



澳門大學
UNIVERSIDADE DE MACAU
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2nd Assignment – Recreation of Visualizations

CISC7204: DATA SCIENCE & VISUALIZATION

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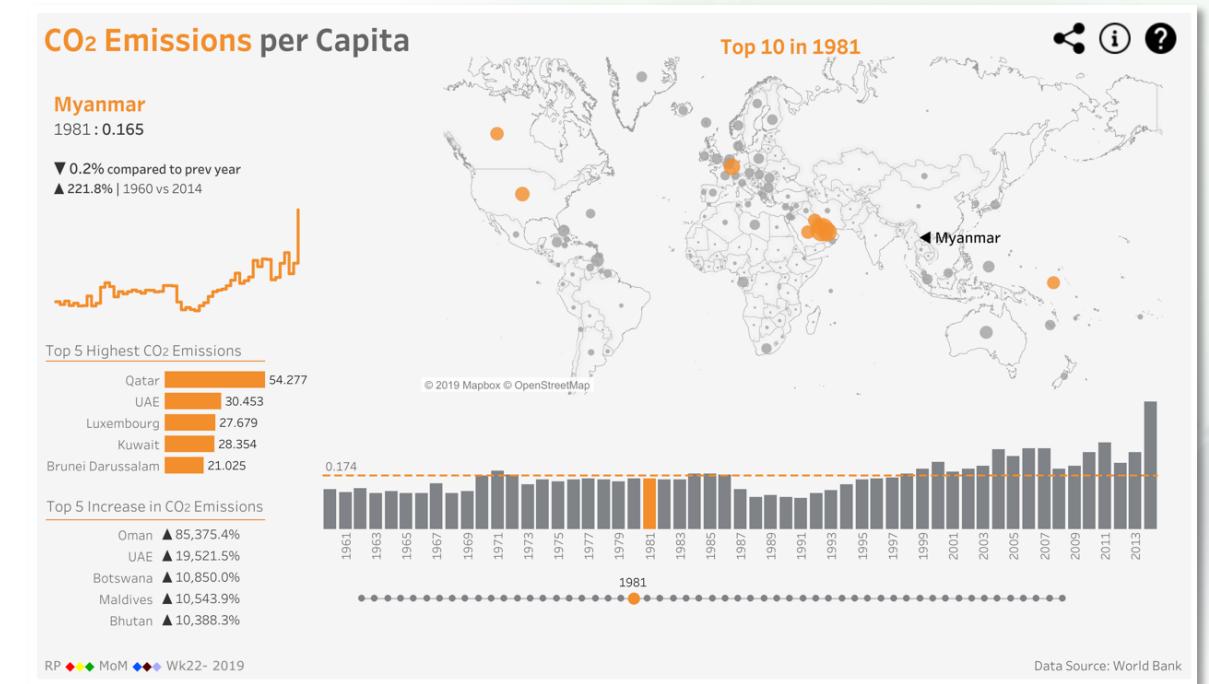
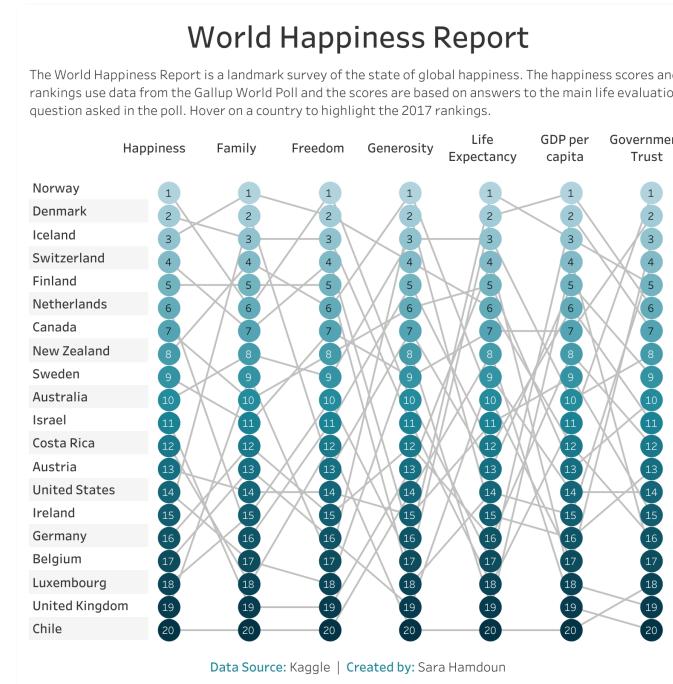
Office Hours: Thu – 16:00~17:30, Fri 11:00~12:30



Natural Language Processing & Portuguese –
Chinese Machine Translation Laboratory
自然語言處理與中葡機器翻譯實驗室

Introduction

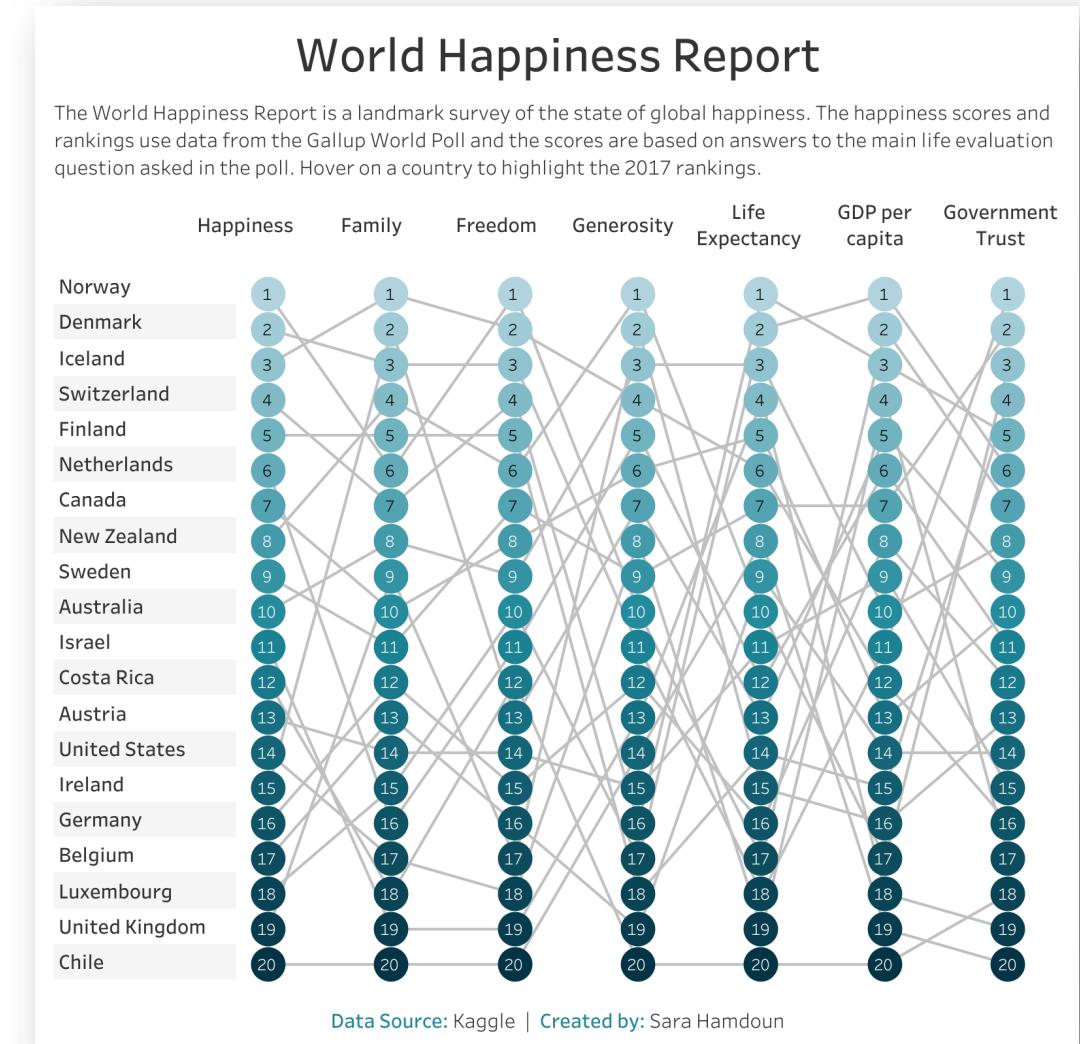
- This assignment requests you to *reconstruct the visualization* from **ONE** of the following two visualization dashboards according to their **DIFFICULTY LEVEL**



World Happiness 2017

Difficulty Level=Normal, Max Grade=90

- The *World Happiness Report* is a survey of the state of global happiness. It ranks **155 countries** by their **happiness levels**



World Happiness 2017

Difficulty Level=Normal, Max Grade=90

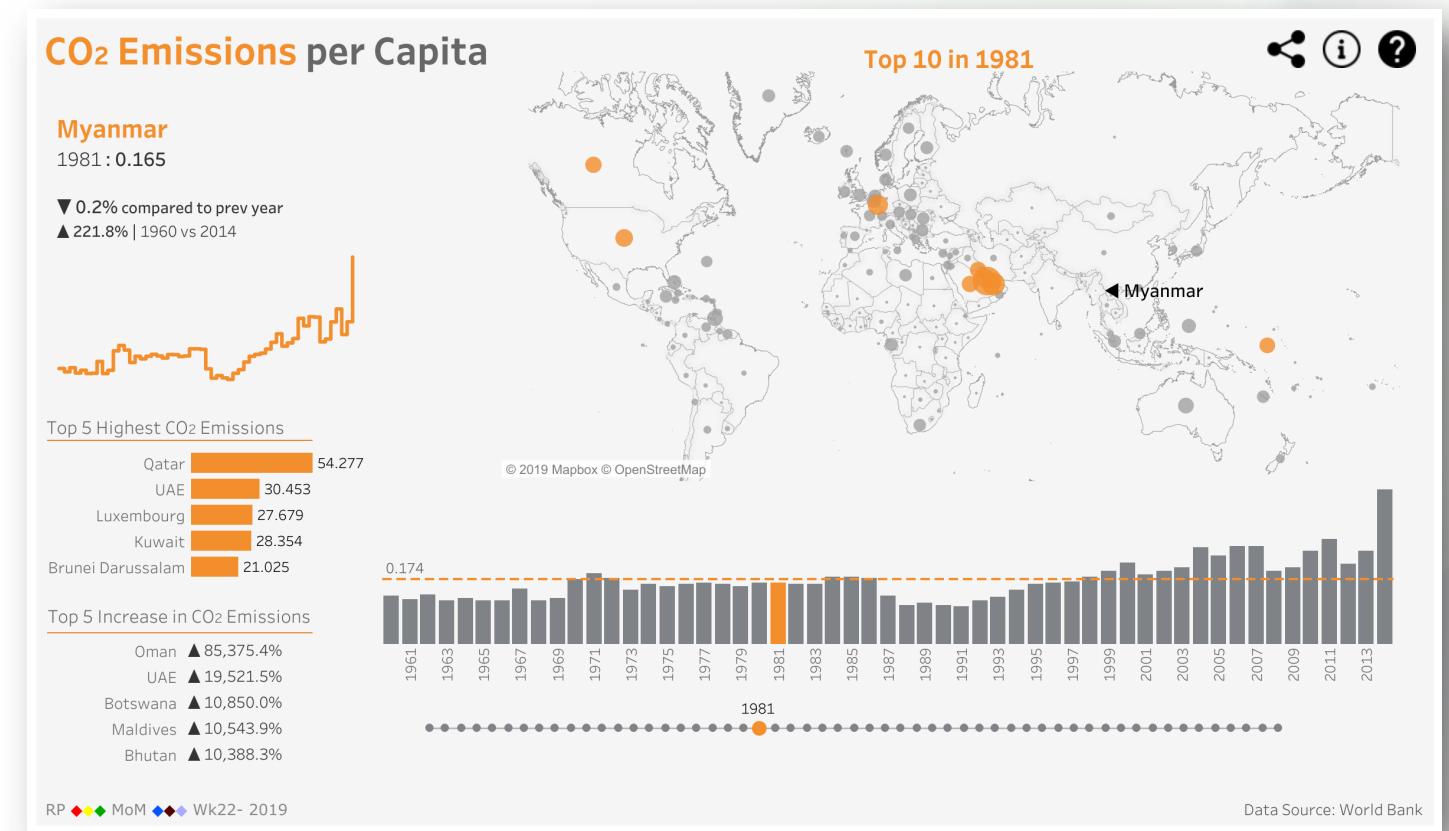
- The *World Happiness Report* is a survey of the state of global happiness. It ranks 155 countries by their *happiness levels*

Attributes	Description
Country	Name of the country
Happiness.Rank	The overall happiness ranking of <i>Country</i>
Pivot Field Names	Name of specific rank (<i>Happiness, Family, Freedom, Generosity, Life Expectancy, GDP Per Capita</i> and <i>Government Trust</i>)
Pivot Field Values	The value of specific type of rank (<i>Pivot Field Names</i>) that contributed the overall ranking

CO2 Emissions

Difficulty Level=Challenging, Max Grade=100

- The *annual per-capita carbon dioxide (CO2) emissions* by country data is released by the *United Nations Millenium Development Goals Indicators*, to show the *CO2 emissions varies by country*



CO2 Emissions

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Attributes	Description
Country Code	Abbreviation of country
Country Name	Full name of country
Income Group	Income group of country (<i>High income, Upper middle income, Lower middle income, Low income</i>)
Year	Year of record
CO2 Emissions	CO2 emissions (metric tons per capita)
Region	Region of country

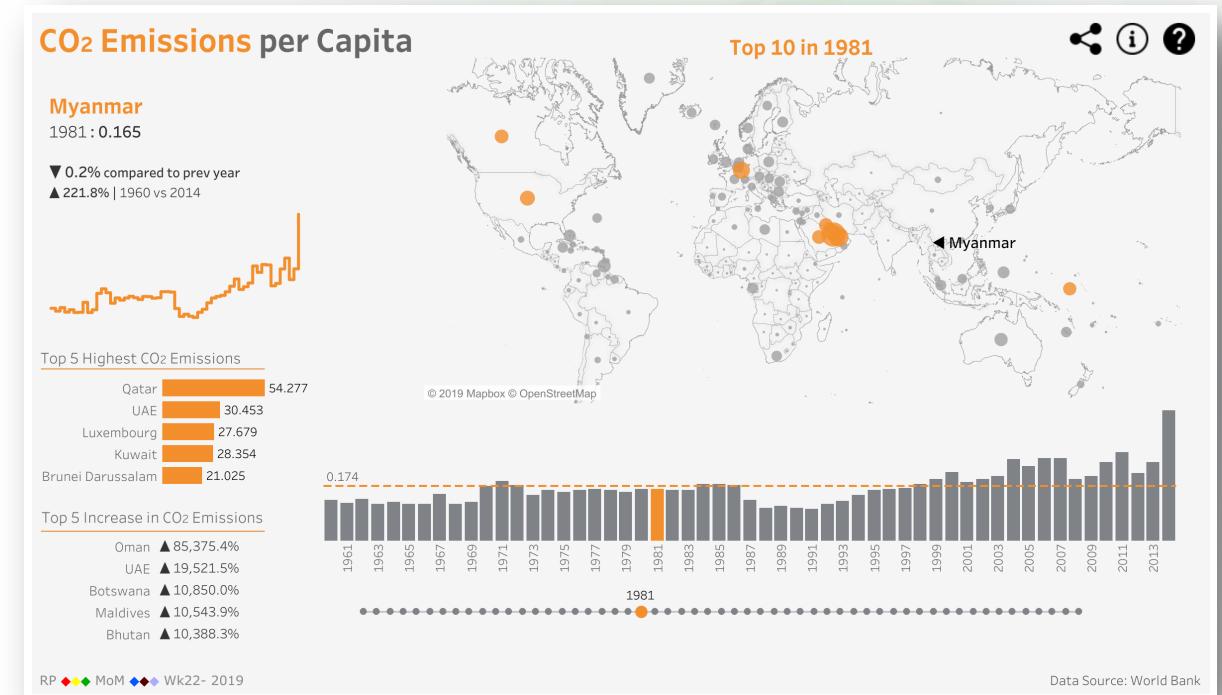
Tableau Knowledge

Content

- Interactive Dashboard Using Actions
 - *Filtering*
 - *Highlight*
 - *URL*
- Dual Axis
- Rank Calculation
- Reference Lines

What is a Dashboard?

- Powerful tool for *combining multiple views* into a *unique workspace*
- Allow us to *analyze different aspects* of data in context of *each other*
- Allow us to create *interactive* and *common filters* for *all the sheets* in the group
- *Excellent* tool for *generic views*



What is an Interactive Dashboard?

An *interactive dashboard* is a *data management technique* that *tracks, analyzes, monitors, and visually displays key business metrics* while allowing users to *interact* with data

- **Agility for decision-makers:** Interactive analysis empowers users to *answer critical business questions on-demand* with the *most up-to-date data*
- **Avoid redundant reports:** You need *only one dashboard* with the *interactive features* to quickly adapt the displayed data instead of *creating 10 static PowerPoint slides*
- **Less IT involvement:** By empowering users to *perform their own ad hoc data analysis*
- **Speed:** *Real-time dashboards enable real-time data* and that is the beauty and power of business intelligence in its core

Interactivity in Tableau

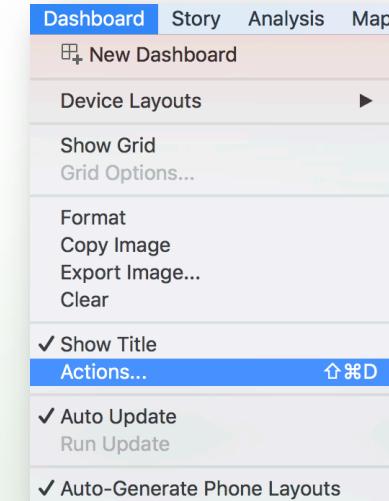
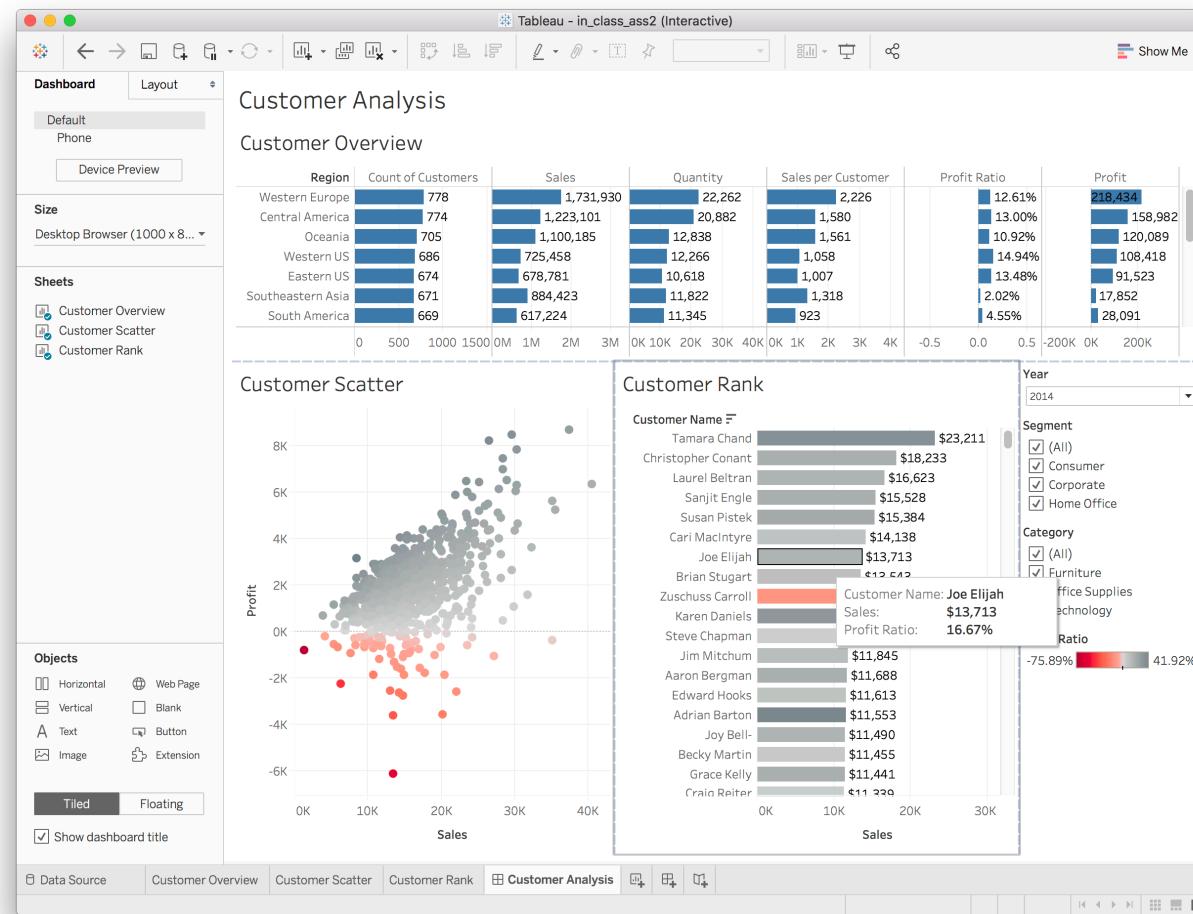
In Tableau, the *ways to transfer the control* of analysis from you to *end users* can be achieved through:

- *Dashboard Actions*
- *Filters*
- *Parameters*

Dashboard Actions

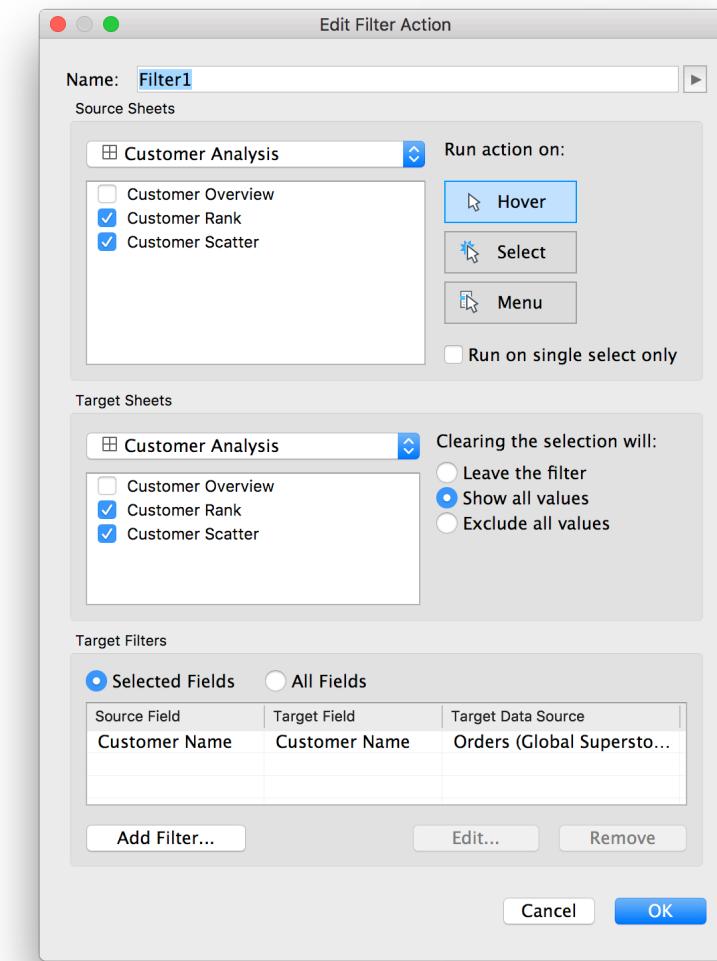
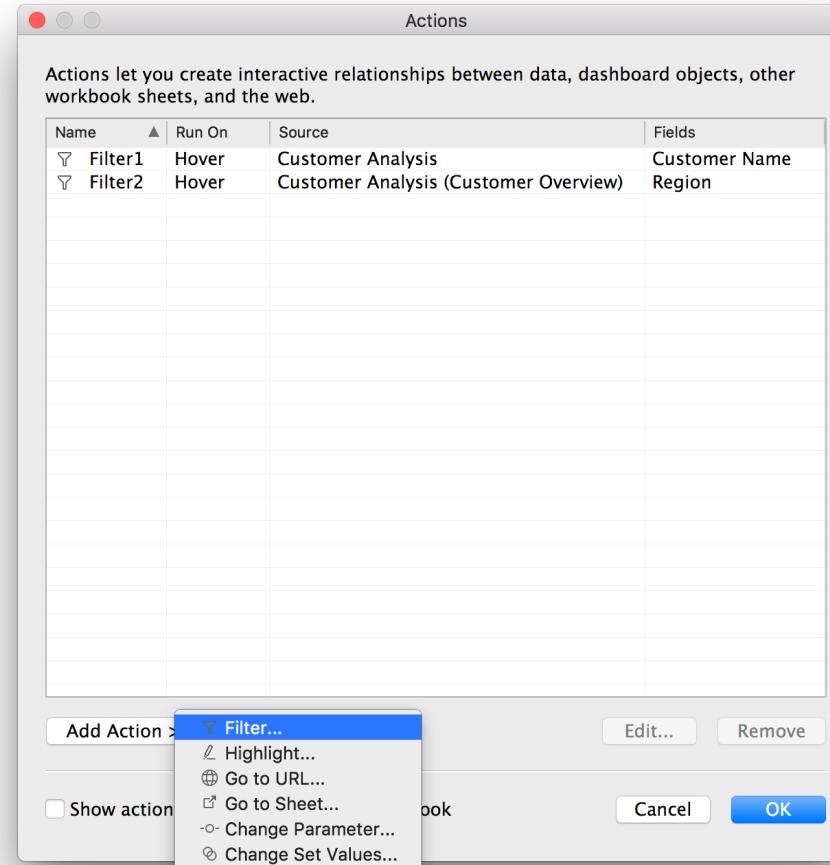
Interactivity in Tableau

Dashboard Actions



Interactivity in Tableau

Dashboard Actions



Interactivity in Tableau

Dashboard Actions

Customer Analysis Dashboard

This dashboard illustrates customer analysis across three main sections: Customer Overview, Customer Scatter, and Customer Rank.

Customer Overview: A bar chart showing the distribution of customers by region, including Count of Customers, Sales, Quantity, Sales per Customer, Profit Ratio, and Profit.

Region	Count of Customers	Sales	Quantity	Sales per Customer	Profit Ratio	Profit
Western Europe	177	1,731,930	22,262	2,226	12.61%	\$18,434
Central America	77	1,223,101	20,882	1,580	13.00%	158,982
Oceania	705	1,100,185	12,838	1,561	10.92%	120,089
Western US	686	725,458	12,266	1,058	14.94%	108,418
Eastern US	674	678,781	10,618	1,007	13.48%	91,523
Southeastern Asia	671	884,423	11,822	1,318	2.02%	17,852
South America	669	617,224	11,345	923	14.55%	128,091

Customer Scatter: A scatter plot showing the relationship between Sales and Profit for individual customers. A color legend indicates Profit Ratio, ranging from -75.89% (red) to 41.92% (green).

Customer Rank: A bar chart ranking customers by profit, showing their names, sales, and profit values.

Dashboard Actions: The dashboard includes a "Customer Analysis" button, which, when clicked, triggers a transition to a new state (e.g., 2014) or performs a specific action like a refresh or update.

Customer Analysis (2014 View): This view shows the same data as the initial dashboard but for the year 2014. It includes a "Customer Analysis" button.

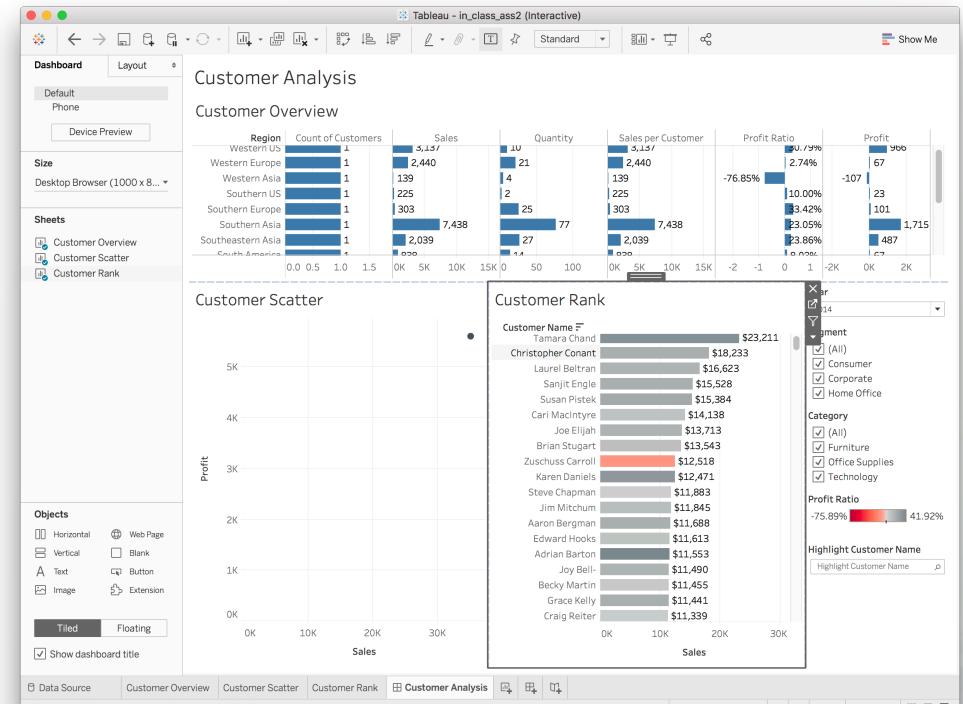
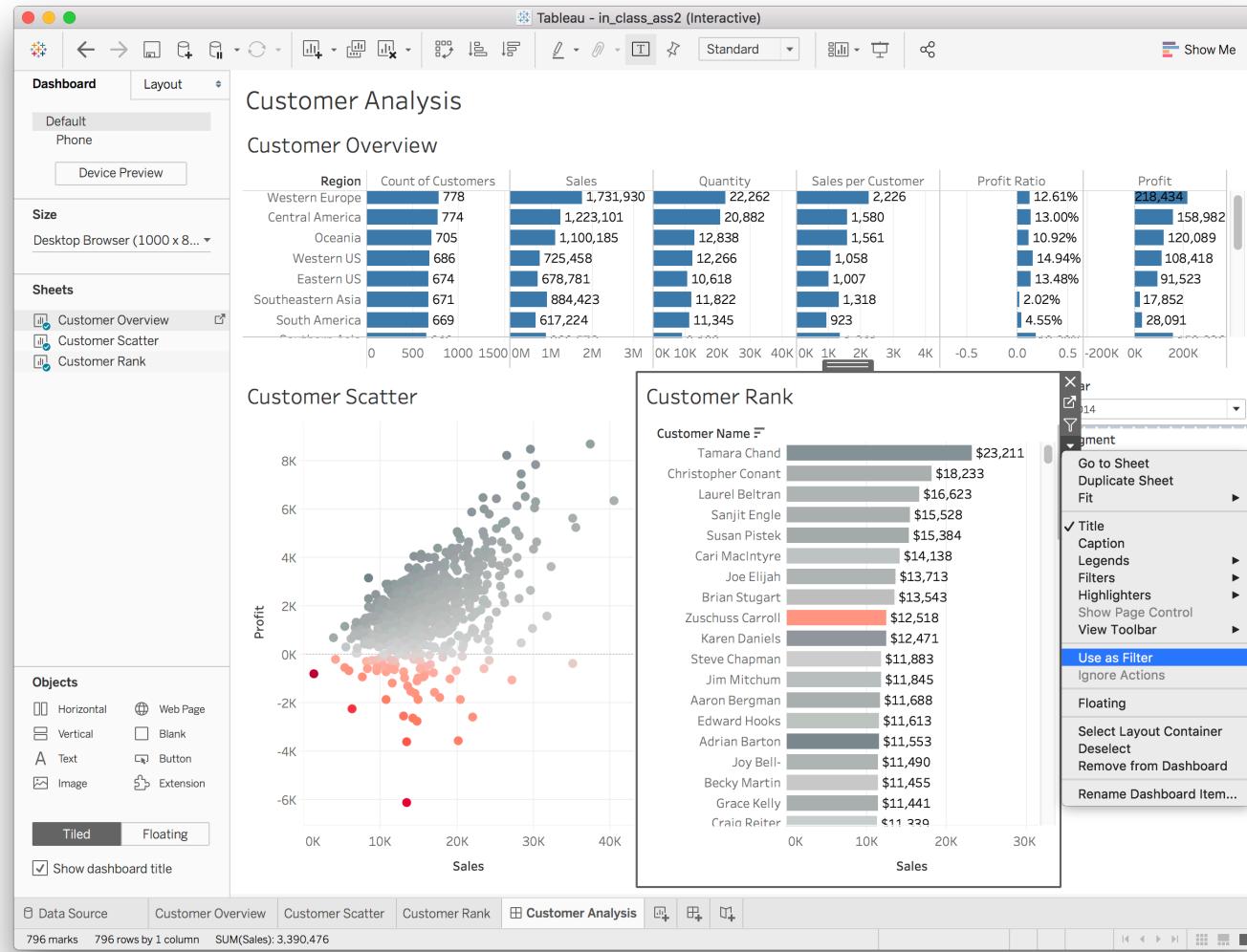
Customer Analysis (2015 View): This view shows the same data as the initial dashboard but for the year 2015. It includes a "Customer Analysis" button.

Customer Analysis (2016 View): This view shows the same data as the initial dashboard but for the year 2016. It includes a "Customer Analysis" button.

Worksheet as Filter

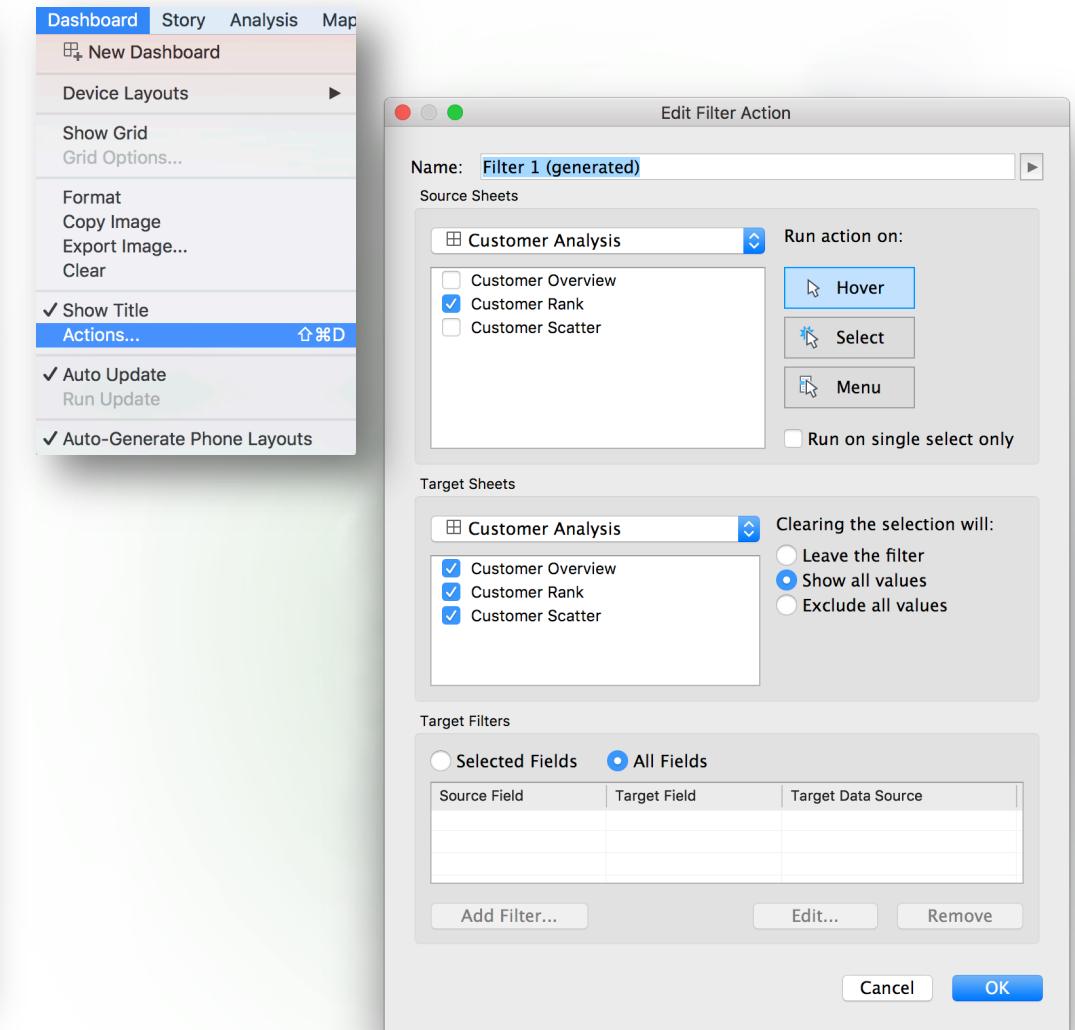
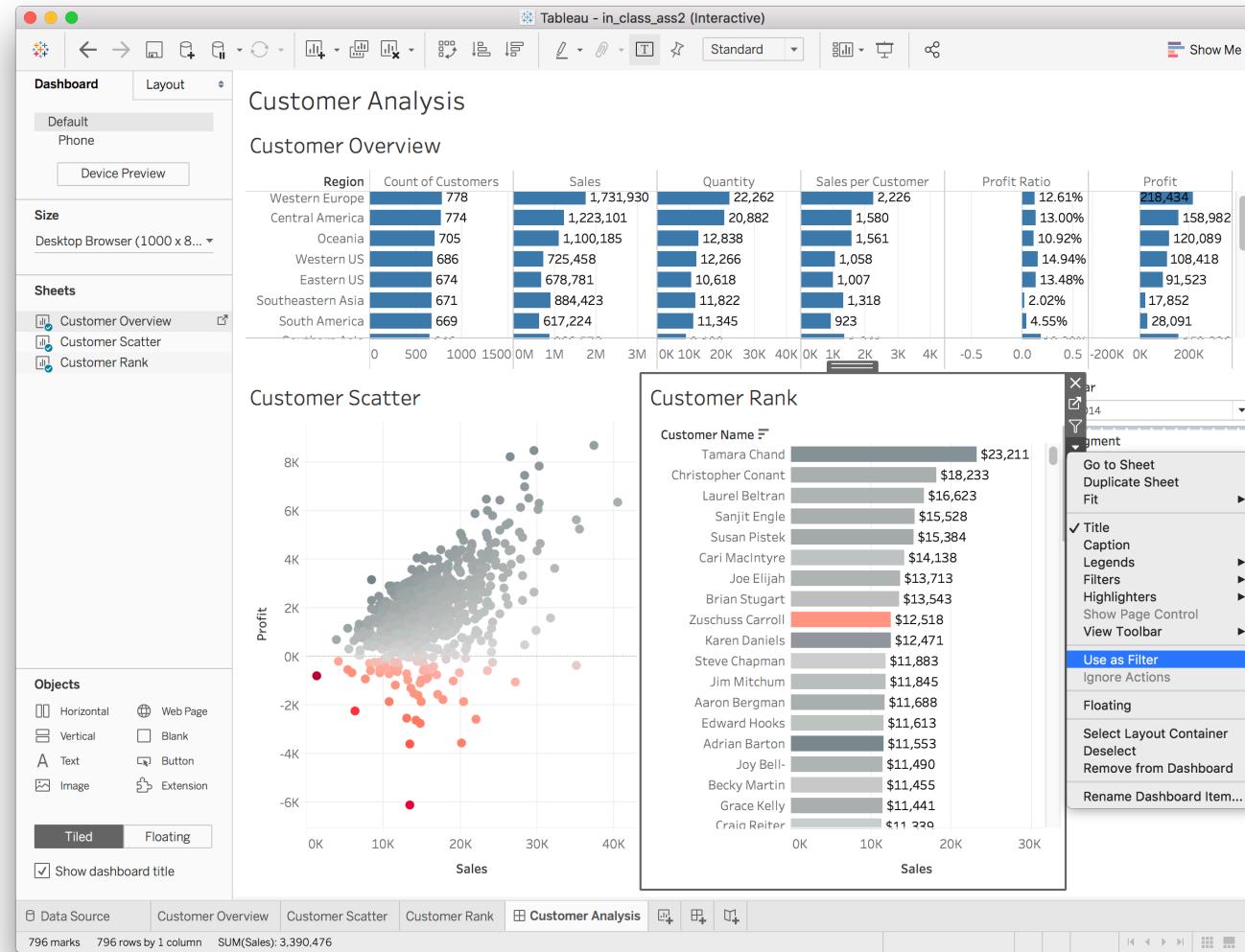
Interactivity in Tableau

Worksheet as Filter



Interactivity in Tableau

Worksheet as Filter

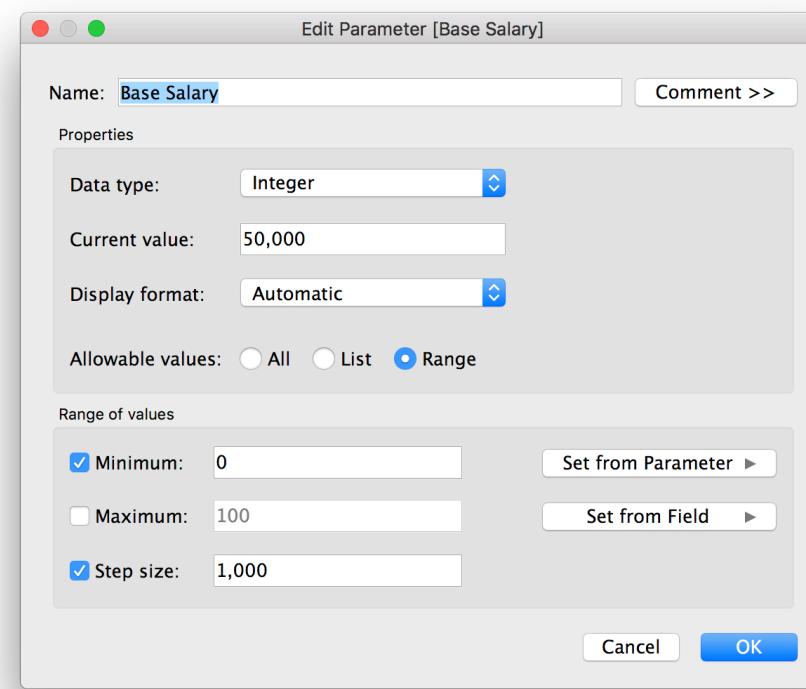


Parameters

Parameters

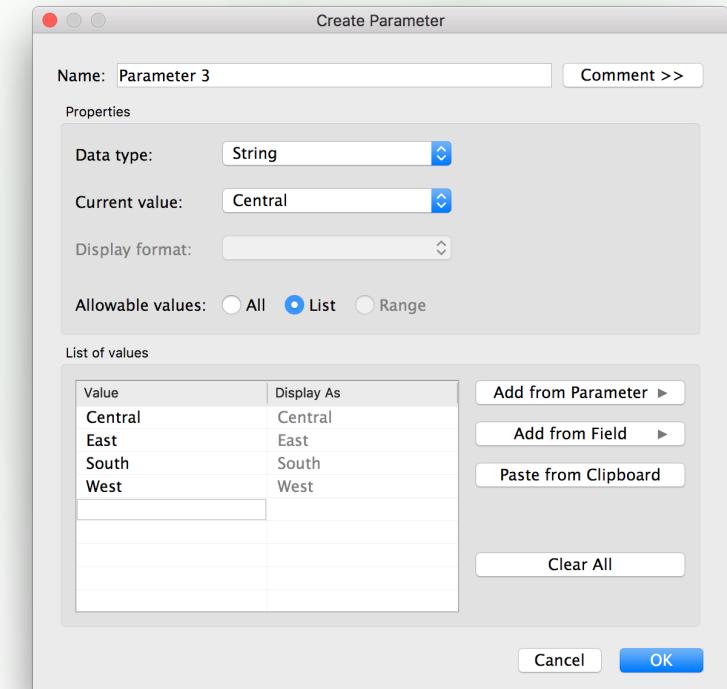
Control Interactivity

- Add *interactivity* and allow users to *interact* with the worksheets and dashboards *using parameters*
- *Parameters* are *values* that can change and *drive other information* in the views



The 'Edit Parameter [Base Salary]' dialog shows the following settings:

- Name:** Base Salary
- Data type:** Integer
- Current value:** 50,000
- Display format:** Automatic
- Allowable values:** Range (radio button selected)
- Range of values:**
 - Minimum: 0 (checkbox checked)
 - Maximum: 100 (checkbox unchecked)
 - Step size: 1,000 (checkbox checked)



The 'Create Parameter' dialog shows the following settings:

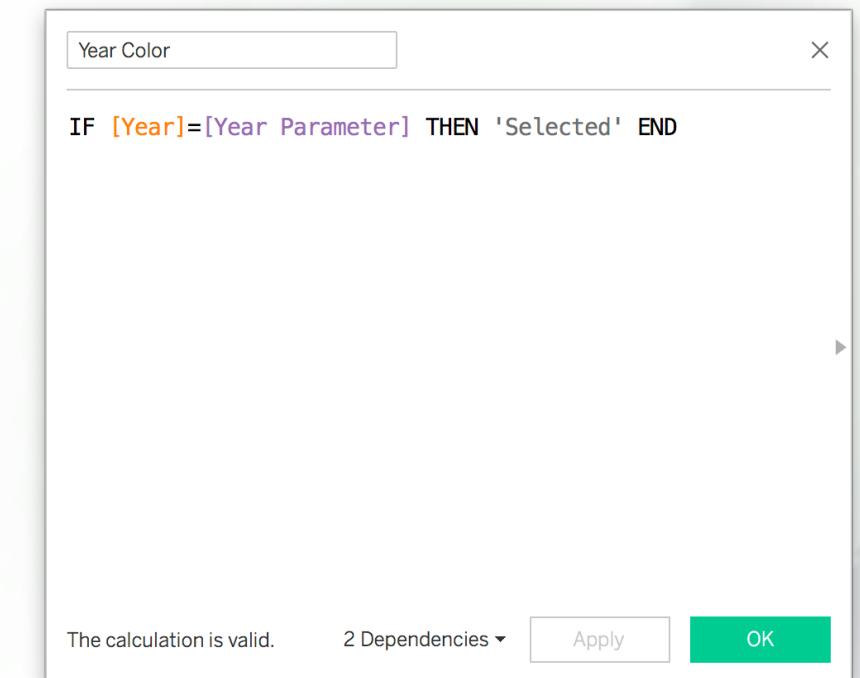
- Name:** Parameter 3
- Properties**:
 - Data type:** String
 - Current value:** Central
 - Display format:** (empty dropdown)
 - Allowable values:** List (radio button selected)
- List of values** table:

Value	Display As
Central	Central
East	East
South	South
West	West

Parameters

Control Interactivity

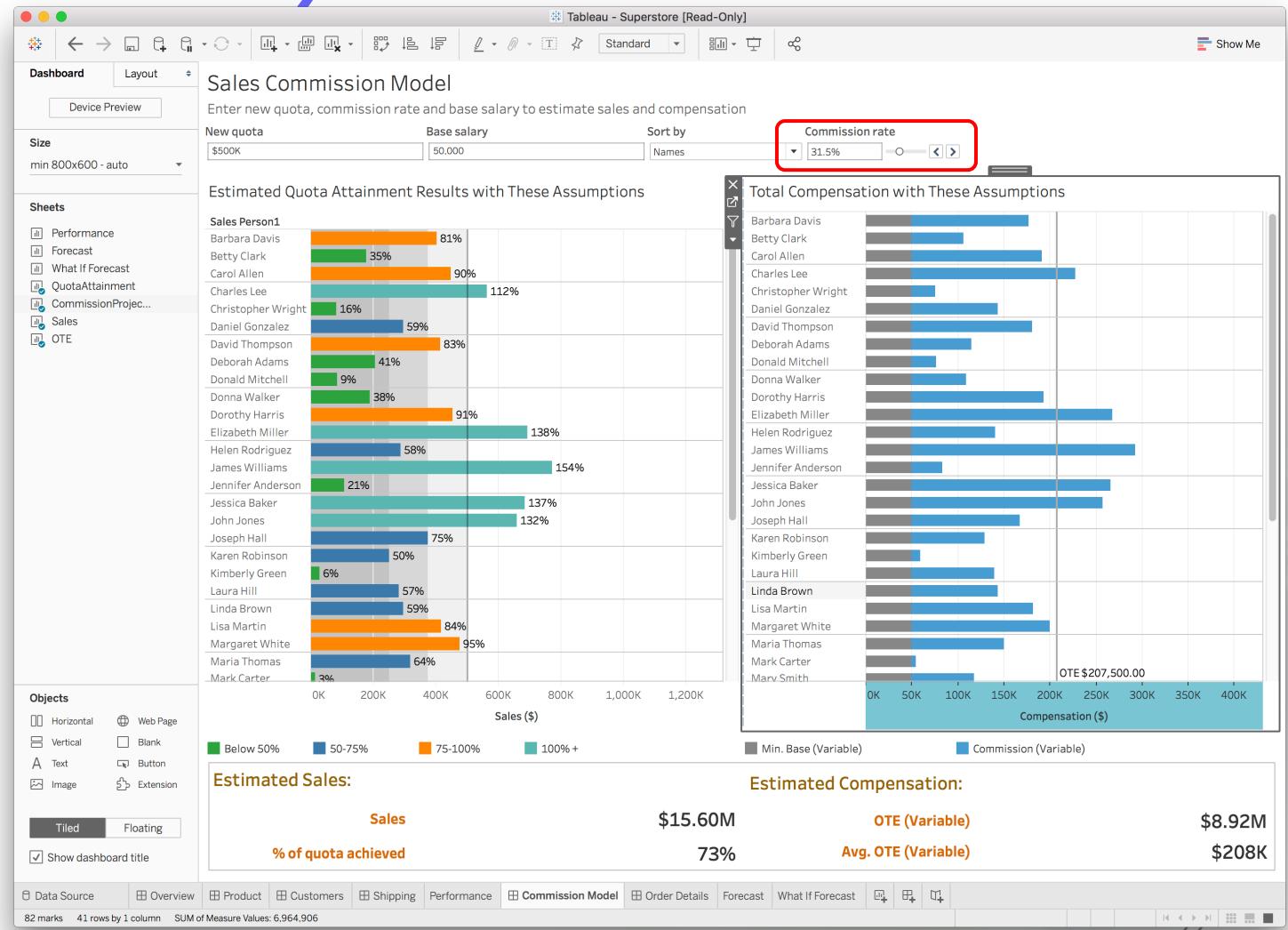
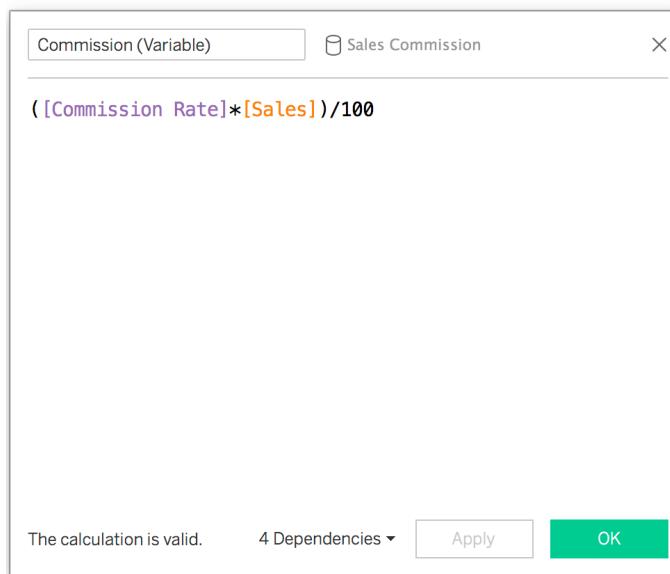
- Using the Parameter in a *Calculation*
- Use *Calculated Field* in Your Visualization



Parameters

Control Interactivity

- Show Parameter Control

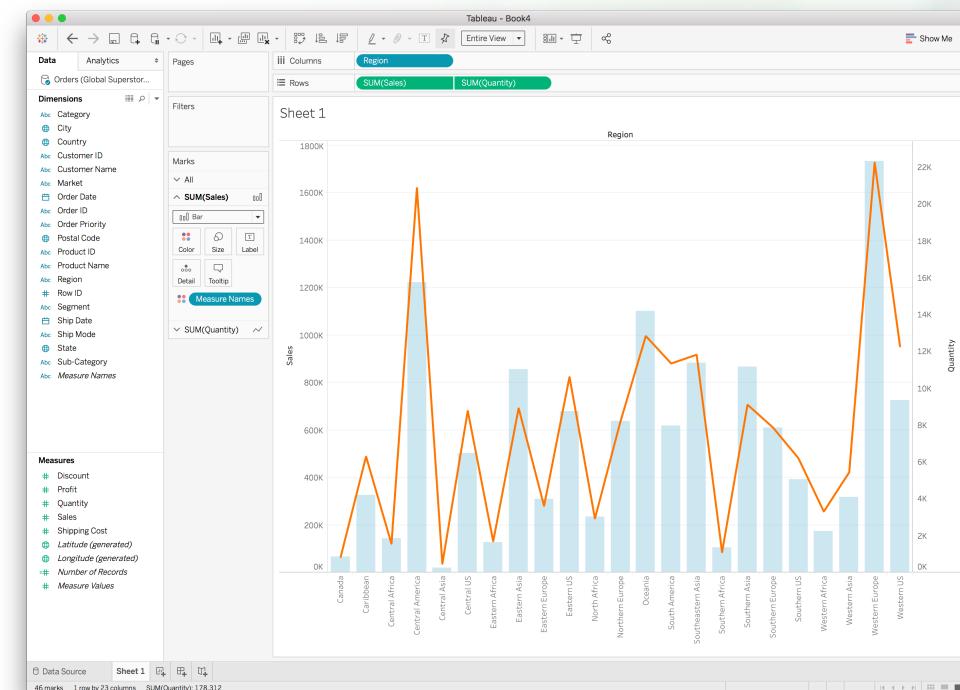
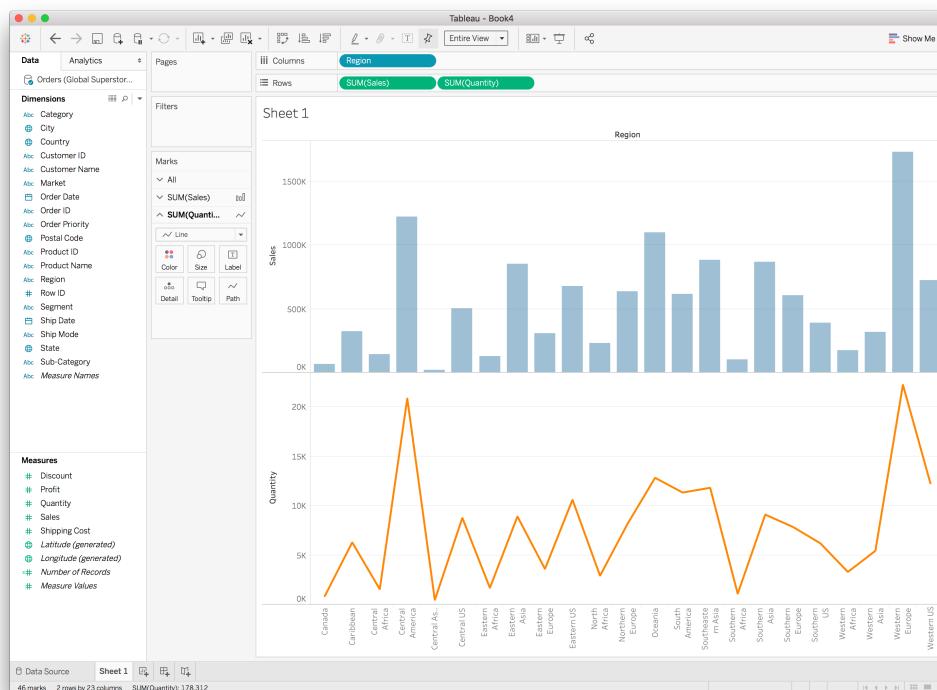


Dual Axis

Dual Axis

Creating an Overlapped Bar Chart

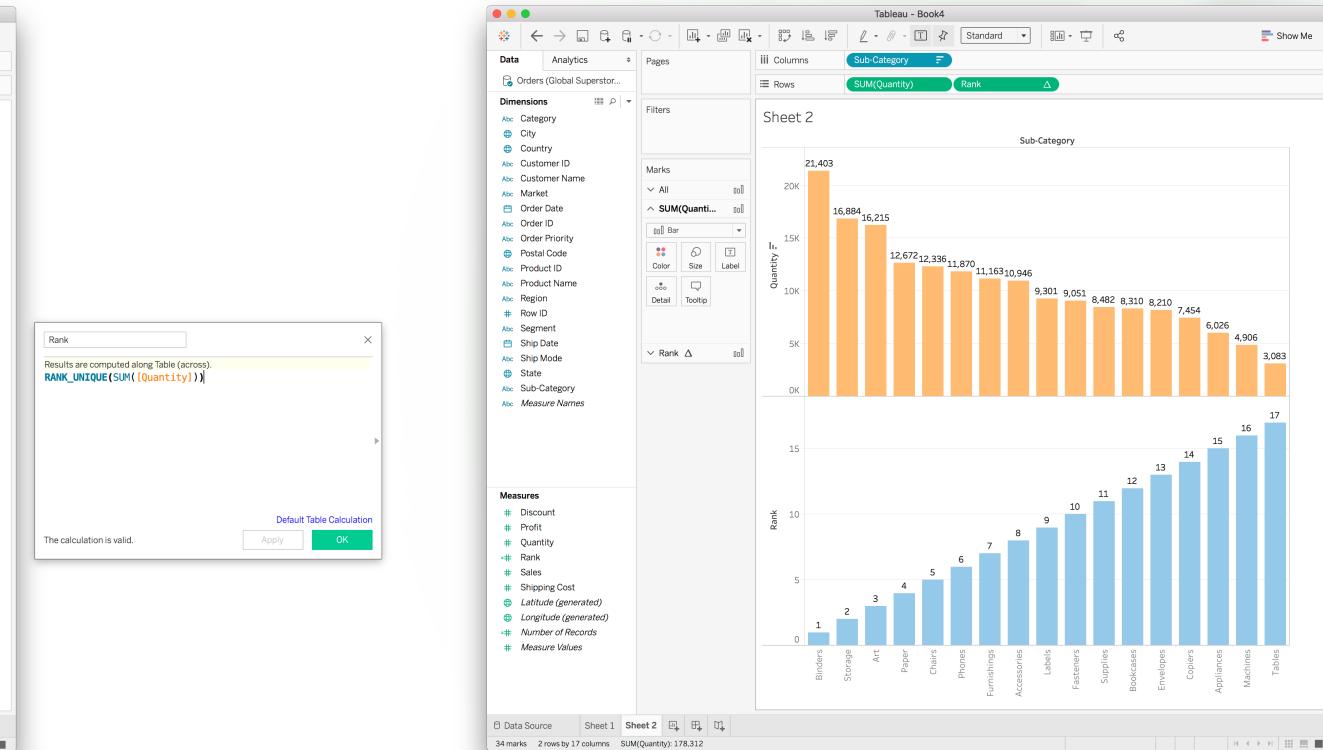
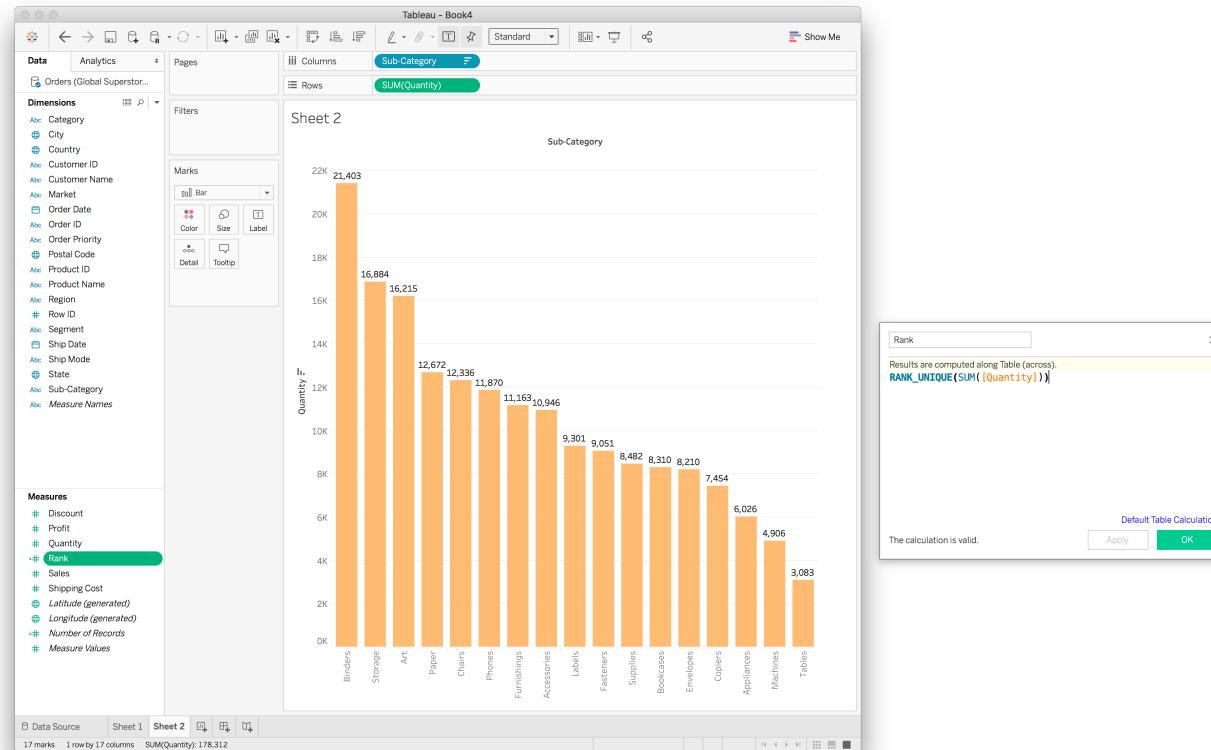
- You can use Dual Axis to overlap two independent axes that are layered on top of each other



Rank Calculation

Rank the Values

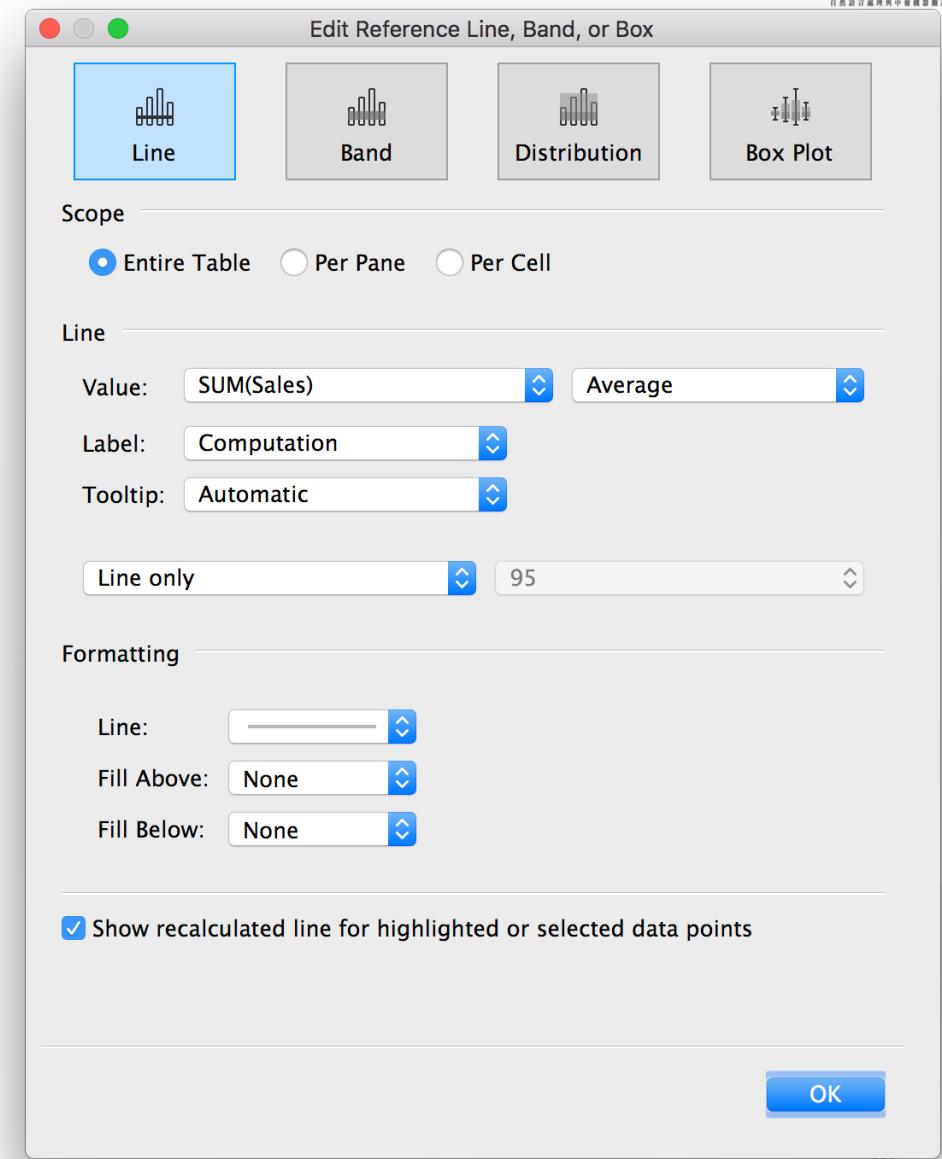
The *Rank function* computes the *competition rank* for the values in the partition. *Identical values* are assigned an *identical rank*



Reference Lines

Reference Lines

- You can add a *reference line, band, distribution* or *box plot* to identify a specific *value, region* or *range* on a continuous axis in a Tableau view
- Including a reference *line at the average sales mark* so you can see *how each product performed* against the average



Reference Lines

