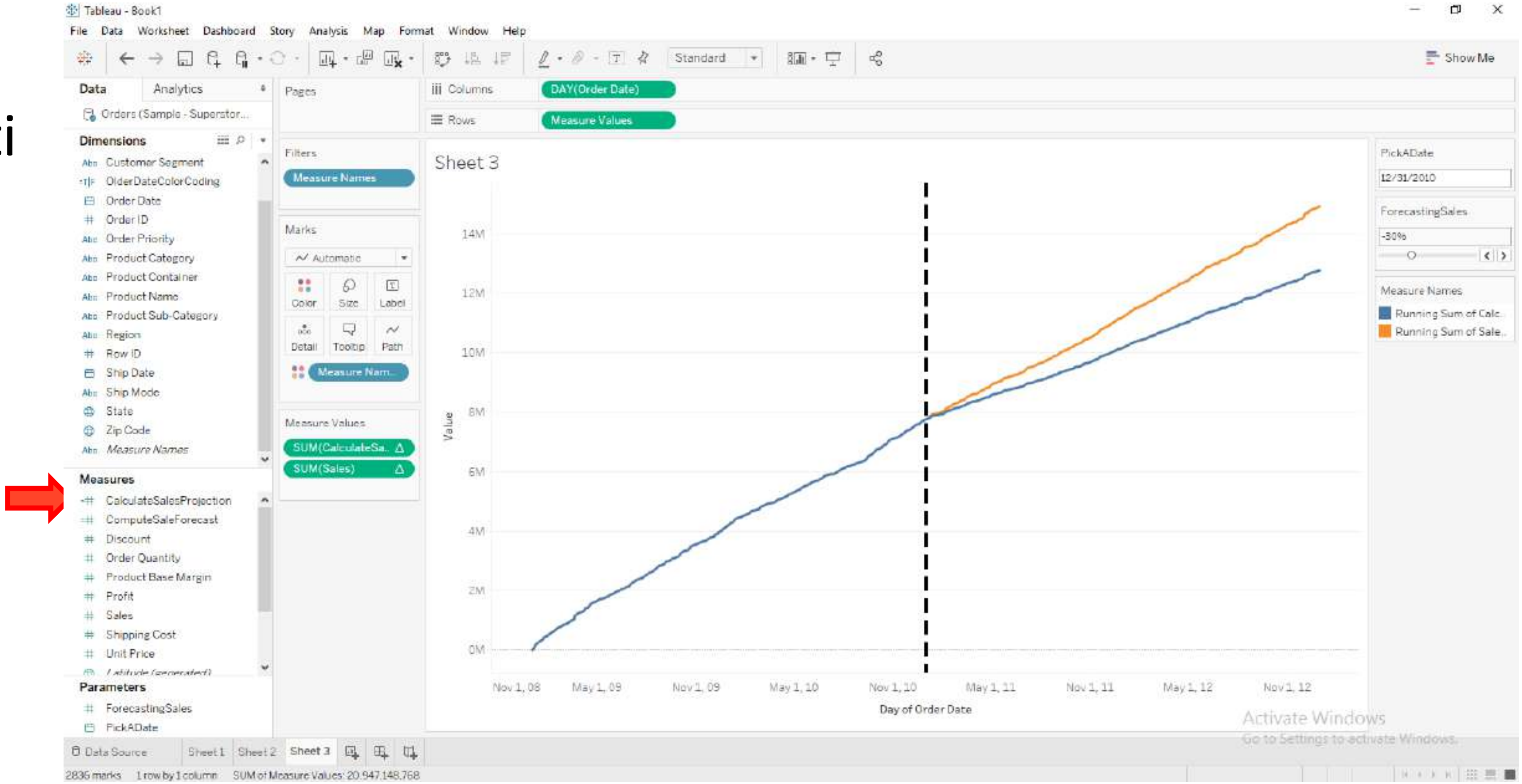
Original Series

Use Case :Sales Forecast

Step 6

- Lets add Measure value(ComputeSalesProjection) to the values(y-axis)
- Select options => Quick Table Calculation => Running Total

COLUMNS:	Day(OrderDate)
ROWS:	Sales



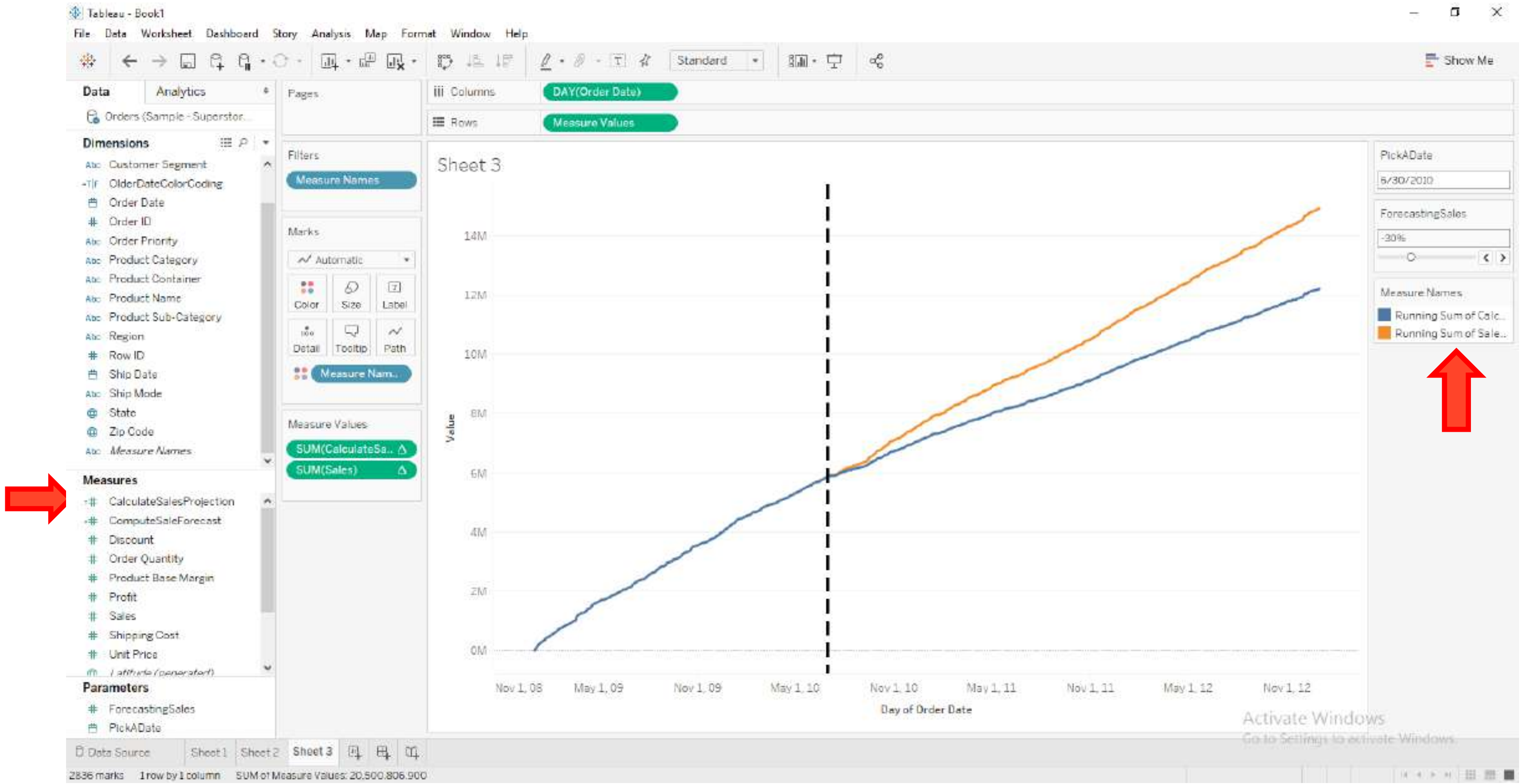
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Sales Forecast

Step 7

COLUMNS:	Day(OrderDate)
ROWS:	Sales

- Upon user defined date selection, we could see the reference line shift and subsequently, we could see the sales projections changing as shown in the figure.



Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

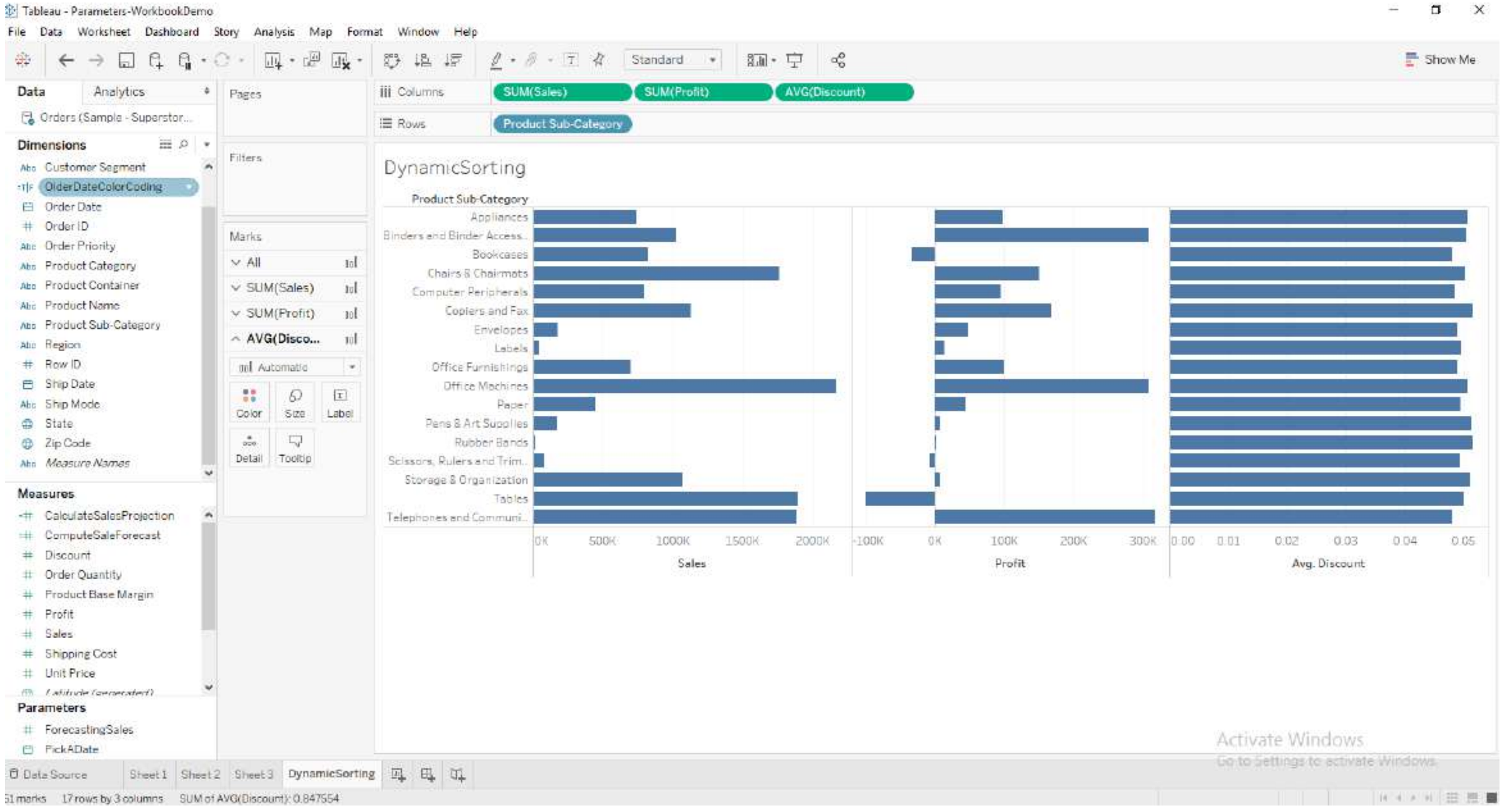
Use Case :Dynamic Sorting

Step 1

- **Dynamic Sorting Demo**

•Lets create a plot for Product Sub-category vs {Sum(Sales),Sum(Profit),Avg (Discount)}

COLUMNS:	SUM(Sales) SUM(Profit) Avg(Discount)
ROWS:	Product sub-category



Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

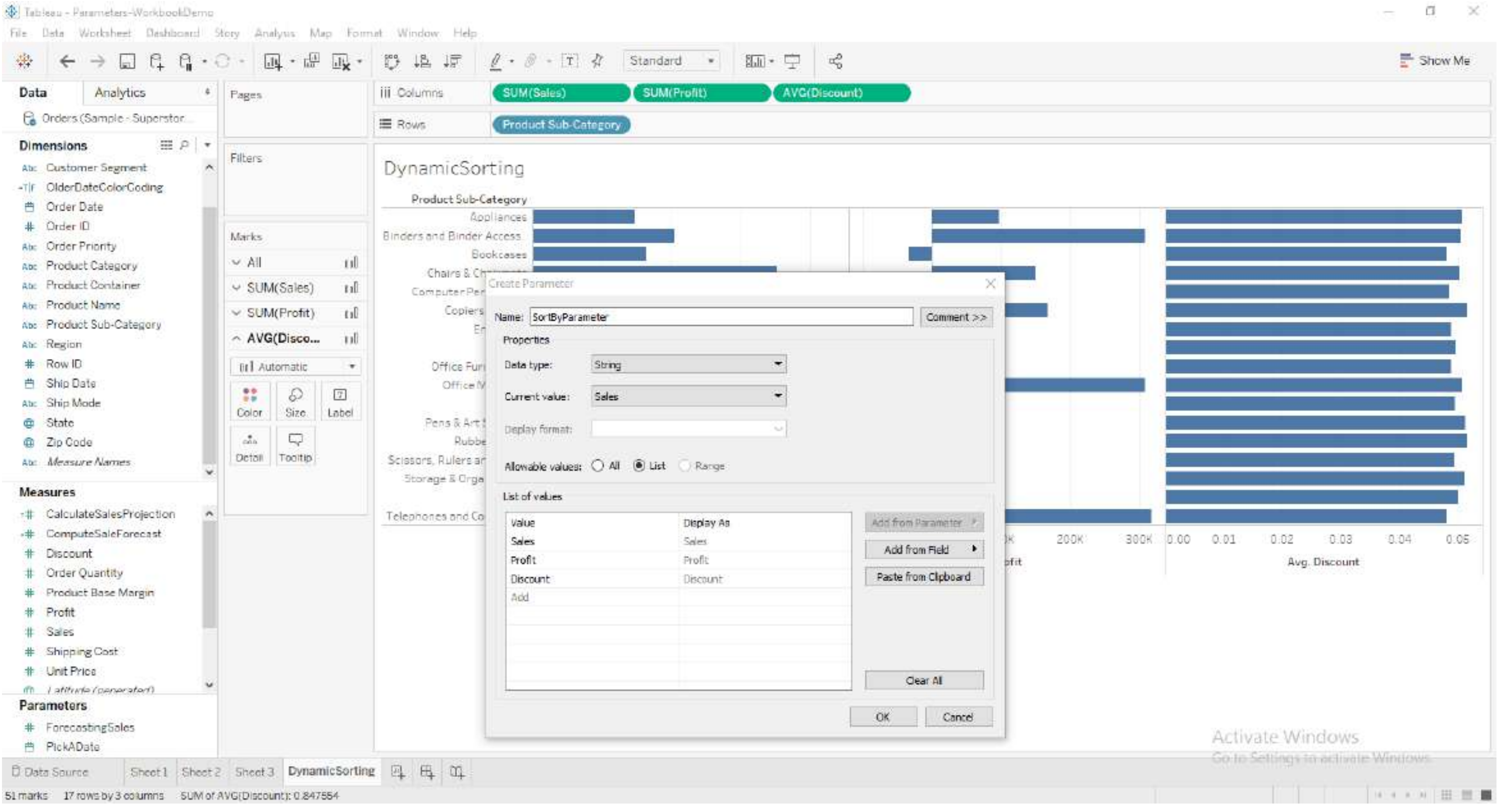
Use Case :Dynamic Sorting

COLUMNS:	SUM(Sales) SUM(Profit) Avg(Discount)
ROWS:	Product sub-category

Step 2

- **Dynamic Sorting Demo**

•Create “SortByParameter” for sorting the plot, this would be of the type “string” which takes in a list of values.



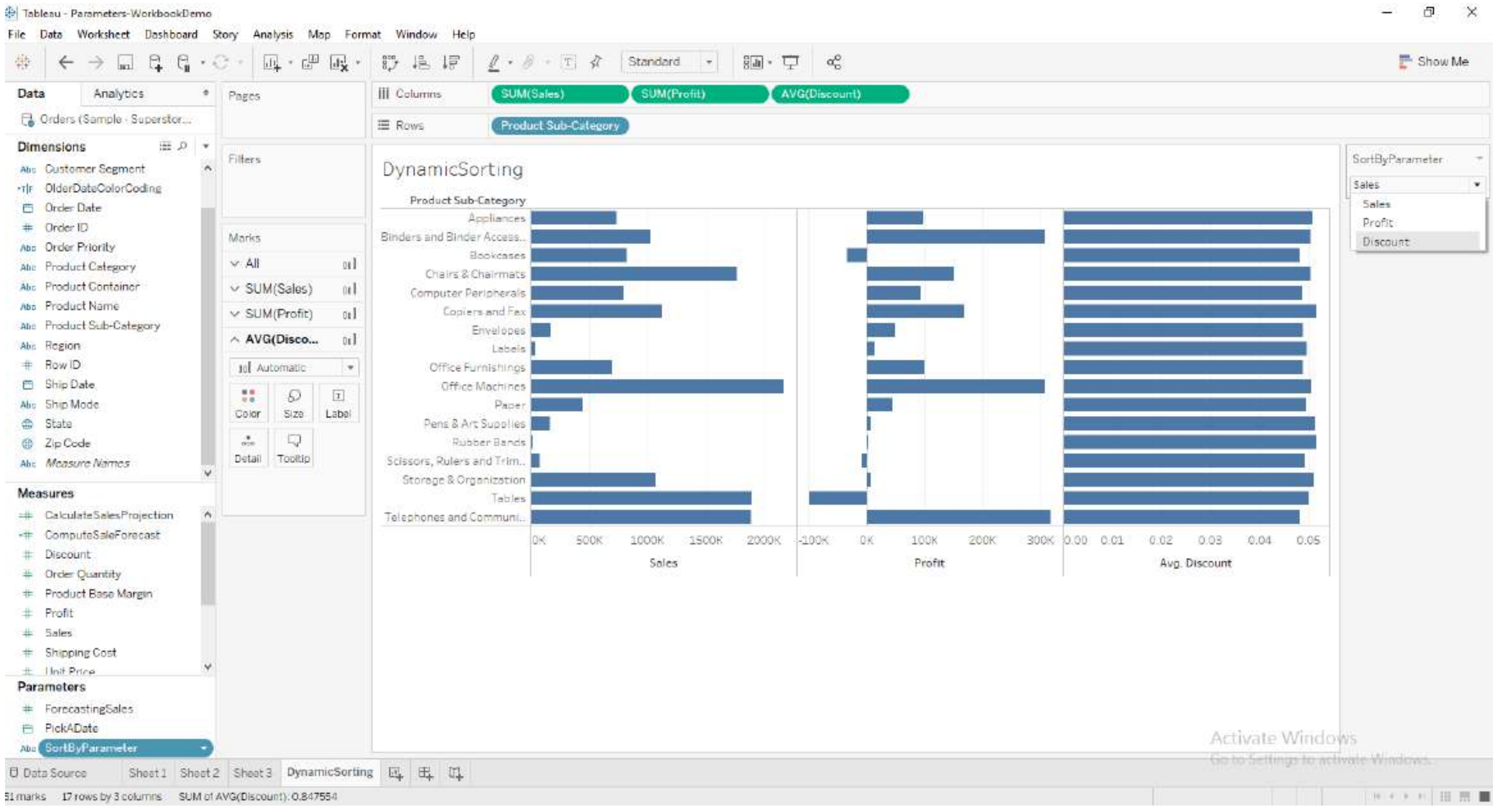
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Dynamic Sorting

COLUMNS:	SUM(Sales) SUM(Profit) Avg(Discount)
ROWS:	Product sub-category

Step 3

- **Dynamic Sorting Demo**
- Lets add the parameter to the worksheet.
- Next step is to connect this to a **calculated field to bind it to the sheet.**



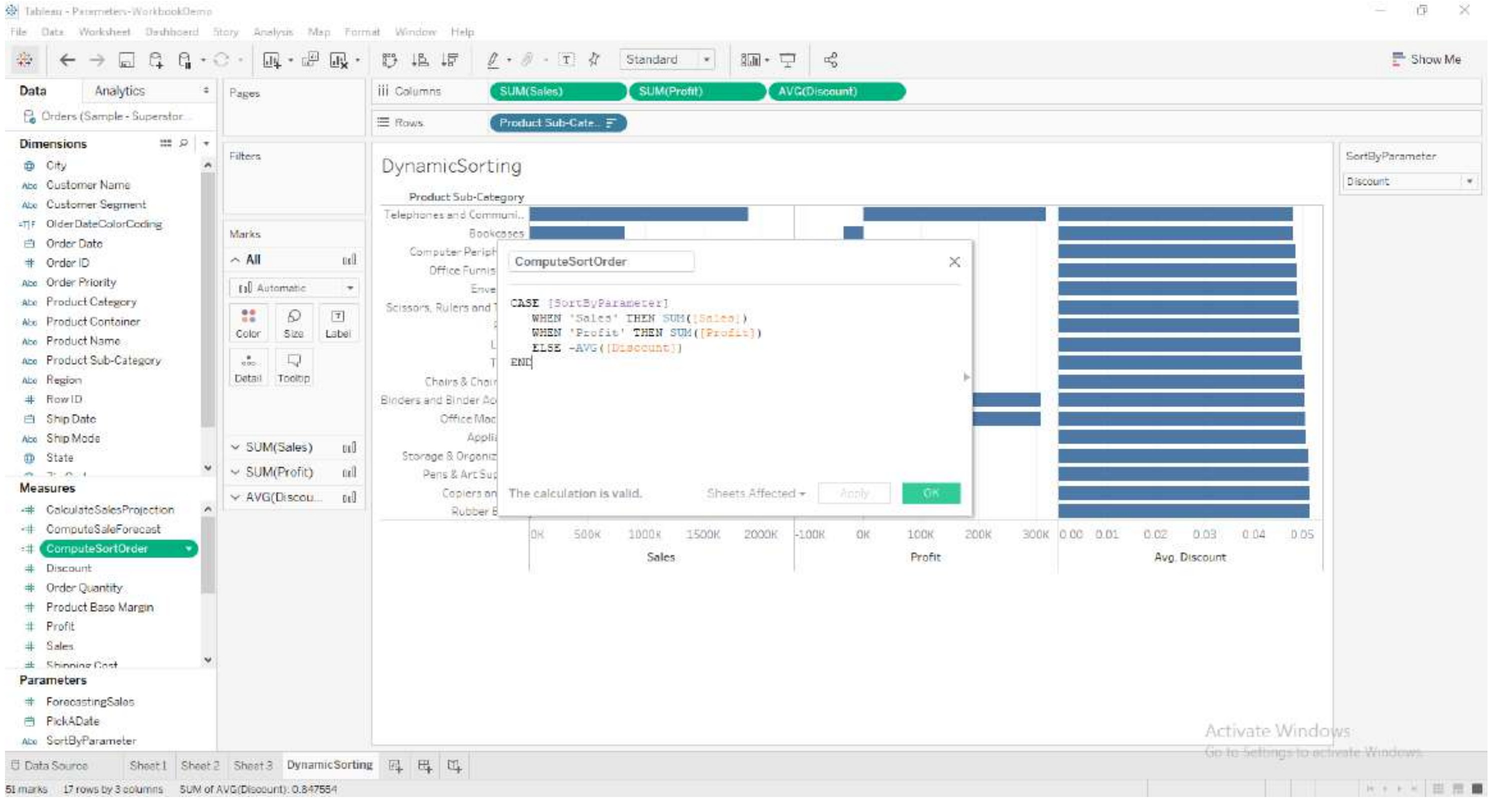
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Dynamic Sorting

COLUMNS:	SUM(Sales) ,SUM(Profit) ,Avg(Discount)
ROWS:	Product sub-category

Step 4

- **Dynamic Sorting Demo**
- Lets create a ComputeSortOrder calculatedfield



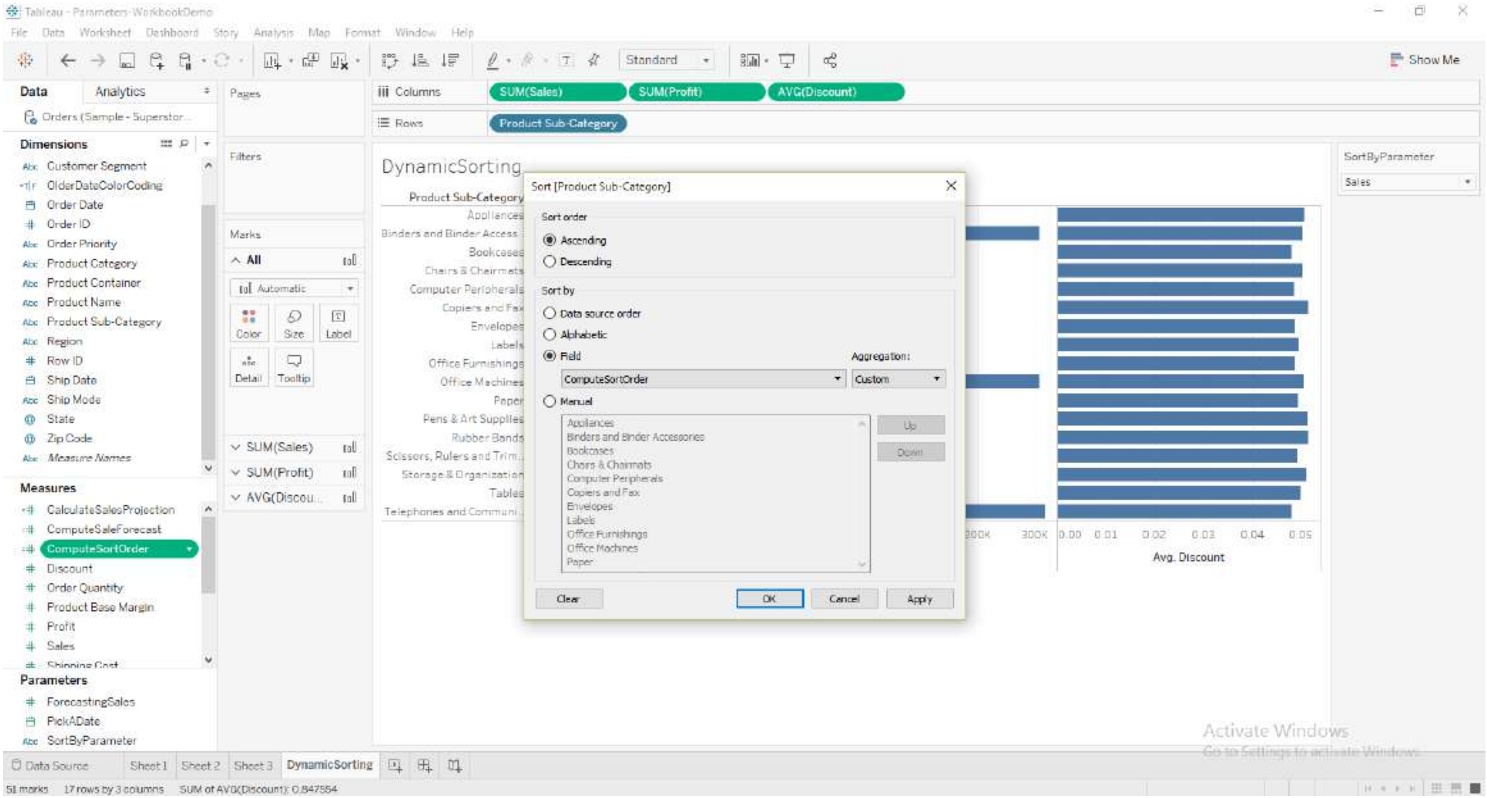
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Dynamic Sorting

Step 5

- **Dynamic Sorting Demo**
- Let us sort Product Sub-Category by "ComputeSortOrder" field as shown in the figure.

COLUMNS:	SUM(Sales) ,SUM(Profit) ,Avg(Discount)
ROWS:	Product sub-category



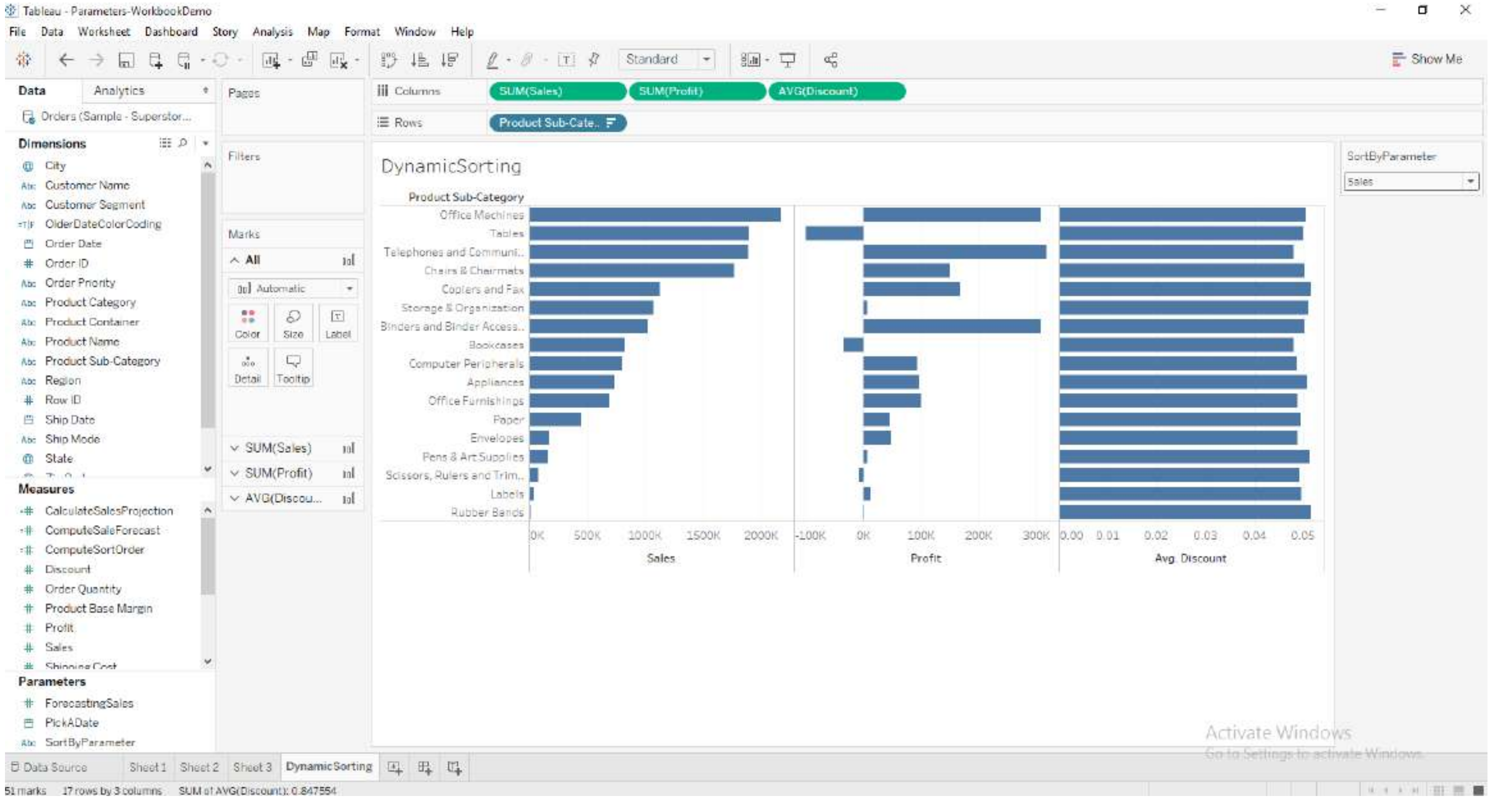
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Dynamic Sorting

COLUMNS:	SUM(Sales) ,SUM(Profit) ,Avg(Discount)
ROWS:	Product sub-category

Step 6

- **Dynamic Sorting Demo**
- Upon user selection of the **SortbyParameter,** there is dynamic sorting of the views.



Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

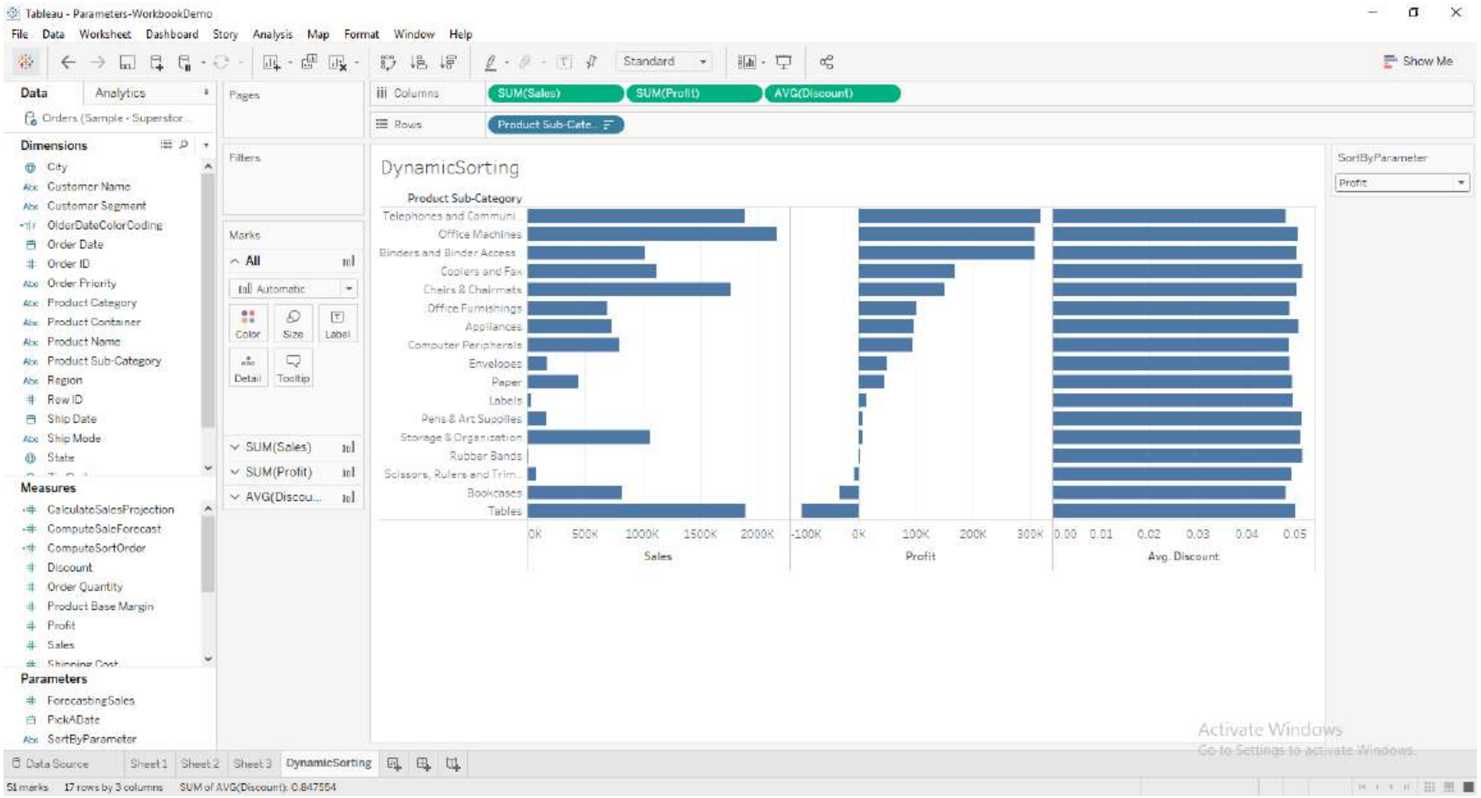
Use Case :Dynamic Sorting

COLUMNS:	SUM(Sales) ,SUM(Profit) ,Avg(Discount)
ROWS:	Product sub-category

Step 7

- **Dynamic Sorting Demo**

•Upon user selection of the **SortbyParameter,** there is dynamic sorting of the views.



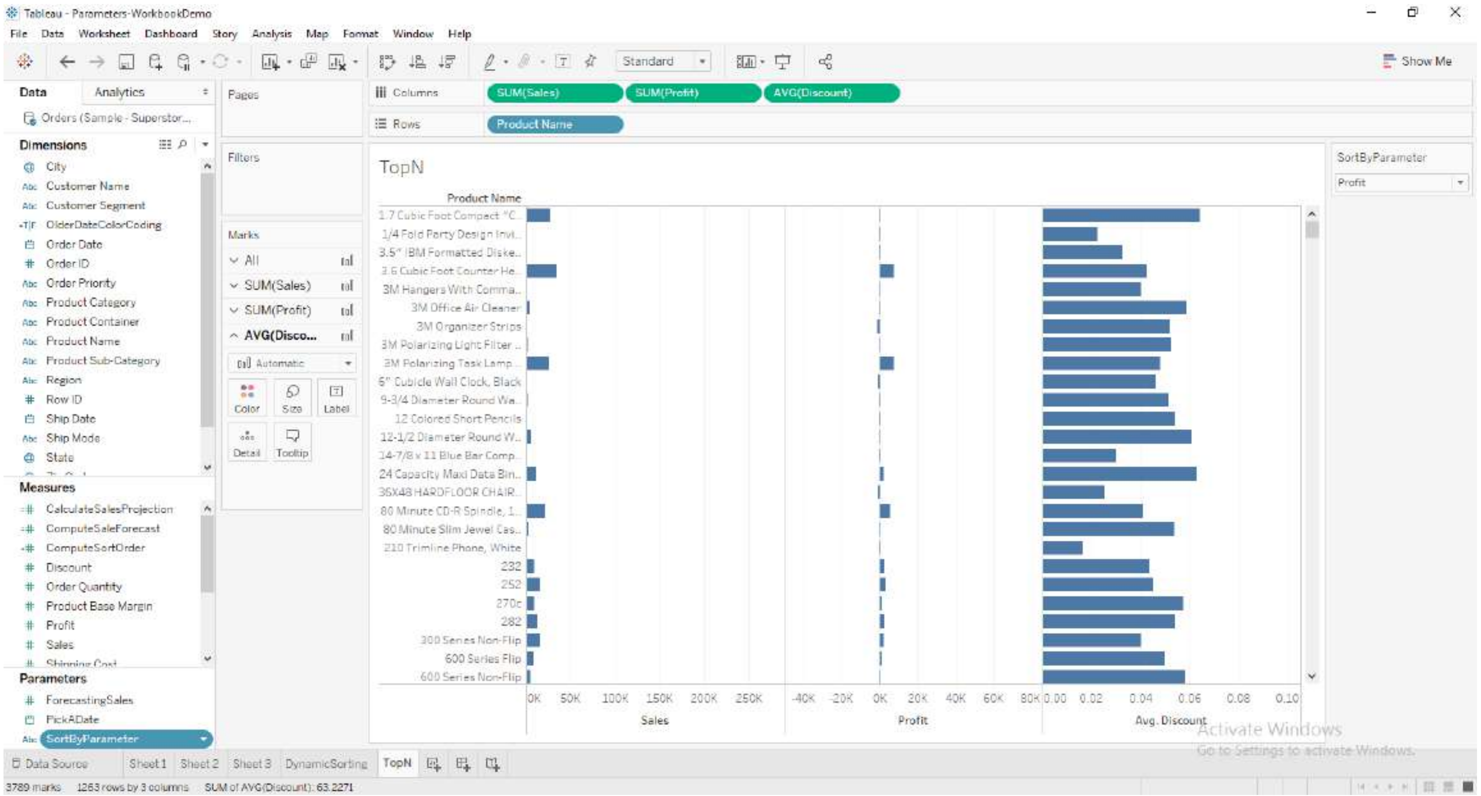
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Top N

Step 1

- **Top N**
- Lets create a plot with productNames vs {Sum(Sales),Sum(Profit),Avg (Discount)}

COLUMNS:	SUM(Sales) ,SUM(Profit) ,Avg(Discount)
ROWS:	Product Name



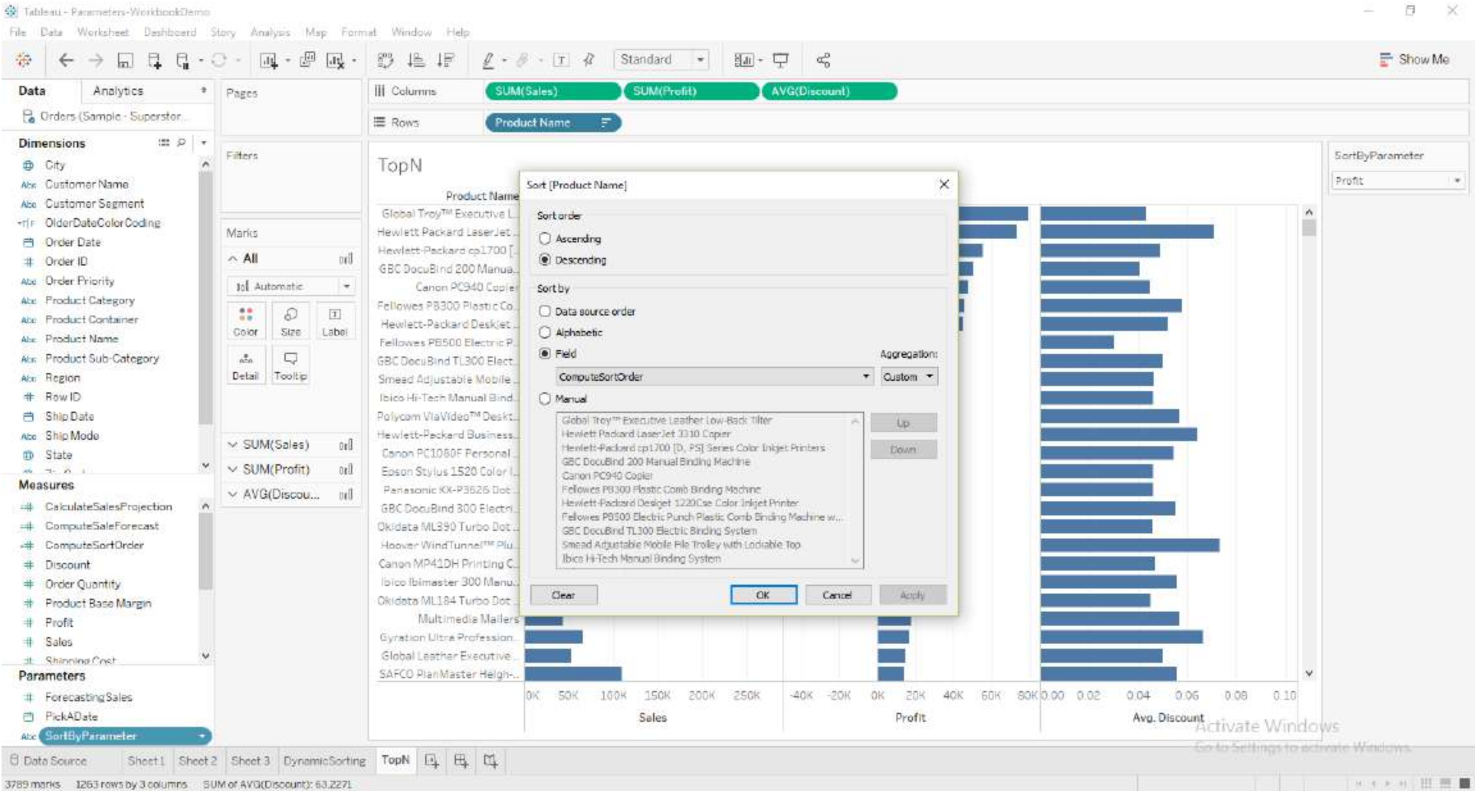
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Top N

Step 2

- **Top N**
- Now lets, add custom sort by "computesortorder" for the productName.

COLUMNS:	SUM(Sales) ,SUM(Profit) ,Avg(Discount)
ROWS:	Product Name



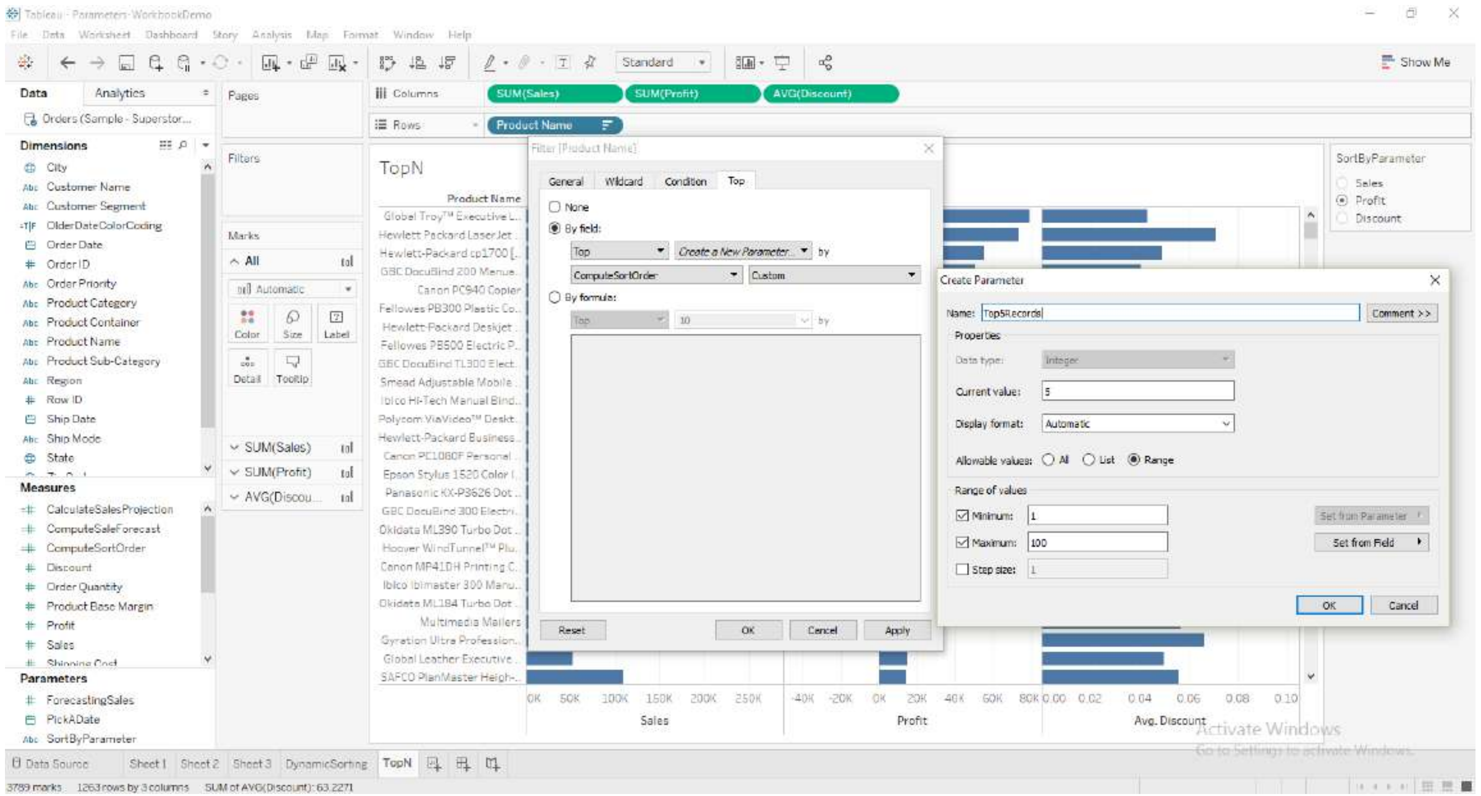
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Top N

Step 3

COLUMNS:	SUM(Sales) ,SUM(Profit) ,Avg(Discount)
ROWS:	Product Name

- **Top N**
- Now lets create a filter for TOP N records from the selection.



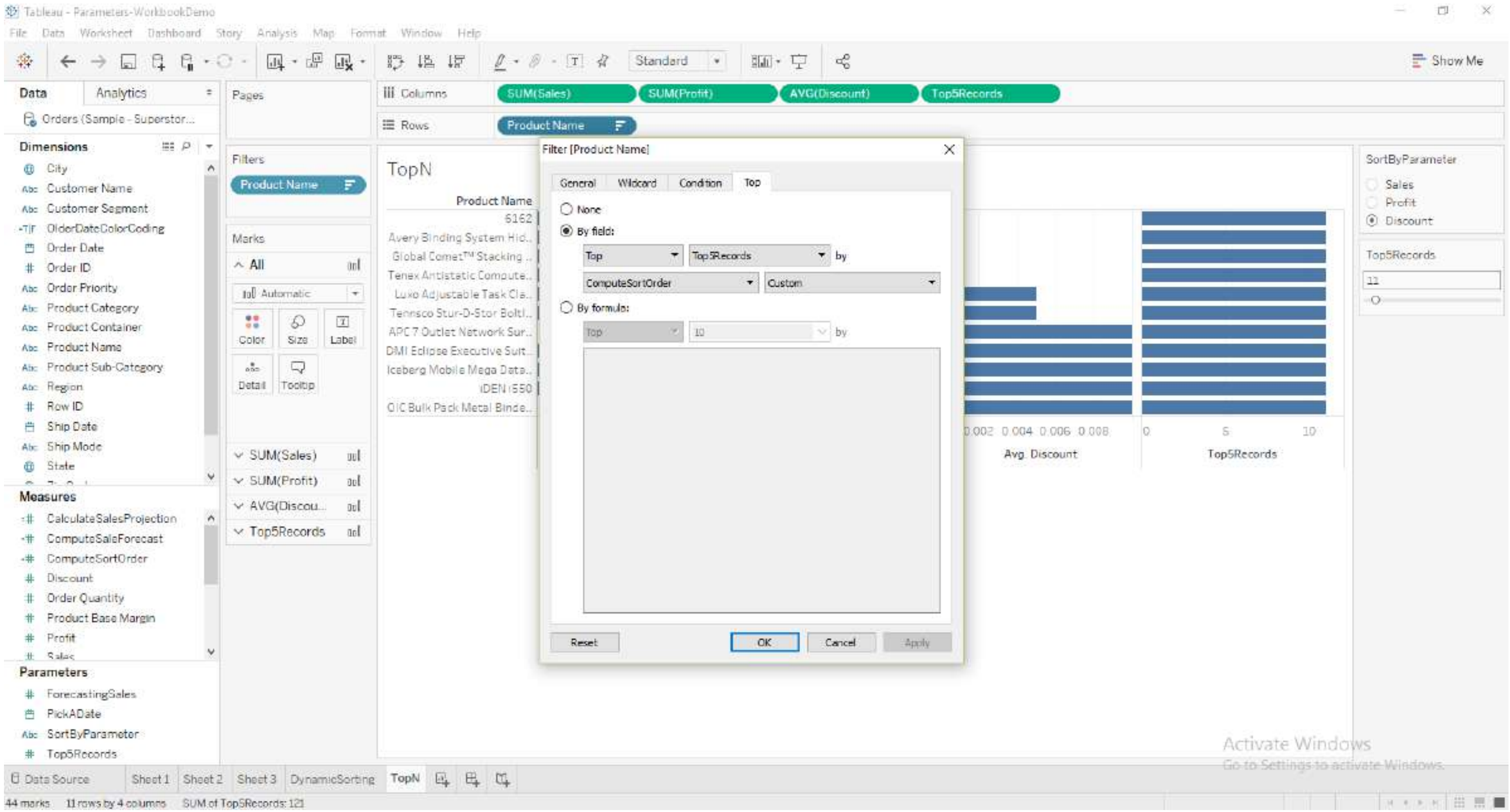
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Top N

Step 4

- **Top N**
- Now lets create a filter for TOP N records from the selection.

COLUMNS:	SUM(Sales) ,SUM(Profit) ,Avg(Discount)
ROWS:	Product Name



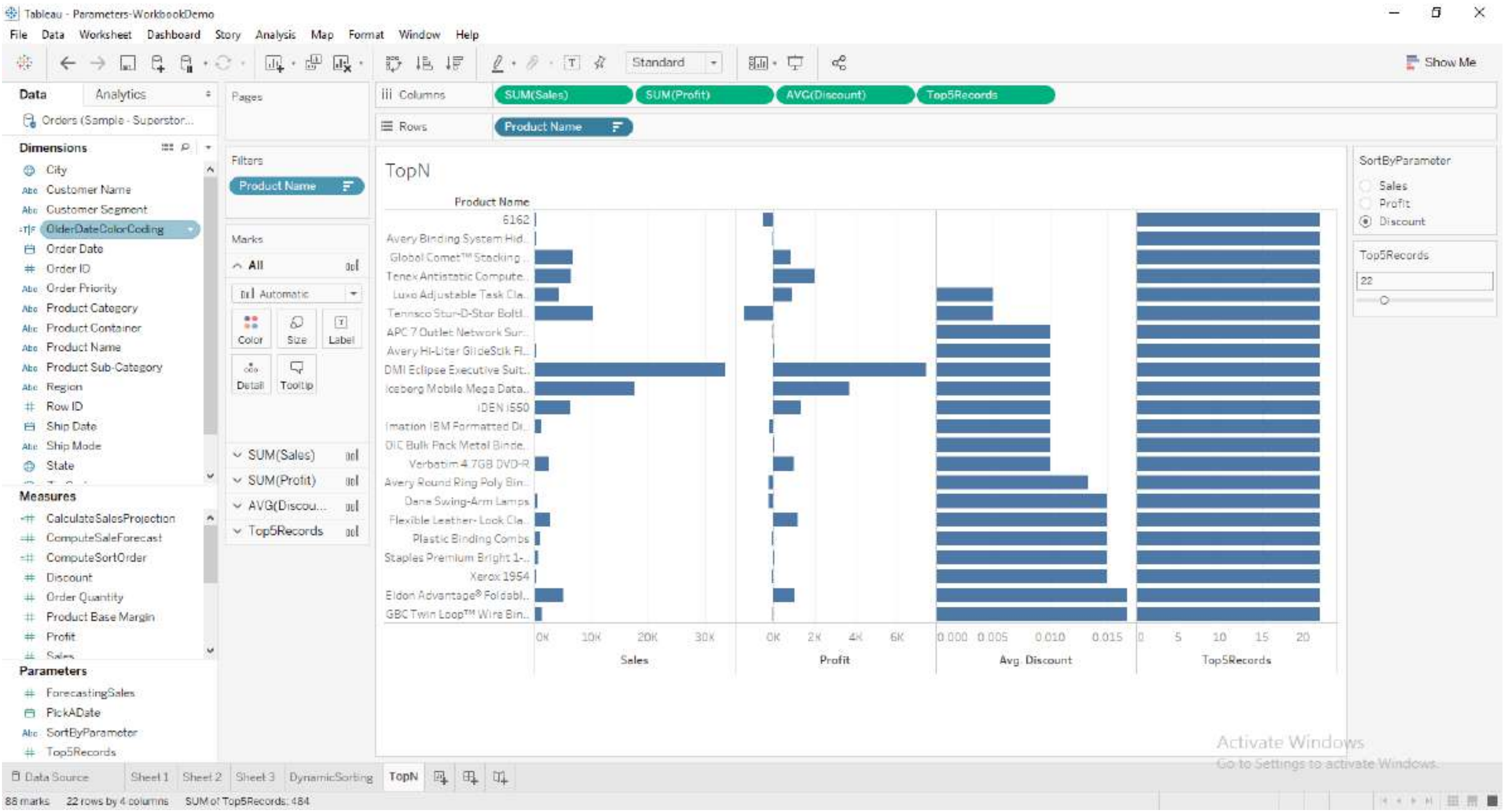
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Top N

Step 5

- **Top N**
- Apply the filter to retrieve the top 22 records as shown in the figure.

COLUMNS:	SUM(Sales) ,SUM(Profit) ,Avg(Discount)
ROWS:	Product Name



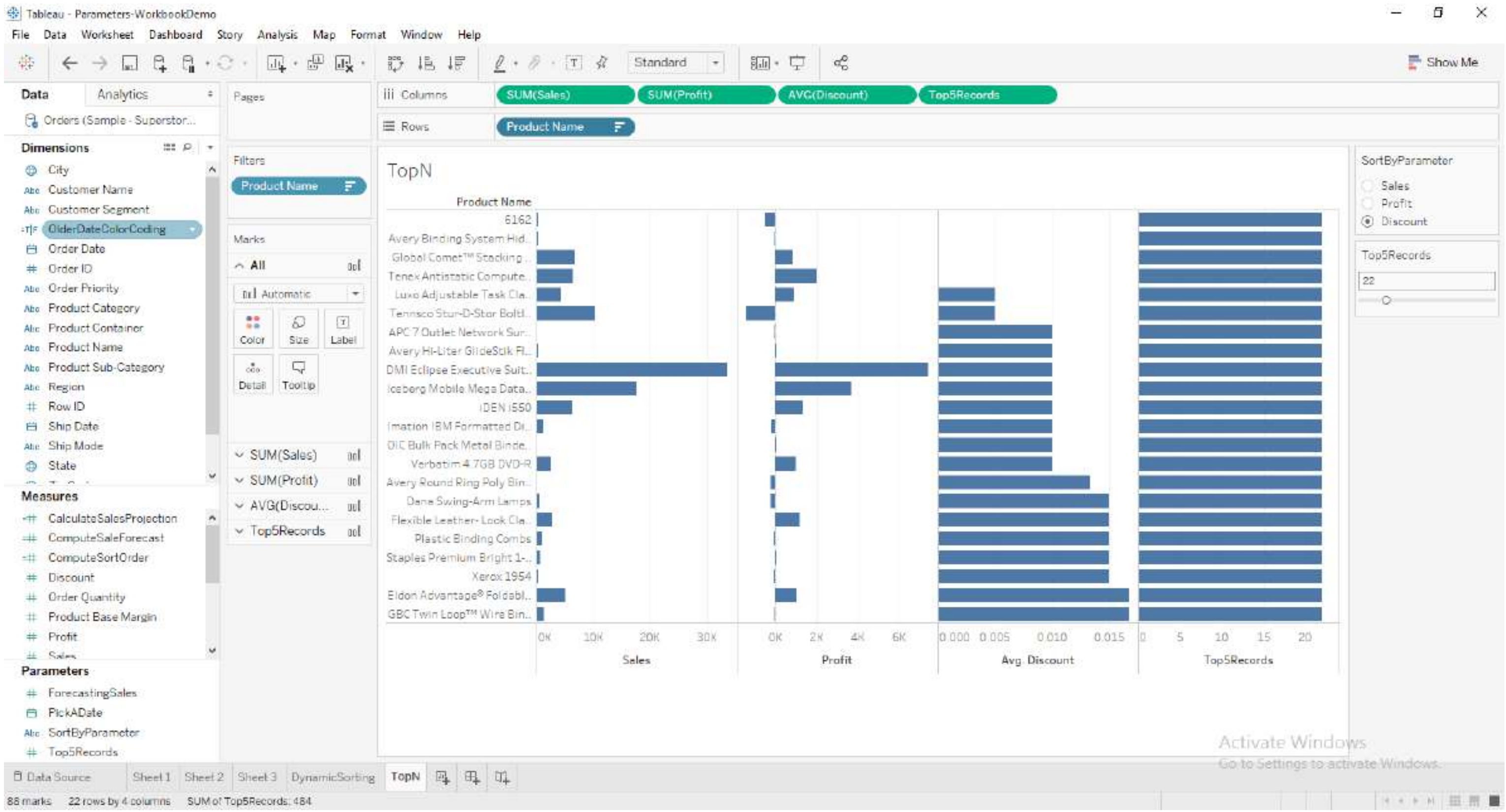
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Top N

Step 5

- **Top N**
- Apply the filter to retrieve the top 22 records as shown in the figure.

COLUMNS:	SUM(Sales) ,SUM(Profit) ,Avg(Discount)
ROWS:	Product Name



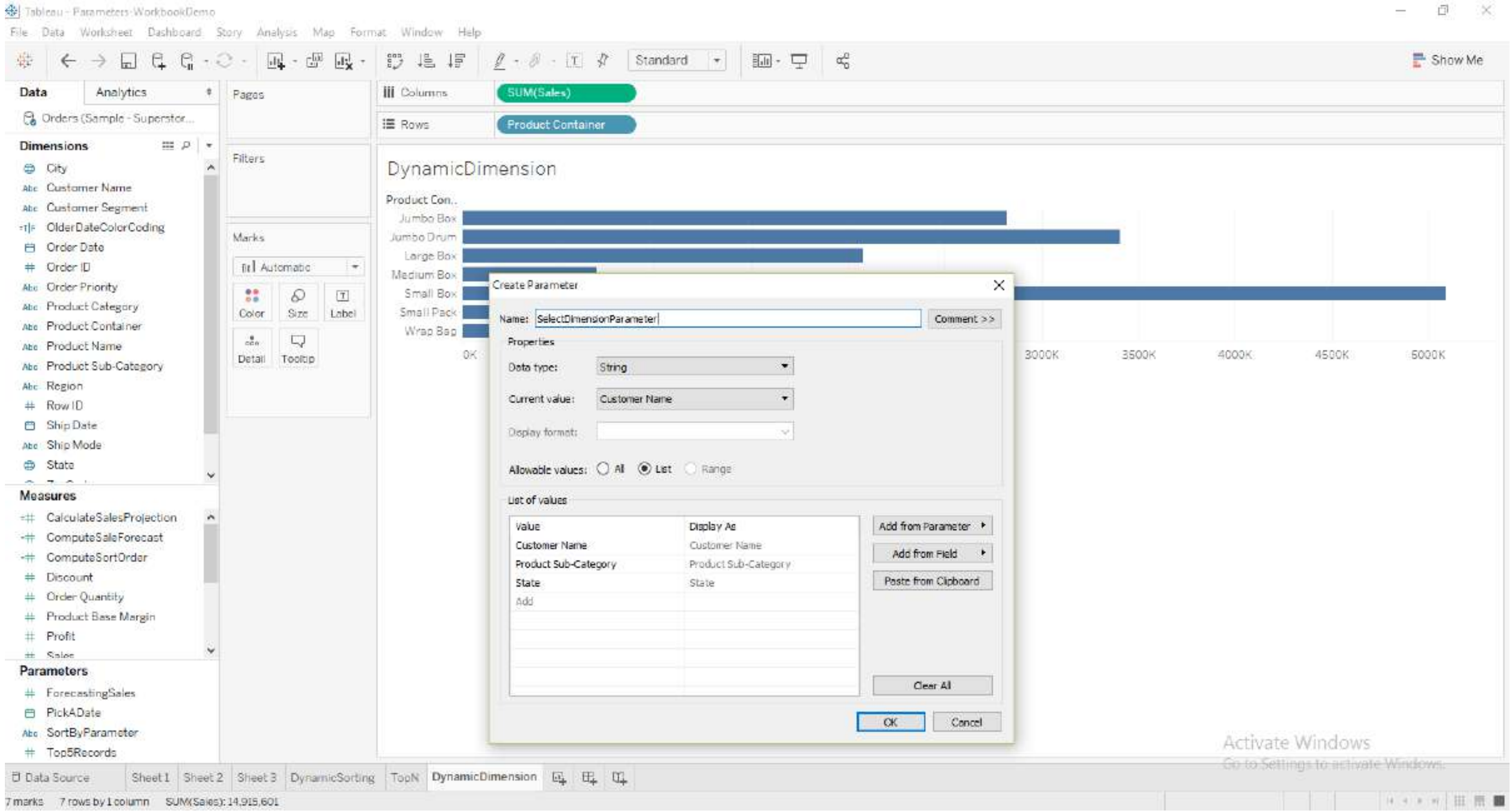
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Dynamic Dimension

COLUMNS:	SUM(Sales)
ROWS:	Product Container

Step 1

- Some times users would like to select a different dimension against a measured value.



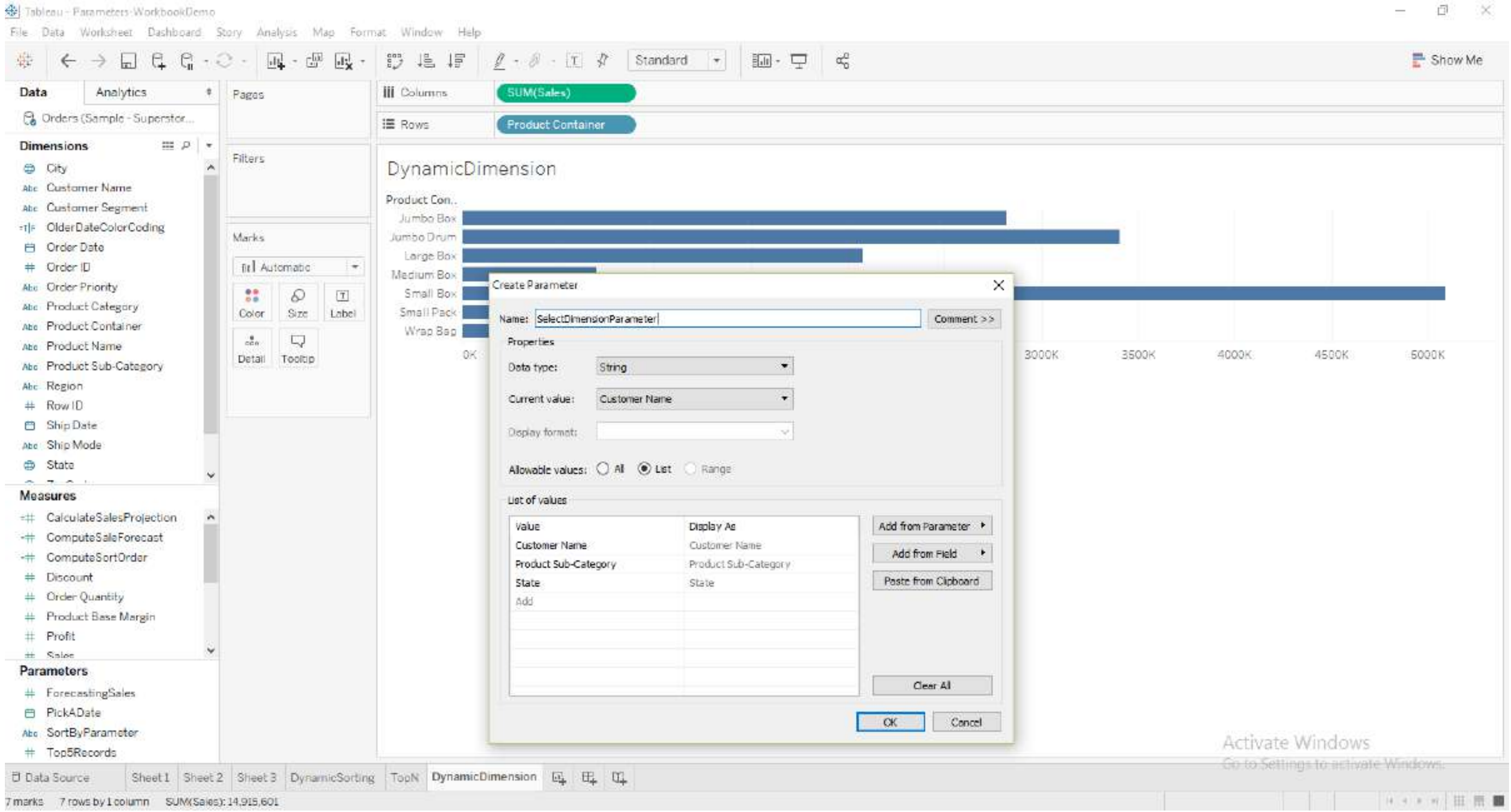
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Dynamic Dimension

Step 2

- Some times users would like to select a different dimension against a measured value.

COLUMNS:	SUM(Sales)
ROWS:	Product Container



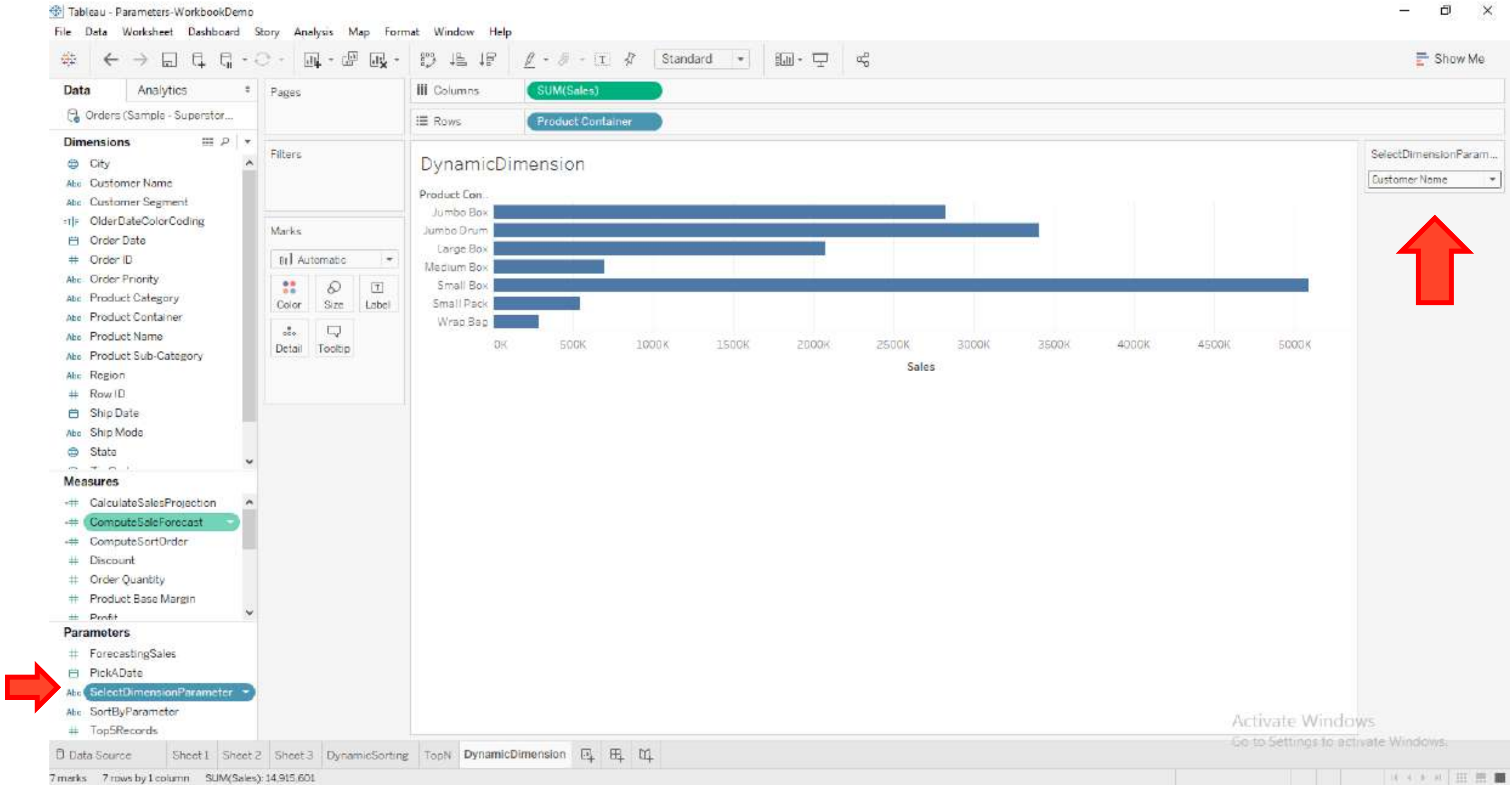
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Dynamic Dimension

Step 3

• We have created a parameter "selectadimensionparameter"

COLUMNS:	SUM(Sales)
ROWS:	Product Container



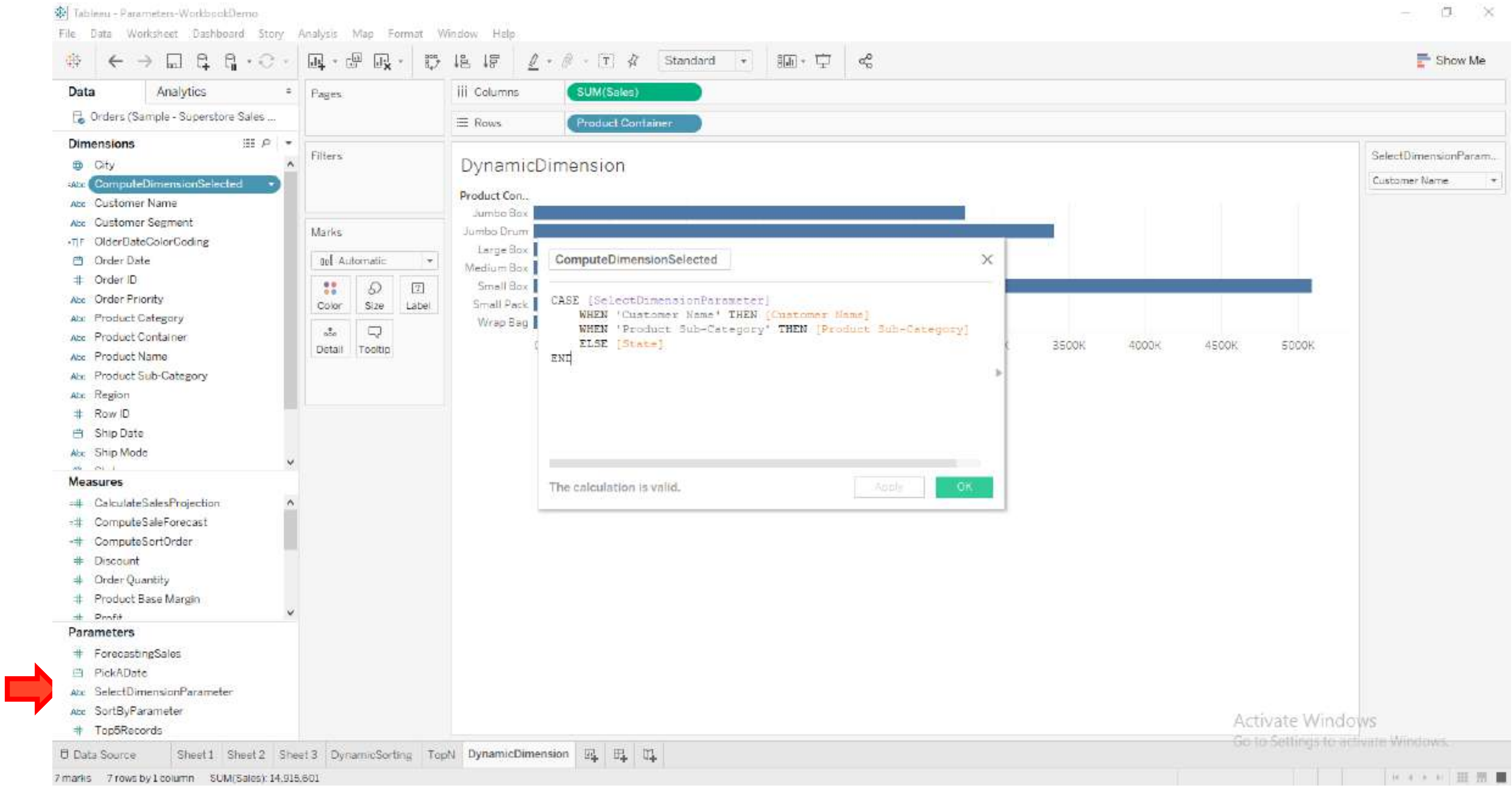
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Dynamic Dimension

COLUMNS:	SUM(Sales)
ROWS:	Product Container

Step 4

- Lets create a calculated field to select a dimension from the parameter defined earlier.



Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

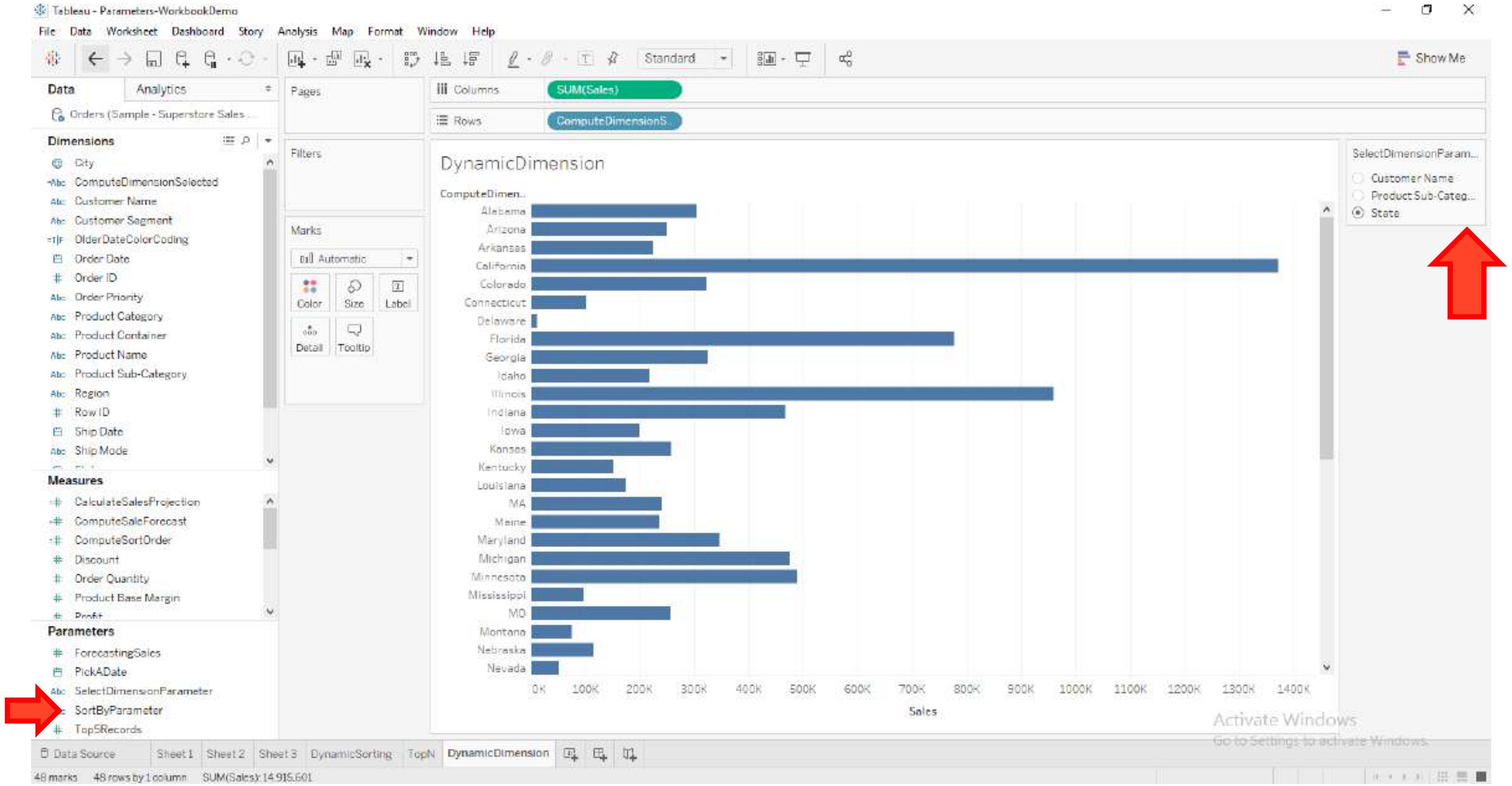
Original Series

Use Case :Dynamic Dimension

Step 5

- Now lets add "computedSelectDimension" created to the rows, we have successfully created Dynamic Dimension Parameter, which changes based on user interaction/user choice.

COLUMNS:	SUM(Sales)
ROWS:	ComputeSelectDimension



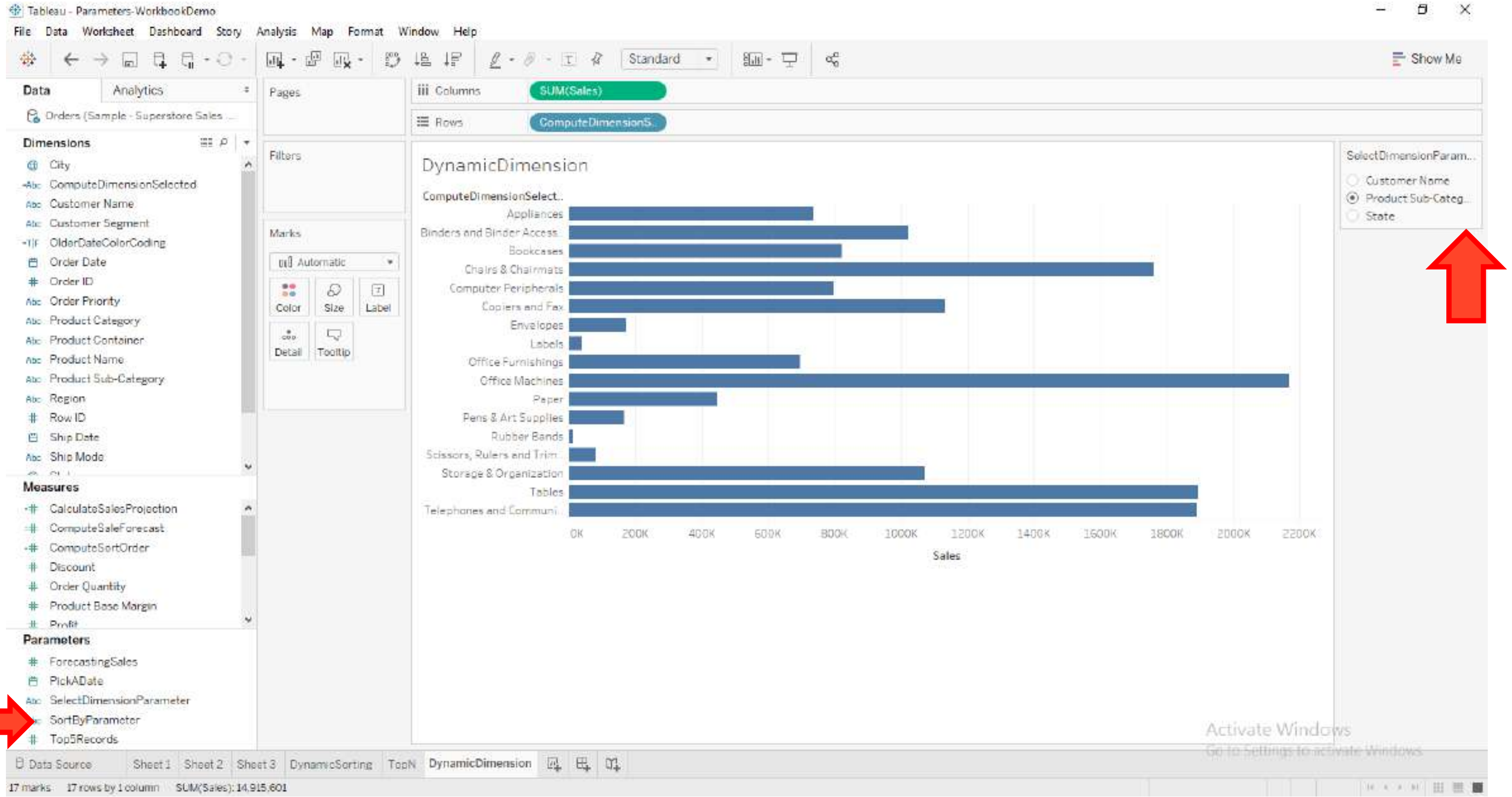
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Dynamic Dimension

COLUMNS:	SUM(Sales)
ROWS:	ComputeSelectDimension

Step 6

- Now lets add "computedSelectDimension" created to the rows, we have successfully created Dynamic Dimension Parameter, which changes based on user interaction/user choice.



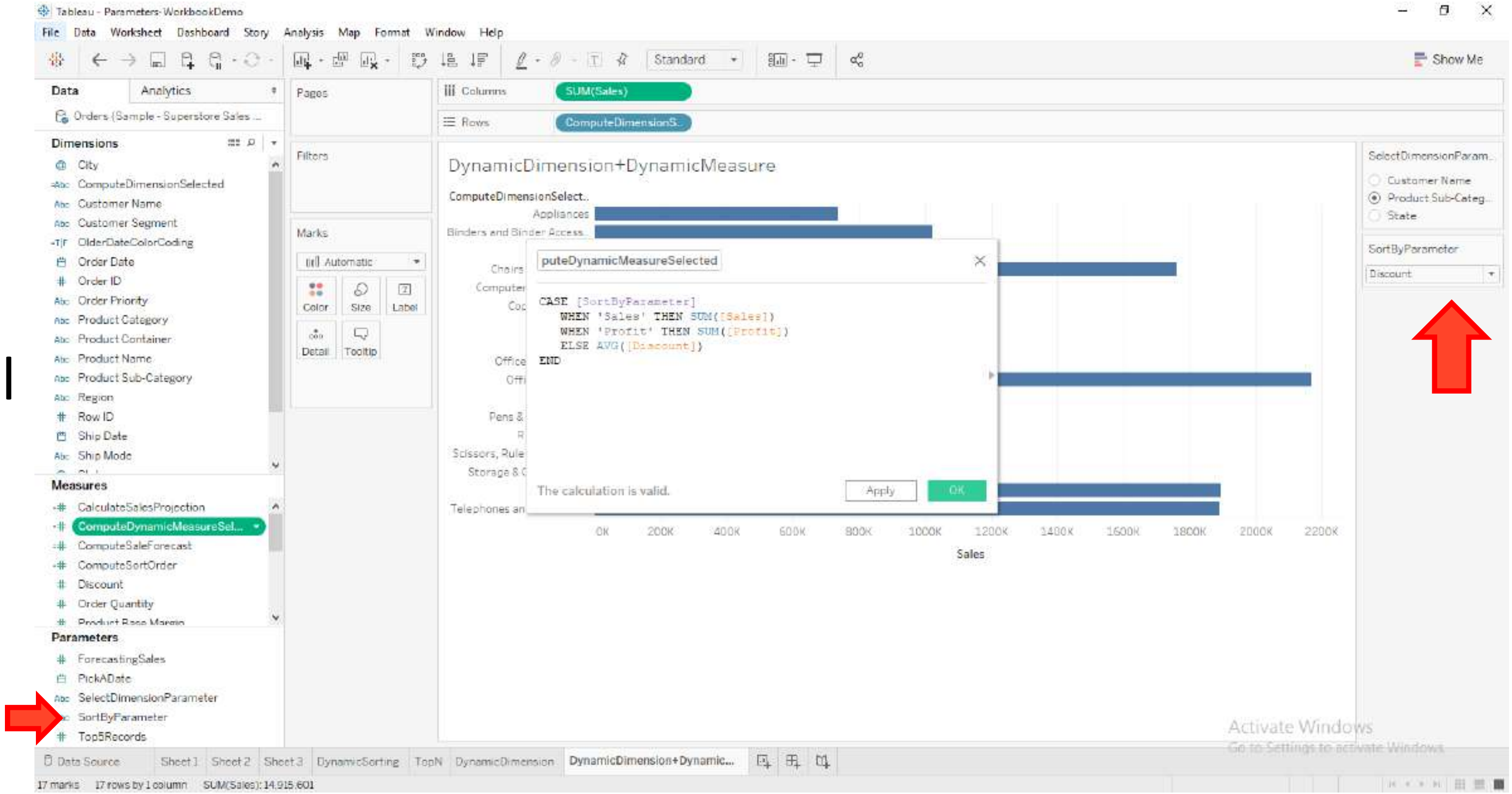
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Dynamic Dimension + Dynamic Measure

Step 1

- Duplicate the Dynamic Dimension Worksheet
- Duplicate and rename the ComputeSortOrder to ComputeDynamicMeasureSelected

COLUMNS:	SUM(Sales)
ROWS:	ComputeSelectDimension



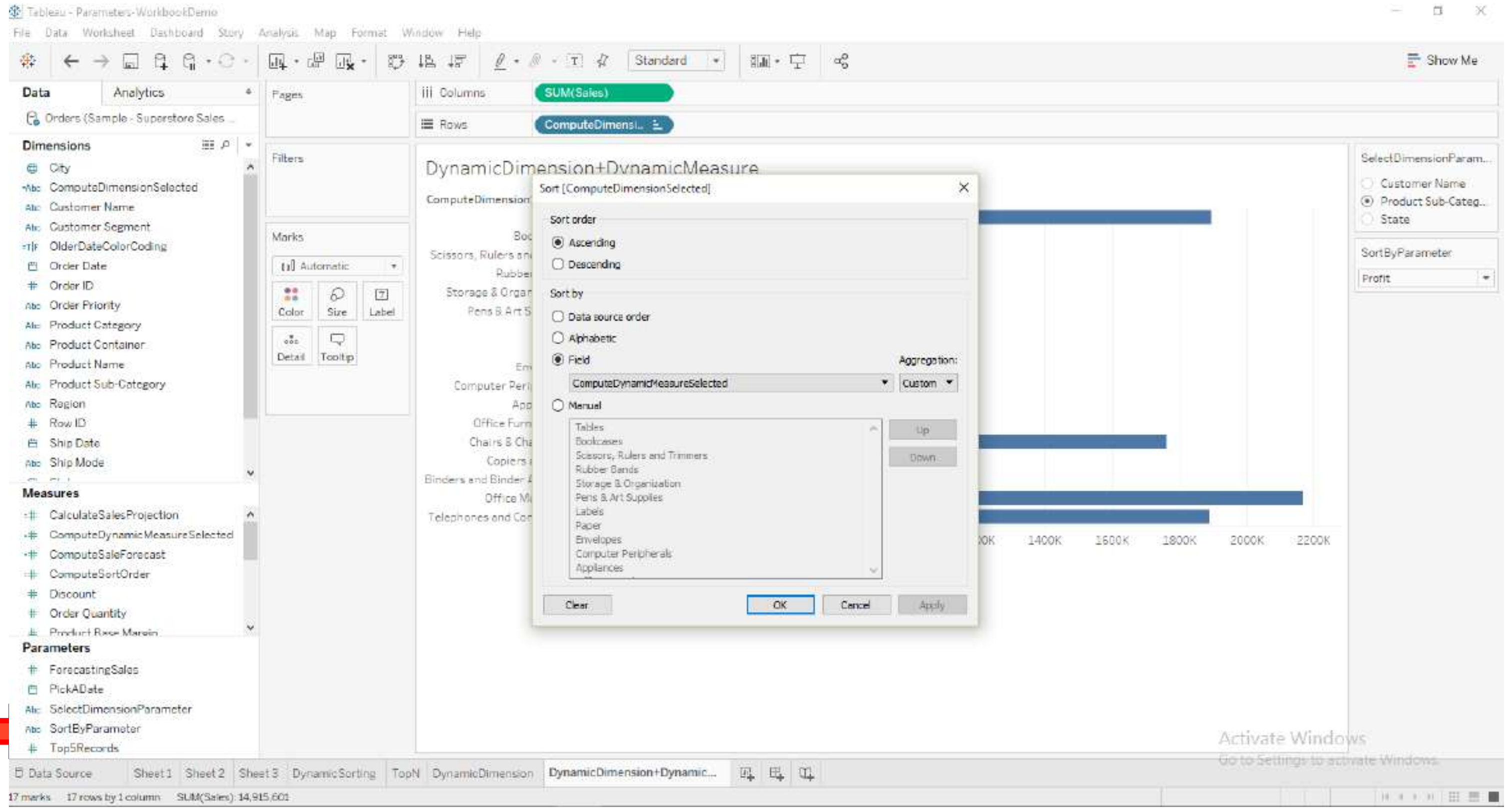
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Dynamic Dimension + Dynamic Measure

Step 2

COLUMNS:	SUM(Sales)
ROWS:	ComputeSelectDimension

- Now apply sort to the productselecteddimension as shown in the figure.



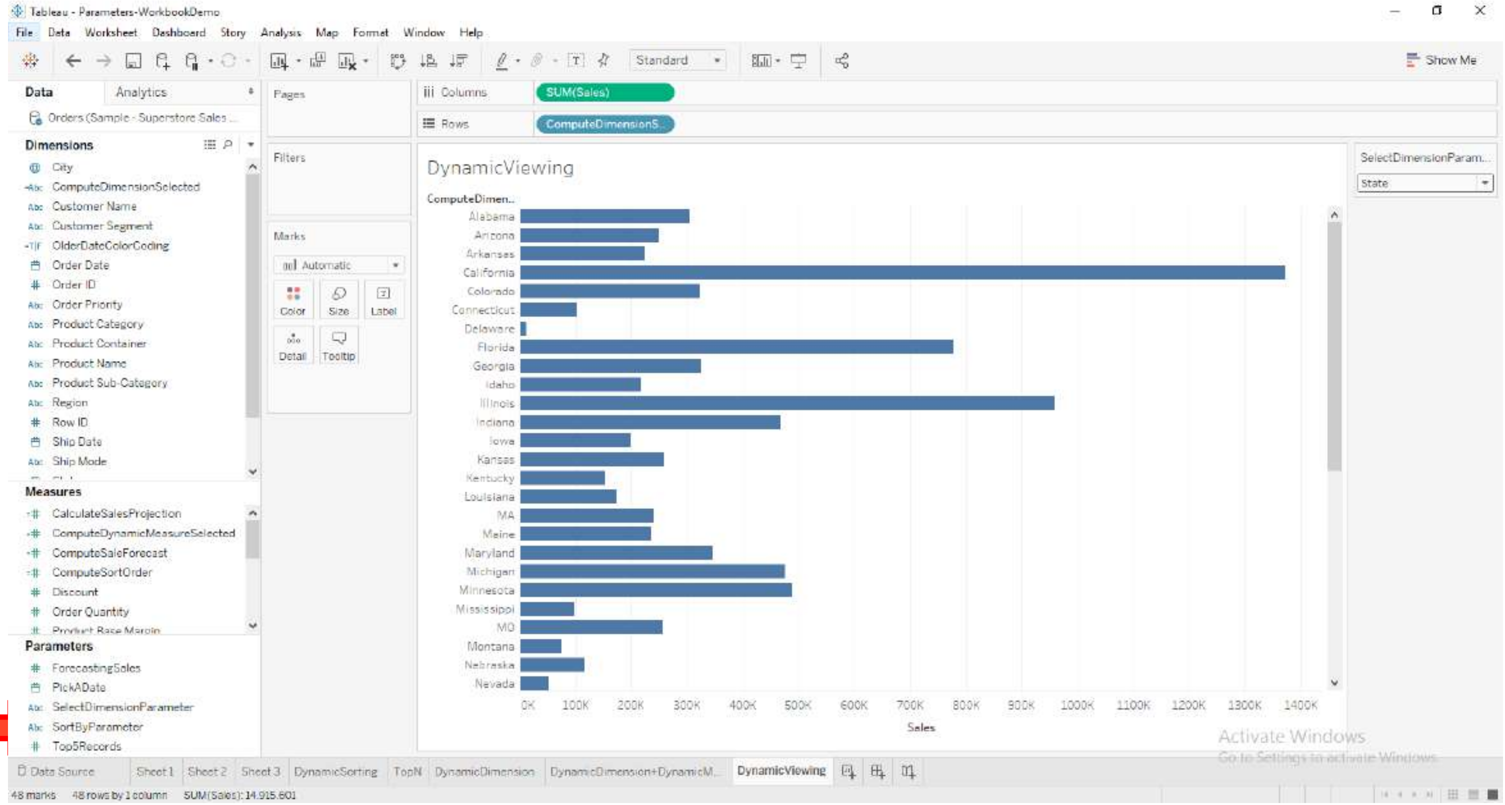
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Dynamic View

Step 1

COLUMNS:	SUM(Sales)
ROWS:	ComputeSelectDimension

- create a worksheet with ComputeSelectDimension and SUM(Sales) as shown in the figure.
- Add SelectDimensionParameter to the Worksheet.
- We would like the view to render a different perspective based on the dimension selected.



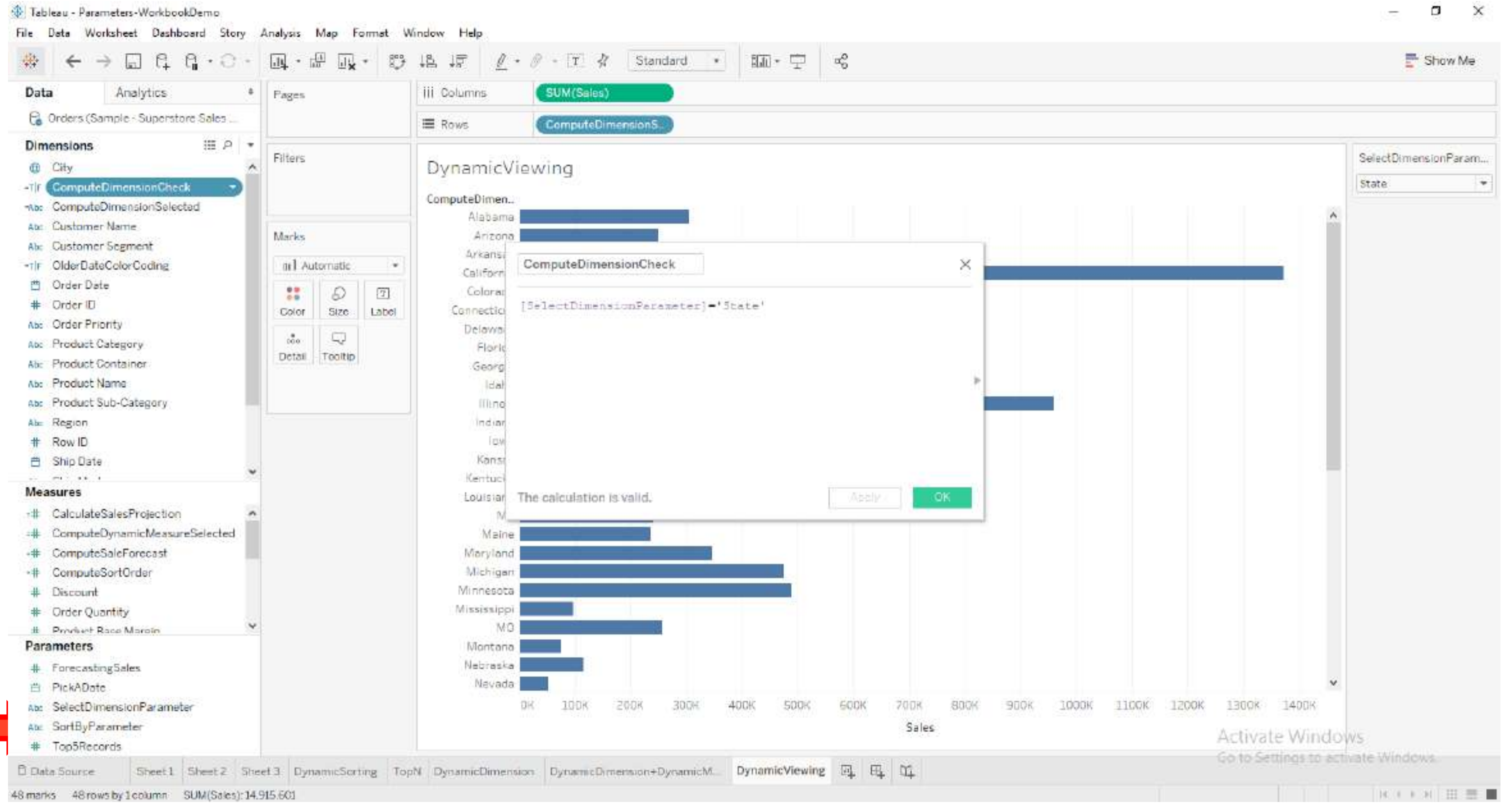
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Dynamic View

COLUMNS:	SUM(Sales)
ROWS:	ComputeSelectDimension

Step 2

- create a computed field to check, whether the selected dimension is of type="state" as shown in the figure.



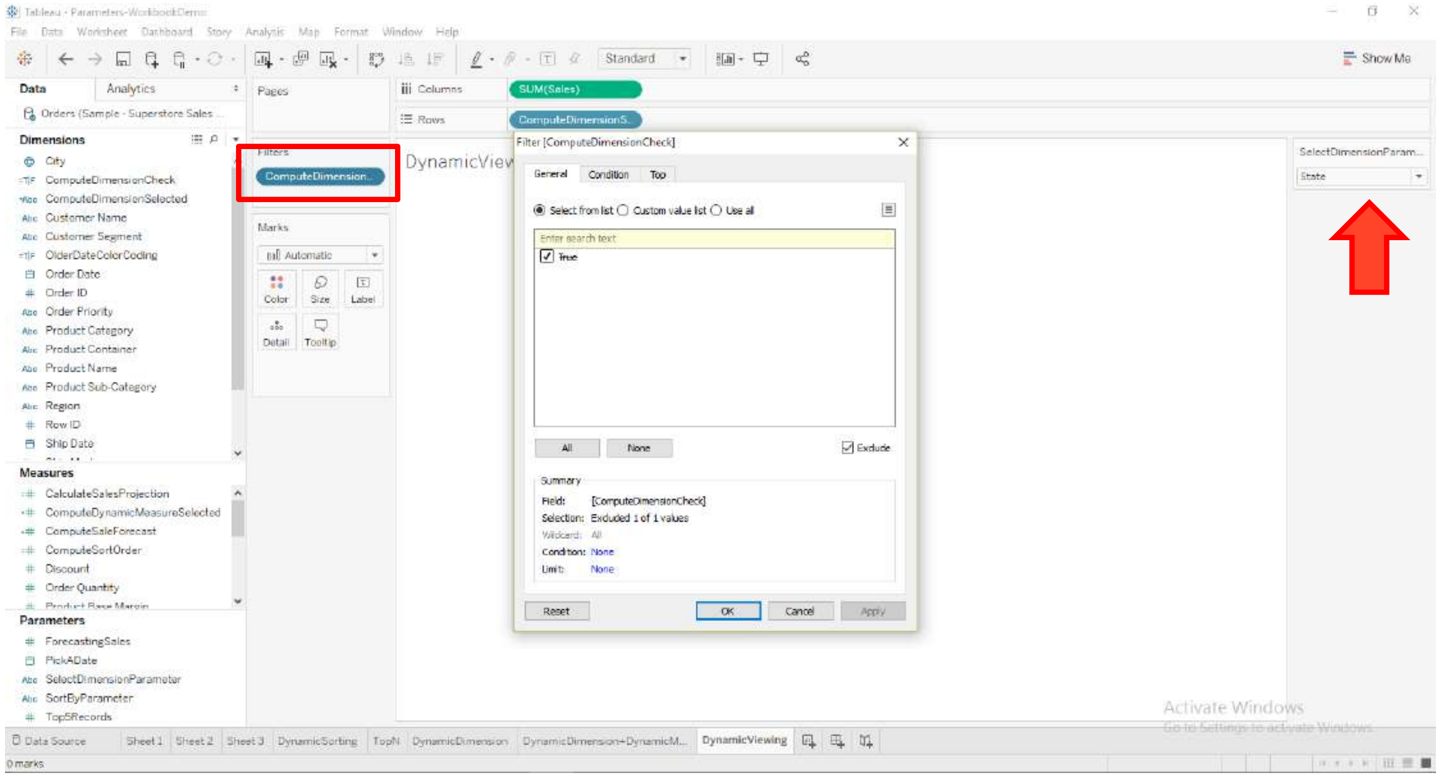
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Dynamic View

COLUMNS:	SUM(Sales)
ROWS:	ComputeSelectDimension

Step 3

- lets apply ComputerDimensionCheck to filter and exclude for state by checking the state to "true" in filters.



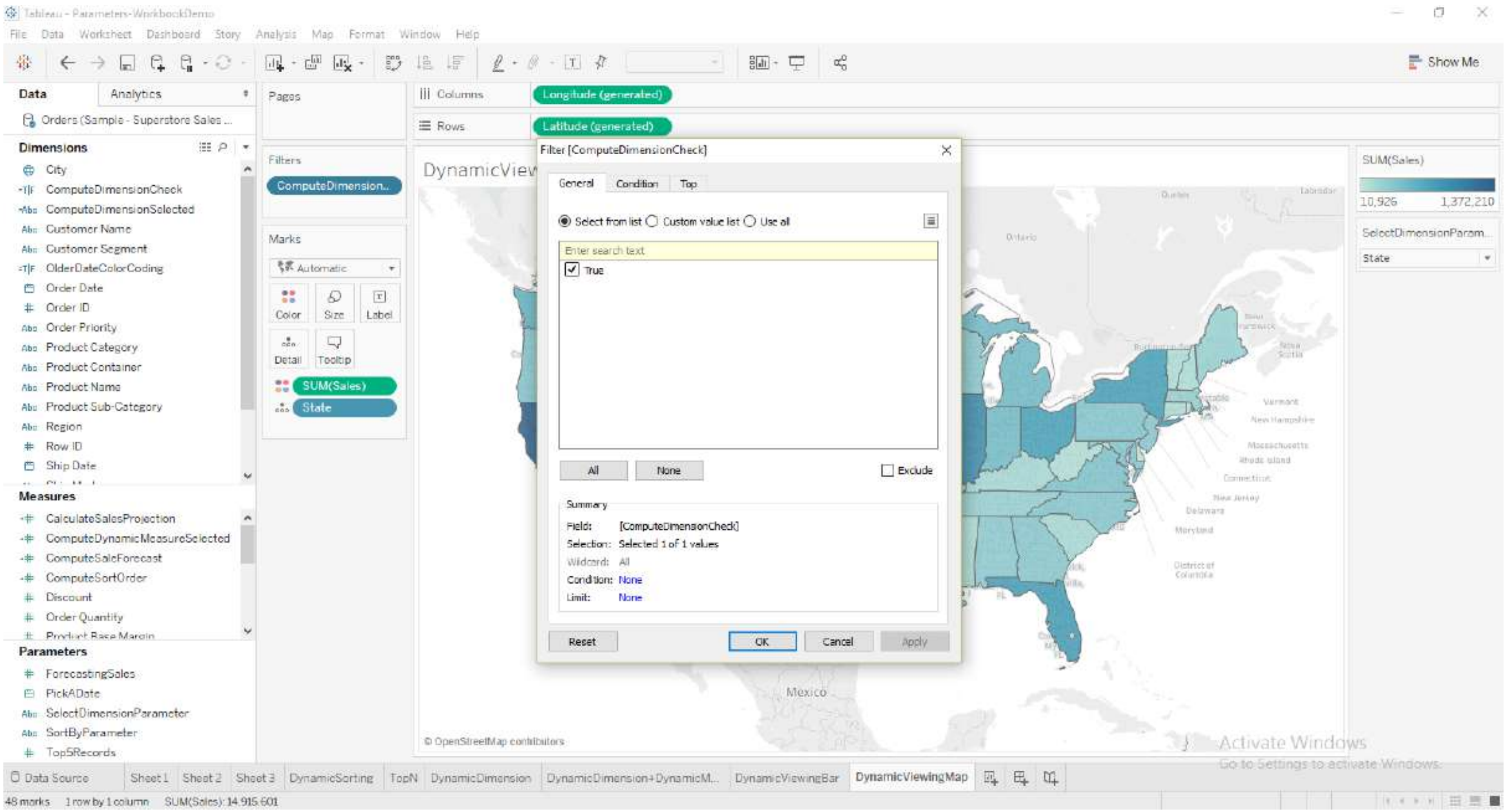
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Dynamic View

COLUMNS:	SUM(Sales)
ROWS:	ComputeSelectDimension

Step 4

- let create a new worksheet with states and sales(colors:marks)
- Now let us add selectdimensionparameter to the worksheet.
- Subsequently, lets add ComputerDImensionCheck to filters and enable it to true.



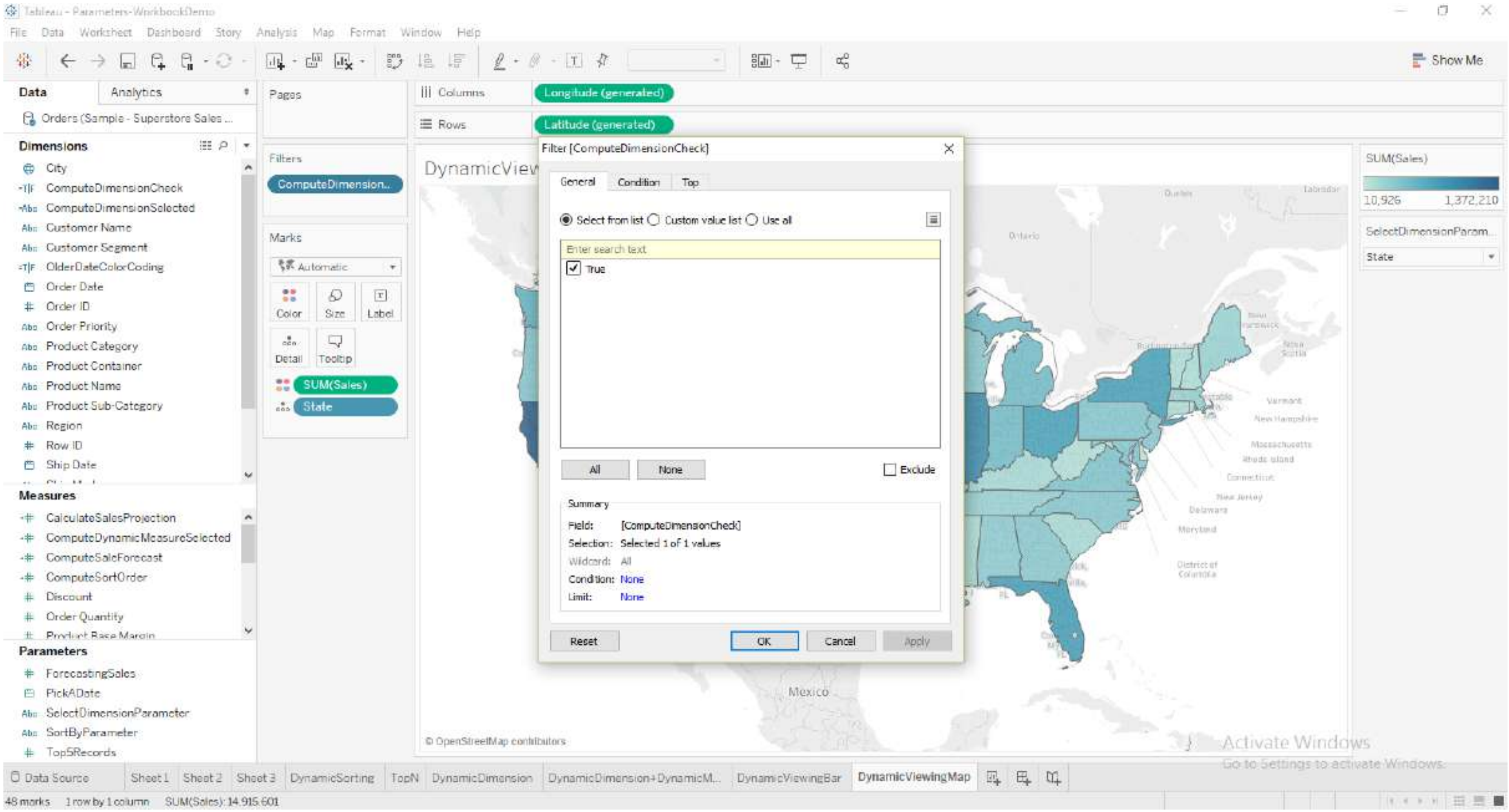
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Dynamic View

Step 5

- Now let us add "computeDimensionCheck" filter and enable it to "true".

COLUMNS:	
ROWS:	



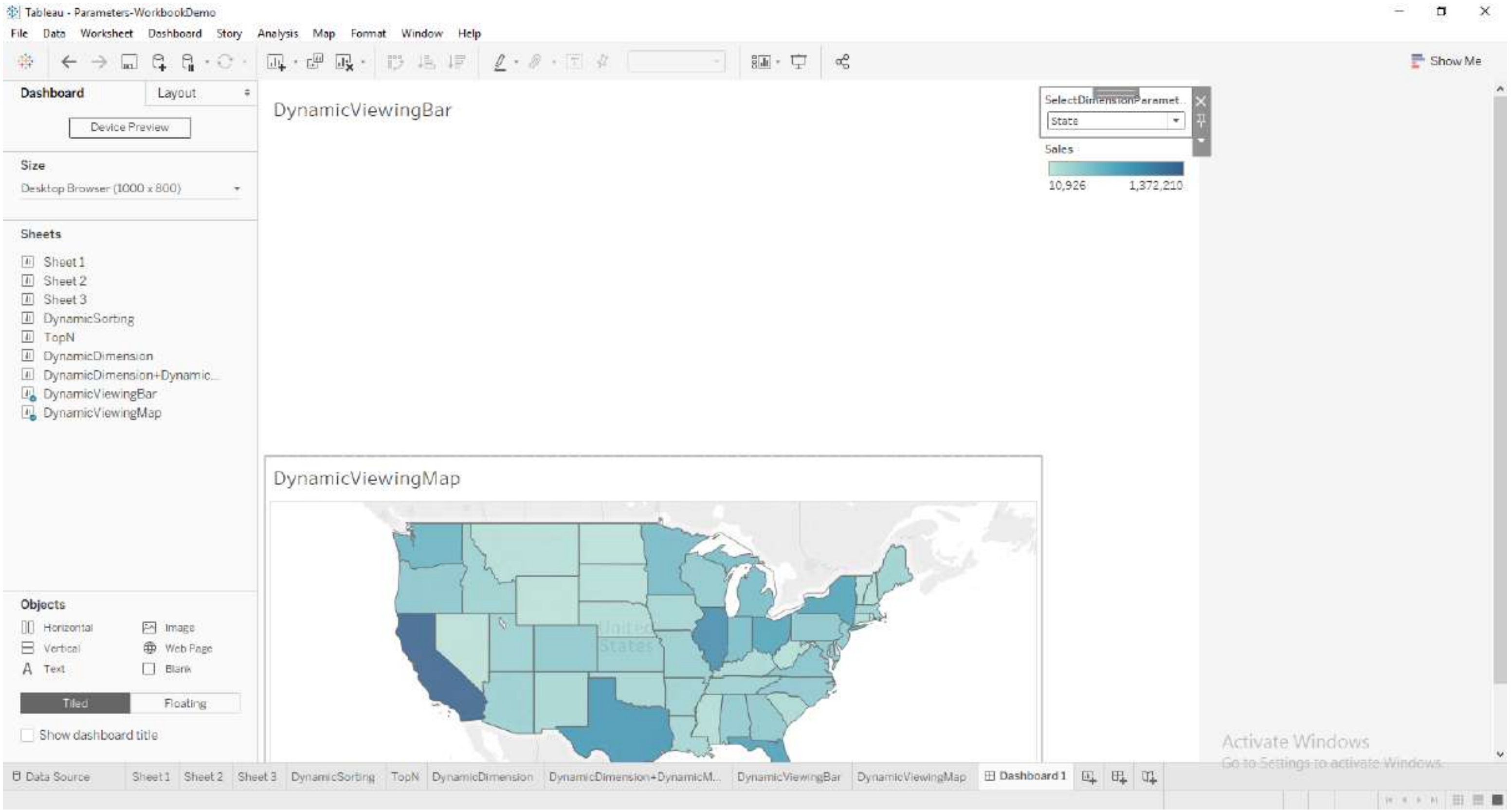
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Dynamic View

COLUMNS:	
ROWS:	

Step 6

- Now let us add a new dashboard and add the two worksheets
- DynamicViewBar
- DynamicViewMap



Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Date Range

Step 1

- Now let us add a new dashboard and add the two worksheets
- DynamicViewBar
- DynamicViewMap

COLUMNS:	
ROWS:	

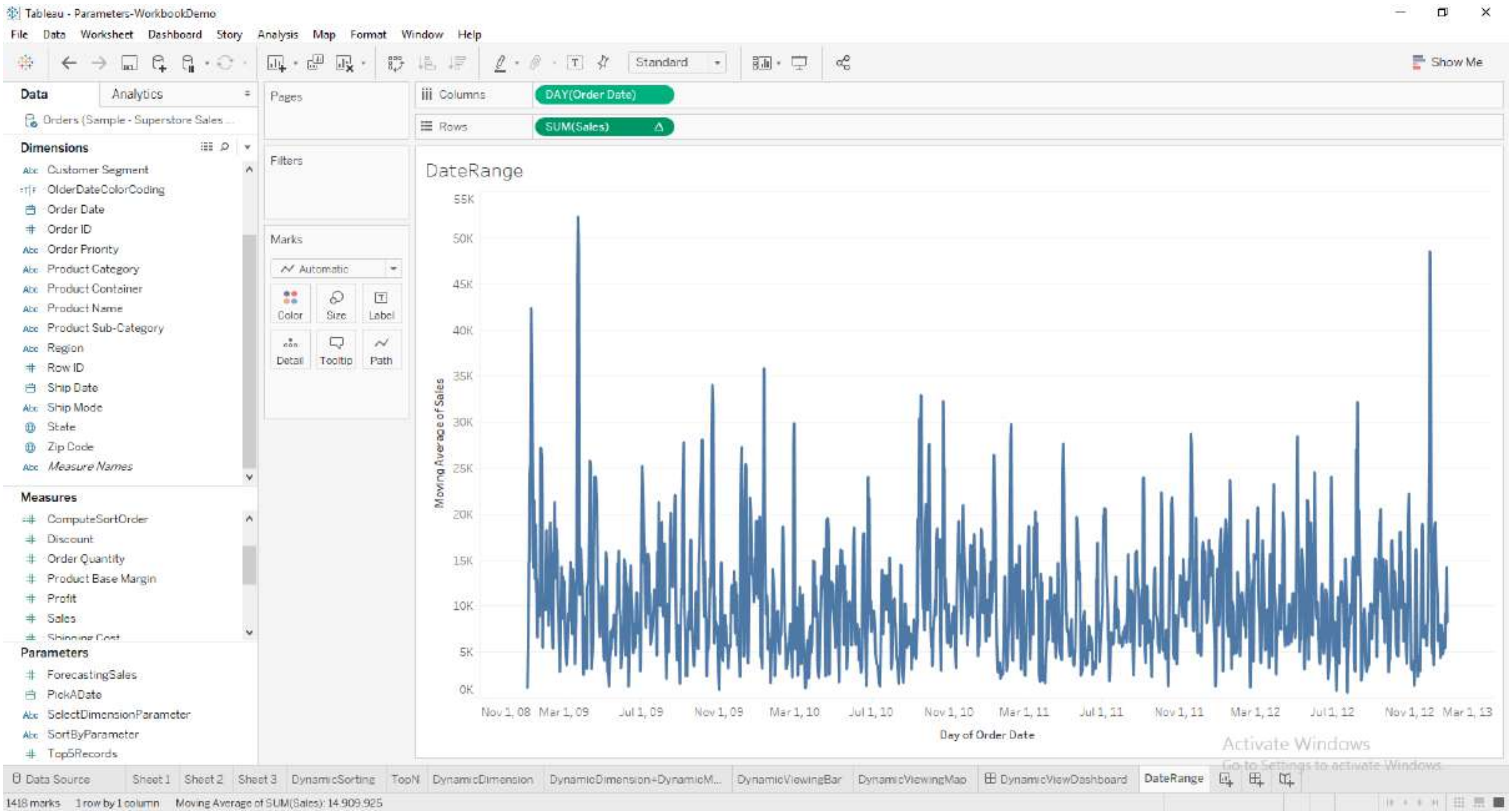
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Date Range

COLUMNS:	Day(OrderDate)
ROWS:	SUM(Sales)

Step 1

- lets create a plot with OrderDate and Sum(Sales)(Moving Average)



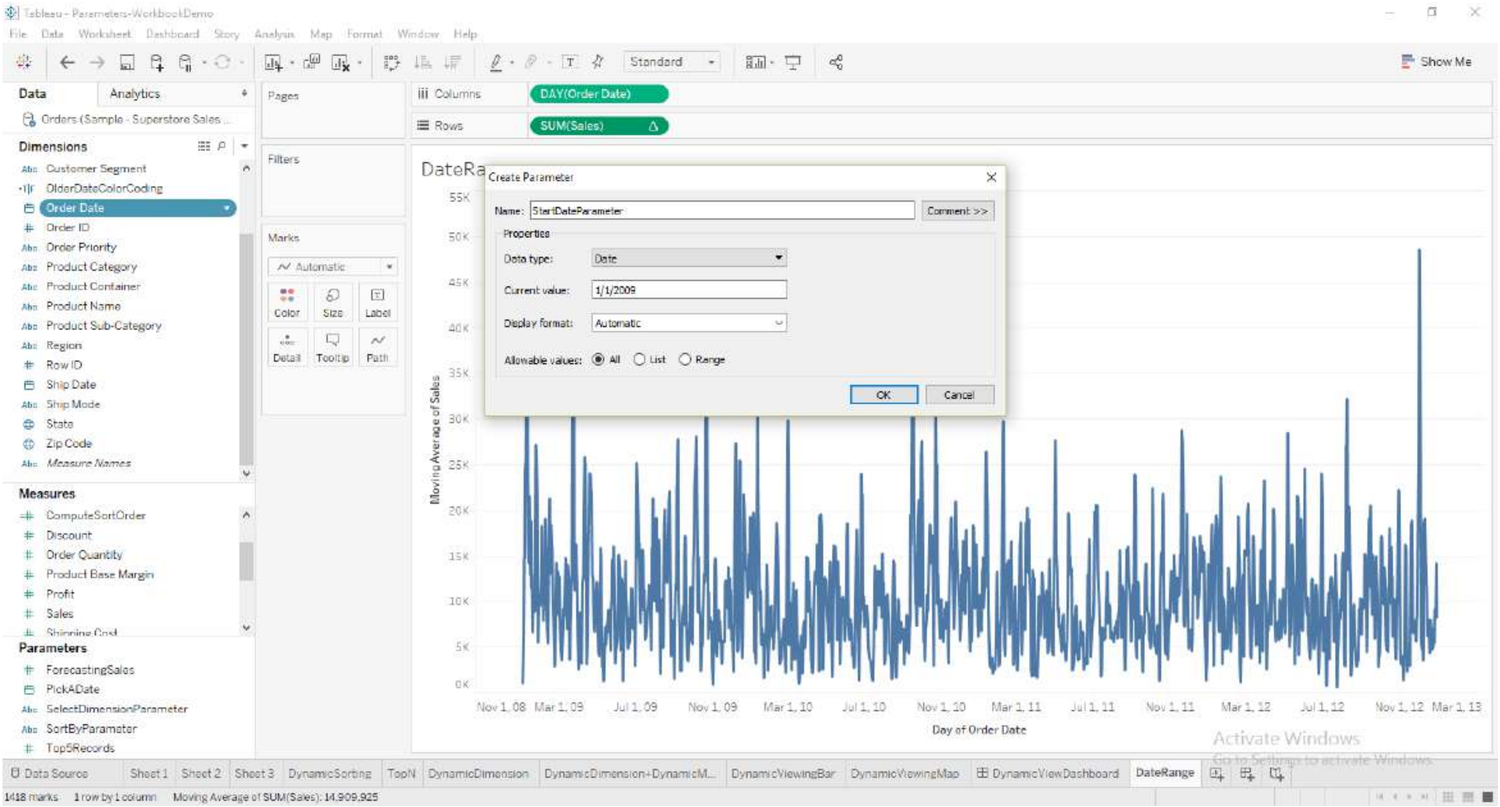
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Date Range

COLUMNS:	Day(OrderDate)
ROWS:	SUM(Sales)

Step 2

- Create a startDate Parameter by selecting orderDate Dimension.



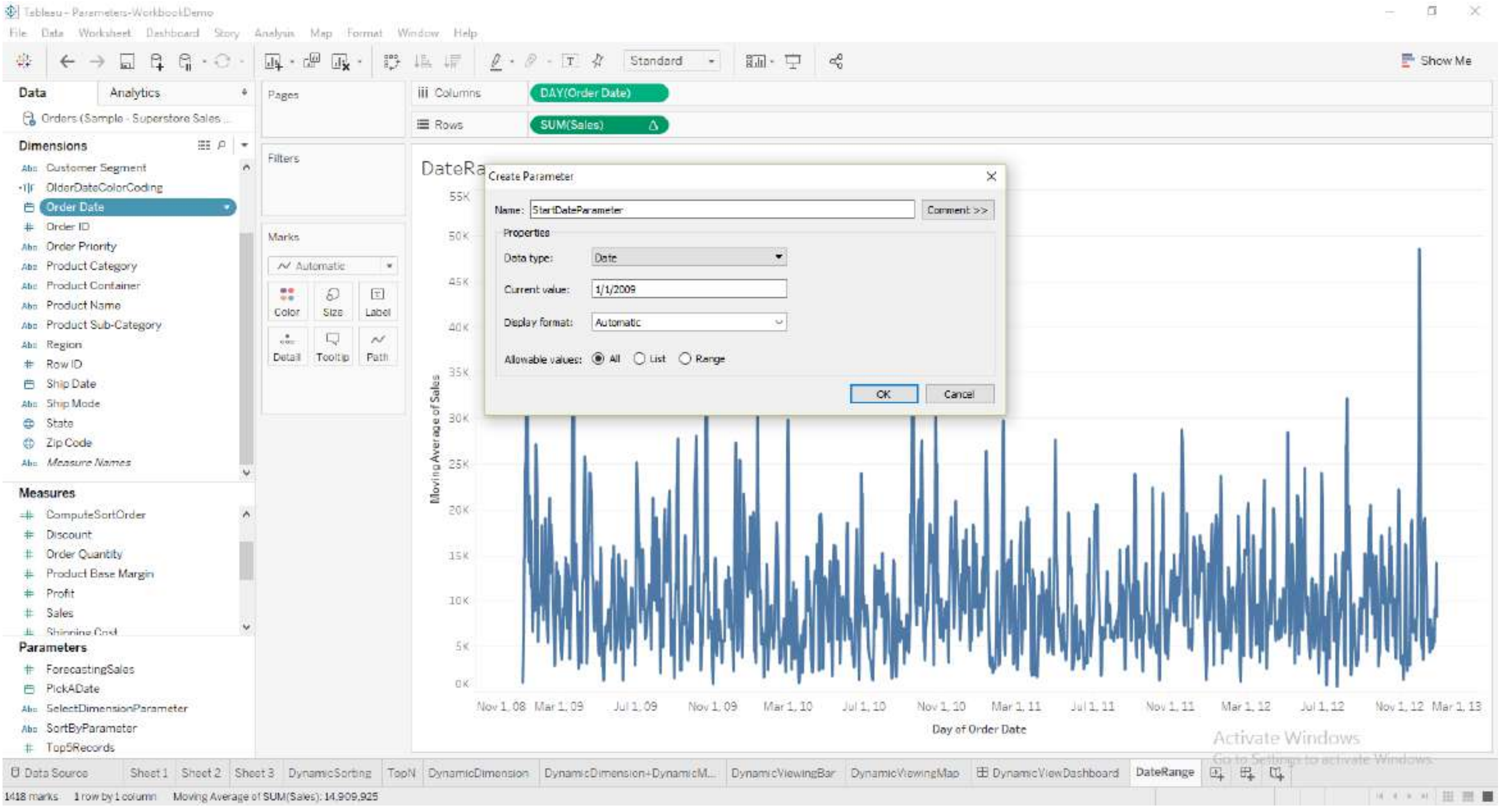
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Date Range

COLUMNS:	Day(OrderDate)
ROWS:	SUM(Sales)

Step 3

- Create a startDate Parameter by selecting orderDate Dimension.
- Select startDateParameter and similarly duplicate to create endDateParameter



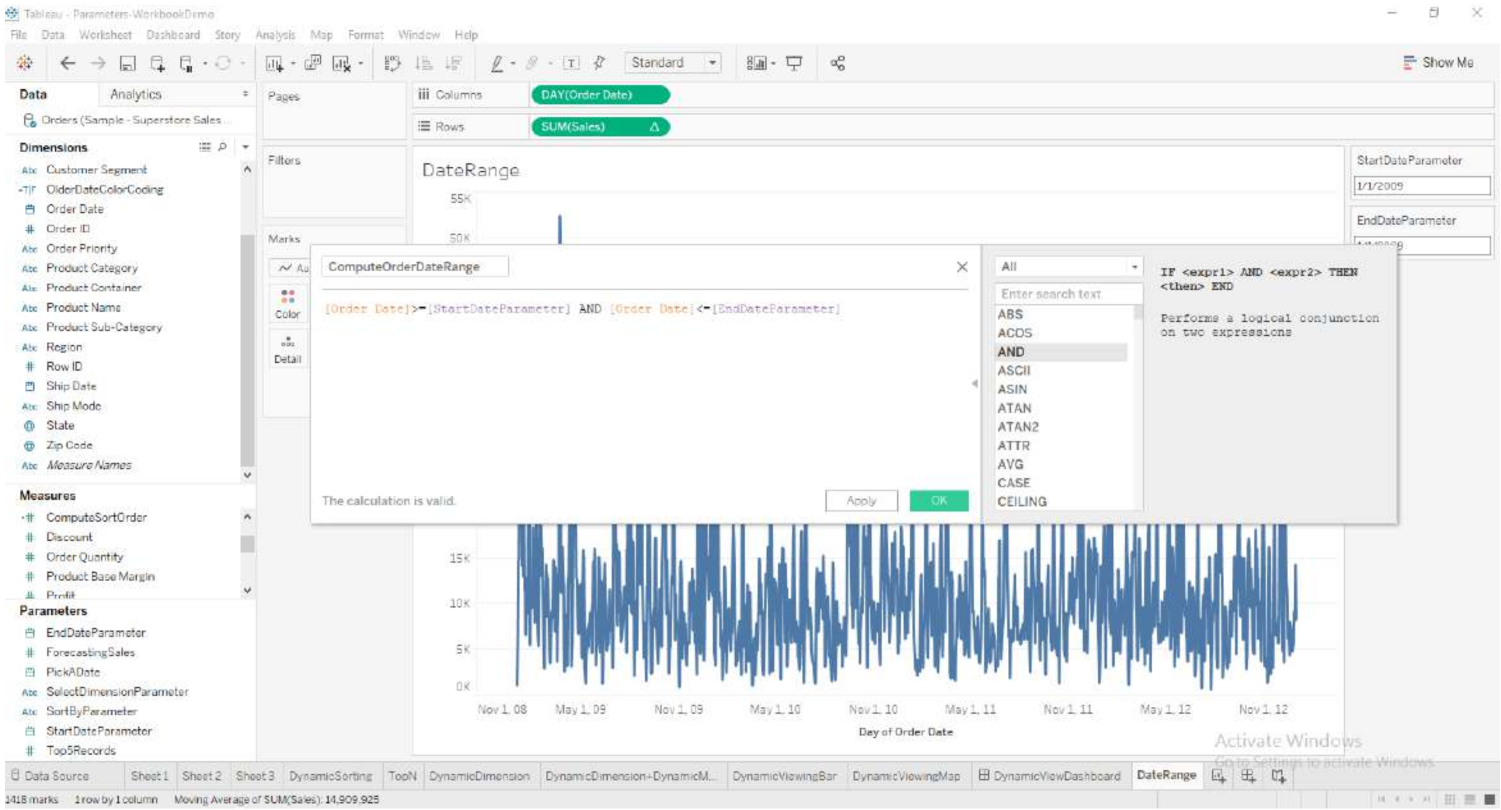
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Date Range

COLUMNS:	Day(OrderDate)
ROWS:	SUM(Sales)

Step 4

- Create ComputeDateRange Calculated Field that computes the dates between the startDateParameter and EndDateParameter as shown in the figure.



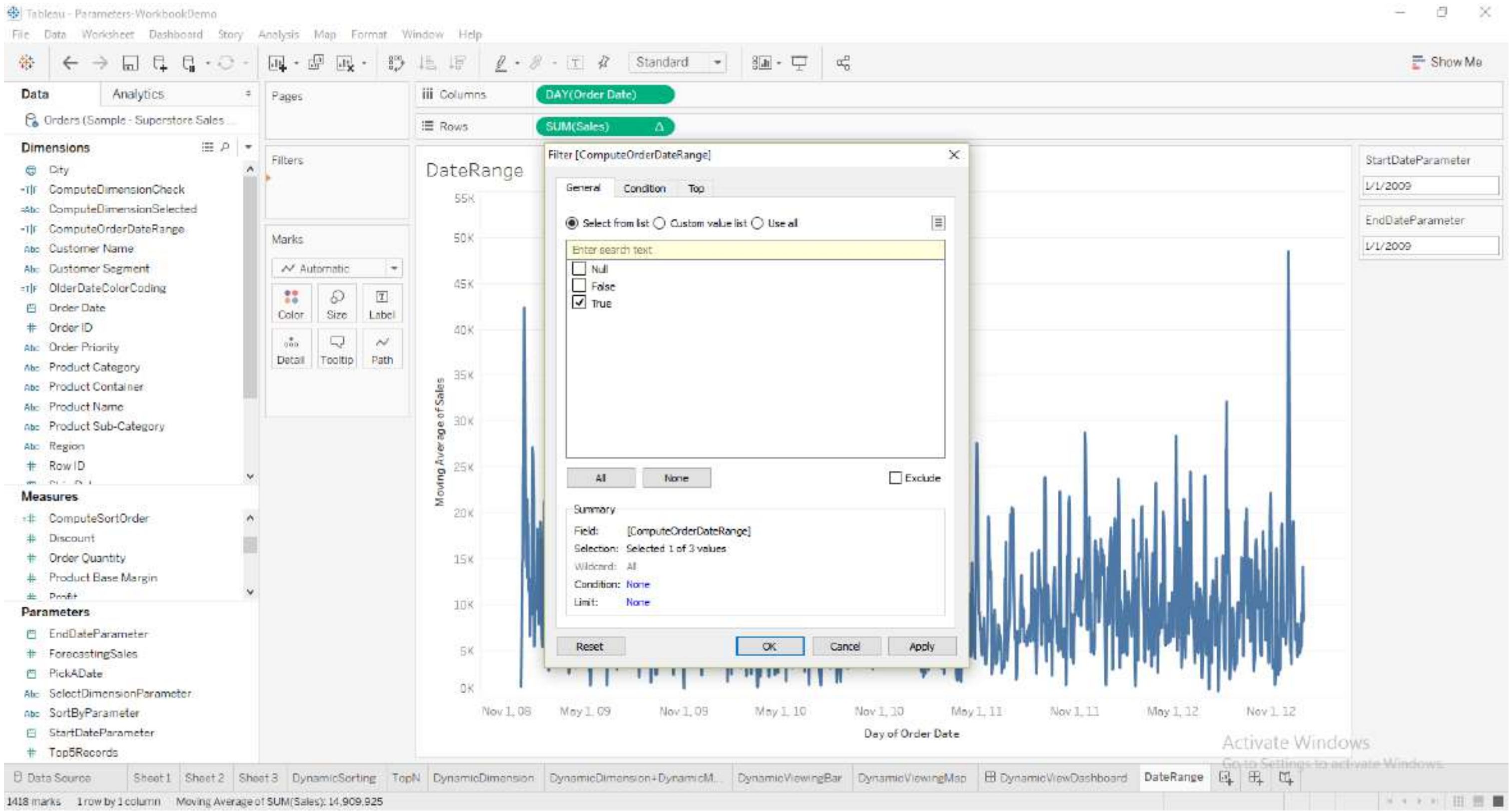
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Date Range

COLUMNS:	Day(OrderDate)
ROWS:	SUM(Sales)

Step 5

- Now drag that ComputeOrderDateRange to the filters and enable it to TRUE.



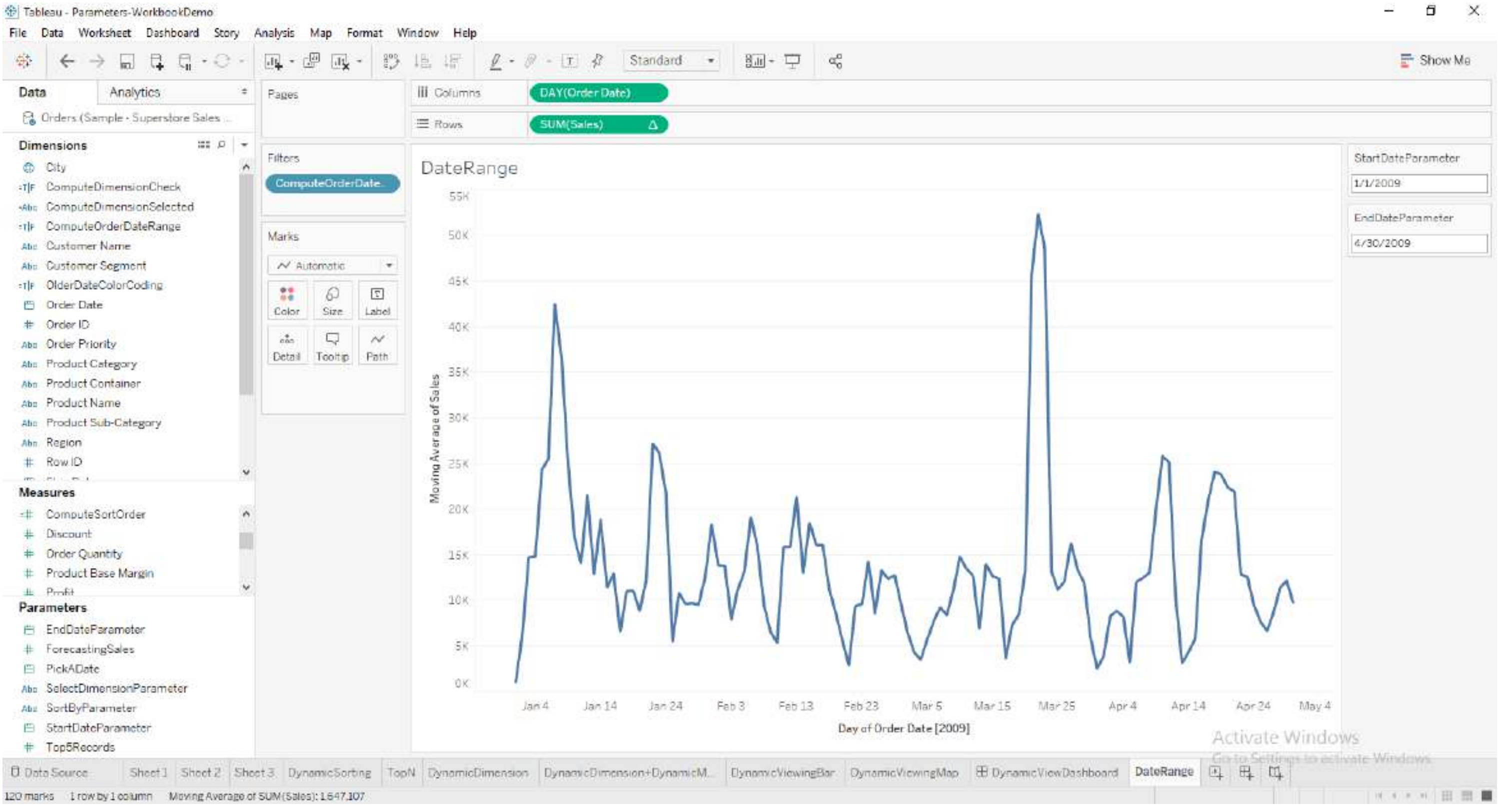
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :Date Range

COLUMNS:	Day(OrderDate)
ROWS:	SUM(Sales)

Step 6

- Upon user selection, we would like to add startDateParameter and endDateParameter
- We see data pruned to the user selected date range.



Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

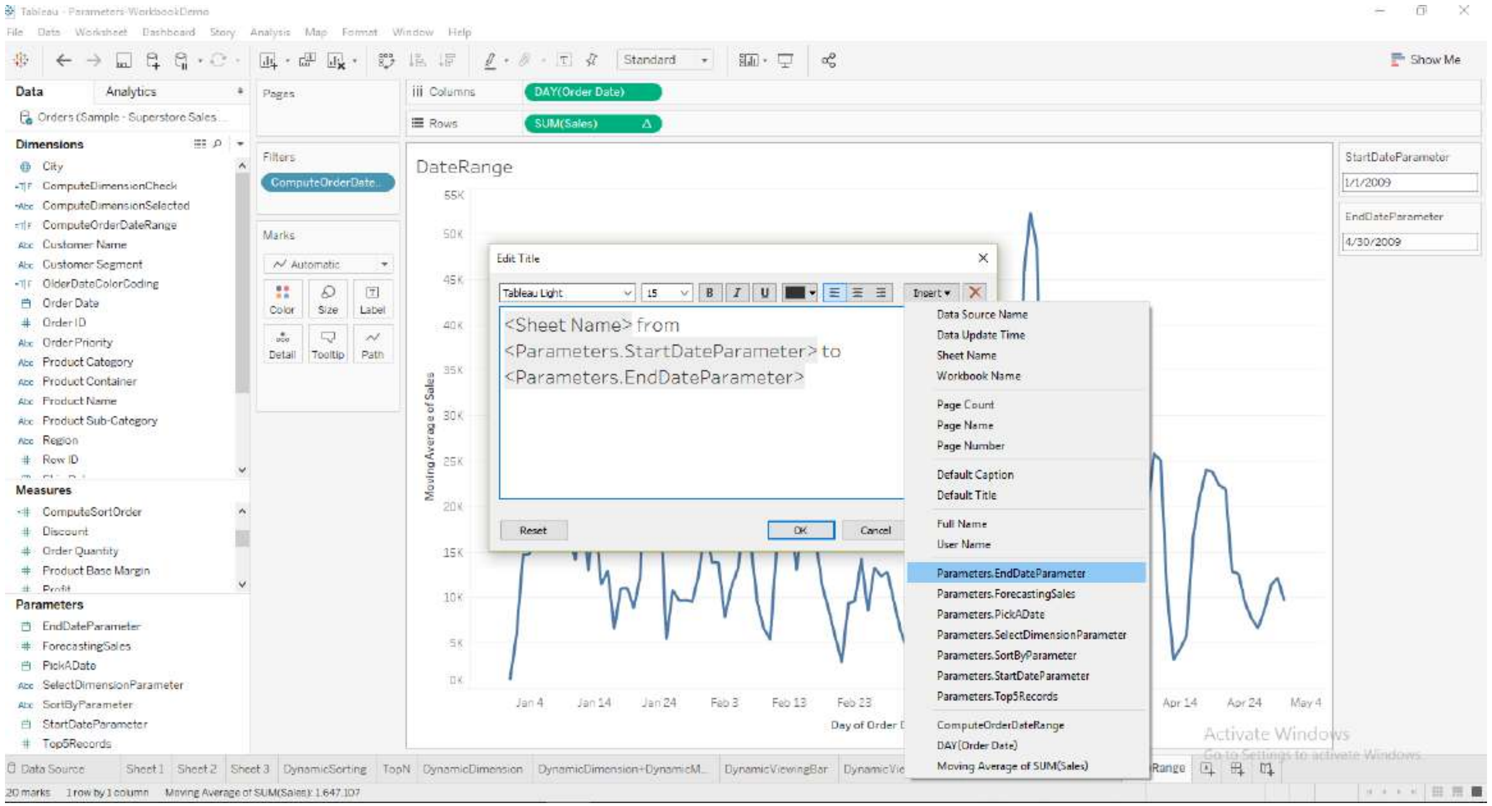
Original Series

Use Case :Date Range

COLUMNS:	Day(OrderDate)
ROWS:	SUM(Sales)

Step 7

- Upon user selection, we would like to add startDateParameter and endDateParameter
- We see data pruned to the user selected date range.



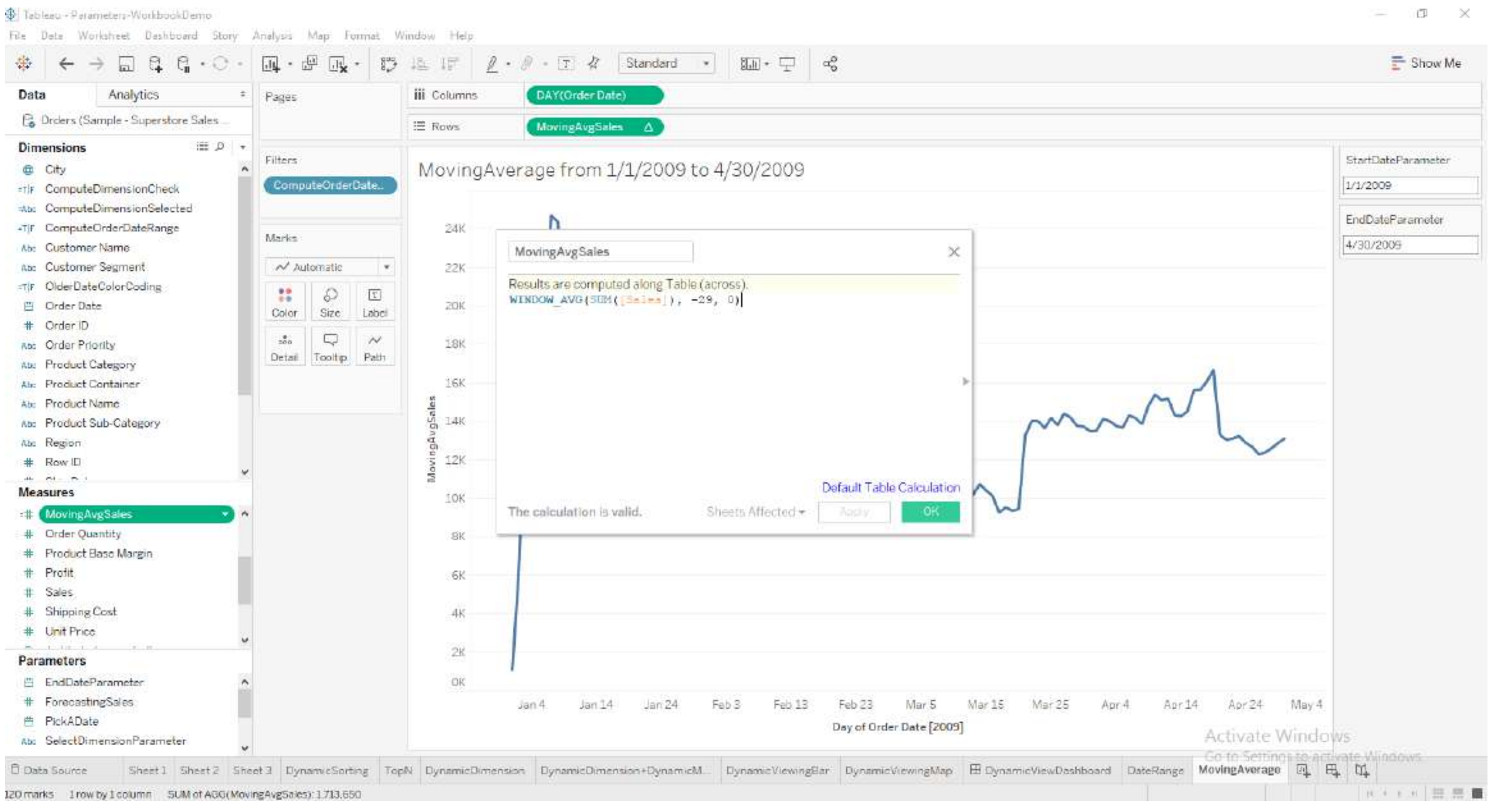
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :UserDefined Moving Average

Step 1

- drag the SUM(Sales) (MovingAverage) to the Measures and rename it as MovingAverage Sales Measure as shown in the Figure.

COLUMNS:	Day(OrderDate)
ROWS:	SUM(Sales)



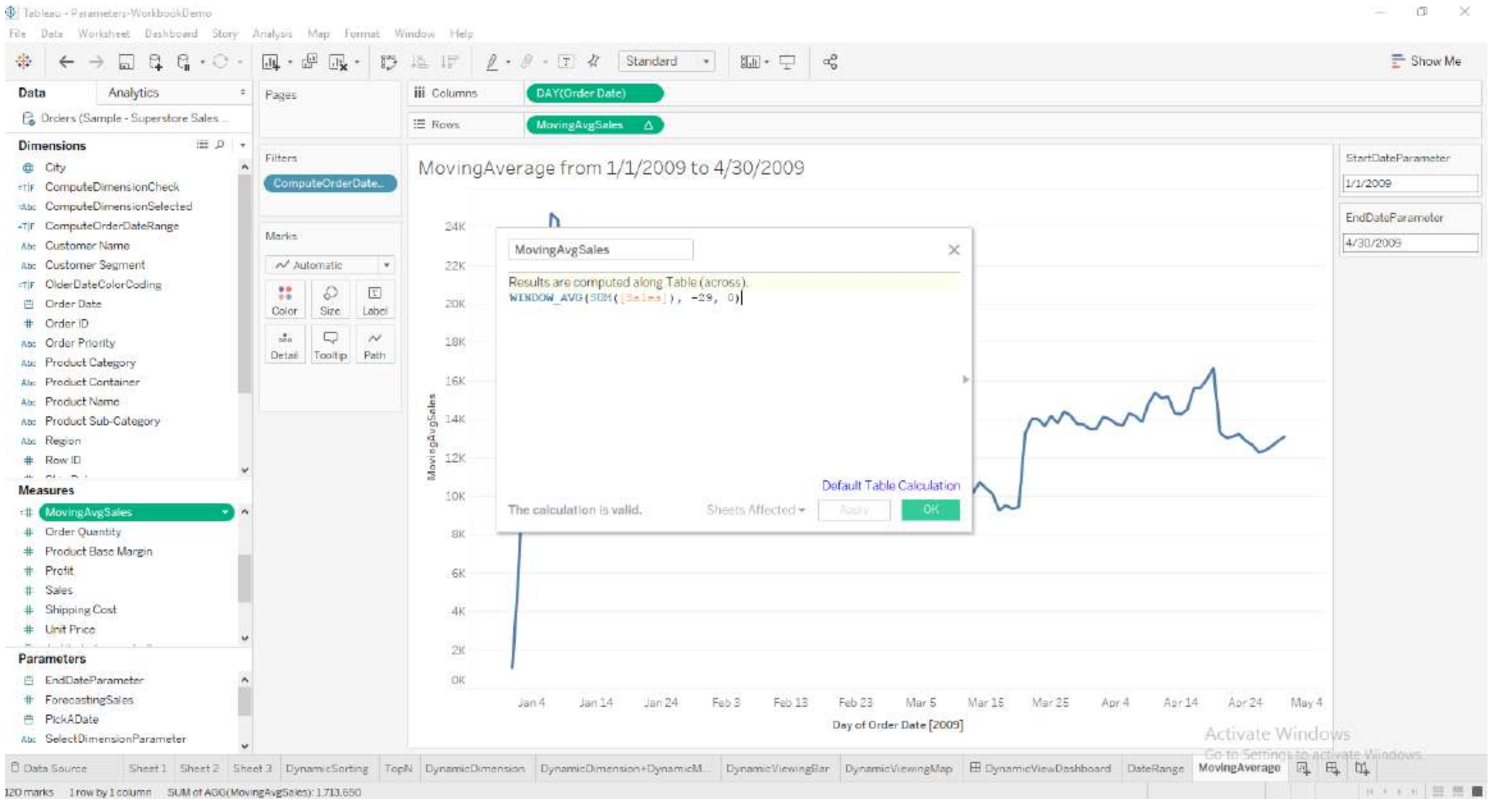
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :UserDefined Moving Average

Step 2

COLUMNS:	Day(OrderDate)
ROWS:	SUM(Sales)

- drag the SUM(Sales) (MovingAverage) to the Measures and rename it as MovingAverage Sales Measure as shown in the Figure.



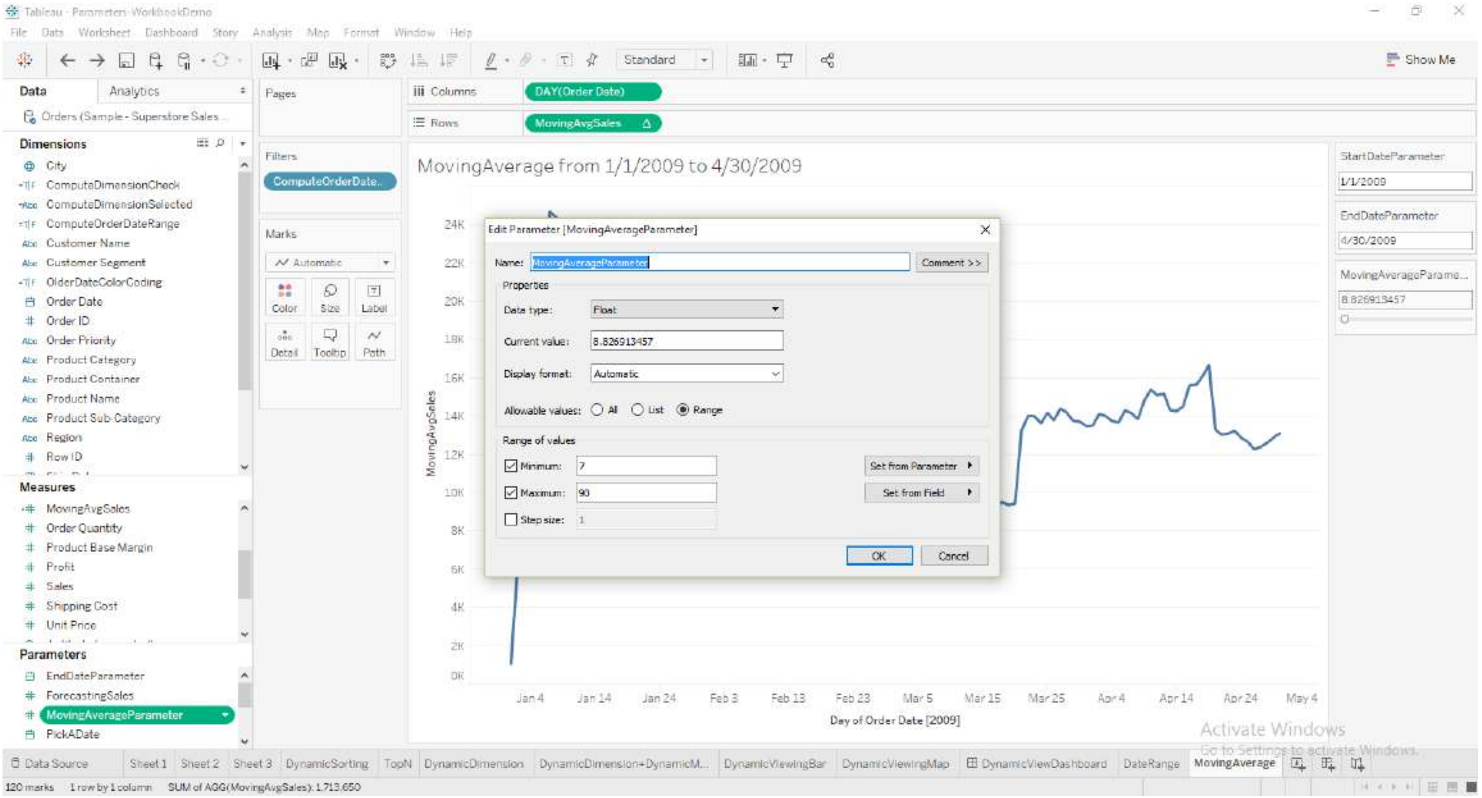
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :UserDefined Moving Average

Step 3

COLUMNS:	Day(OrderDate)
ROWS:	SUM(Sales)

- create a movingaverageparameter as shown in the figure. As a range from 7 days to 90 days



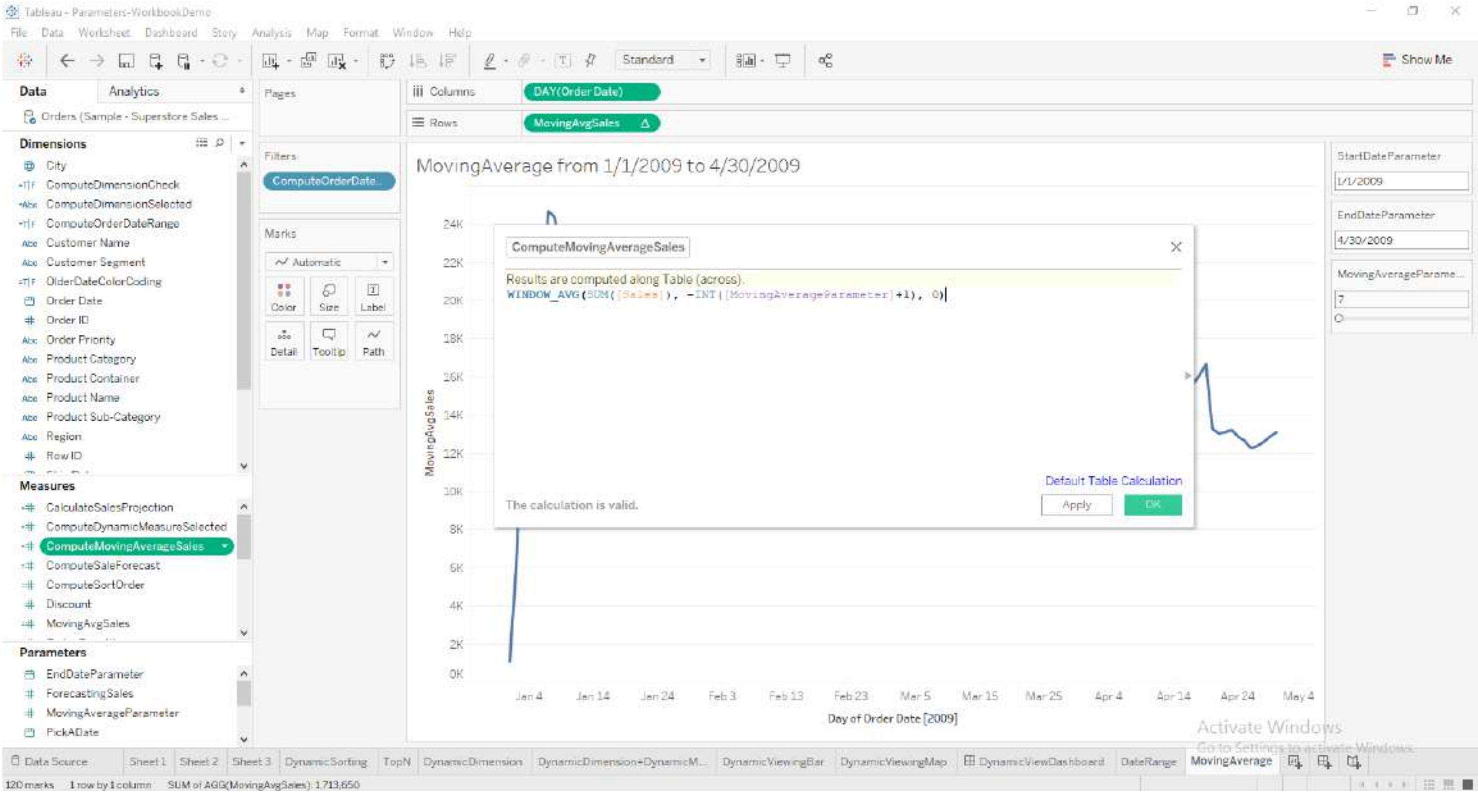
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :UserDefined Moving Average

Step 4

COLUMNS:	Day(OrderDate)
ROWS:	SUM(Sales)

- Now create a moving average calculated field.



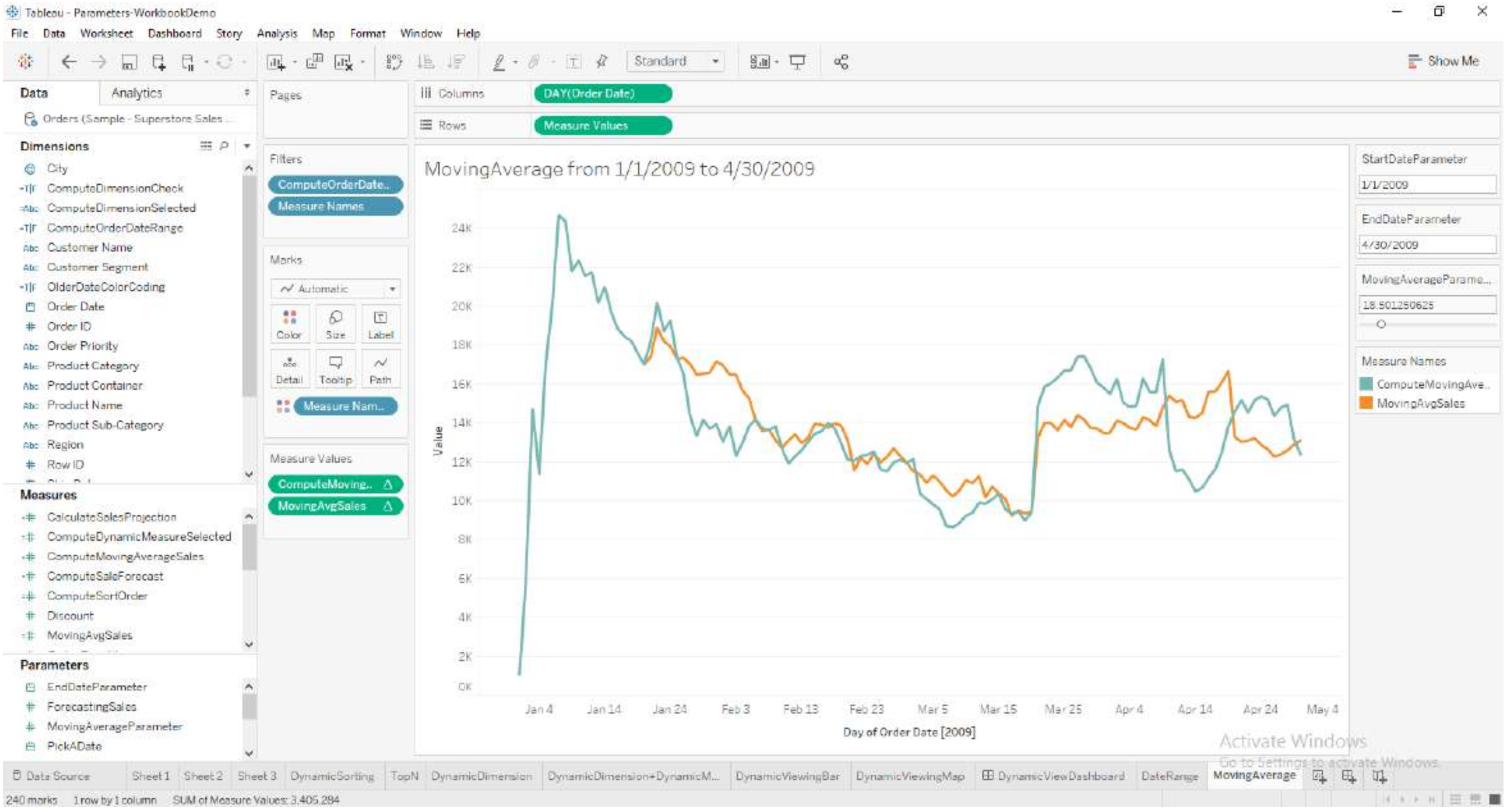
Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Use Case :UserDefined Moving Average

Step 5

COLUMNS:	Day(OrderDate)
ROWS:	SUM(Sales)

- Now combine MovingAverageSales and ComputedMovingAverageSales on the Y-axis, we can see relative moving averages.



Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Original Series

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TABLEAU : LEVELS OF DETAILS EXPRESSIONS

Level of Details Expressions

- Introduced in Tableau 9.0
- They provide a way to easily compute aggregations that are **not at the level of detail of the visualization**
- **Level of Detail/Granularity depends on dimensions placed in row, column, colour,size, label, path or detail shelves.**

- Why LOD expressions?
  - Finding no of orders each customer has made is relatively easy.
  - **How to identify the customers, who have made one, two or three orders?**
    - **Number of customers/number of orders made.**
- **LOD (Calculation) allows one to determine the levels of detail used in a calculation without actually using these dimensions in the view or visualization that one creates.**

Types of LOD Expression

FIXED

- Calculates the aggregation at the level of detail specified in the calculated field regardless of any dimensions in the view.

INCLUDE

- Calculate the aggregation at the level of detail specified by the dimensions included in the calculated field.
- result in calculation of the aggregation at a lower level of detail than the view.

EXCLUDE

- Calculates the aggregation at the level of detail specified by the dimensions in the view, excluding any listed in the calculated field.
- Result in calculation of the aggregation at a higher level of detail than the view.

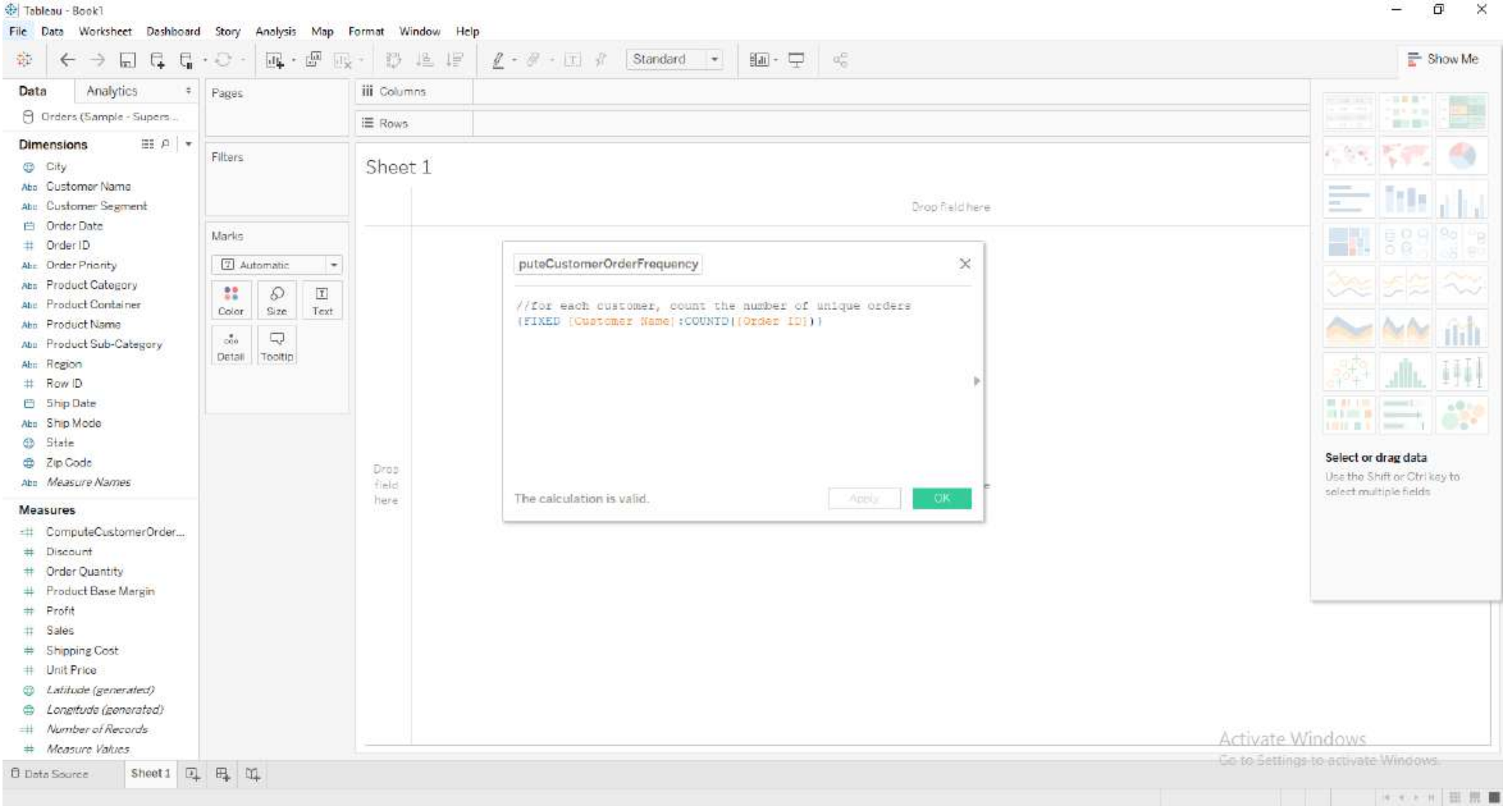
Problem Description:	**How many customers placed how many orders by region and product category?**
Data set used:	demo1/ Sample - Superstore Sales (Excel).xlsx

FIXED LEVEL OF DETAIL EXPRESSION

COLUMNS:	
ROWS:	

Step 1

- create ComputeCustomerOrderFrequency calculated field to compute for each customer, what are the unique no of orders, by order id.



Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

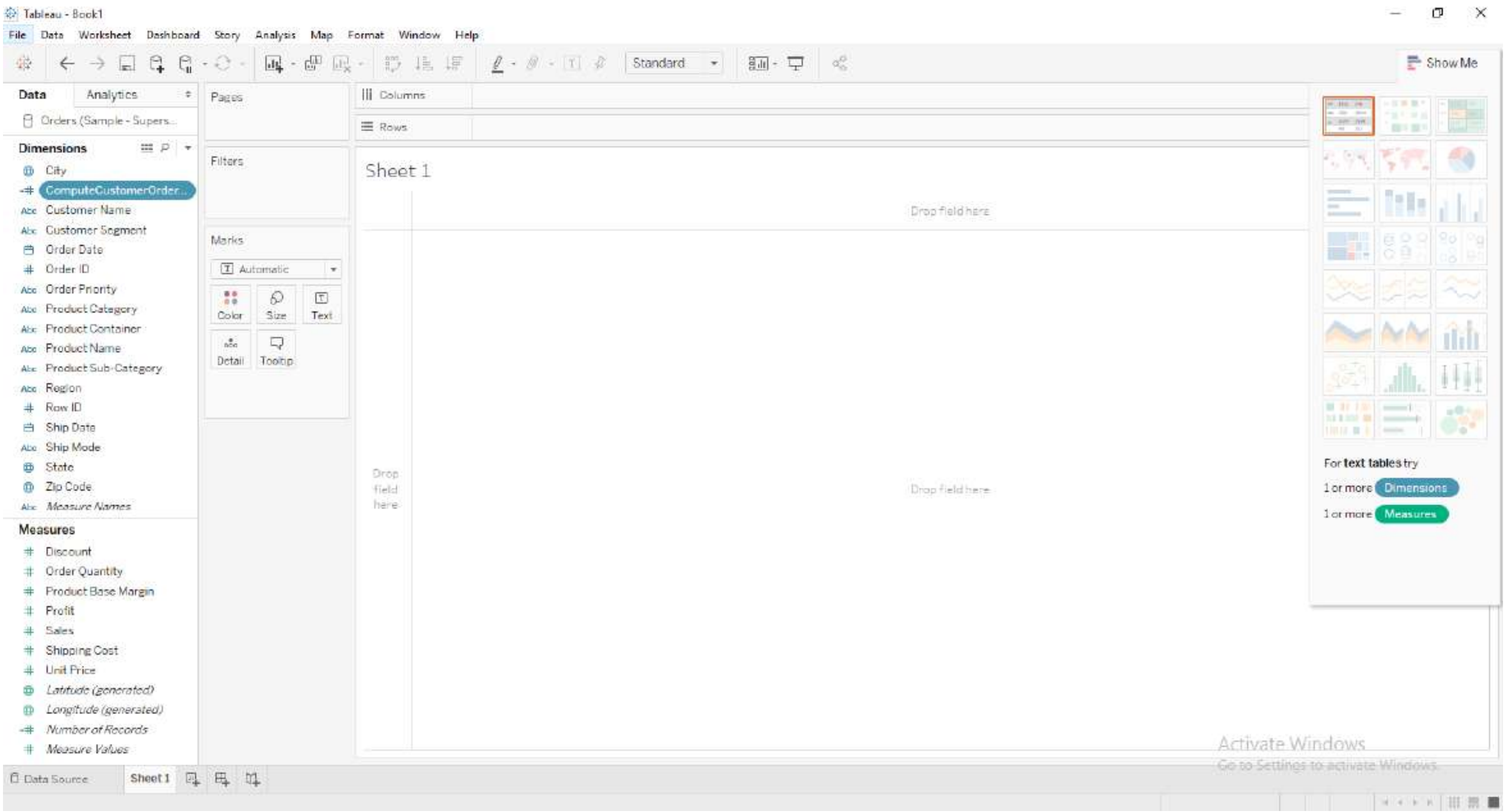
Original Series

TERRITORIAL PRESCIENCE
provoke thought, invoke action

COLUMNS:	
ROWS:	

Step 2

- Convert the **computecustomerorderfrequency to discrete value by dragging it to the dimension pane/shelf**

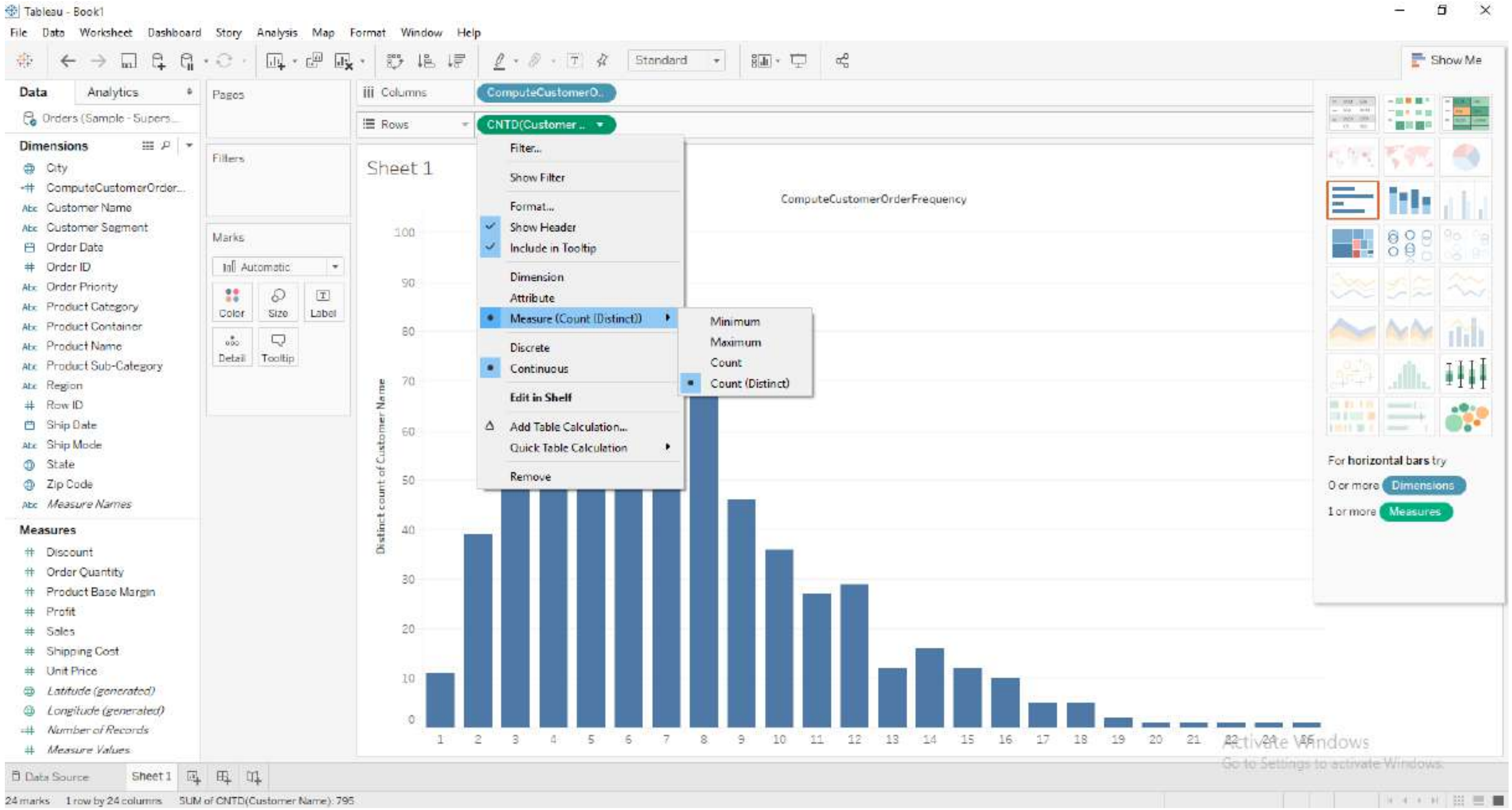


Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Step 3

- plot ComputeCustomerOrderFrequency vs Count(CustomerName)

COLUMNS:	ComputeCustomerOrderFrequency
ROWS:	COUNT(Customer Name)

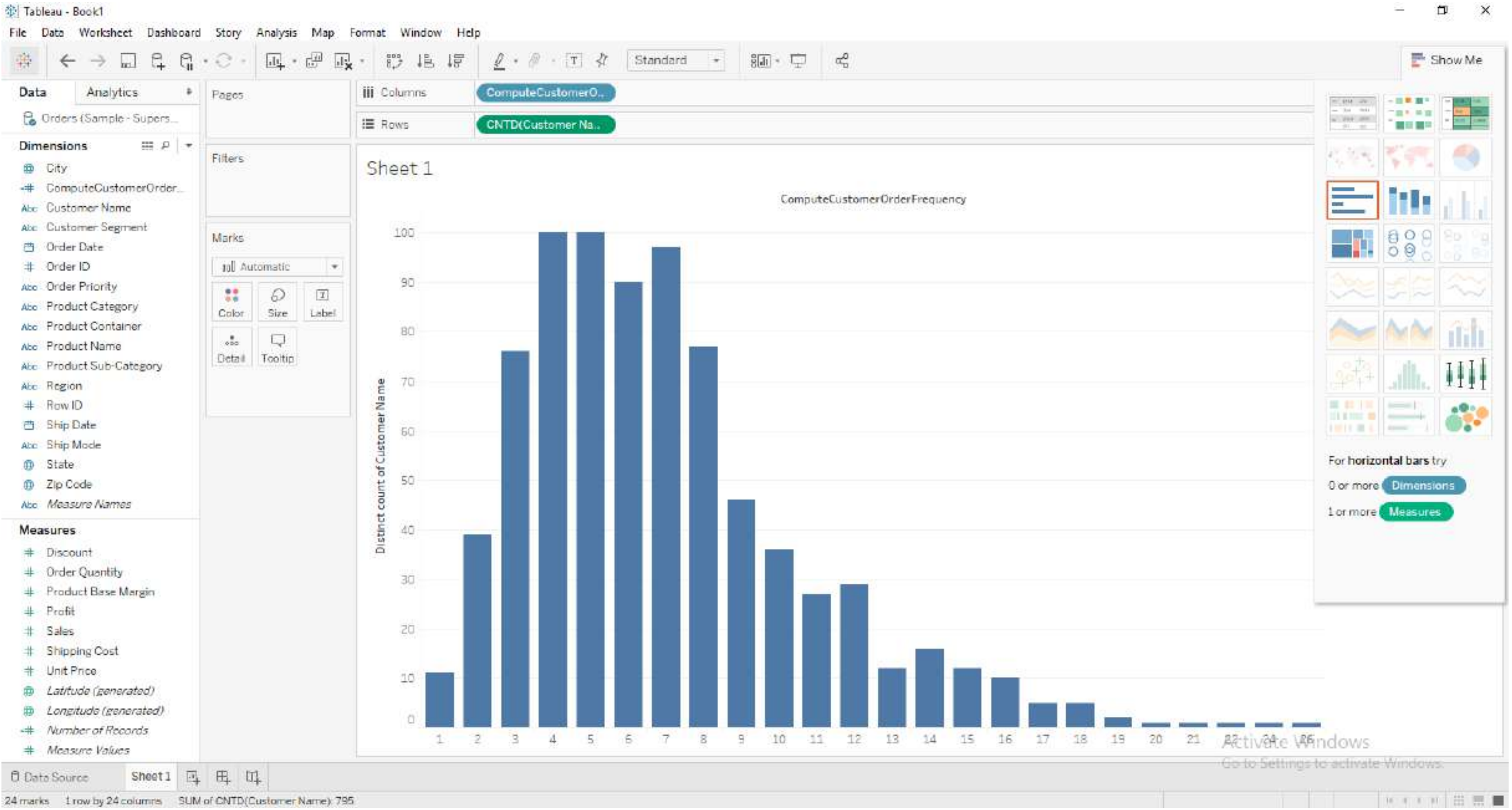


Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

COLUMNS:	ComputeCustomerOrderFrequency
ROWS:	COUNT(Customer Name)

Step 4

- This visualization answers the question for "**How many customers placed how many orders?**"

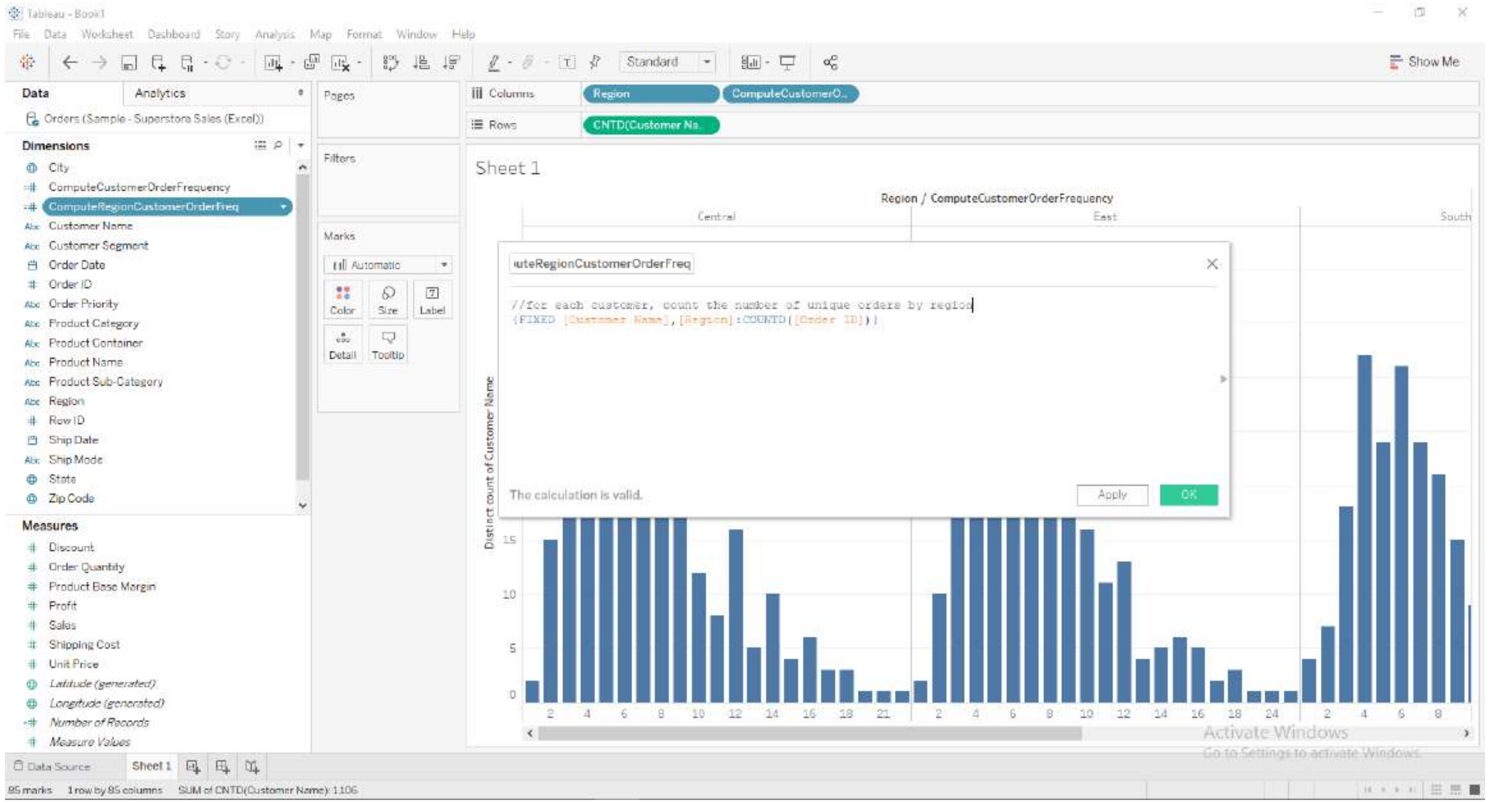


Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

COLUMNS:	Region, ComputeRegionCustomerOrderFreq
ROWS:	COUNT(Customer Name)

Step 5

- Now, we would like to answer, how many customers placed how many orders by region?
    - **let us add region to “columns” on the left of ComputeCustomerOrderFrequency**

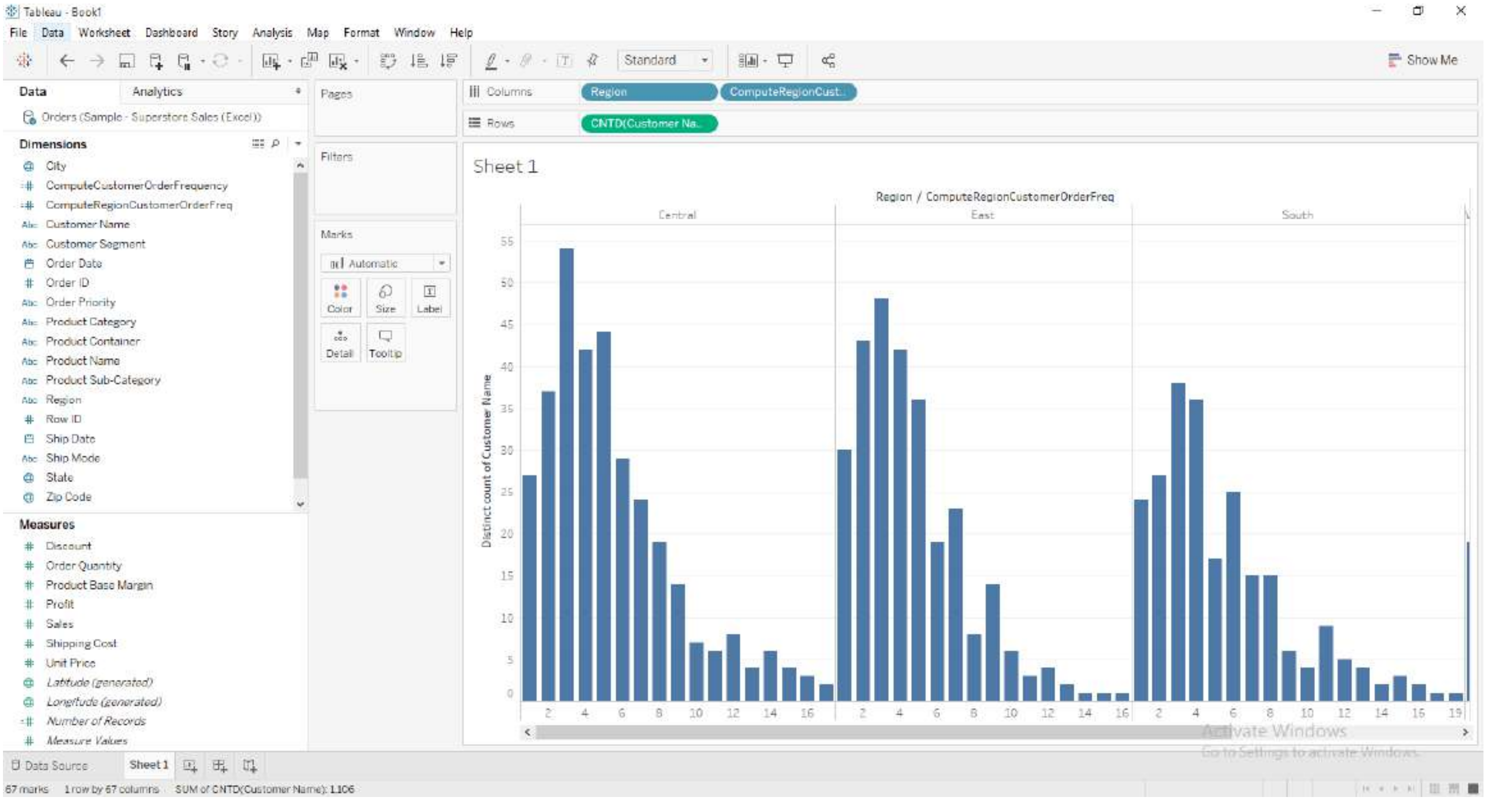


Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

COLUMNS:	Region, ComputeRegionCustomerOrderFreq
ROWS:	COUNT(Customer Name)

Step 6

- Upon adding the new calculated field “ComputeRegionCustomerOrderFreq” we can now visualize the no of unique customers by region.

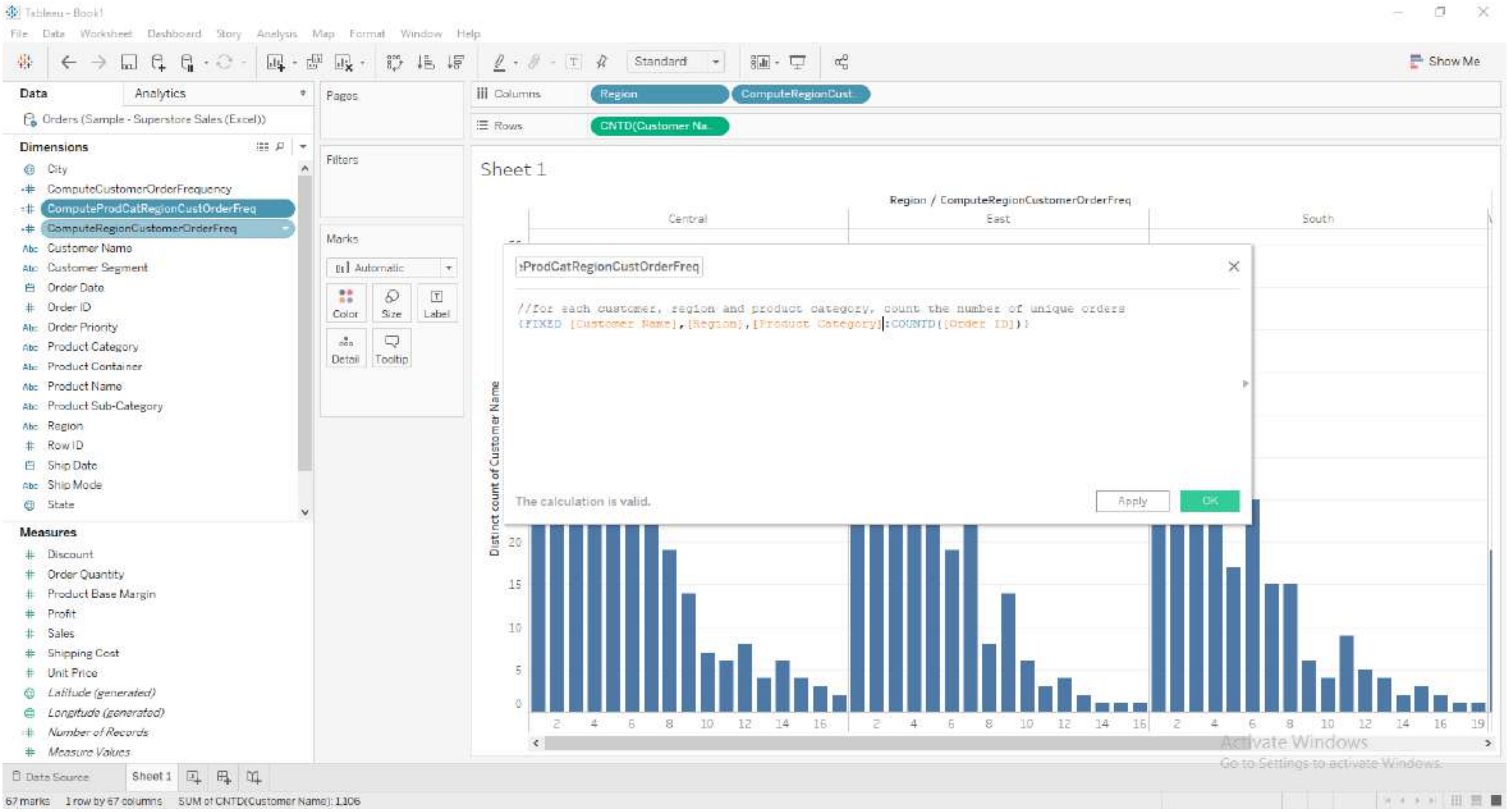


Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

COLUMNS:	Region, ComputeRegionCustomerOrderFreq
ROWS:	COUNT(Customer Name)

Step 7

- Now lets answer the question : **How many customers placed how many orders by region and product category?**

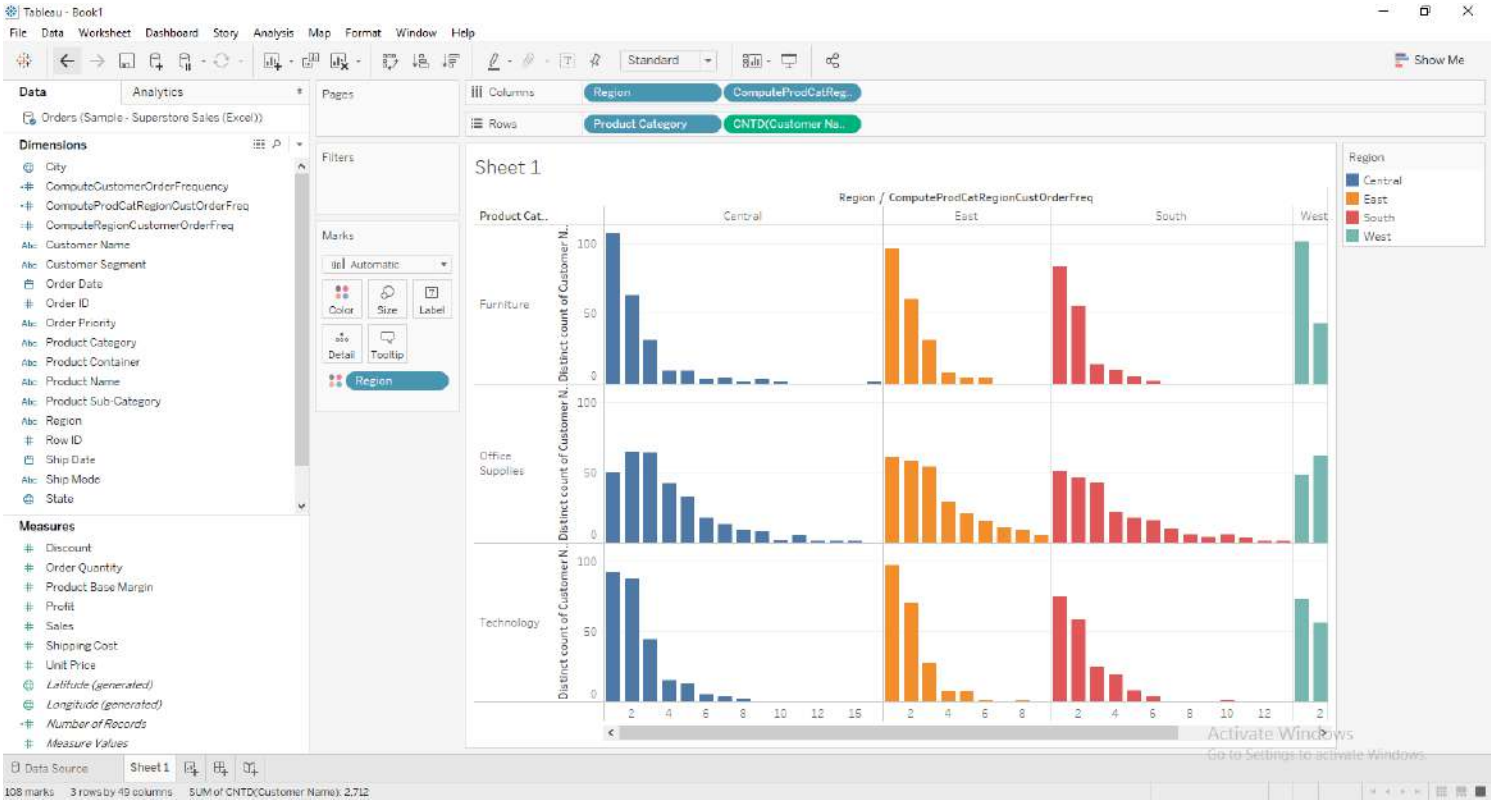


Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

COLUMNS:	Region, ComputeRegionCustomerOrderFreq
ROWS:	COUNT(Customer Name)

Step 8

- Now lets answer the question : How many customers placed how many orders by region and product category?



Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

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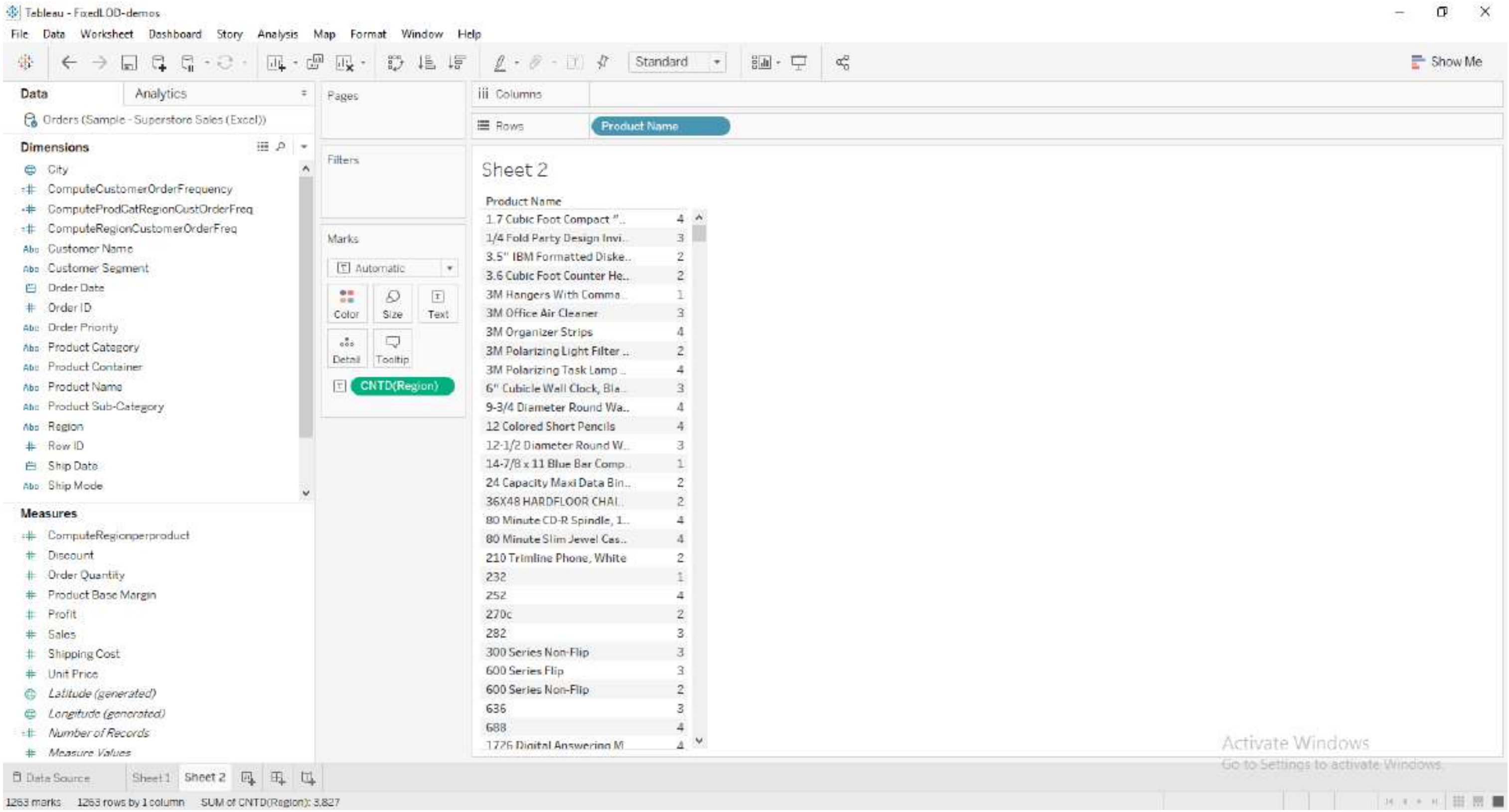
Original Series

TERRITORIAL PRESCIENCE
provoke thought, invoke action

Step 9

- Now lets answer the question : How many products sell in how many regions by year and quarter?

COLUMNS:	
ROWS:	Region

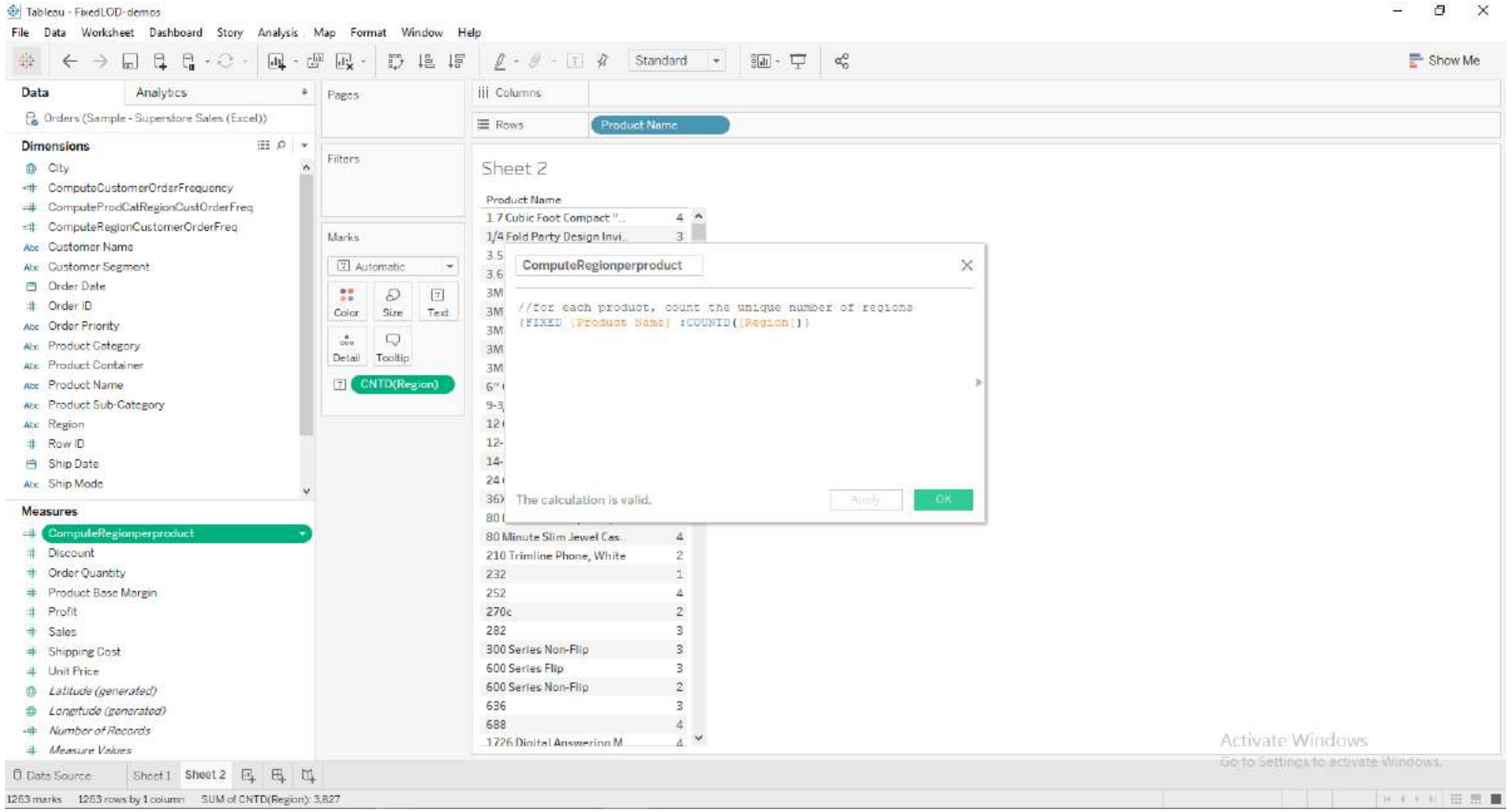


Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

COLUMNS:	
ROWS:	Region

Step 10

- for each product name, count the unique no of regions.

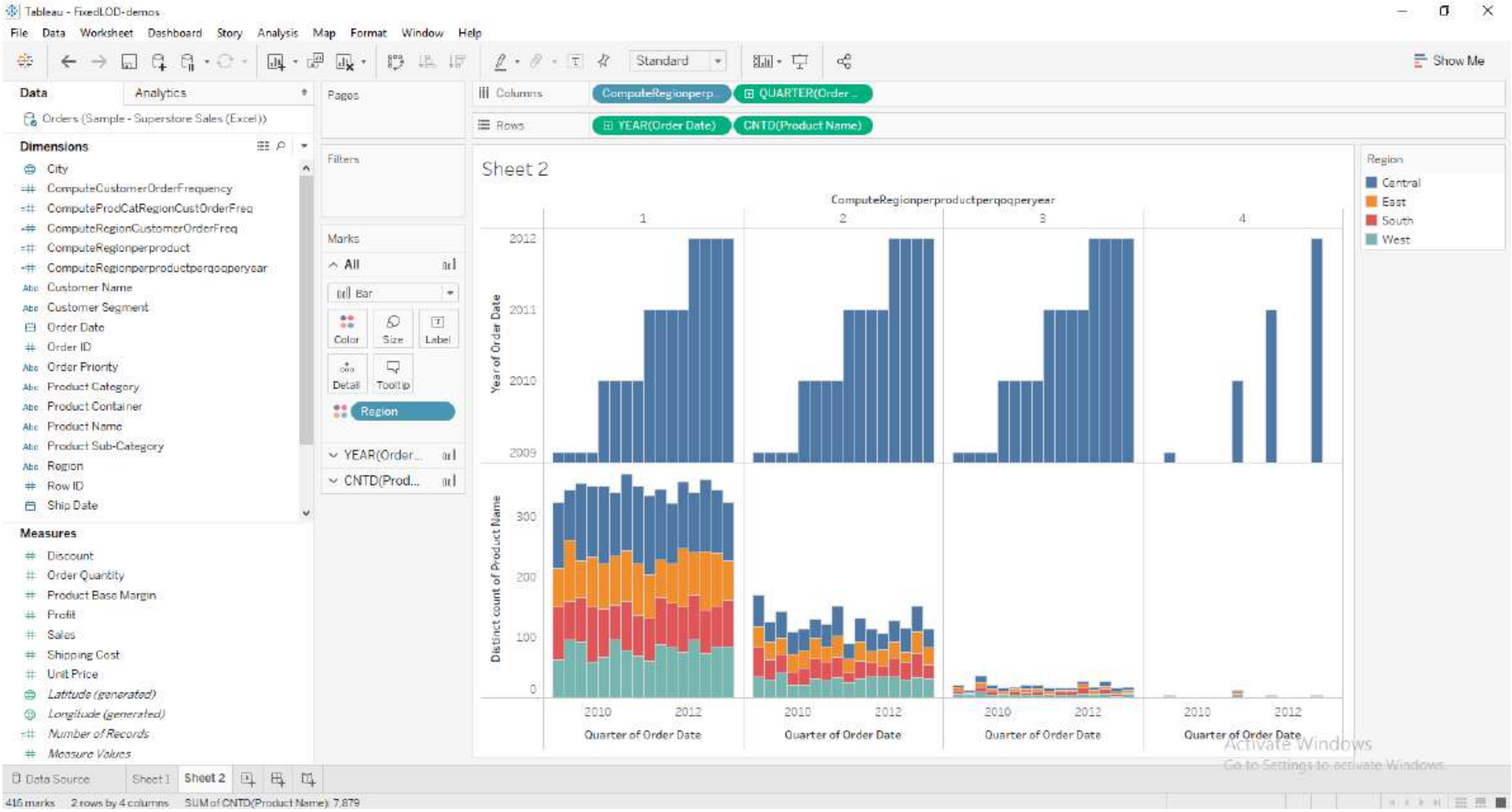


Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

COLUMNS:	ComputeRegionperproduct,Quarter(OrderDate)
ROWS:	Year(OrderDate),CNTD(ProductName)

Step 11

- We have the final answer

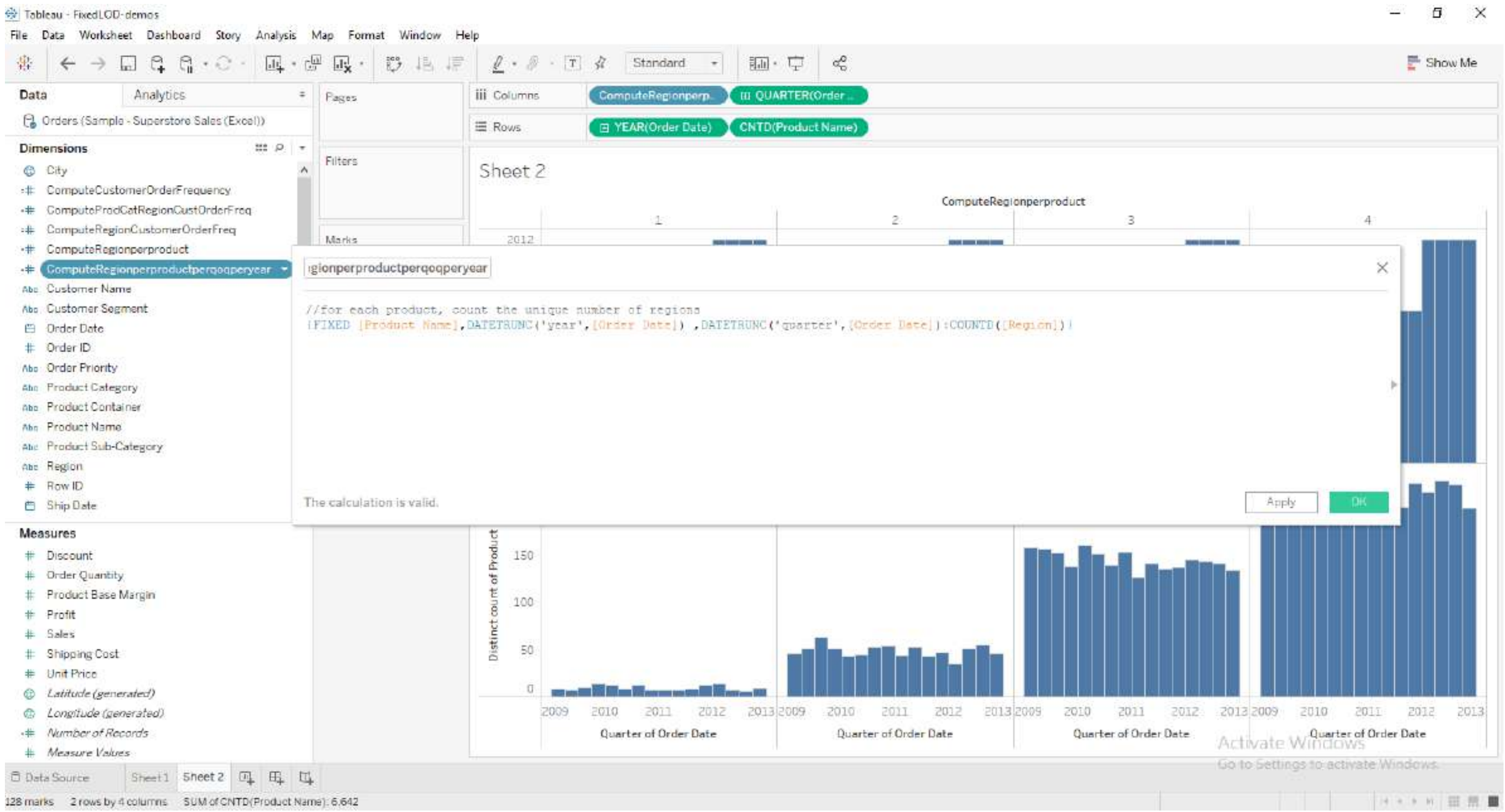


Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

COLUMNS:	ComputeRegionperproduct,Quarter(OrderDate)
ROWS:	Year(OrderDate),CNTD(ProductName)

Step 12

- Duplicate ComputeRegionperproduct and create a new ComputeRegionperproductperqoqperyear as shown in the figure.



Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

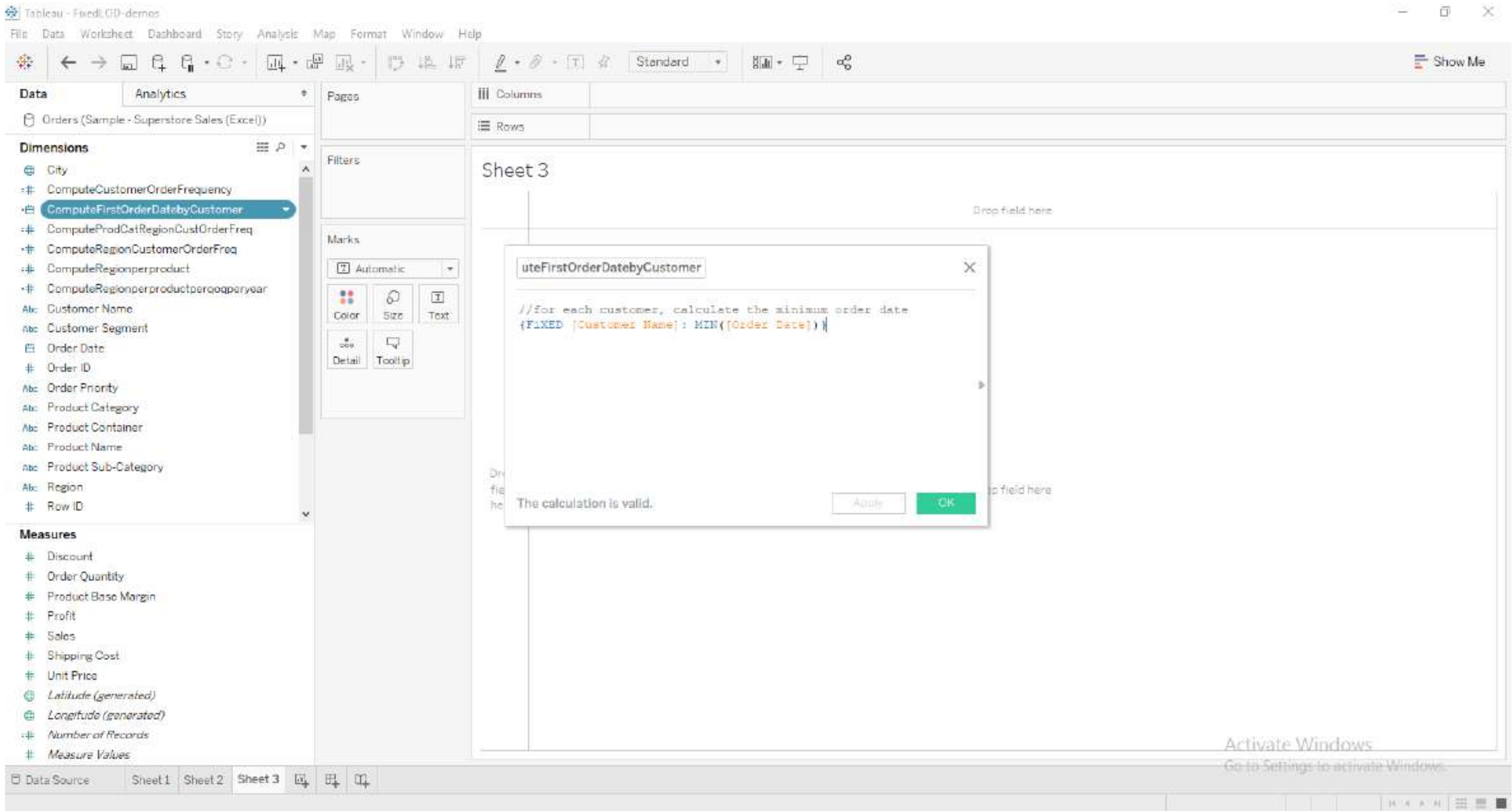
COLUMNS:

ROWS:

Step 12

- Now lets answer the question : Identify the total number of customers acquired by region by day?

- **Create a calculatedfield : computefirstorderdatebycustomer**

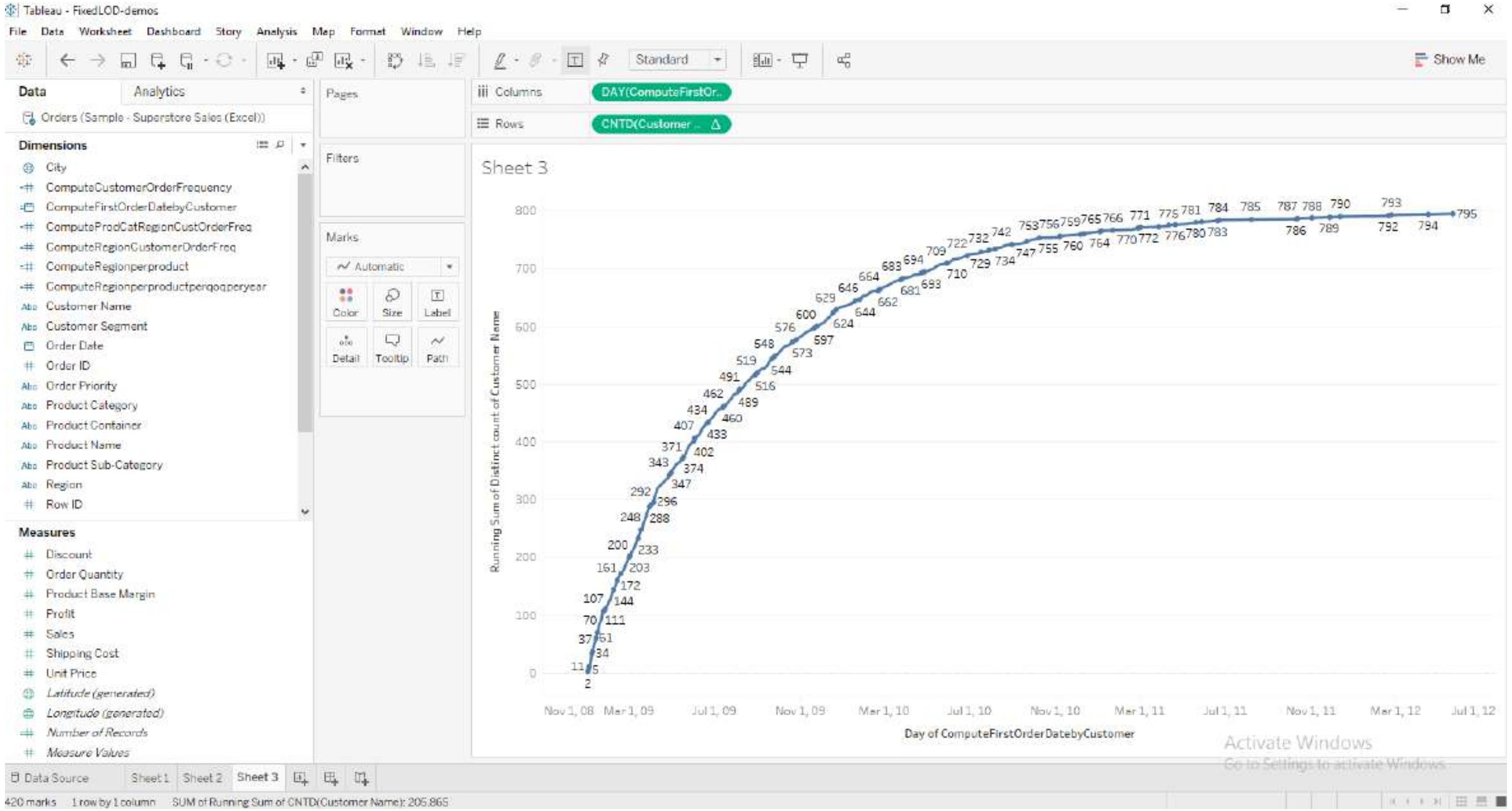


Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

COLUMNS:	DAY(computefirstorderdatebycustomer)
ROWS:	CNTD(CustomerName)

Step 13

- Now lets answer the question : Identify the total number of customers acquired by region by day?
- **Create a calculatedfield : computefirstorderdatebycustomer**
- **To the rows apply CTND(CustomerName)=> RunningTotal**



Data Source: demo1/ Sample - Superstore Sales (Excel).xlsx

Problem Description:	
Data set used:	

SYED AWASE KHIRNI

TABLEAU : ADVANCED CHART TYPES

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Problem Description:	
Data set used:	

SYED AWASE KHIRNI

TABLEAU : DATA BLENDING

Original Series

Problem Description:	
Data set used:	

SYED AWASE KHIRNI

TABLEAU : INTEGRATING R WITH TABLEAU

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SYED AWASE KHIRNI

TABLEAU : DASHBOARD CREATION

Original Series

Problem Description:	**To create a dashboard with maps and scatter plot explore the ecommerce data, mocked up using www.mockaroo.com. Identify the profit margin for all the states in United States.**
Data set used:	www.mockaroo.com=> demo3/ tpri-ecommerce-orders.xlsx

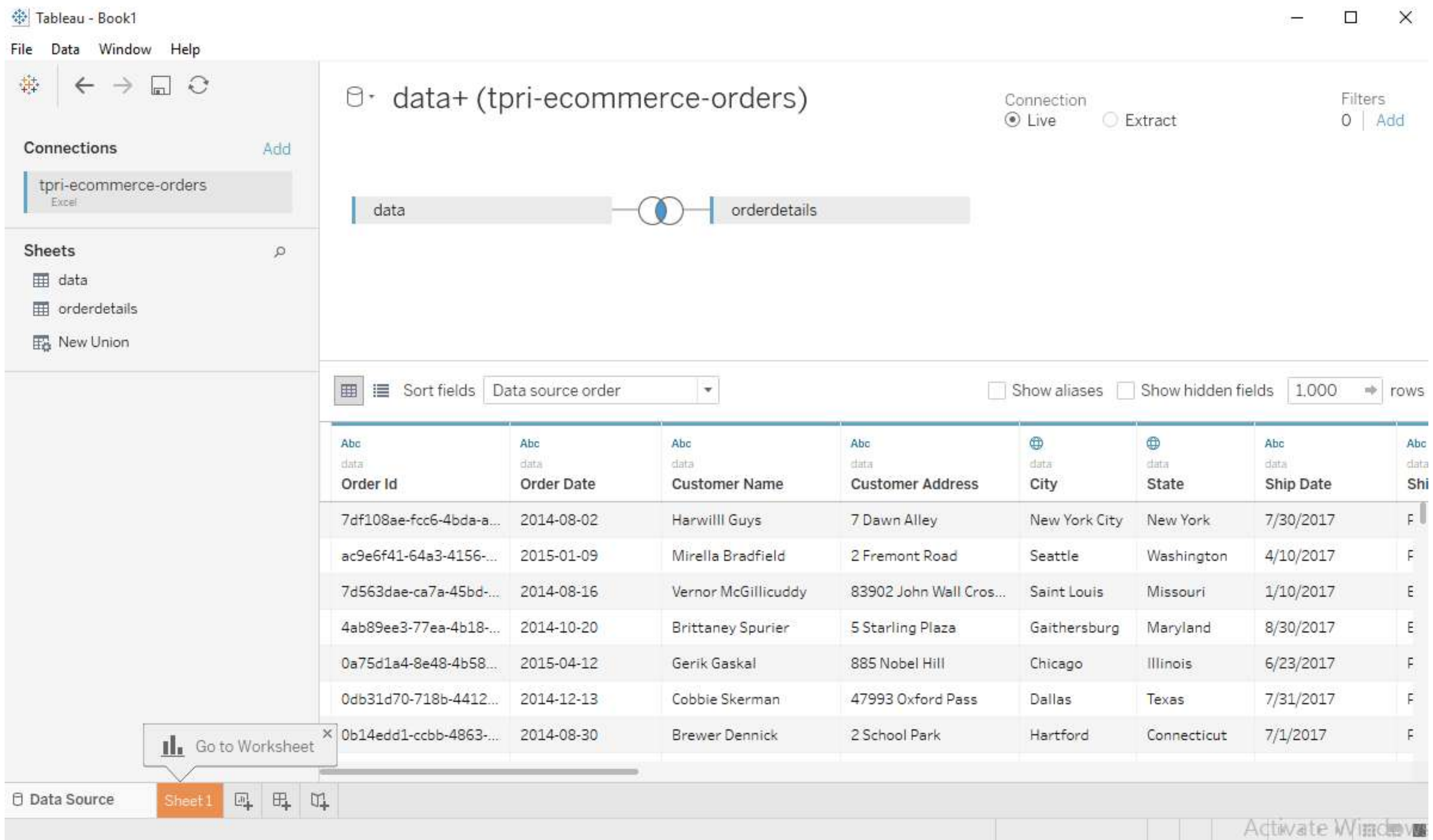
SYED AWASE KHIRNI

TABLEAU : DASHBOARD CREATION:SCENARIO 1

COLUMNS:	
ROWS:	

Step 1

- load the tpri-ecommerce-orders.xlsx file from demo3 folder.
- Let us select data and orderdetails worksheet and perform "innerjoin"



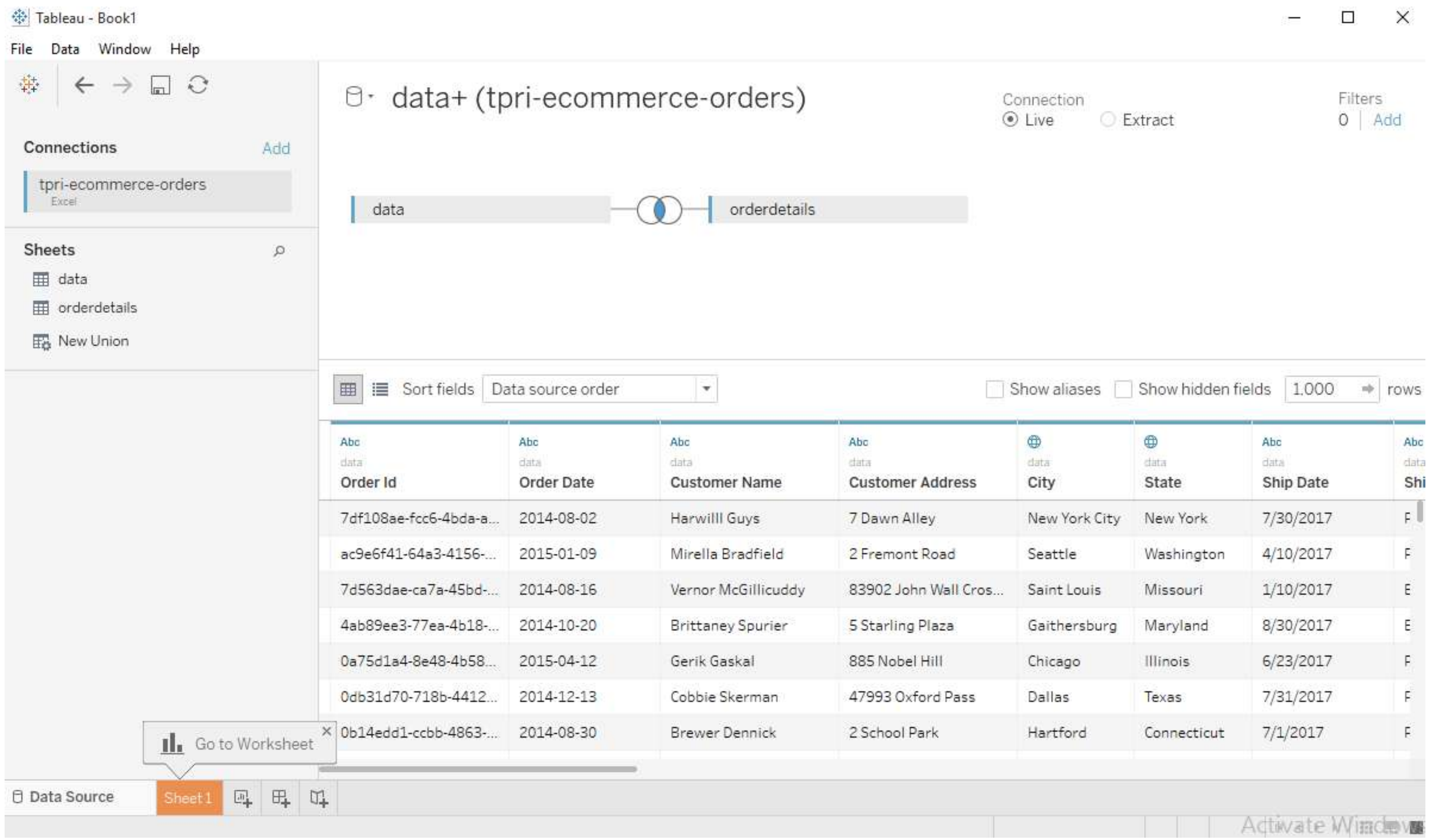
Data Source: demo3/ tpri-ecommerce-orders.xlsx

COLUMNS:

ROWS:

Step 2

- load the tpri-ecommerce-orders.xlsx file from demo3 folder.
- Let us select data and orderdetails worksheet and perform “innerjoin”



Data Source: demo3/ tpri-ecommerce-orders.xlsx

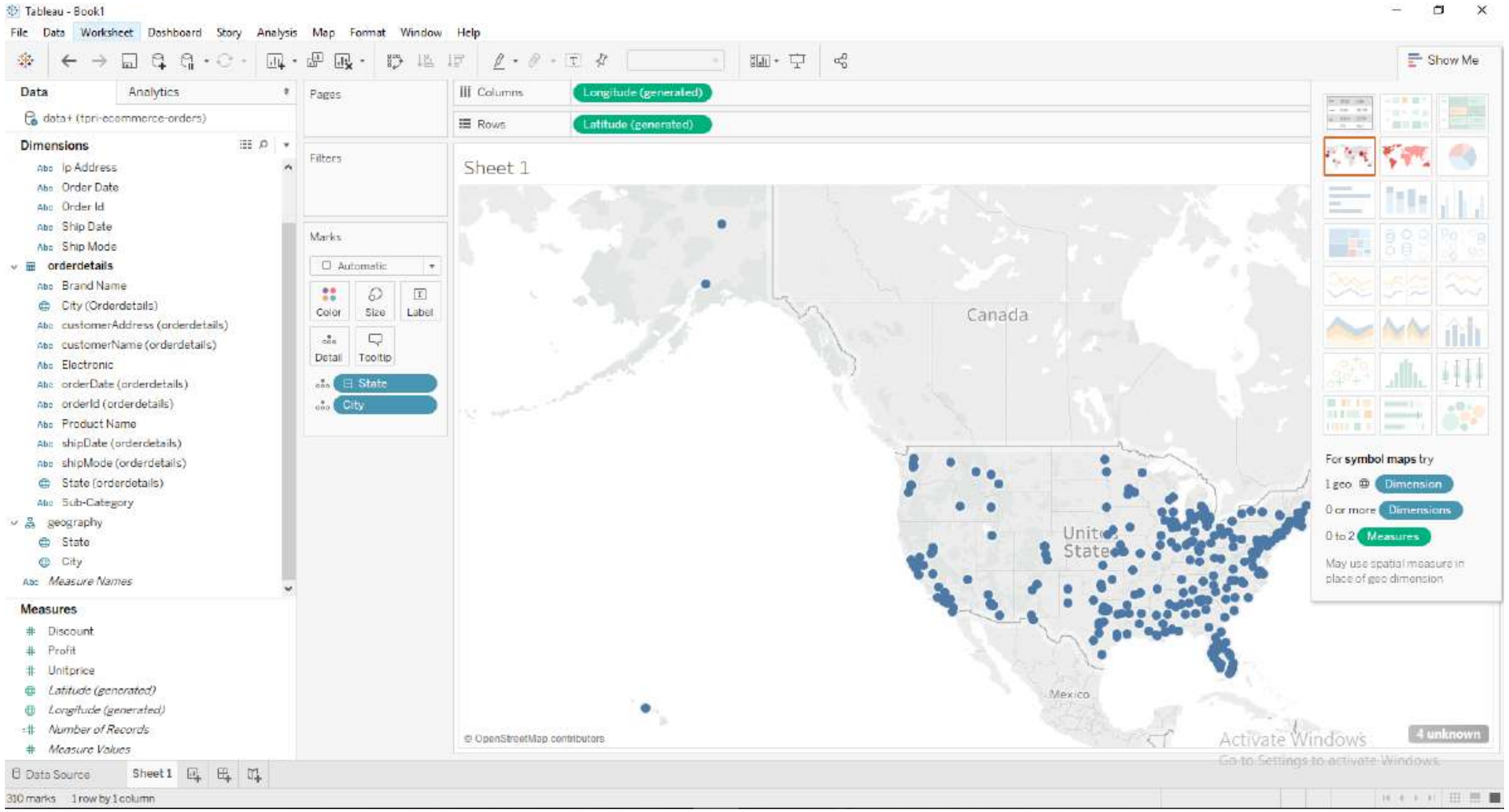
Map

- Applicable for postal codes, state abbreviations, country names or your own custom geocoding.
- Used to show geocoded data.
- Layering bubble charts on top of maps, to demonstrate the concentration of data and their varied size to understand relative data.

Step 3

- Now, we shall create a geographical hierarchy, by selecting state and city.
- Upon dragging the state and city to canvas panel, tableau automatically generates map by using openstreetmap data.

COLUMNS:	
ROWS:	

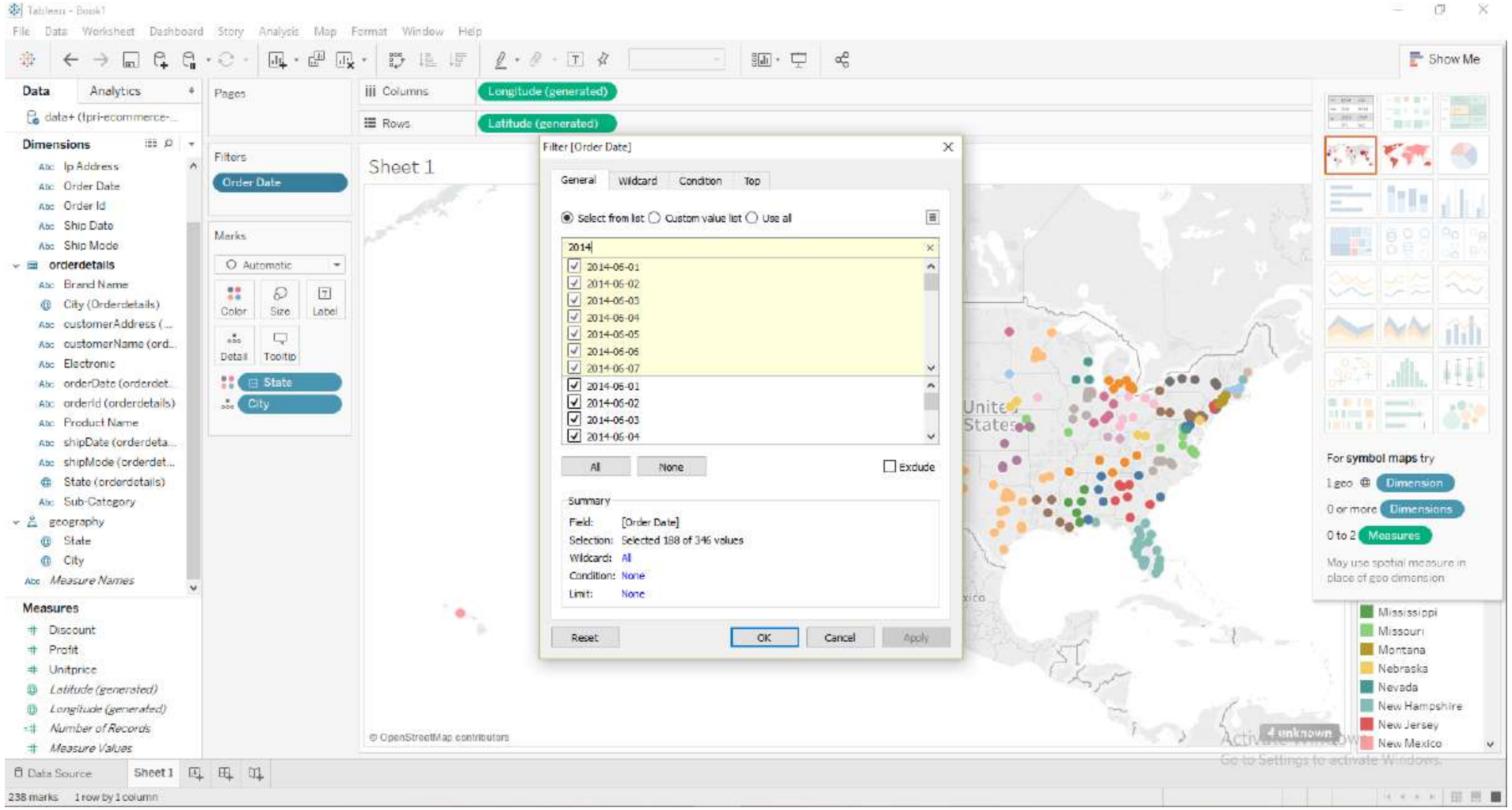


Data Source: demo3/ tpri-ecommerce-orders.xlsx

COLUMNS:	
ROWS:	

Step 4

- let us now filter the data, based on orderDate for the year 2014.



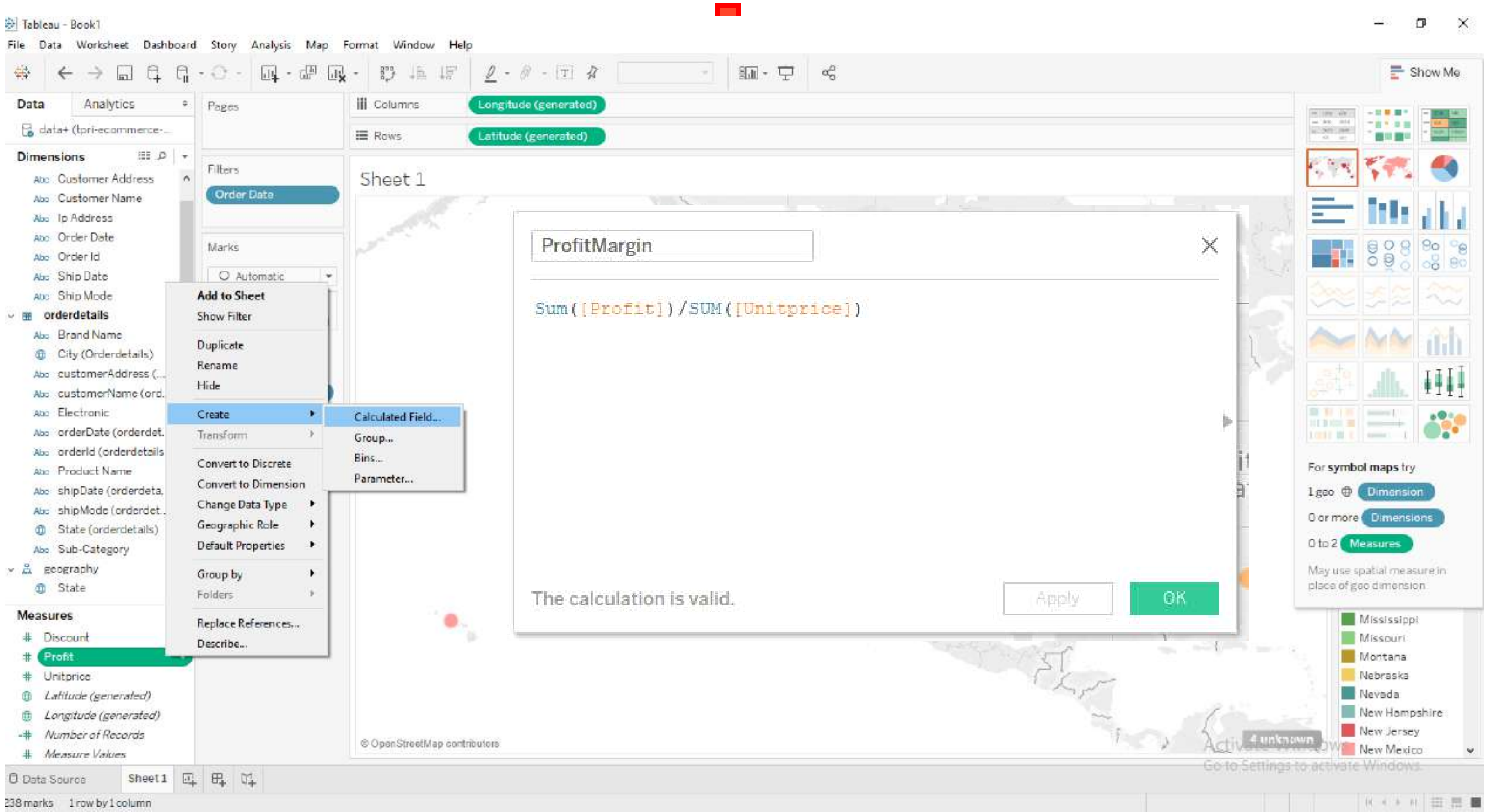
Data Source: demo3/ tpri-ecommerce-orders.xlsx

COLUMNS:

ROWS:

Step 5

- let us compute "ProfitMargin" for each state, as calculated field.

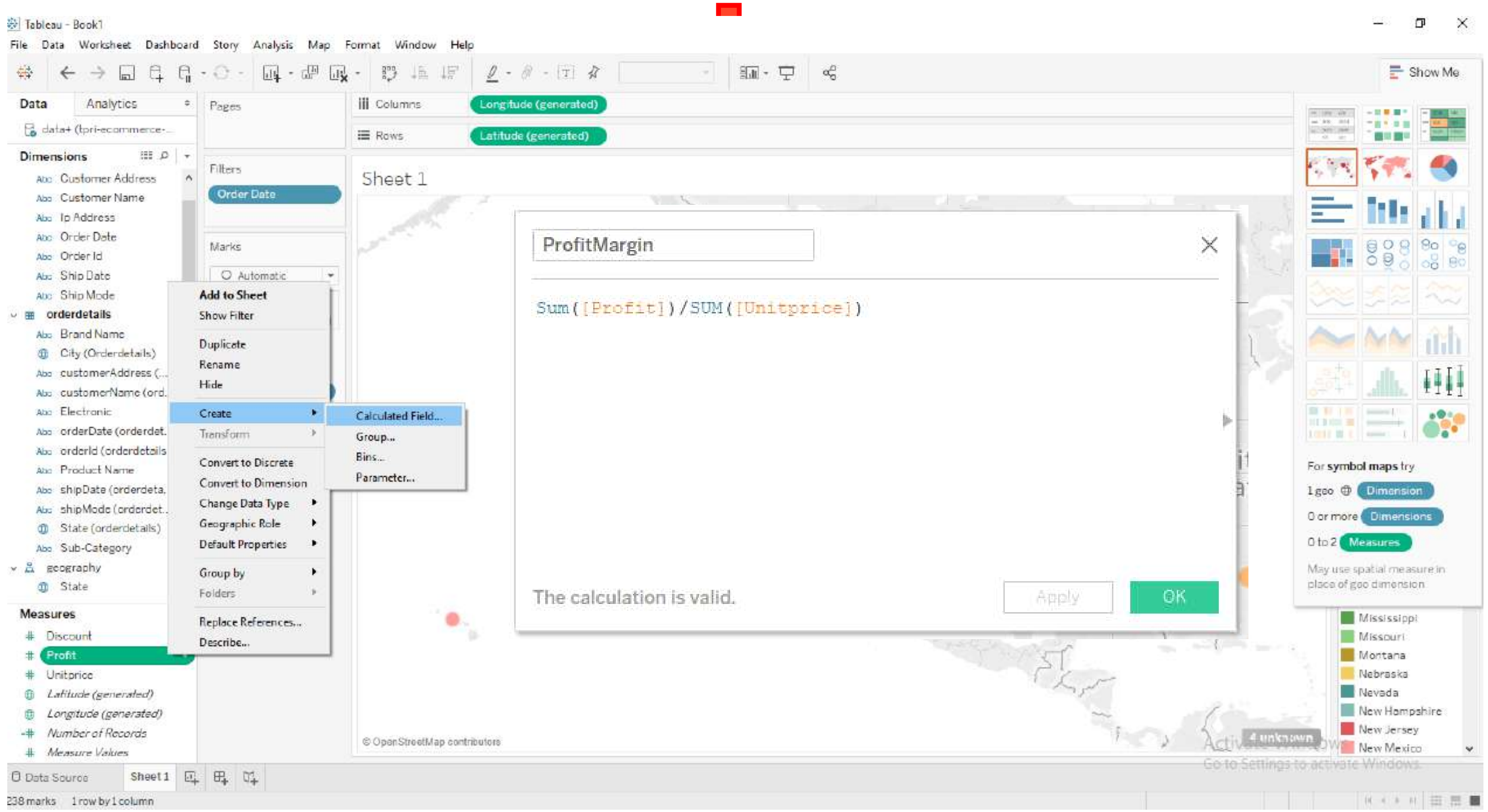


Data Source: demo3/ tpri-ecommerce-orders.xlsx

COLUMNS:	
ROWS:	

Step 5

- let us compute “ProfitMargin” for each state, as calculated field.

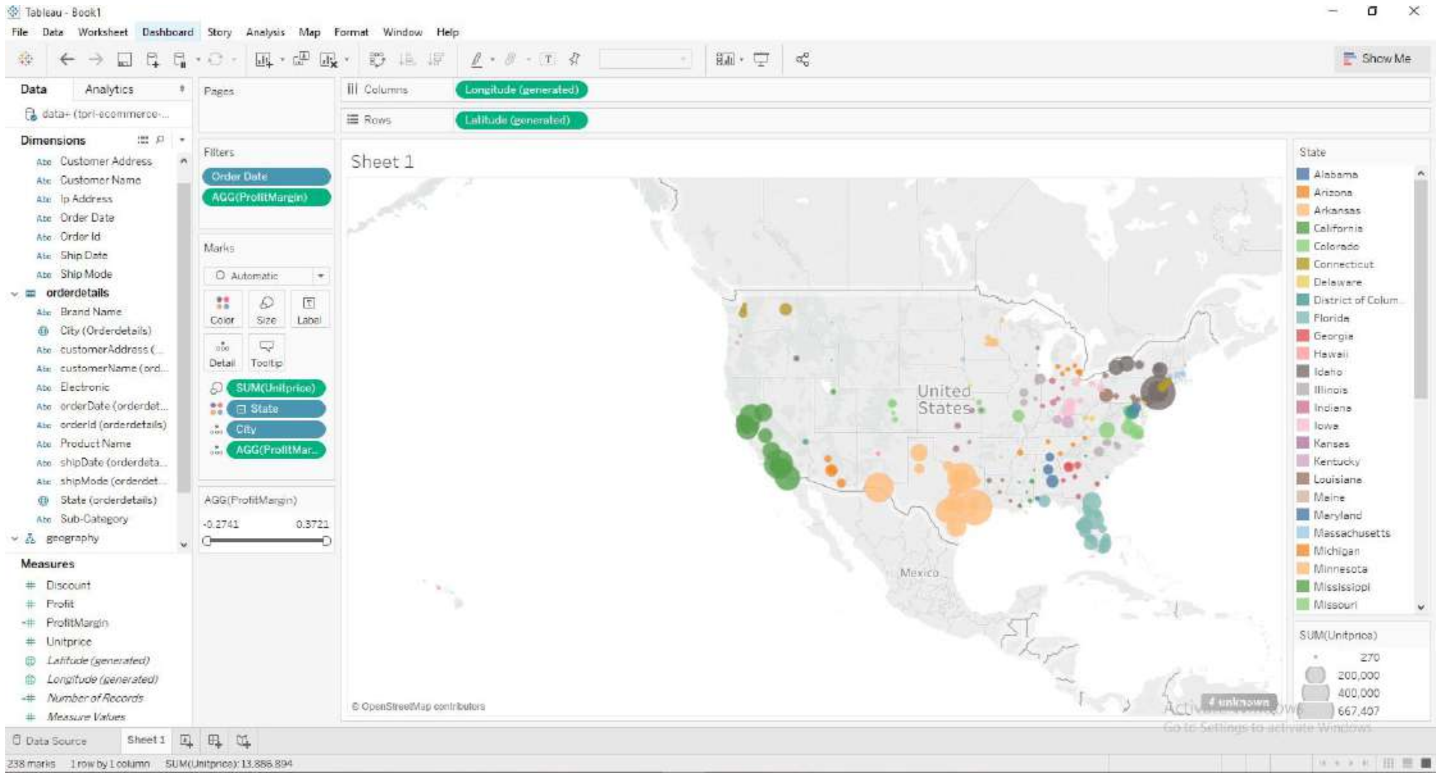


Data Source: demo3/ tpri-ecommerce-orders.xlsx

COLUMNS:	
ROWS:	

Step 6

- let us drag the “unitprice” on to the **size marks** this will show different size orbs on the us map.

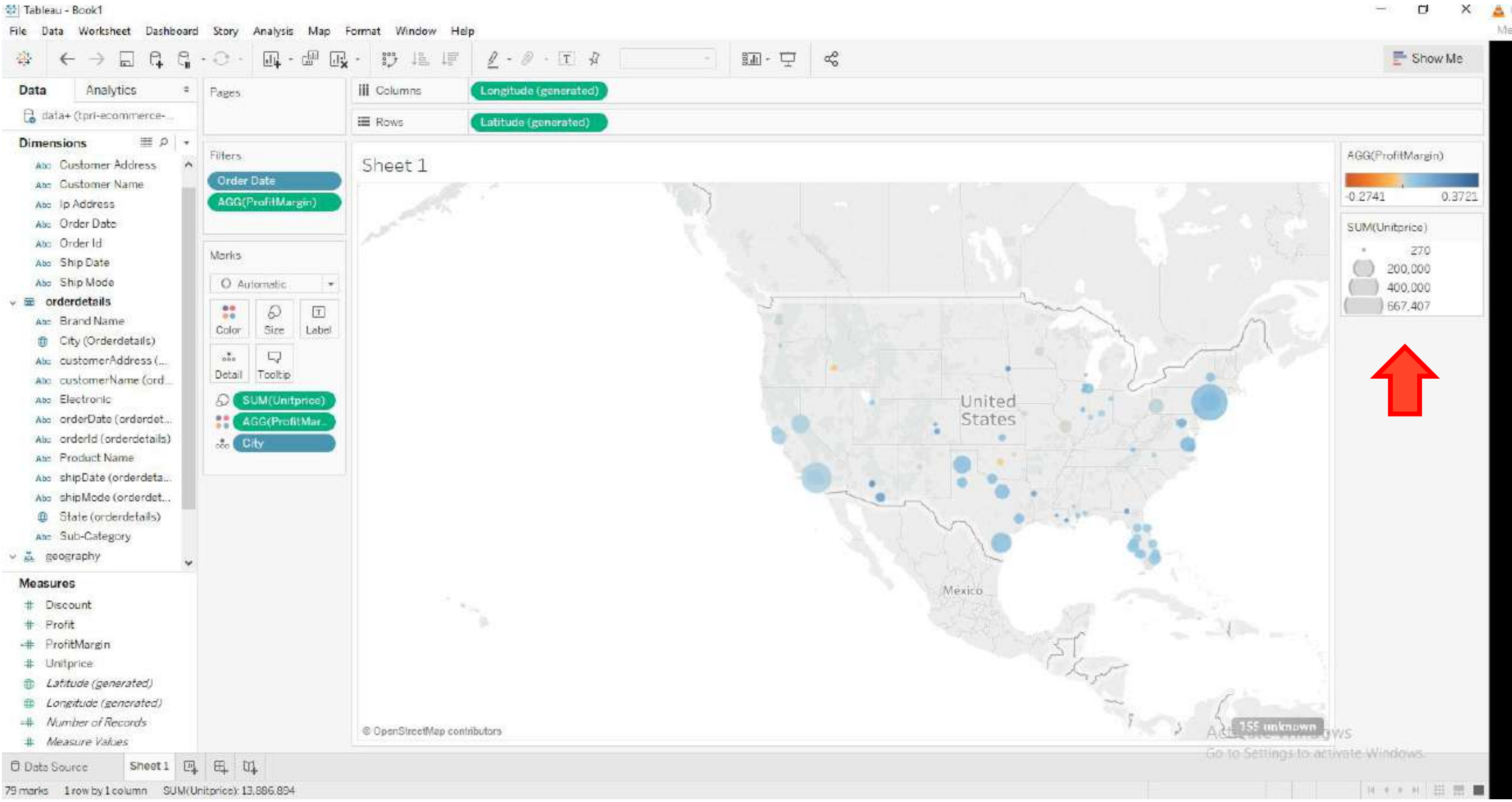


Data Source: demo3/ tpri-ecommerce-orders.xlsx

COLUMNS:	
ROWS:	

Step 7

- Let us also add the measure(calculated value): **"ProfitMargin"** on to the **color marks, this will display color filter with ranges as shown in the figure.**

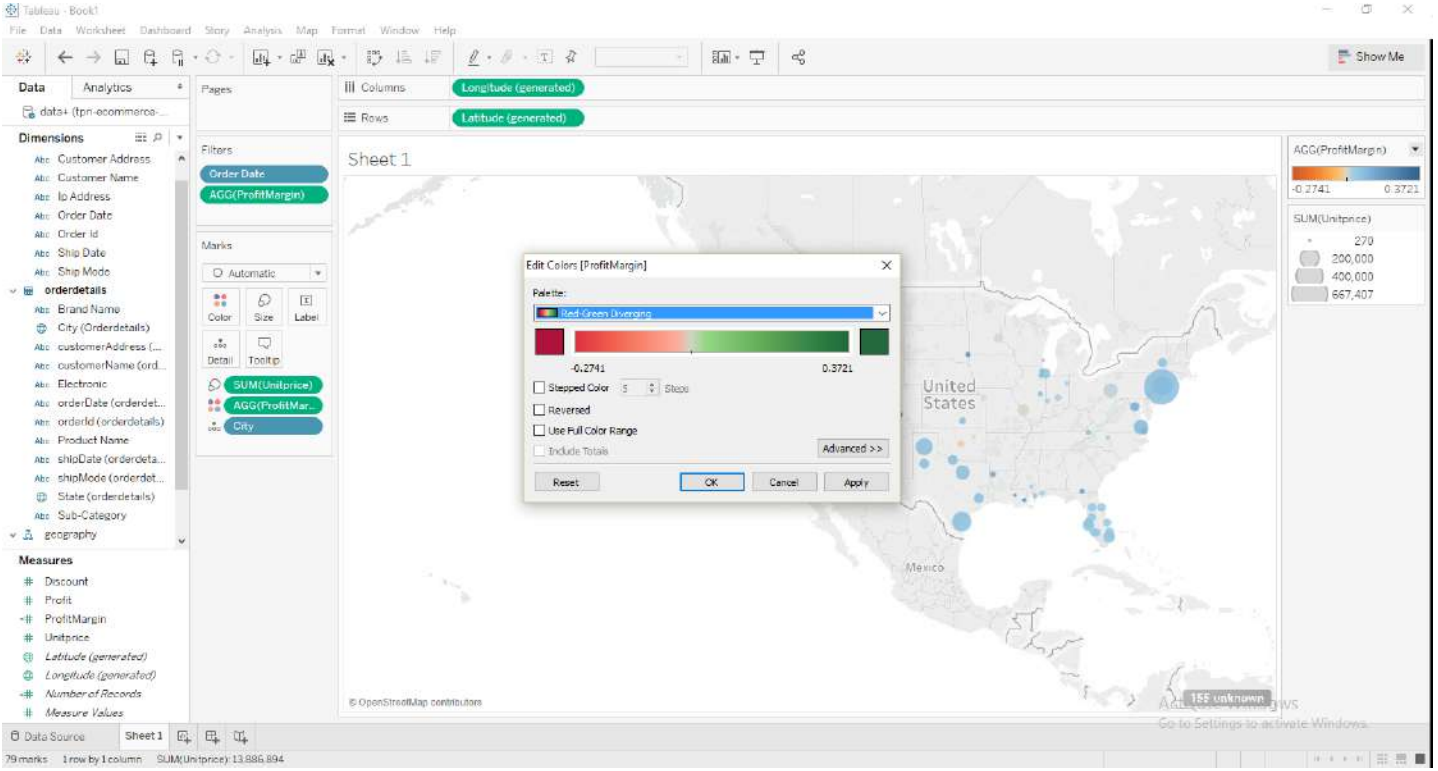


Data Source: demo3/ tpri-ecommerce-orders.xlsx

COLUMNS:	
ROWS:	

Step 8

- Now let us define a custom color palette to the Aggregate(ProfitMargin)

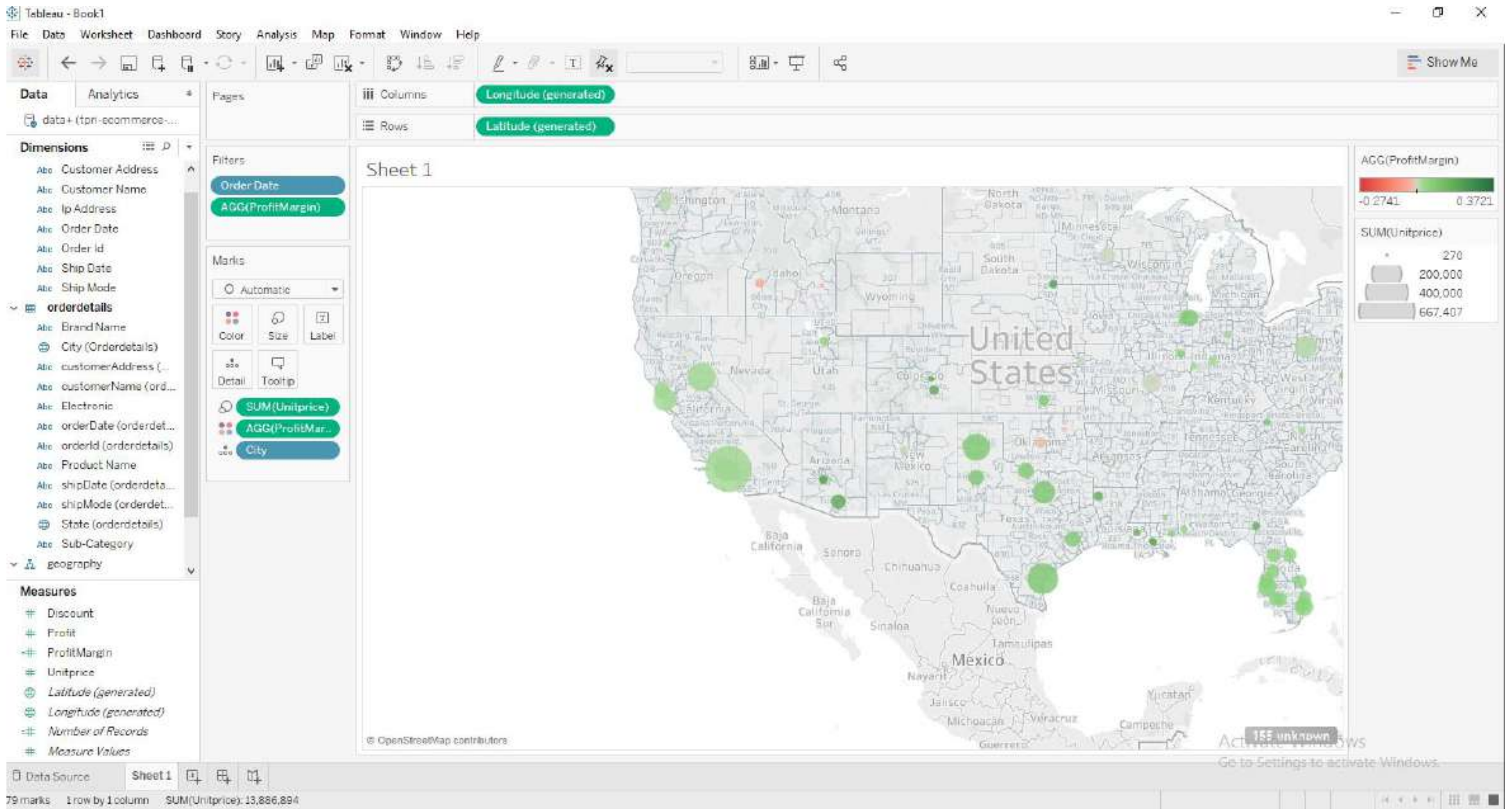


Data Source: demo3/ tpri-ecommerce-orders.xlsx

Step 8

COLUMNS:	
ROWS:	

- Upon applying the filter you can visualize the perspective, where it displays profitmargin orbs overlayed on the map.

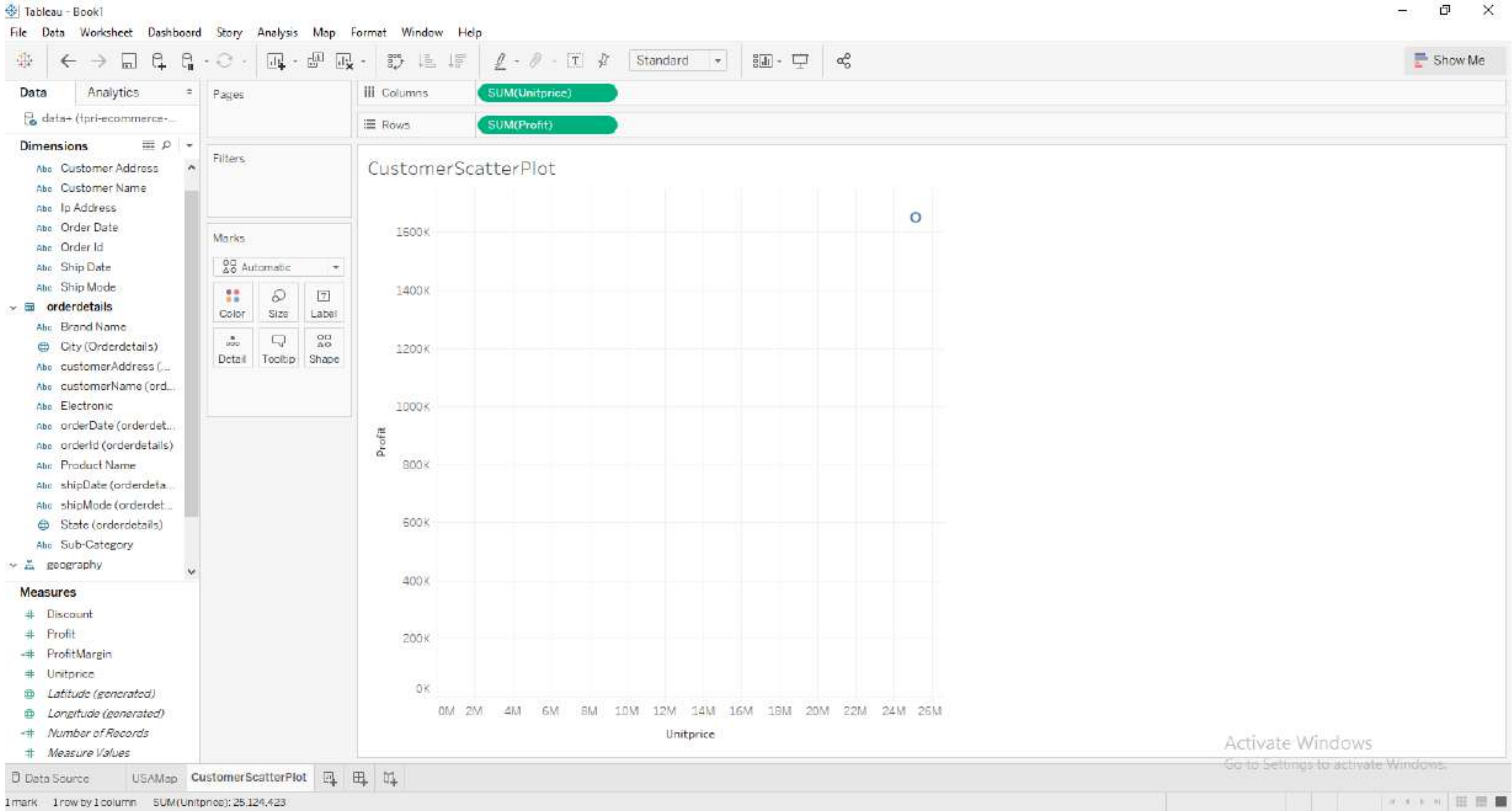


Data Source: demo3/ tpri-ecommerce-orders.xlsx

COLUMNS:	SUM(UnitPrice)
ROWS:	SUM(Profit)

Step 9

- Now let us visualize the Customer Sales against Profit made by creating a new worksheet.

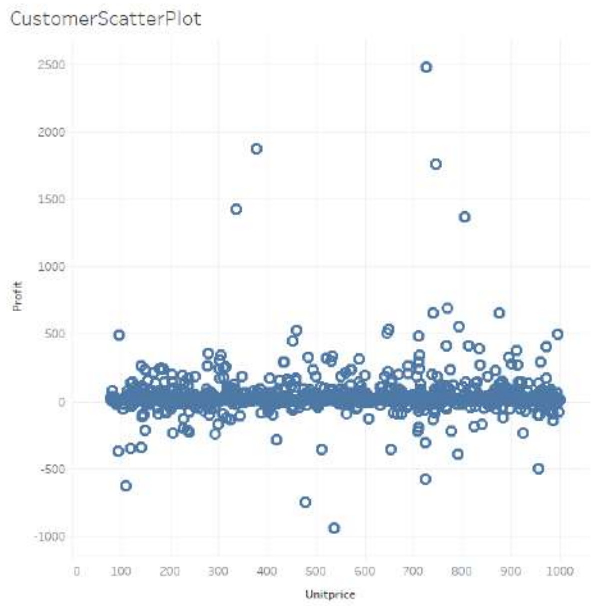


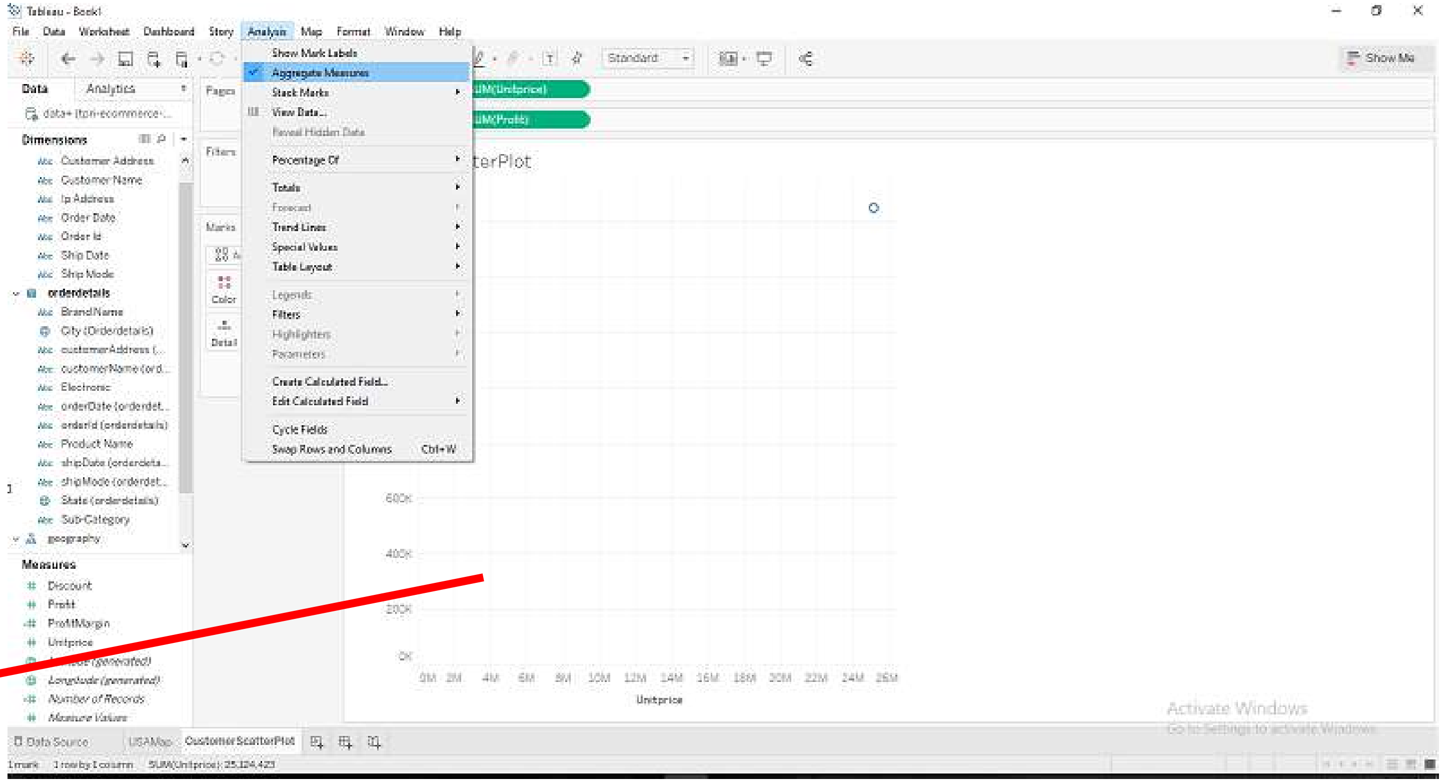
Data Source: demo3/ tpri-ecommerce-orders.xlsx

COLUMNS:	SUM(UnitPrice)
ROWS:	SUM(Profit)

Step 10

- let us untoggle from the aggregate measure perspective to display all the data points.



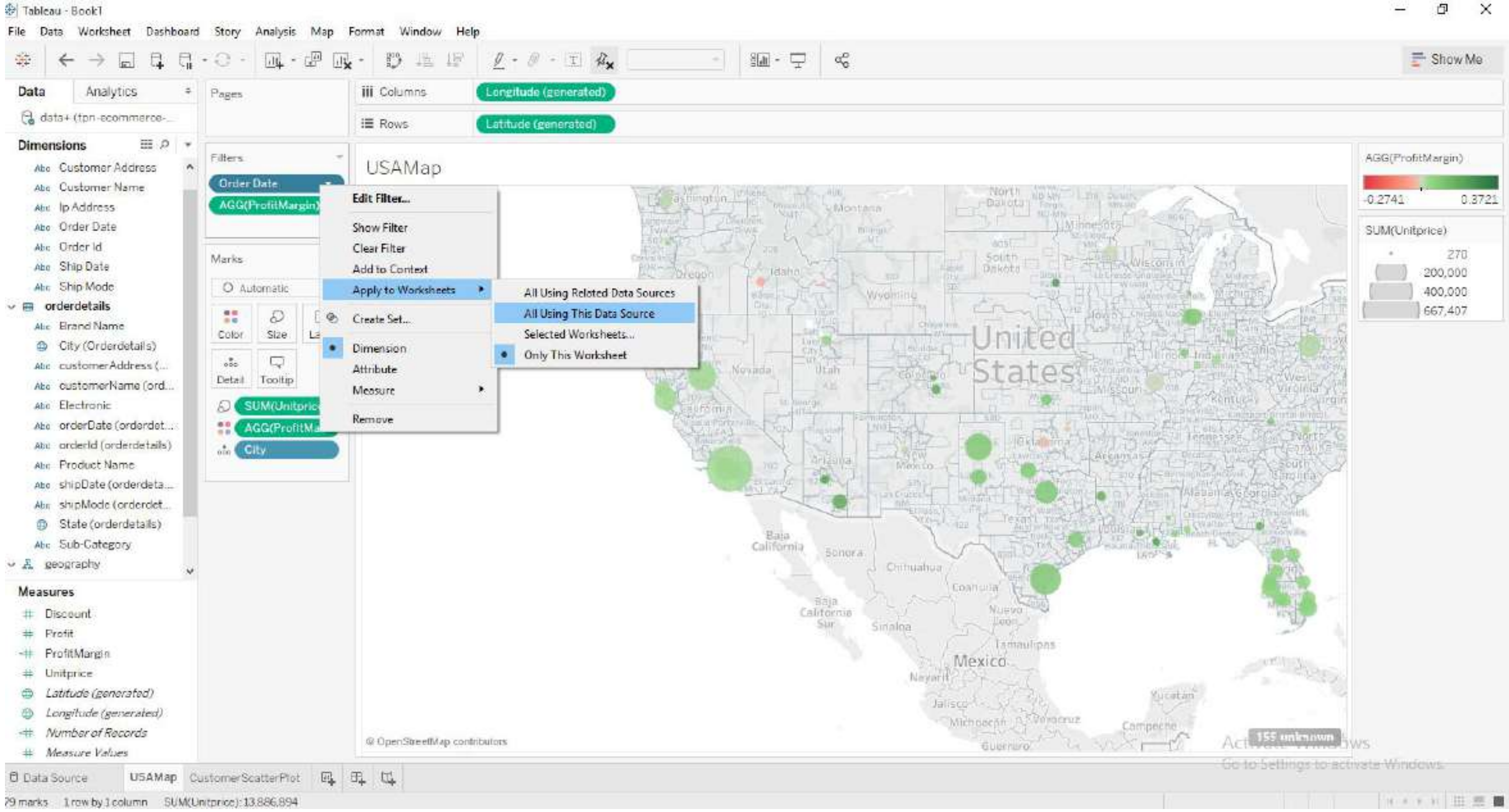


Data Source: demo3/ tpri-ecommerce-orders.xlsx

COLUMNS:	SUM(UnitPrice)
ROWS:	SUM(Profit)

Step 11

- Now, we would like to apply the same filter across all the worksheets that are using the data source.
- Switch to the USAMap worksheet and select filter and apply “All Using This Data Source”



Data Source: demo3/ tpri-ecommerce-orders.xlsx

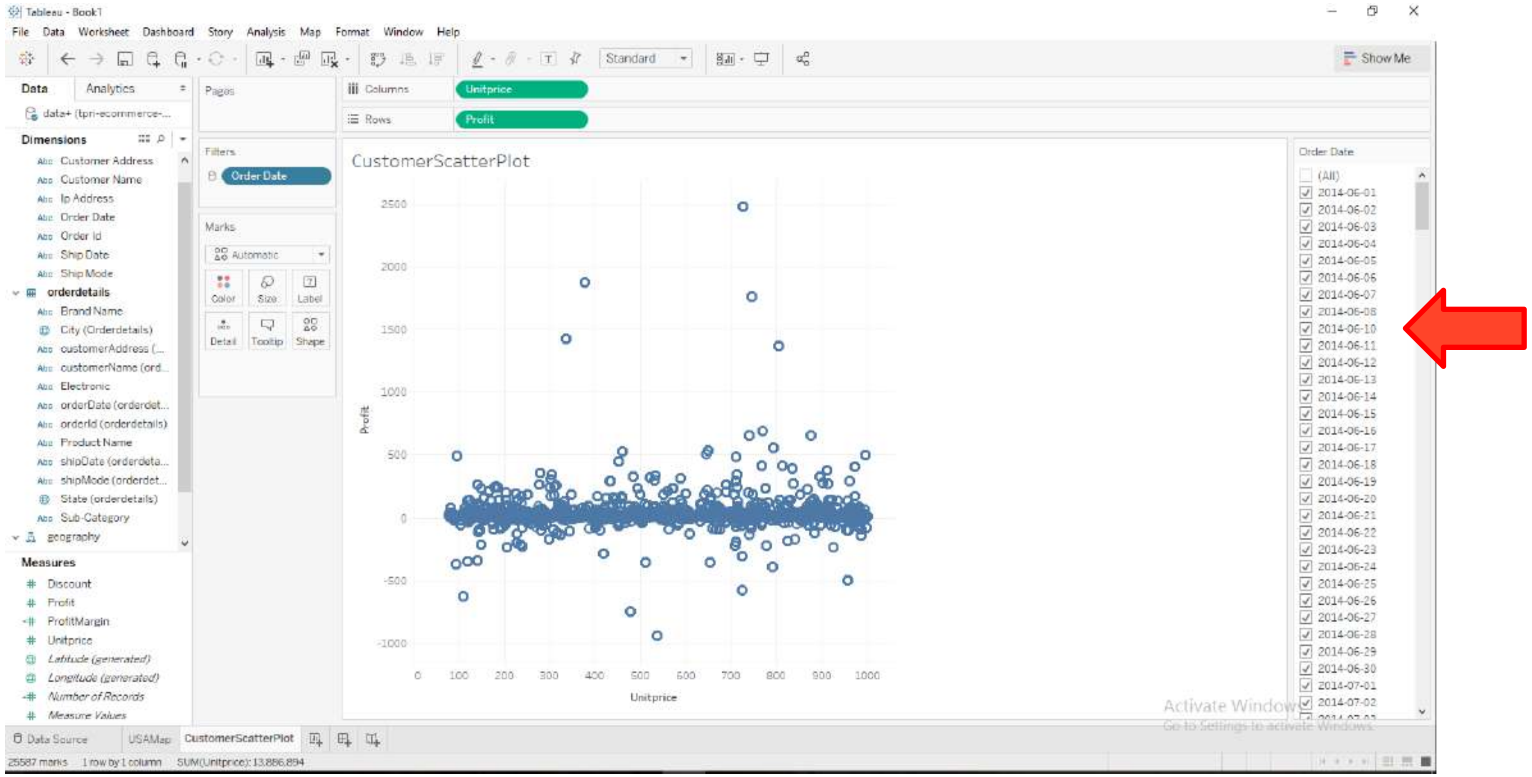
Scatter plot

- Used to demonstrate trends, concentrations and outliers that will direct users for further investigation/analysis.
- Used to investigate relationship between different variables.
- By adding a trend line the correlation among the data is clear.
- By incorporating filters, users can drill down into different perspectives and details to quickly identify patterns in the data.

COLUMNS:	SUM(UnitPrice)
ROWS:	SUM(Profit)

Step 11

- You can see that "orderDate" filter being applied to the Customer ScatterPlot.

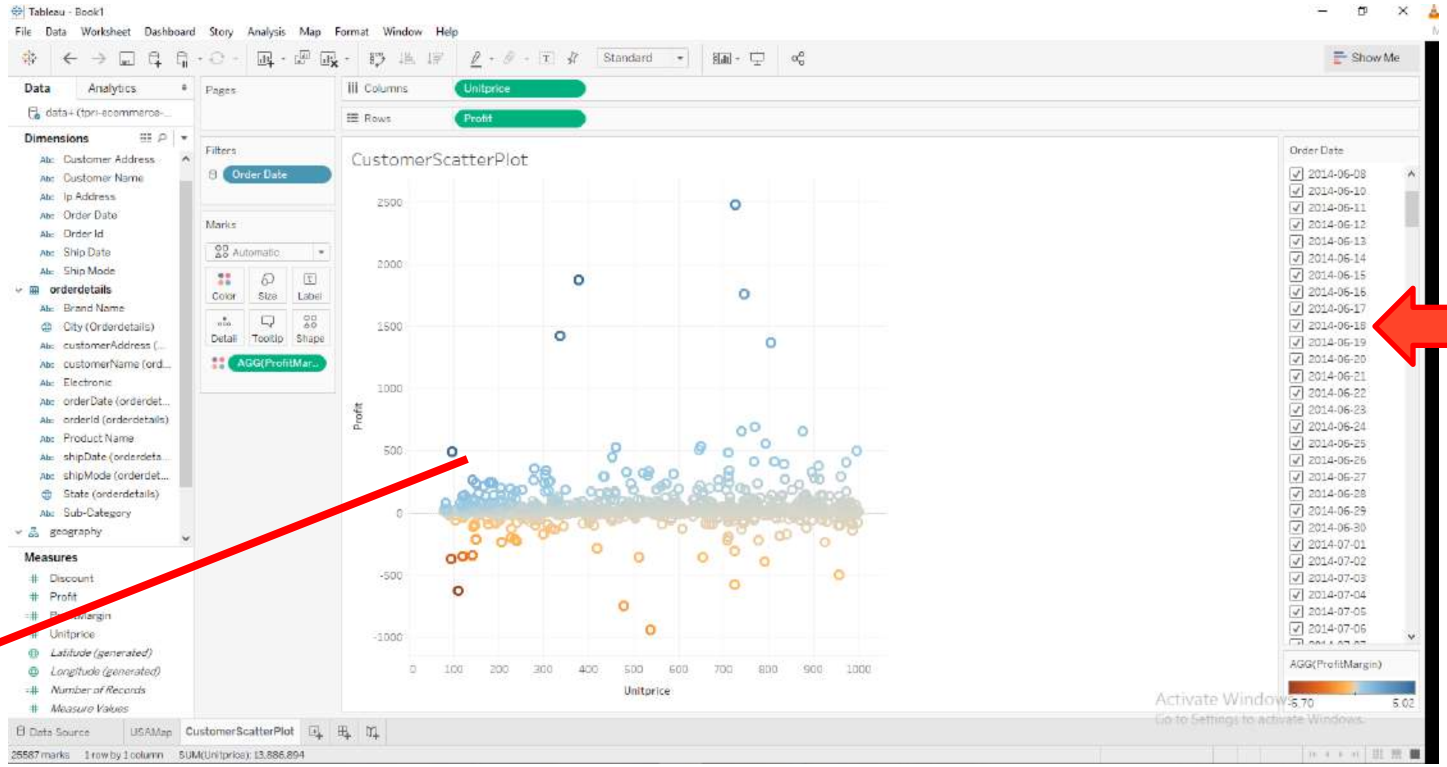


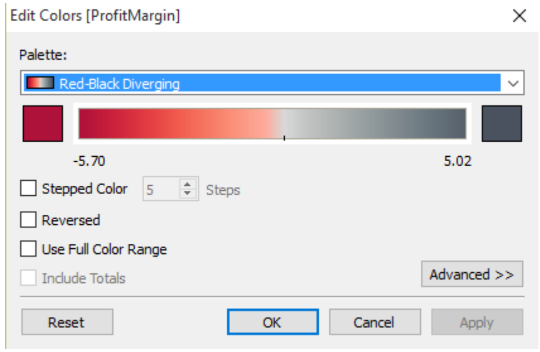
Data Source: demo3/ tpri-ecommerce-orders.xlsx

COLUMNS:	SUM(UnitPrice)
ROWS:	SUM(Profit)

Step 11

- Now bring apply the "profitmargin" onto the color palette marks to visualize draw a new perspective as shown in the figure.

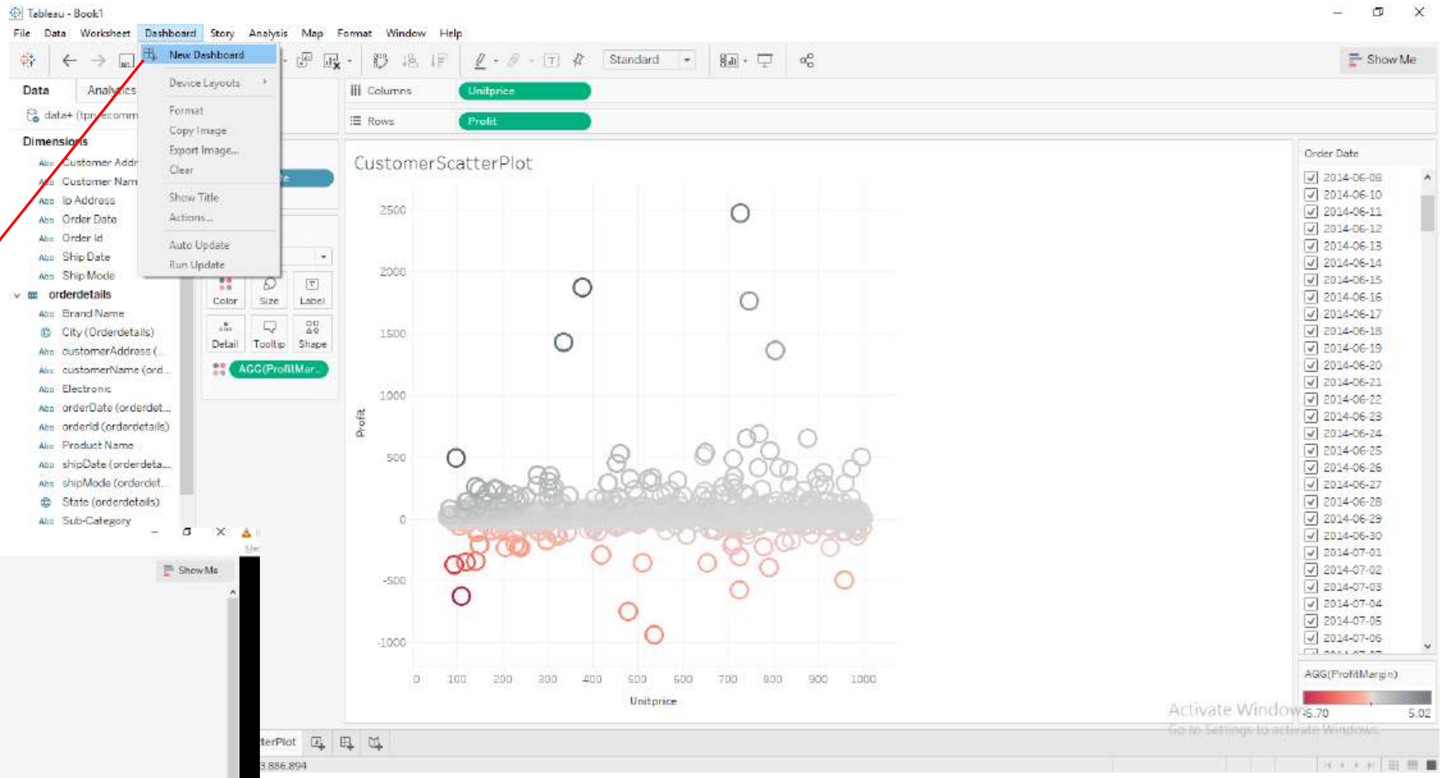


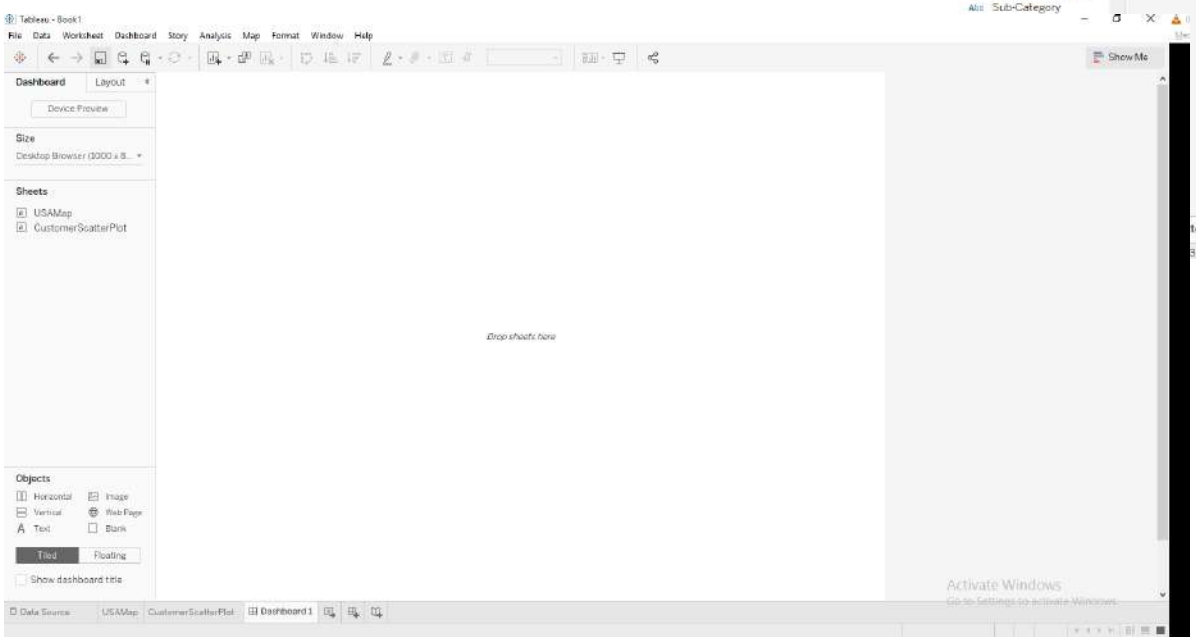


Data Source: demo3/ tpri-ecommerce-orders.xlsx

Step 12

- Creating a dashboard



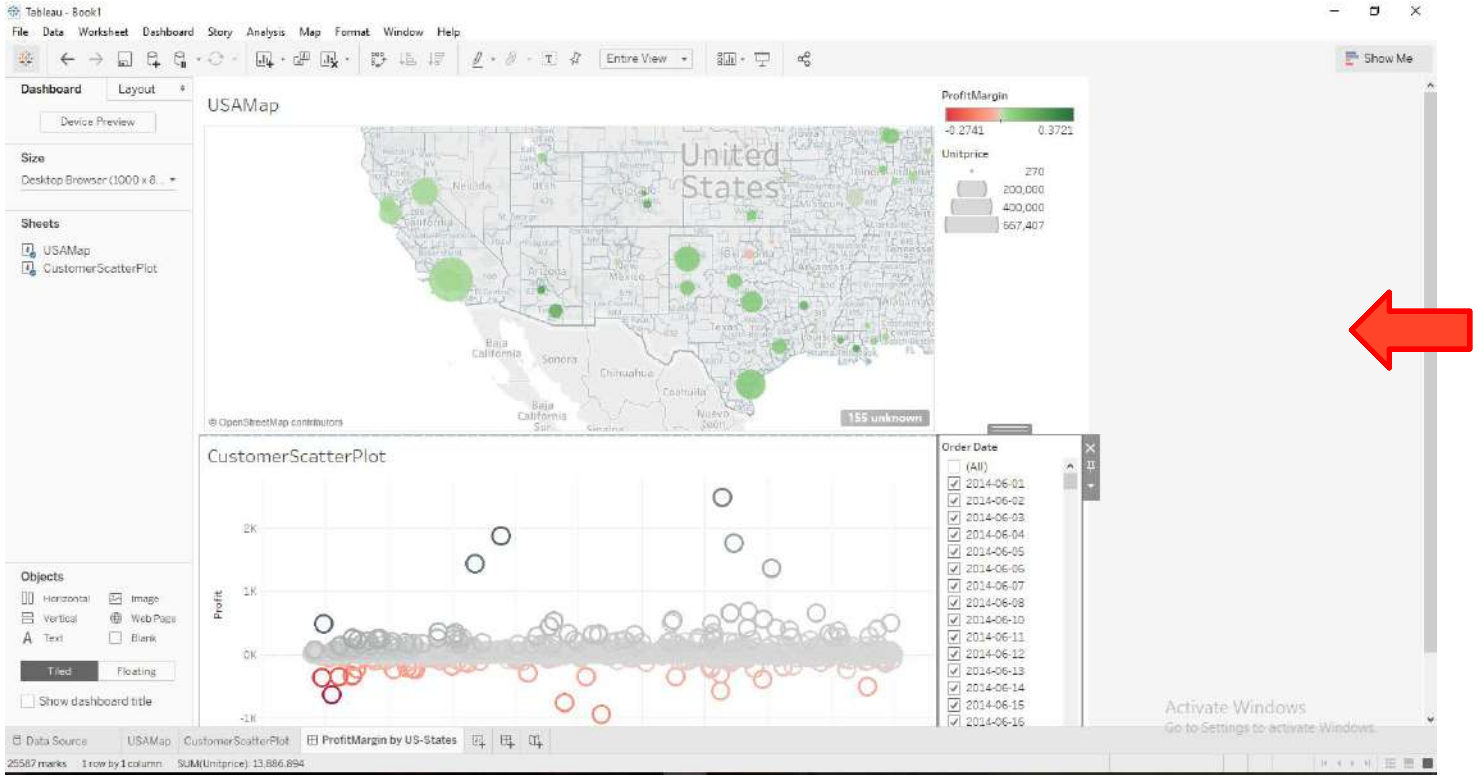


Original Series

COLUMNS:	SUM(UnitPrice)
ROWS:	SUM(Profit)

Step 13

- Drag and drop to create a dashboard of USAMap and CustomerScatterPlot as shown in the figure.

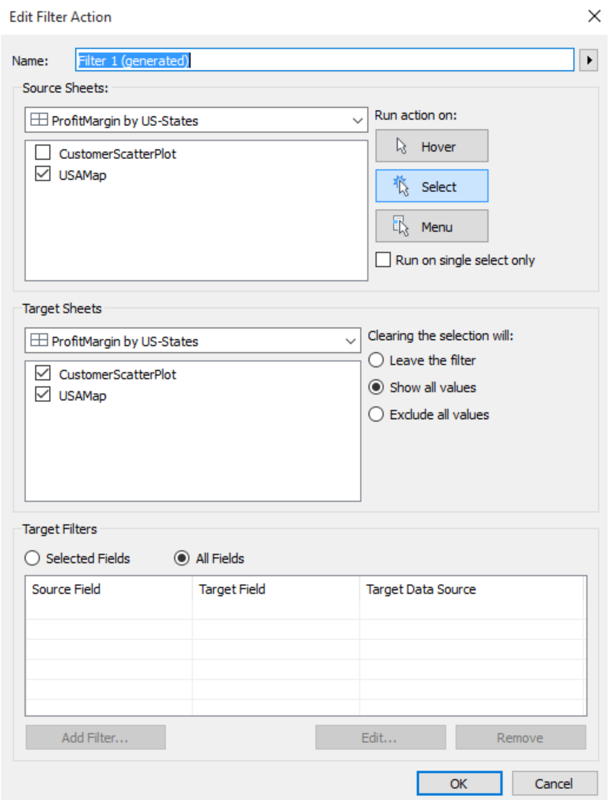


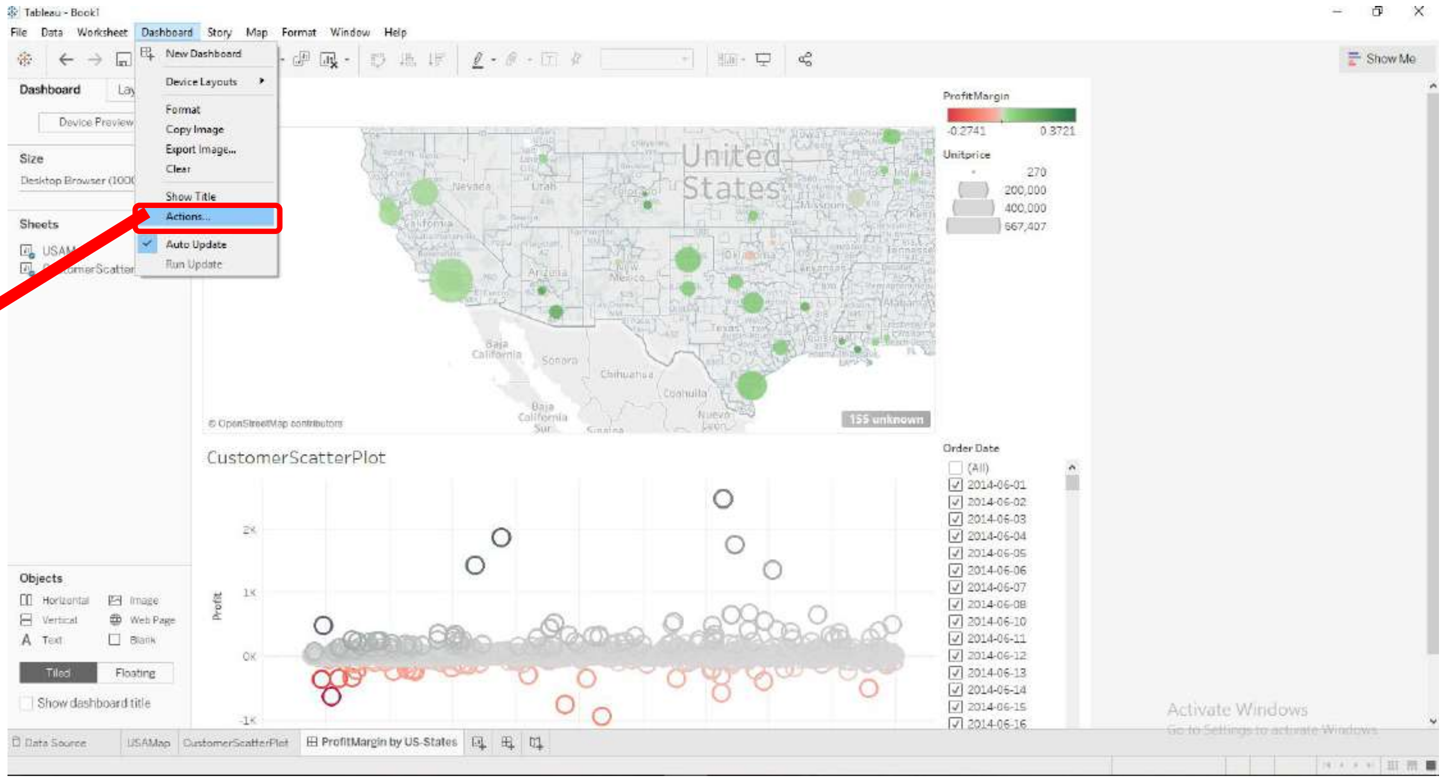
Data Source: demo3/ tpri-ecommerce-orders.xlsx

COLUMNS:	SUM(UnitPrice)
ROWS:	SUM(Profit)

Step 14

- Let us add "action filters" to the dashboard.





Please read terms of use for authorized access

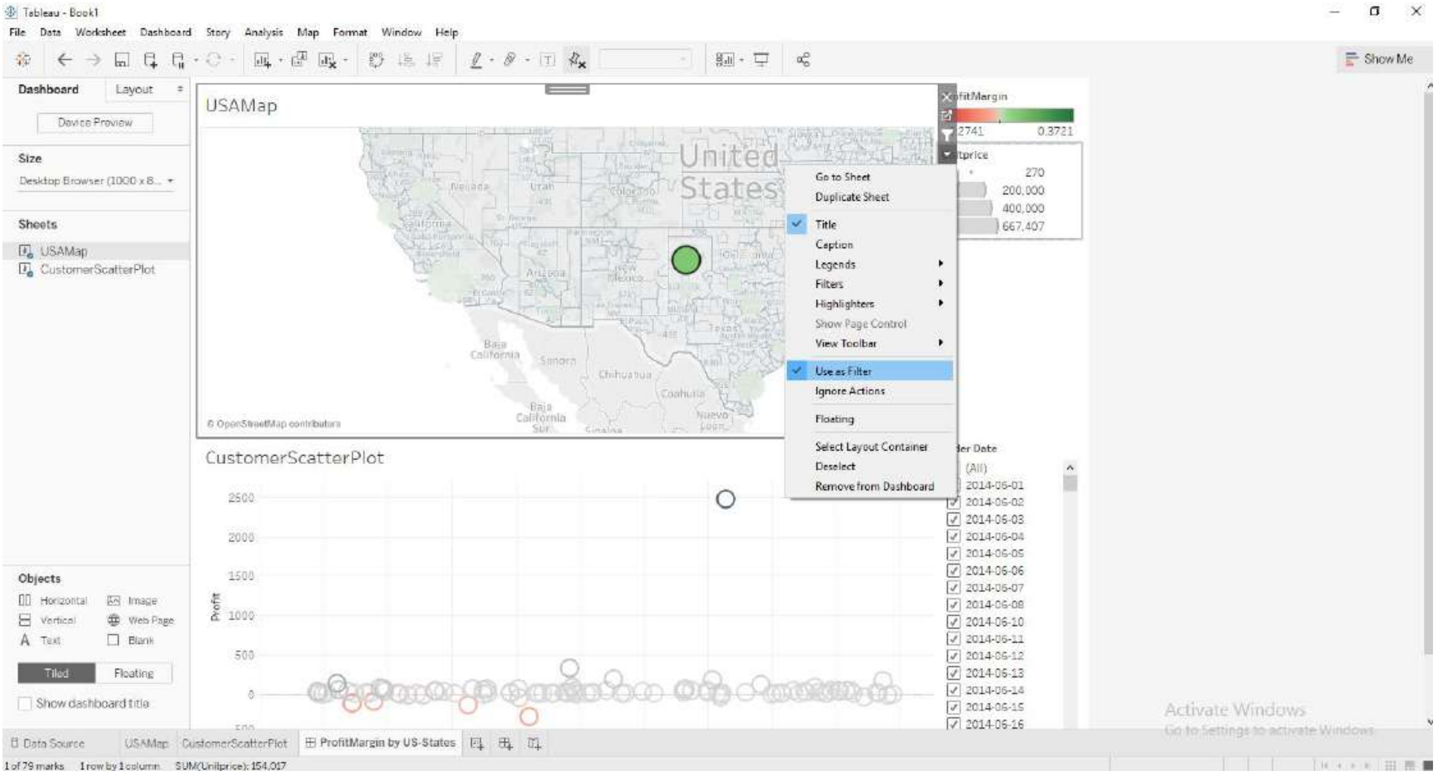
Original Series

Data Source: demo3/ tpri-ecommerce-orders.xlsx

COLUMNS:	SUM(UnitPrice)
ROWS:	SUM(Profit)

Step 15

- Let us add "**action filters**" to the dashboard.
- Alternatively, you can select the "USAmap" worksheet and select "**use as filter**" option, which would enable, filtering, linking and highlight based on user selection in the map.

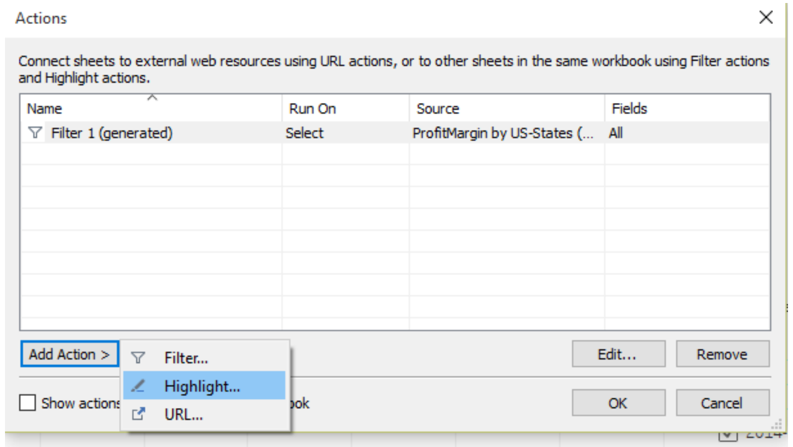


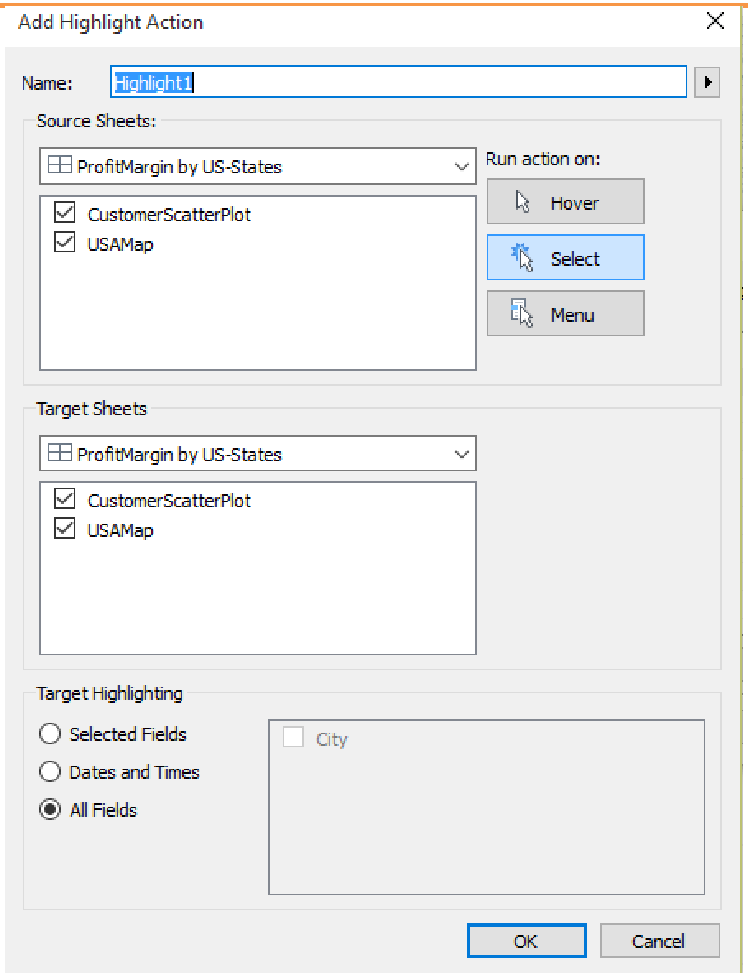
Data Source: demo3/ tpri-ecommerce-orders.xlsx

COLUMNS:	SUM(UnitPrice)
ROWS:	SUM(Profit)

Step 16

- Upon **"highlighting" action , users can highlight a specific selection.**





Data Source: demo3/ tpri-ecommerce-orders.xlsx

Problem Description:	**To create a dashboard depicting global economic trend analysis, with their gdp growth quarter on quarter and demonstrate the relationship of inflation, unemployment rate using action fliters.**
Data set used:	Demo2/GlobalEconomicDataSet.xlsx

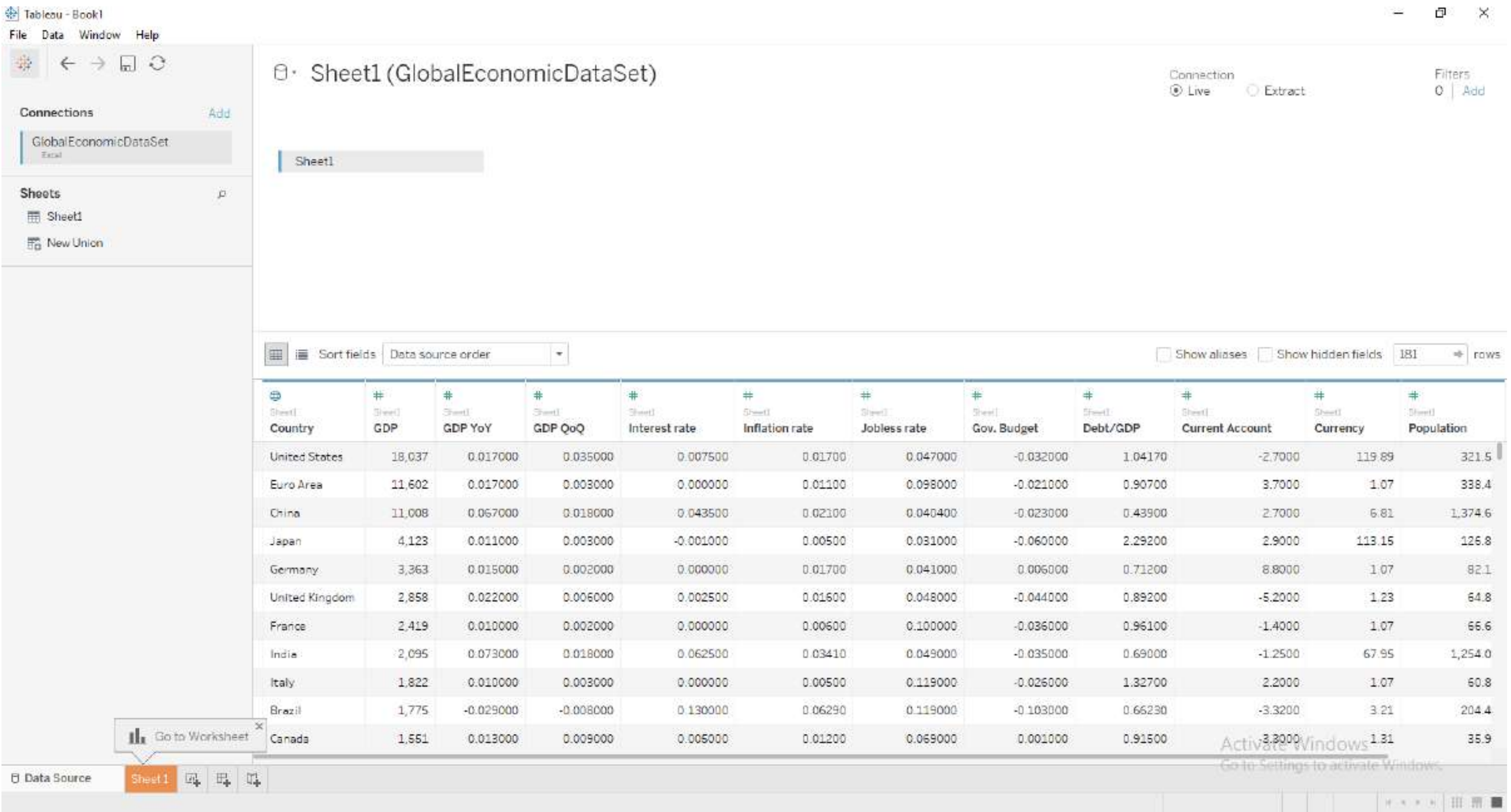
SYED AWASE KHIRNI

TABLEAU : DASHBOARD CREATION:SCENARIO 2

COLUMNS:	
ROWS:	

Step 1

- .load the global economic dataset.xlsx into tableau.



Country	GDP	GDP YoY	GDP QoQ	Interest rate	Inflation rate	Jobless rate	Gov. Budget	Debt/GDP	Current Account	Currency	Population
United States	18,037	0.017000	0.035000	0.007500	0.01700	0.047000	-0.032000	1.04170	-2.7000	119.89	321.5
Euro Area	11,602	0.017000	0.003000	0.000000	0.01100	0.098000	-0.021000	0.90700	3.7000	1.07	338.4
China	11,008	0.067000	0.018000	0.043500	0.02100	0.040400	-0.023000	0.43900	2.7000	6.81	1,374.6
Japan	4,123	0.011000	0.003000	-0.001000	0.00500	0.031000	-0.060000	2.29200	2.9000	113.15	126.8
Germany	3,363	0.015000	0.002000	0.000000	0.01700	0.041000	0.006000	0.71200	8.8000	1.07	82.1
United Kingdom	2,858	0.022000	0.006000	0.002500	0.01600	0.048000	-0.044000	0.89200	-5.2000	1.23	64.8
France	2,419	0.010000	0.002000	0.000000	0.00600	0.100000	-0.036000	0.96100	-1.4000	1.07	66.6
India	2,095	0.073000	0.018000	0.062500	0.03410	0.049000	-0.035000	0.69000	-1.2500	67.95	1,254.0
Italy	1,822	0.010000	0.003000	0.000000	0.00500	0.119000	-0.026000	1.32700	2.2000	1.07	60.8
Brazil	1,775	-0.029000	-0.008000	0.130000	0.06290	0.119000	-0.103000	0.66230	-3.3200	3.21	204.4
Canada	1,551	0.013000	0.009000	0.005000	0.01200	0.069000	0.001000	0.91500	-3.3000	1.31	35.9

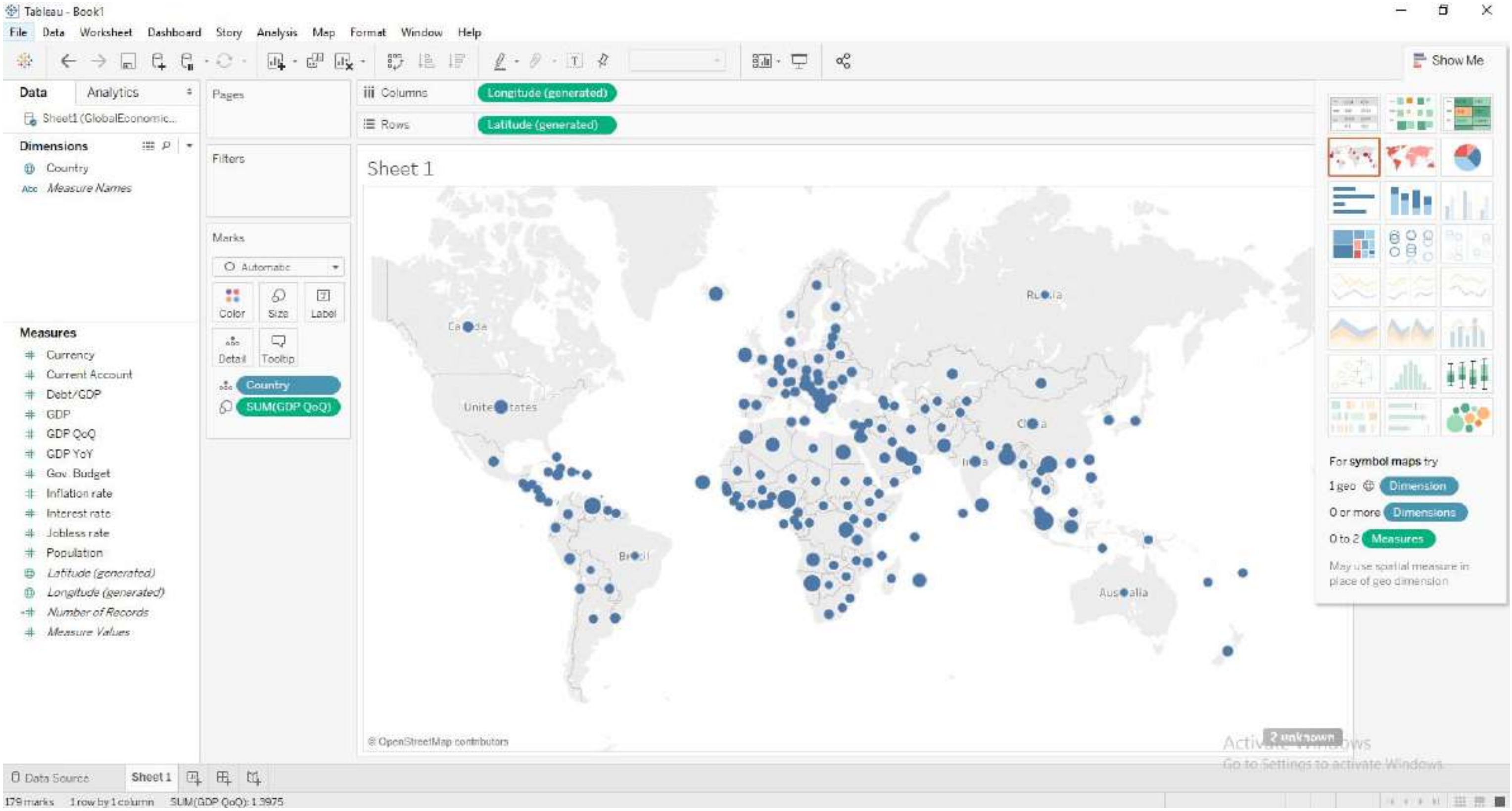
Data Source: demo2/ GlobalEconomicDataSet.xlsx

COLUMNS:

ROWS:

Step 2

- .Upon selecting country and gdpQoQ we get openstreetmap with orbs depicting the growth of gdp of a country.

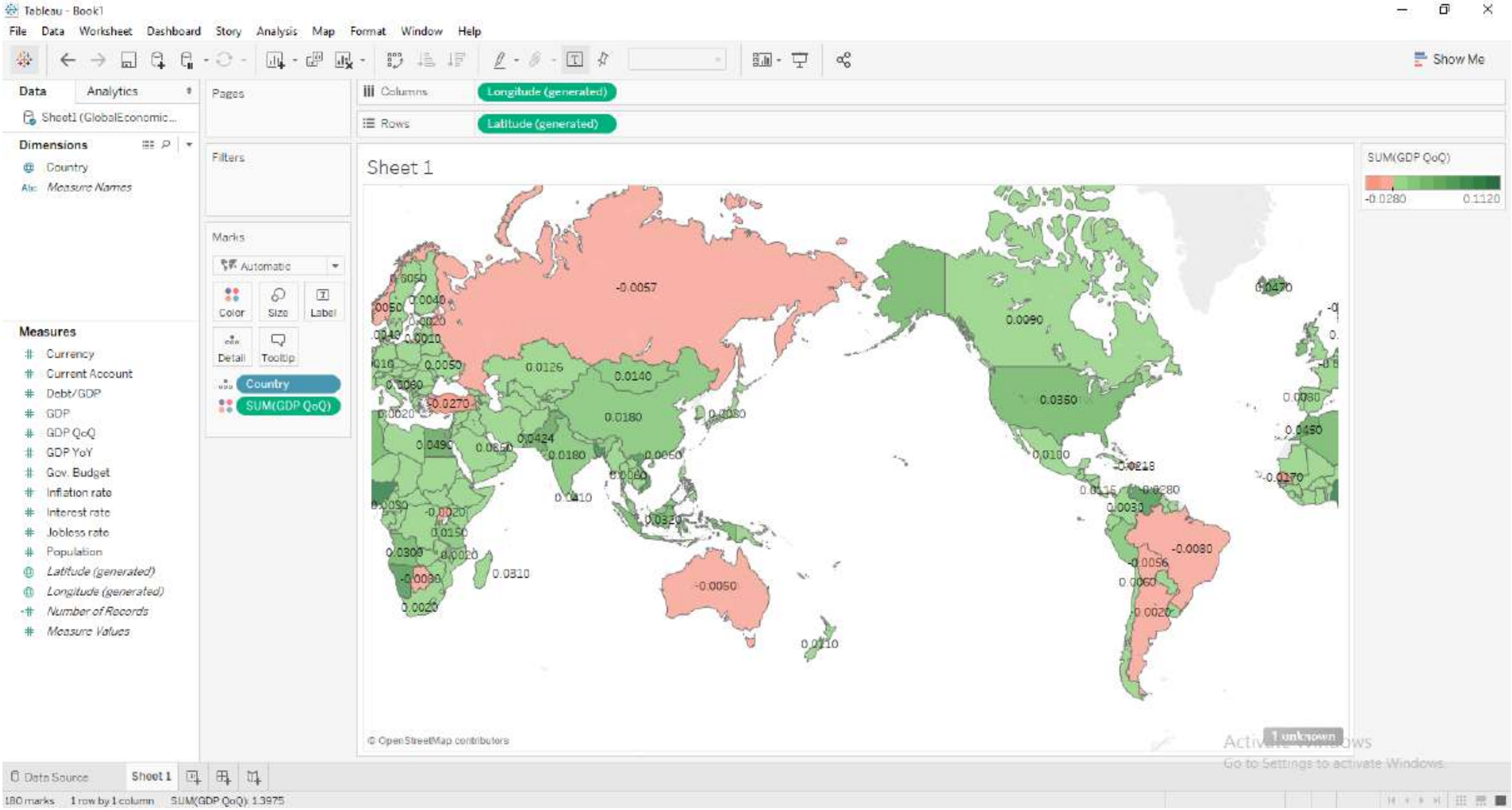


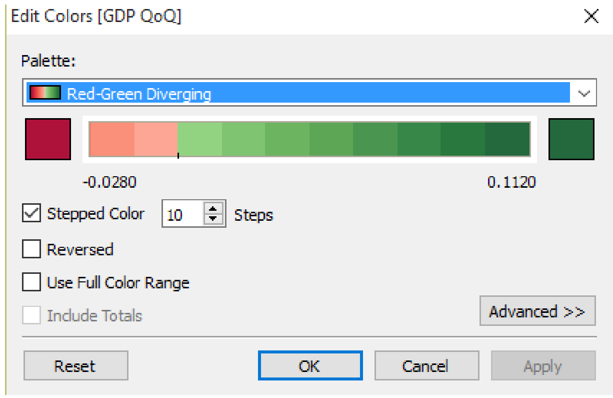
Data Source: demo2/ GlobalEconomicDataSet.xlsx

Step 3

- .Upon choosing an alternative perspective, we can depict the same spatial visualization using a heatmap.

COLUMNS:	
ROWS:	





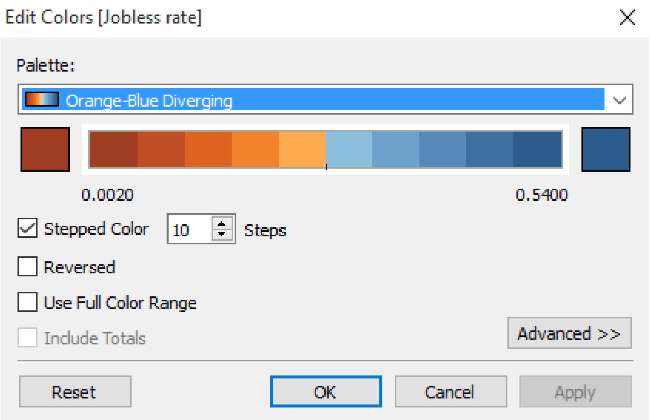
Data Source: demo2/ GlobalEconomicDataSet.xlsx

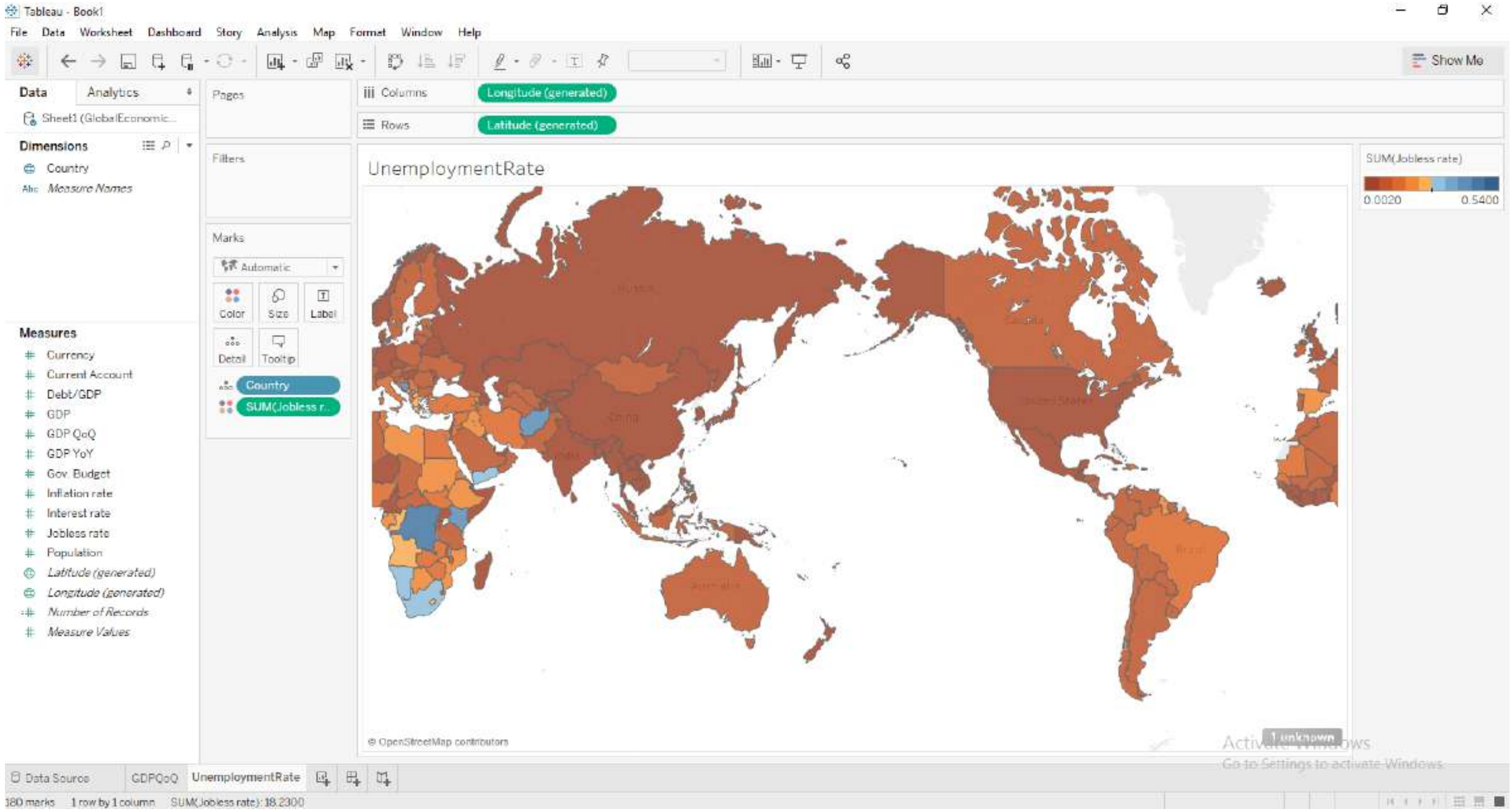
COLUMNS:

ROWS:

Step 4

- .Similarly we create unemployment rate map



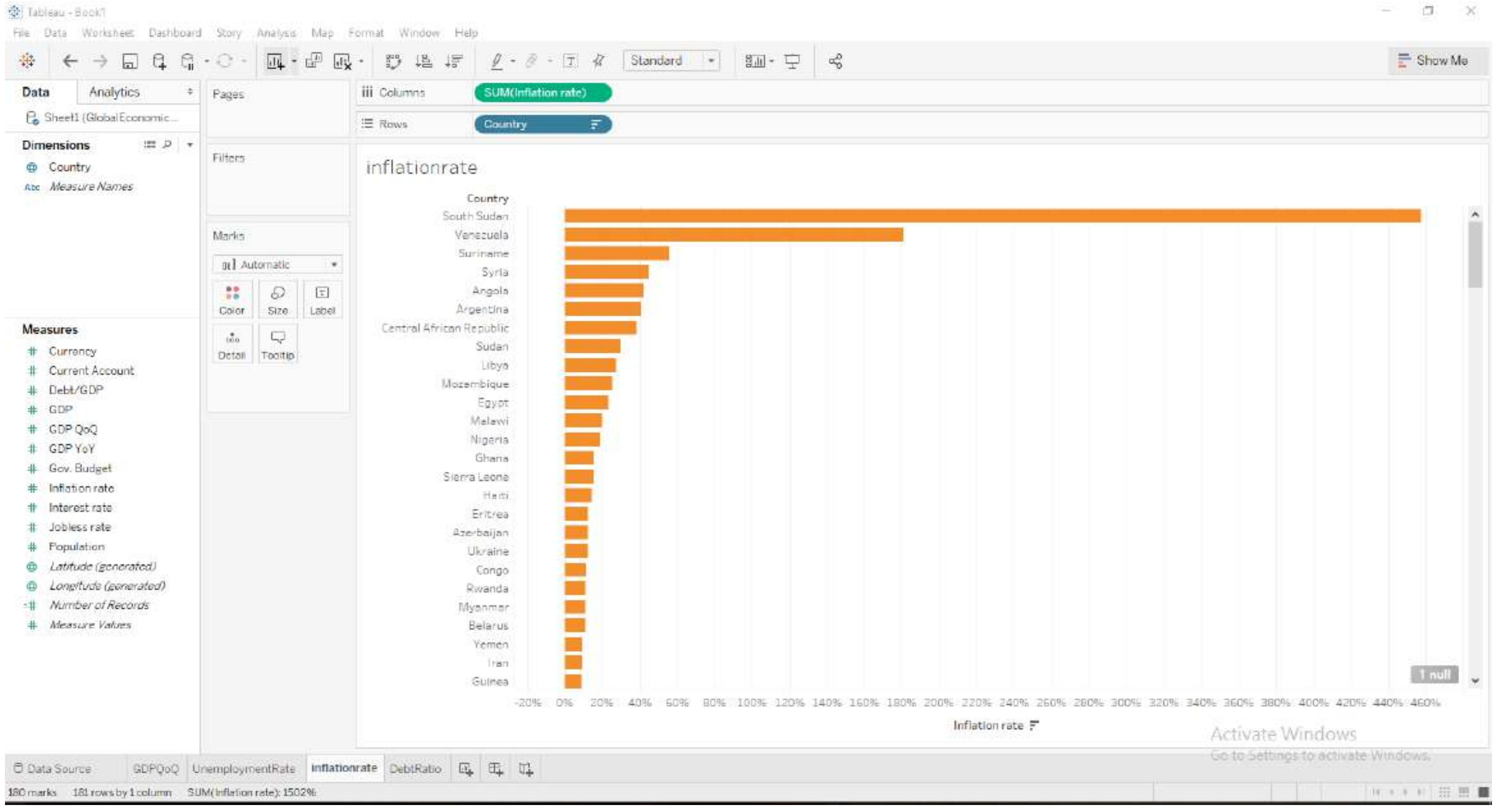


Data Source: demo2/ GlobalEconomicDataSet.xlsx

COLUMNS:	
ROWS:	

Step 5

- Create an inflationrate plot for country and inflationrate as shown in the figure.

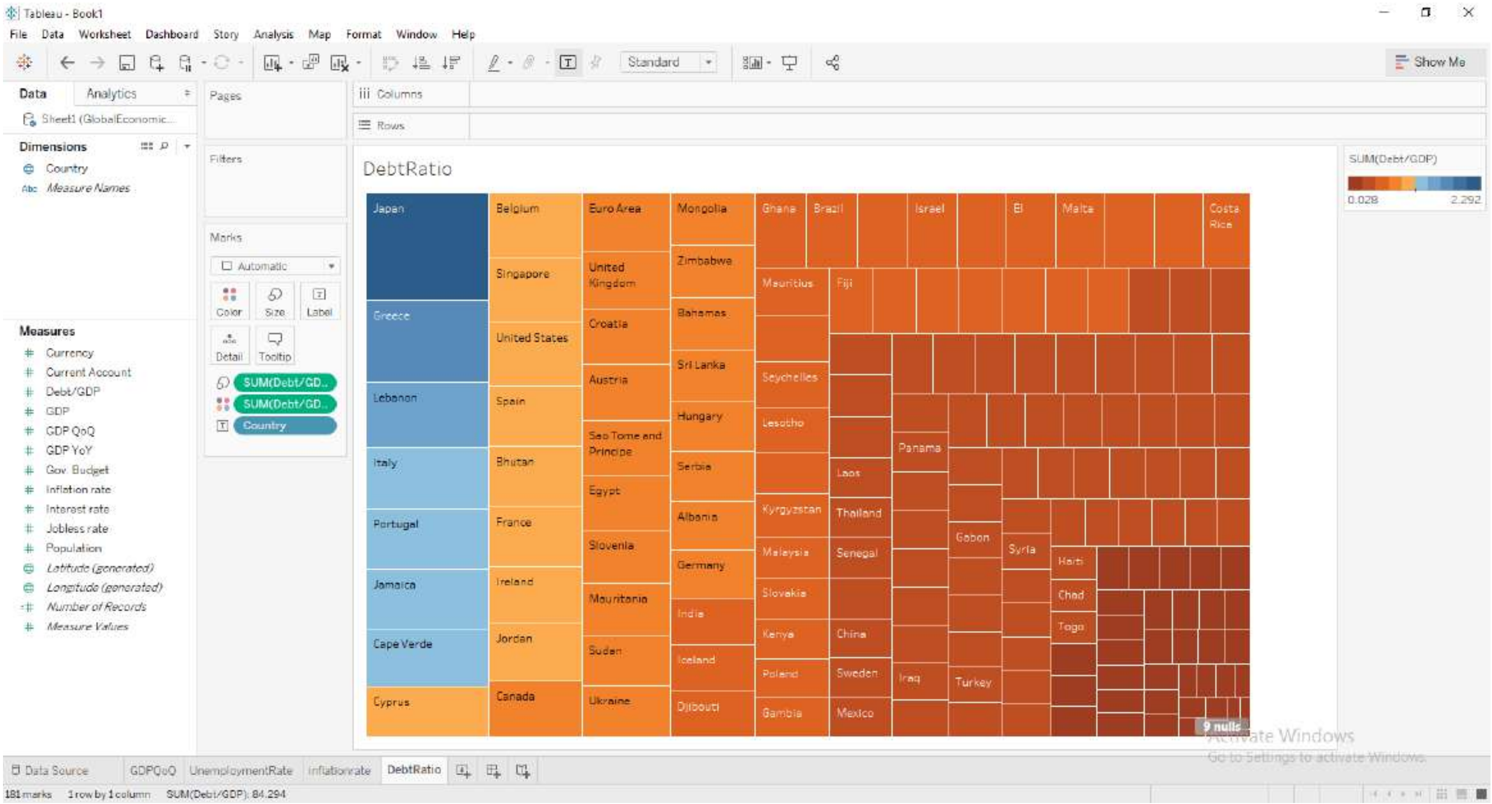


Data Source: demo2/ GlobalEconomicDataSet.xlsx

Step 6

- Create a debtration treemap for each country.

COLUMNS:	
ROWS:	

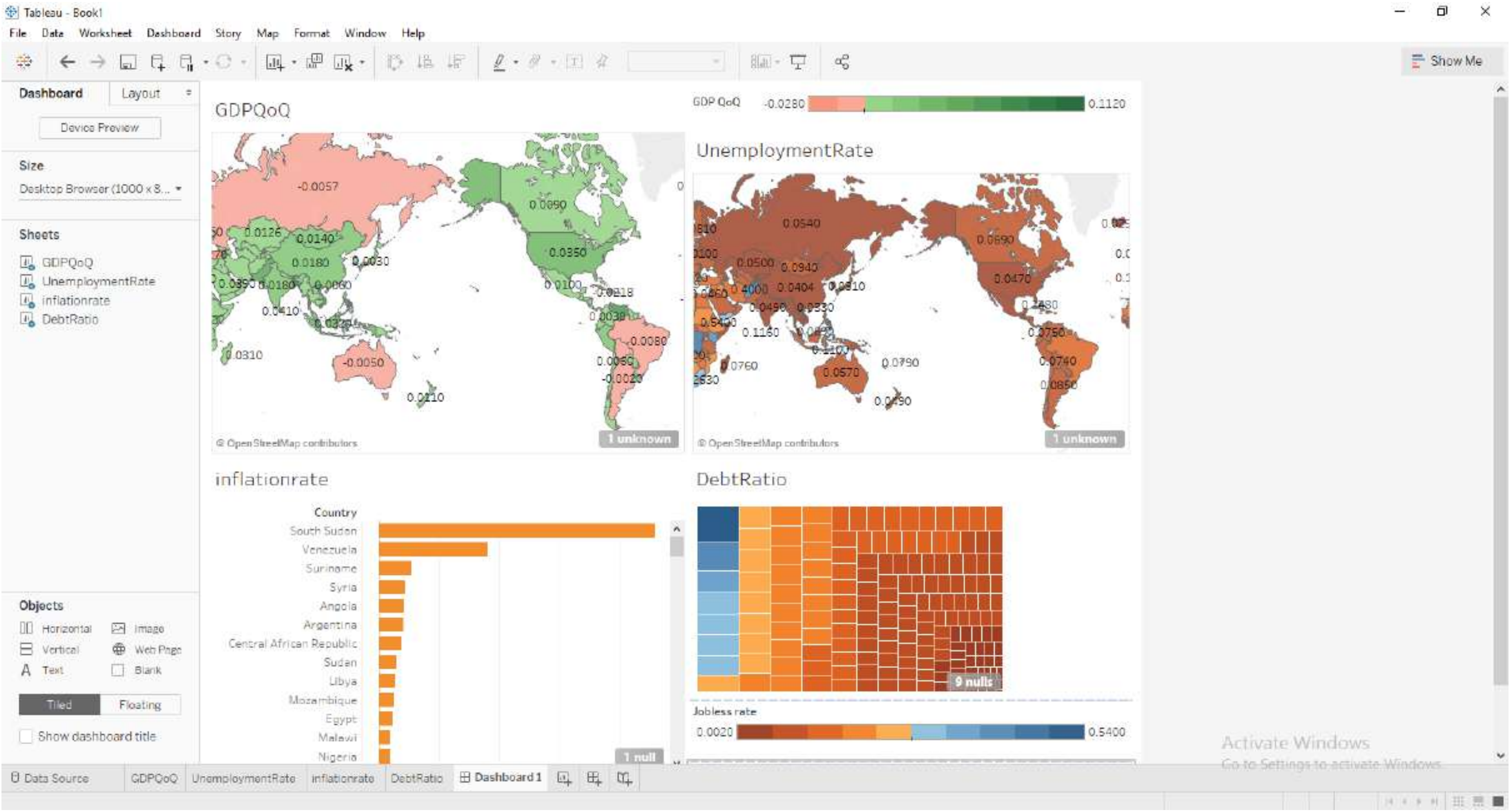


Data Source: demo2/ GlobalEconomicDataSet.xlsx

COLUMNS:	
ROWS:	

Step 7

- Now create a dashboard and add all the worksheets to the dashboard as shown in the figure.



Data Source: demo2/ GlobalEconomicDataSet.xlsx

+ a b | e a u

Code Focused Training

COLUMNS:	
ROWS:	

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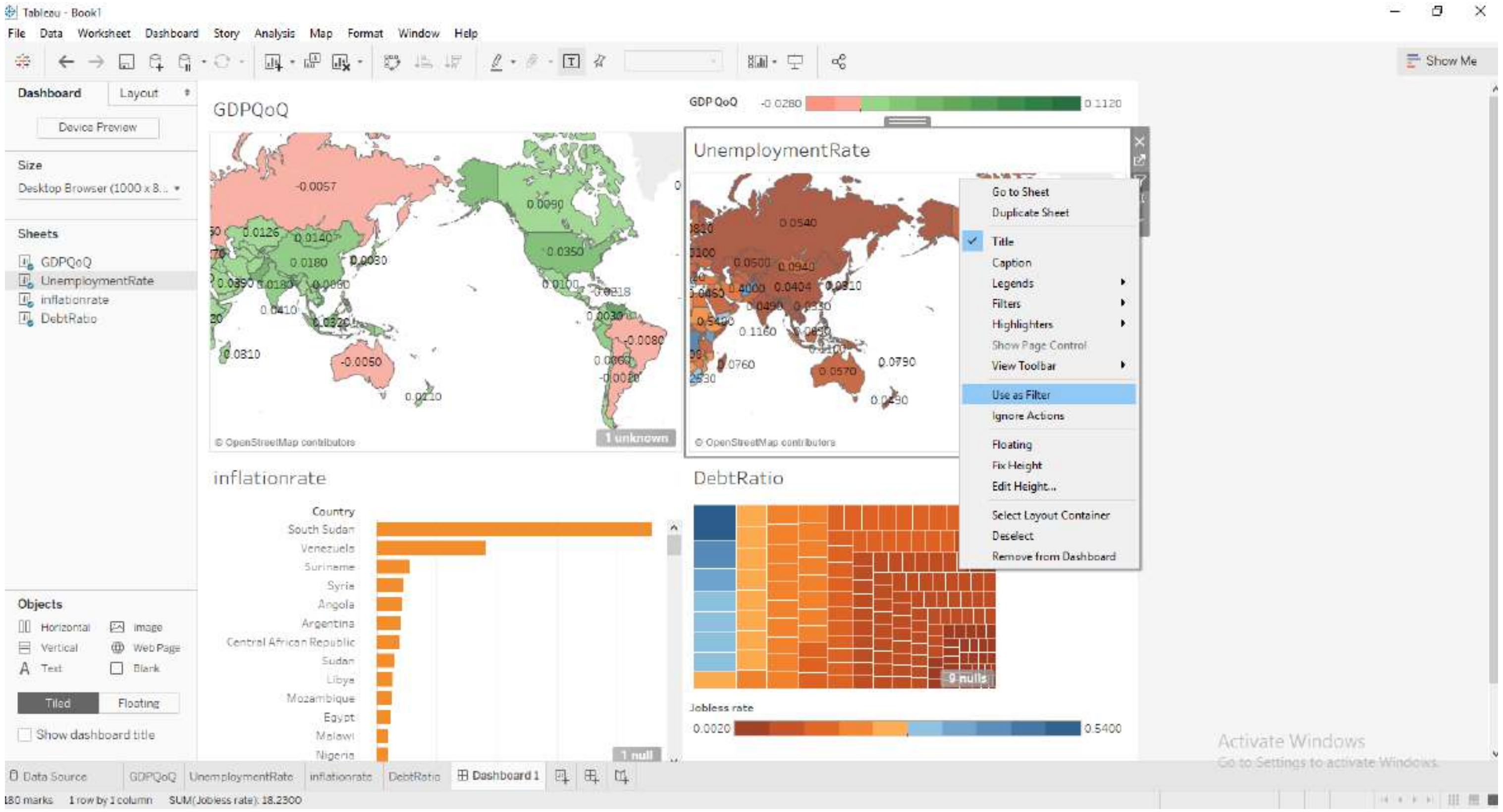
Step 8

- Now let us add action filter to one of the maps, based on the selection of a specific geographic region/country, subsequent worksheets would reflect corresponding perspectives.



Original Series

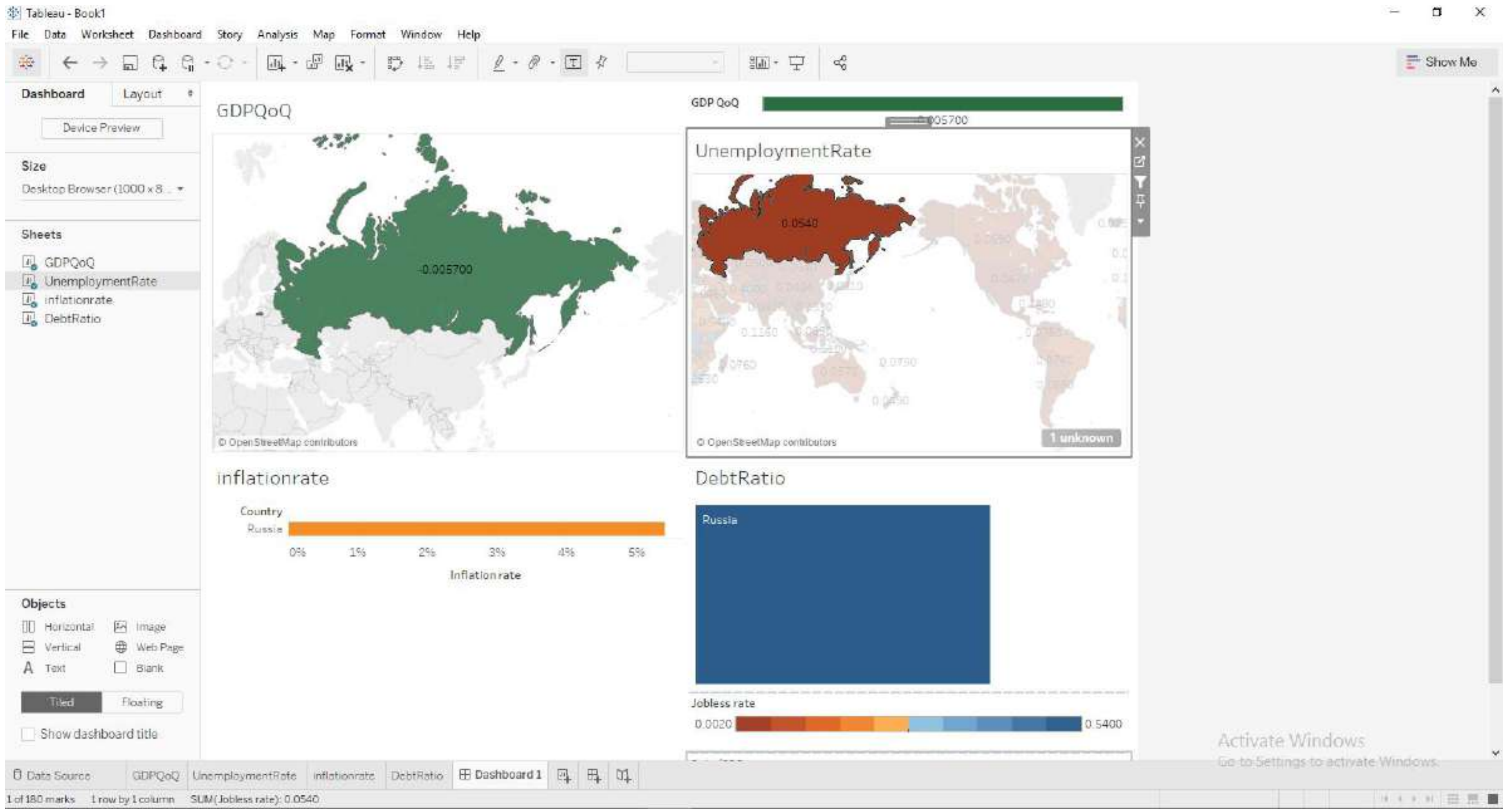
Data Source: demo2/ GlobalEconomicDataSet.xlsx

TERRITORIAL PRESCIENCE
provoke thought, invoke action

COLUMNS:	
ROWS:	

Step 9

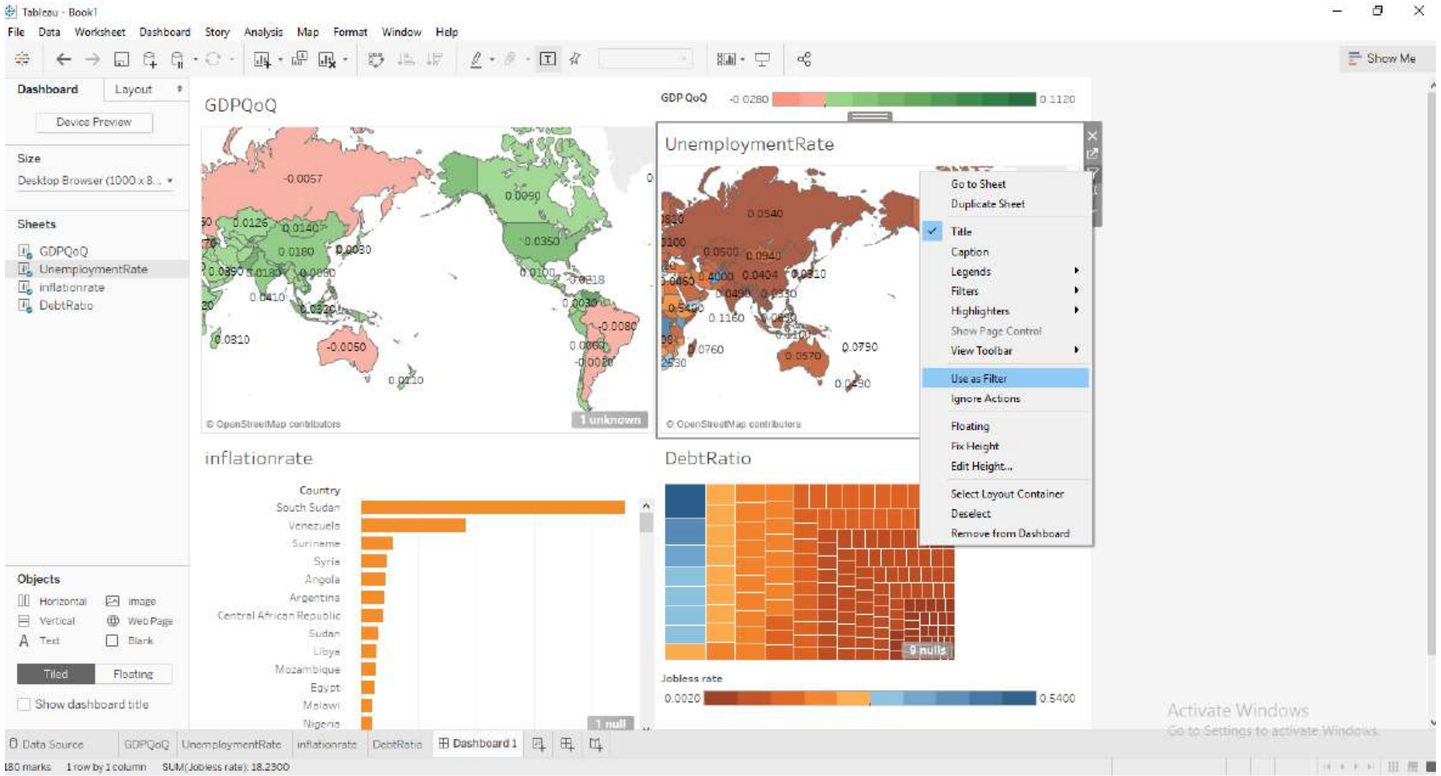
- We have successfully created a dashboard with action filters.



Data Source: demo2/ GlobalEconomicDataSet.xlsx

Step 10

- dashboard with all views.



Problem Description:	**Analysis of Broadband internet usage. To answer the following questions:** **1. What is the average monthly, weekly and daily internet usage?** **2. How does uploaded volume compare against downloaded volume on monthly, weekly and daily basis?** **3. What is the usage pattern with respect to the day of the week?** **4. What is the usage pattern with respect to the hour of the day?**
Data set used:	www.mockaroo.com=> demo3/ broadband-usage-data.xlsx

SYED AWASE KHIRNI

TABLEAU : DASHBOARD CREATION:SCENARIO 2

Problem Description:	
Data set used:	

TABLEAU

PLAY BOOK : CREATING A STORY BOARD USING TABLEAU

Problem Description:	
Data set used:	Demo3/marketbasketanalysisdata.xlsx

SYED AWASE KHIRNI

TABLEAU : MARKET BASKET ANALYSIS

Steps

1
- Use demo3/marketbasketanalysisdata.xlsx, load data to workbook

2
- Create a parameter – Base Product Type Parameter

3
- Create a calculation to count Products in an order –Compute Product Type Count

4
- Create a calculation to find other products in the same order – Computer Other Product Types

5
- Create a set for OrderID, to find the orders having more than one product

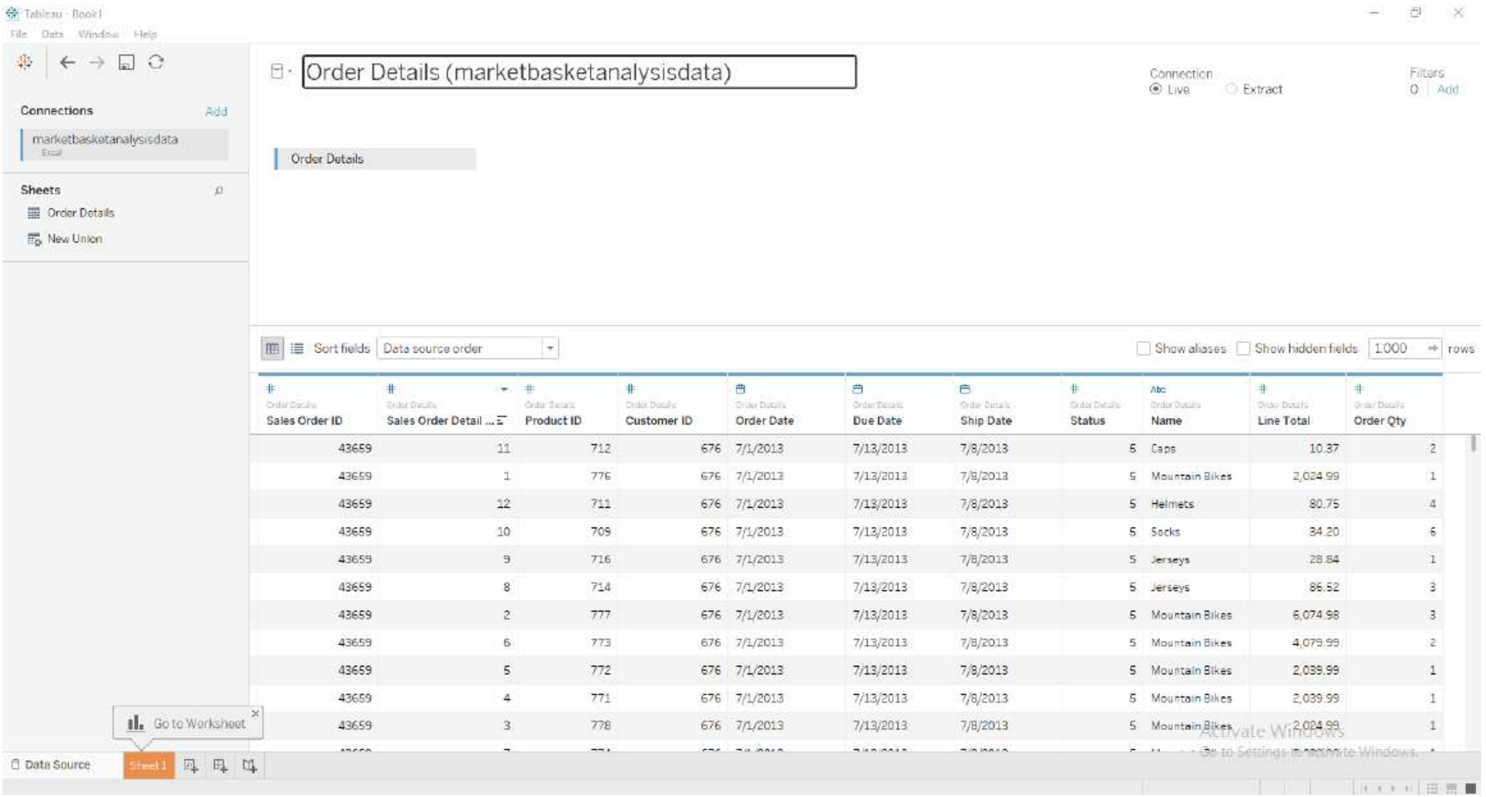
6

COLUMNS:	
ROWS:	

Step 1

- Load demo3/marketbasketanalysisdata.xlsx,

To tableau workbook



Data Source: demo3/marketbasketanalysisdata.xlsx

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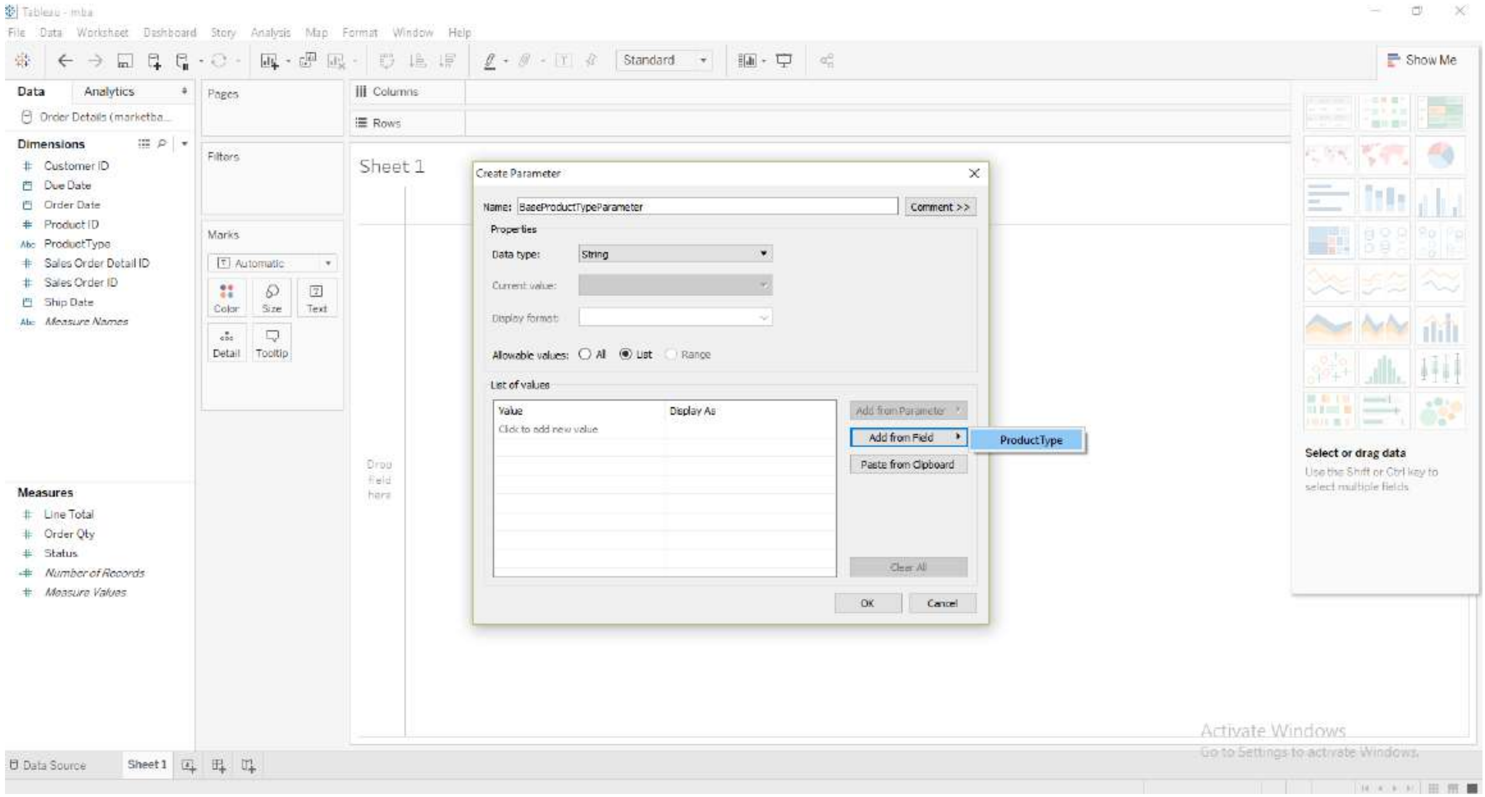
Original Series

COLUMNS:	
ROWS:	

Step 2

- Rename “name” to ProductType in Dimensions and create Parameter:BaseProductTypeParameter

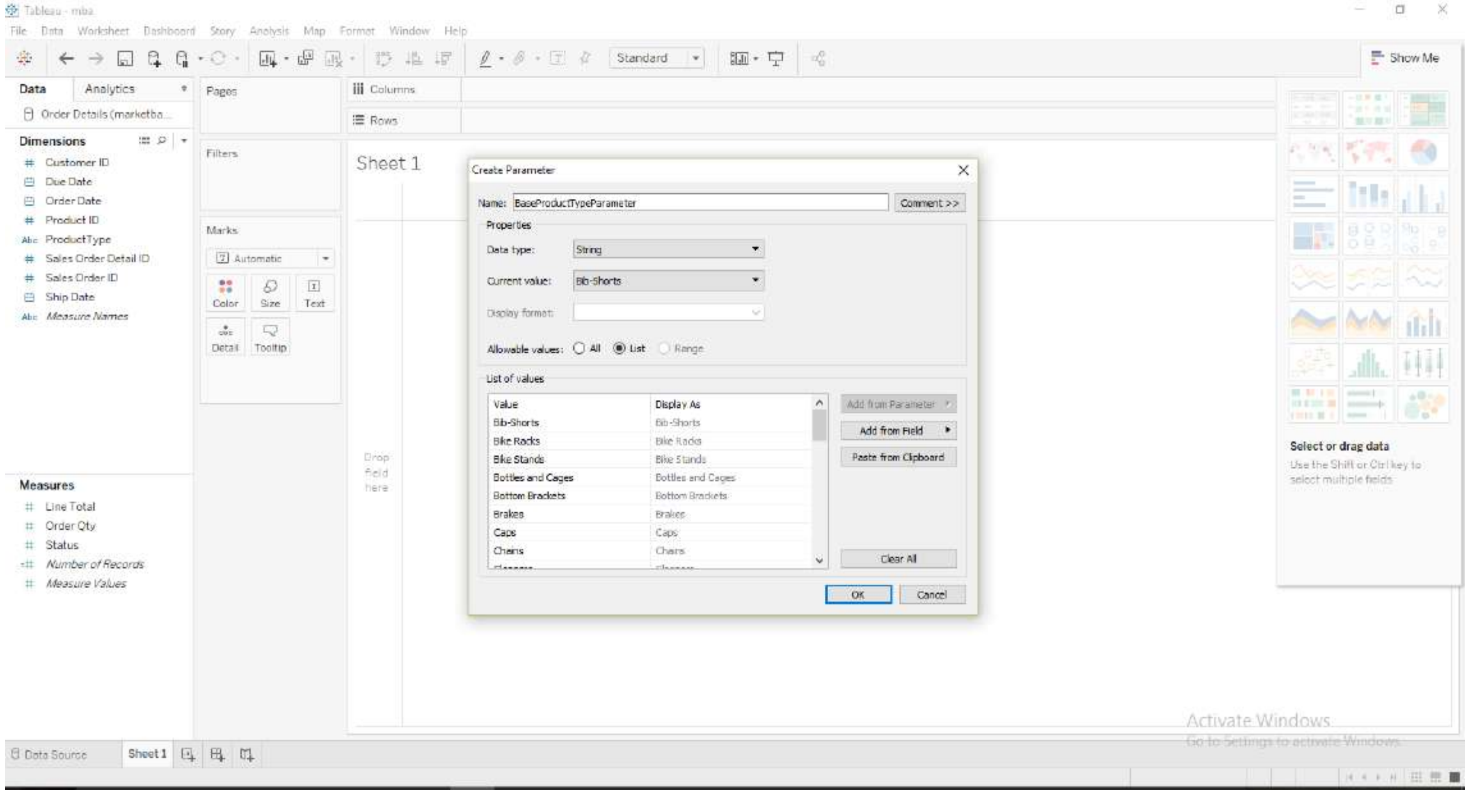


Data Source: demo3/marketbasketanalysisdata.xlsx

COLUMNS:	
ROWS:	

Step 3

- BaseProductTypeParameter

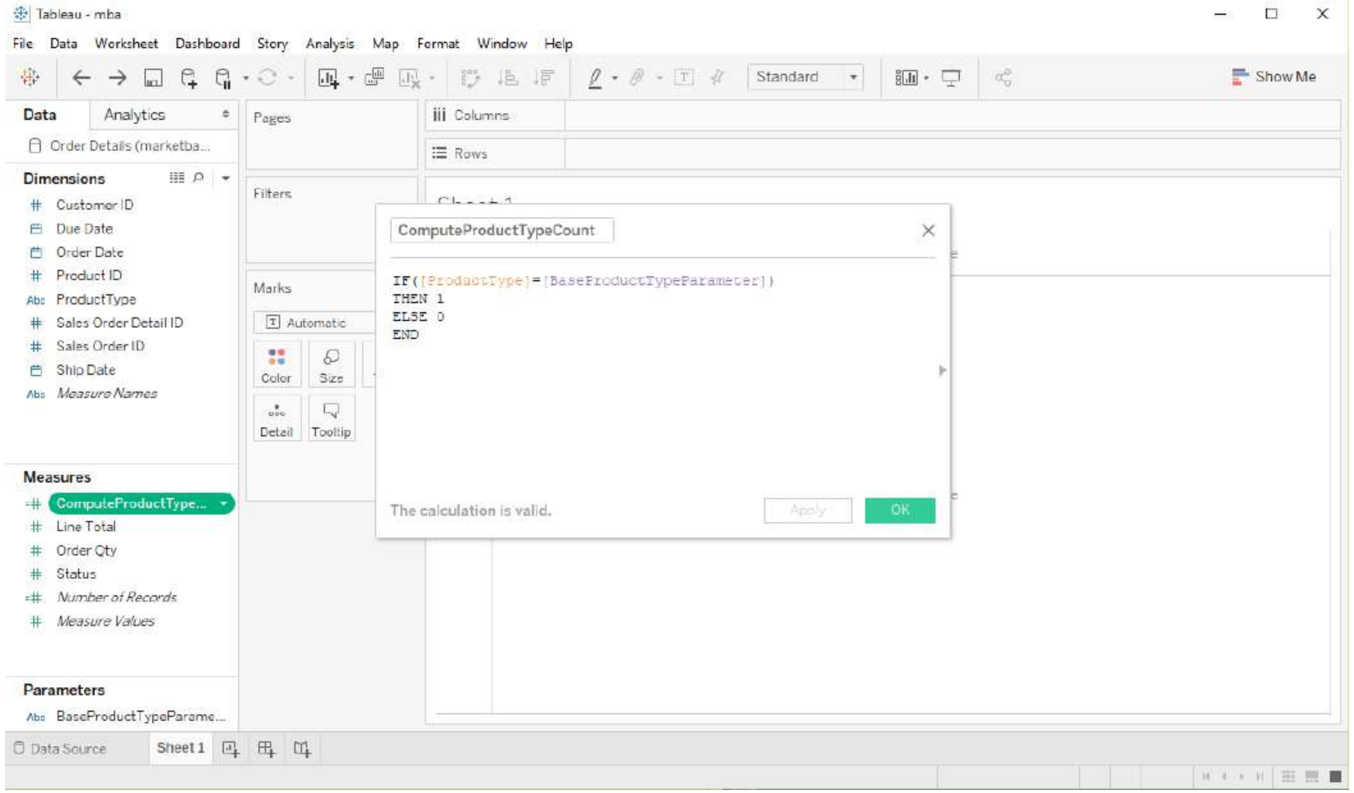


Data Source: demo3/marketbasketanalysisdata.xlsx

COLUMNS:	
ROWS:	

Step 4

- Create calculated field :ComputeProductTypeCount
-

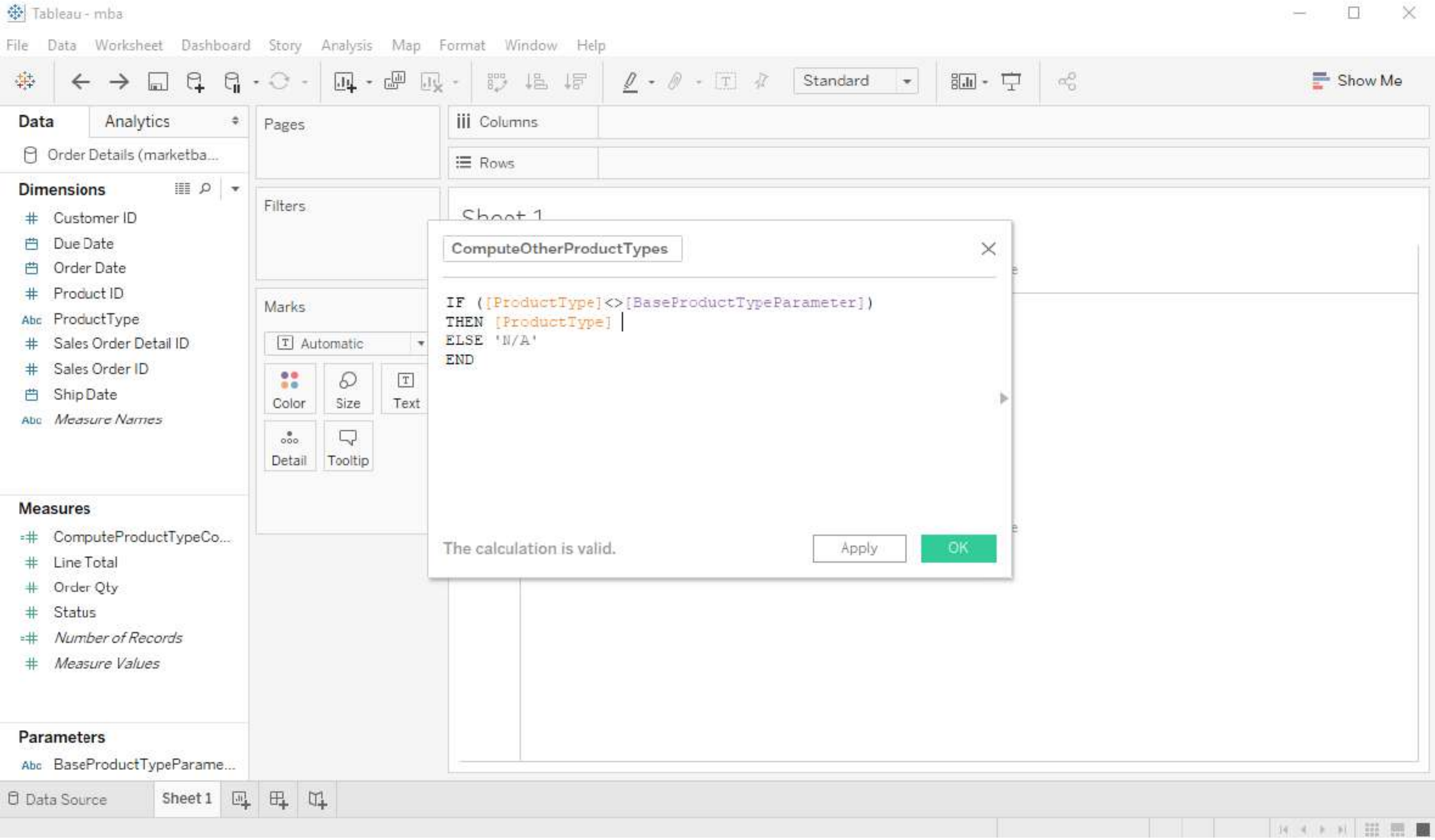


Data Source: demo3/marketbasketanalysisdata.xlsx

Step 5

- Create calculated field :ComputeOtherProductType
- .

COLUMNS:	
ROWS:	

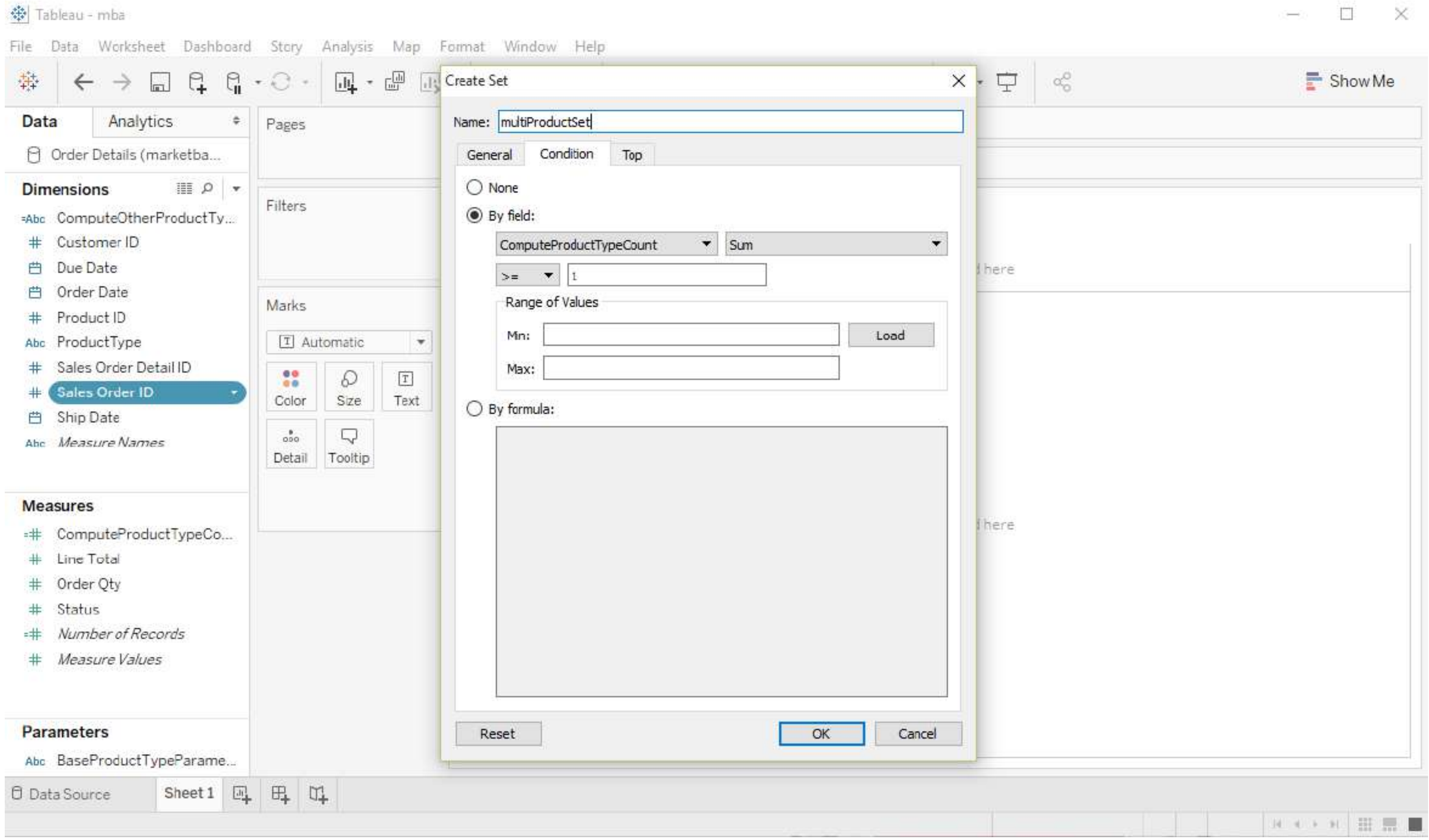


Data Source: demo3/marketbasketanalysisdata.xlsx

COLUMNS:	
ROWS:	

Step 6

- Create a multiProductSet to identify products greater than or equal to 1.



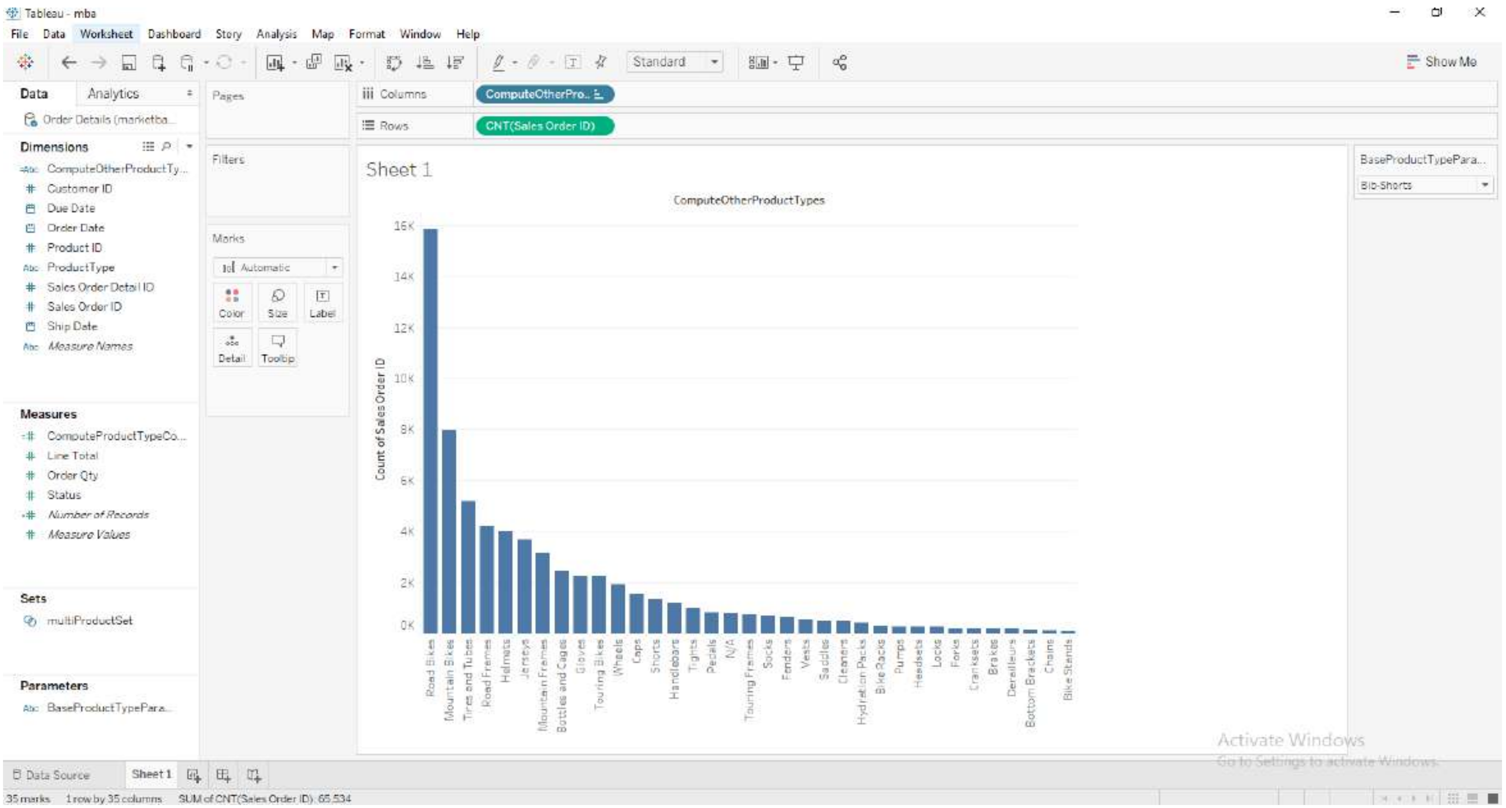
Data Source: demo3/marketbasketanalysisdata.xlsx

Code Focused Training

COLUMNS:	ComputeOtherProductTypes
ROWS:	Count(SalesOrderID)

Step 7

- plot ComputeOtherProductTypes vs Count(SalesOrderID) as shown in the figure.



Data Source: demo3/marketbasketanalysisdata.xlsx

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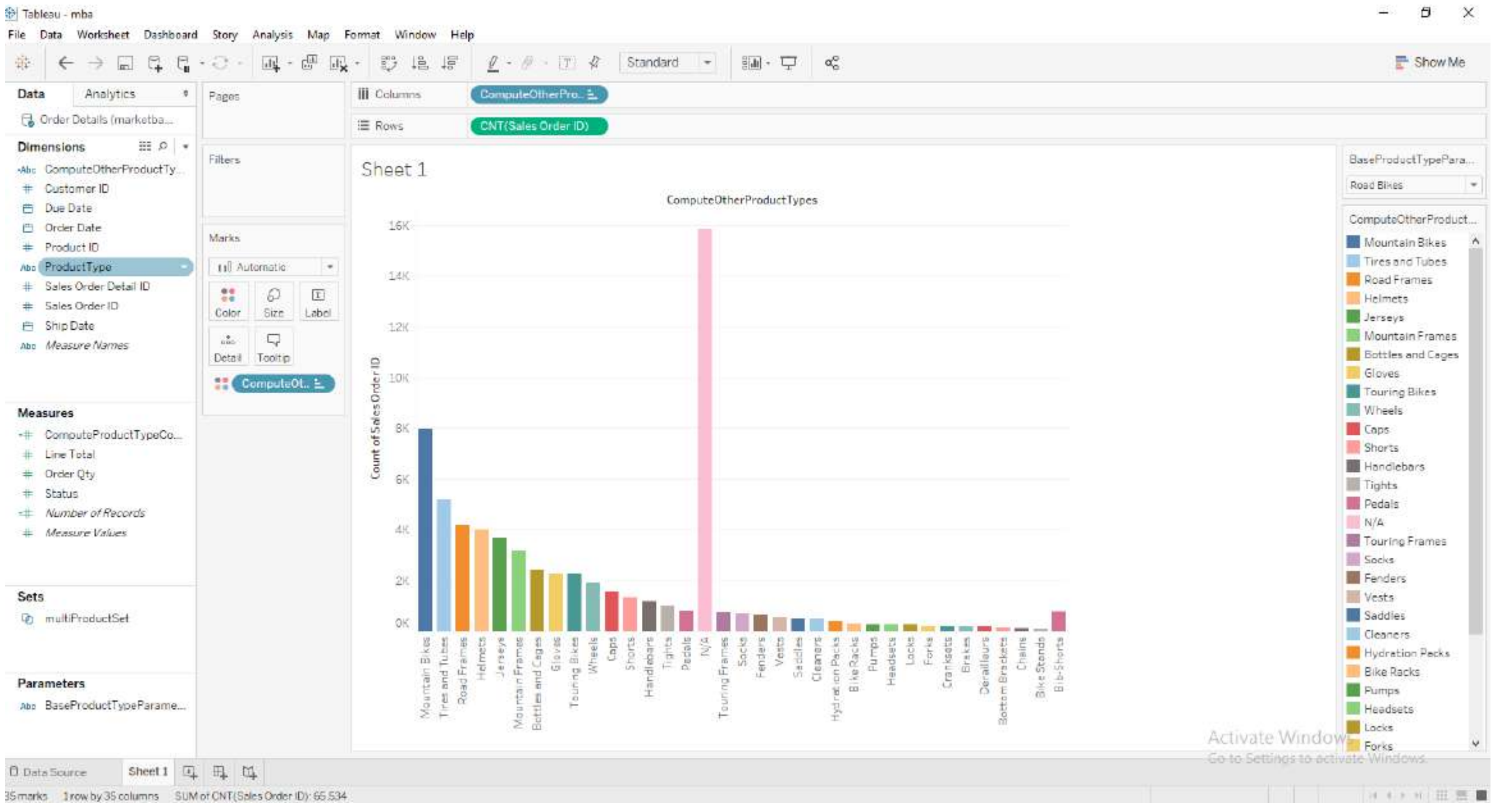
Original Series

TERRITORIAL PRESCIENCE
provoke thought, invoke action

COLUMNS:	ComputeOtherProductTypes
ROWS:	Count(SalesOrderID)

Step 8

- plot ComputeOtherProductTypes vs Count(SalesOrderID) as shown in the figure.

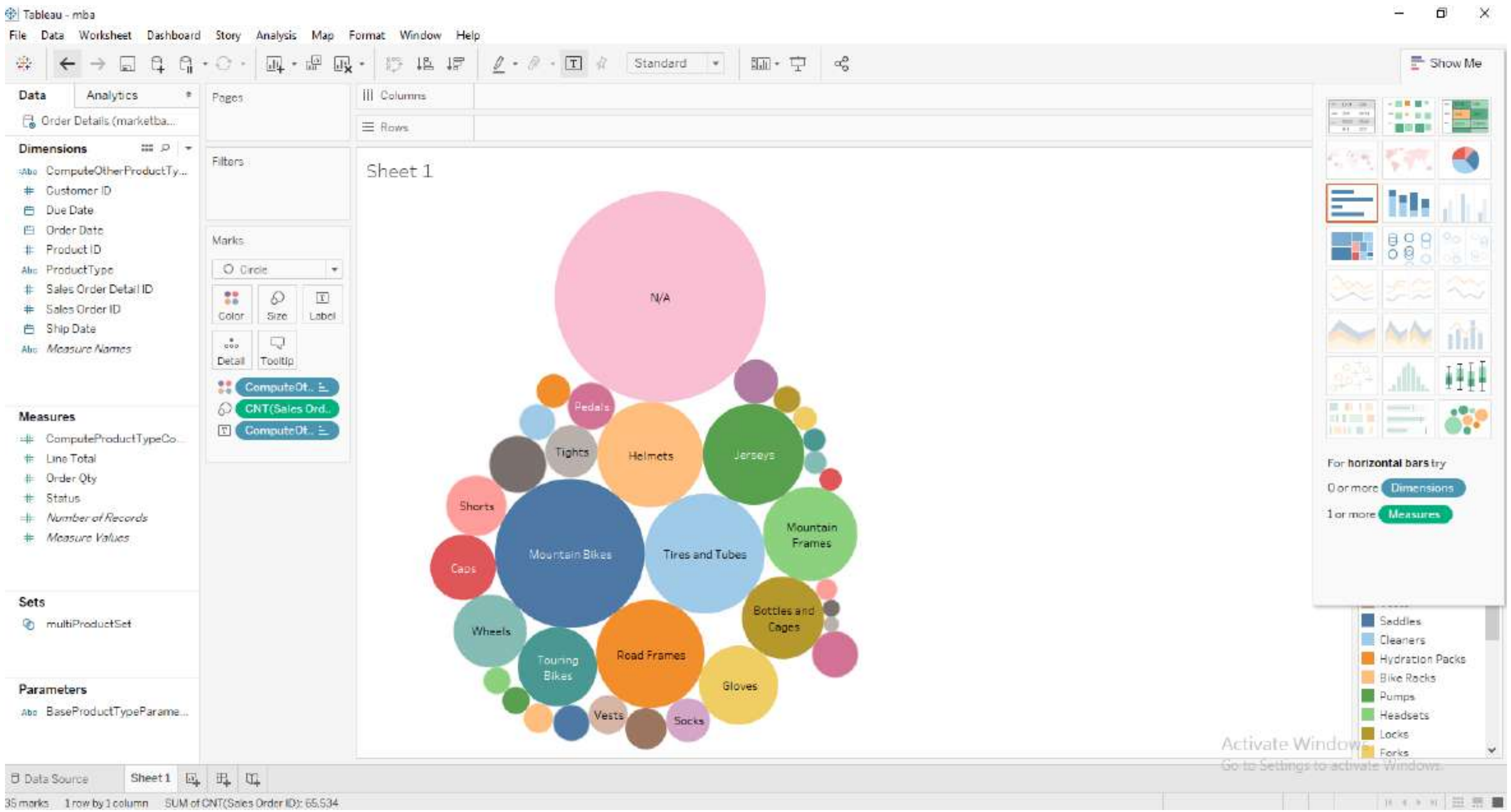


Data Source: demo3/marketbasketanalysisdata.xlsx

COLUMNS:	ComputeOtherProductTypes
ROWS:	Count(SalesOrderID)

Step 9

- choose a different perspective to visualize



Data Source: demo3/marketbasketanalysisdata.xlsx

Problem Description:	
Data set used:	

SYED AWASE KHIRNI

TABLEAU : CHALLENGES

Problem Description:	**It's Annual Compensation Review (ACR), TPRI Ecommerce division would like to identify it's top performing employee in each region, qualifying for a bonus. Find out employees who are eligible to get bonuses and compensation hike.**
Data set used:	TPRI Ecommerce division, measures employee performance based on the total sales. Generated using www.mockaroo.com => **demo3/tpri-ecommerce-sales-y2013.xlsx**

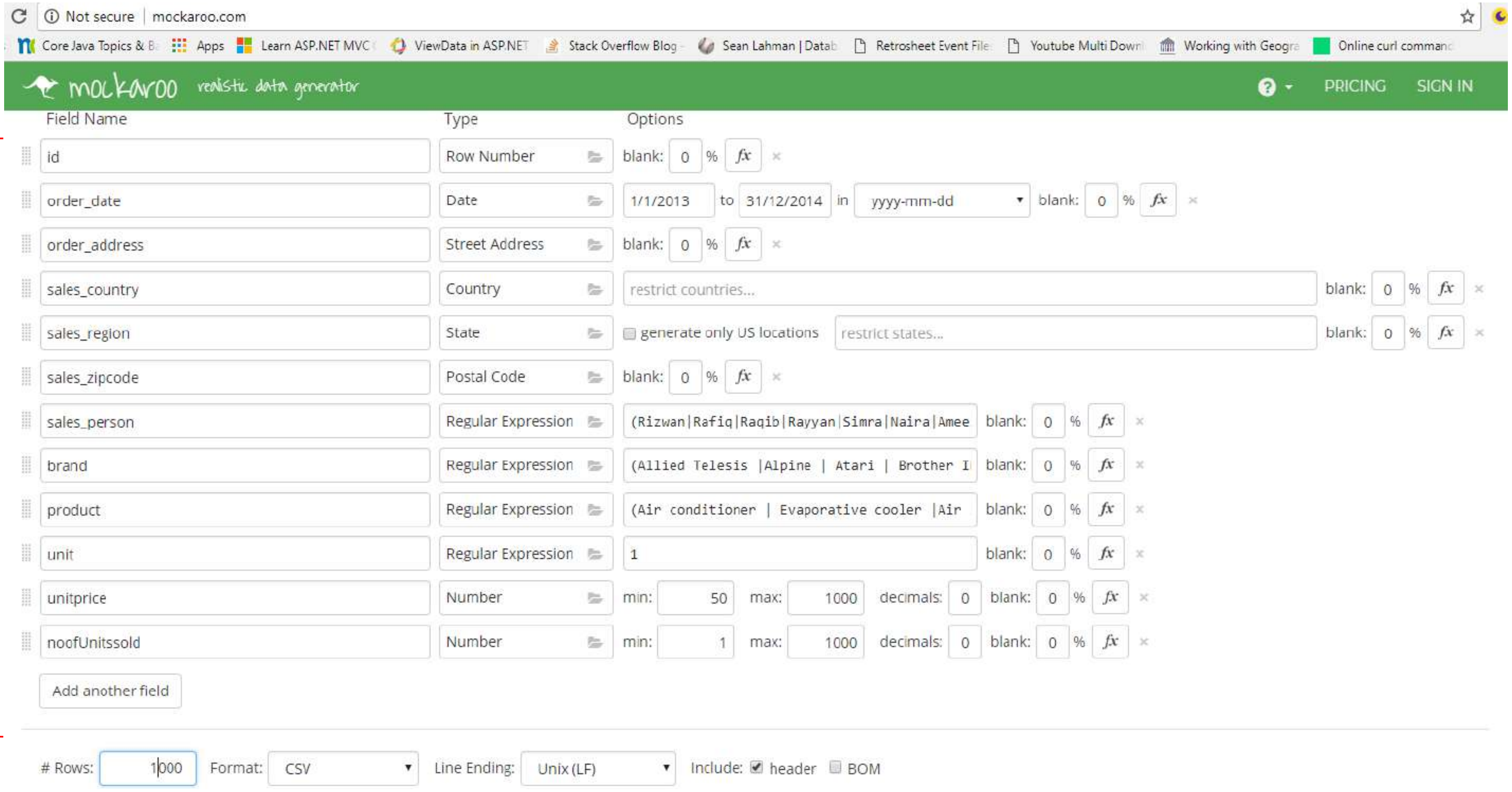
SYED AWASE KHIRNI

TABLEAU : CHALLENGE 1

Mock your sales data using www.mockaroo.com

Data source saved as : **demo3/tpri-ecommerce-sales-y2013.xlsx**

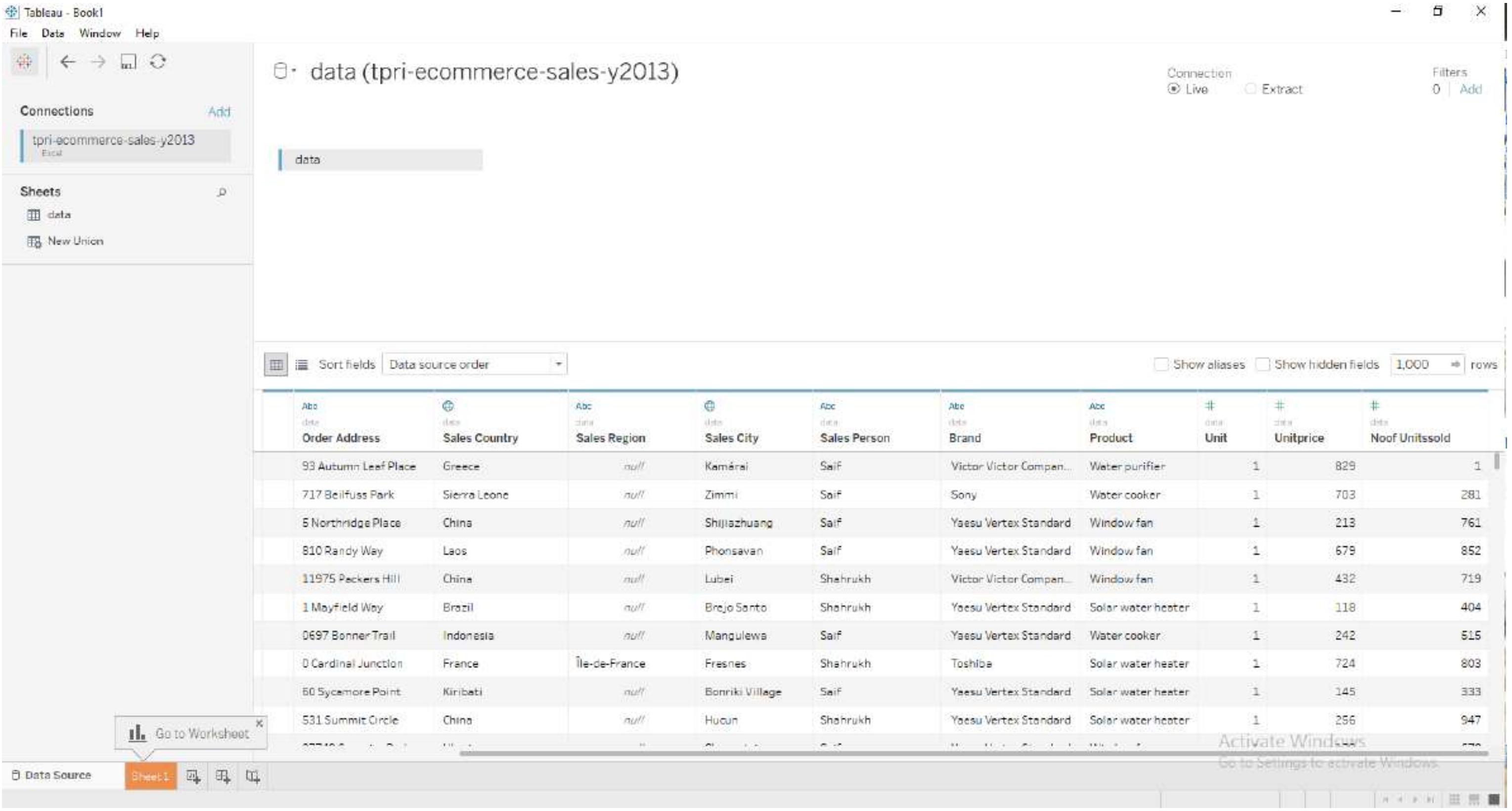
Mock your data To generate 1000 records in desired format



Step 1

- load the tpri-ecommerce-sales-y2013.xlsx

COLUMNS:	
ROWS:	

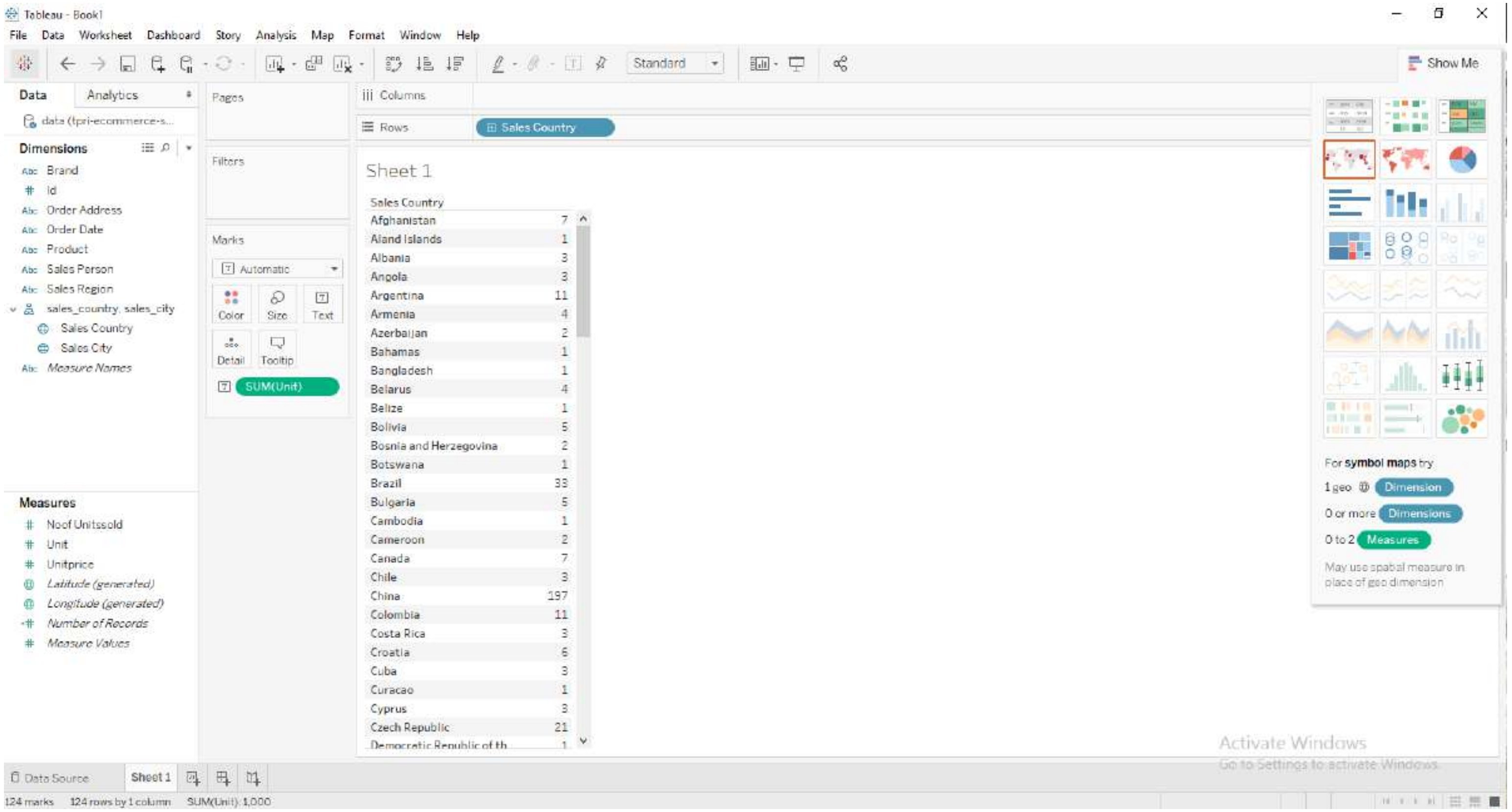


Data Source: **demo3/tpri-ecommerce-sales-y2013.xlsx**

COLUMNS:	
ROWS:	Sales_Country

Step 2

- load the ROWS:Sales_Country and drag the no of units sold by country.

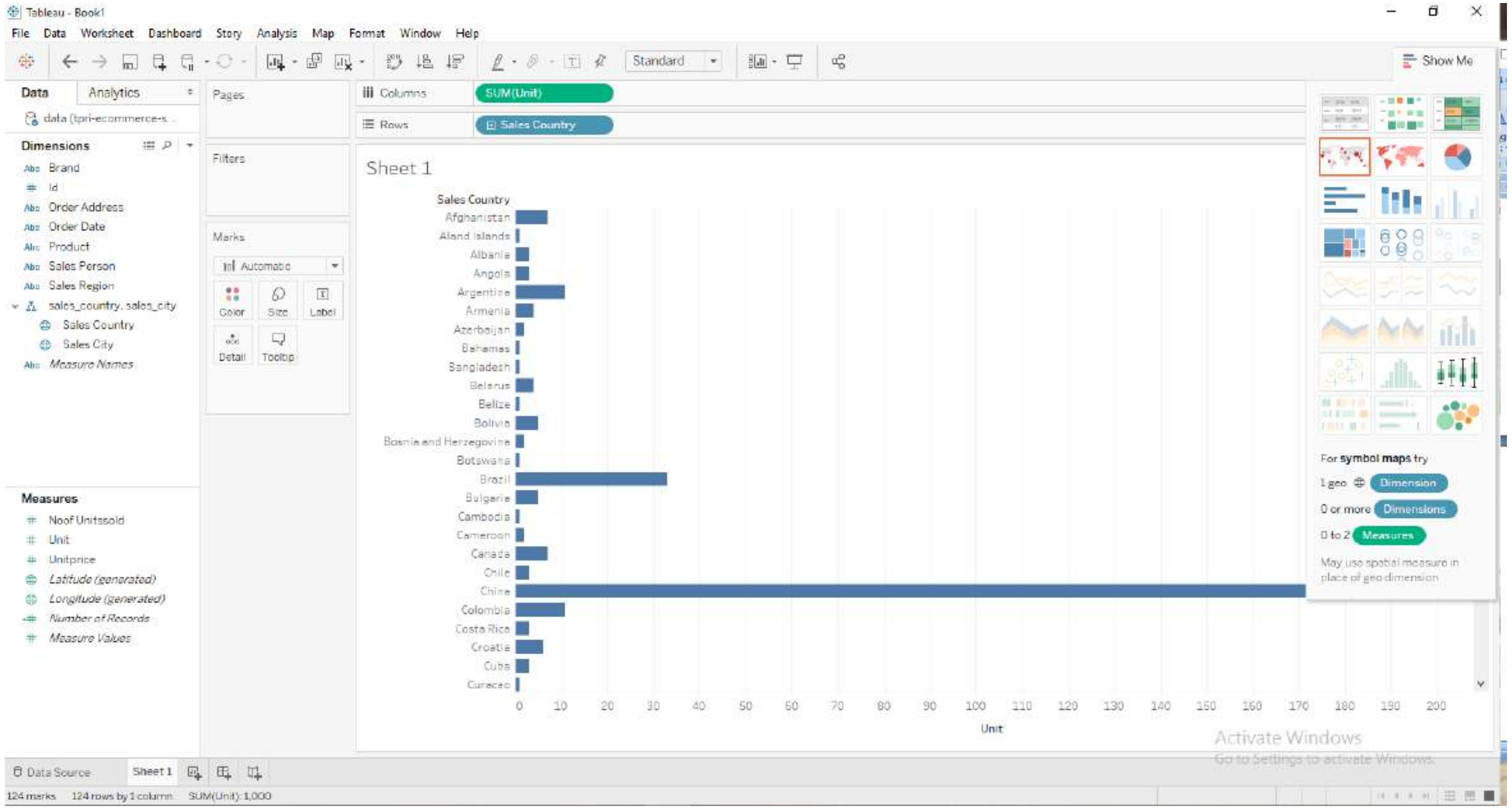


Data Source: **demo3/tpri-ecommerce-sales-y2013.xlsx**

COLUMNS:	units
ROWS:	Sales_Country

Step 3

- Up on adding the Units to Columns dimension, tableau automatically prompts bar chart visualization as shown in the figure

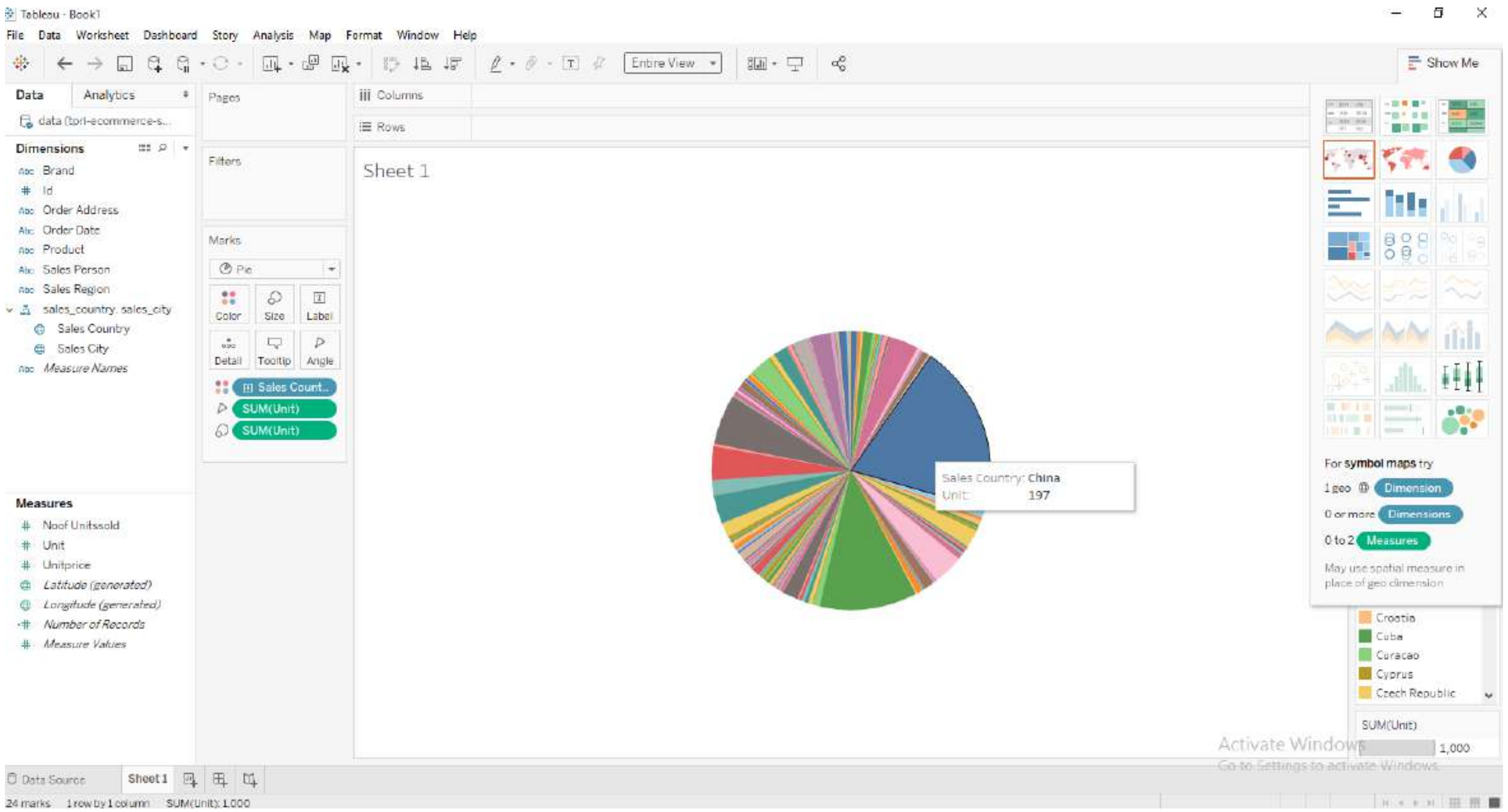


Data Source: **demo3/tpri-ecommerce-sales-y2013.xlsx**

COLUMNS:	units
ROWS:	Sales_Country

Step 4

- we can switch to a new perspective using “show me” visualization tab to visualize the data in a pie chart.

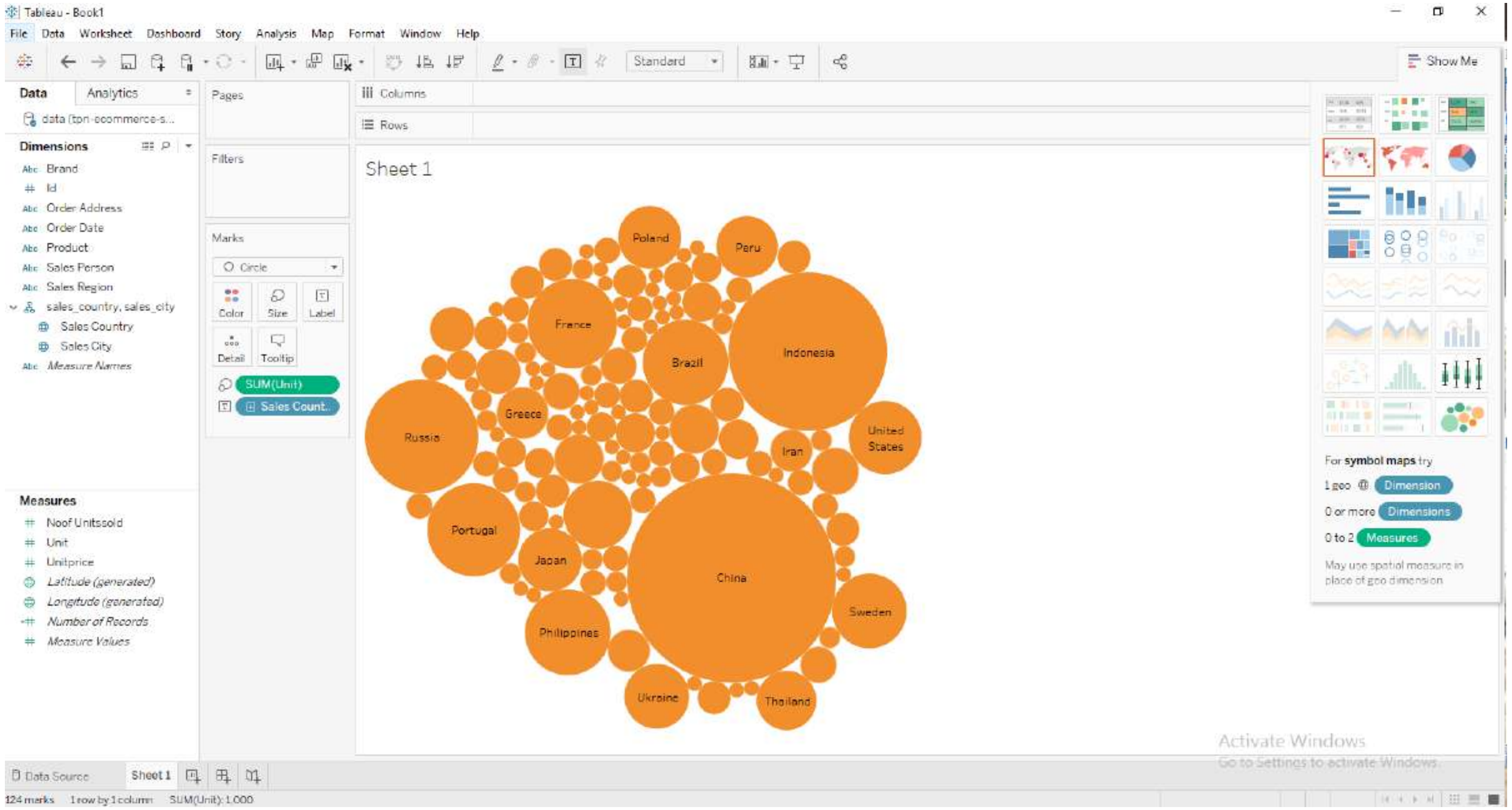


Data Source: **demo3/tpri-ecommerce-sales-y2013.xlsx**

COLUMNS:	units
ROWS:	Sales_Country

Step 5

- we can switch to a new perspective using “show me” visualization tab to visualize the data in a bubble chart.

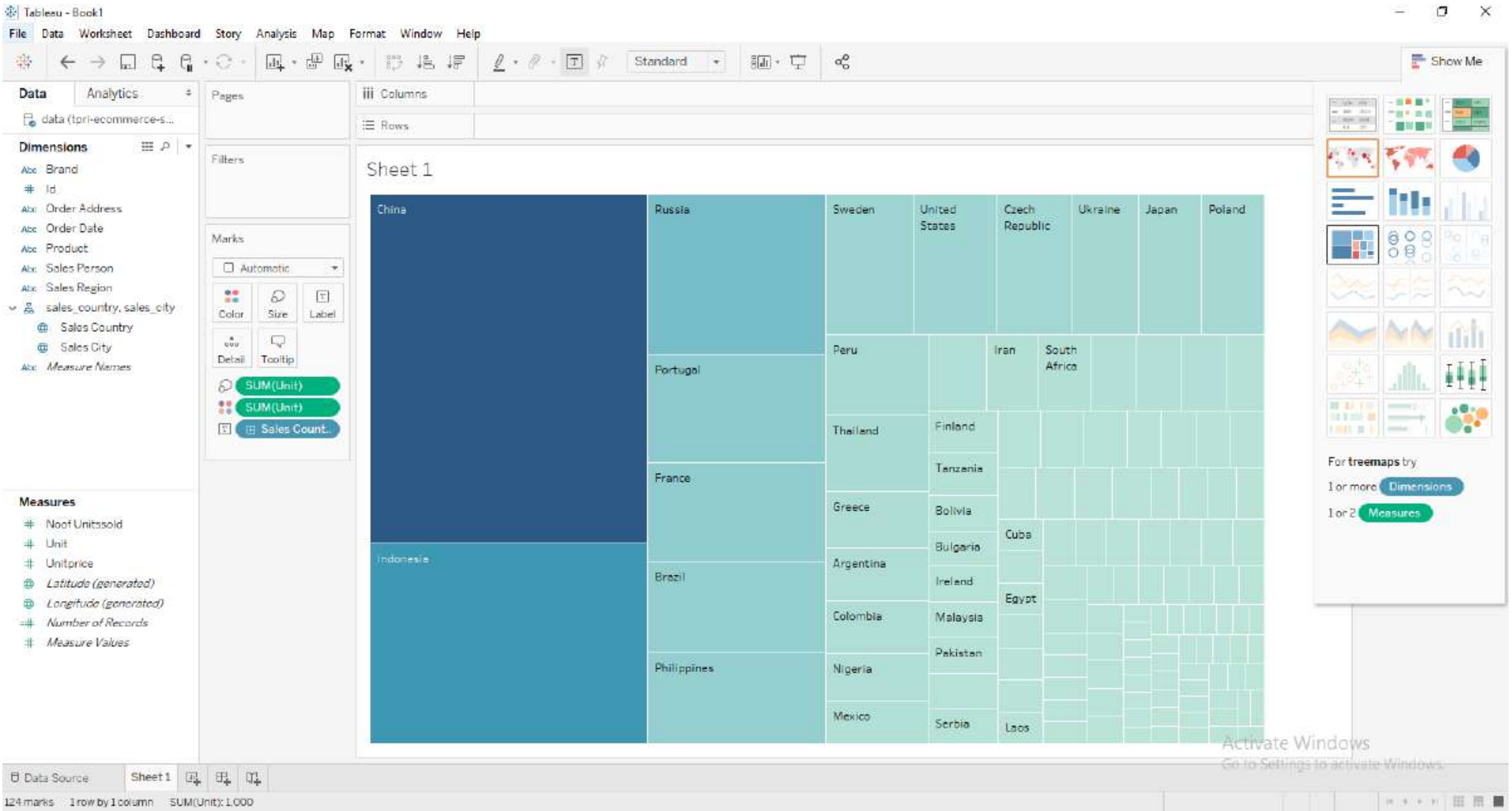


Data Source: **demo3/tpri-ecommerce-sales-y2013.xlsx**

COLUMNS:	units
ROWS:	Sales_Country

Step 6

- we can switch to a new perspective using “show me” visualization tab to visualize the data in a tree map

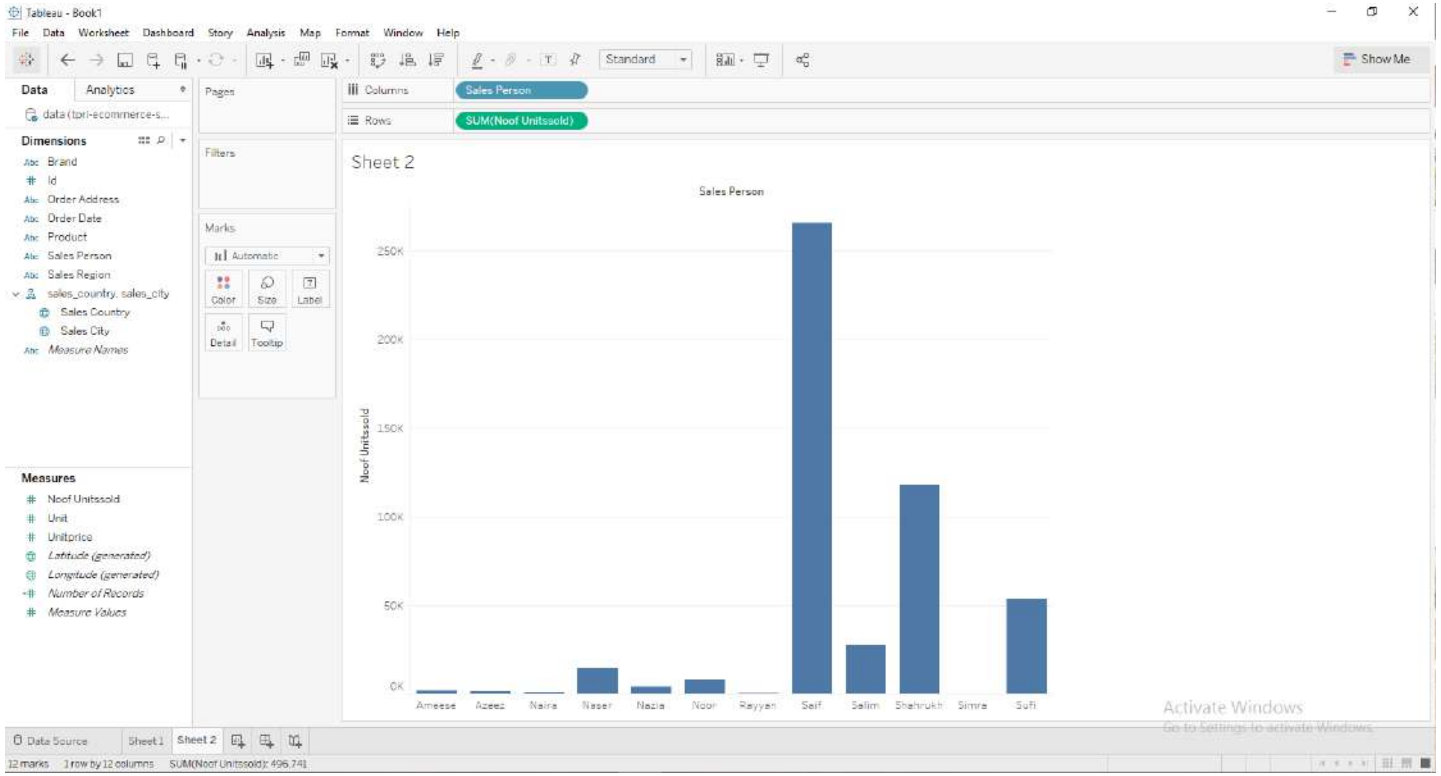


Data Source: **demo3/tpri-ecommerce-sales-y2013.xlsx**

COLUMNS:	Sales_person
ROWS:	Noofunitssold

Step 6

- create a new sheet, where we select columns: sales_person and rows:noofunitssold

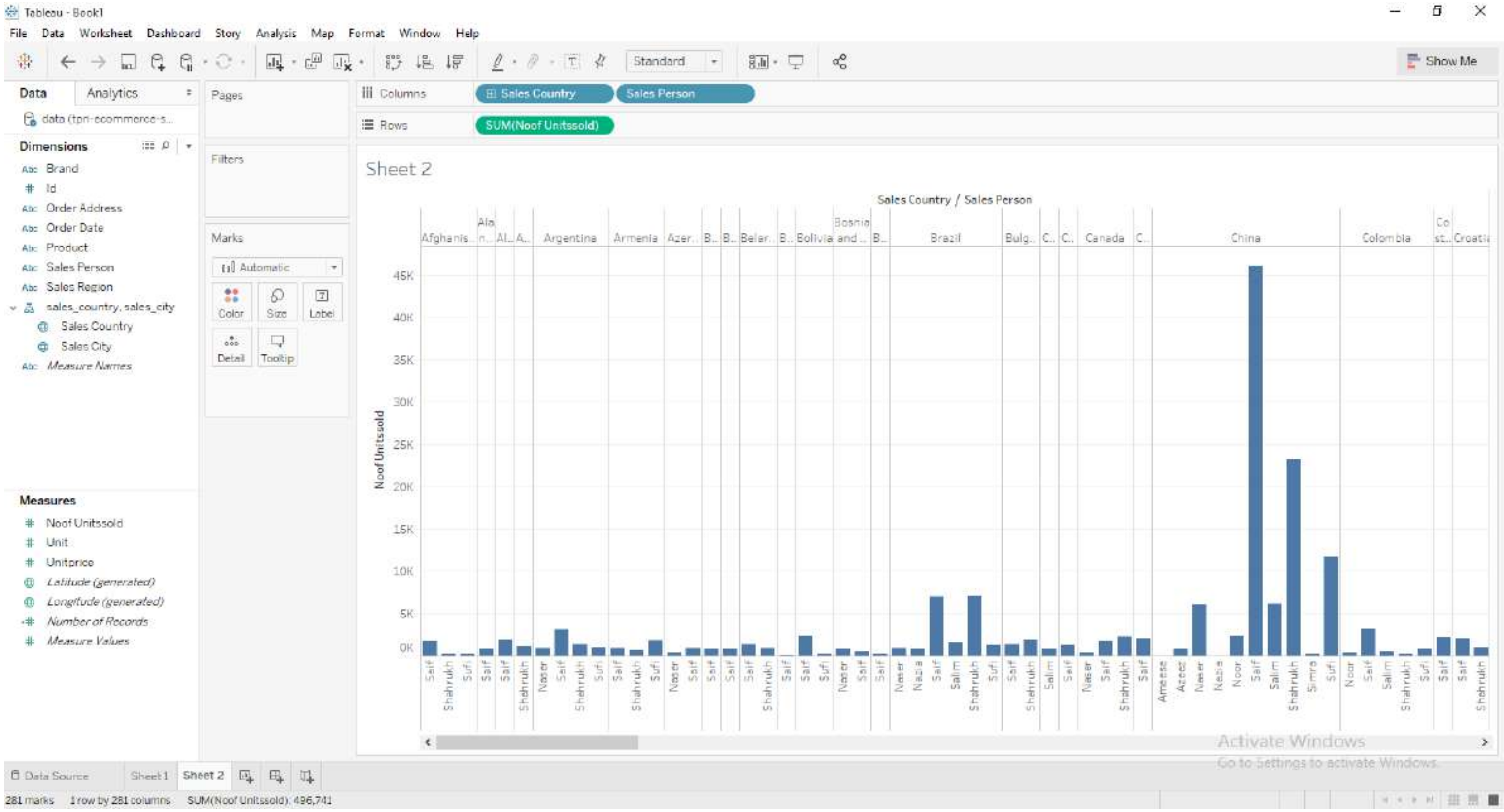


Data Source: demo3/tpri-ecommerce-sales-y2013.xlsx

COLUMNS:	Sales_country,Sales_person
ROWS:	Noofunitssold

Step 7

- Now let us add sales_country dimension to the columns, to identify which sales person has sold most products by geography.



Data Source: **demo3/tpri-ecommerce-sales-y2013.xlsx**

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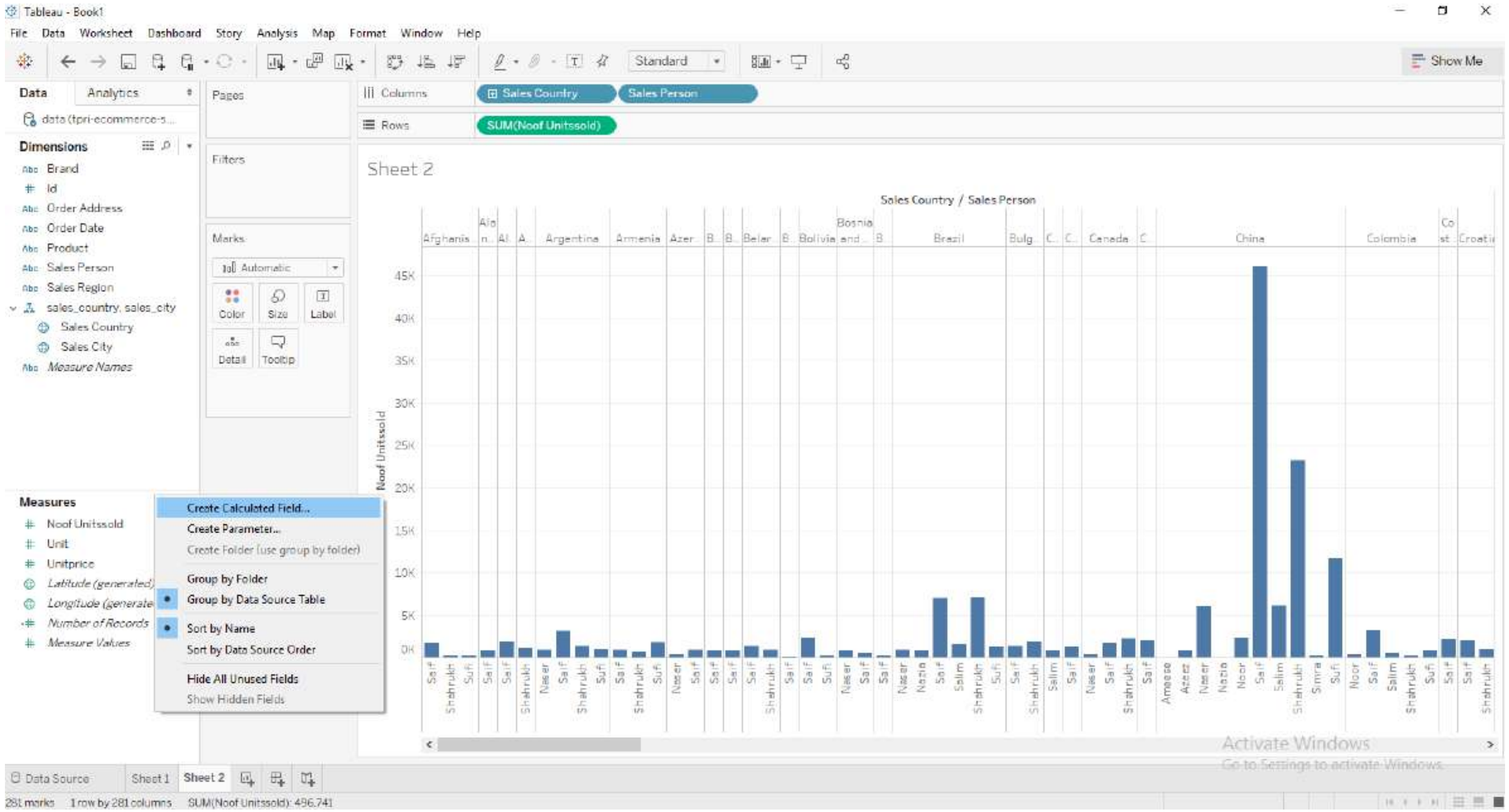
Step 8

- create “calculated field” for computing the total_sale_value

COLUMNS:	Sales_country,Sales_person
ROWS:	Noofunitssold



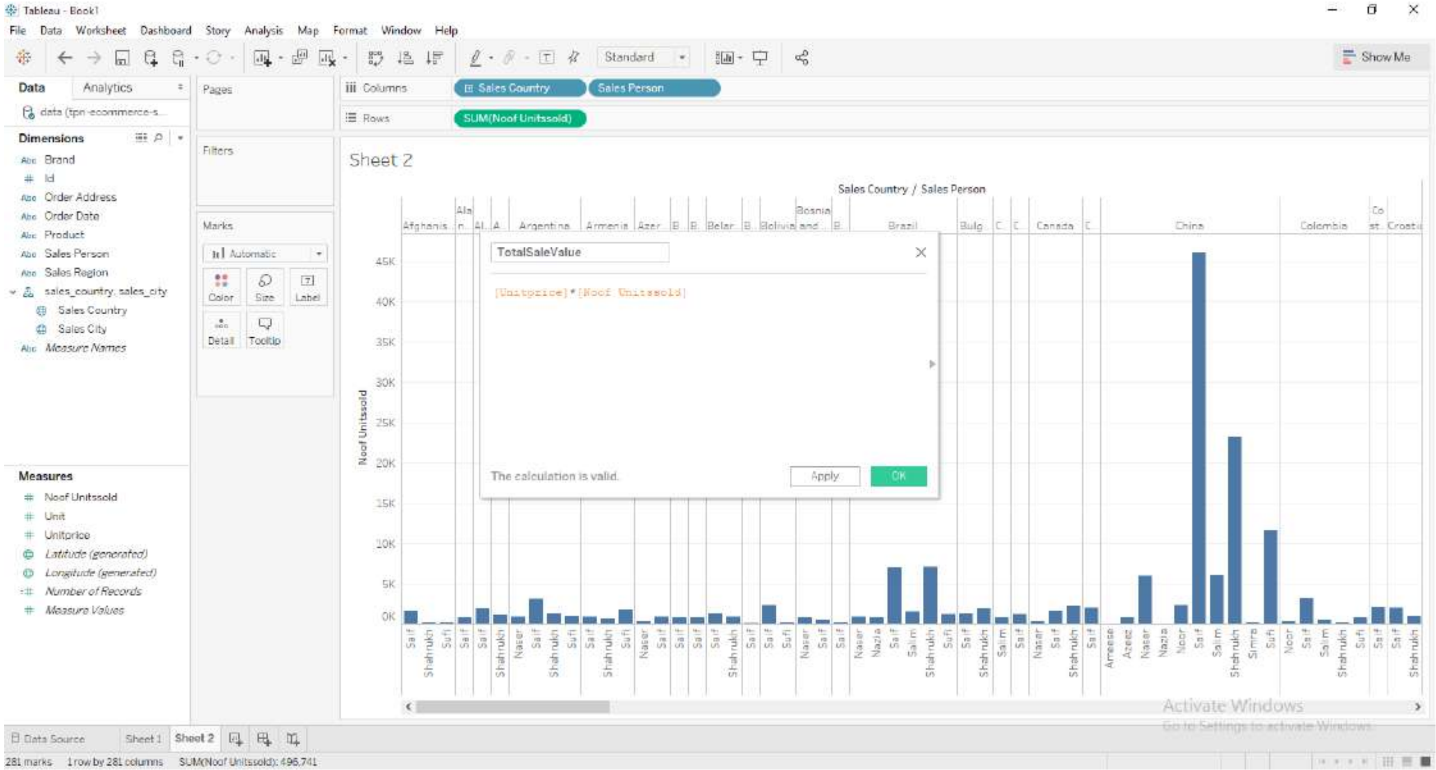
Data Source: **demo3/tpri-ecommerce-sales-y2013.xlsx**

Original Series

COLUMNS:	Sales_country,Sales_person
ROWS:	Noofunitssold

Step 9

- create “calculated field” for computing the total_sale_value = [unitprice]*[noofunitssold]



Data Source: demo3/tpri-ecommerce-sales-y2013.xlsx

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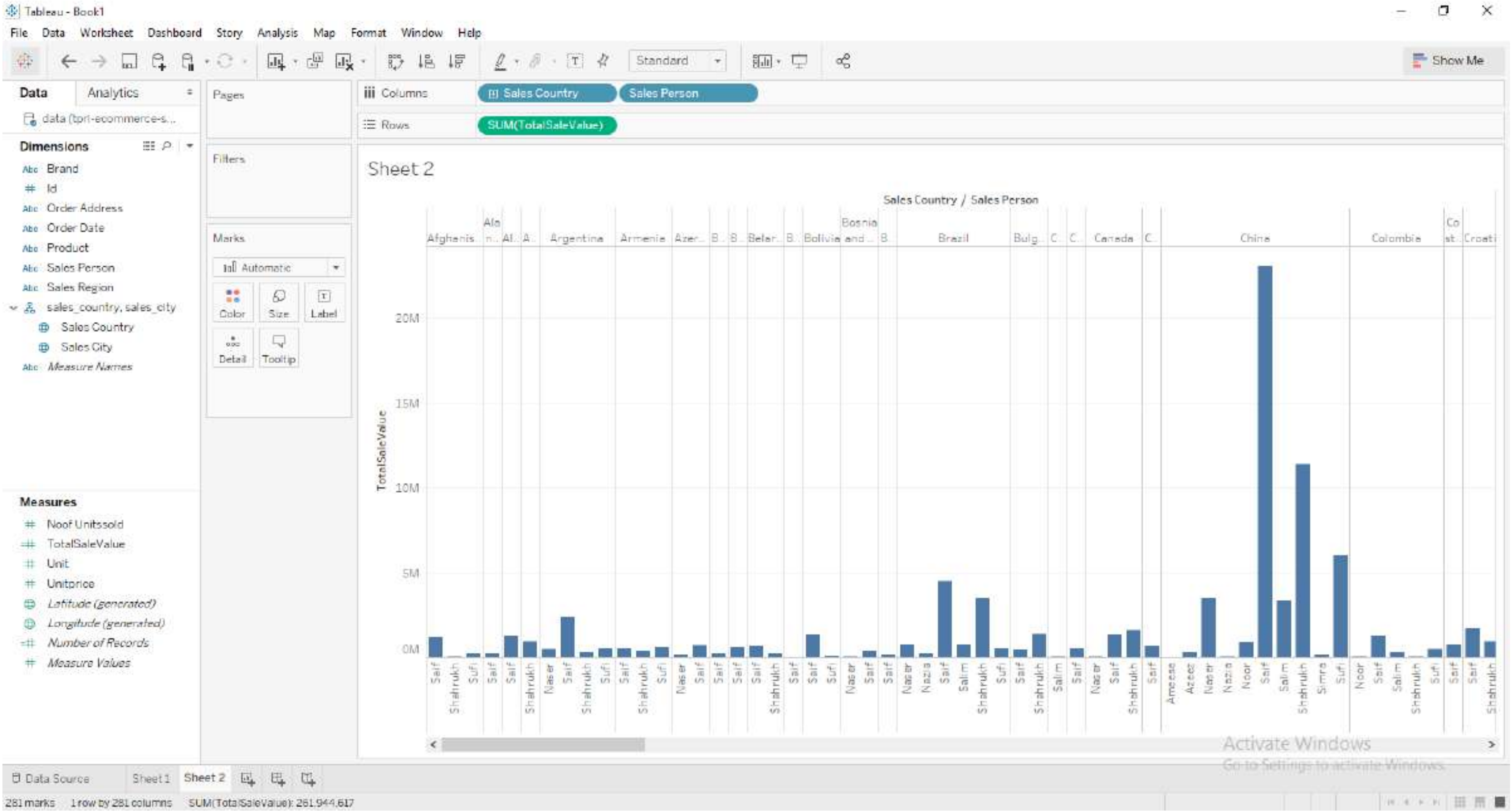
Original Series

COLUMNS:	Sales_country,Sales_person
ROWS:	Noofunitssold

Step 10

- Now lets view the total sales value against sales_country+sales_person.
- Now we have top 3 sales_person by country.

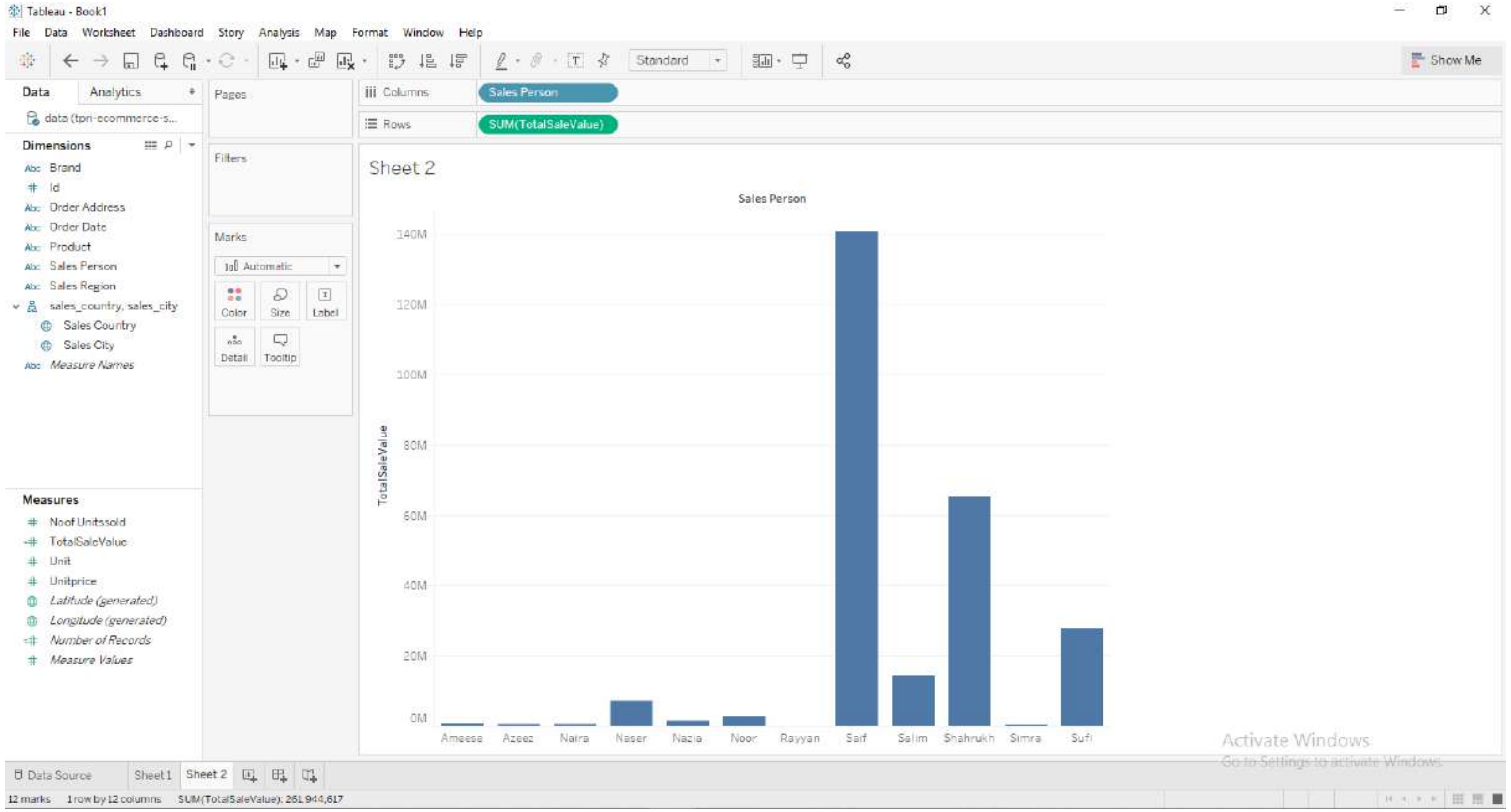


Data Source: **demo3/tpri-ecommerce-sales-y2013.xlsx**

COLUMNS:	Sales_country,Sales_person
ROWS:	Noofunitssold

Step 11

- We would like to identify overall total sales value generated by the sales person, irrespective of the geographic region.

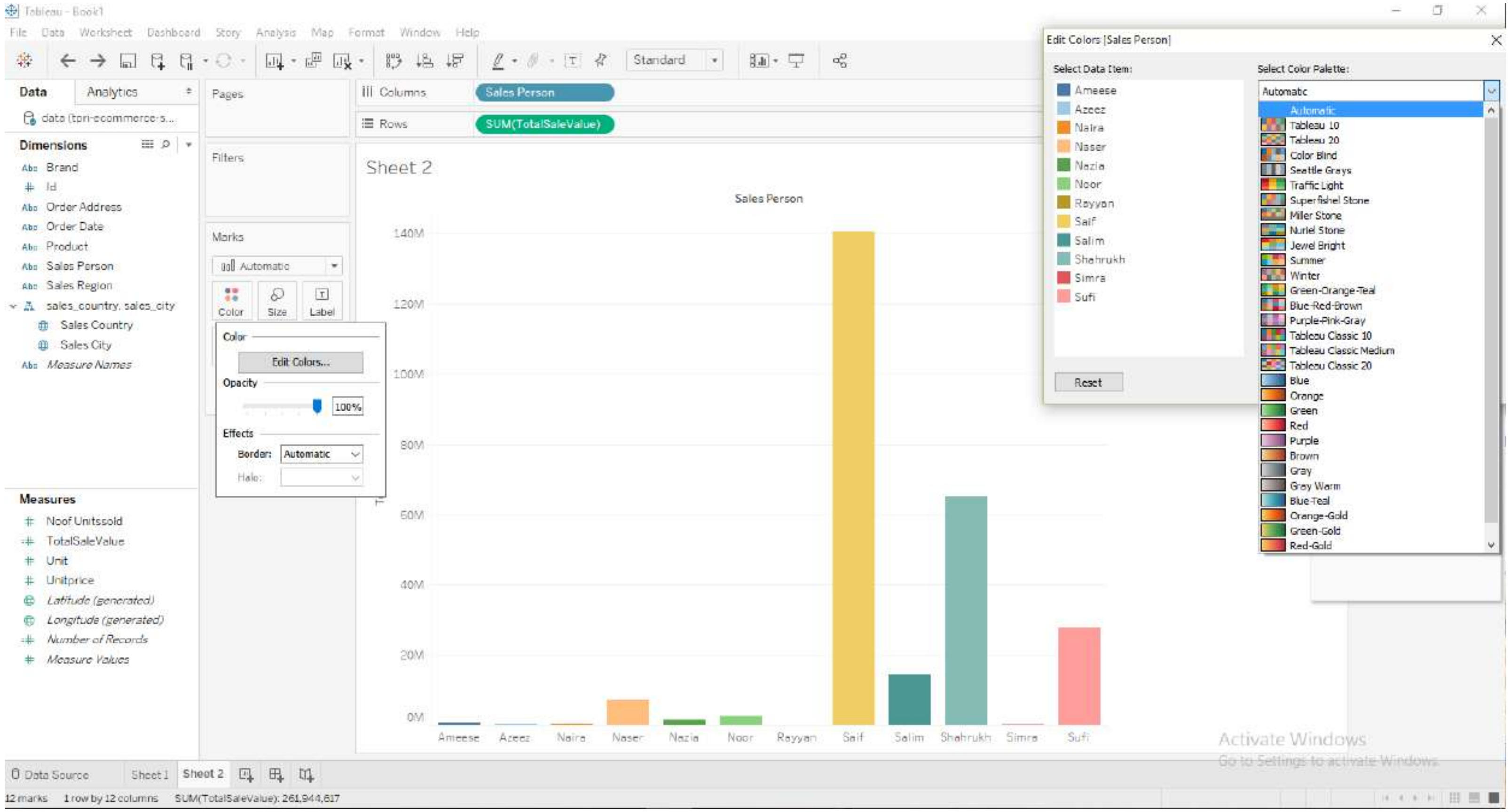


Data Source: **demo3/tpri-ecommerce-sales-y2013.xlsx**

COLUMNS:	Sales_country,Sales_person
ROWS:	Noofunitssold

Step 12

- Codifying your data by **color** to differentiate by the variable “sales_person”

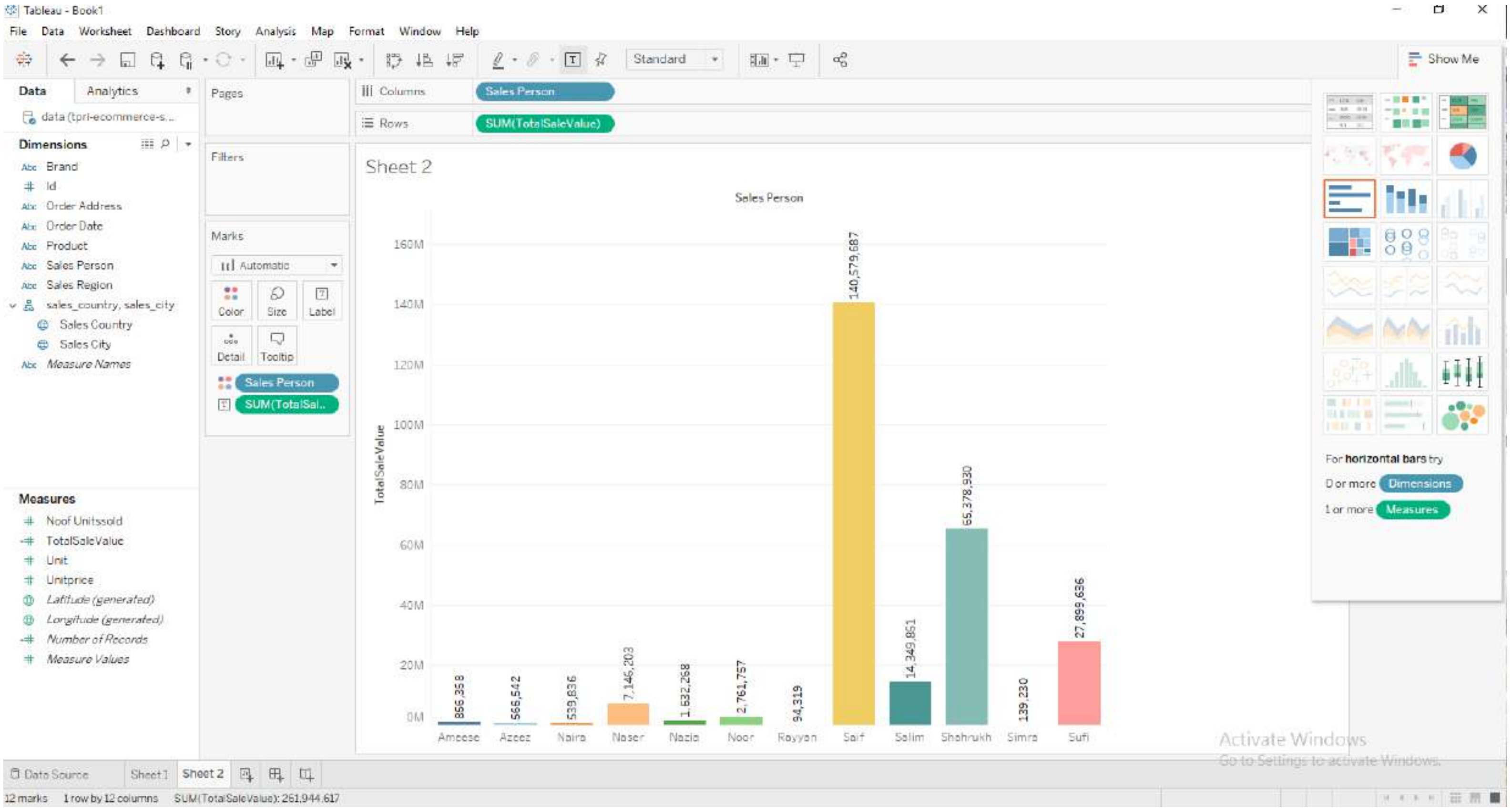


Data Source: **demo3/tpri-ecommerce-sales-y2013.xlsx**

COLUMNS:	Sales_country,Sales_person
ROWS:	Noofunitssold

Step 13

- Now drag TotalSaleValue to label Marker panel

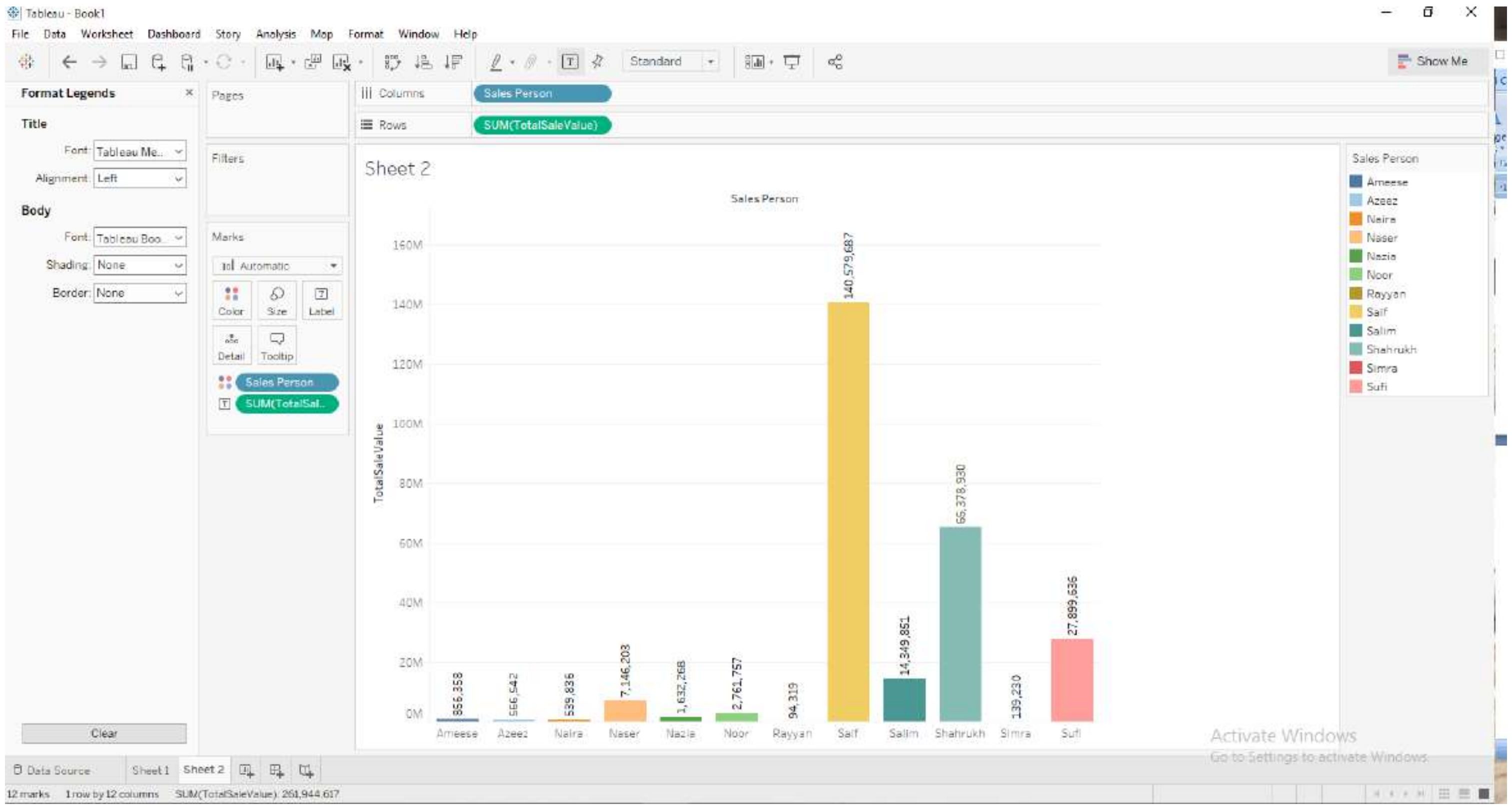


Data Source: **demo3/tpri-ecommerce-sales-y2013.xlsx**

COLUMNS:	Sales_country,Sales_person
ROWS:	Noofunitssold

Step 14

- Visualization with legend.
- The top 5 sales persons who receive bonus are
  1. Saif
  2. Shahrukh
  3. Sufi
  4. Salim
  5. Naser



Data Source: demo3/tpri-ecommerce-sales-y2013.xlsx

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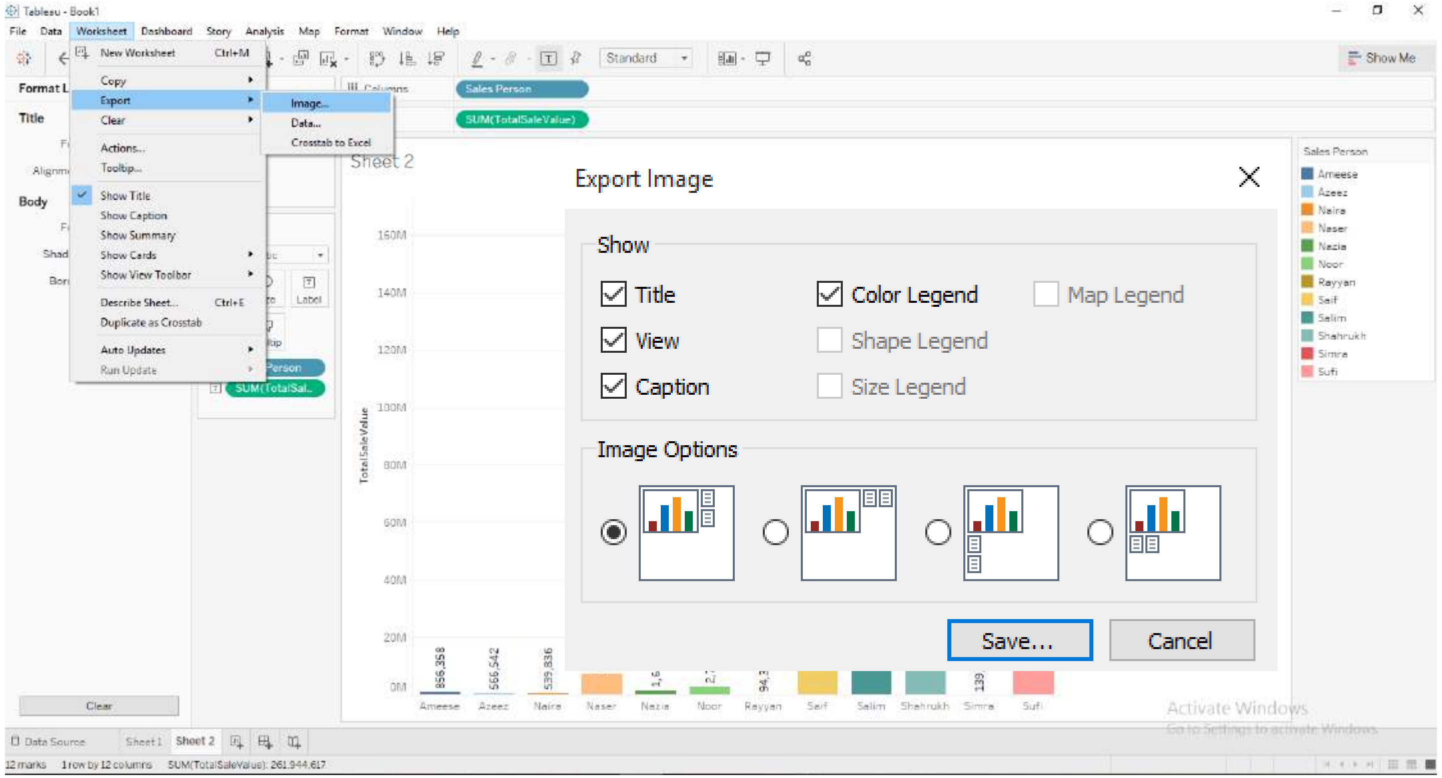
Original Series

COLUMNS:	Sales_country,Sales_person
ROWS:	Noofunitssold

Step 15

- Exporting the visualization as an image.



Data Source: **demo3/tpri-ecommerce-sales-y2013.xlsx**

Problem Description:	**Analysis of Broadband internet usage. To answer the following questions:** **1. What is the average monthly, weekly and daily internet usage?** **2. How does uploaded volume compare against downloaded volume on monthly, weekly and daily basis?** **3. What is the usage pattern with respect to the day of the week?** **4. What is the usage pattern with respect to the hour of the day?**
Data set used:	www.mockaroo.com=> demo3/ broadband-usage-data.xlsx

SYED AWASE KHIRNI

TABLEAU : CHALLENGE