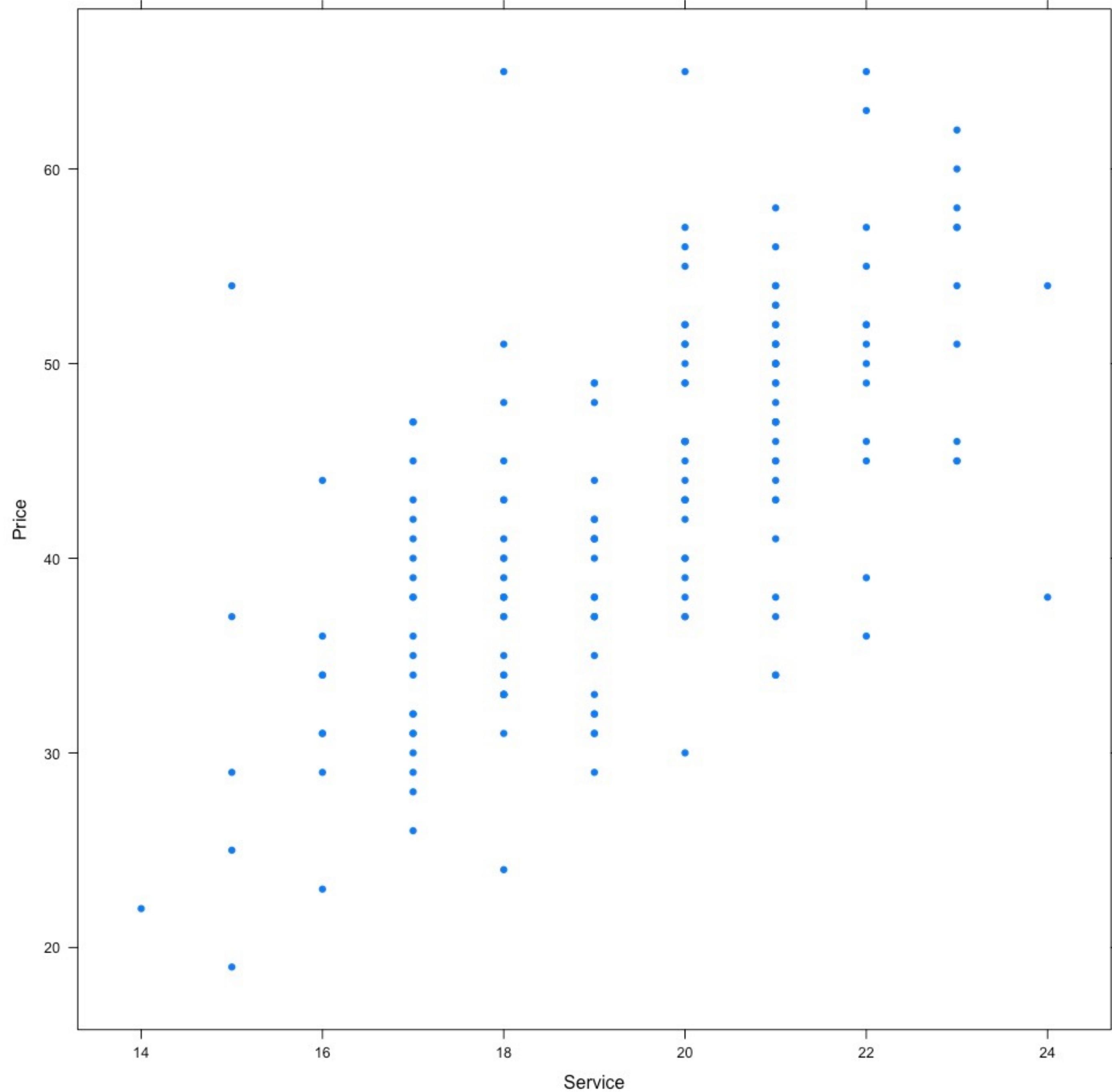


more variables: animation, iteration, interactivity

Multidimensional data

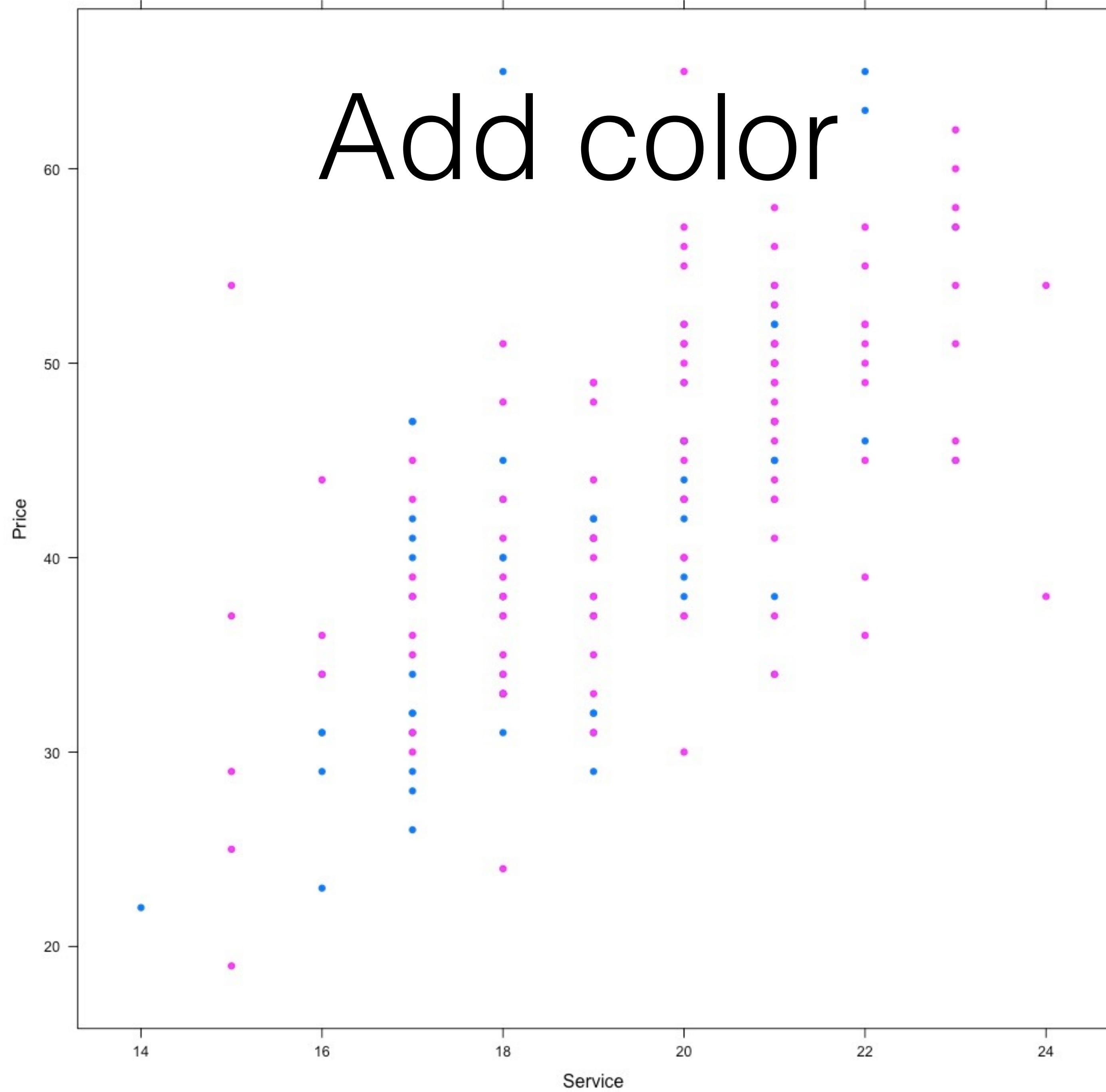
Big data is tall,
multidimensional
data is wide

Data can be both!

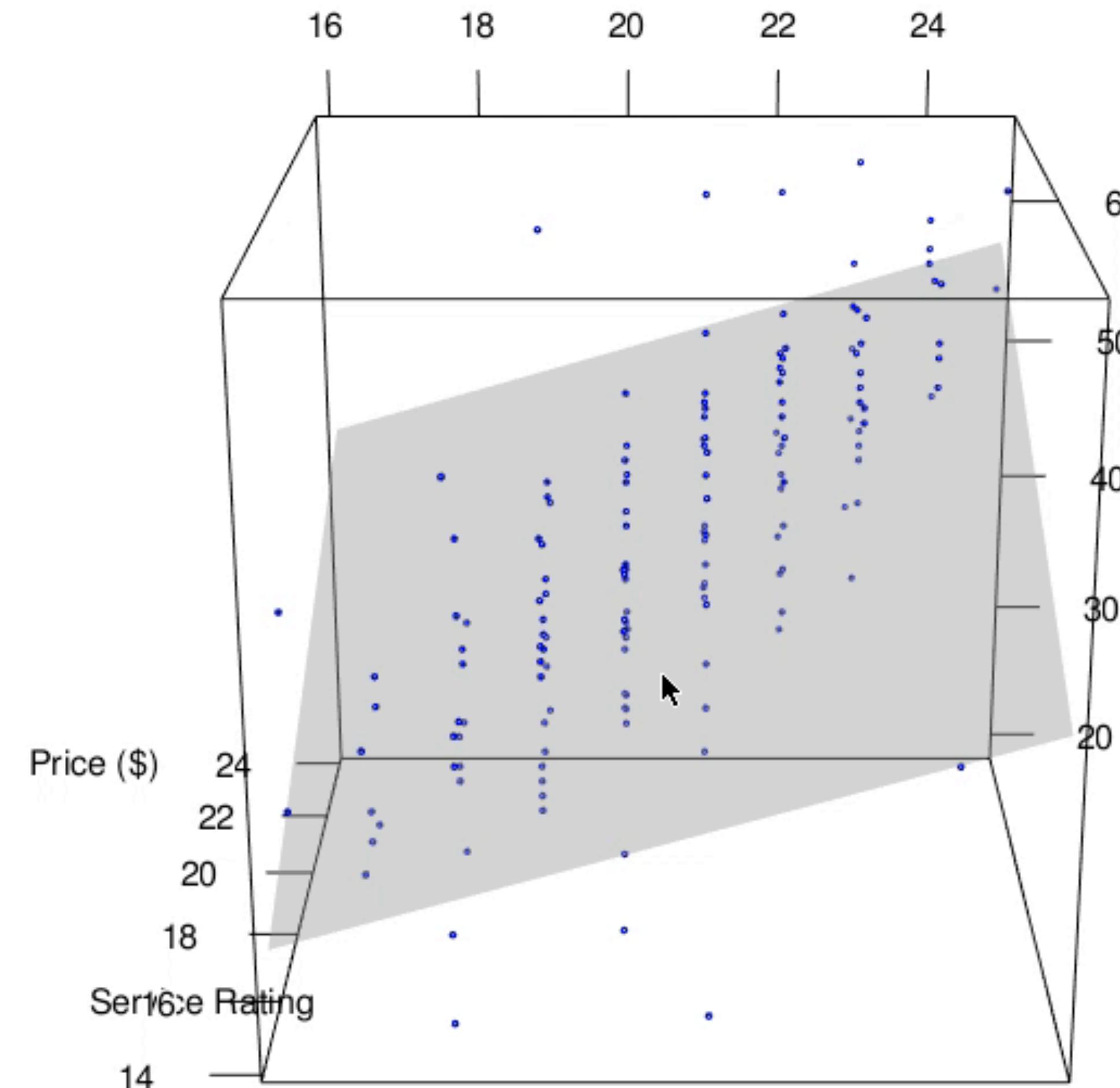


What if you want to
visualize more variables?

Add color



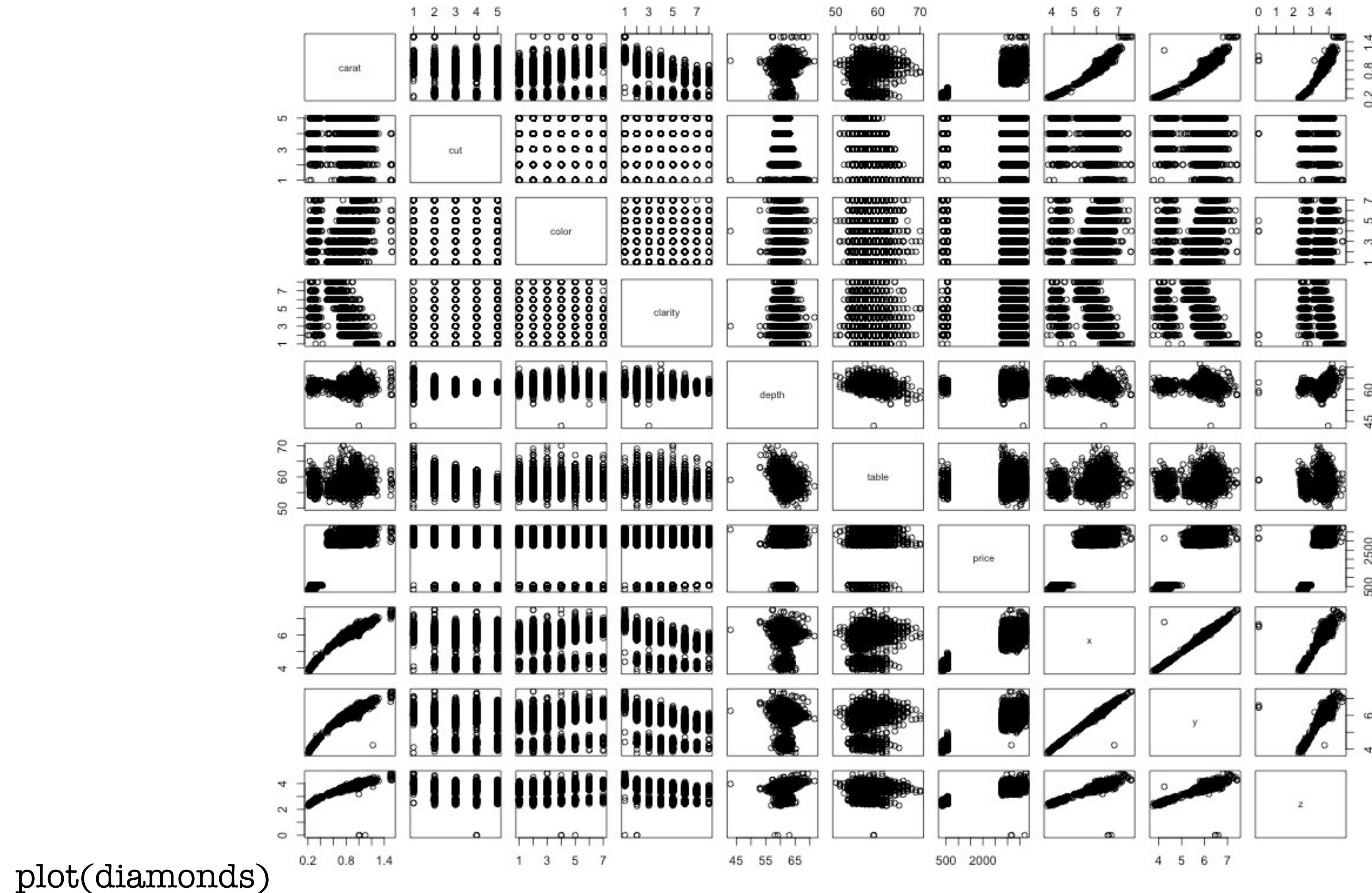
Add a 3rd dimension

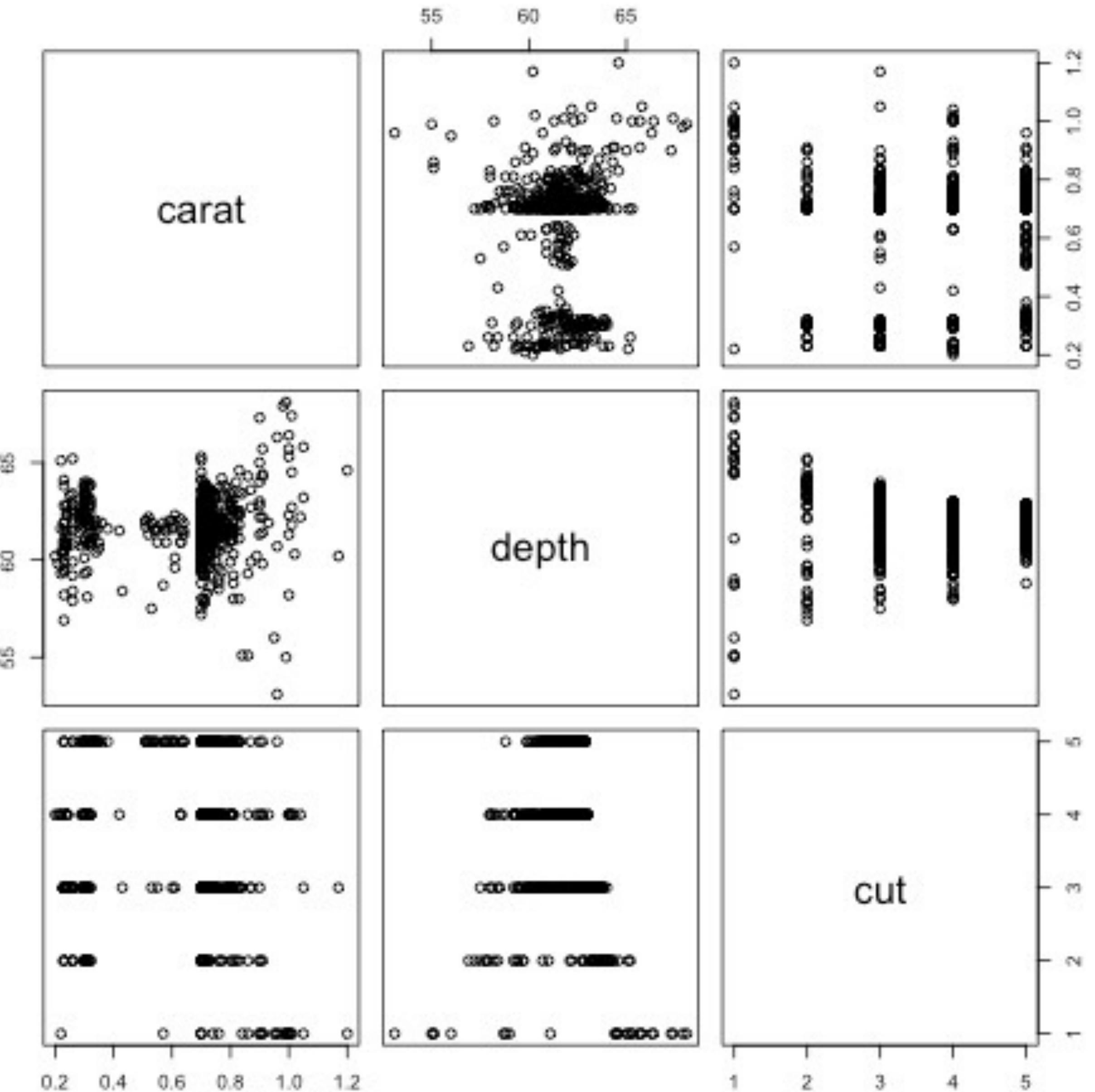


library(rgl)

Food Rating

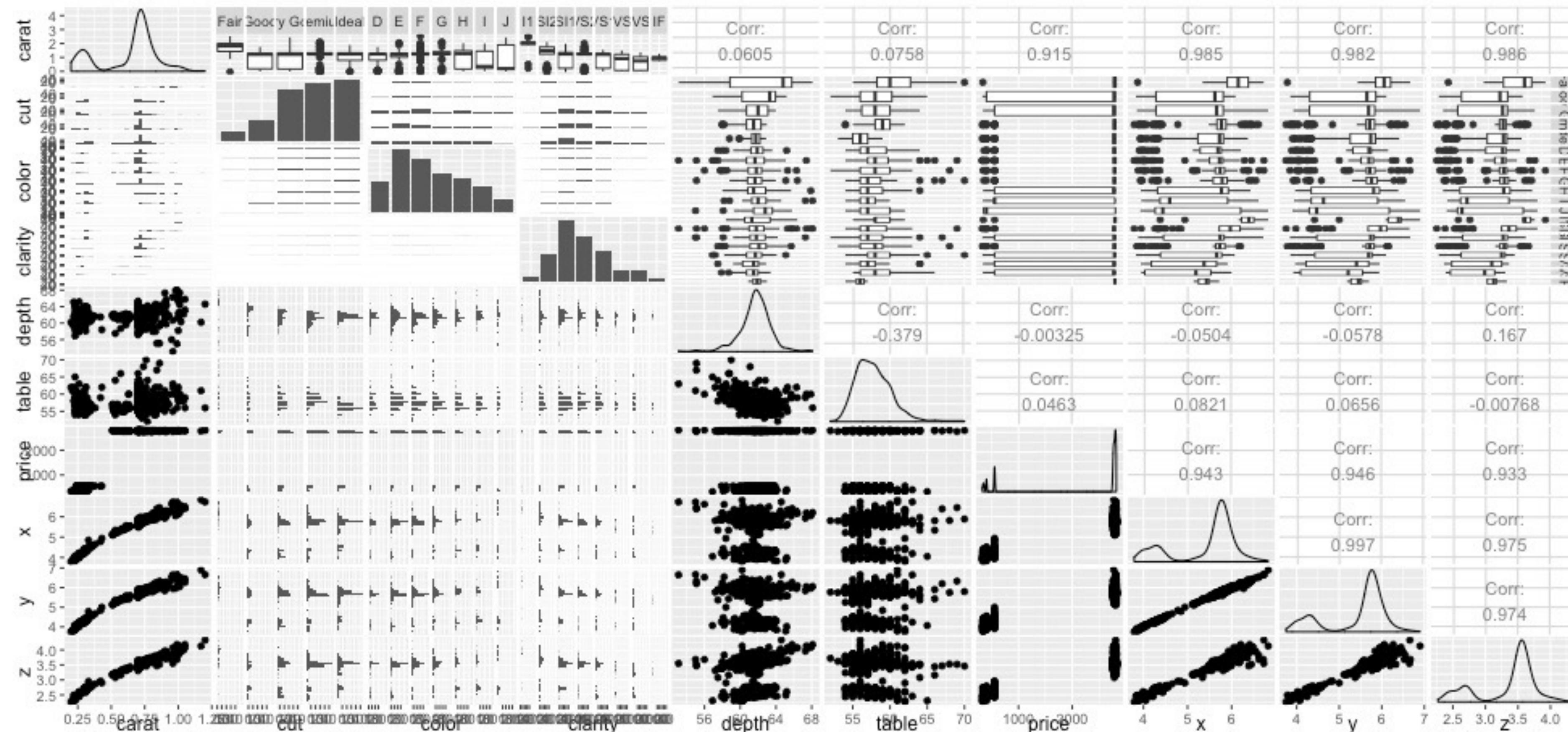
Make a scatterplot matrix





```
select(diamonds, carat, depth, cut) %>%  
  plot()
```

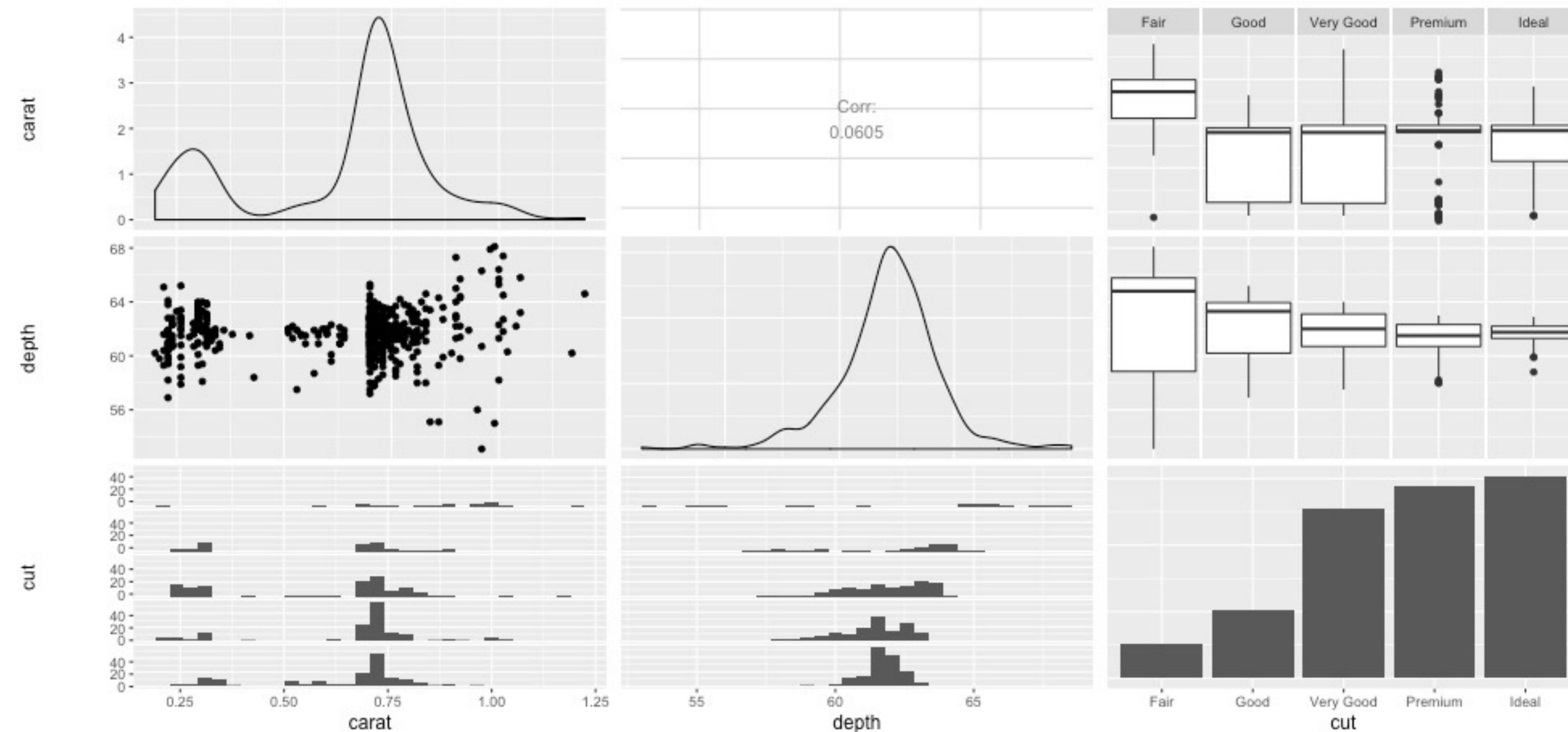
Generalized pairs plot



```
library(GGally)  
ggpairs(diamonds)
```

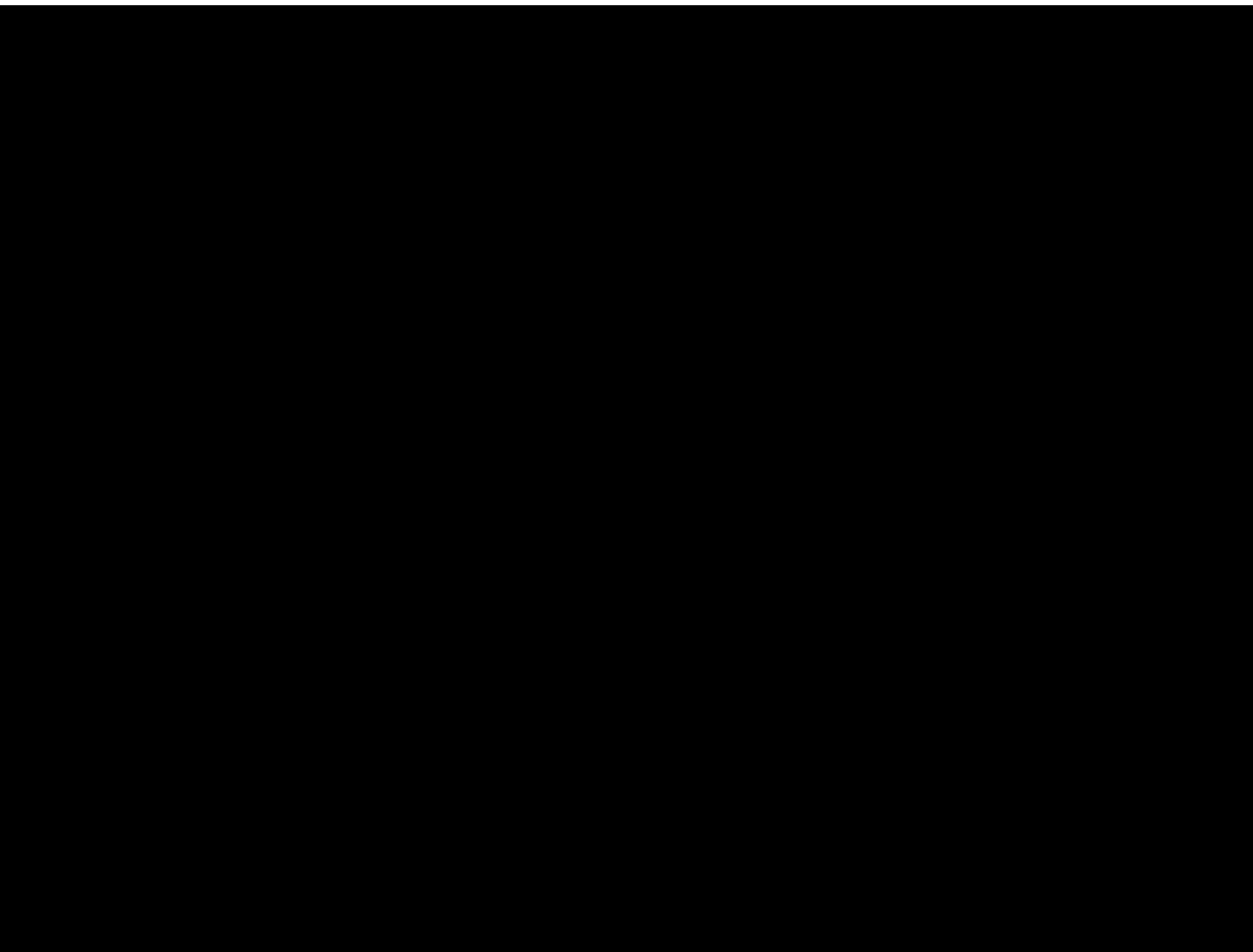
Emerson, J. W., Green, W. A., Schloerke, B., Crowley, J., Cook, D., Hofmann, H., and Wickham, H. (2013). The generalized pairs plot. Journal of Computational and Graphical Statistics, 22(1):79–91. <http://bit.ly/gpairs>

Generalized pairs plot

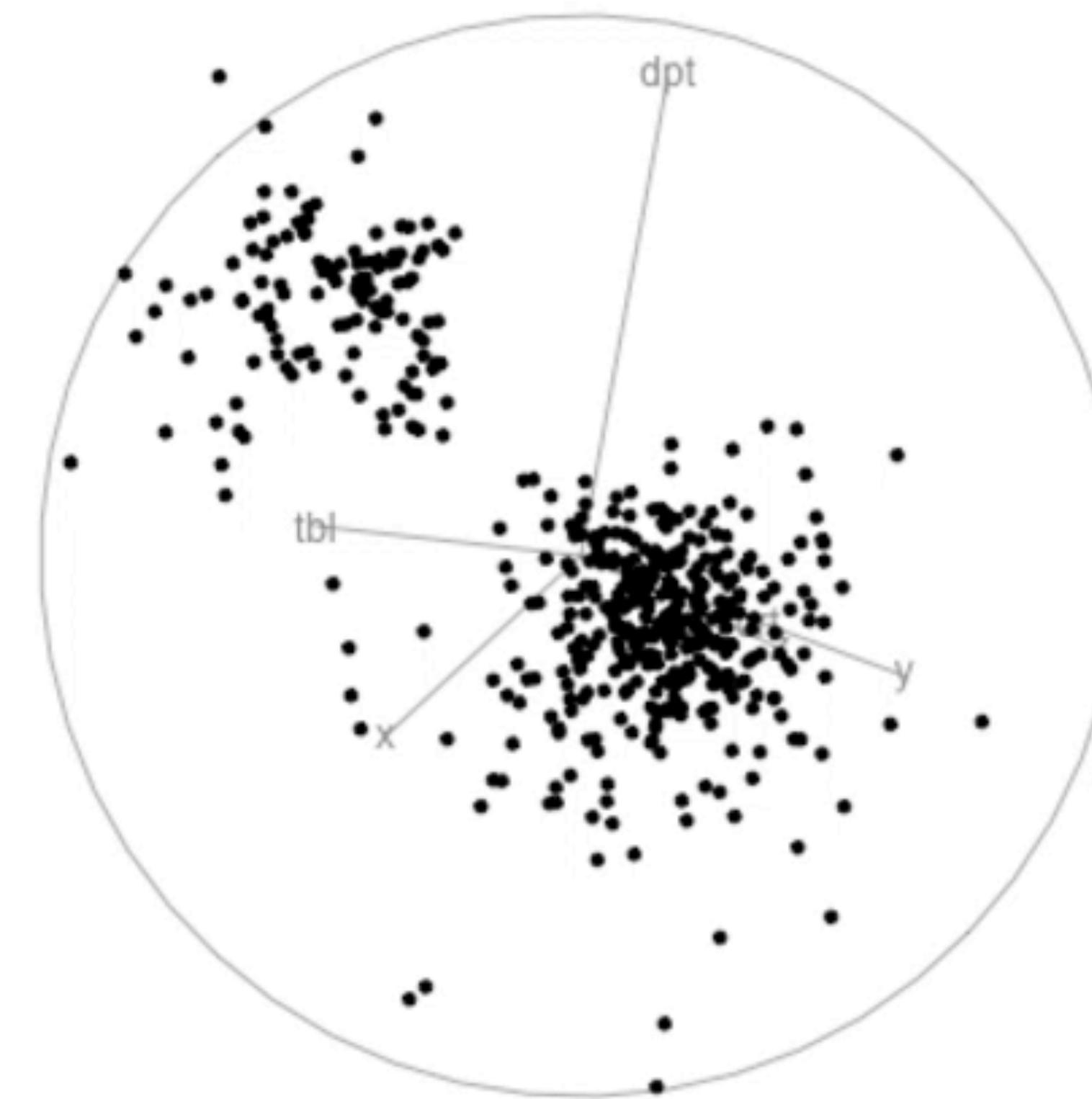


```
select(diamonds, carat, depth, cut) %>%
  ggpairs()
```

prim9



The Grand Tour



```
library(tourrr)
select(diamonds, carat, depth, table, x, y, z) %>%
  animate(grand_tour(), display = display_xy(),fps=15)
```

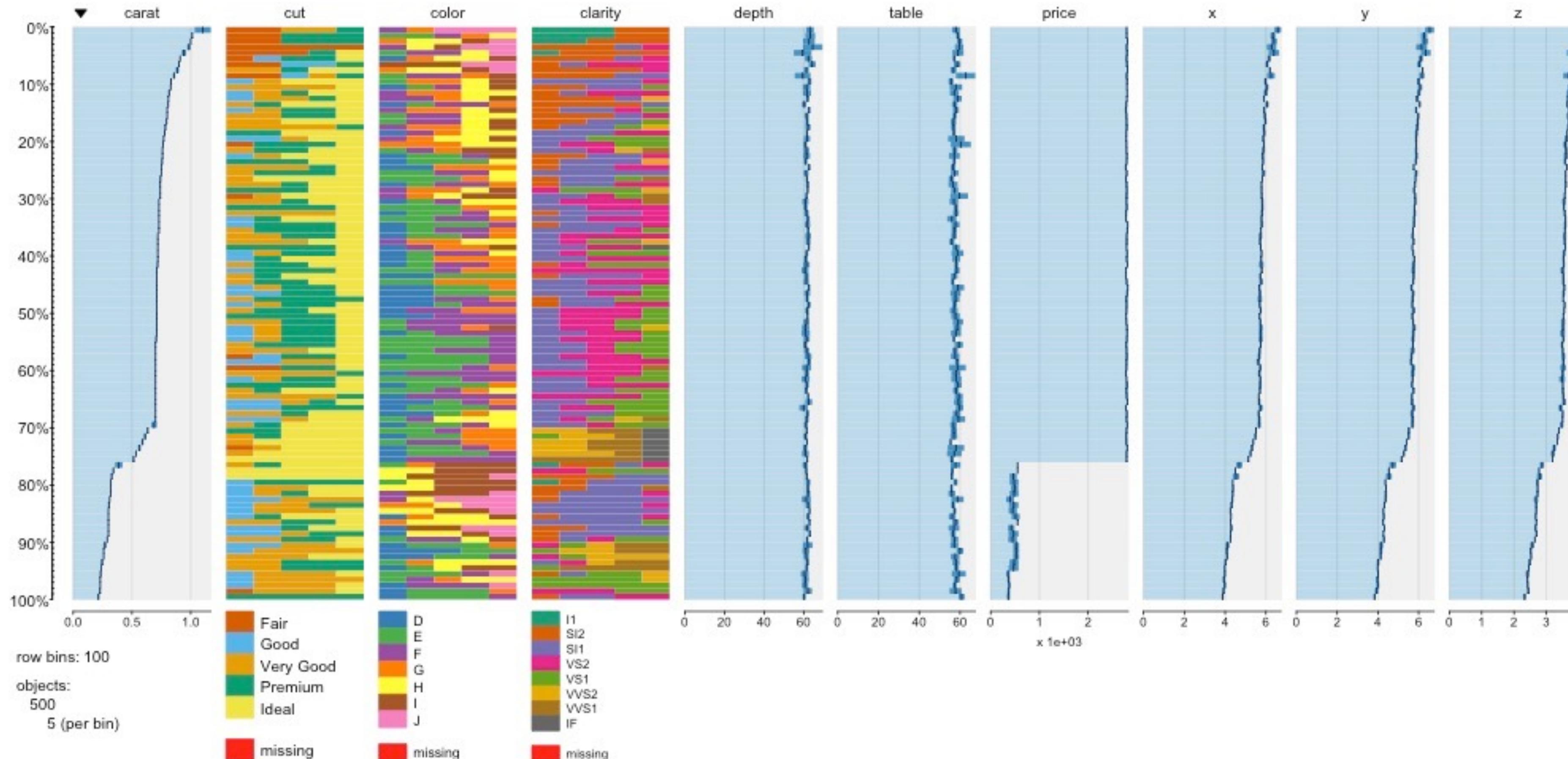
Wickham, H., Cook, D., Hofmann, H., and Buja, A. (2011). tourr: An R package for exploring multivariate data with projections. Journal of Statistical Software, 40(2).

CSV fingerprint



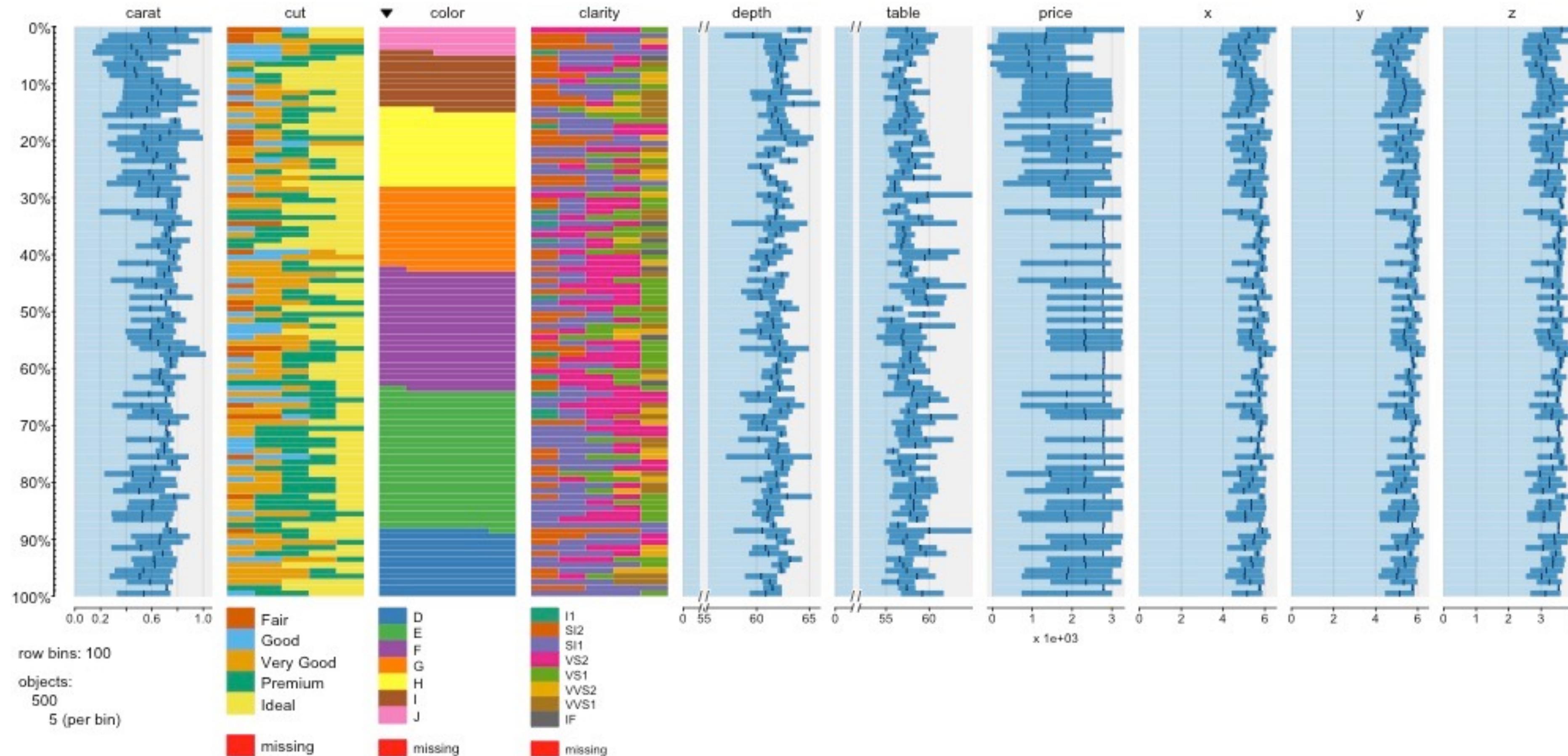
String Empty Decimal Integer

Tableplots



```
library(tabplot)  
tableplot(diamonds)
```

Tableplots



```
tableplot(diamonds, sortCol="color")
```

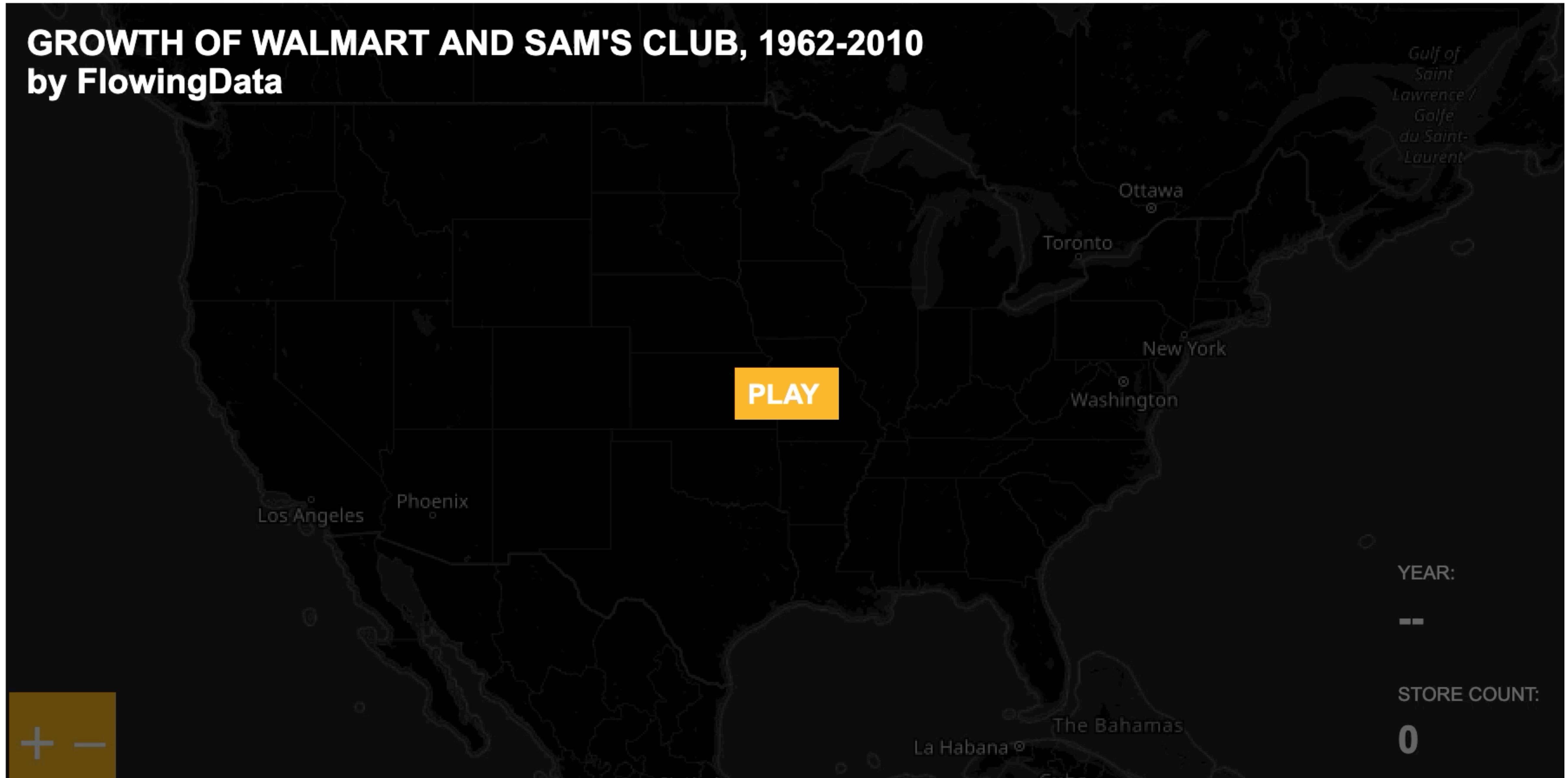
Animation

As encoding



As encoding

GROWTH OF WALMART AND SAM'S CLUB, 1962-2010
by FlowingData

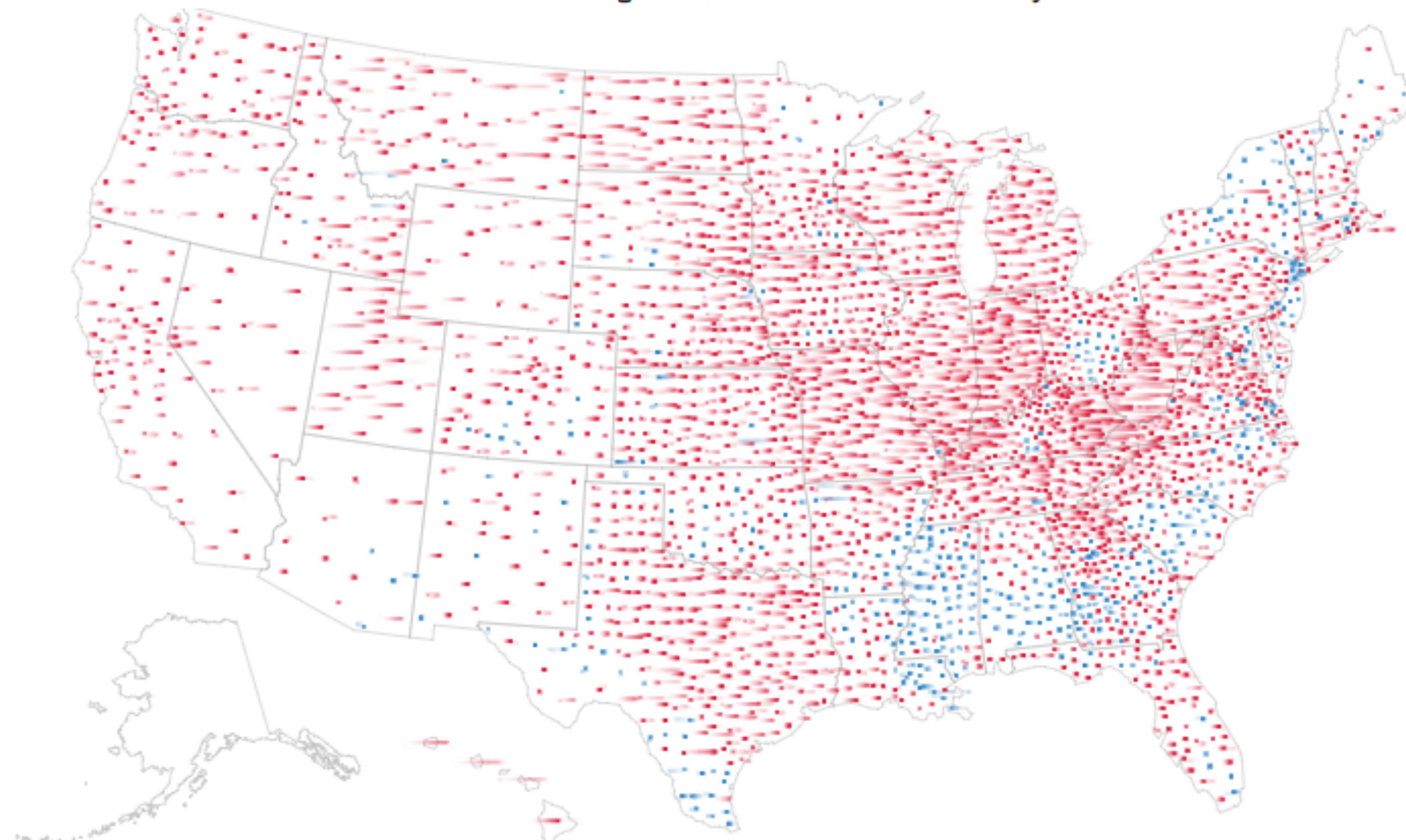


Romney's Shift Wasn't Enough

2008

2012

Most of the nation shifted to the right in Tuesday's vote,
but not far enough to secure a win for Mitt Romney.



306

Joseph R. Biden Jr. ✓

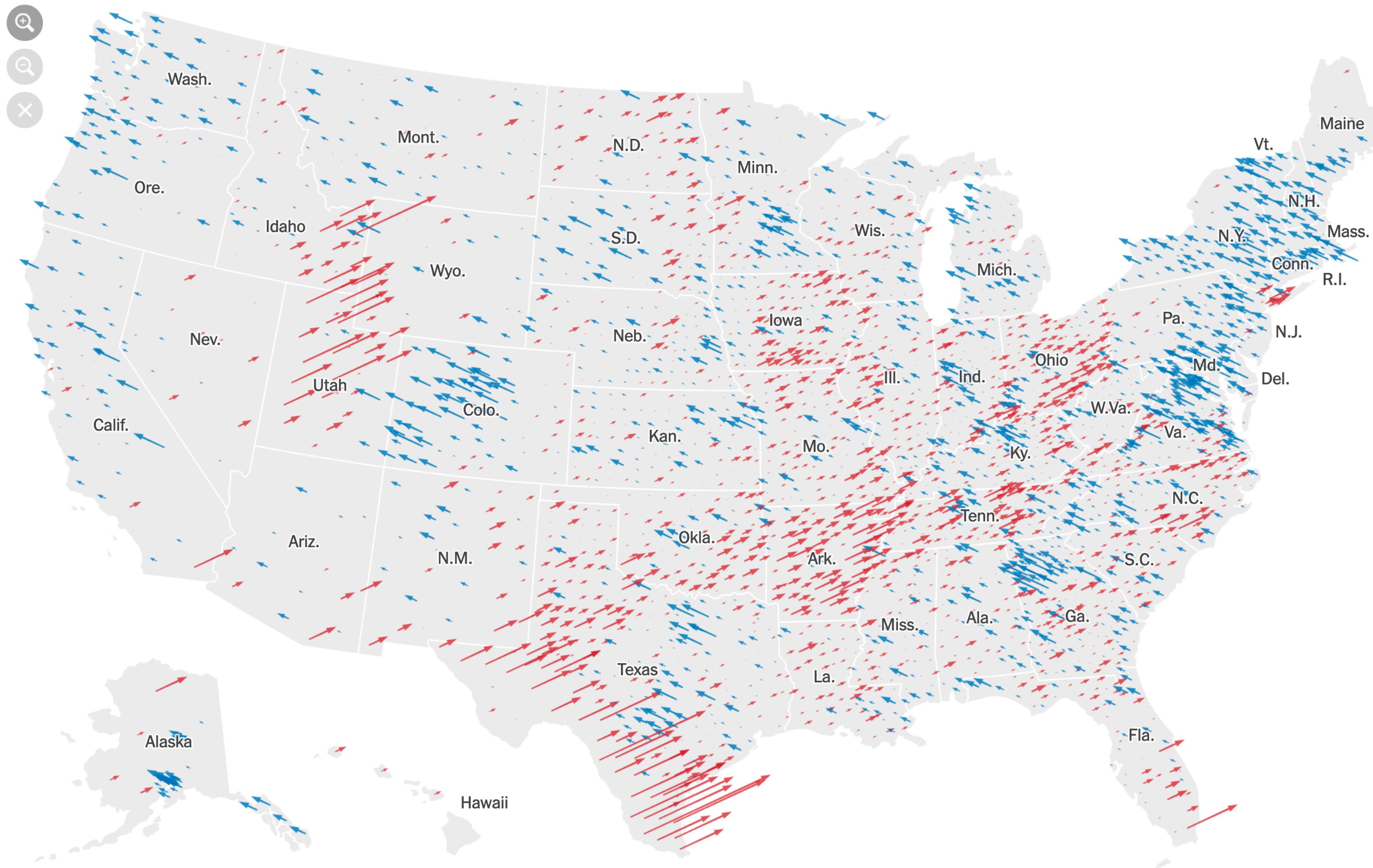
232

Donald J. Trump

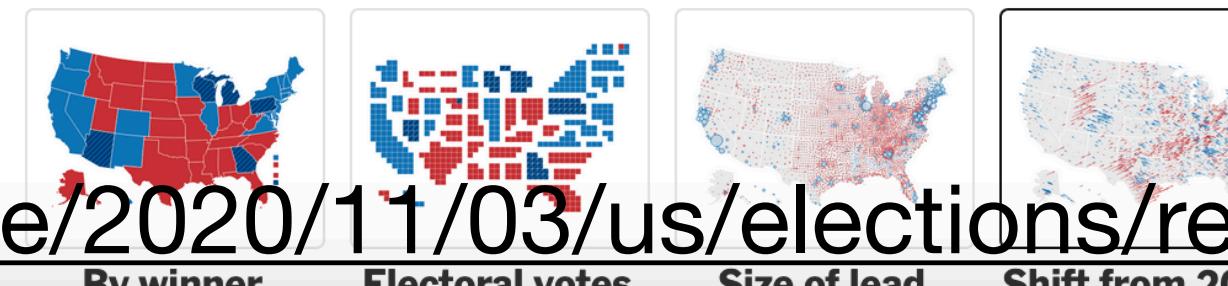
81,284,666 votes (51.3%)

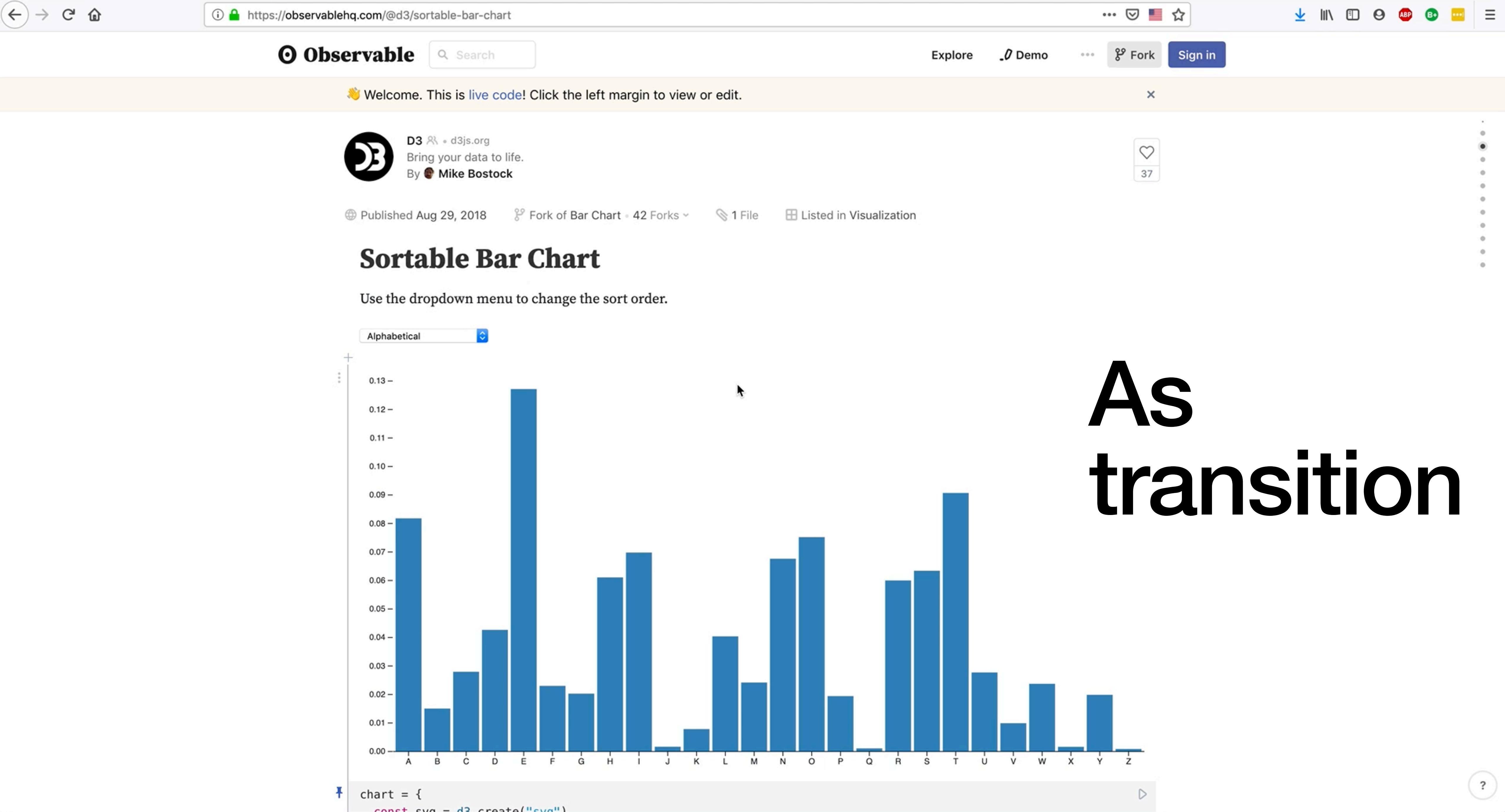
270
TO WIN

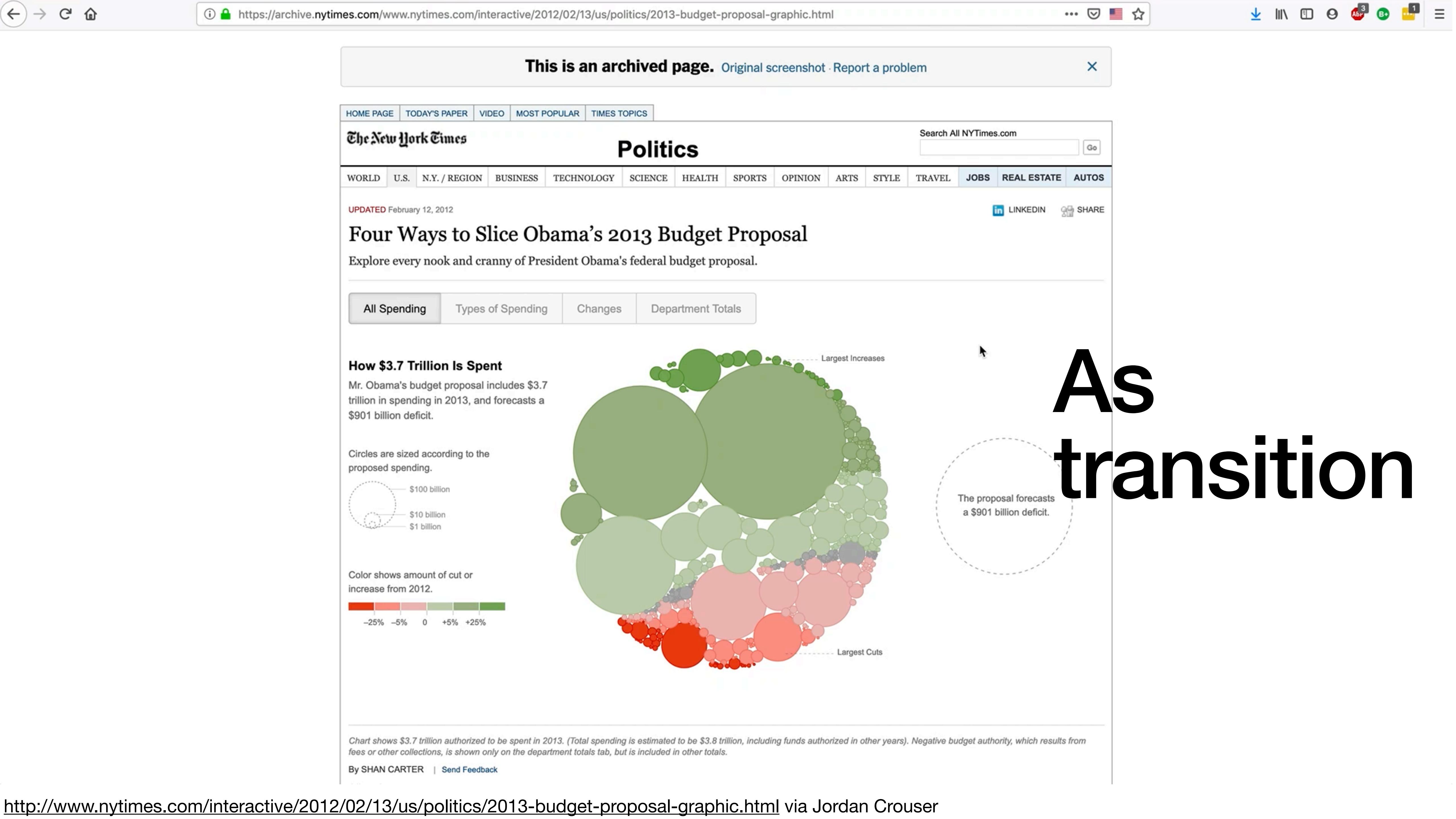
74,224,319 votes (46.8%)



SHIFT IN MARGIN
In counties that have
reported almost all of their
votes



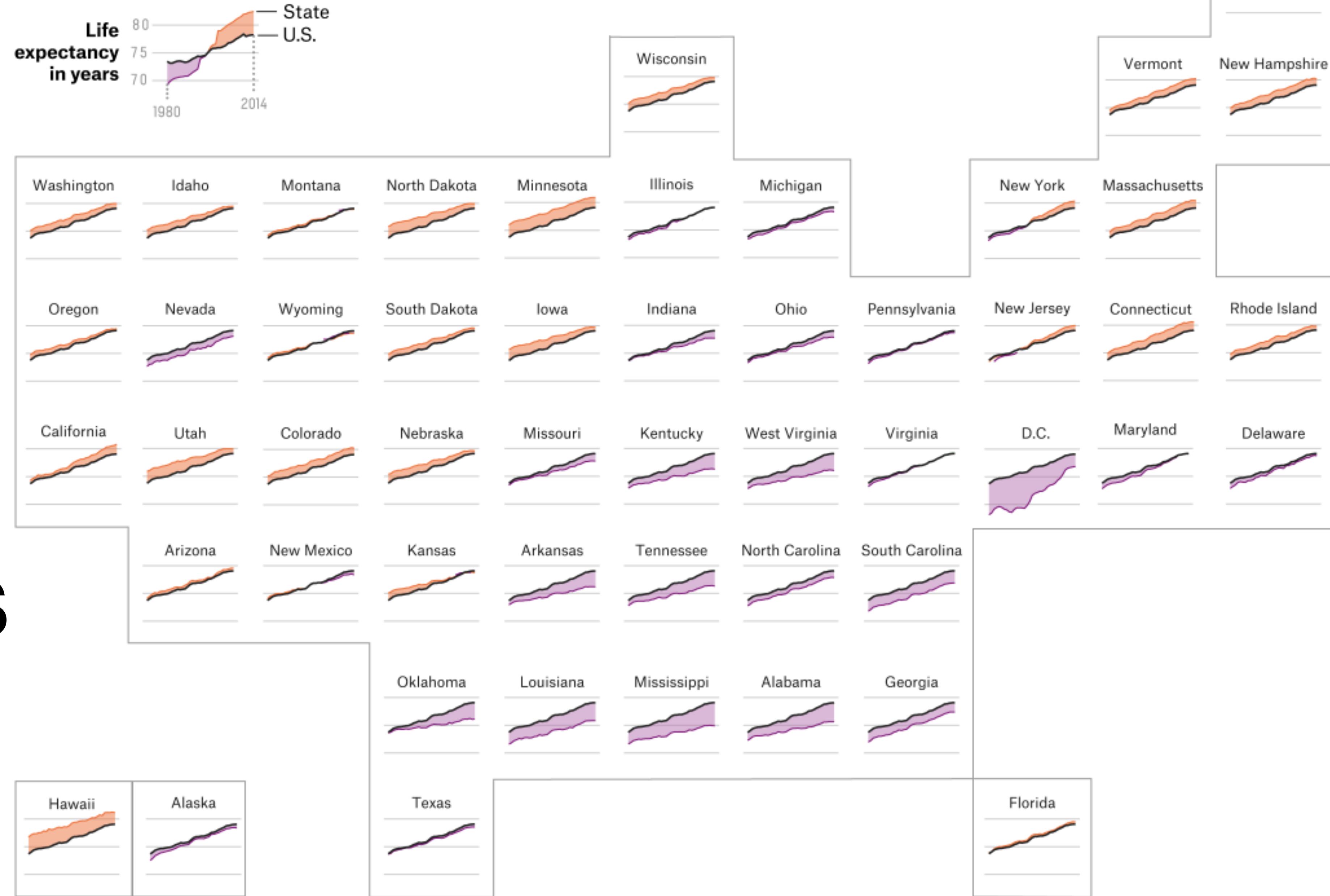




Iteration

Life expectancy in each state vs. U.S. average, 1980-2014

Small multiples



FiveThirtyEight

SOURCE: INSTITUTE FOR HEALTH METRICS AND EVALUATION

<https://fivethirtyeight.com/features/as-u-s-life-expectancies-climb-people-in-a-few-places-are-dying-younger/>

Small things



Lena Groeger on small things (5 min) <https://vimeo.com/91429794>

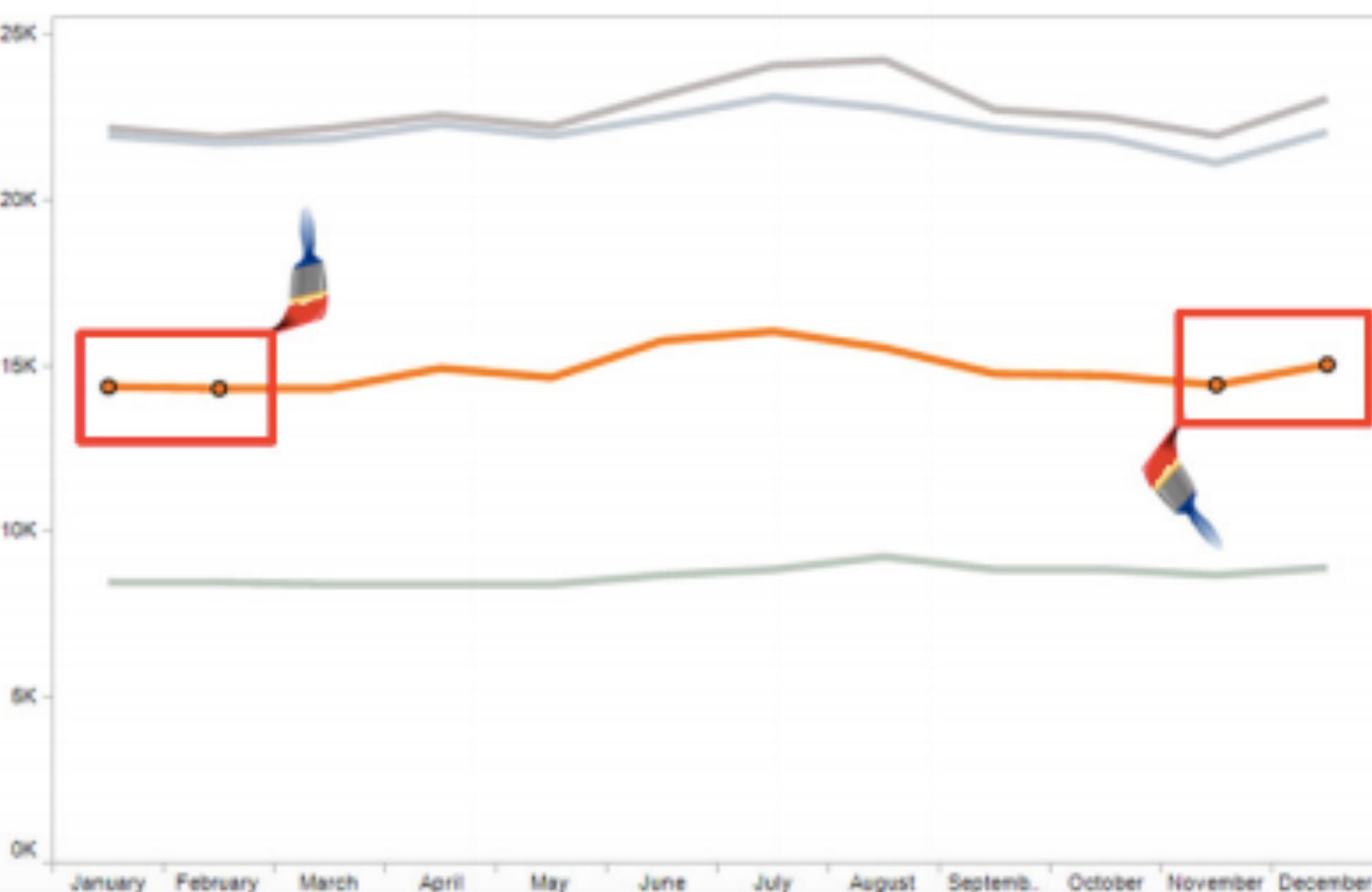
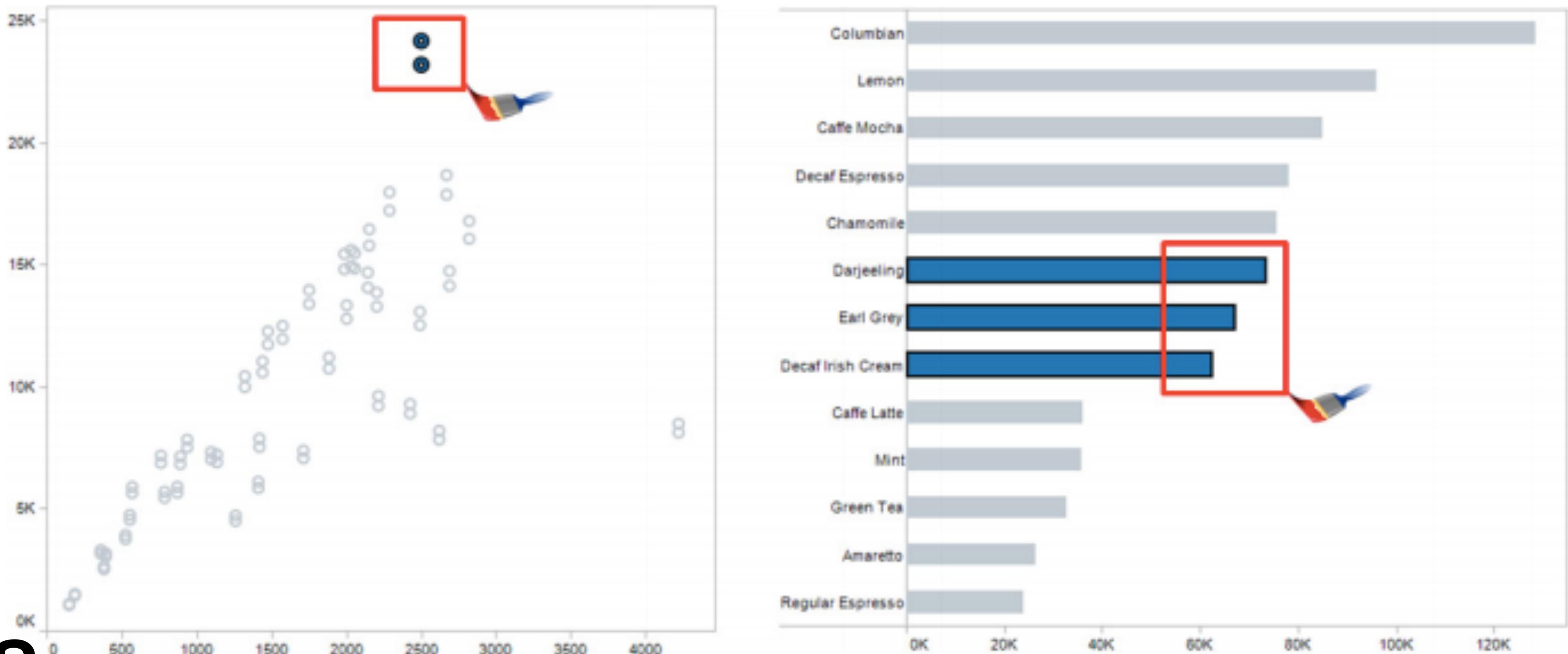
(25 min) <https://www.youtube.com/watch?v=ZPAp3Fxx7TE>

Interactivity

Types of interaction

- **Select:** mark something as interesting
- **Explore:** show me something else
- **Reconfigure:** show me a different arrangement
- **Encode:** show me a different representation
- **Abstract/Elaborate:** show me more or less detail
- **Filter:** show me something conditionally
- **Connect:** show me related items

Select: mark something as interesting



Stephen Few. (2010). Coordinated highlighting in context.

https://www.perceptualedge.com/articles/visual_business_intelligence/coordinated_highlighting_in_context.pdf

BY HANAH ANDERSON
AND MATT DANIELS
APRIL 2016



Explore: show me something else

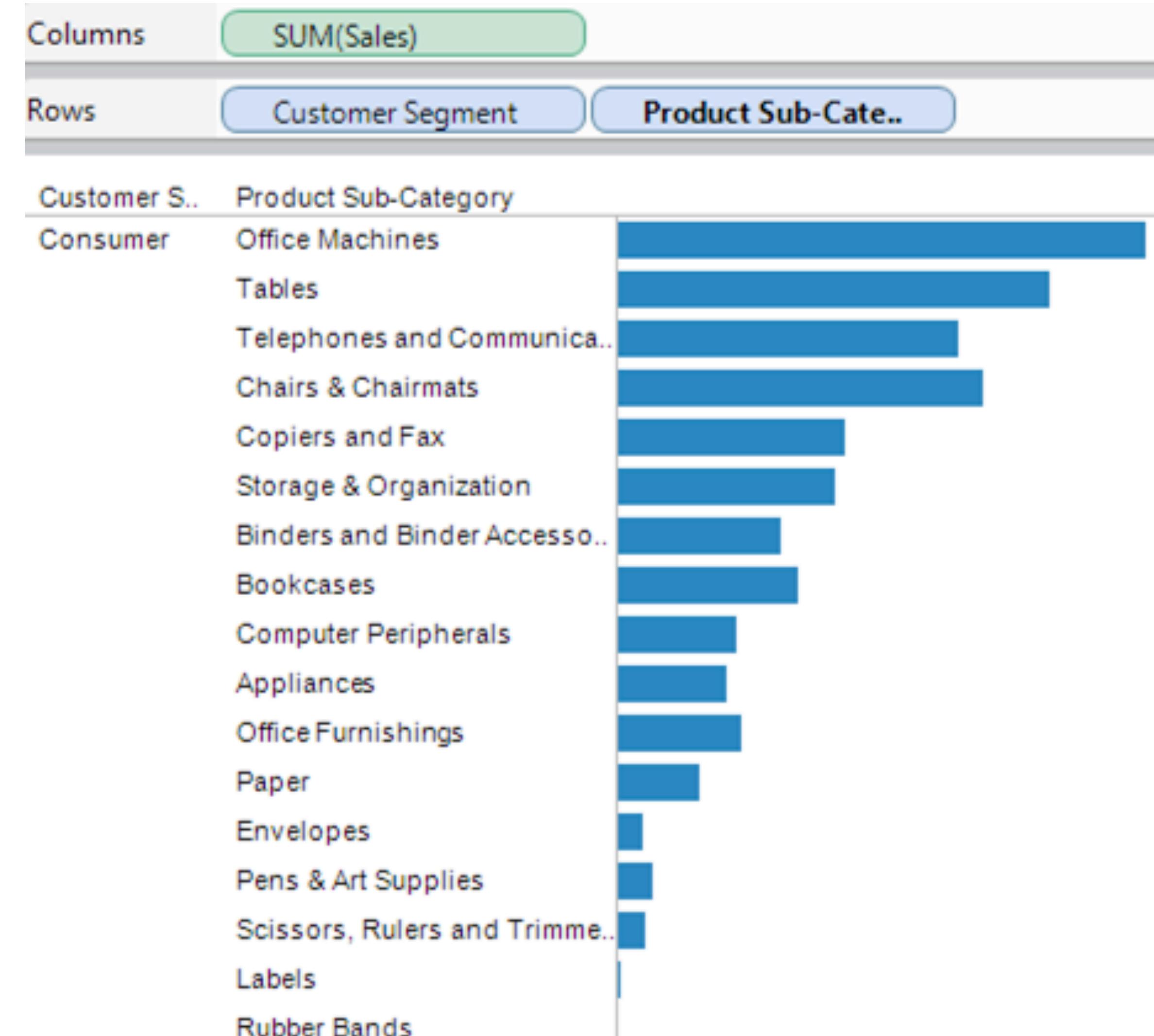
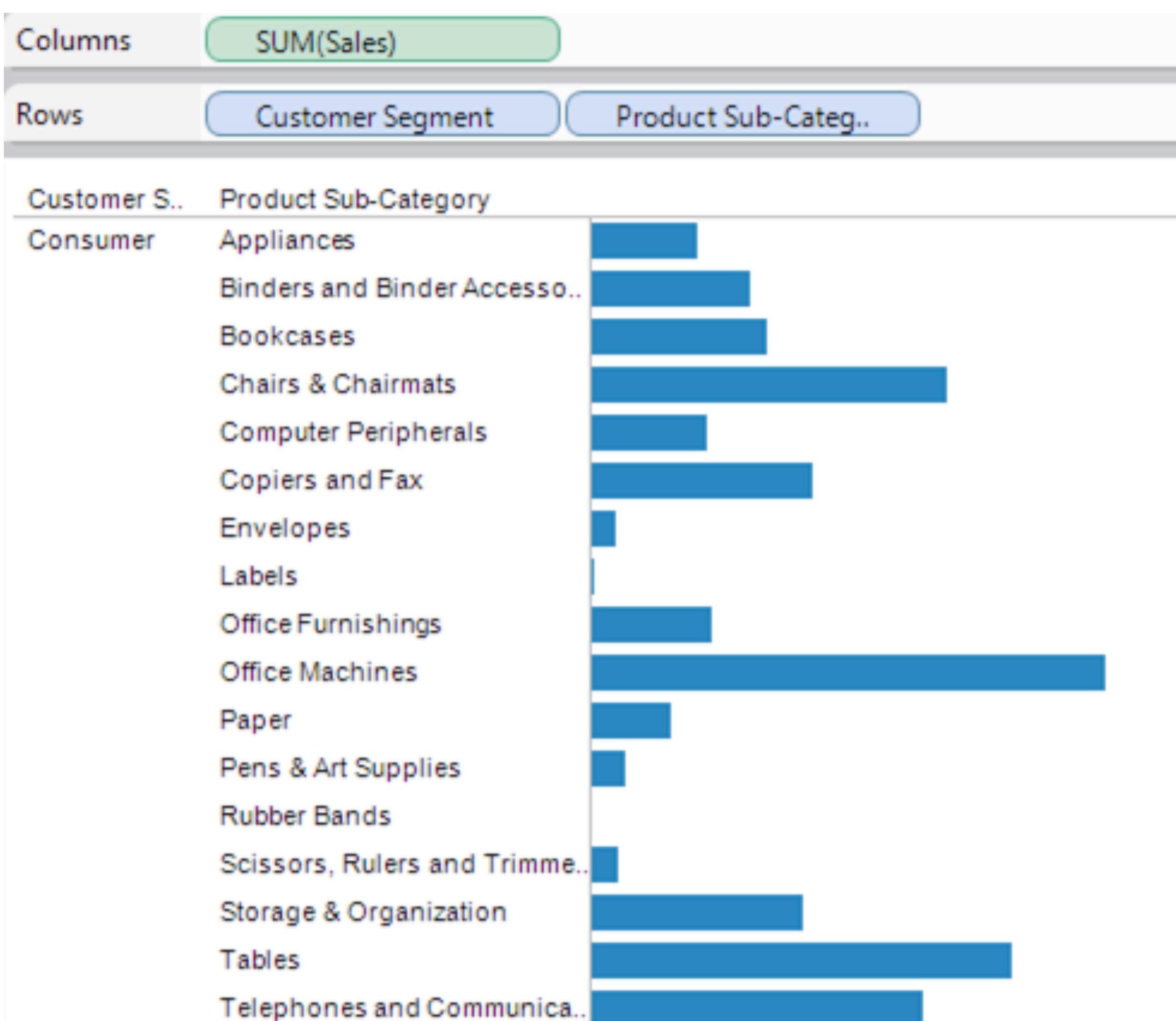
- Scroll bars (scrollytelling)
- Panning
- Steppers
- Direct walk (e.g. hyperlink travel)

Film Dialogue

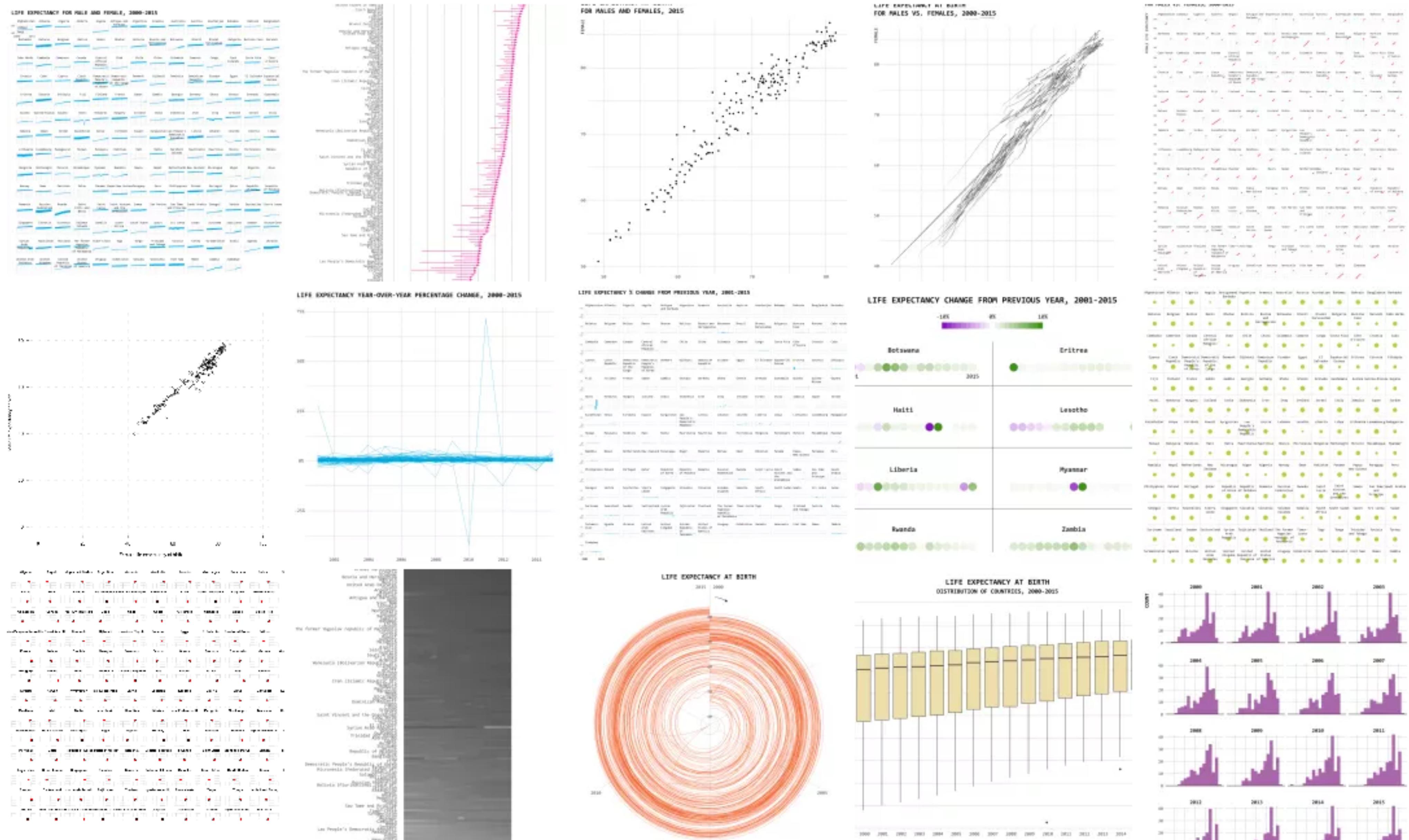
from 2,000 screenplays, Broken
Down by Gender and Age

Lately, Hollywood has been taking so much shit for rampant sexism and racism. The prevailing theme: **white men dominate movie roles.**

Reconfigure: show me a different arrangement



Encode: show me a different representation

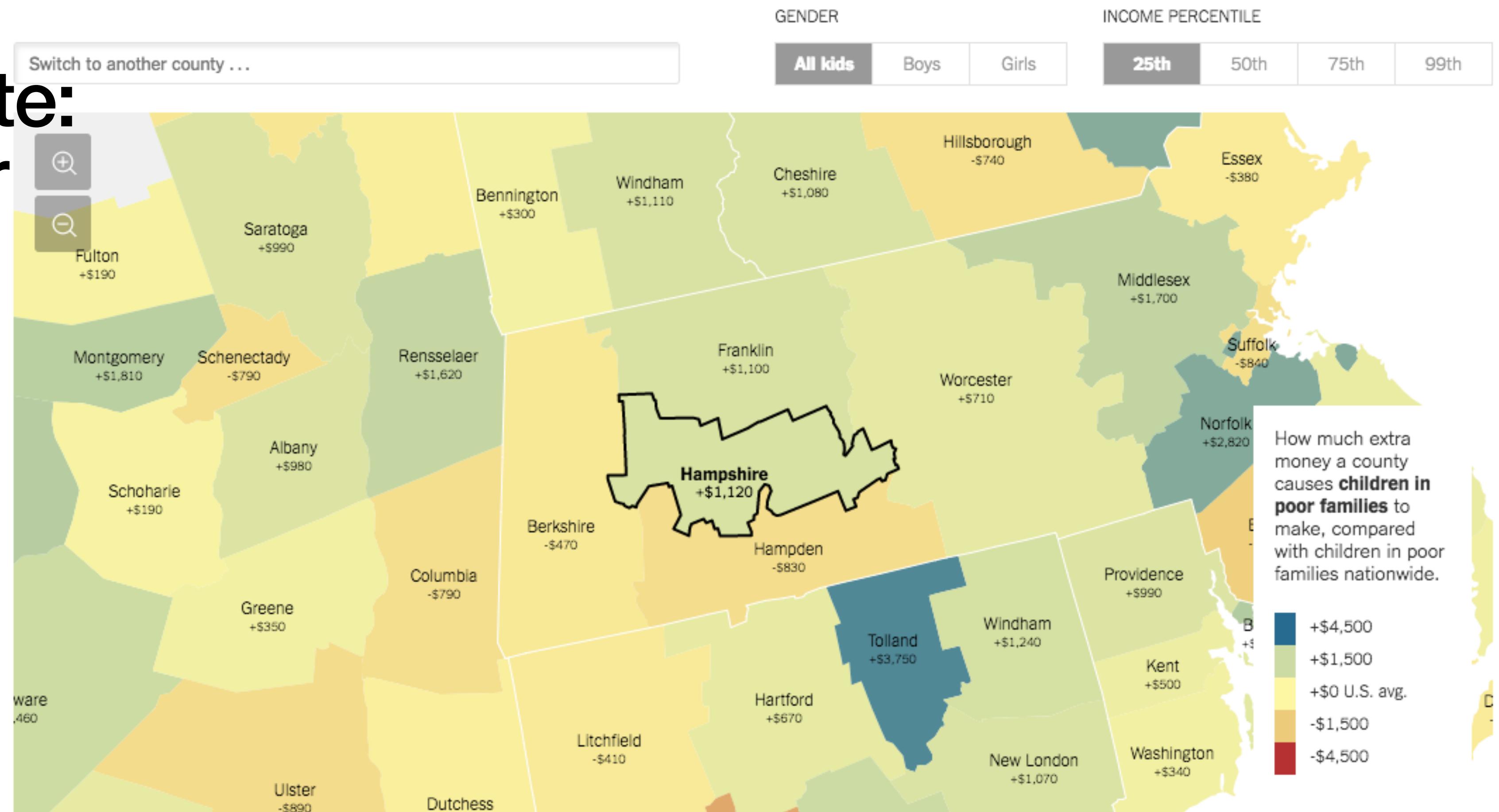


The Best and Worst Places to Grow Up: How Your Area Compares

MAY 4, 2015

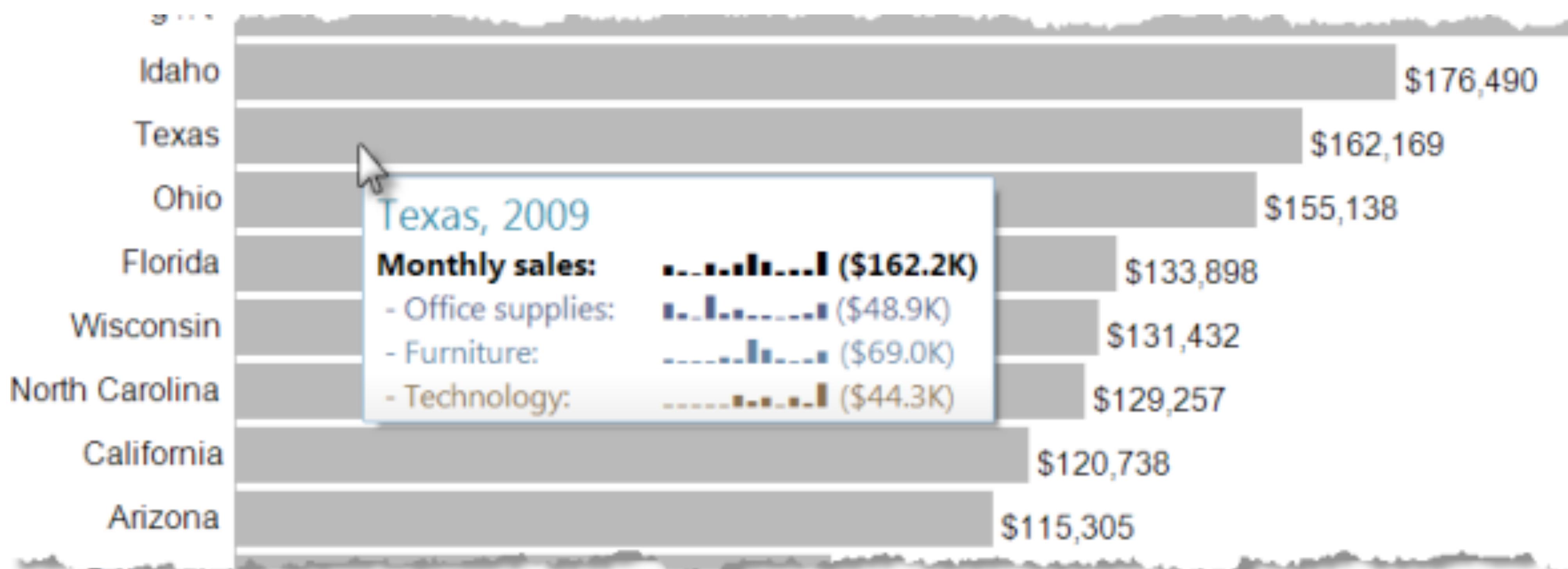
Children who grow up in some places go on to earn much more than they would if they grew up elsewhere. [RELATED ARTICLE](#)

**Abstract/Elaborate:
show me more or
less detail**



Hampshire County is about average for income mobility for children in poor families. It is better than about 57 percent of counties.

Abstract/Elaborate: show me more or less detail



NameVoyager: Explore baby names and name trends letter by letter

Looking for the perfect baby name? [Sign up for free](#) to receive access to our expert tools!

Baby Name >

Both Boys Girls

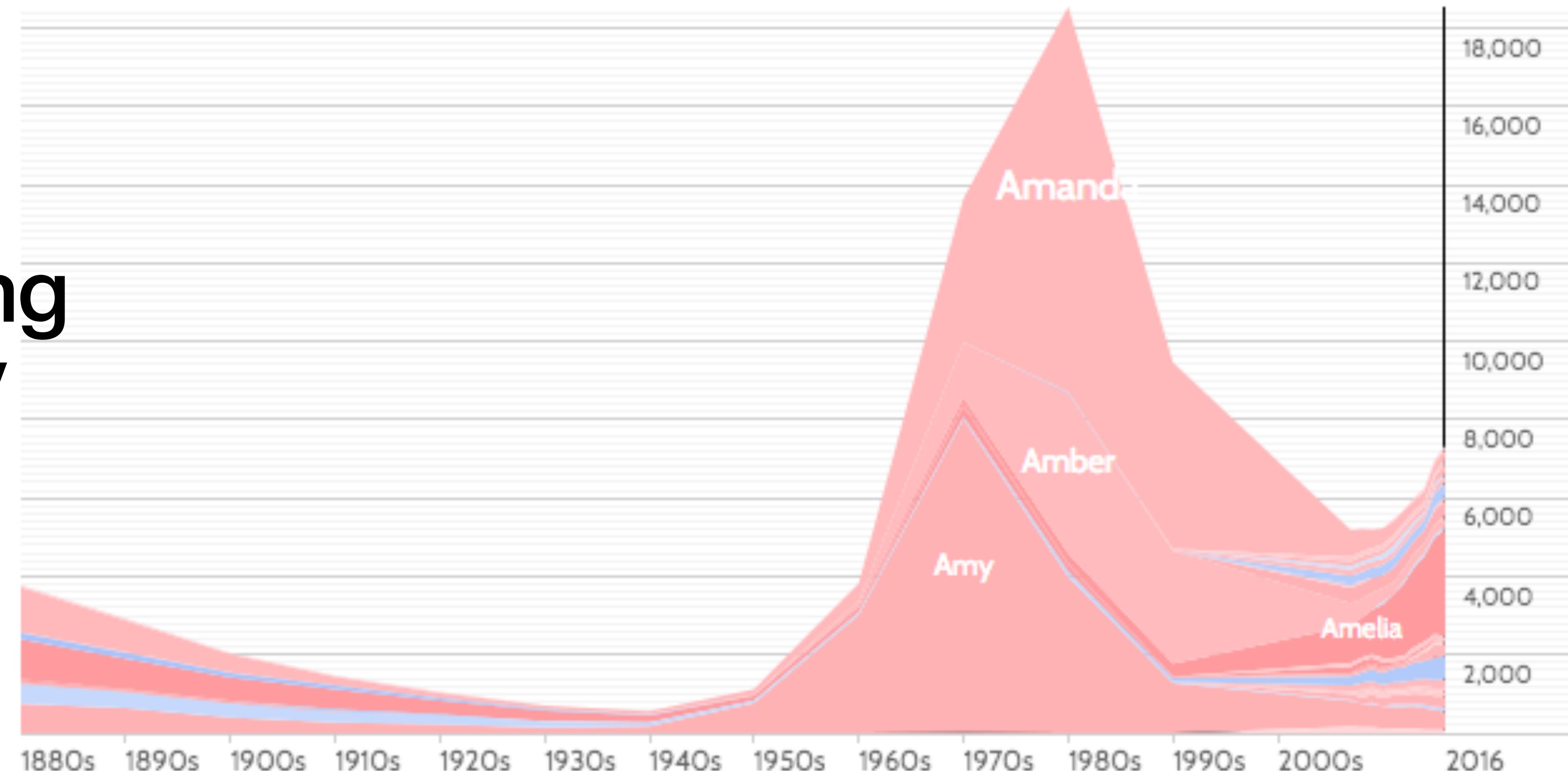
boys	1000	500	100	25	1
girls	1000	500	100	25	1

Current rank:

per million births

Names starting with 'AM' per million babies

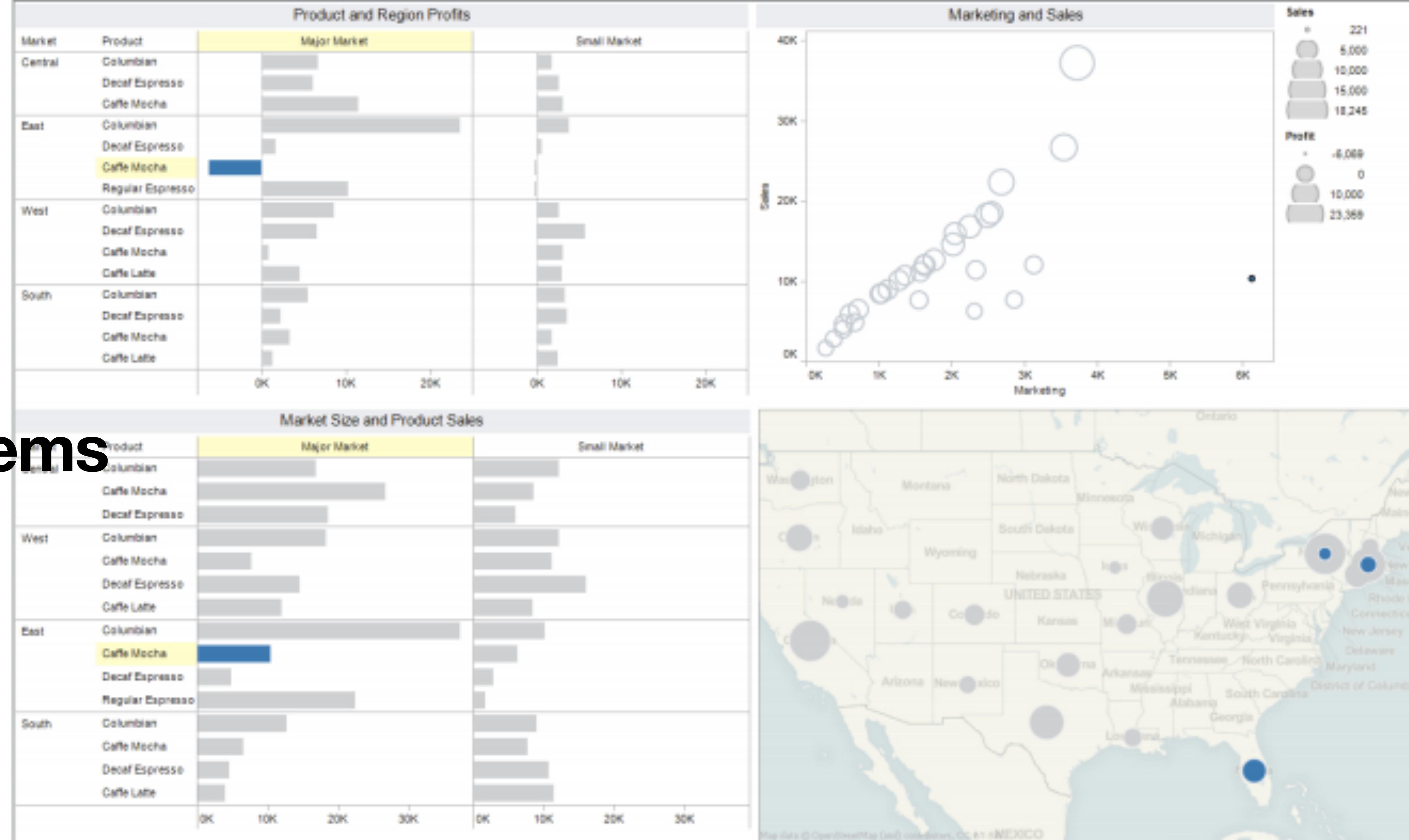
Filter: show me something conditionally



Click a name graph to view that name. Double-click to read more about it.

[enlarge](#)

Connect: show me related items



Stephen Few. (2010). Coordinated highlighting in context.