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# Tableau Workshop

Presented by Alicia Key at Galvanize Boulder  
February 5, 2019

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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
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# 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
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# What is Tableau?

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# 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.
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# 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.
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# Visualization Methods

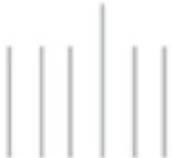



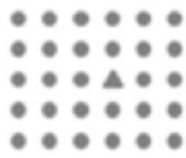




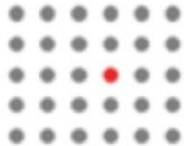
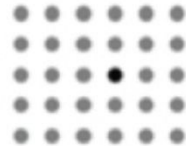
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# Types of data

- 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 Fahrenheit
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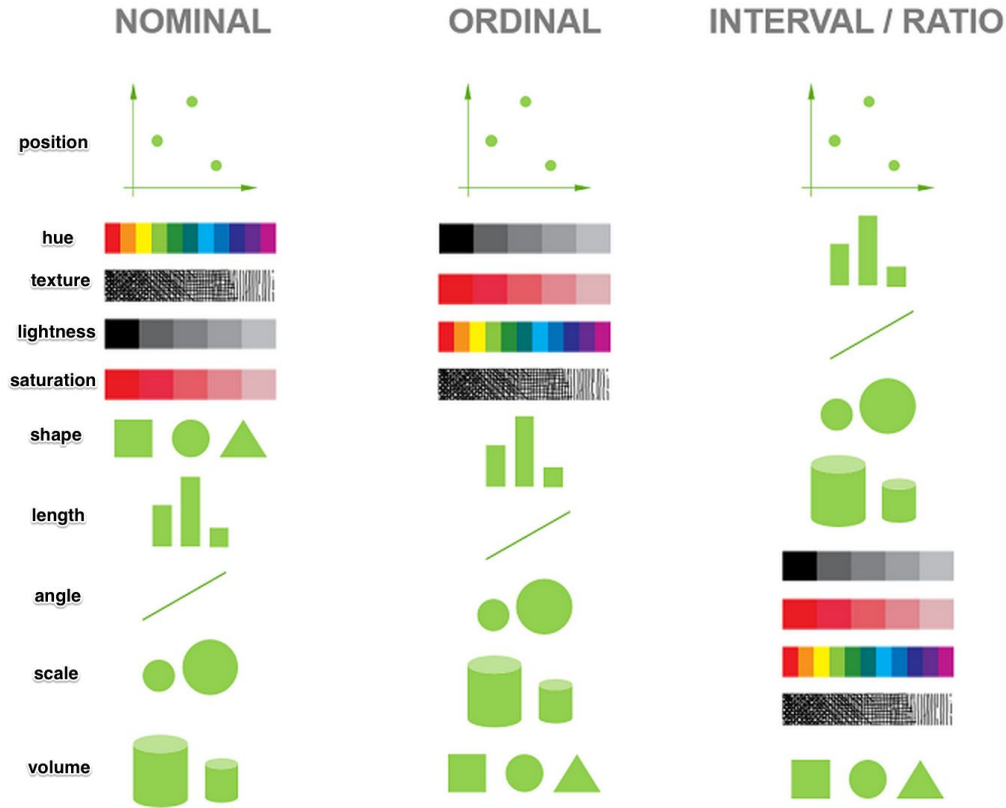


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Length	Width	Orientation	Size	Shape	Curvature
					
Enclosure	2-D Position	Spatial Grouping	Color (Hue)	Color (Intensity)	
					

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

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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](https://en.wikipedia.org/wiki/Pronto_Cycle_Share)

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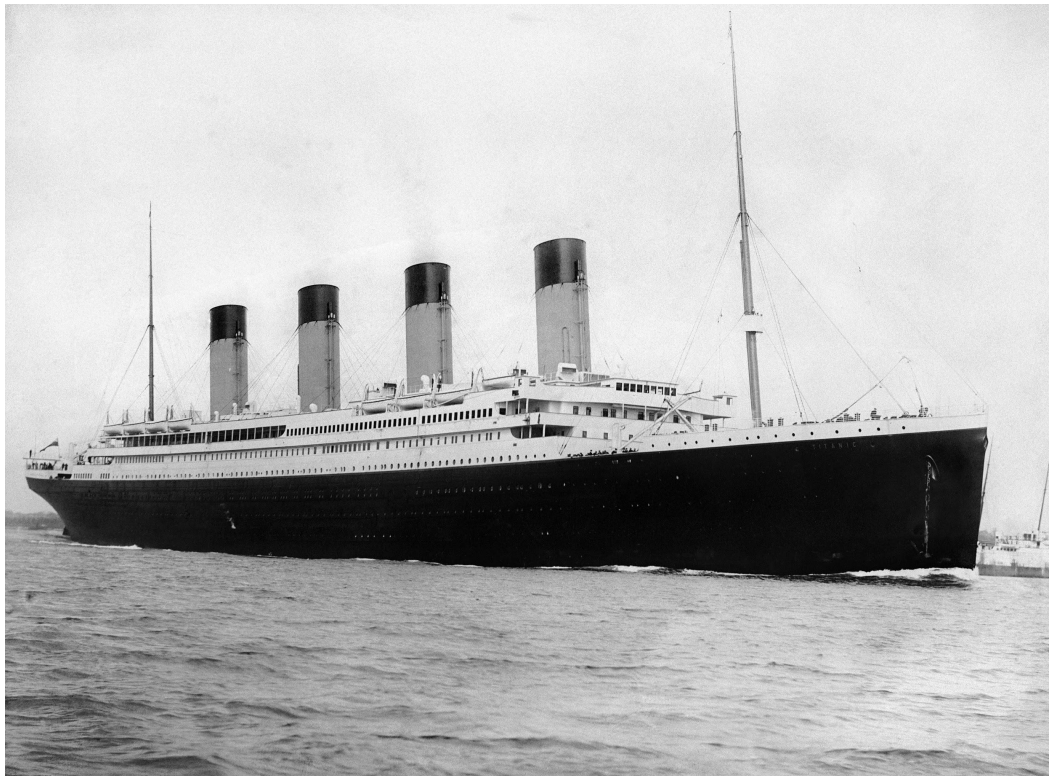
<https://public.tableau.com/profile/alicia.key#!/vizhome/Pronto01/TripsPerMonth>

Pronto bikeshare chart

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# The Titanic



[https://en.wikipedia.org/wiki/RMS\\_Titanic](https://en.wikipedia.org/wiki/RMS_Titanic)

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# 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.
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# 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.
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<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.

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# 2013 FBI Crime Data

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# No picture

Watch a TV crime show instead.

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# 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
  - $[\text{Violent Crime}] / [\text{Population}] * 100000$ 
    - Incidents per 100,000 people
  - Filter by state
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# 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 points encoded with colors and size to show crime rates.
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<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.

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# SEA Pet Licenses



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

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

Pet licenses by ZIP code on a map.

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