Tableau Workshop

Presented by Alicia Key at Galvanize Boulder
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About me

- Started my career with data visualization
  - University of Washington in Seattle
- Instructor at Galvanize in Boulder since 2016
  - Introduction to Data Science
  - Python Fundamentals
  - Data Analytics
  - Software Engineering

Objectives

- Describe what Tableau is and how to obtain it.
- List types of data
- List common ways to display different types of data
- Explore a dataset about the Seattle based, now defunct Pronto bike share service.
- Explain how a dashboard can make a narrative.
- Explore a dataset about the voyage of the Titanic
- Explore a dataset from the FBI about US crime on 2013

What is Tableau?

Tableau can...

- Connect to many data sources:
  - Microsoft Excel spreadsheets
  - CSV files
  - SQL databases
- Combine data from multiple sources
- Offers and drag and drop interface to make individual charts and entire dashboards
- Great for exploratory data analysis
- Great for finished visualization products.

How does one obtain Tableau?

Tableau Public

- Free to obtain and use.
- You must save your work on Tableau Public

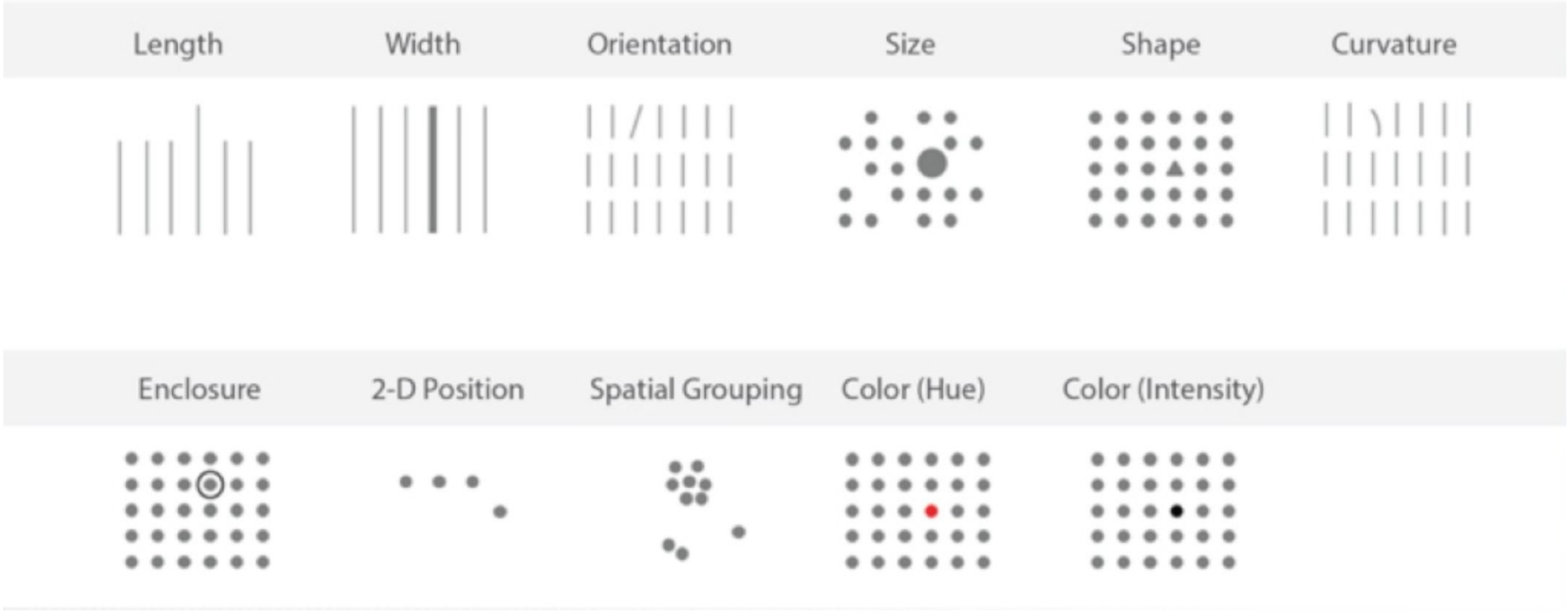
Tableau, commercial version

- Lots of pricing options.
- You can save data privately on your computer.

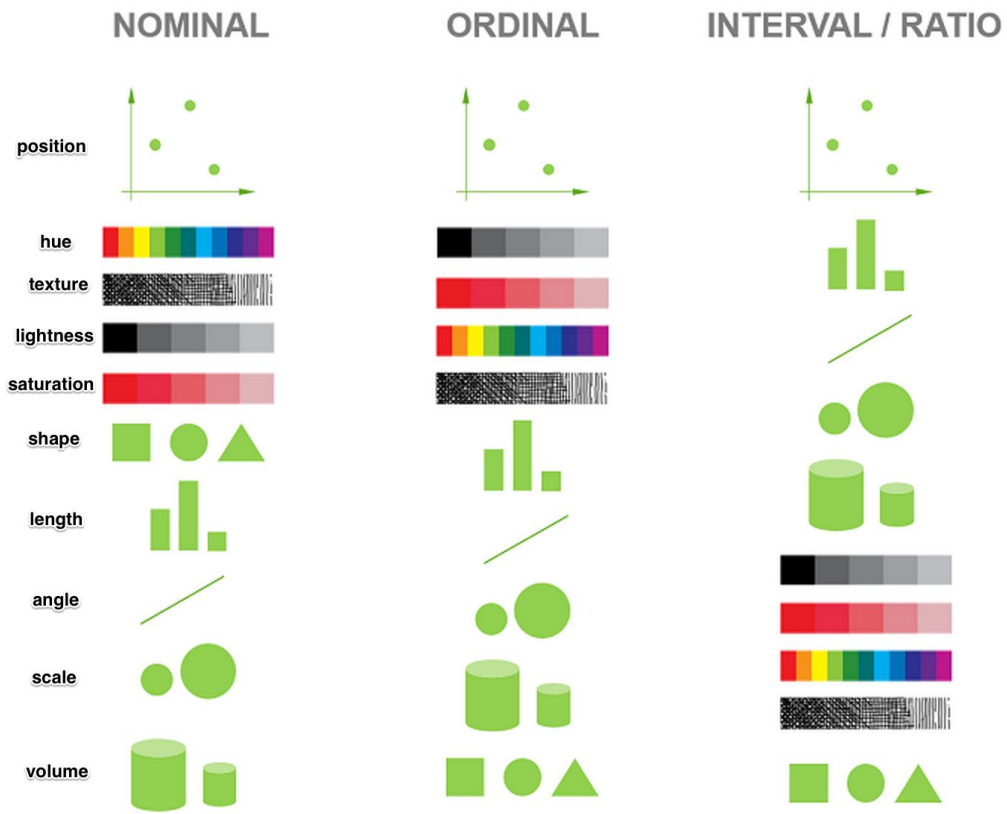
Visualization Methods

Types of data

- Nominal
  - Non-numeric categories
  - Arizona, Utah, New Mexico, Colorado
- Ordinal
  - Numeric data with non-constant or unknown spacing
  - Strongly disagree, disagree, neutral, agree, strongly agree.
- Interval
  - Numeric with uniform spacing
  - Feb 01, Feb 02, …
- Ratio
  - Interval with a zero point
  - Degrees Farenheit



https://pt.slideshare.net/Qualtrics/best-practices-for-killer-data-visualization



Different ways to show different types of data, in descending usefulness

Bars, lines, maps and color

You can go more complicated, of course, and maybe with good results. But if you are wondering what to do, try the following things:

- Comparing numeric values? Bar chart.
- Showing a trend over time? Line chart.
- Geographic locations? Use a map.
- Show clusters between to non-time variables? Use a scatter plot.

- Highlight important parts with a significant color, intensity or shape.

- Humans can distinguish about 8 colors at once.

Pronto Bike Share

https://en.wikipedia.org/wiki/Pronto_Cycle_Share

Pronto Bike Share

- Pronto was a bike sharing service in Seattle from 2014 to 2017.
- We have 191,000 records of data for all the trips in 2015.
- We are concerned with month of the year and the trips taken within that month.

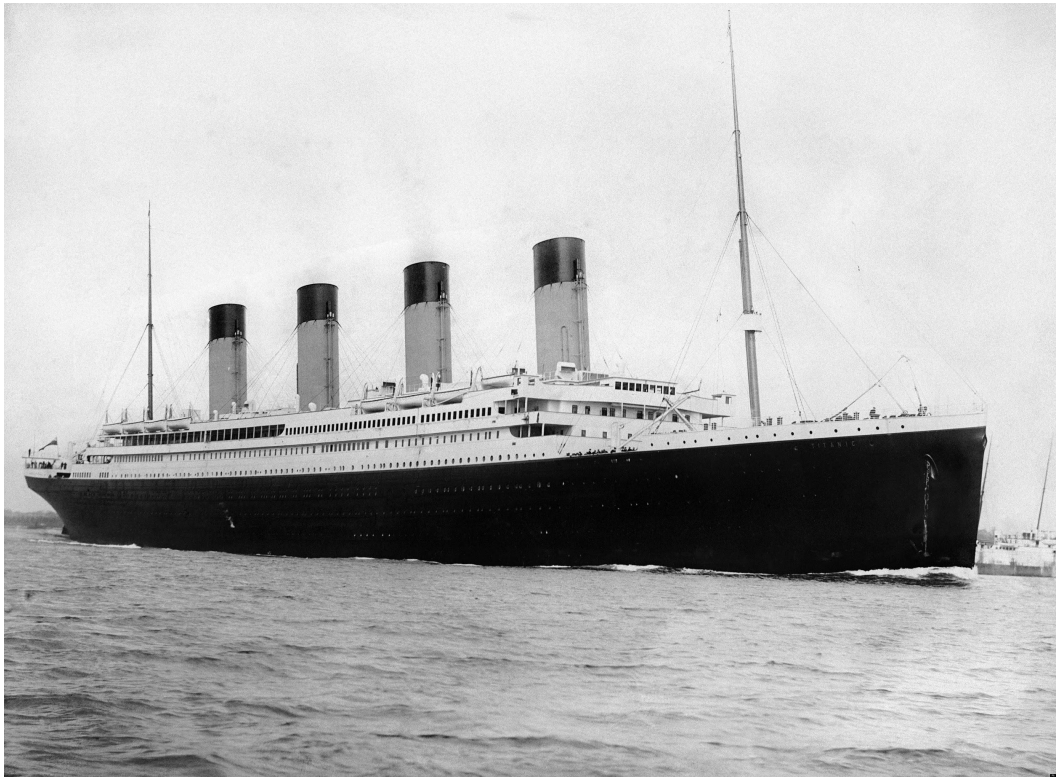
Pronto visualization goals

- Aggregate trips per month
- Show a line chart with a trend over time
- Single visualization
- Use a calculated field to extract the month from a date

https://public.tableau.com/profile/alicia.key#!/vizhome/Pronto01/TripsPerMonth

Pronto bikeshare chart

The Titanic



https://en.wikipedia.org/wiki/RMS_Titanic

Titanic dataset

- Epic fail, but great dashboards
- We are concerned with:
  - Embark location: Southampton, Cobh (Queenstown), Cherbourg
  - Passenger class
  - Alive or dead

- Other attributes as fun for the future!
- There are no missing data in this version. Missing ages filled with median.

Titanic Visualization Goals

- Use stacked bar charts to show passenger classes encoded with color
- Use a map to show places of embarkment
- Use bar charts with a hierarchy of dimensions to show deaths of the various passenger classes.

https://public.tableau.com/profile/alicia.key#!/vizhome/Titanic03/FullStory

This is where people got on the Titanic (and the passenger class predominant at each port) alongside the rates of death by passenger class.

2013 FBI Crime Data

No picture

Watch a TV crime show instead.

FBI Crime Data

- Variety of crime types by state and city in 2013. We are concerned mostly with:
  - Violent crime
  - Population
- But, comparing raw violent crime numbers is pointless.
- The values need to be normalized to a violent crime rate
- [Violent Crime] / [Population] * 100000
  - Incidents per 100,000 people
- Filter by state

FBI Crime visualization goals

- Use a calculated field to determine violent crime rate
- Use an interactive filter to control bars on a chart and points on a map at the same time.
- Use a map with with points encoded with colors and size to show crime rates.

https://public.tableau.com/profile/alicia.key#!/vizhome/Crime05/Dashboard1

This is violent crime rate in 2013 as reported by the FBI in the indicated states and cities.

SEA Pet Licenses

https://en.wikipedia.org/wiki/Goat

Seattle Pet License Data

- We are concerned about ZIP code and species of the pet

Your Turn!

- Display a map that has a dot over each ZIP code
- Each dot should be sized proportionally to the total number of pet licenses issued in that ZIP code.
- Add a filter to filter down to unique species

https://public.tableau.com/profile/alicia.key#!/vizhome/SEAPetLicenses01/Dashboard1

Pet licenses by ZIP code on a map.