

# Communicating with Data – Basic Charts

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Slides based off slides courtesy of Jordan Crouser (<https://jcrouser.github.io/>)

# Plan for Today

- A sampling of visualization techniques
- Tableau Live Demo
- Lab 2: Building charts in Tableau

Recall: Data →  
Visuals

- Remember... **Big idea behind visualization**
  - **Map data dimensions to visual dimensions in a principled way**
  - Not all visual dimensions can represent all data types

	<div>Categorical<div>Apple, Banana, Grapes</div>Ordinal<div>Child, Adult, Elderly</div>Quantitative<div>Double-headed arrow</div></div>		
POSITION			
SIZE			
VALUE			
COLOR			
ORIENTATION			
SHAPE			

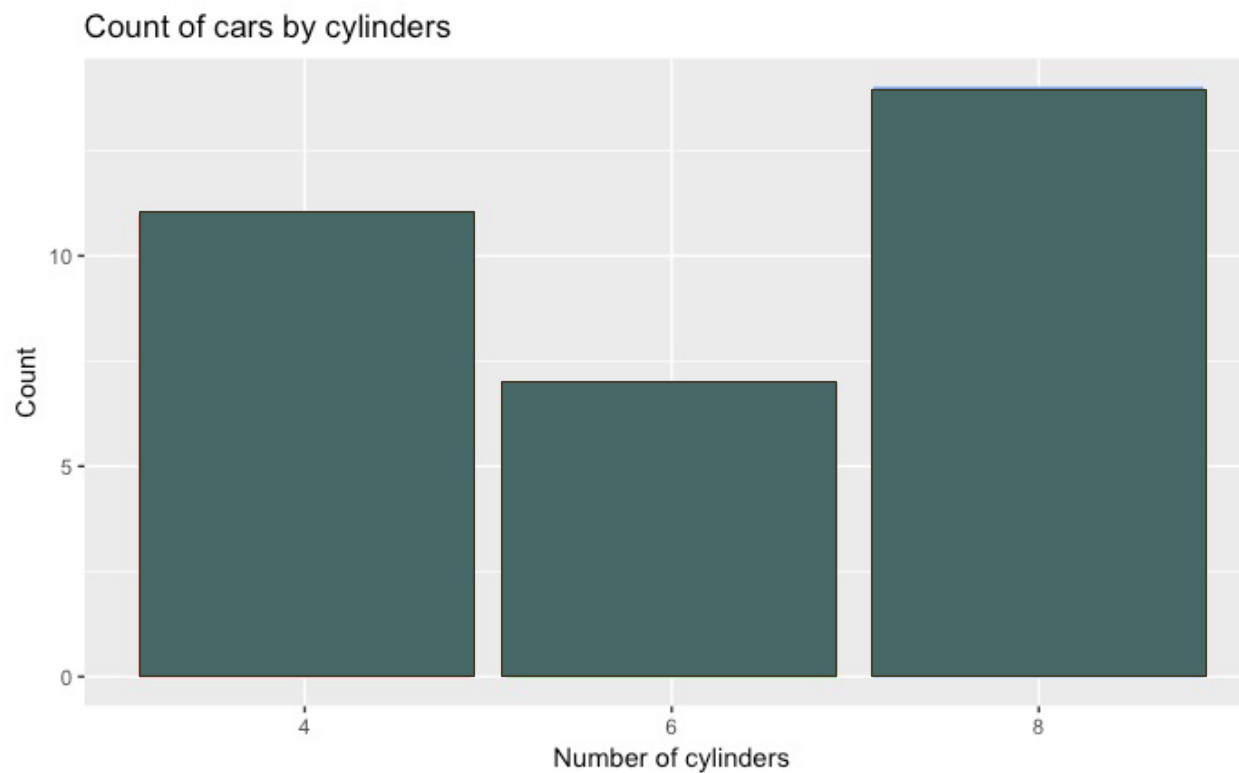
# A sampling of visualization techniques



# Bar chart

- Used to
  - **Compare**
  - Highlight
  - Grouped
- variable  
ies  
to sub-

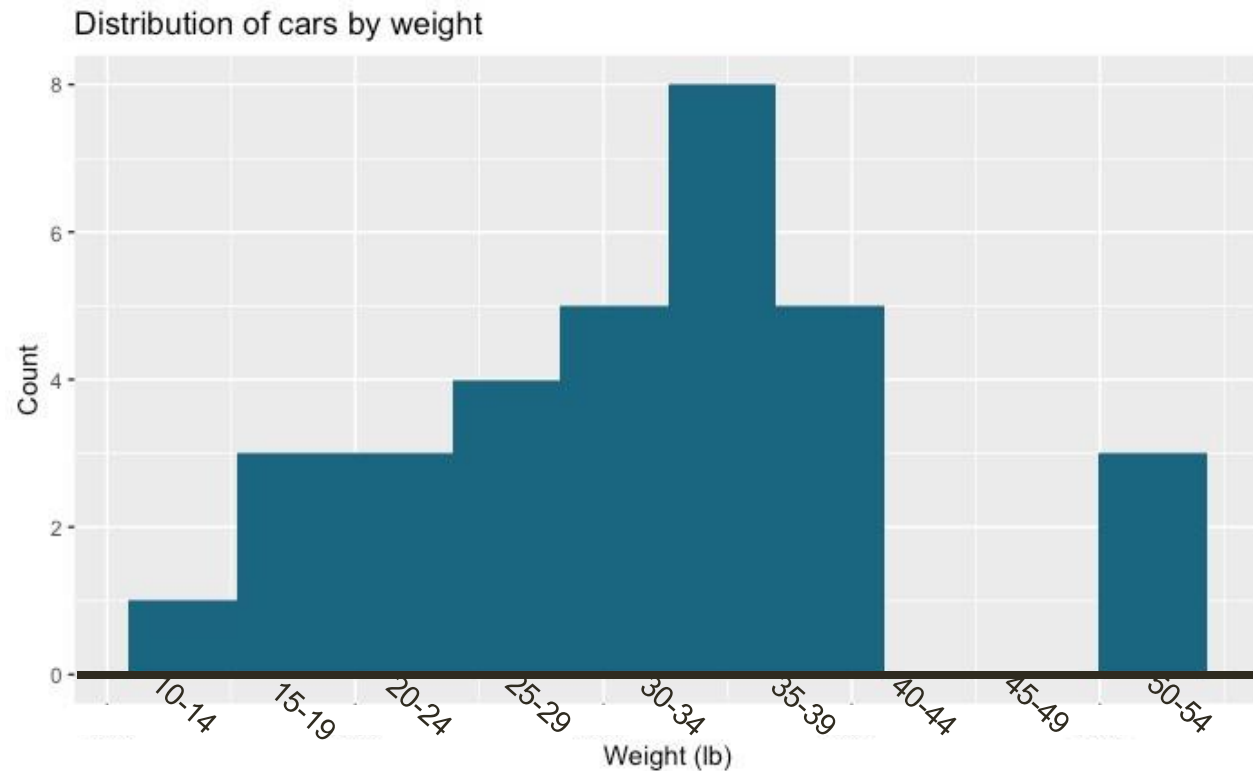
What is the data visual mapping in this chart?



# Histogram

- Used for
- Looks like a bar chart, but the bars represent size ranges
- Y-axis represents count or frequency
- Highlights distribution
- Note: bin size makes a big difference!

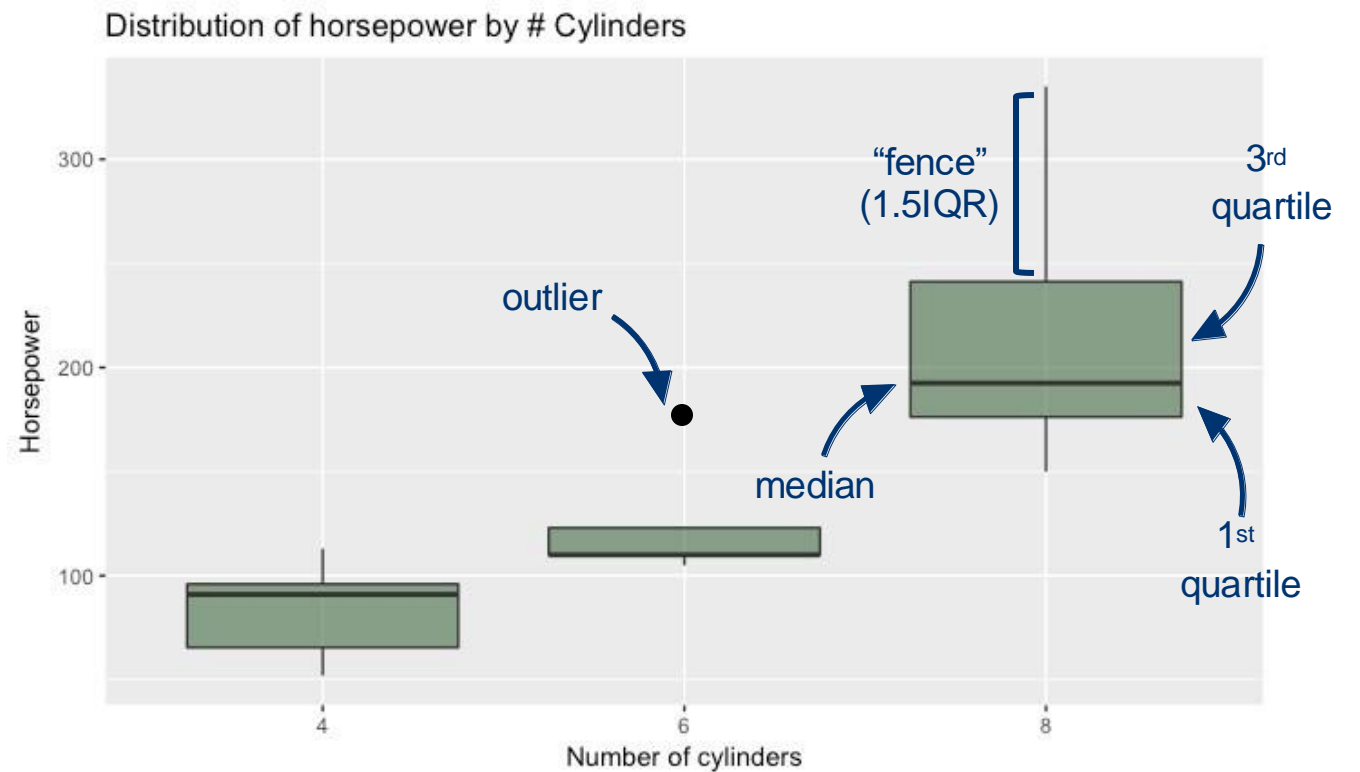
What is the data visual mapping in this chart?



# Boxplot

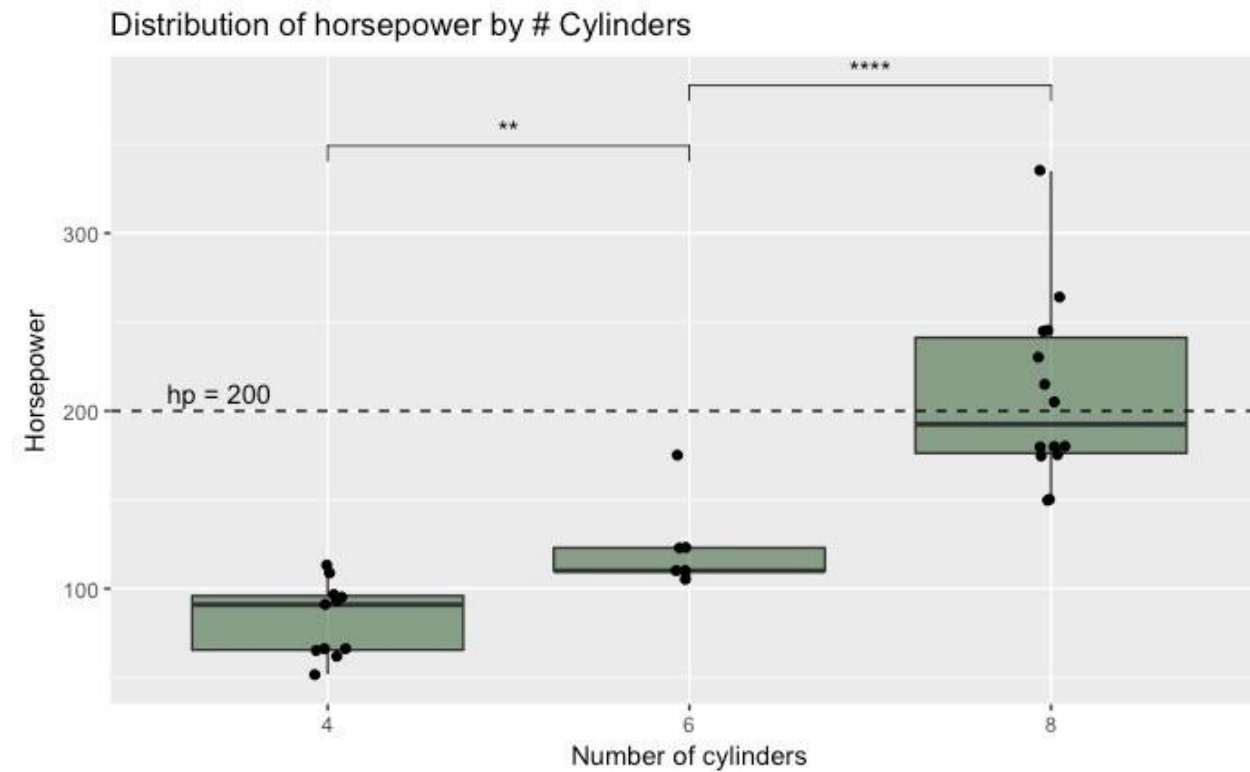
- Used for
- Also used
- Calls out
  - median
  - 1st & 3rd quartiles
  - "fences"
  - outliers

What is the data visual mapping in this chart?



# Boxplot

- Use “jitter” to show actual values
- Reference lines can help provide context
- Can use annotations to show statistical significance

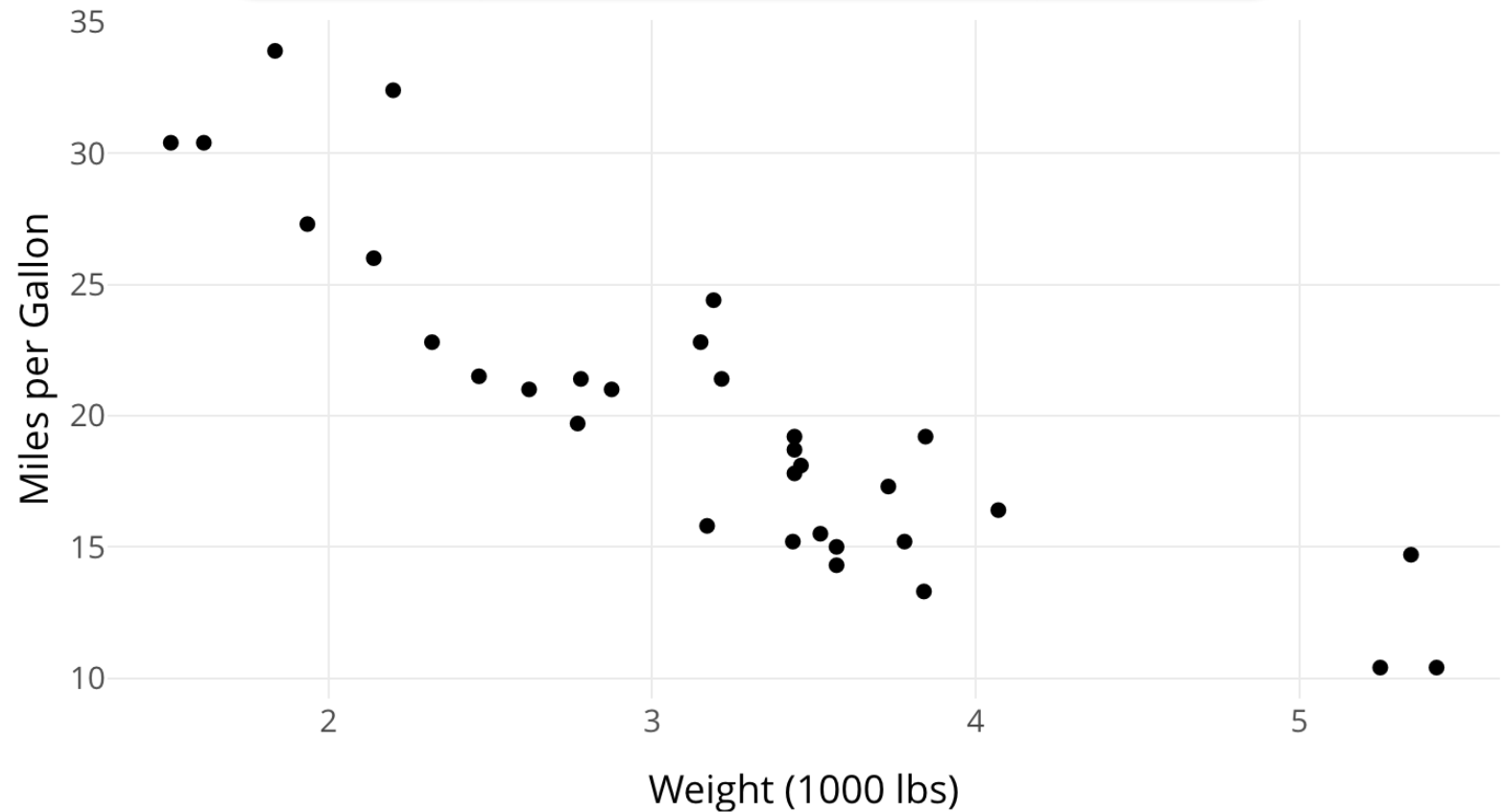




# Scatterplot

- Used to visualize the relationship between two quantitative variables
- Shows the distribution of data points
- Each point represents an observation

What is the data visual mapping in this chart?

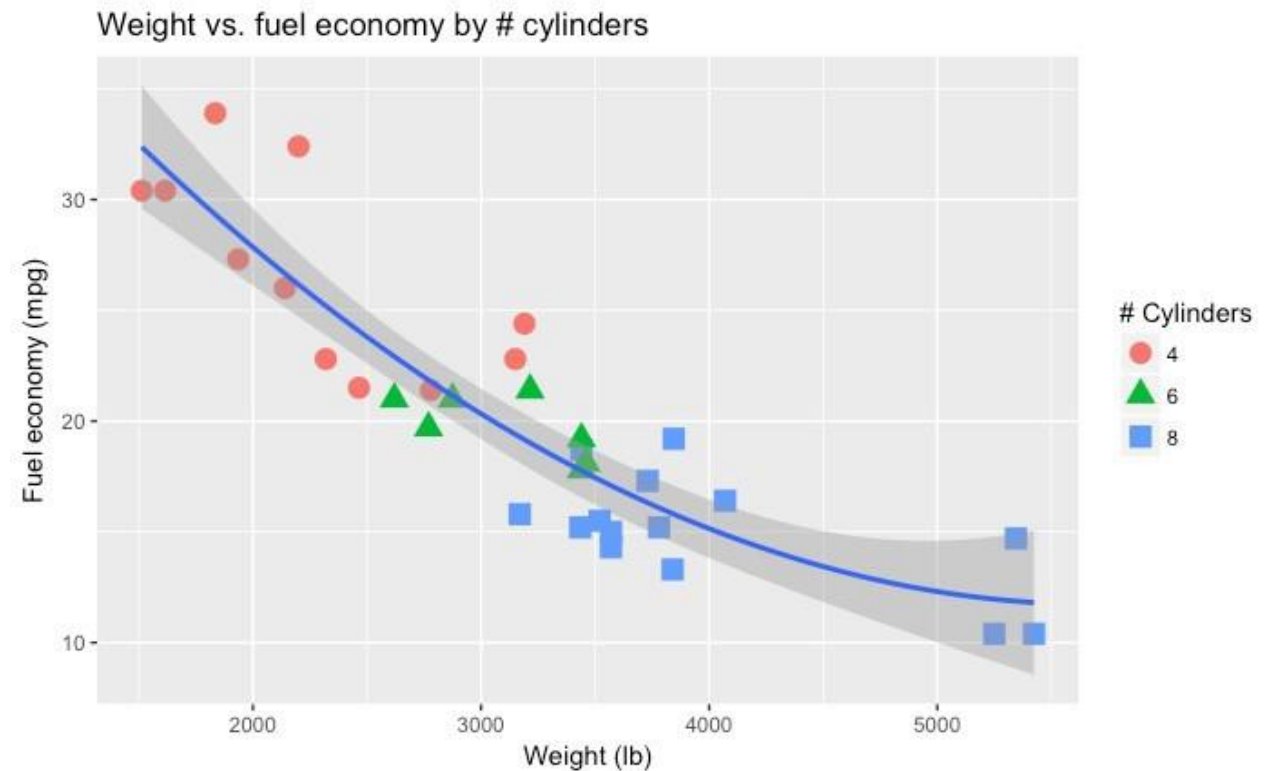


# Scatterplot

- Can use
- **quantitative**
- This high
- Sometimes

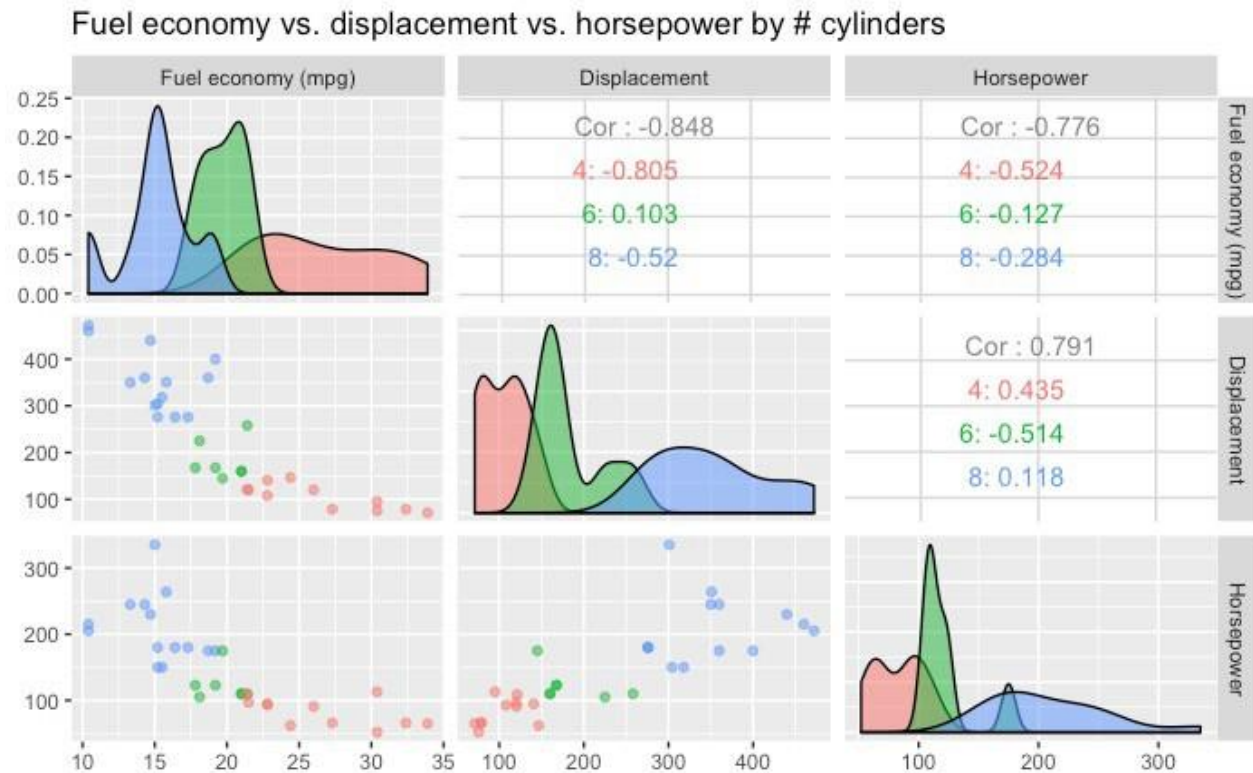
variable X one

What is the data visual mapping in this chart?



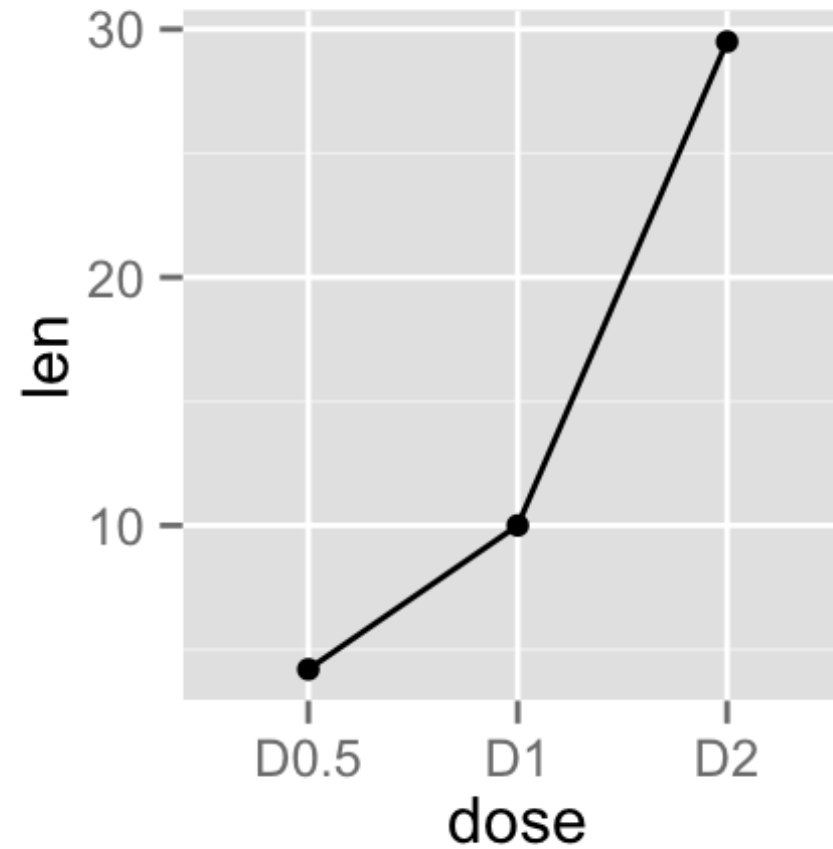
# Scatterplot matrix (SPLOM)

- Can use to show **many combinations of one quantitative variable X one quantitative variable**
- Combines multiple scatterplots into a matrix to show **additional relationships**



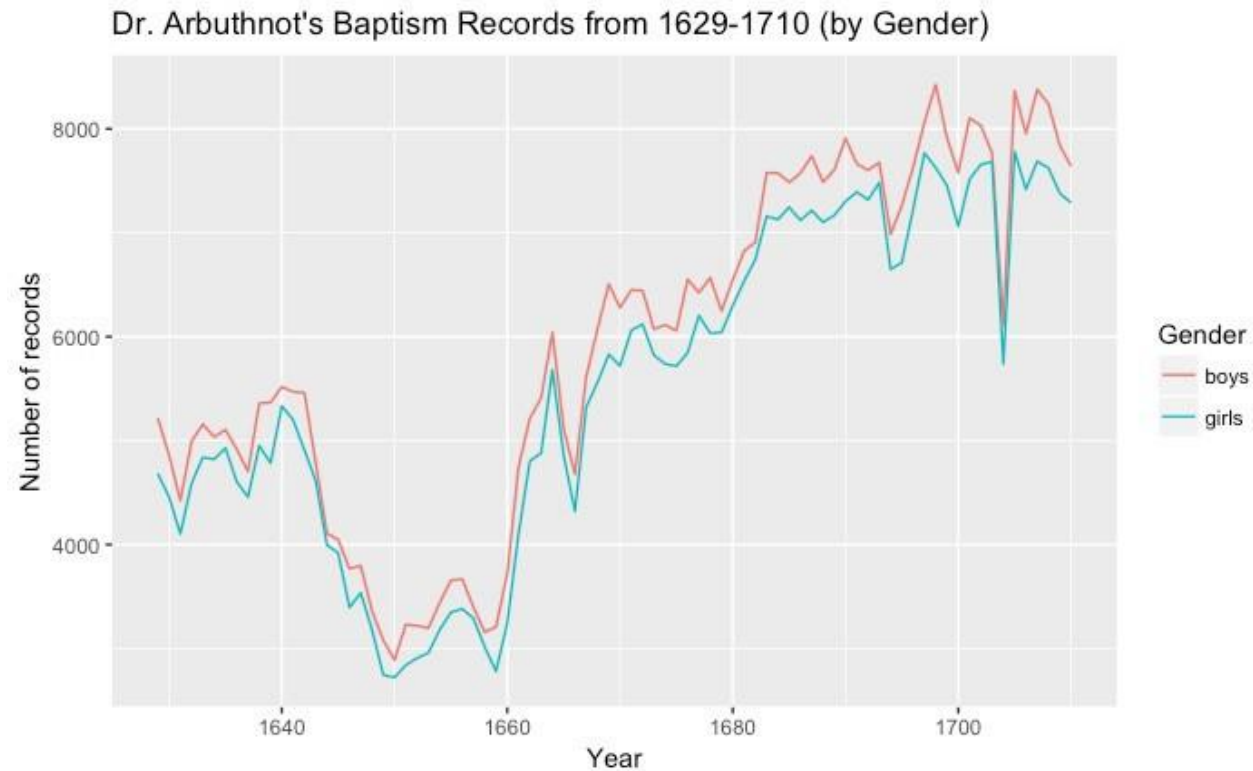
## Line chart

- Shows the relationship between variables over time
- What is the data visual mapping in this chart?

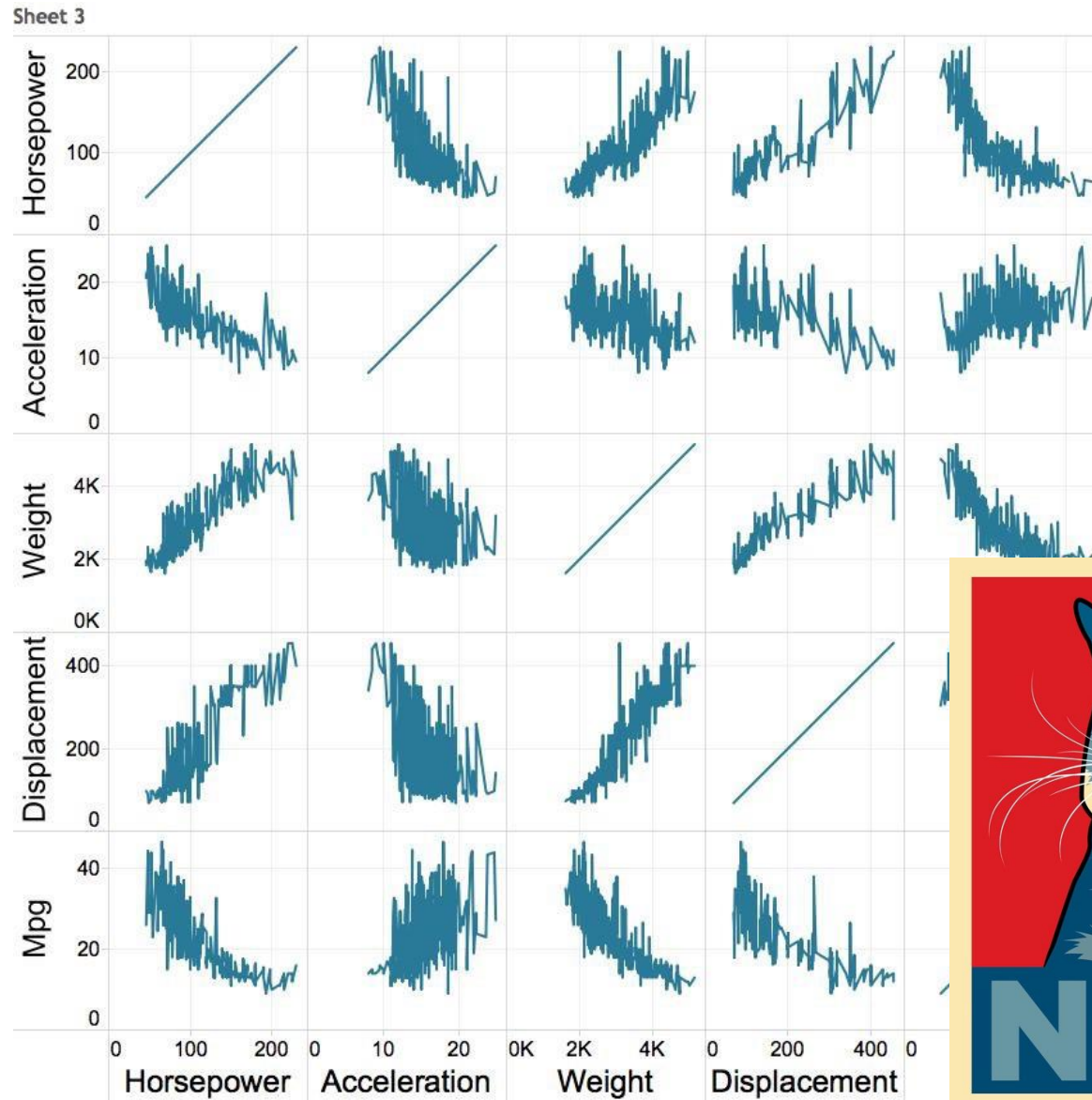


## Line chart

- Multiple lines allow **comparison of trends**
- Can show one quantitative variable across groups, or multiple quantitative variables (if they have the same scale)
- Highlights “position switches”

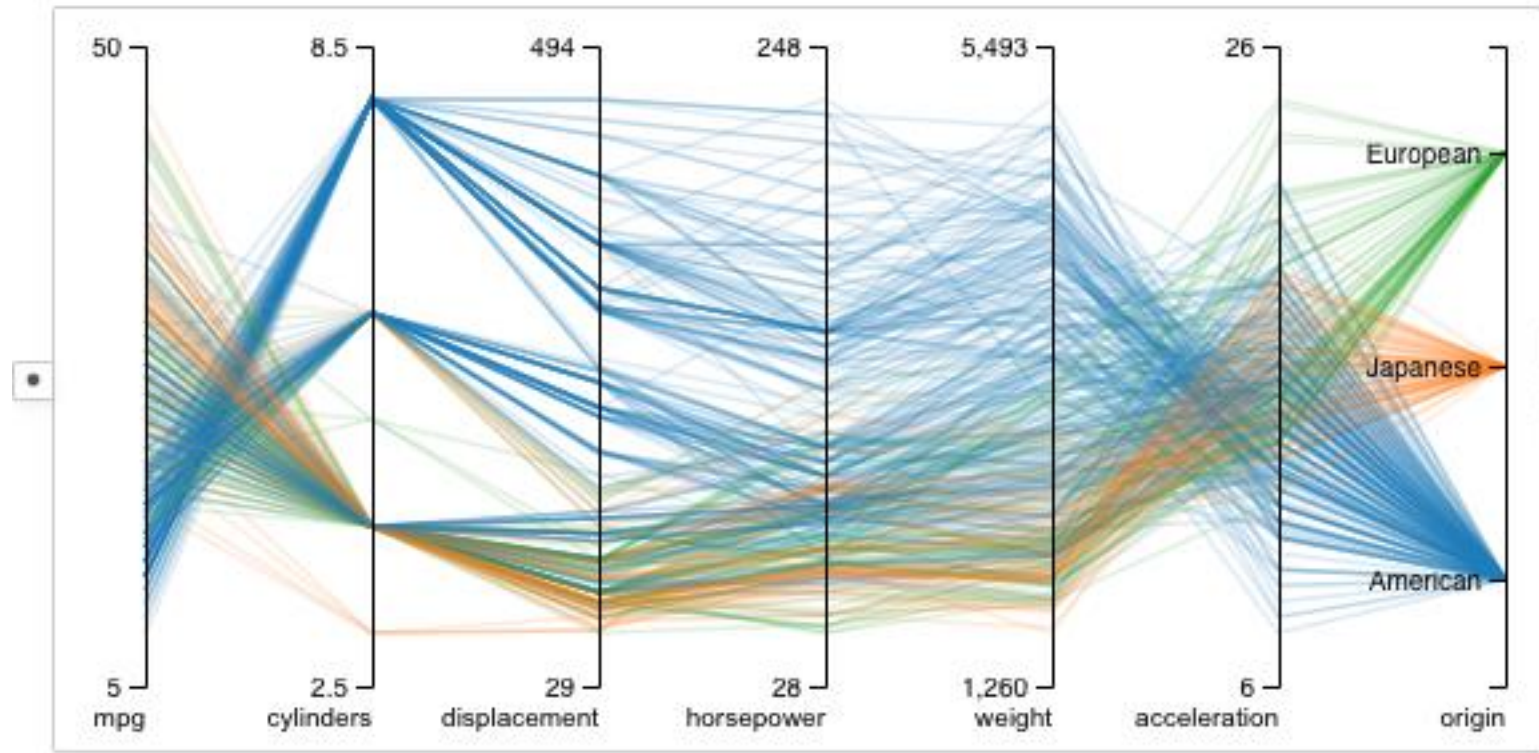


Multiple  
variables: line  
chart matrix?



# Parallel Coordinates Plot

- Supports (pairwise) **comparison of a collection of quantitative variables**
- Each axis represents one variable
  - They may have different scales, typically you normalize them
- Each line represents one observation (connecting the associated values along each axis)
- Axis order matters!



<https://visflow.org/node/visualization/parallel-coordinates.html>

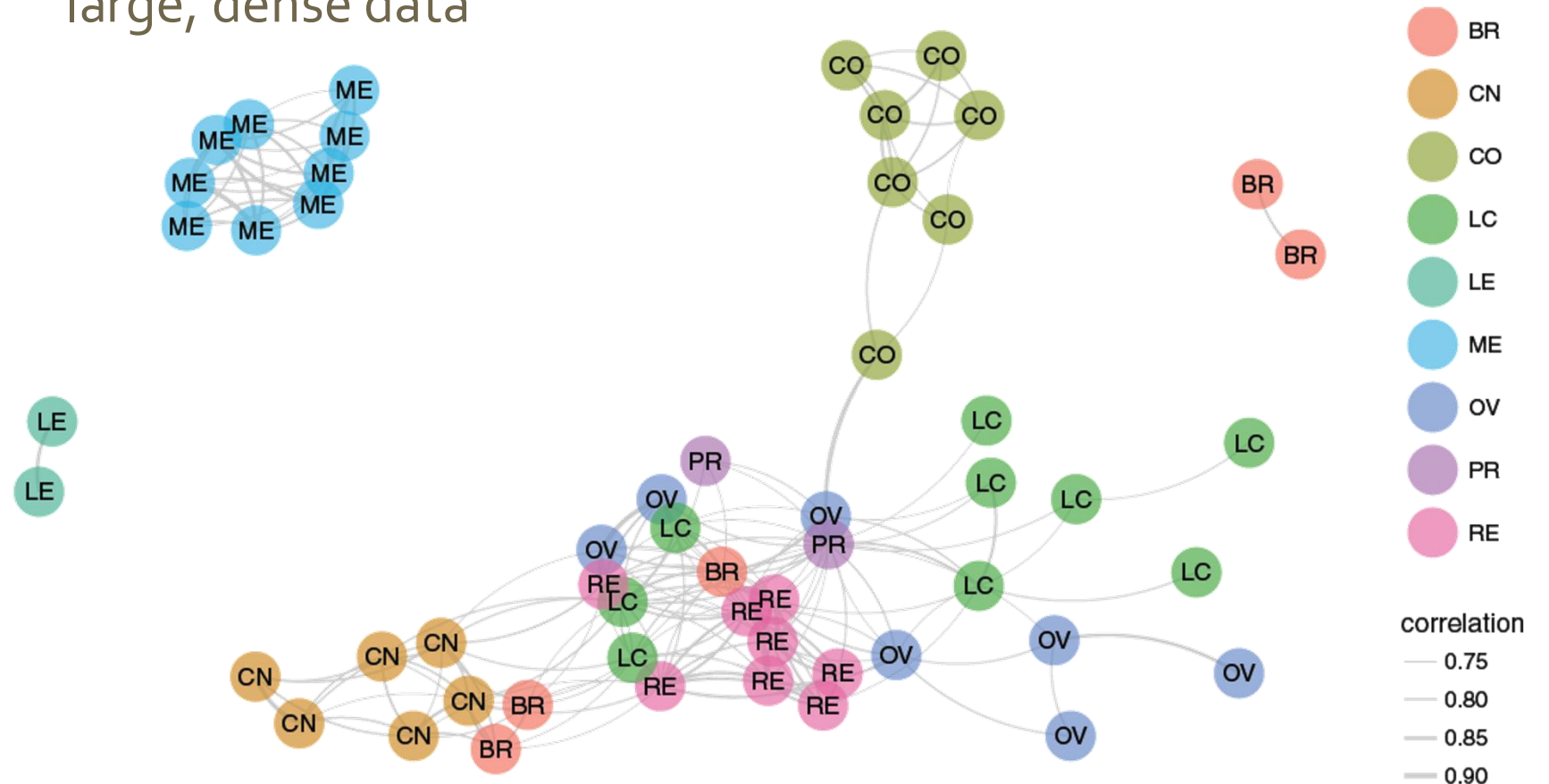
[ta-to-parallel.html](#)



# Network

- Shows
  - Useful
  - Can use
  - Caveat
- large, dense data

What is the data visual mapping in this chart?





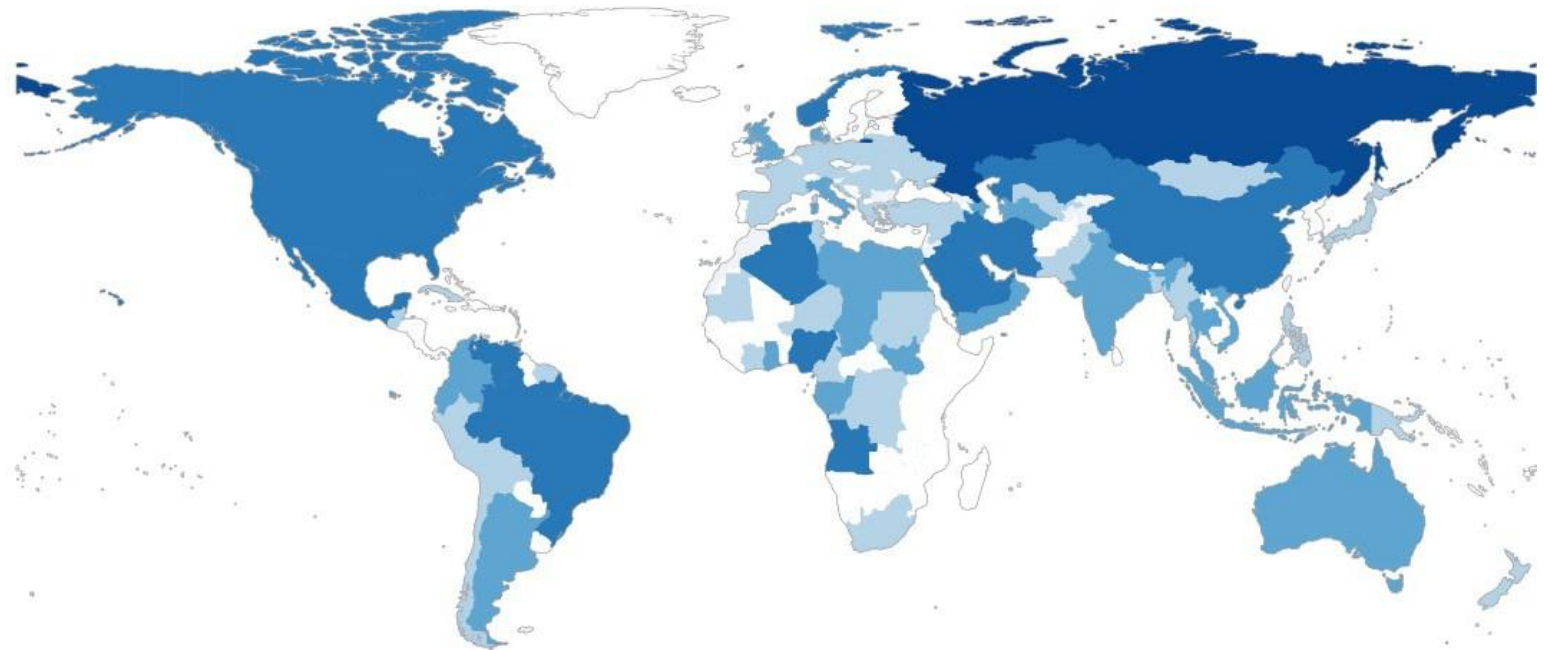
- Shows
  - Useful
  - Filled
  - Remember
- than size comparisons.

What is the data visual mapping in this chart?

ponent  
humans

Oil Prod. (bbl/day)

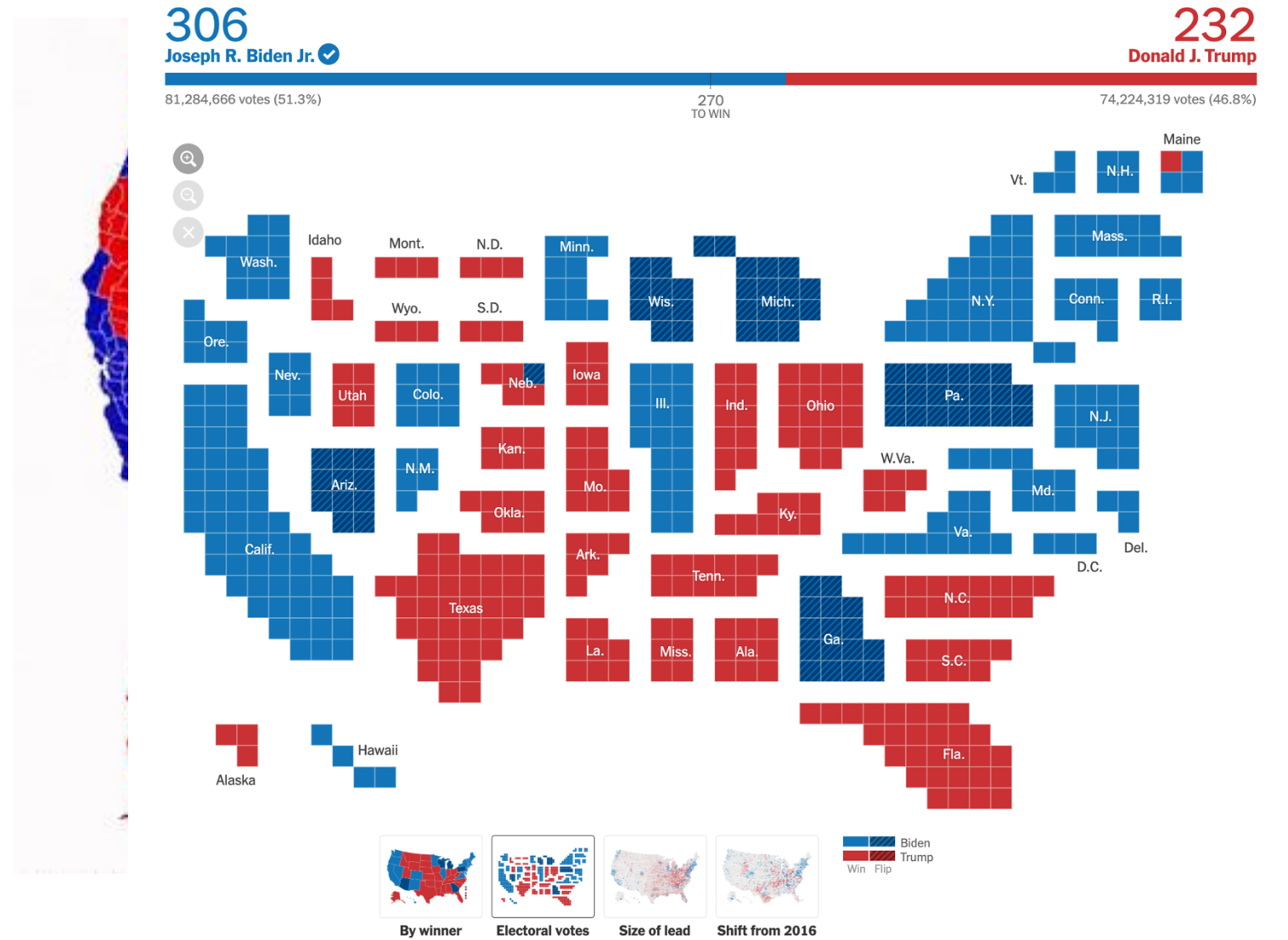
>1000	>100,000	>10 million
>10,000	>1 million	NA



Map

# Map

- Remember to map the correct data to your visual channels



## Practice Time

- Work with a partner
- Find a new dataset you have not yet worked with
- In Tableau, build at least three different visualizations chosen from the techniques we looked at today
- Once you have three, try customizing them (ex. Change the shapes used, the color pallet, the size, etc..)
- Be ready to share what you end up with and any tricks you learn with another group at the end of class!