mwGuest

Getonline!

Data Visualization with Tableau

Agenda

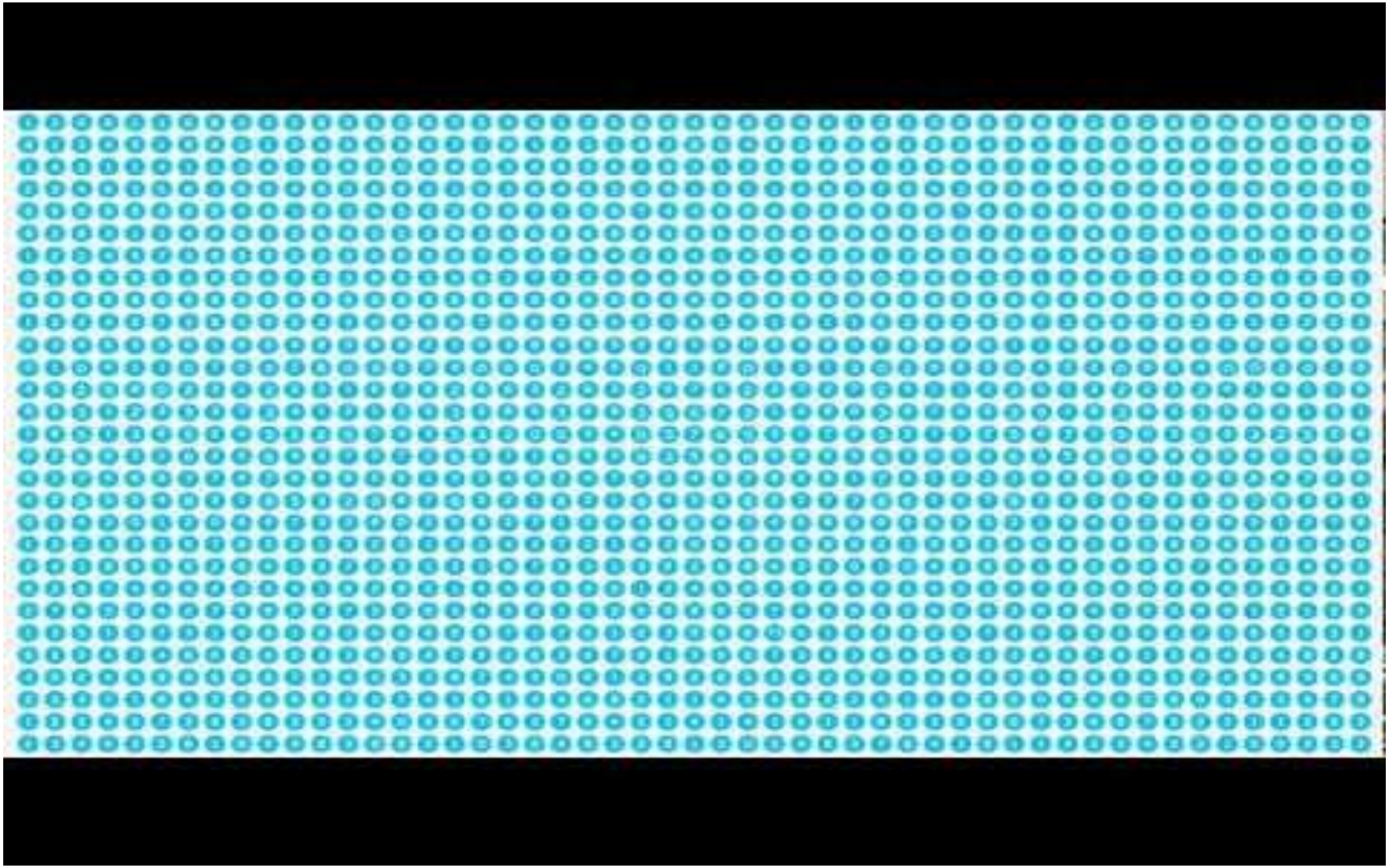
- Data Visualization
- Why Tableau?
- Real World Examples
- Demo/Example
- Something to take home ☺

First, download tableau from:

https://www.tableau.com/products/desktop/download

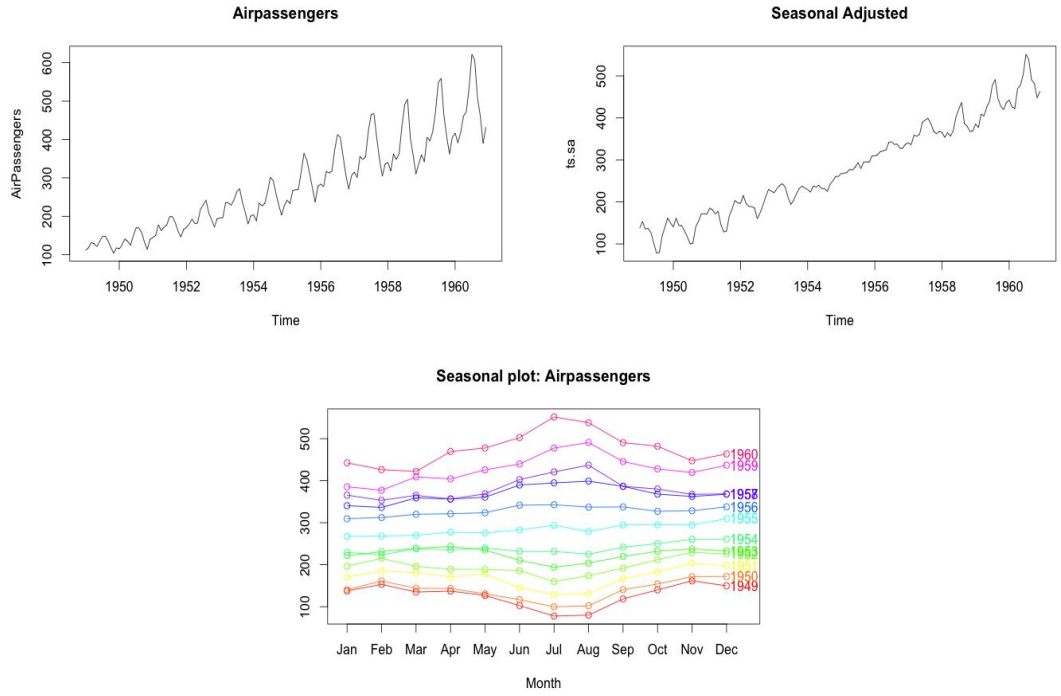
Data Visualization

What is Data Visualization?



What is Data Visualization?

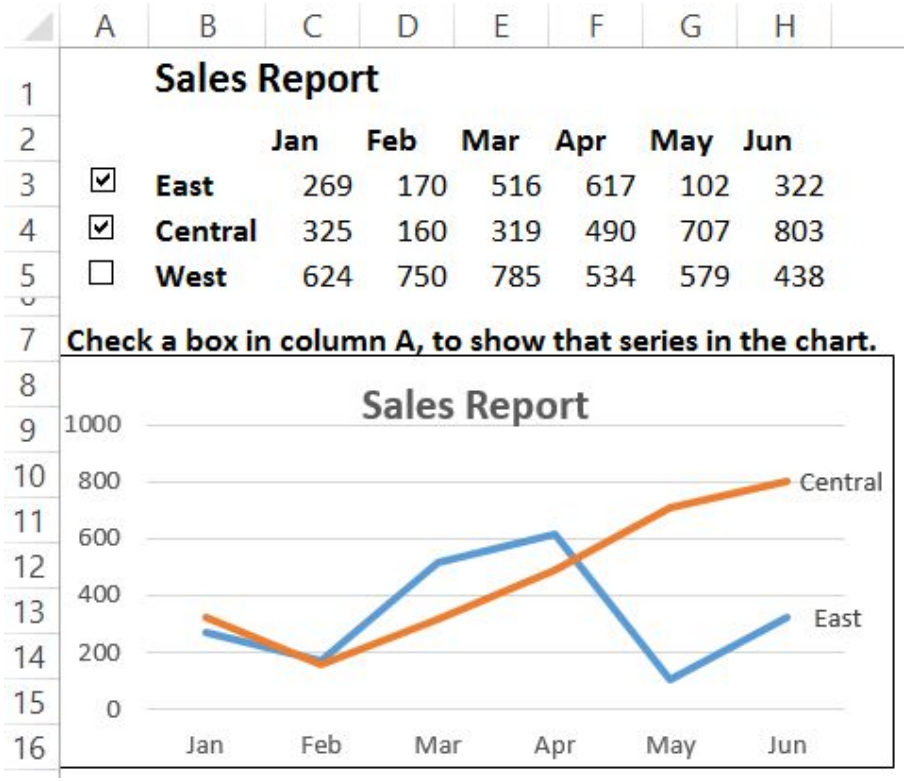
Data visualization – that, which helps people understand the significance of data in a visual context. It could be patterns, trends, correlations etc. that might go undetected in text-based data can be exposed and recognized easier with data visualization



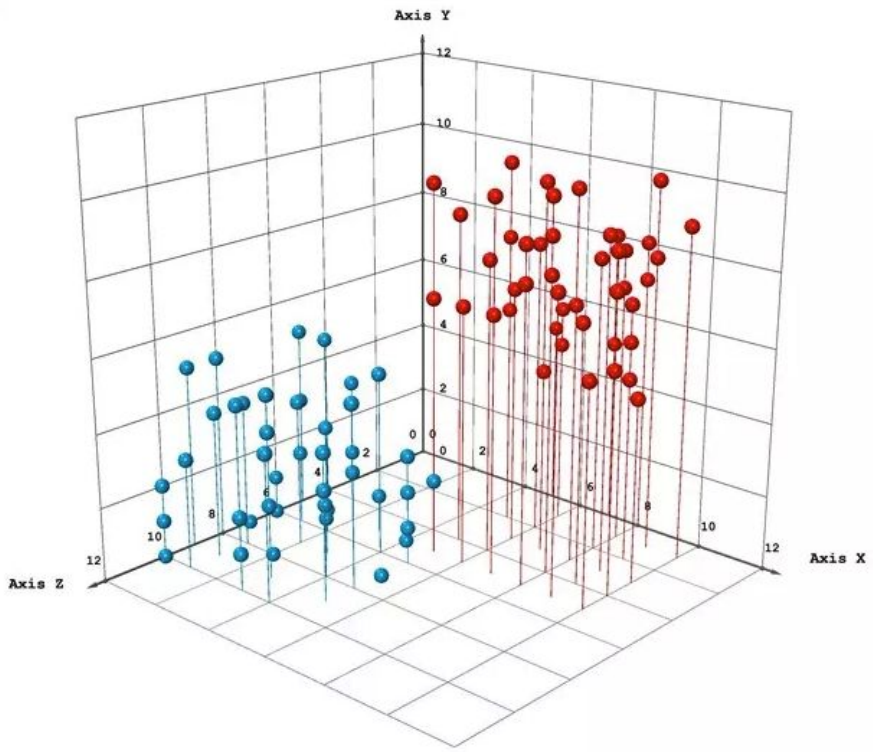
Why Data Visualization is Important

90% of all the data in the world has been generated over the last two years, 2.5 billion GB of new data is generated everyday.

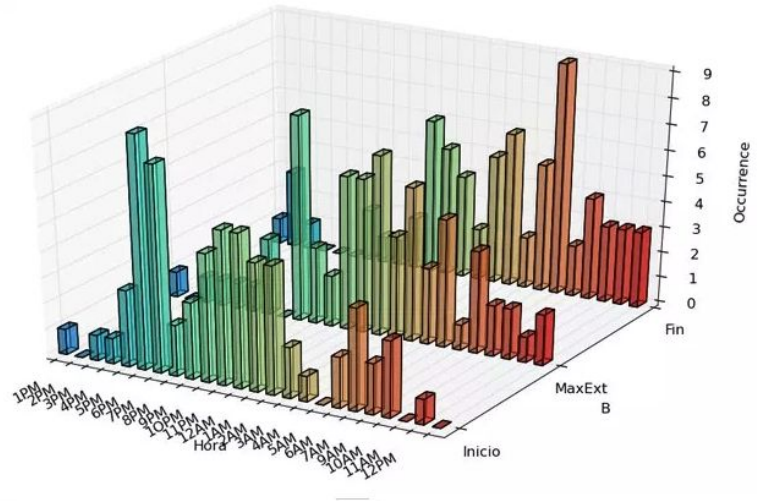
- Absorb information quickly
- Help drive strategy decisions
- Uncover patterns and trends in the data
- Connect the dots
- Find outliers

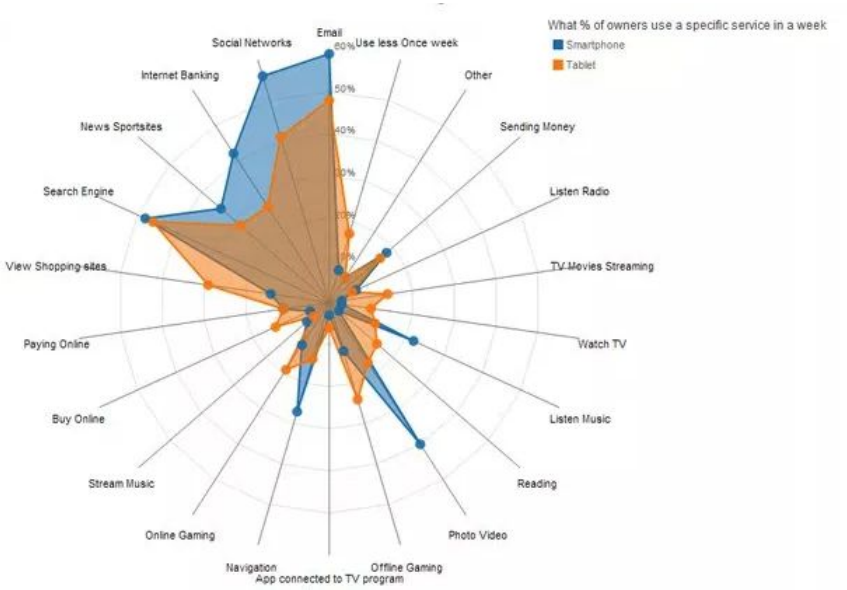


Data Visualization Pitfalls

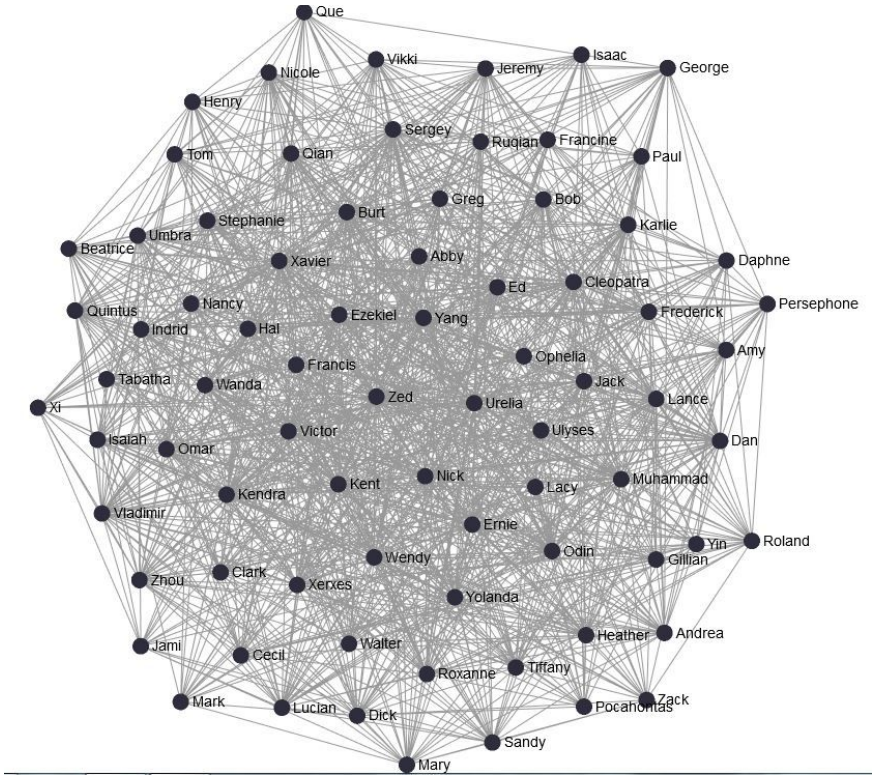


Complexity for the sake of complexity

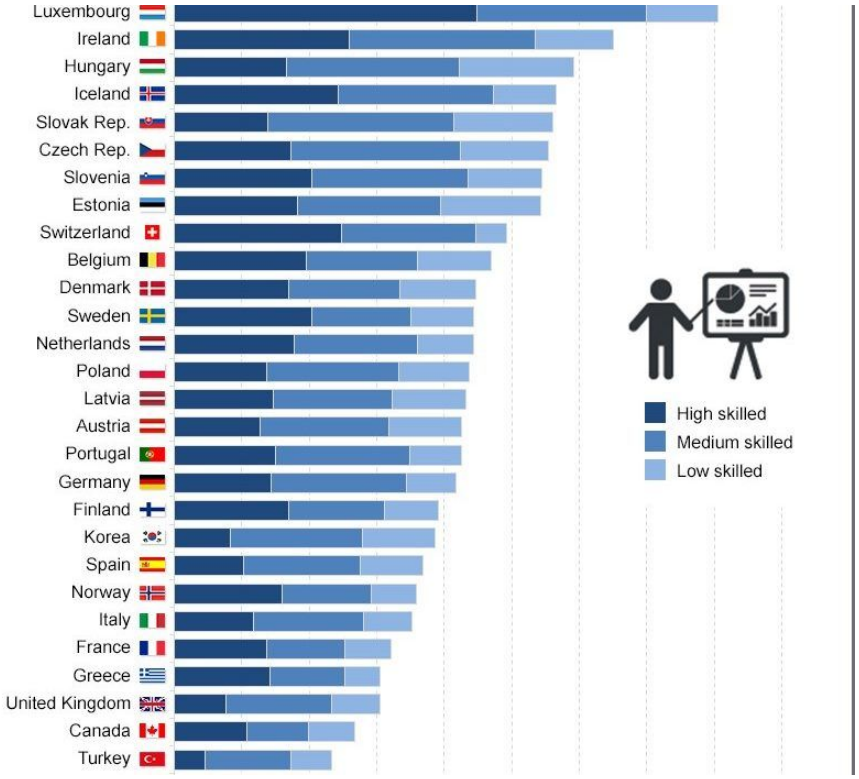




Data Visualization Pitfalls



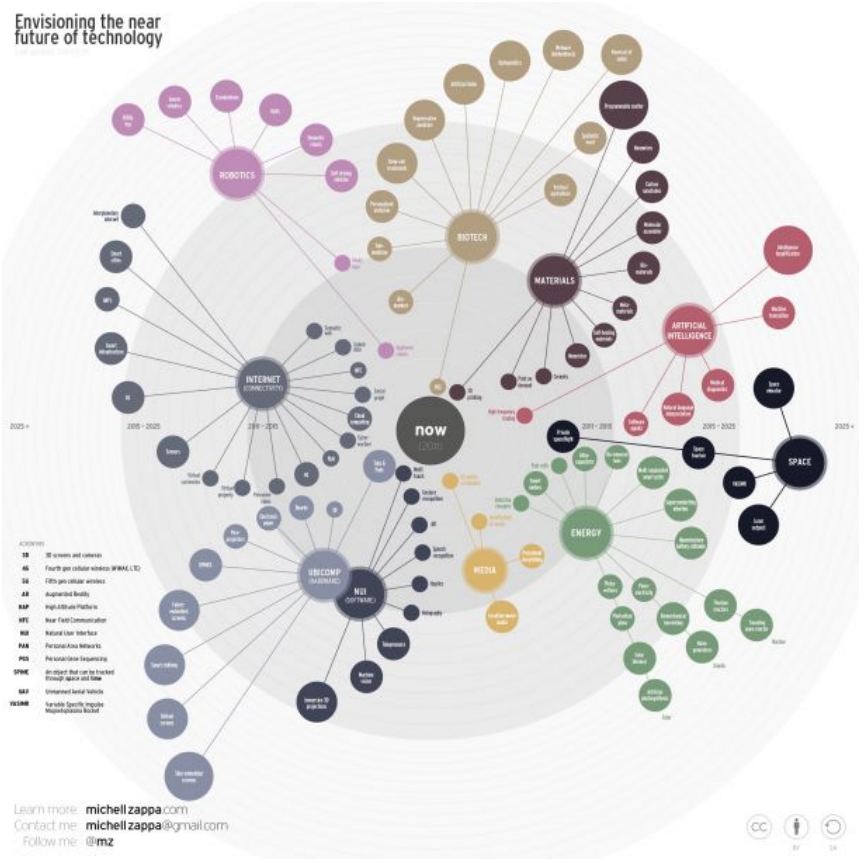
Data visuals for me.



Data visuals for you.

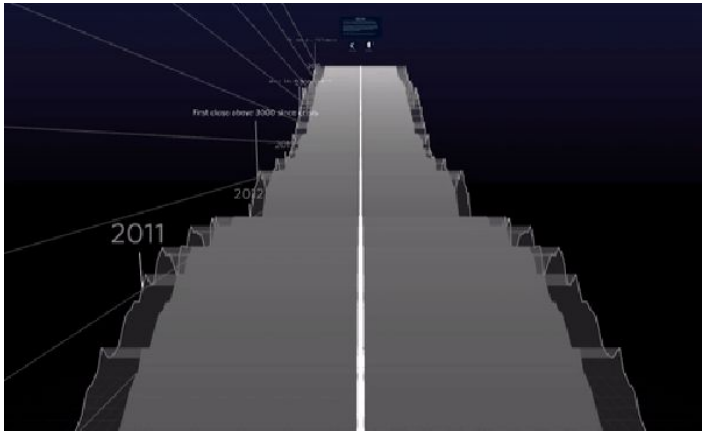
What Makes A Good Data Visual?

- Easy to understand.
- Tailored for your audience.
- It answers specific questions.
- User-friendly
- Useful
- Honest
- Rule of thumb: 10-15 seconds to understand



https://thekinigroup.com/importance-data-visualization/

Innovations in Visualization



Virtual Reality - According to research firm IDC, the market for augmented and virtual reality is expected to grow from $5.2 billion in 2016 to $162 billion in 2020

Mobile-first Visualizations - Tableau, for one, has now launched support for device layouts with Tableau 10, and it is a field that is slowly being perfected as designers establish the difference from building visuals for desktop.

Artificial Intelligence - Natural Language Generation (NLG)

What tools exist for data visualization?

- d3
- R (ggplot)
- Python (matplotlib, seaborn)
- Plotly
- Tableau
- PowerBI
- and so many more!

What tools exist for data visualization?

- d3.js
- R (ggplot)
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- Plotly
- Tableau
- PowerBI
- and so many more!

Tableau

Tableau

- Developed in 2003 at Stanford University
- Data visualization business intelligence tool
- Making databases and spreadsheets understandable to ordinary people

>50,000 Customers

SpaceX, Bank of America, Deloitte, Coca-Cola, UC Irvine, IRS, Merck, LinkedIn, Amazon, Google, American Airlines

Products

Why Tableau?

***Visual Reasoning*:** For a long time, people have used charts and graphs to understand information, easily and quickly. It is because of the way human brain processes information; charts and graphs over pages/spreadsheets of data – any day, right?

Speed: When you put data in a visual form, working with information questions can be done at speed of thought rather than doing Queries on database

Interface: Very simple drop and drag interface. Very easy to use! **No coding needed :)**

What can Tableau do?

- Robust visual analytics for today's data
- Tableau's rapid-fire business intelligence provides a fast, easy way to make strategic decisions
- Designing and implementing dashboards

Business Dashboards

Data Discovery

Data Visualization

Mapping Software

Social Media Analytics

R, Python, Hadoop Integration

Survey Analysis

Sports Management

Time Series Analysis

Big Data Analysis

and many more!

Who uses Tableau?

Industries - Banking, CPG, Insurance, Higher Education, Government, Retail, Real Estate, Pharmaceuticals, Gaming etc.

All Departments

HR- Improve retention and recruiting, increase productivity

Sales- Real time reporting to track and meet quotas

Marketing - Learn trends and design campaigns

Finance – Stock price trends, credit scores etc.

and every other team!

WHY?

- Customizable - Can fit any business' size or need
- Easy to use - Intuitive drag and drop design lets anyone
- Speed - Visualize data in a matter of seconds

Big Data Analytics

Where is this tool in the Big Data Analytics space?

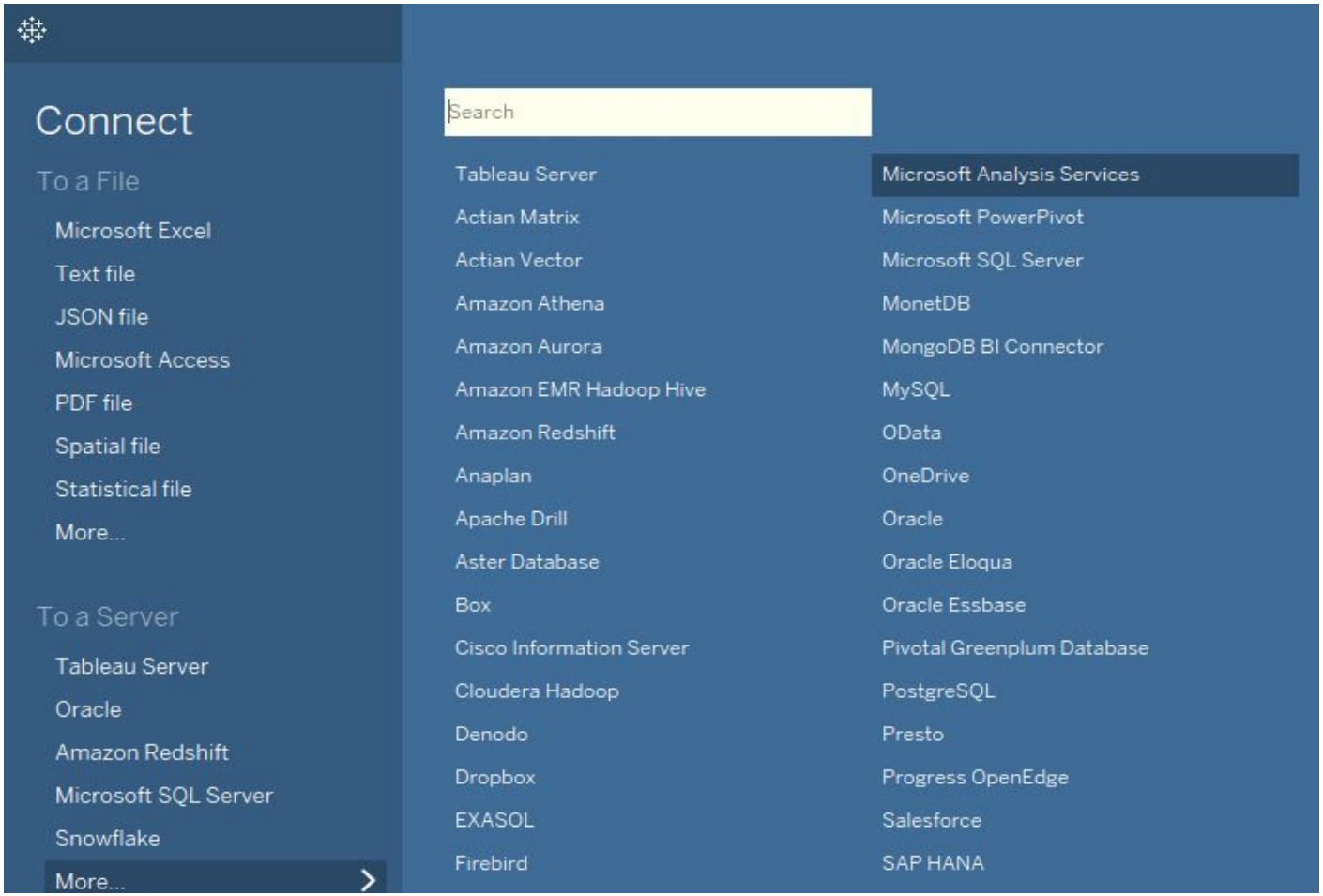
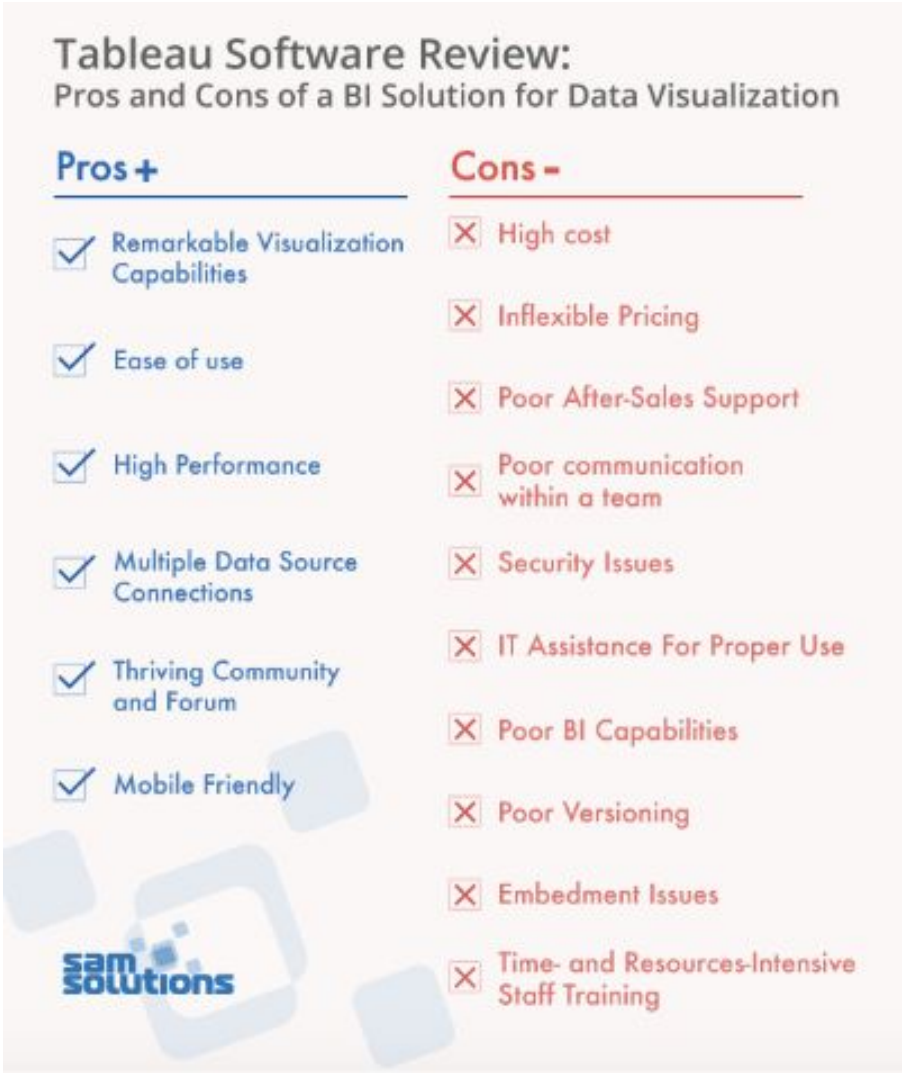


Tableau (Pros/Cons)

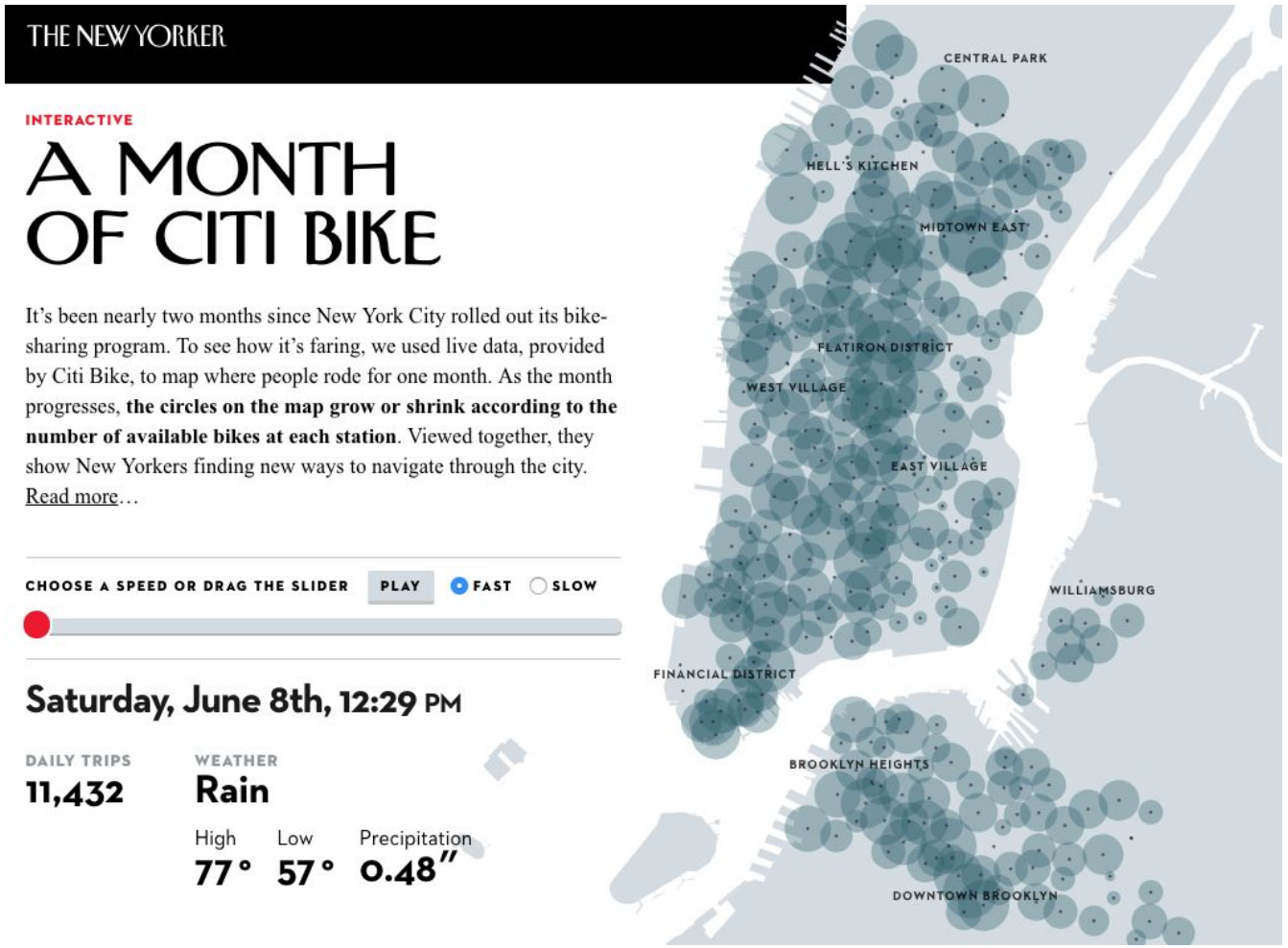


https://www.sam-solutions.com/blog/tableau-software-review-pros-and-cons-of-a-bi-solution-for-data-visualization/

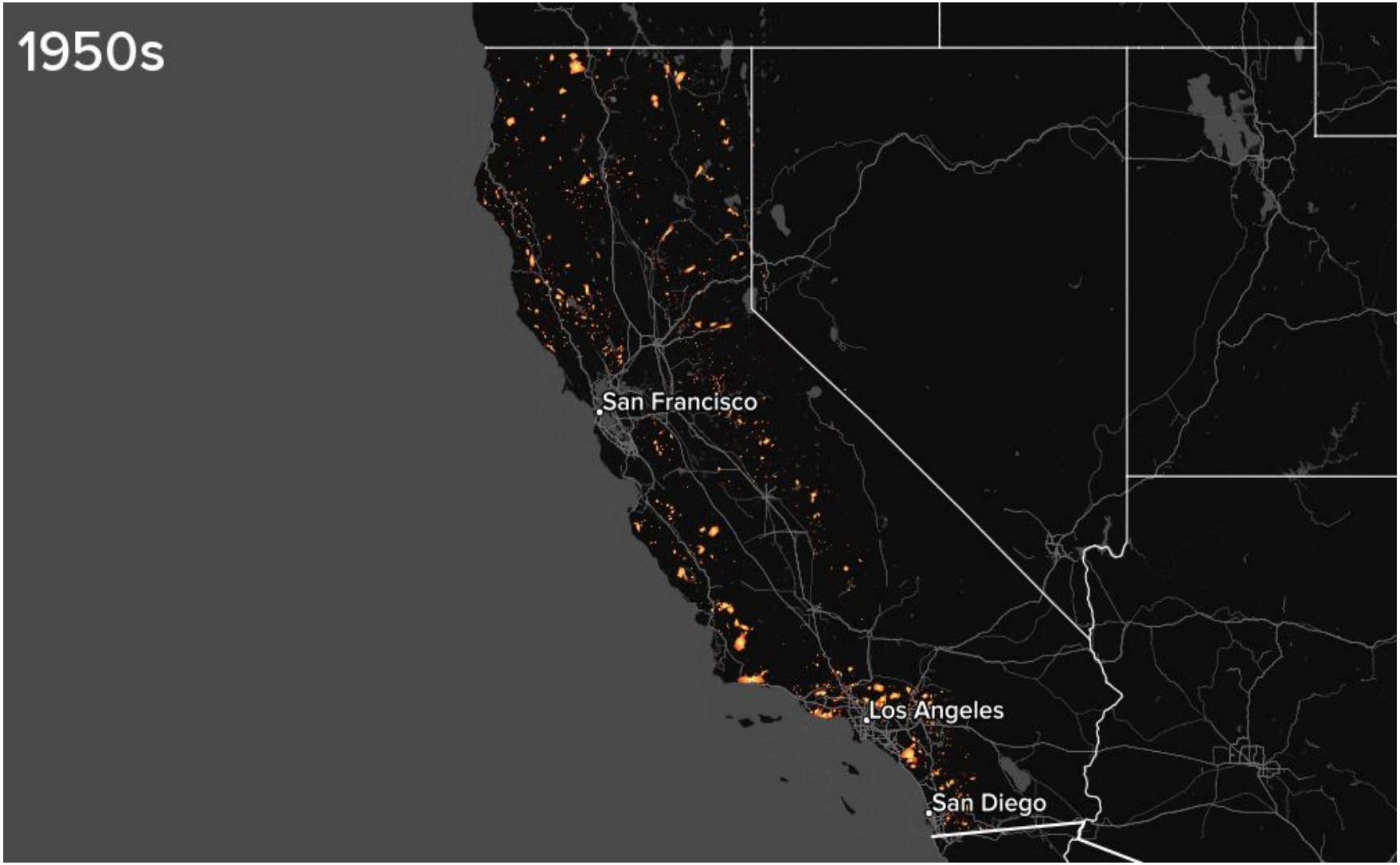
Examples

The New Yorker: A Month of City Bike

https://projects.newyorker.com/story/citi-bike.html



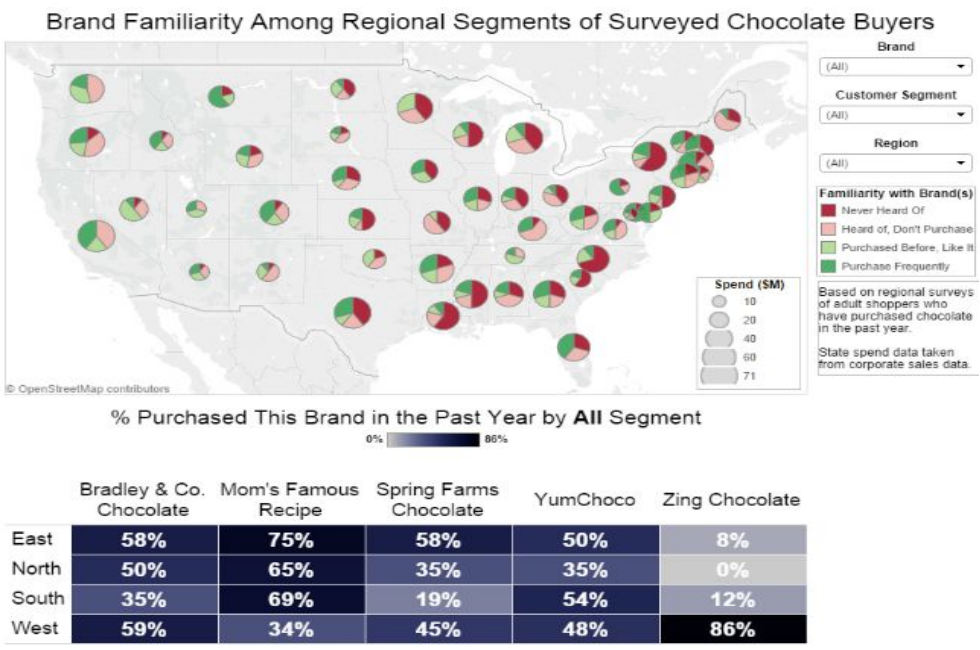
Climate Change Made California's Wildfires Worse Than Ever



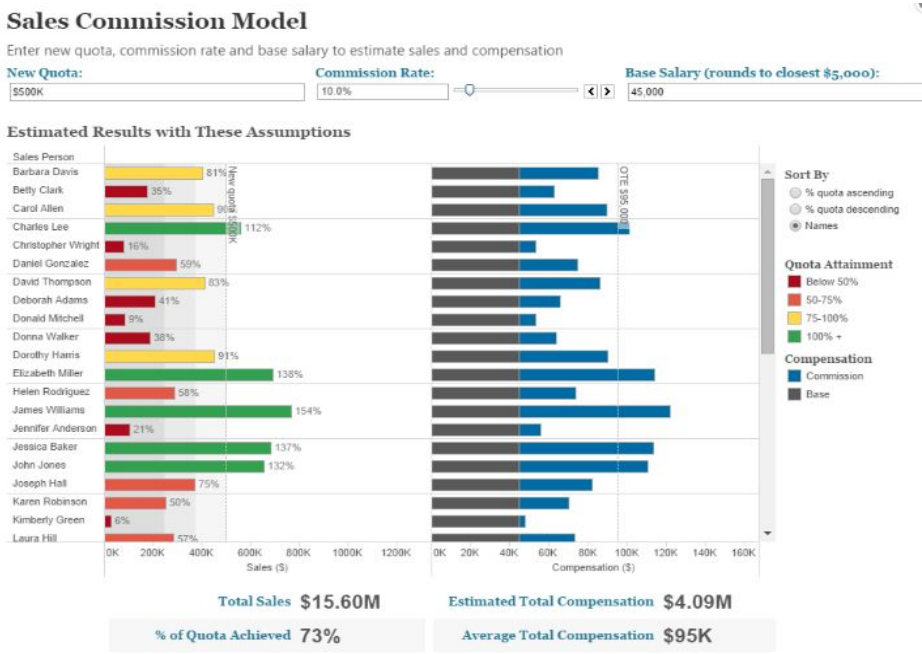
Industry Examples

[Marketing Analytics]

[Sales Analytics]

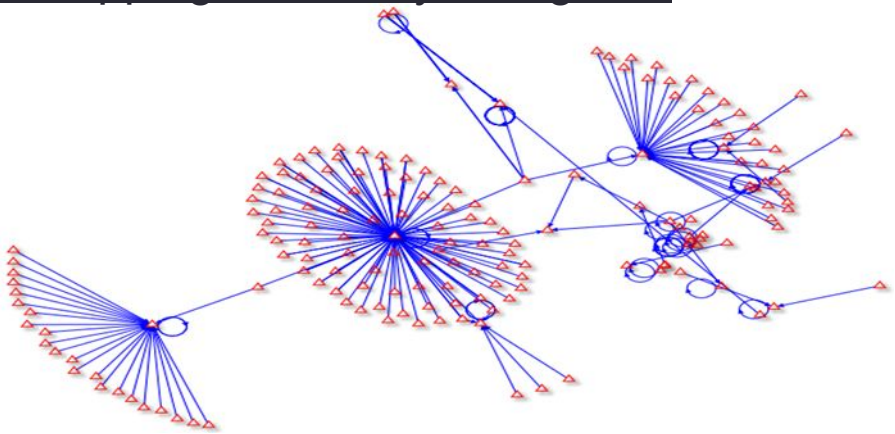


	Bradley & Co. Chocolate	Mom's Famous Recipe	Spring Farms Chocolate	YumChoco	Zing Chocolate
East	58%	75%	58%	50%	8%
North	50%	65%	35%	35%	0%
South	35%	69%	19%	54%	12%
West	59%	34%	45%	48%	86%

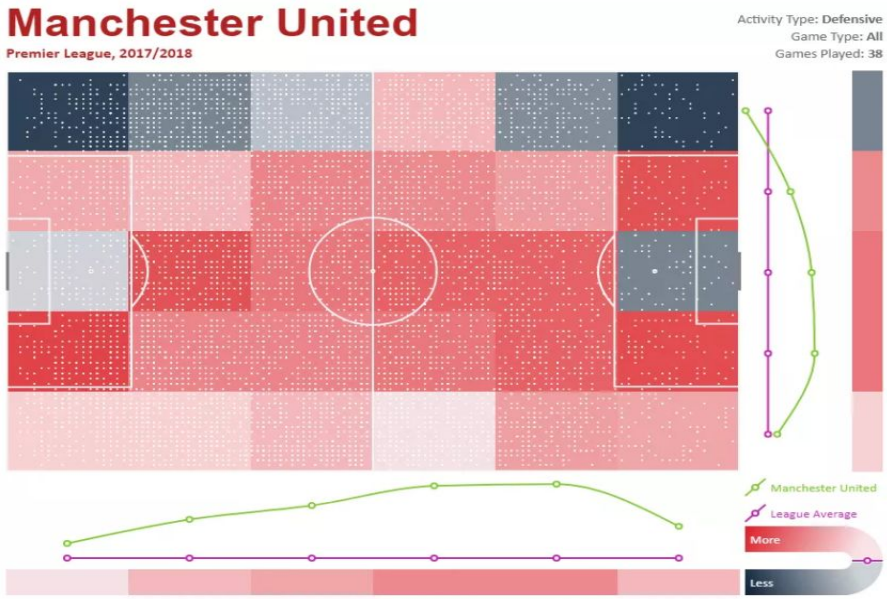


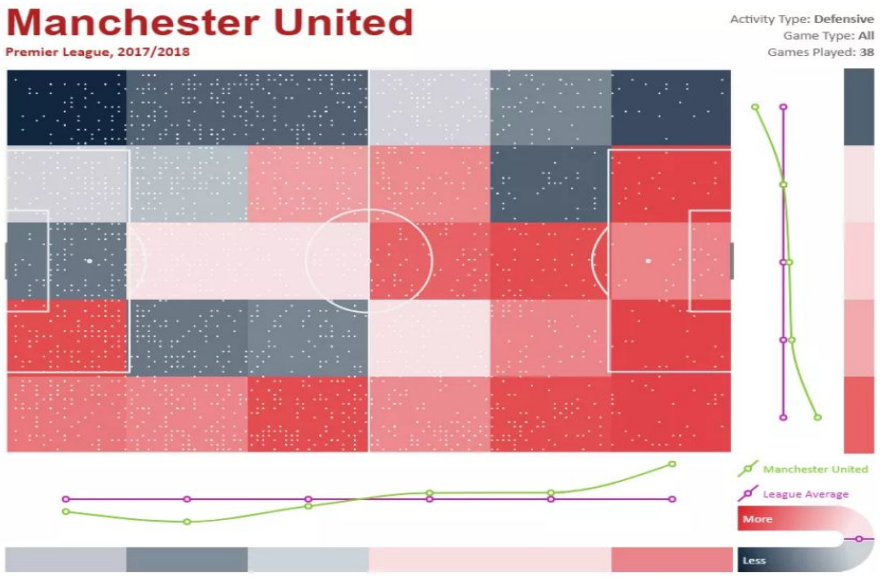
Other unconventional examples

Tweets with keywords ‘Shopping’ + ‘Disney’ + ‘Jigsaw’

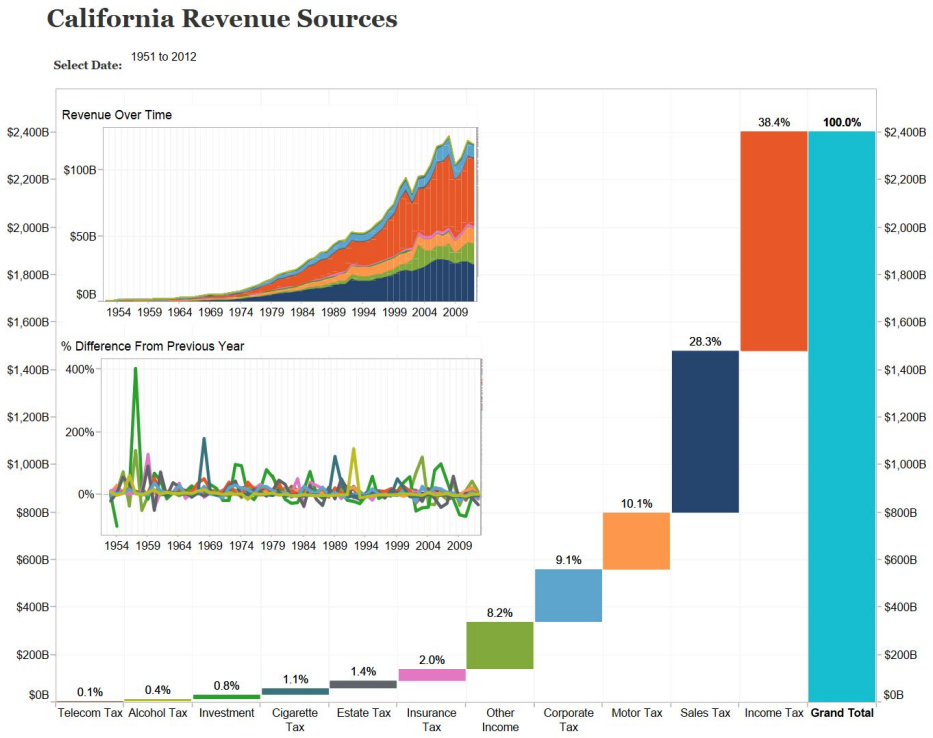


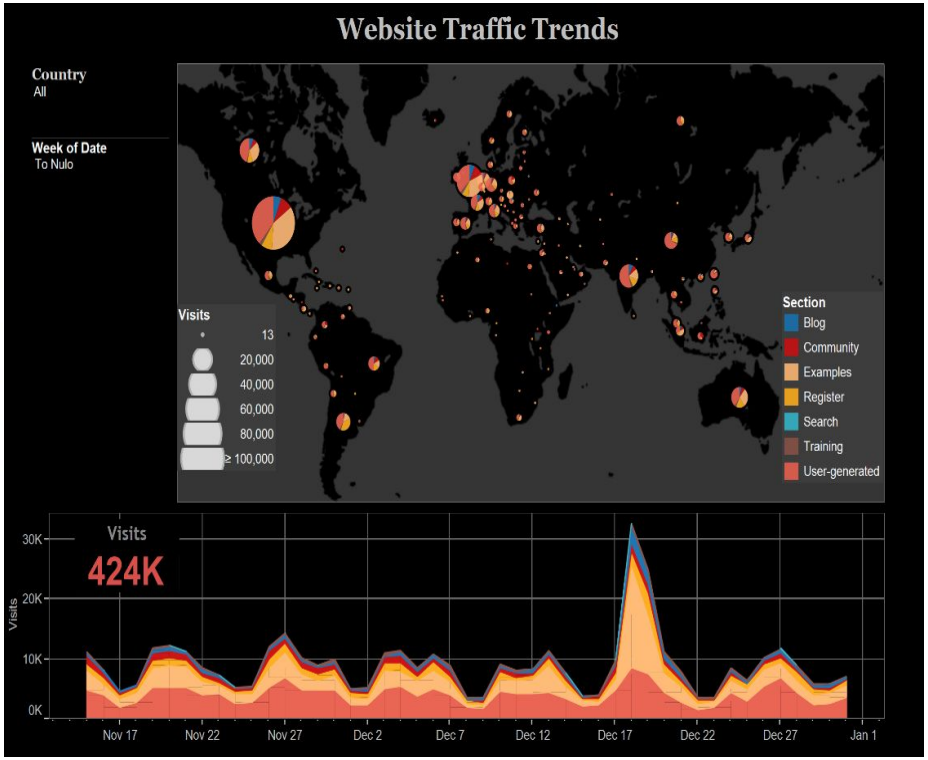
Manchester United’s defensive campaign 2017-18





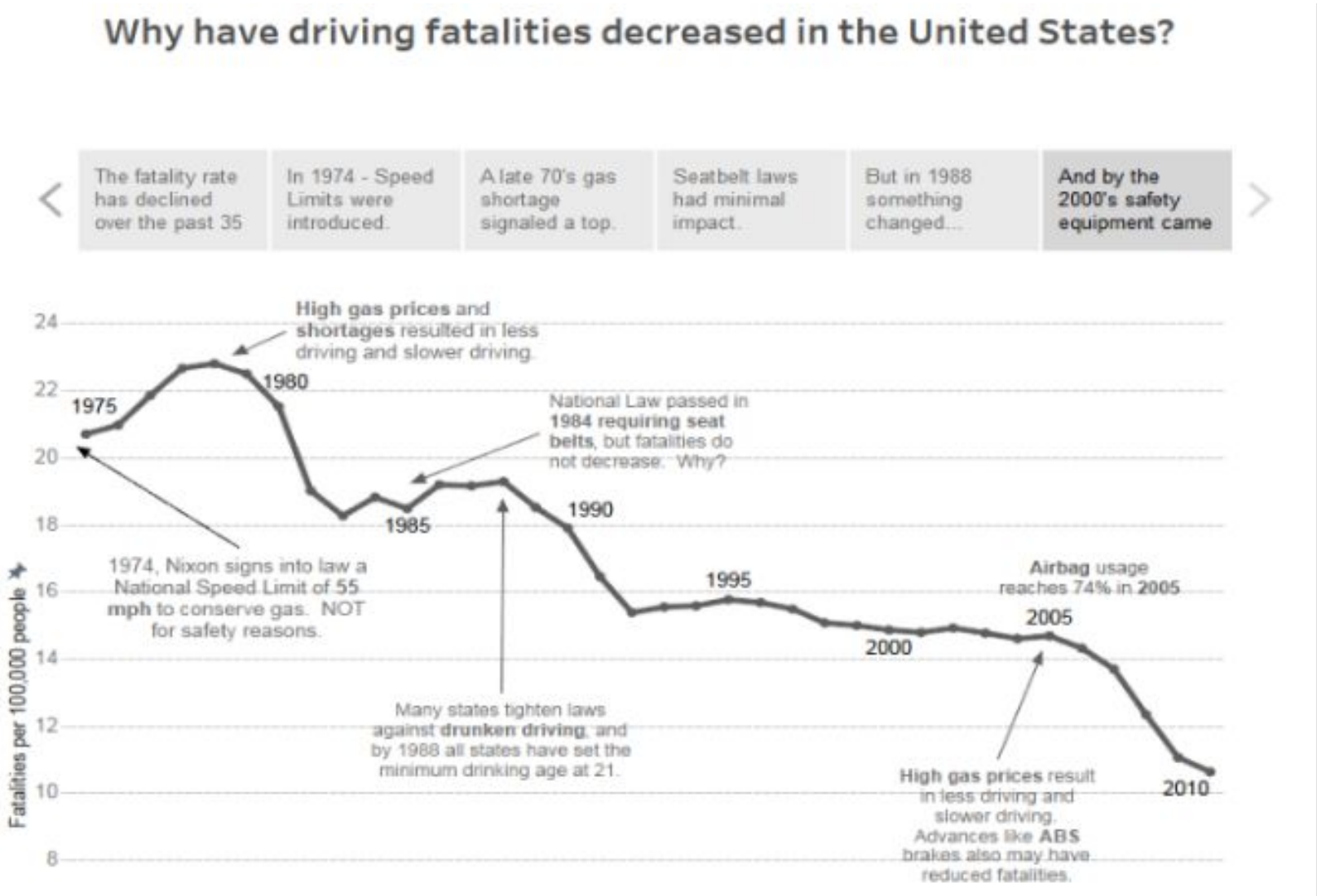
Other cool dashboards!





http://www.tableau.com/learn/gallery

Additional Capabilities



[Redefining Powerpoint]

Demo

Demo

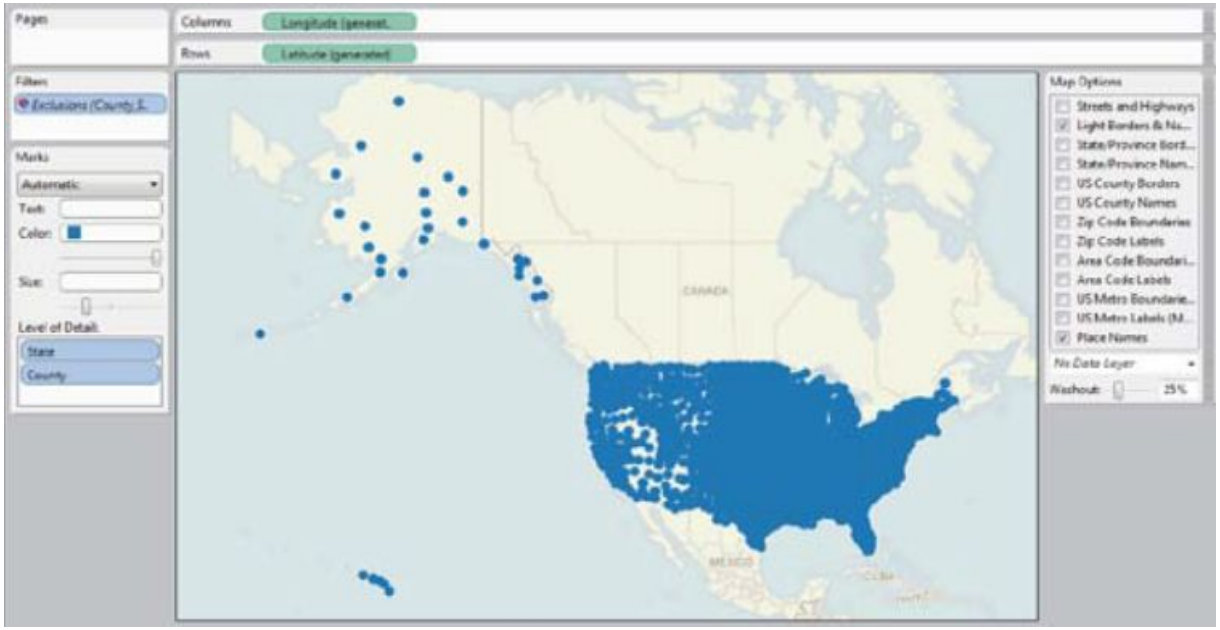
- Let us consider ‘USDA_activity_dataset.xls’ and examine its contents **http://www.peteraldhous.com/Data/USDA_activity_dataset.xls**

- The data details physical activity, obesity, and other health data in nearly 100 columns, for more than 3000 rows, one for each county in the US

- Tableau automatically recognizes categorical fields, like “State,” and numerical measures like “Adult obesity rate.”

Introductory Magic!

- Double click on “State” and “County.” Tableau automatically recognizes them as geographical entities and creates a map
- Now you have a map showing a dot for every county where you have a record:

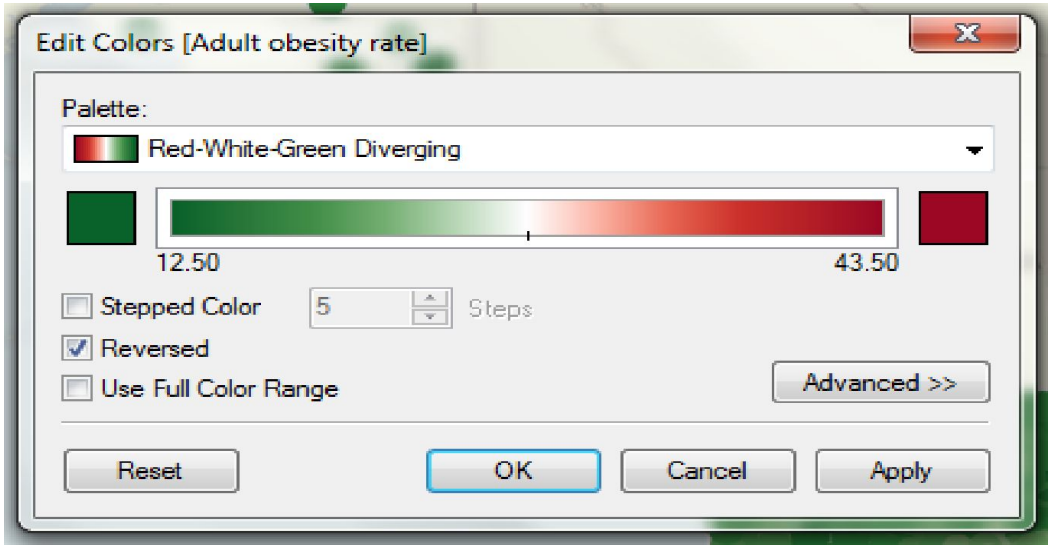


Types of geographic roles in Tableau

Geographic Role	Assign this role to a field if it contains:
Airport	International Air Transport Association (IATA) or International Civil Aviation Organization (ICAO) airport codes.
Area Code (U.S.)	U.S. telephone area codes; numbers only.
CBSA/MSA (U.S.)	U.S. Core Based Statistical Areas (CBSA), which includes Metropolitan Statistical Areas (MSA), as defined by the U.S. Office of Management and Budget. CBSA/MSA Codes and Names are recognized.
City	Worldwide cities with population of 15,000 or more. Names are in English, French, German, Spanish, Brazilian-Portuguese, Japanese, Korean, and Chinese.
Congressional District (U.S.)	U.S. congressional districts.
Country/Region	Worldwide countries, regions, and territories. Names are in English, French, German, Spanish, Brazilian-Portuguese, Japanese, Korean, and Chinese. Tableau also recognizes, FIPS 10, ISO 3166-1 alpha 2, and ISO 3166-1 alpha 3. Names are included in various forms, including long, short, and various abbreviations.
County	Second-level administrative divisions for select countries. For example, U.S. counties, French départements, German kriese, etc. **Note:** Second-level administrative division definitions vary by country. In Tableau, all second-level administrative divisions are geocoded with the County geographic role. For more information, see the Location Data that Tableau Supports for Building Map Views section.
NUTS Europe	NUTS (Nomenclature of Territorial Units for Statistics) levels 1 – 3 codes. Codes and names, including synonyms, are supported.
Latitude	Latitude in decimal degrees. Only available for numeric fields.
Longitude	Longitude in decimal degrees. Only available for numeric fields.
State/Province	Worldwide state, province, and other first-level administrative divisions. Names are in English, French, German, Spanish, Brazilian-Portuguese, Japanese, Korean, and Chinese. **Note:** Some names are available only in their local form.
ZIP Code/Postcode	ZIP codes and postcodes for select countries. For example, U.S. five-digit zip codes, Australian four-digit postcodes, German five-digit postcodes, etc. For more information, see the Location Data that Tableau Supports for Building Map Views section.

Contd..

- Add “Adult obesity rate” from the Measures panel into Color, and copy it into Size shelf to encode counties by those values.
- Change the Color to Red–Green-White Diverging, and reverse it

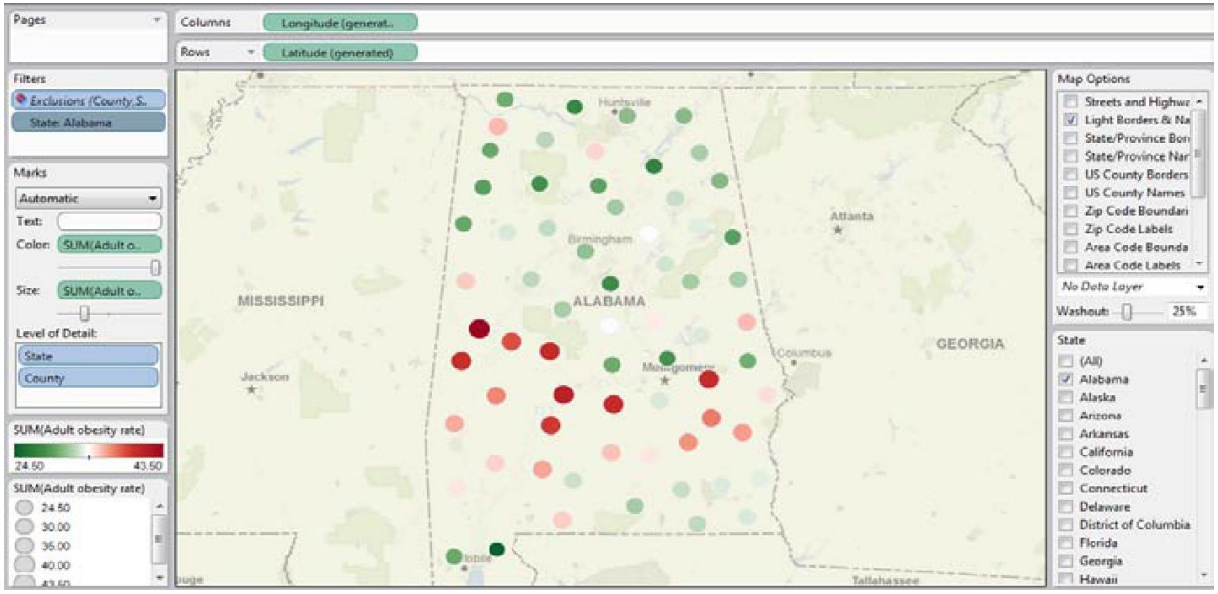


Contd..

- Now add a filter to enable the selection of individual states. Click and drag **“State”** into the **Filters** shelf, click OK at the dialog box.

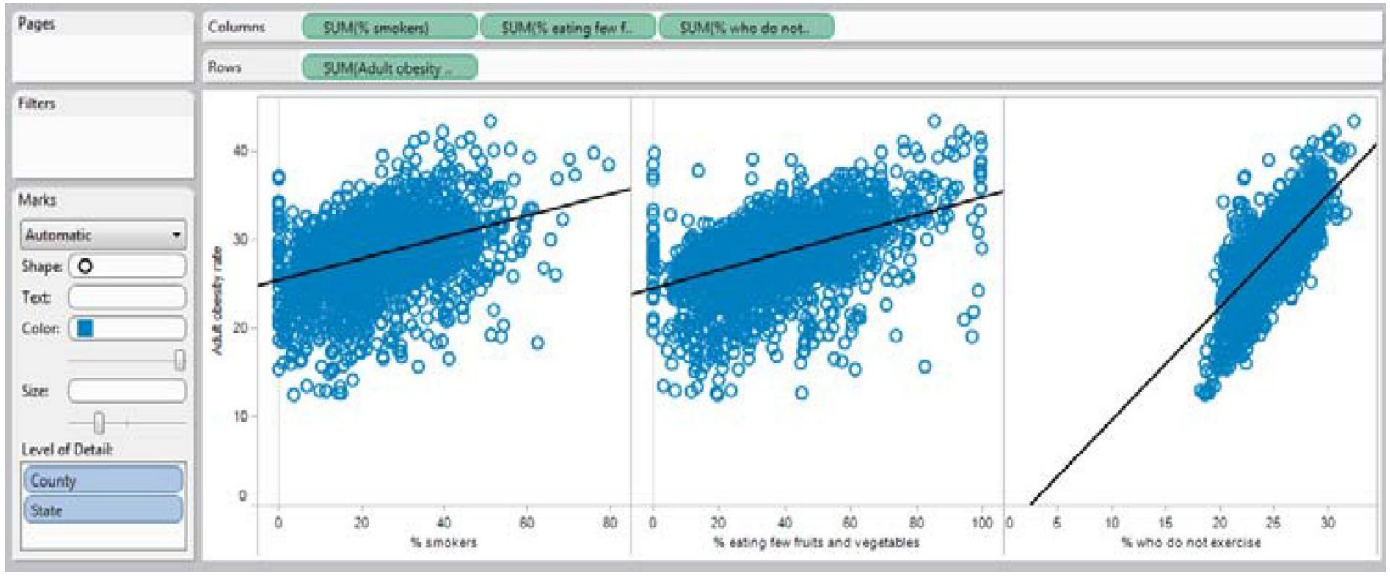
- Right click on **“State”** in the **Filters** shelf and select **Show Quick Filter**. Deselect **All** and then select **Alabama**.

- Rename the worksheet **“Map View”** by right clicking on the tab at the bottom.



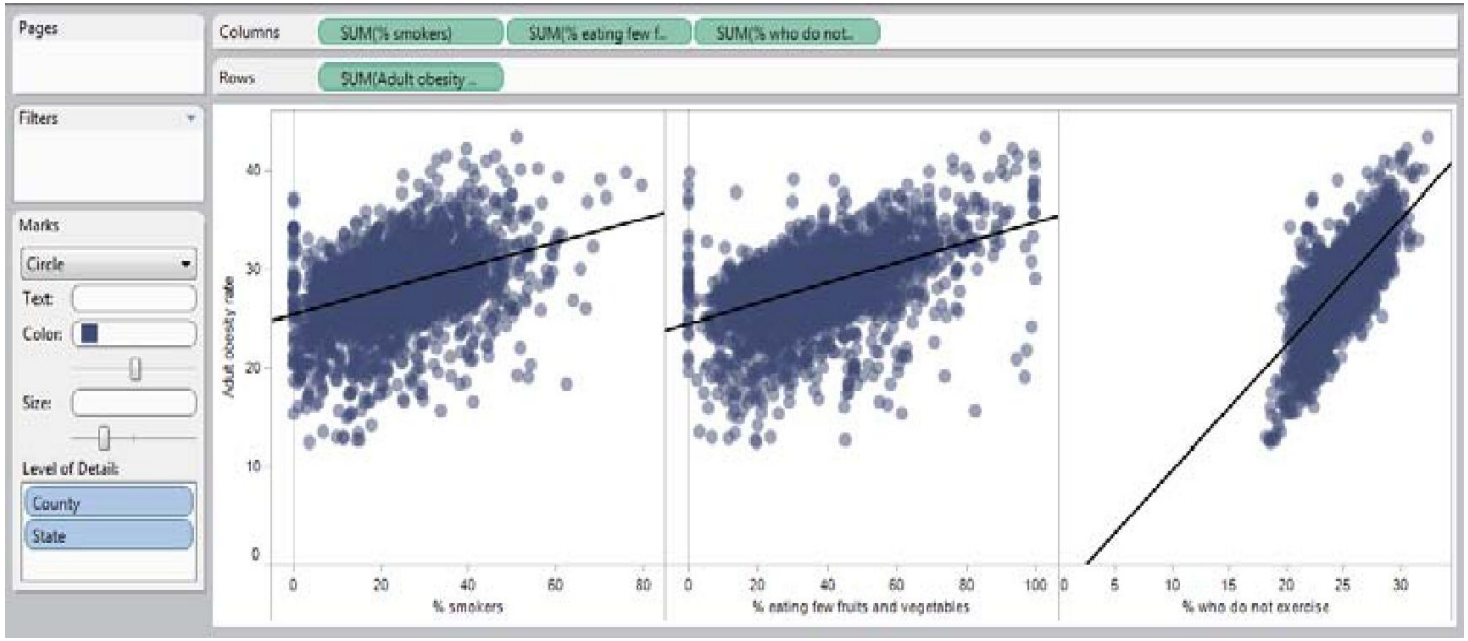
More Analysis

- Drag “Adult obesity rate” onto Rows and “% smokers,” “% eating few fruits and vegetables” and “% who do not exercise” into Columns.
- Drag “County” and “State” into Level of Detail.
- Add “Adult obesity rate” from the Measures panel into Color, and copy it into Size shelf to encode counties by those values.
- It should look like the following:

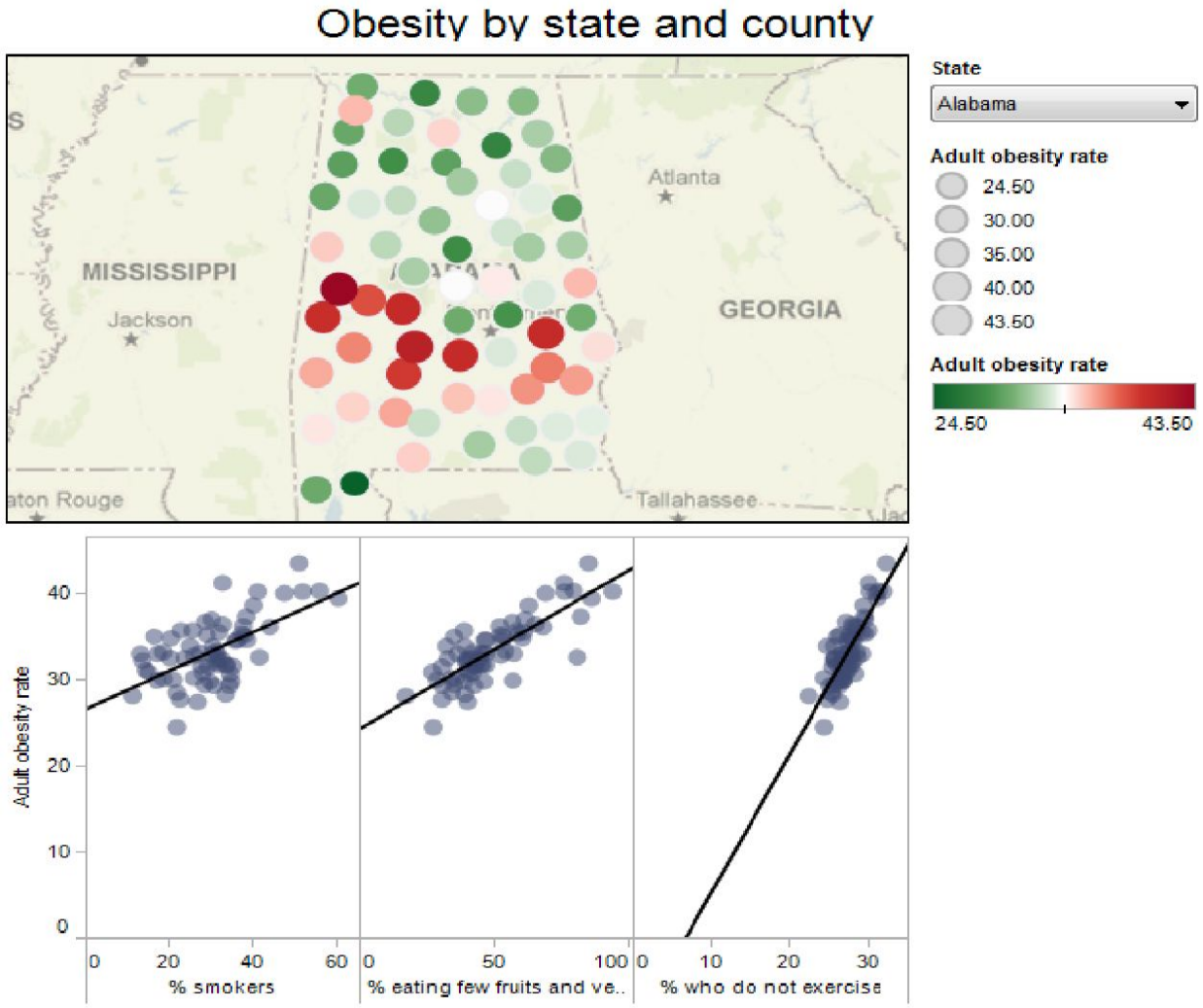


Explore the tool

- Change Color to purple, open the Drop down menu next to “Automatic” and select Circle, then move the slider below to the left to increase transparency of the points.
- Select Analysis in the top menu and check Trend Lines.
- Final image should look like below:



Dashboarding… Try and achieve the exact same!



Assignment

1. Gain familiarity with Tableau – Familiarize yourself with the visualization techniques via on-line videos at:
   http: http://www.tableausoftware.com/learn/training

2. Please download a set of data from
   here: http://data.worldbank.org/indicator

Build a dashboard to show which country you would recommend opening a business in based on your chosen factors. Build at least 2 sheets and a dashboard with dashboard actions.

Do **NOT** make all of your questions be about correlations or min or max values.

Then **save to a Tableau Public account** and share the interactive link.

Assignment

Choose another/same dataset and answer the following:

- **Part 1** – List your three questions and answers, along with a screen shot showing the visualization you used to answer each question. One page per question – screen shot and narrative.

- **Part 2** – Critique the system. What are the system's strengths and weaknesses? For what kinds of user tasks is the system particularly well suited? Focus more here on the visualization techniques as opposed to the particular user interface quirks, though you should feel free to comment on UI aspects when they are particularly good or bad. Describe characteristics of the UI using the concepts and terminology you have learned in class. This second part should be 2 to 3 pages.

- **Submission:** Your document should be in PDF format and is limited to a maximum of 6 pages including cover sheet. Use Times Roman 12 point type with normal margins, 1.5 line spacing.

Resources

Download Tableau

Tableau Desktop for students
https://www.tableau.com/academic/students#form

Training

On-demand and online from Tableau
http://www.tableau.com/learn/training

https://community.tableau.com/community/tabwiki

Coursera
https://www.coursera.org/courses?query=tableau

Lynda.com (Videos from Curt Frye)
http://www.lynda.com/search?q=tableau

Books

Learning Tableau - How Data Visualization Brings Business Intelligence to Life by Joshua N Milligan

Communicating Data with Tableau by Ben Jones

Blogs

Vizwiz.blogspot.com (Tableau Tip Tuesdays)
public.tableau.com/s/blog (Tableau Public Team posts)

Forums for data visualizations

- Visit http://visualoop.com/blog/3199/25-great-data-visualizations-made-with-tableau-public and check the diverse set of visualizations.
- http://www.kddanalytics.com/data_visuals.html
- http://vizpainter.com/