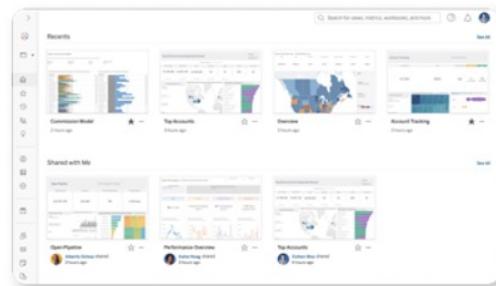


# Data Preparation and Visualization

## Business Analytics

**Tableau** is a powerful **data visualization** tool used in the Business Intelligence Industry. It helps in simplifying raw data in a very easily understandable format. Tableau helps create the data that can be **understood** by professionals at any level in an organization. It also allows non-technical users to create customized dashboards.



**Tableau Cloud**

- Visualize data
- Alert
- Report
- Automate Updation



**Tableau Desktop**

- Develop Dashboards
- Actions
- Analyse data
- Create insights



**Tableau Prep**

- Transform Data
- ETL: Extract; Transform; Load

# Tableau Desktop

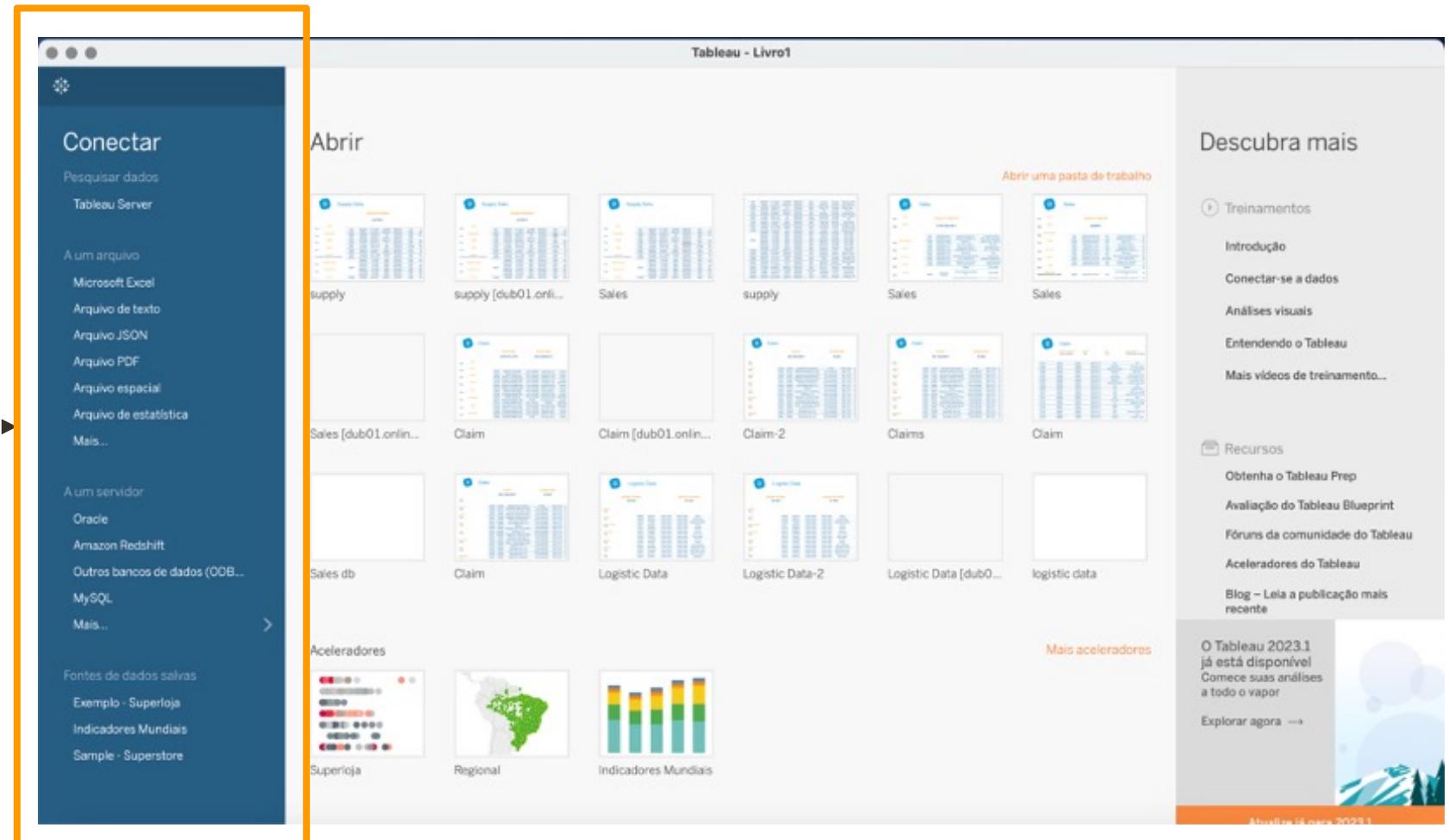
# Connect to data

## 1. Servidor

- MySQL db
- PostgreSQL db
- SQL server db
- ...

## 2. Local File

- Excel
- CSV
- json
- Txt
- ...



# TABLEAU FILES



Workbooks

.twb



Packaged Workbooks

.twbx

1. Twb can be opened only with Desktop. Twbx can be opened with Desktop and Reader.
2. Twb can be connected to the actual source or an extract. Twbx must be connected to an extract.
3. With Desktop, both twb and twbx allows for viewing underlying data.
4. With Reader, twbx does not allow for viewing underlying data or creating new drilldowns.

# DATA CONNECTION

REAL  
TIME

Extract

Tableau - Livro1

Conexões  Exemplo - Superloja Microsoft Excel

Planilhas  Devoluções, Pedidos, Pessoas

Exemplo - Superloja

Conexão  Em tempo real  Extração

Filtros 0 |

REAL TIME

Extract

Diagrama de dados:

```

    graph LR
      Pedidos --> Devolucoes
      Pedidos --> Pessoas
  
```

Tabela "Pedidos":

Nome	Campos	Linhas
Pedidos	19 campos 10262 linhas	100 → linhas

Campos:

Tipo	Nome do campo	Tabela física	Nome do campo
Abc	ID do pedido	Pedidos	ID do pedido
Abc	Data do pedido	Pedidos	Data do pedido
Abc	Data de envio	Pedidos	Data de envio
Abc	Modo de envio	Pedidos	Modo de envio

Exemplo de dados:

ID do pedido	Data do pedido	Data de envio	Modo de envio	Nome do cliente	Segmento
MX-2022-143658	02/10/2022	06/10/2022	Classe padrão	Sofia Rocha	Varejo
MX-2020-155047	16/10/2020	21/10/2020	Classe padrão	Larissa Cardoso	Varejo
MX-2020-155047	16/10/2020	21/10/2020	Classe padrão	Larissa Cardoso	Varejo
MX-2020-155047	16/10/2020	21/10/2020	Classe padrão	Larissa Cardoso	Varejo
MX-2020-155047	16/10/2020	21/10/2020	Classe padrão	Larissa Cardoso	Varejo
MX-2021-134096	28/09/2021	02/10/2021	Classe padrão	Diogo Goncalves	Varejo

Ir para planilha

Fonte de dados Planilha 1

# Dimension & Measure

<b>Tabelas</b>	
⊕	City
⊕	Country
Abc	Customer ID
Abc	Customer Name
✓	first_hier
Abc	Category
Abc	Sub-Category
⊕	Order Date
Abc	Order ID
⊕	Postal Code
Abc	Product ID
Abc	Product Name
.ill.	Quantity (compartimento)
Abc	Region
#	Row ID
Abc	Segment
⊕	Ship Date
Abc	Ship Mode
⊕	State
⊕	Sub-Category (grupo)
Abc	Nomes de medida
#	Discount
*T F	flag_prej
#	Profit
#	Quantity
#	Sales
*#	Sales 2016
*#	Sales 2017
⊕	Latitude (gerada)
⊕	Longitude (gerada)
#	Orders (Contagem)
#	Valores de medida



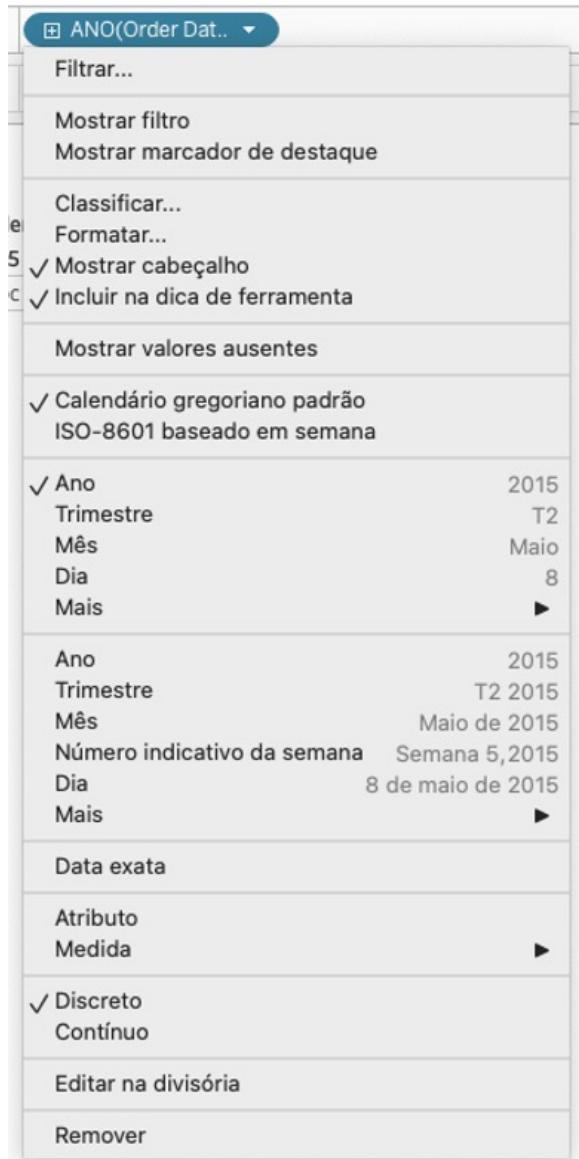
## Dimension

- Concat Strings
- Data Types:
  - string
  - Date
  - Country/Zip Code /City



## Measure

- Math operations
  - Sum
  - Count
  - CountD
  - var
  - std
  - Max
  - Min

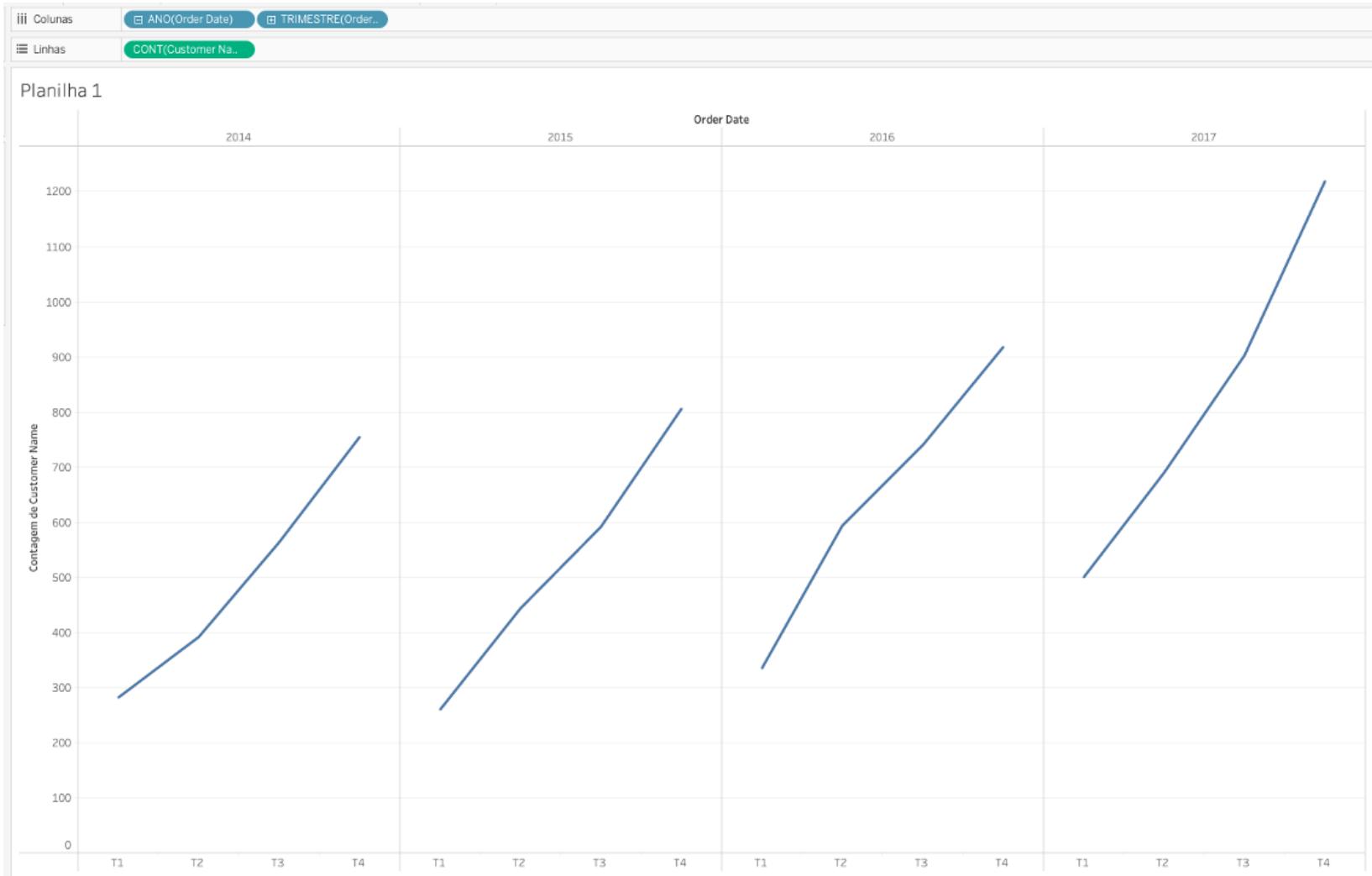


→ Discrete Date

→ Continuous Date

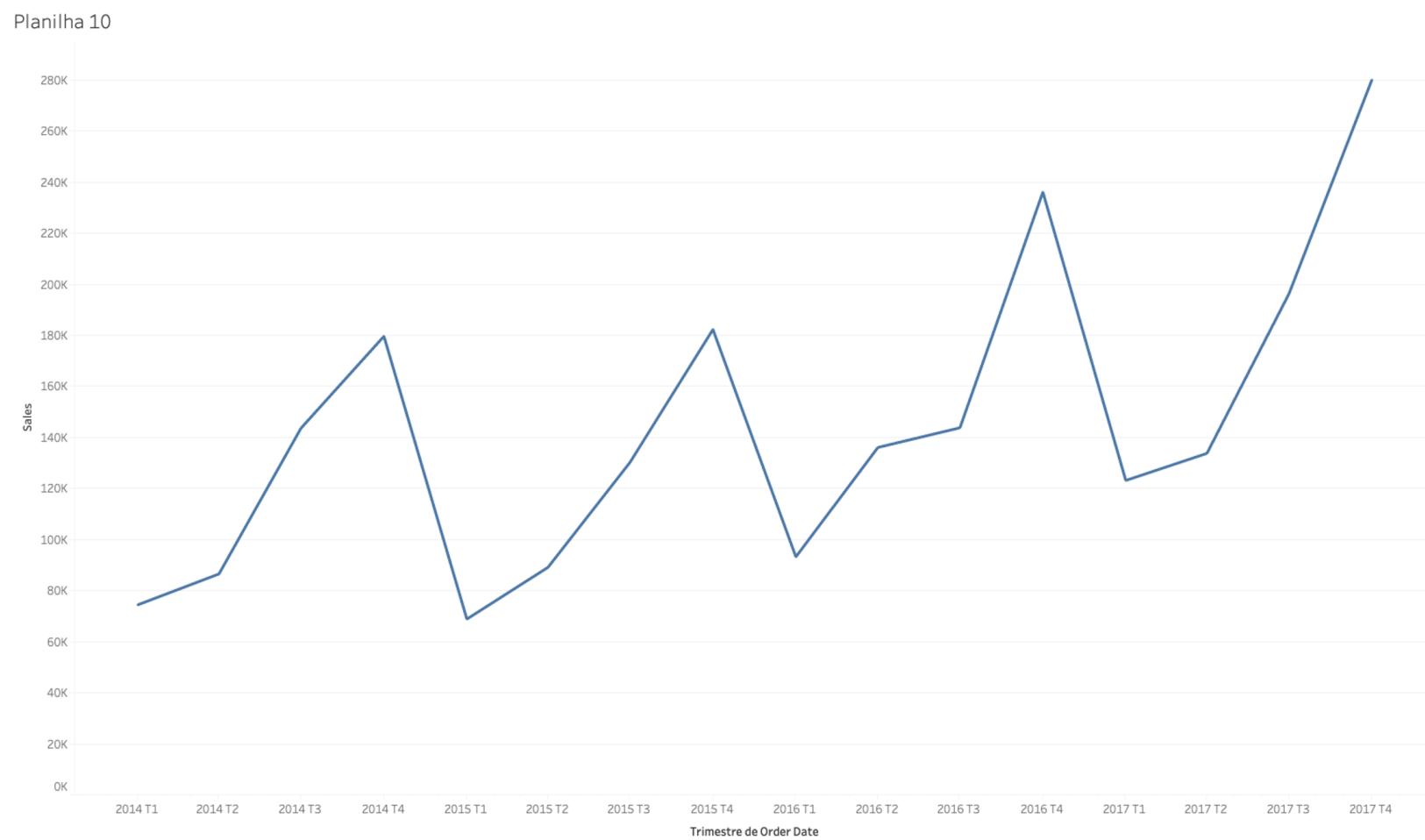
Example: **Sample - Superstore**

### Discrete Date



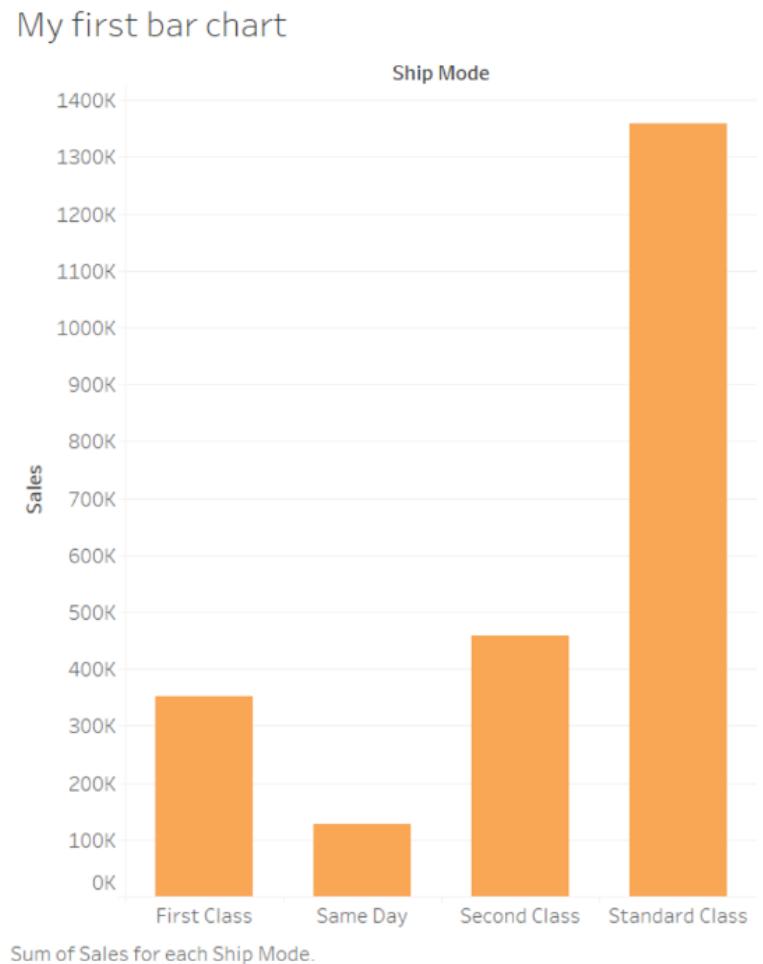
## Example: Sample - Superstore

### Continuous Date



## Example: Simple Bar Chart

- rename sheet
- change title
- transpose
- change color and width of bars
- save workbook



## Example: Second Bar Chart

- bar chart with Sales x

{Region, Segment, Category}

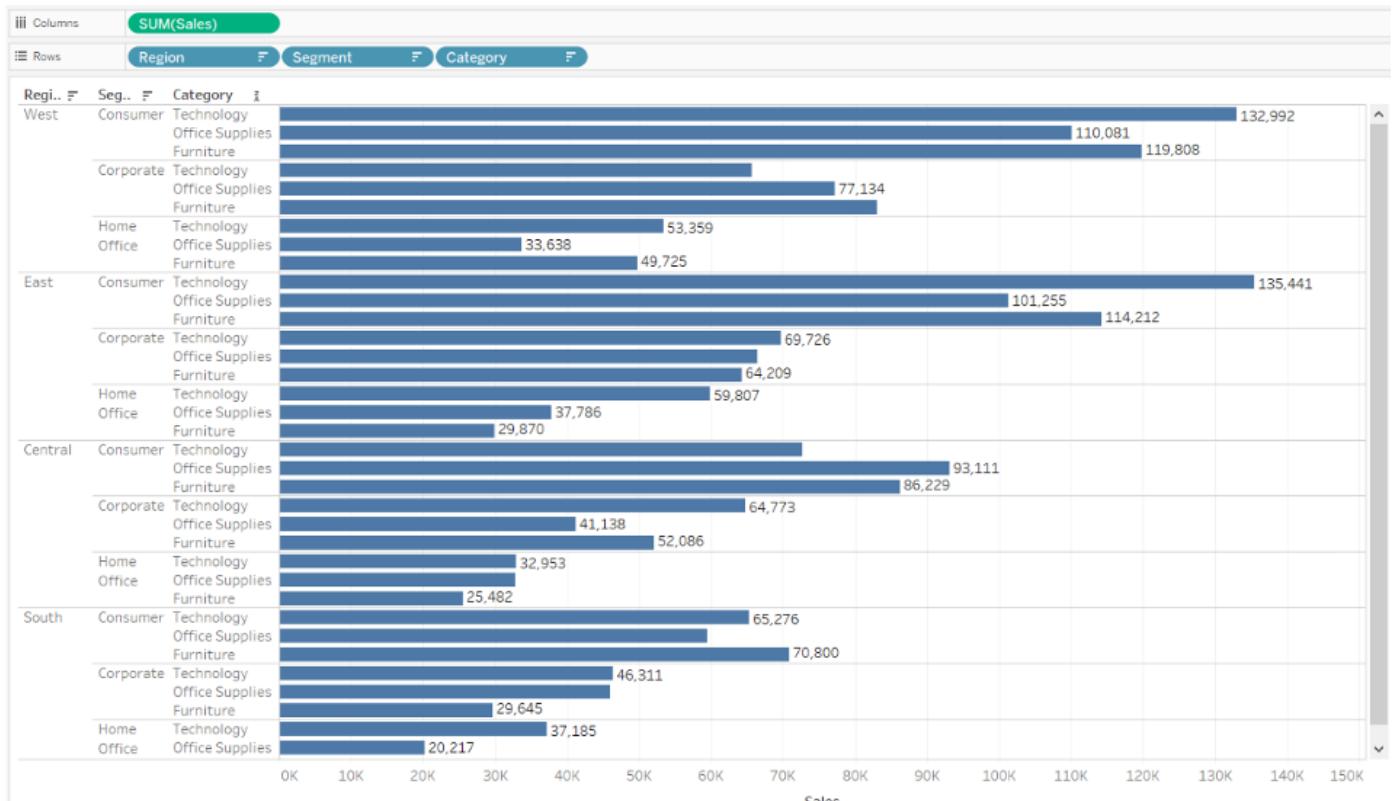
- Change the order of dimensions
- Sort bars and dimensions

(By quantity or alphabetically)

- Show/hide mark labels

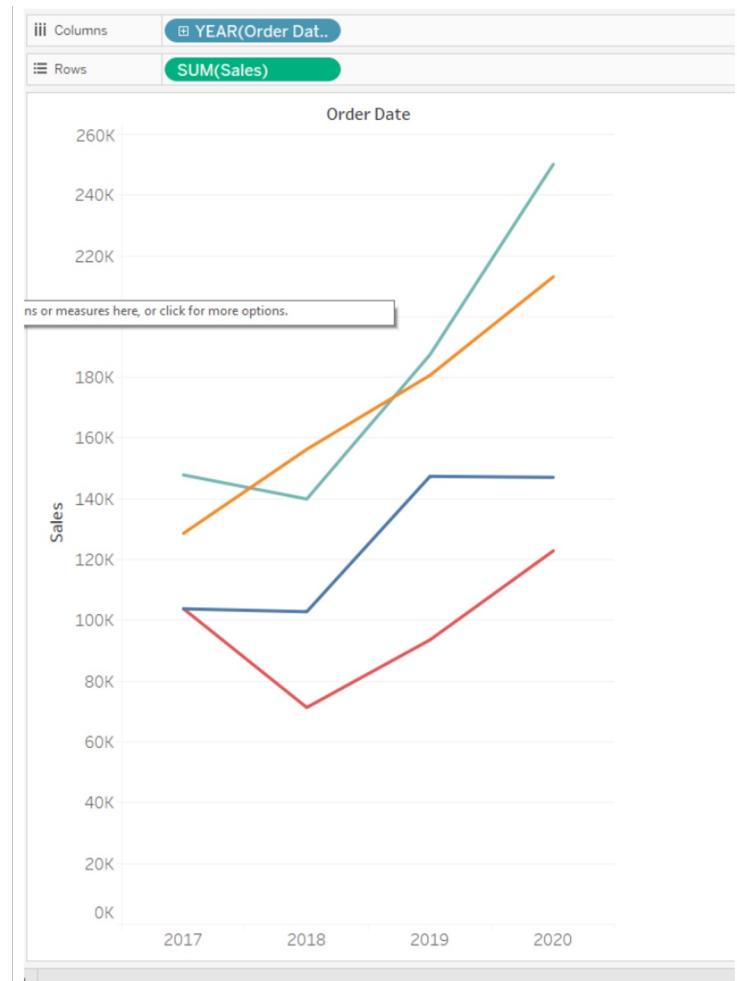
(button in the toolbar)

- Try other charts in "Show Me"



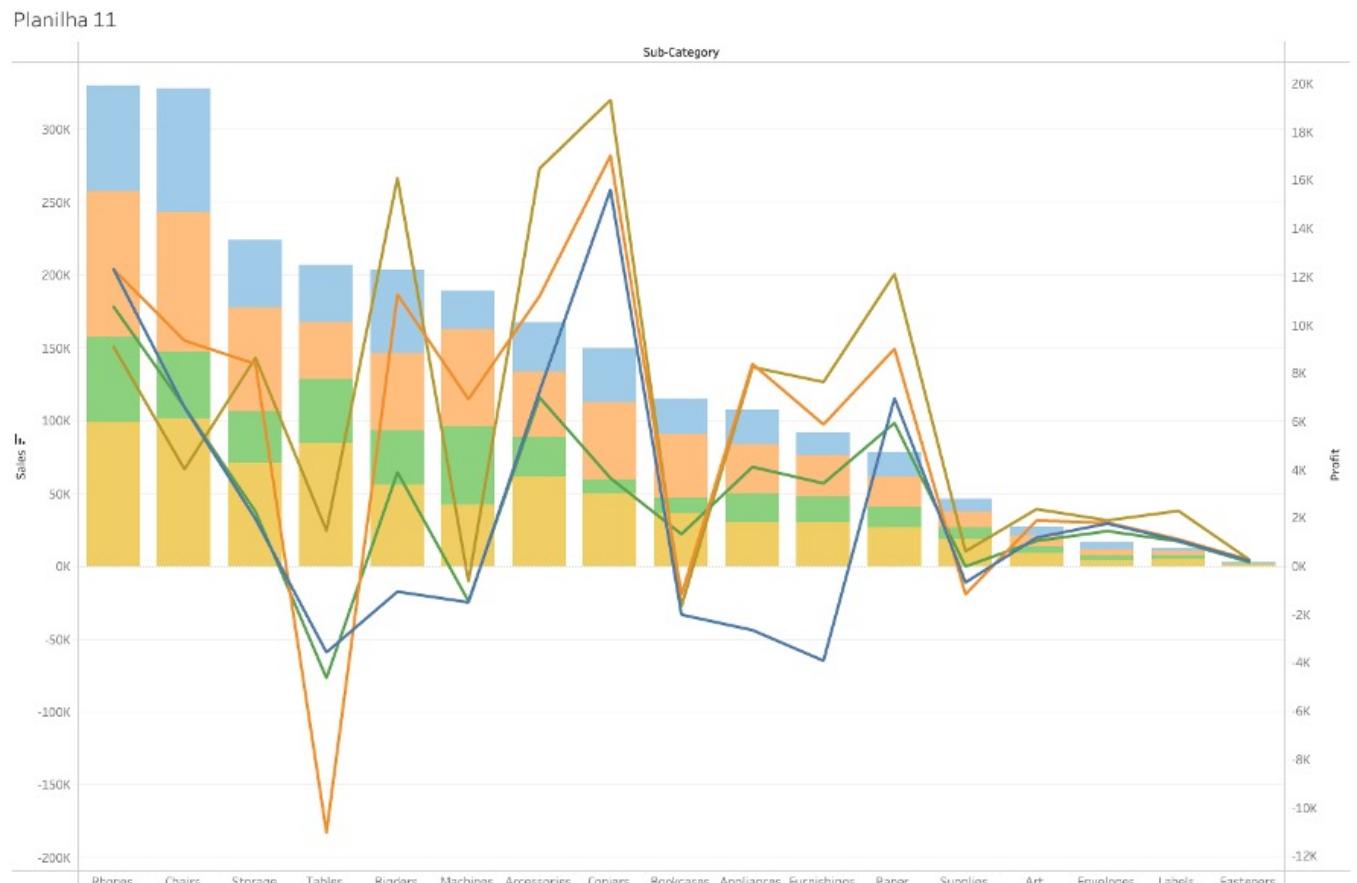
## Example: **Line Chart and dates**

- bar chart with OrderDate x Sales
- Explore the date drill down and roll up
- Add color by region
- Play with line and bar charts



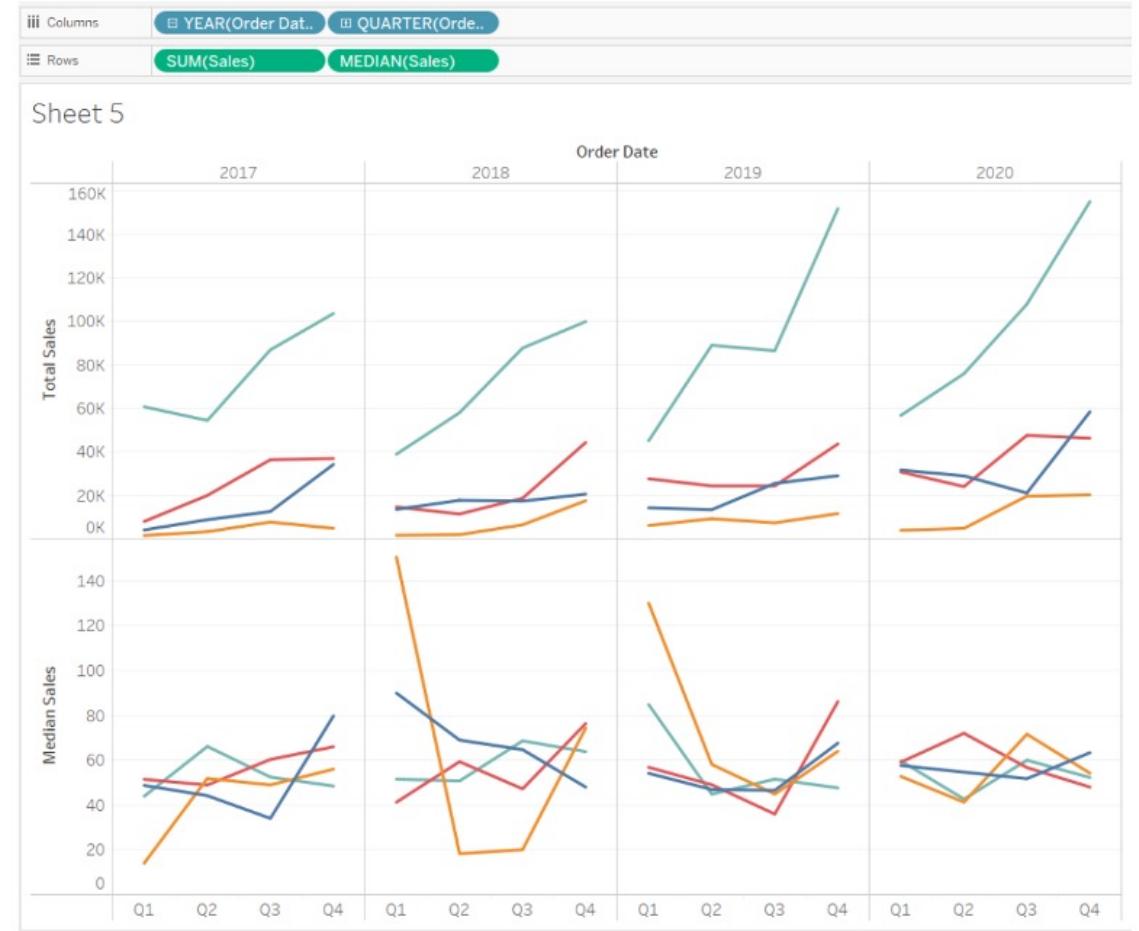
## Example: Dual Axis

- Create a bar chart with  
Sub-Category x Sales
- Add color according to Region
- Add the Profit Measure
- Try dual-axis
- Change the mark type of one of the charts



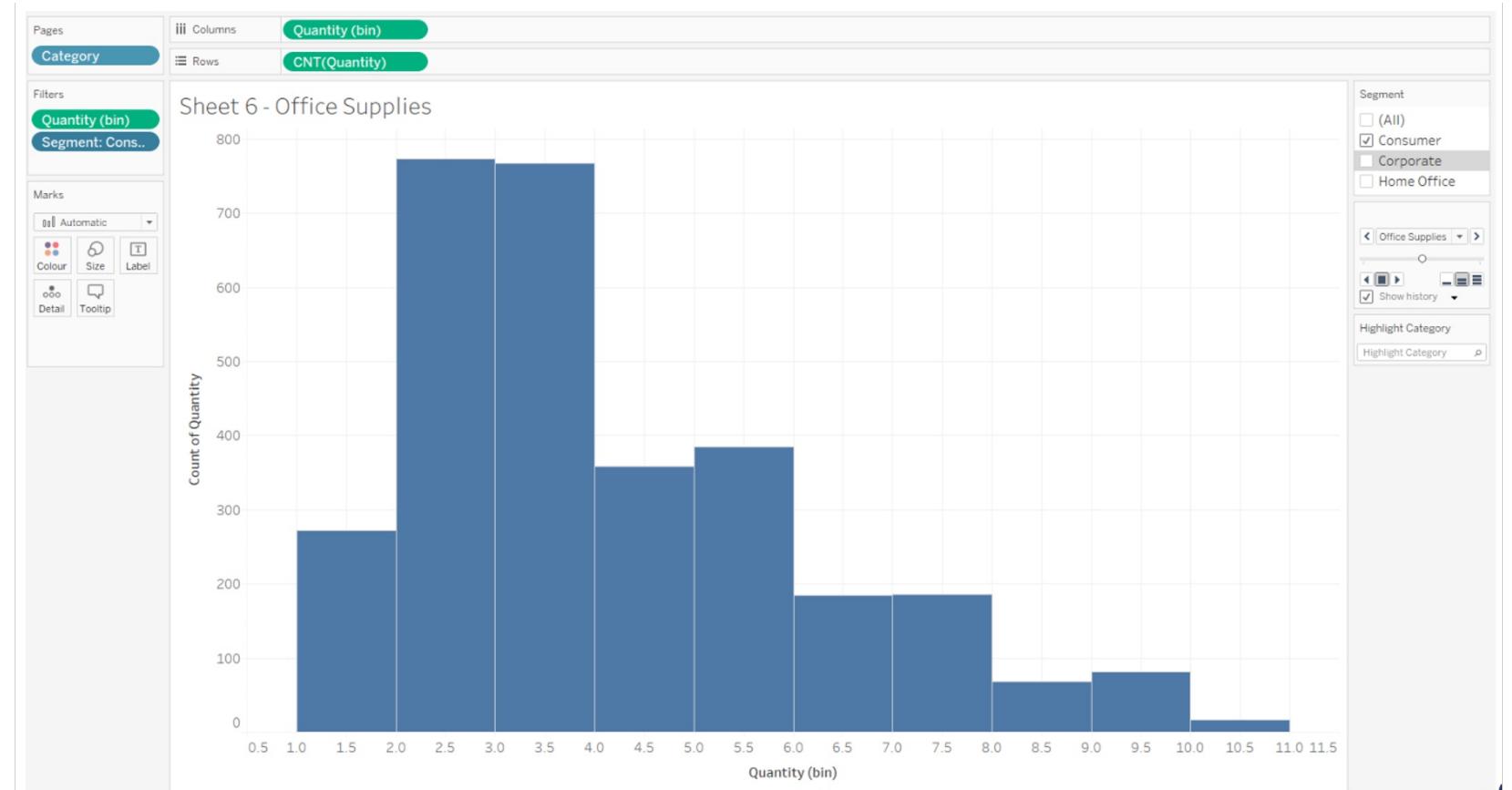
## Example: **changing measures**

- Create a line plot with Order Date x Sales
- Color by ship mode
- Change the sum of sales to average or the standard deviation, max, count, etc.



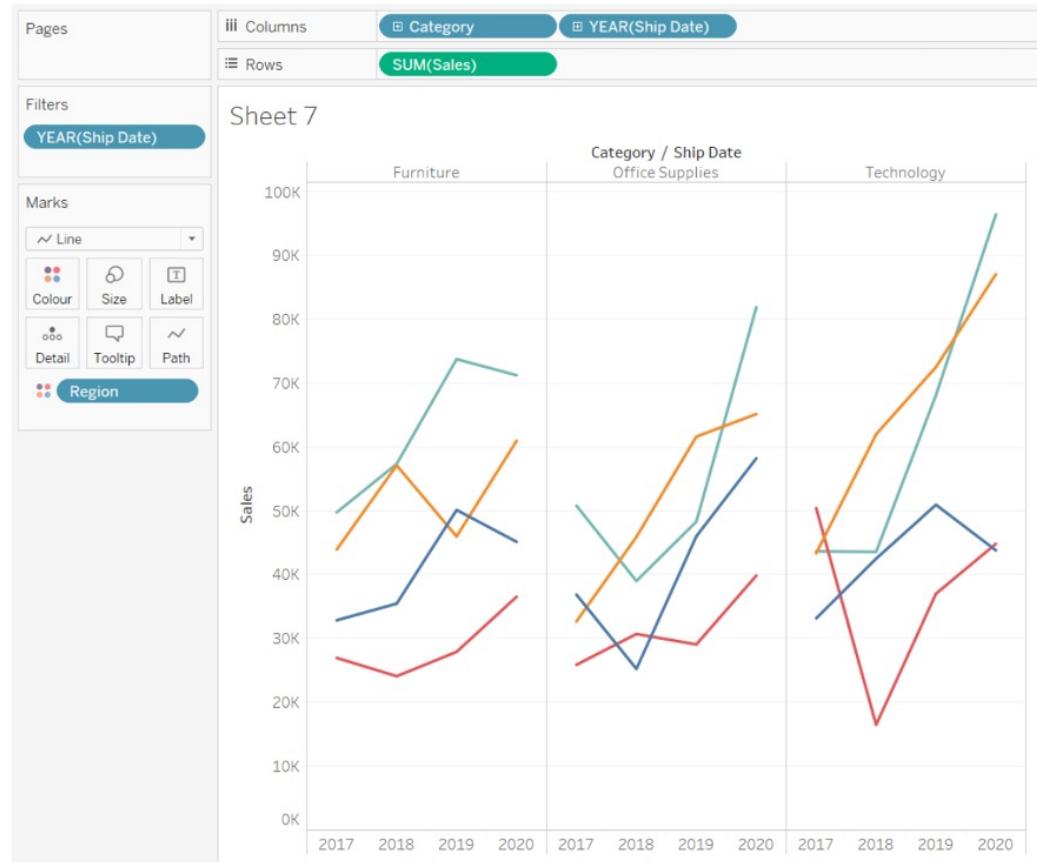
## Example: **changing measures**

- Create an histogram for quantity
- Adjust bin width to 1  
(see dimension Quantity(bin))
- Filter by Quantity < 10
- Play with the filter
- Add pages by Segment



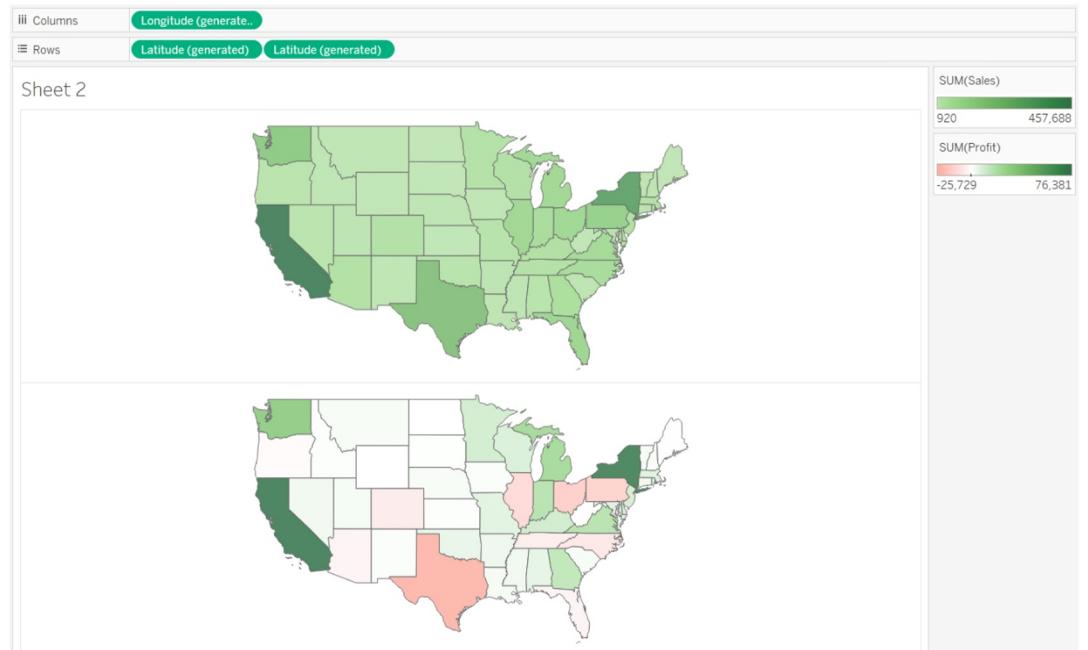
## Example: **hierarchies**

- Plot Sales x ShipDate
- Add color by Region
- Define the Category-Sub-Category hierarchy
- Add the hierarchy to the columns



Example: **map**

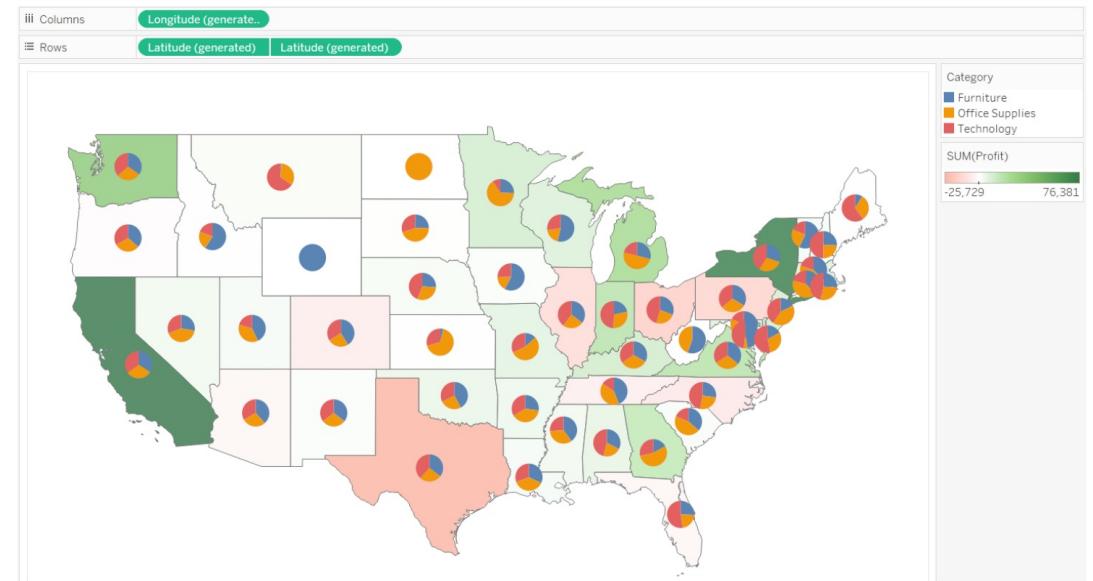
- Create a Map Plot with Sales by State (probably need to correct the geographic role of state)
- Remove undesired Map Layers
- Choose color scale
- Duplicate Latitude dimension
- In the bottom plot replace Sales by Profit in Size and choose a nice color



Example: **map**

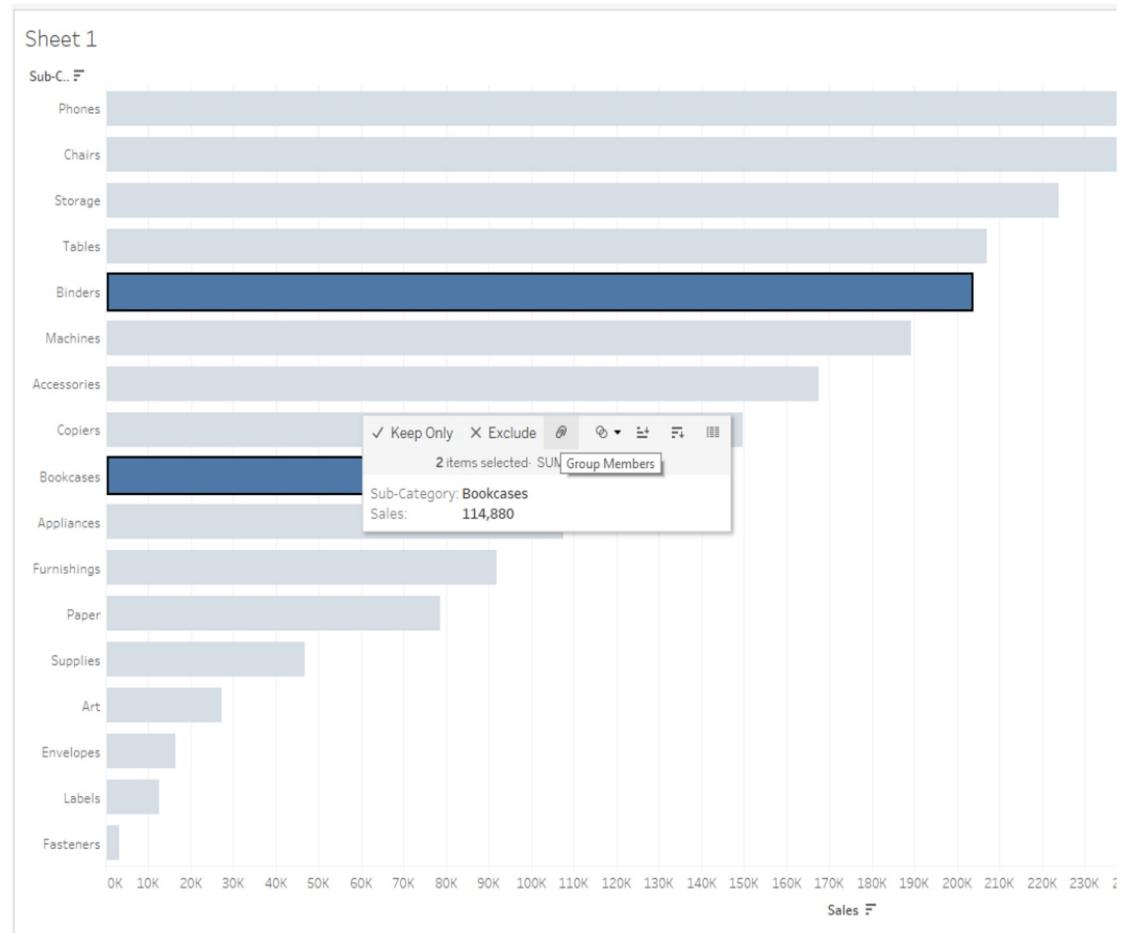
Now change the way we are showing profit:

- Remove Profit
- Add Category to color
- Change to Pie Chart
- Place Profit in the Angle
- Set Dual Axis (Latitude combo box)

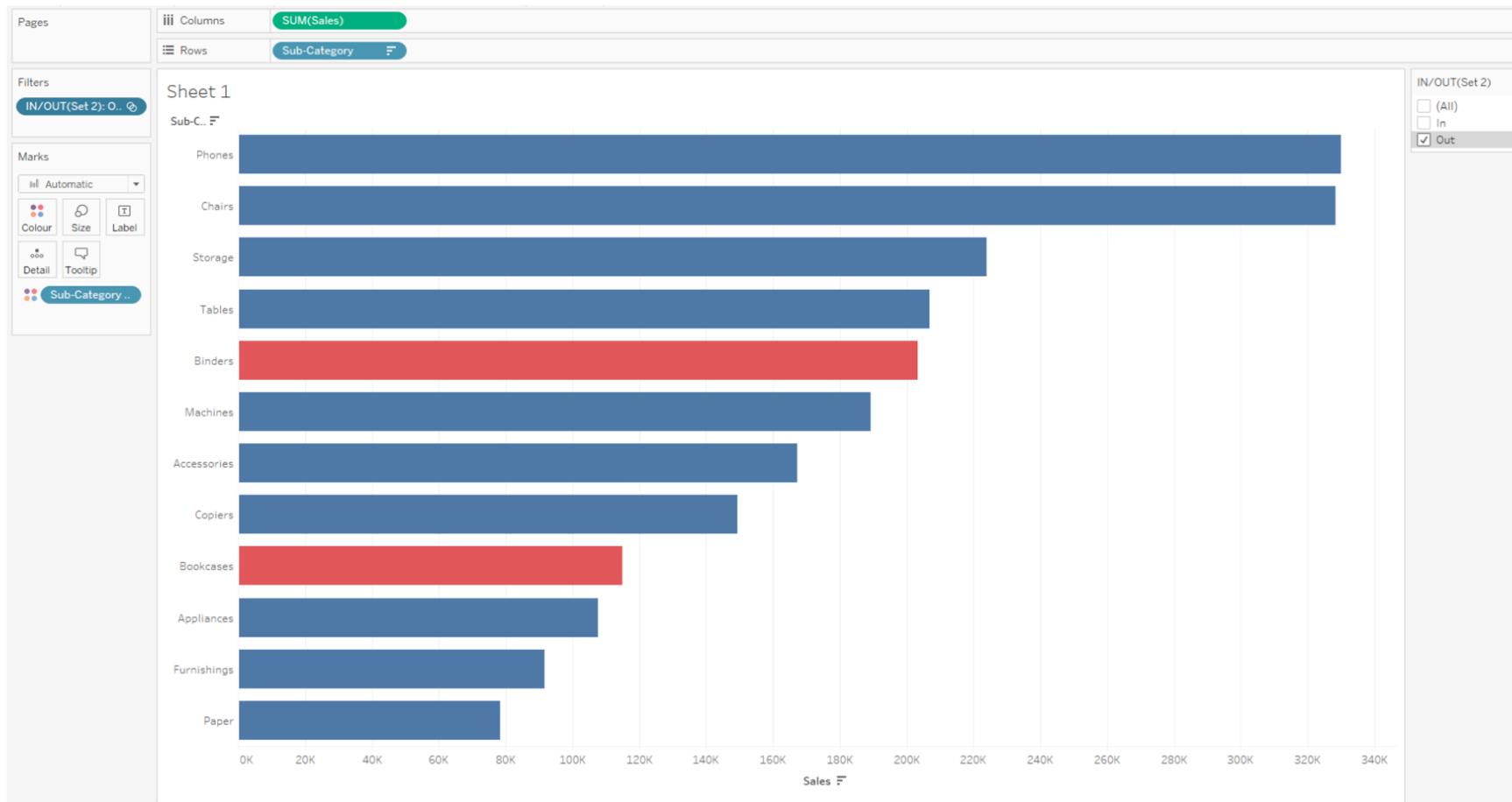


Example: **highlight and group bars**

- create a bar plot with sub-category x sales
- select the bars to highlight
- set group in popup window
- set colors

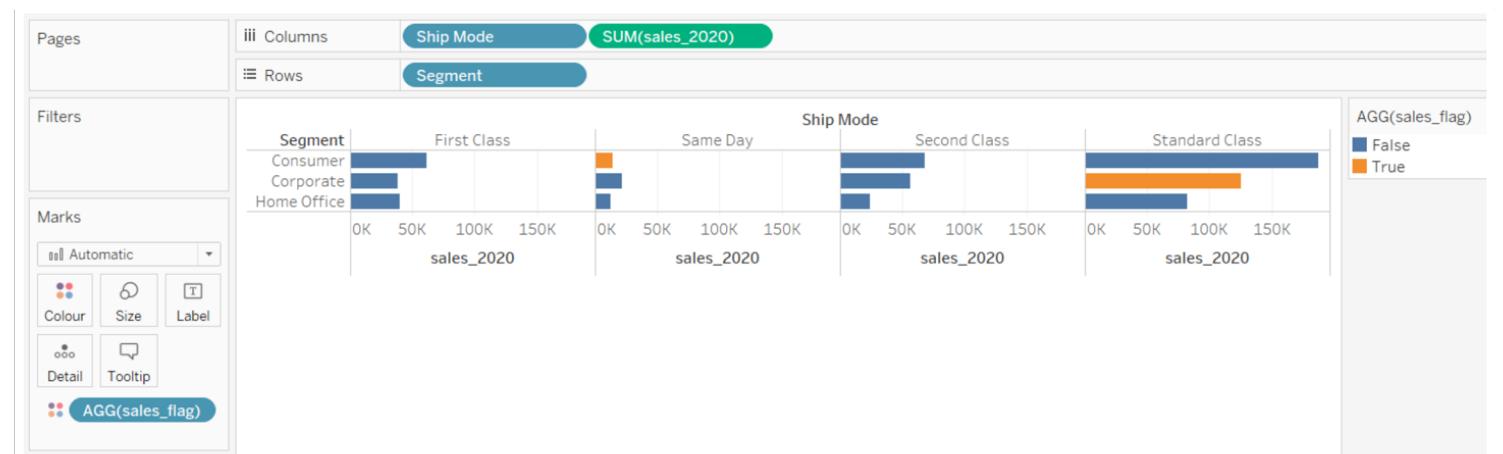
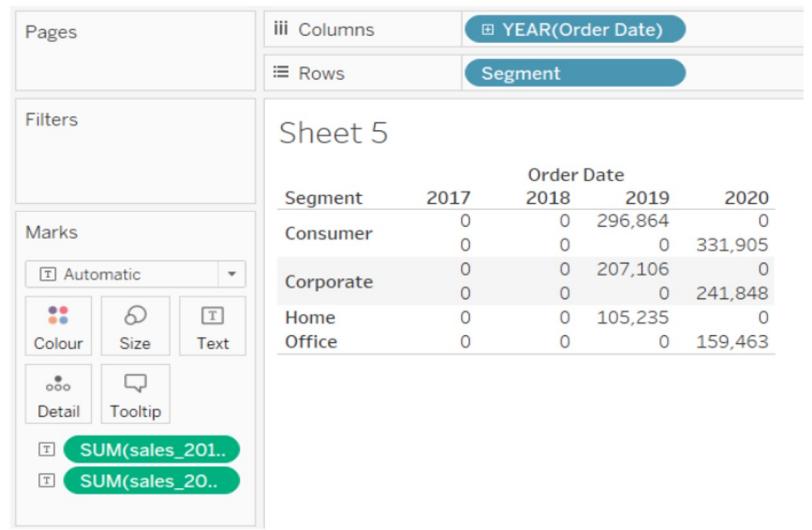


## Example: use it as filter



## Example: **calculated fields**

- Create sales\_2016 and sales\_2017 fields
- Create a table with order\_date x segment to check the new fields
- Create a sales\_flag to be true (if sales\_2016 > sales\_2017)
- create a bar-plot segment x shop mode, sales\_2017 color by the flag



## Example: **reference**

- add a reference line showing the sales\_2016
- change color and thickness
- add region to rows



## Example: waterfall plot

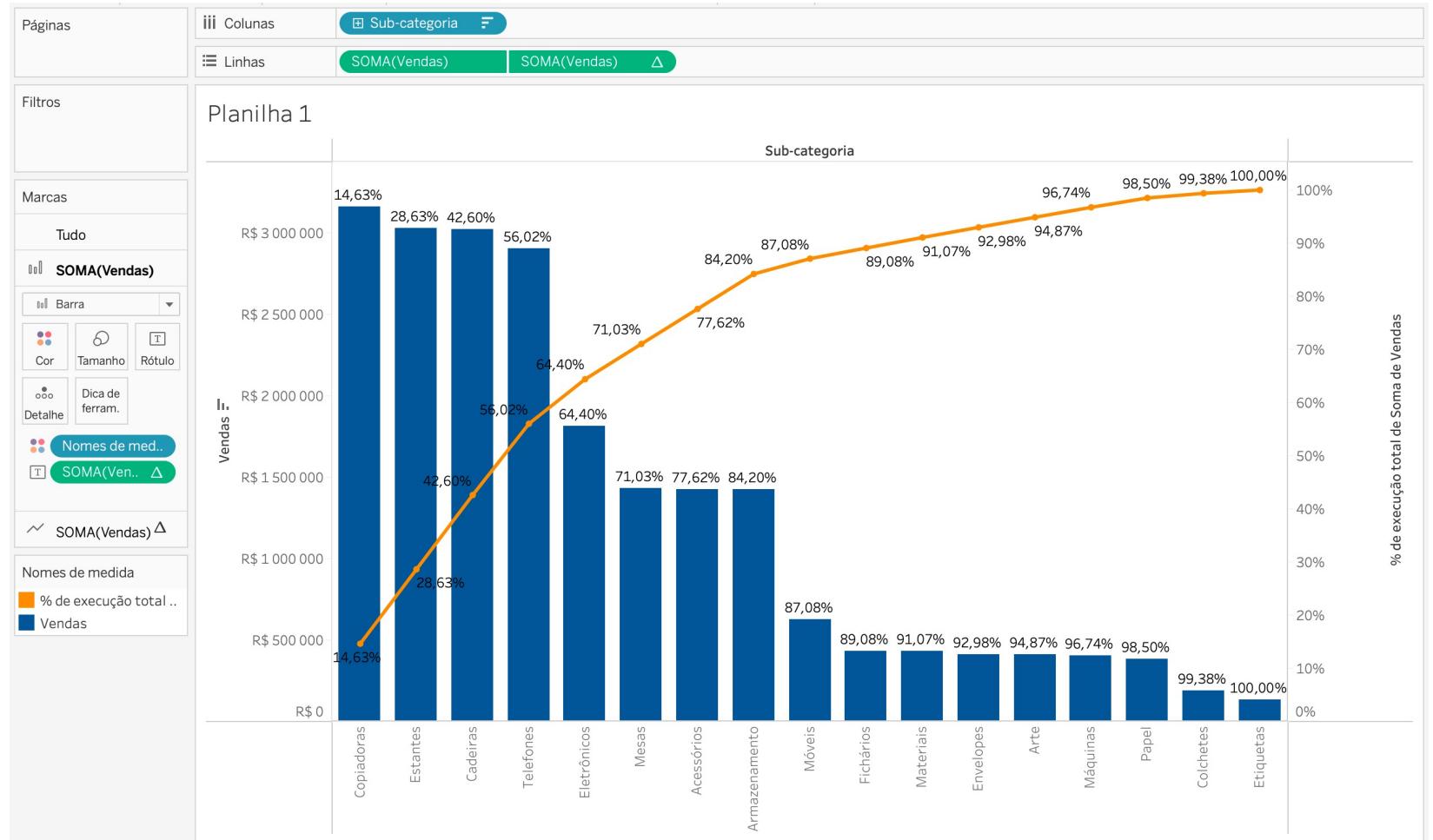
- create a plot with sub-category x profit
- change the mark to Gantt bar
- create a var with -profit
- set the size by the new var
- set the color by profit
  - modify the color scale for two levels
- in the rows sum(profit) go to quick table calculation
  - choose running total
- In the analysis\totals menu
  - select show grand totals



Example: **pareto**

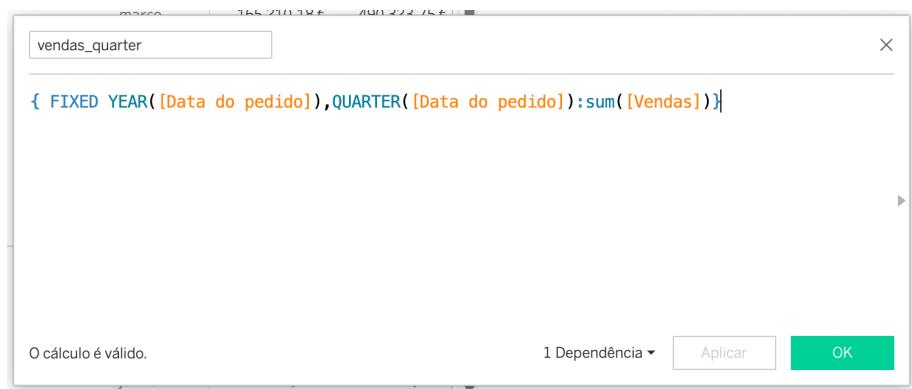
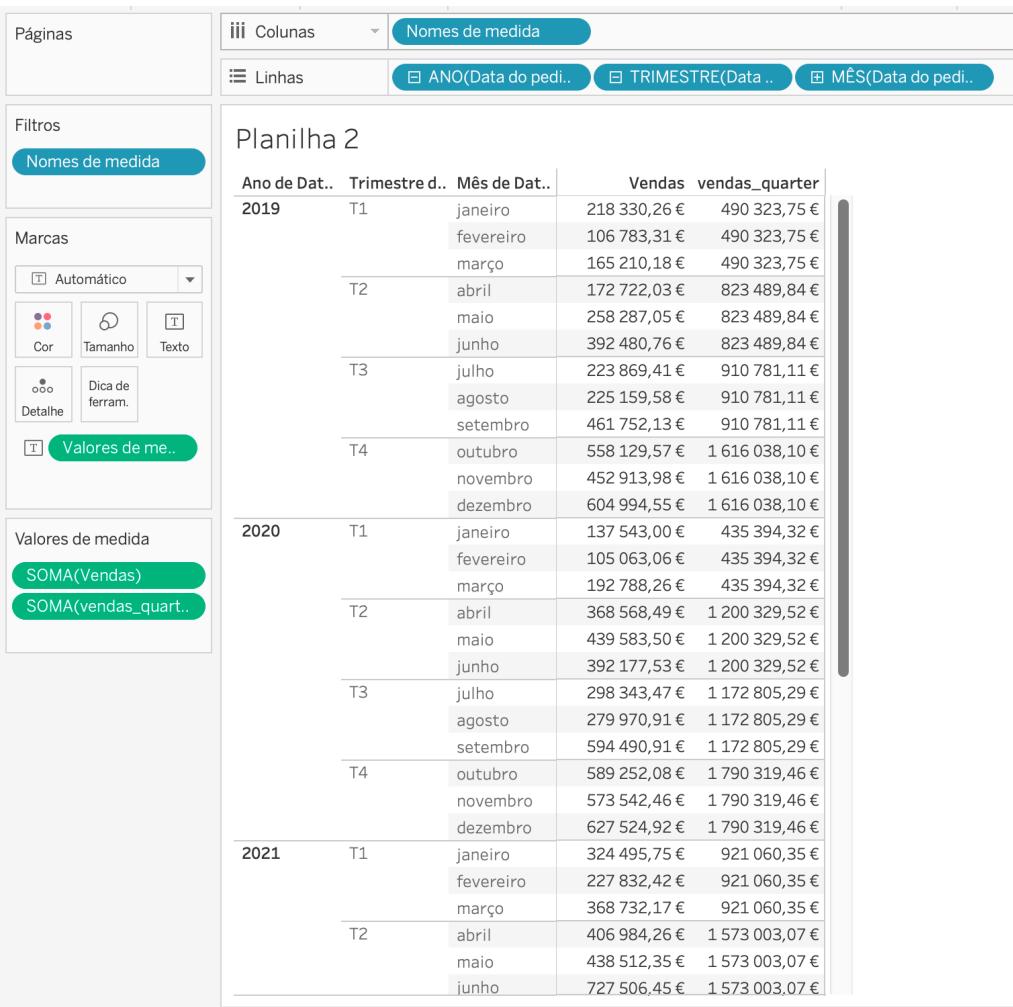
## ● Plot Sales x Total% Sales

## ● Dual Axis



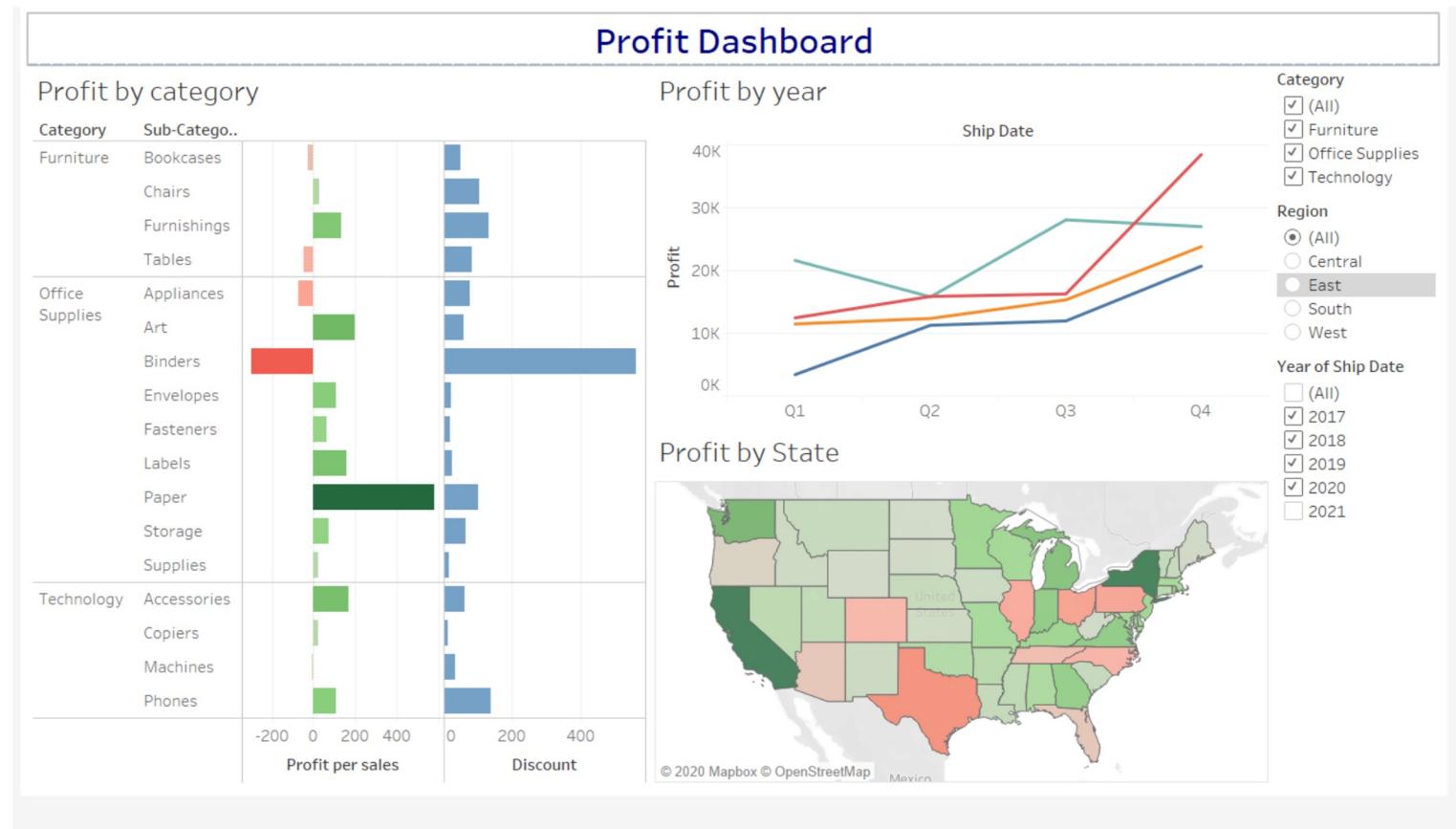
## Example: **fixed function**

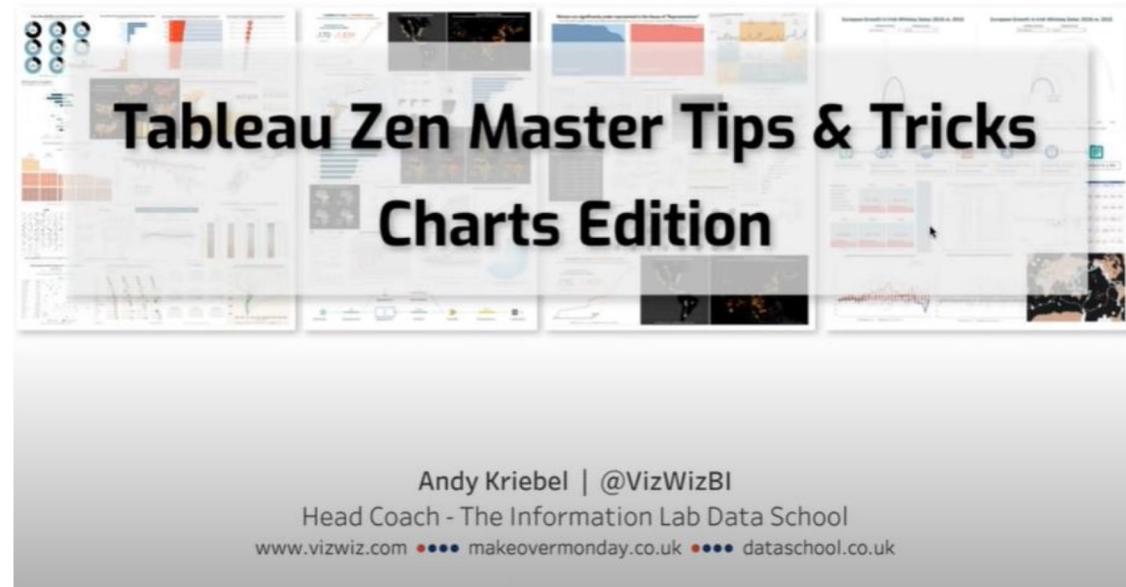
- Aggregate by a fixed dimension

**Planilha 2**

Ano de Dat..	Trimestre d..	Mês de Dat..	Vendas	vendas_quarter
2019	T1	janeiro	218 330,26 €	490 323,75 €
		fevereiro	106 783,31 €	490 323,75 €
		março	165 210,18 €	490 323,75 €
	T2	abril	172 722,03 €	823 489,84 €
		maio	258 287,05 €	823 489,84 €
		junho	392 480,76 €	823 489,84 €
	T3	julho	223 869,41 €	910 781,11 €
		agosto	225 159,58 €	910 781,11 €
		setembro	461 752,13 €	910 781,11 €
	T4	outubro	558 129,57 €	1 616 038,10 €
		novembro	452 913,98 €	1 616 038,10 €
		dezembro	604 994,55 €	1 616 038,10 €
2020	T1	janeiro	137 543,00 €	435 394,32 €
		fevereiro	105 063,06 €	435 394,32 €
		março	192 788,26 €	435 394,32 €
	T2	abril	368 568,49 €	1 200 329,52 €
		maio	439 583,50 €	1 200 329,52 €
		junho	392 177,53 €	1 200 329,52 €
	T3	julho	298 343,47 €	1 172 805,29 €
		agosto	279 970,91 €	1 172 805,29 €
		setembro	594 490,91 €	1 172 805,29 €
	T4	outubro	589 252,08 €	1 790 319,46 €
		novembro	573 542,46 €	1 790 319,46 €
		dezembro	627 524,92 €	1 790 319,46 €
2021	T1	janeiro	324 495,75 €	921 060,35 €
		fevereiro	227 832,42 €	921 060,35 €
		março	368 732,17 €	921 060,35 €
	T2	abril	406 984,26 €	1 573 003,07 €
		maio	438 512,35 €	1 573 003,07 €
		junho	727 506,45 €	1 573 003,07 €





## Tableau Zen Master Tips & Tricks - Charts Edition

<https://www.youtube.com/watch?v=S5QN-fK2-wU>

# Q&A