Intro to Data Visualization

With Tableau

Studied Business
Administration

Worked as Sales,
Account Manager,
Product Manager
(mainly in ad tech)

Now: Data Analyst at
TravelPerk

ESADE

2009-2014

2014-2019
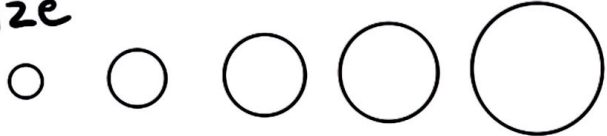
2019

Data Visualization Fundamentals

"A picture is worth a thousand words"

English proverb

Visual Encodings

Data-Ink Ratio

CALORIE COUNTS *per 100g*

CALORIE COUNTS *per 100g*
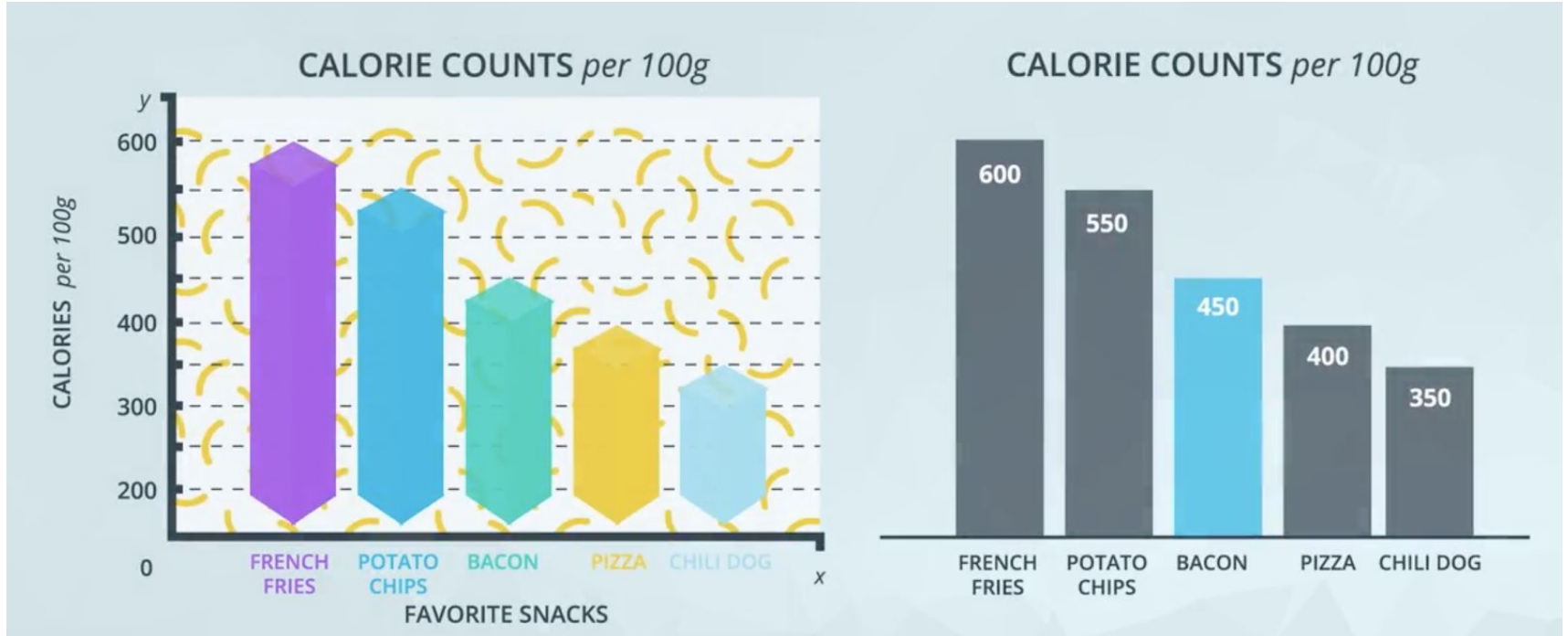
Data-Ink Ratio

$$\text{Data-ink ratio} = \frac{\text{Data-ink}}{\text{Total ink used to print the graphic}}$$

Goal: maximize data-ink ratio and erase as much chart junk as possible.

Data visualization bad practices

3D visualizations

Data visualization bad practices

Truncating axes

Same Data, Different Y-Axis
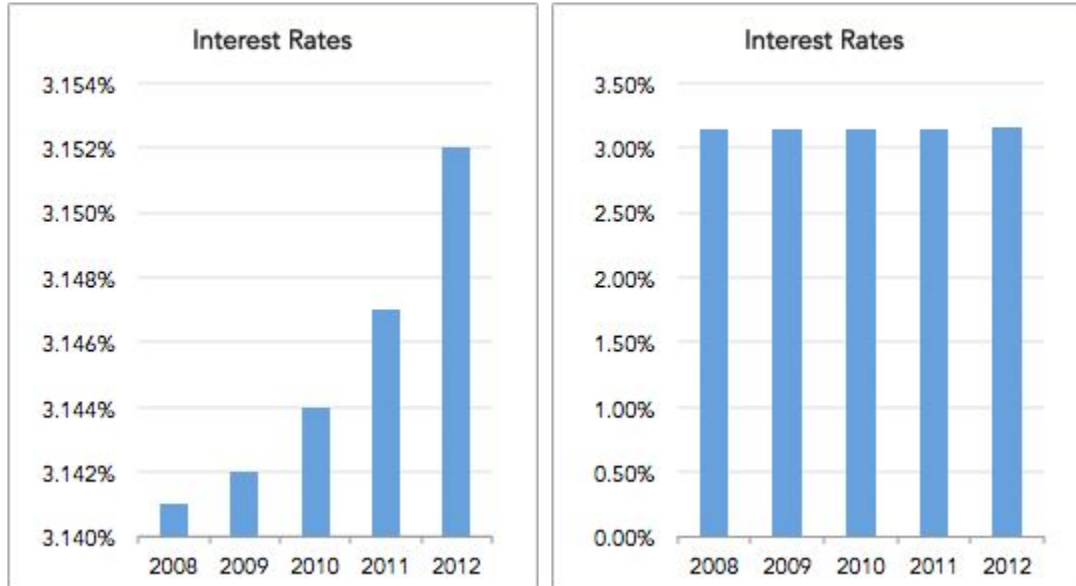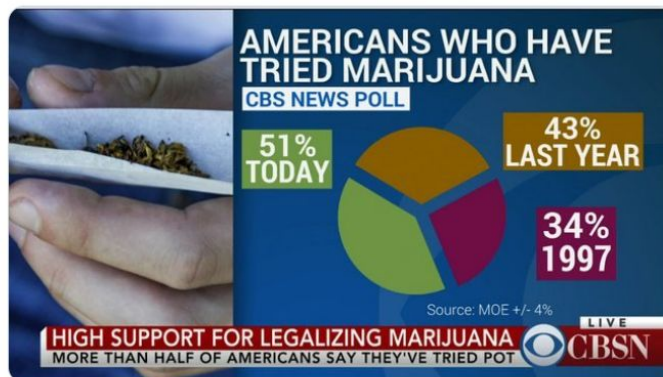
Data visualization bad practices

Choice of Graph Type
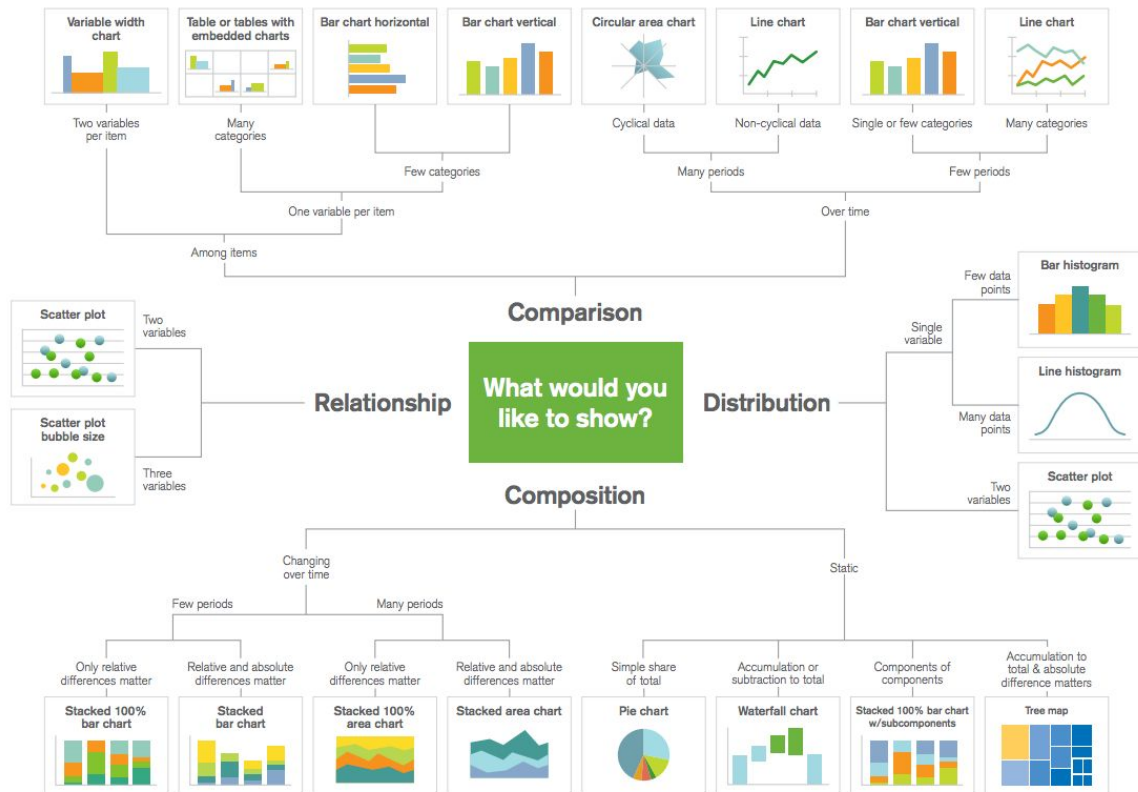
Choose the "right" graph

PRE: How do you feel about doing science?

- Bored — 11%
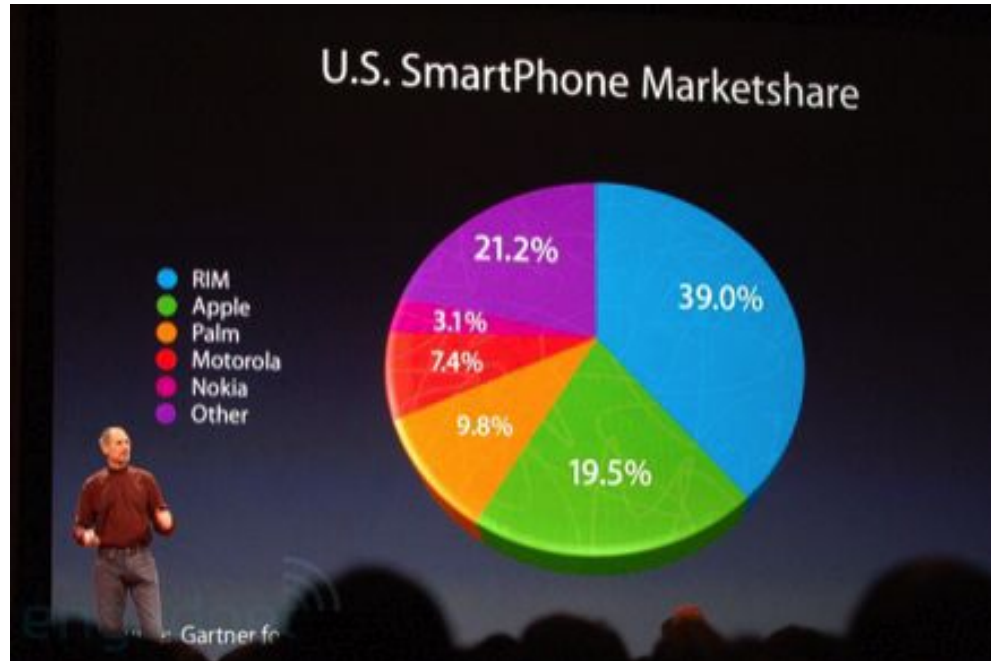- Not great — 5%
- OK — 40%
- Kind of interested — 25%
- Excited — 19%

POST: How do you feel about doing science?

- Bored — 12%
- Not great — 6%
- OK — 14%
- Kind of interested — 30%
- Excited — 38%

Cole Nussbaumer, Storytelling with Data
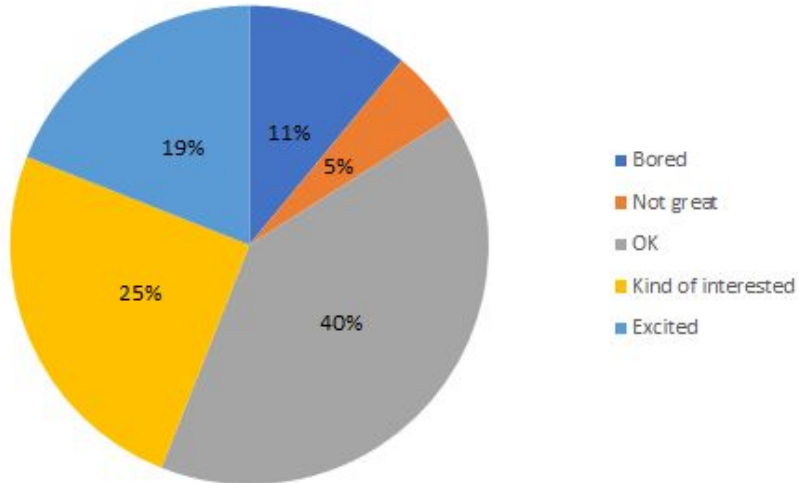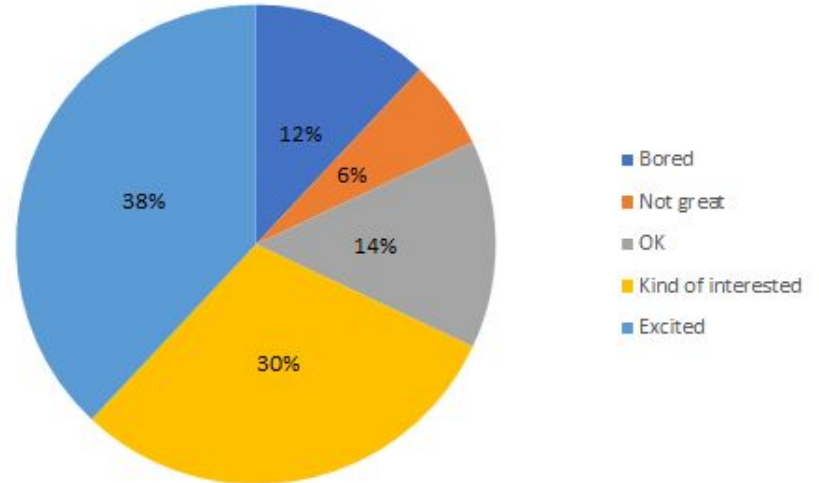
Choose the "right" graph

How do you feel about science?

BEFORE program, the majority of children felt just *OK* about science

AFTER program, more children were *Kind of interested* & *Excited* about science.

	Bored	Not great	OK	Kind of interested	Excited
Before	11%	5%	40%	25%	19%
After	12%	6%	14%	30%	38%
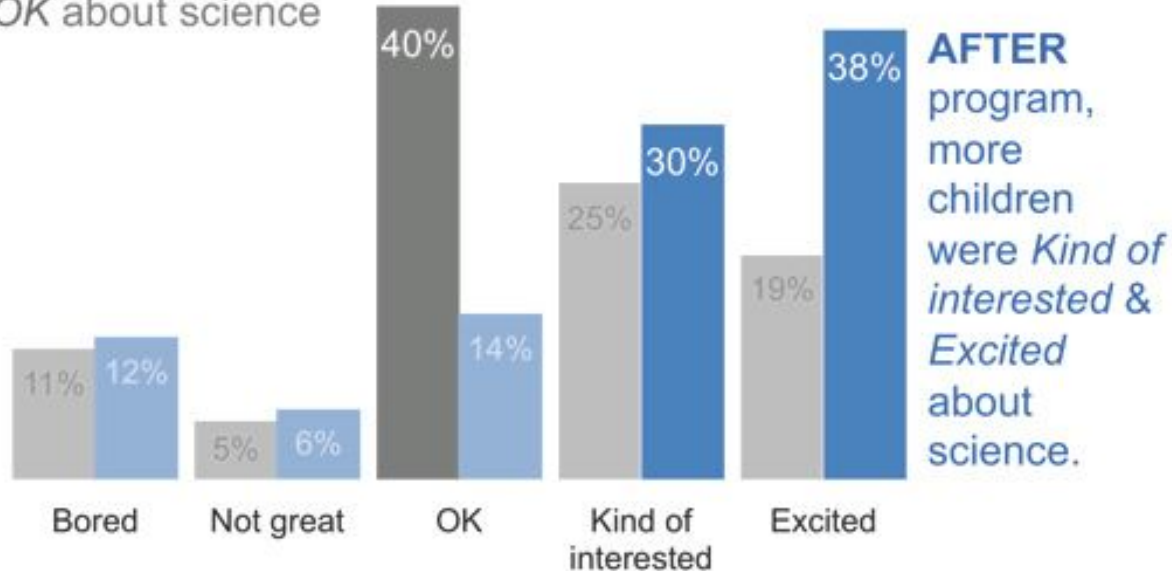
Choose the "right" graph

Cumulative monthly change in jobs since September 2010

Job losses in March and April nearly wiped out the previous 113 months of job gains, but May showed a partial comeback.

+20 million

+15

+10

+5

130 million total jobs in Sept. 2010

0

+22,106,000 jobs from Oct. 2010 through Feb. 2020

−1,373,000 in March

−20,687,000 in April

+2,509,000 in May

'11 '12 '13 '14 '15 '16 '17 '18 '19 '20
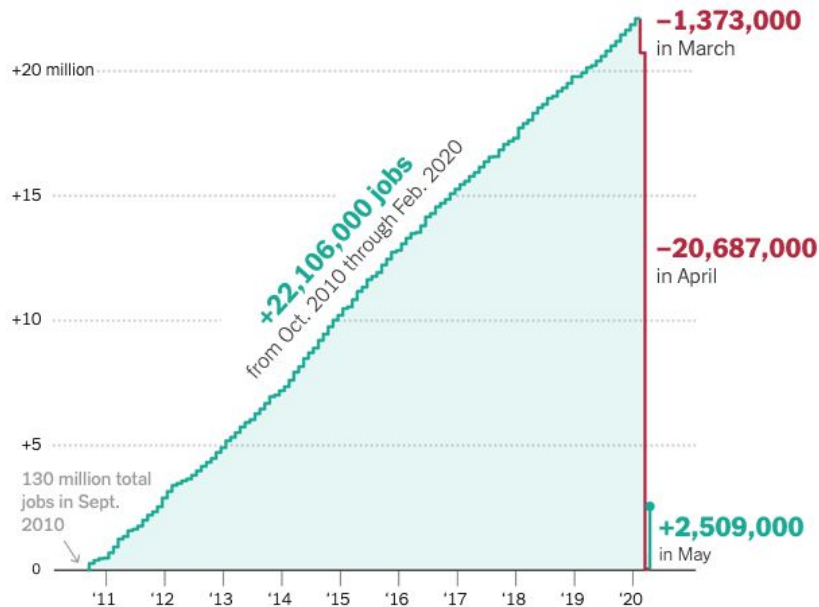
By Ella Koeze · Source: Bureau of Labor Statistics

Job losses and gains since 2015

Total nonfarm payrolls, change from previous month
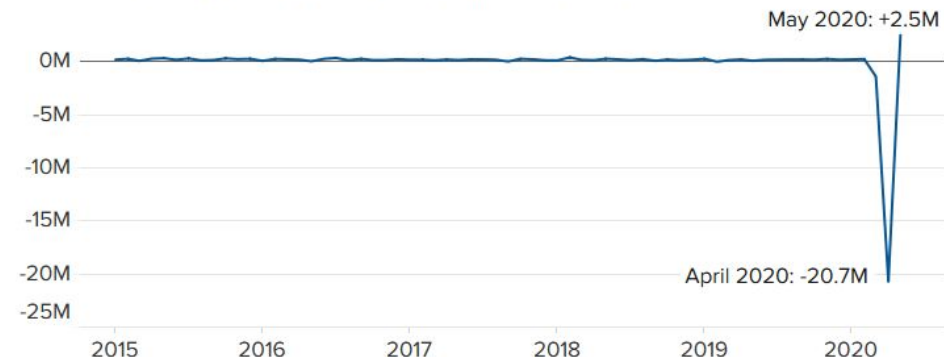
0M

−5M

−10M

−15M

−20M

−25M

2015 2016 2017 2018 2019 2020

May 2020: +2.5M

April 2020: −20.7M

SOURCE: Bureau of Labor Statistics

CNBC

Design inclusively
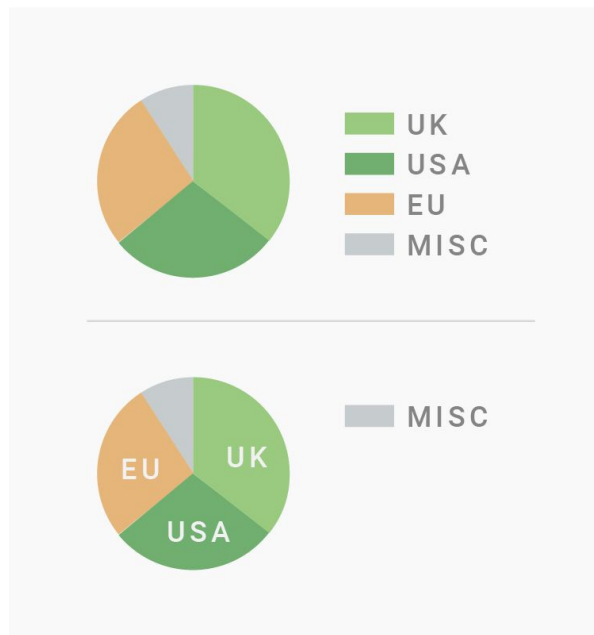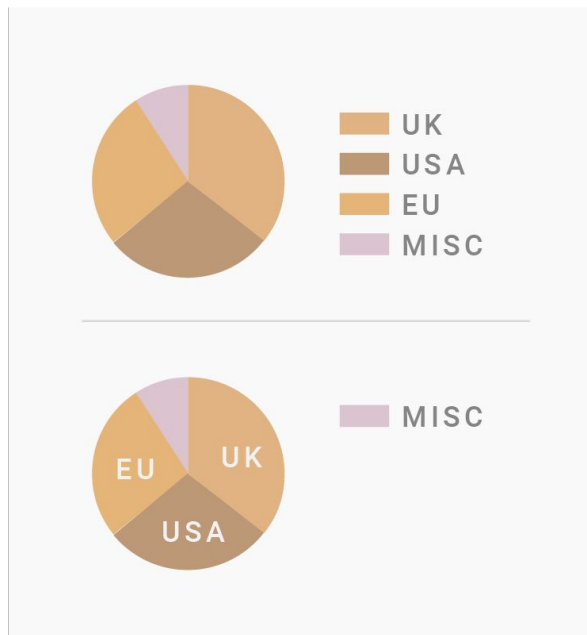
- Get it right in black and white

- Choose colorblind friendly palette

- Use other symbols apart from color (labels, shapes, patterns)

Business Intelligence Tools

Most used BI tools

Tableau Public vs Tableau Desktop

Public

- You can only store your work online
- Can be connected with a limited number of data sources
- Used mostly for education
- Free

Desktop

- You can store your work locally (on your computer)
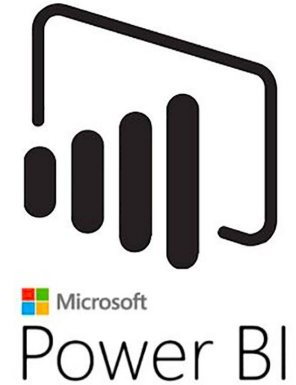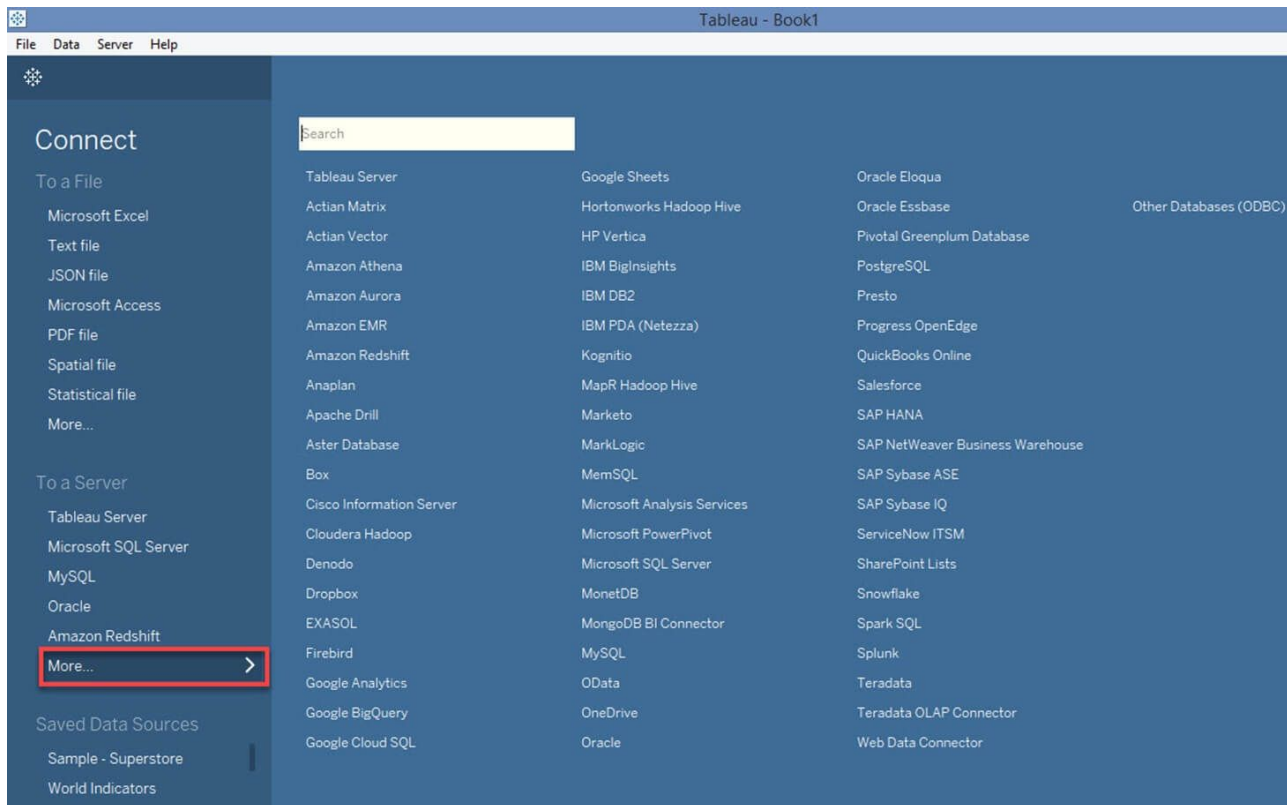- Can connect to more data sources
- Used mostly for work
- Paid

Tableau Fundamentals

Connecting to Data Source

Data Types

Data type icone in Tableau

Icon	Data type
Abc	*Text (string) values*
📅	*Date values*
📅🕐	*Date & Time values*
#	*Numerical values*
T|F	*Boolean values (relational only)*
🌐	*Geographic values (used with maps)*

Tableau Workspace
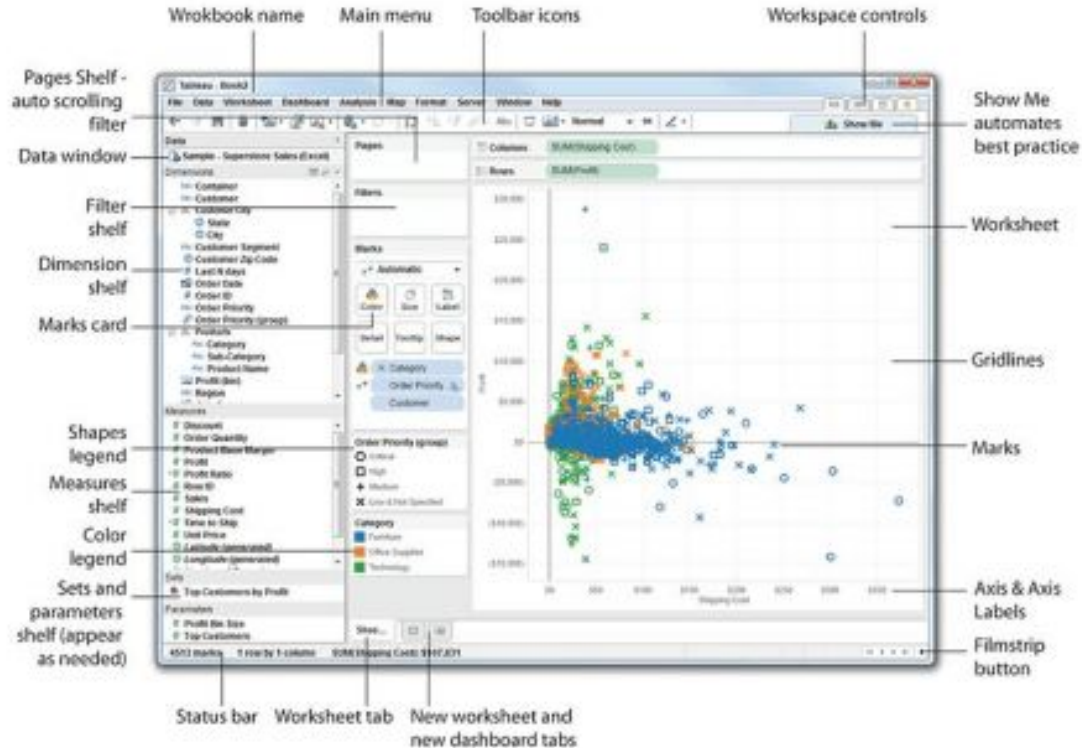
Building Charts in Tableau

Bubble Charts

Netflix Genres
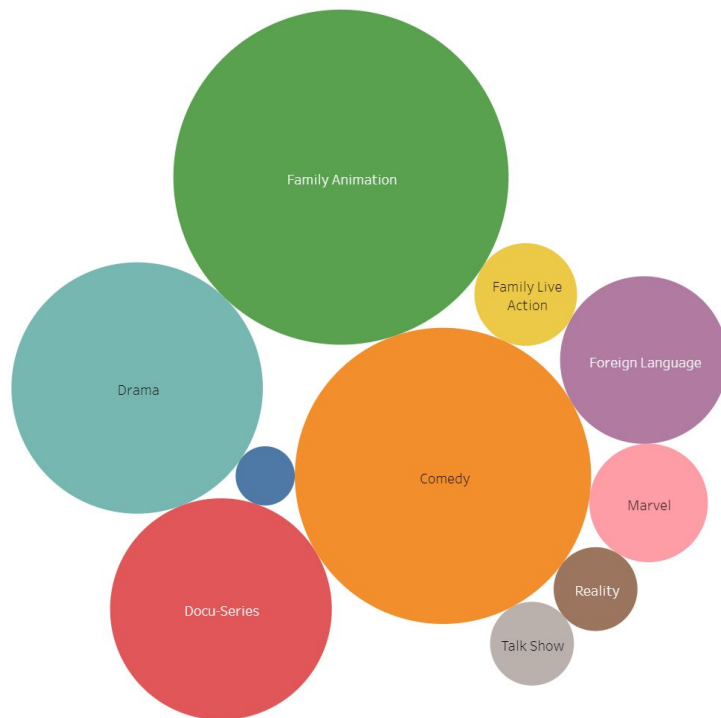
Major Genre
- Animation
- Comedy
- Docu-Series
- Drama
- Family Animation
- Family Live Action
- Foreign Language
- Marvel
- Reality
- Talk Show

Histograms

IMDB Ratings Distribution

Boxplots

IMBD Rating Distribution by Genre
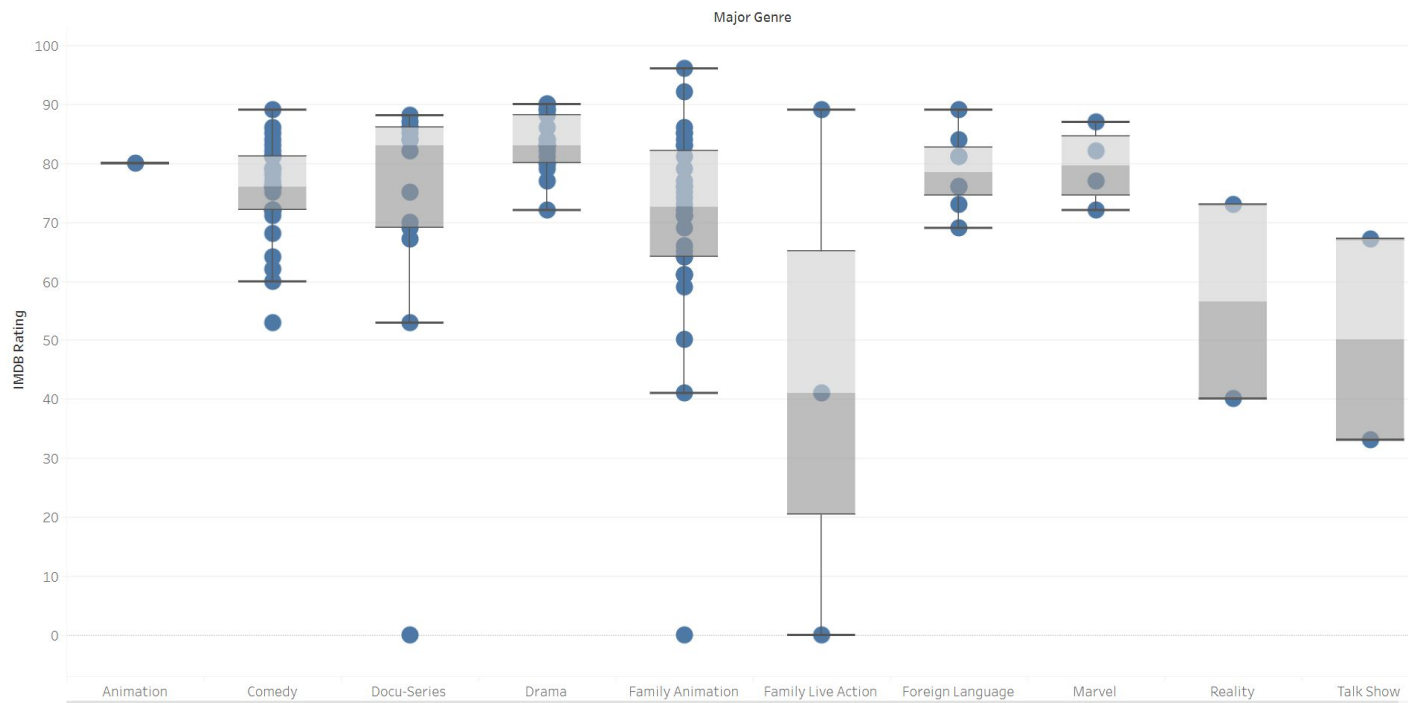
Scatterplots

IMDB Rating vs Number of Episodes, by Genre

Major Genre
- Animation
- Comedy
- Docu-Series
- Drama
- Family Animation
- Family Live Action
- Foreign Language
- Marvel
- Reality
- Talk Show
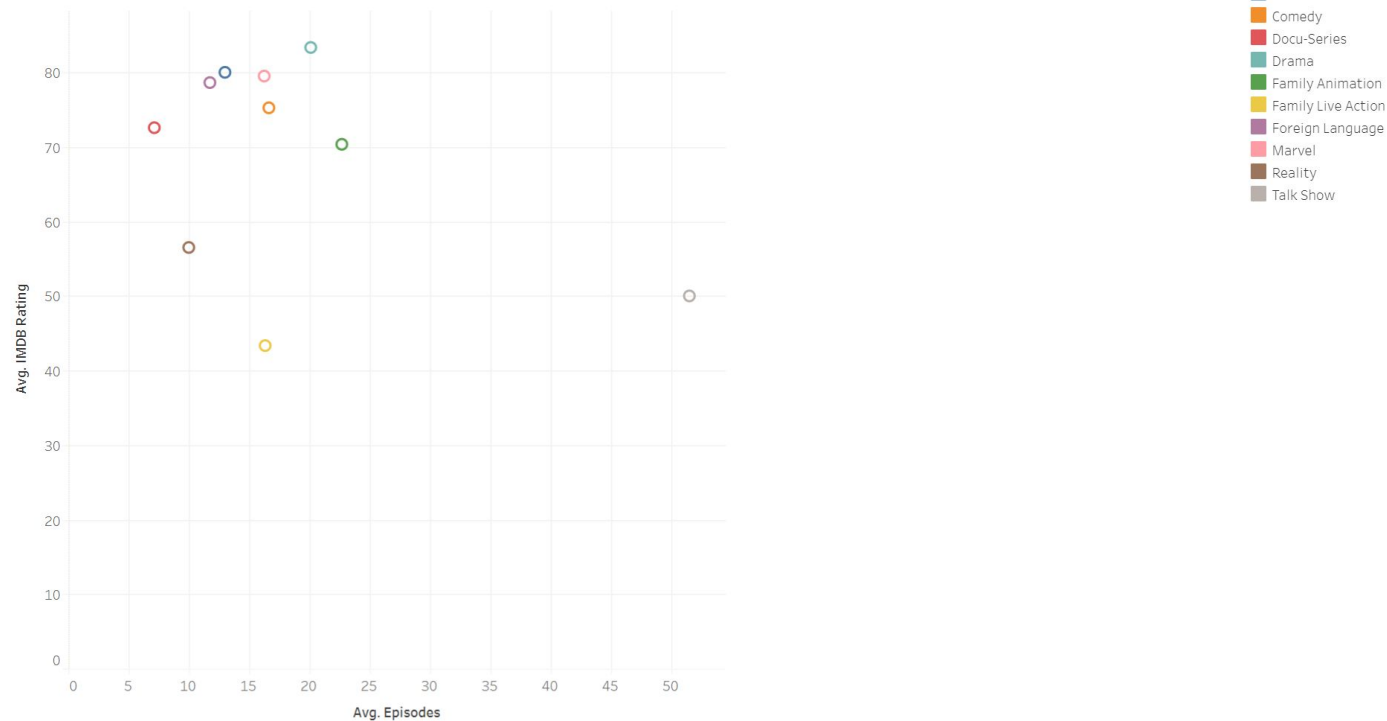
Bar Plots
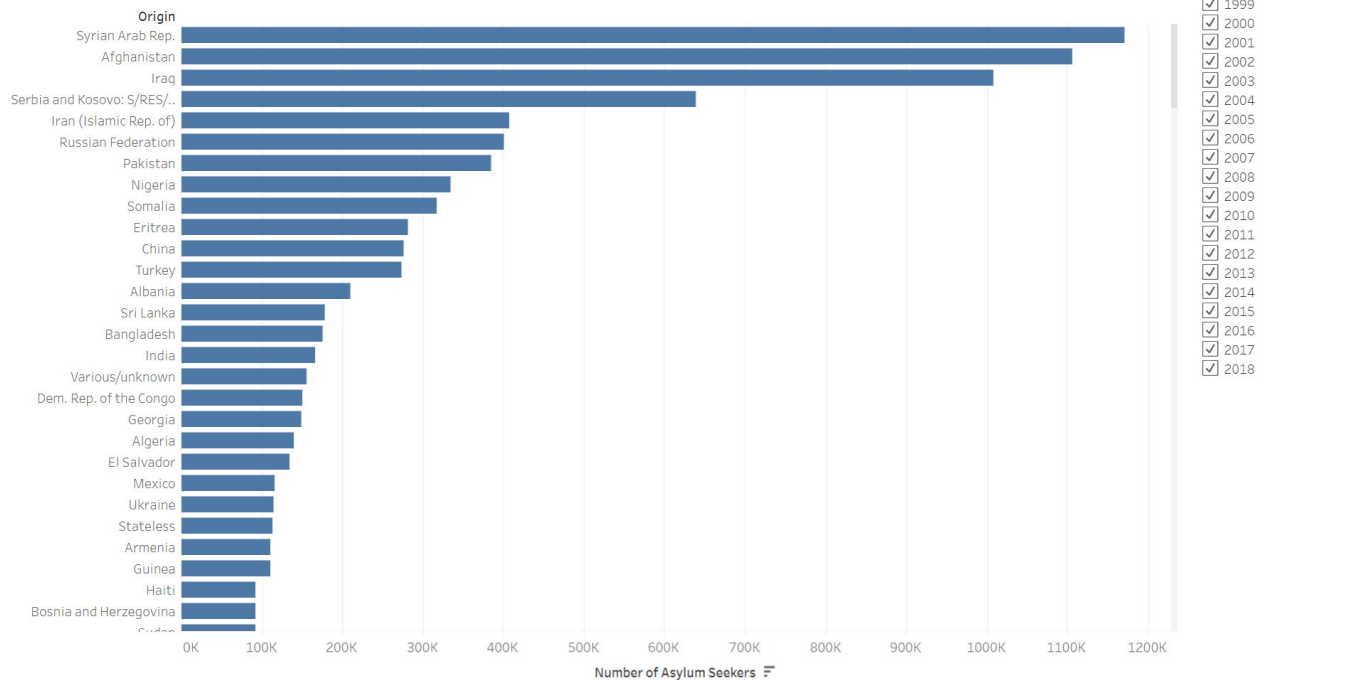
Line Charts

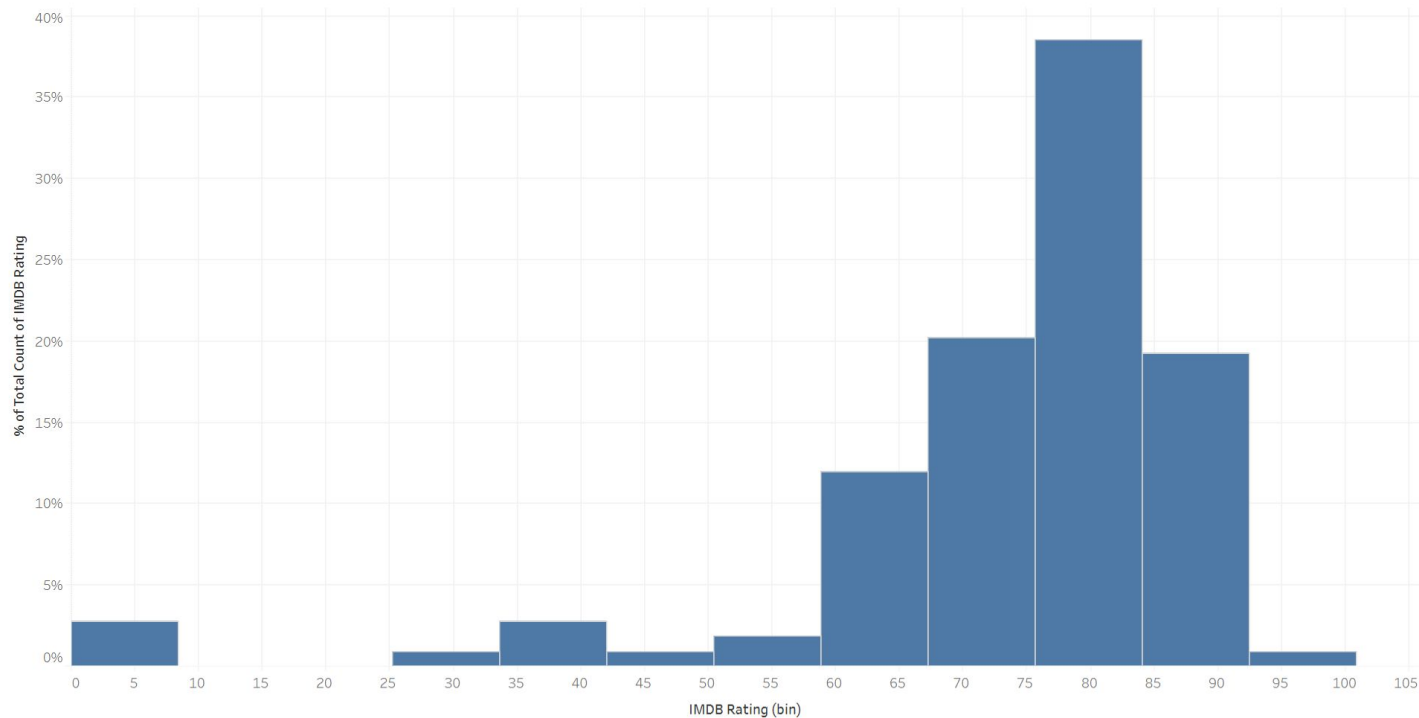Number of Asylum Seekers by Month
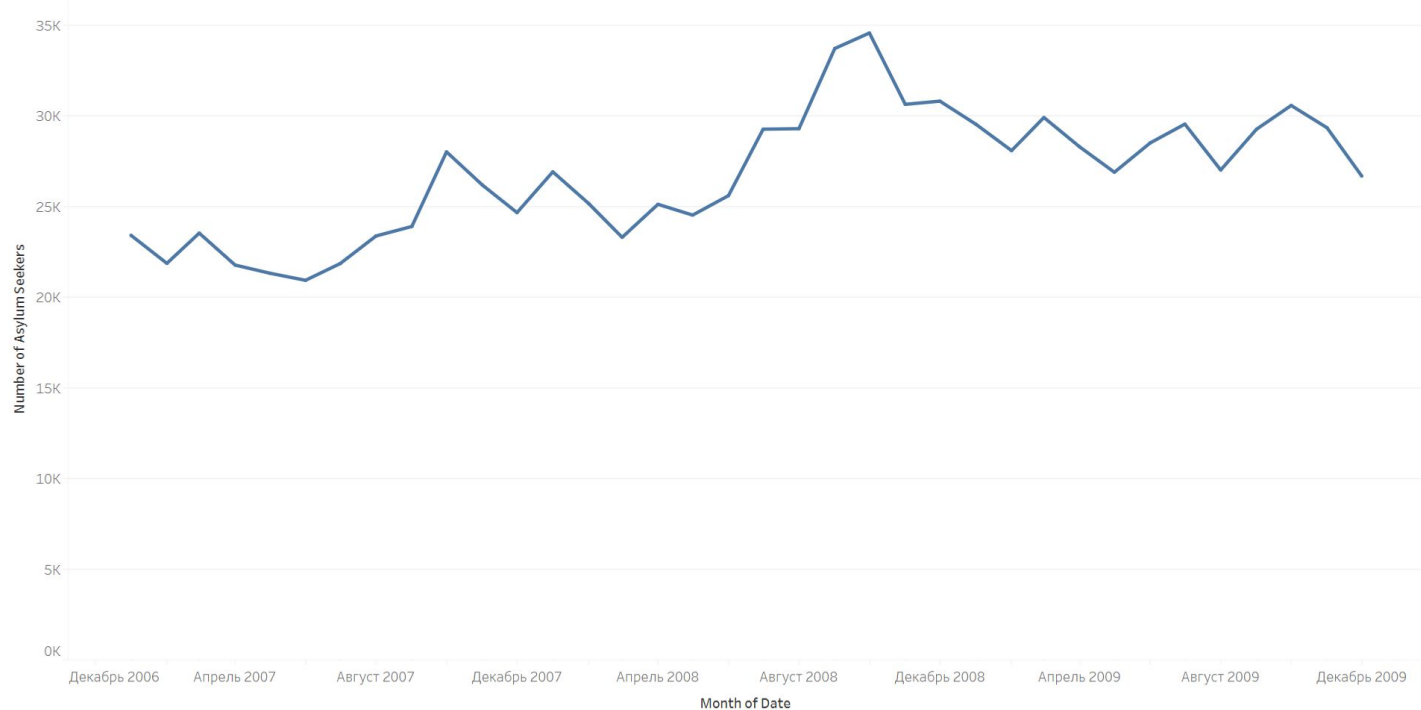
Geospatial data in Tableau

Asylum seekers by country of asylum

Number of Asylum Seekers
30   106 303

Greenland

Canada

United States

Mexico

Iceland

Sweden

Finland

Ukraine

Kazakhstan

France

Spain

Algeria

Libya

Egypt

Saudi Arabia

Turkey

Iraq

Iran

Pakistan

India

China

Sudan

Yemen

Colombia

Peru

Brazil

Democratic Republic of Congo

© 2019 Mapbox© OpenStreetMap

+ableau

Tableau Dashboards & Stories

Local Maps & Density Maps
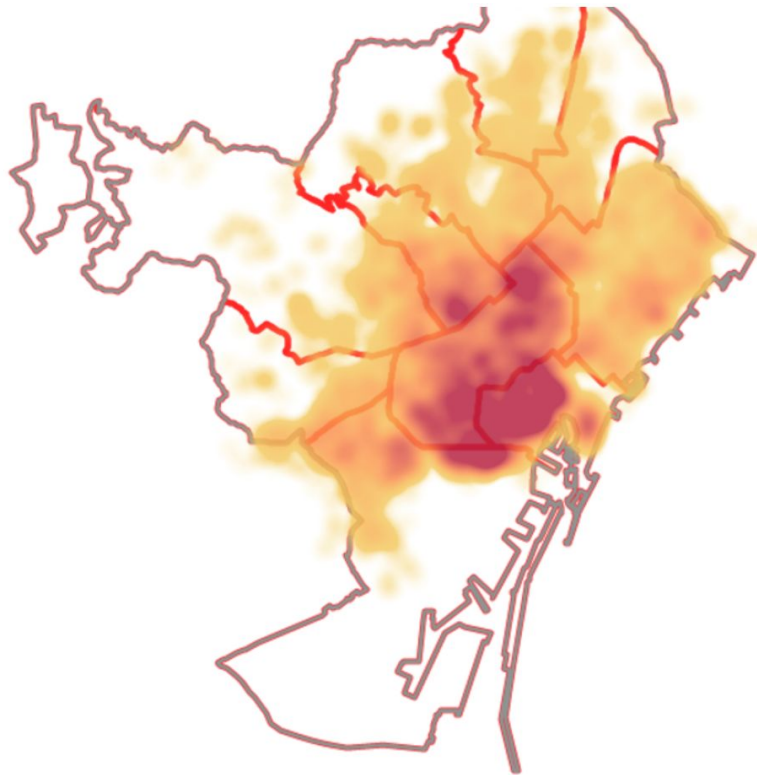
- What geographical location does this map correspond to?

- What do you think this graph represents?

Tableau Practice

Tableau Practice

Dataset: [OECD Meat Consumption](#) combined with GDP per country

- meat_per_cap file
- meat_gdp file

Tableau Practice

Task 1: Visualize the trend of consumption of each type of meat per capita over years (use meat_per_cap file)

Q1: What happened in 2000? Can you find the reason for it?

Tableau Practice

Task 2: Visualize which countries consume the most and the least amount of meat per capita, given a specific year (and meat type) (use meat_per_cap file)

Q2: Which country had the highest meat consumption in 2018 of each of the meat types?

- Of Beef
- Of Pig
- Of Poultry
- Of Sheep

Tableau Practice

Task 3: Visualize the relationship between meat consumption per capita and GDP per capita (use meat_gdp file)

Q3: Do you see any correlation?

Tableau Practice

Task 4: Put the graphs that you built together in a dashboard. Add interactivity by using filters

Tableau Homework

1. Think of a topic or question that interests you
2. Find dataset that is related to this topic
   - Kaggle, Dataworld
   - World development indicators (World Bank, OECD)
   - Dataquest recopilation of resources
   - Barcelona Open Data
3. Explore the dataset to understand the data and find the answer to your question
4. Build an interactive dashboard and share it with others to get feedback

Additional Resources

- [Video Visualization of Countries Wealth vs Life Expectancy](#)
- https://datavizcatalogue.com
- [Gapminder](#)
- [Learning from errors in data our visualizations by The Economist](#)
- [Choosing graph type mindmap](#)
- [The Pudding - Data Journalism](#)
- [Flowing Data - How to Spot Visualization Lies](#)
- [Cole Nussbaumer Knaflic: "Storytelling with Data" | Talks at Google](#)
- [Storytelling with Data - Gallery](#)
- [Twitter thread on stocks / levels vs flows / rates](#)
- [What to consider when visualizing data for colorblind readers](#)
- [What is this graph telling you? 5 key questions when user-testing data visualization](#)