Interaction

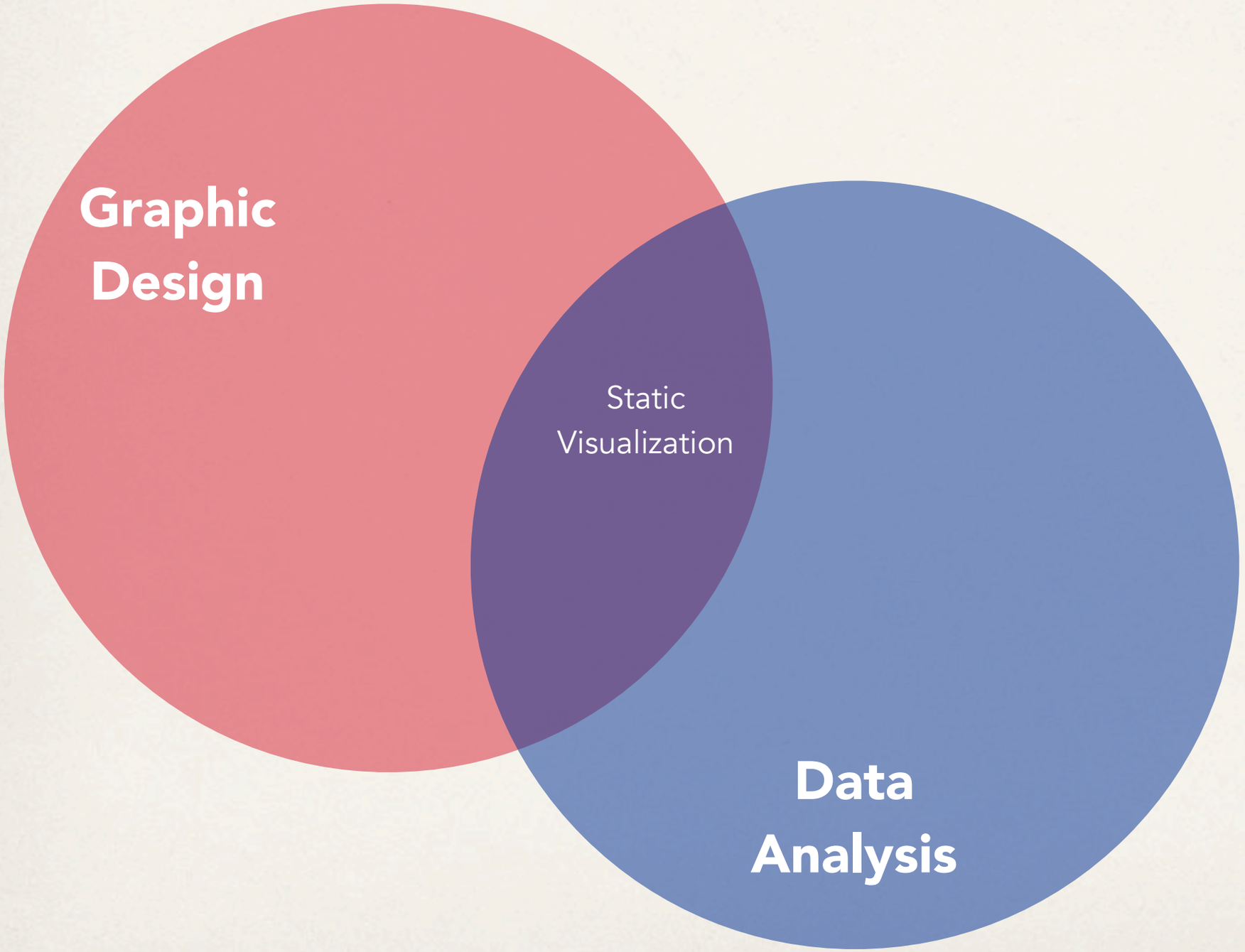
C. Andrews

2014-03-13

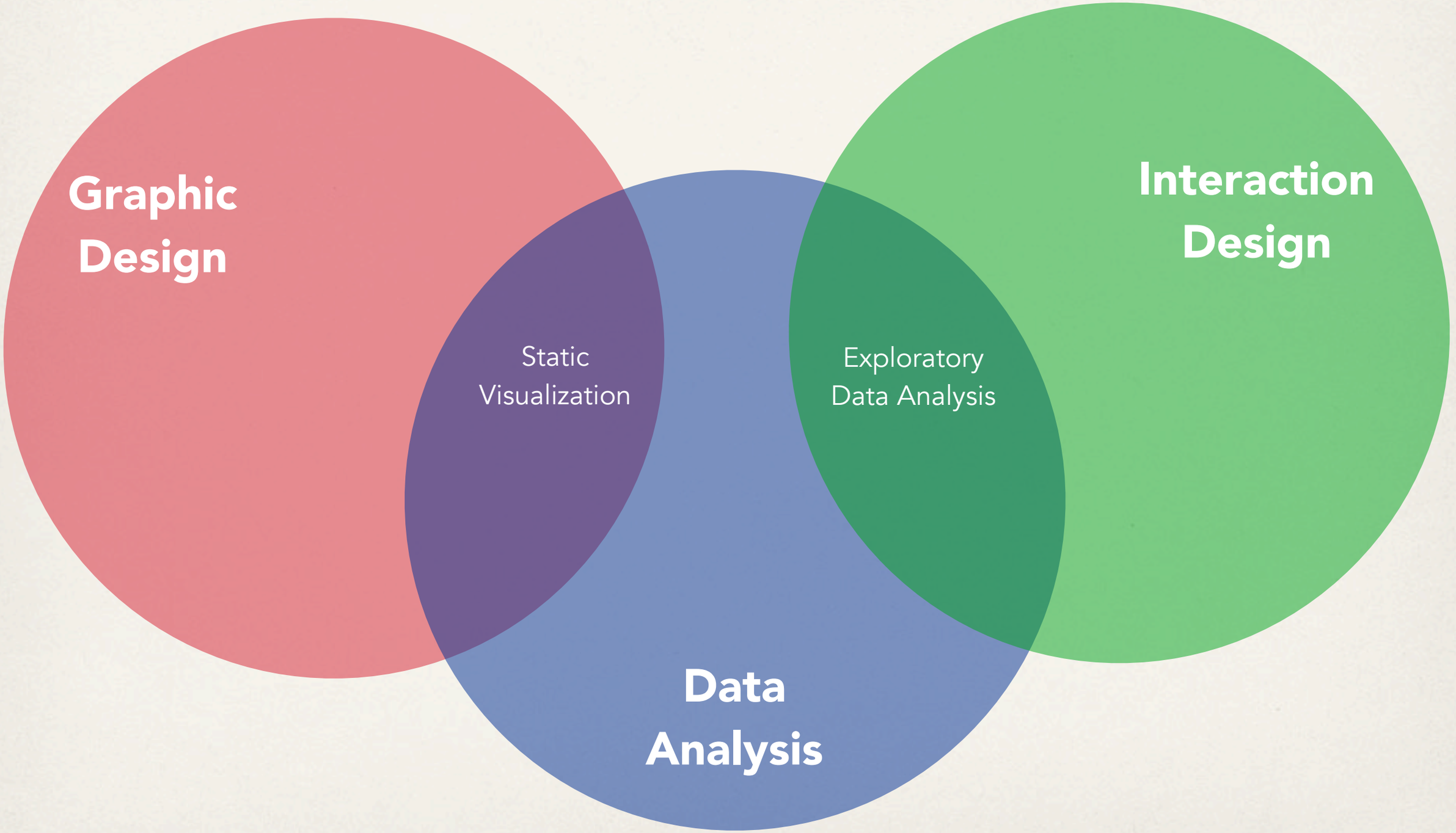
Graphic
Design

Data
Analysis

borrowed from Micheal Porath



borrowed from Micheal Porath



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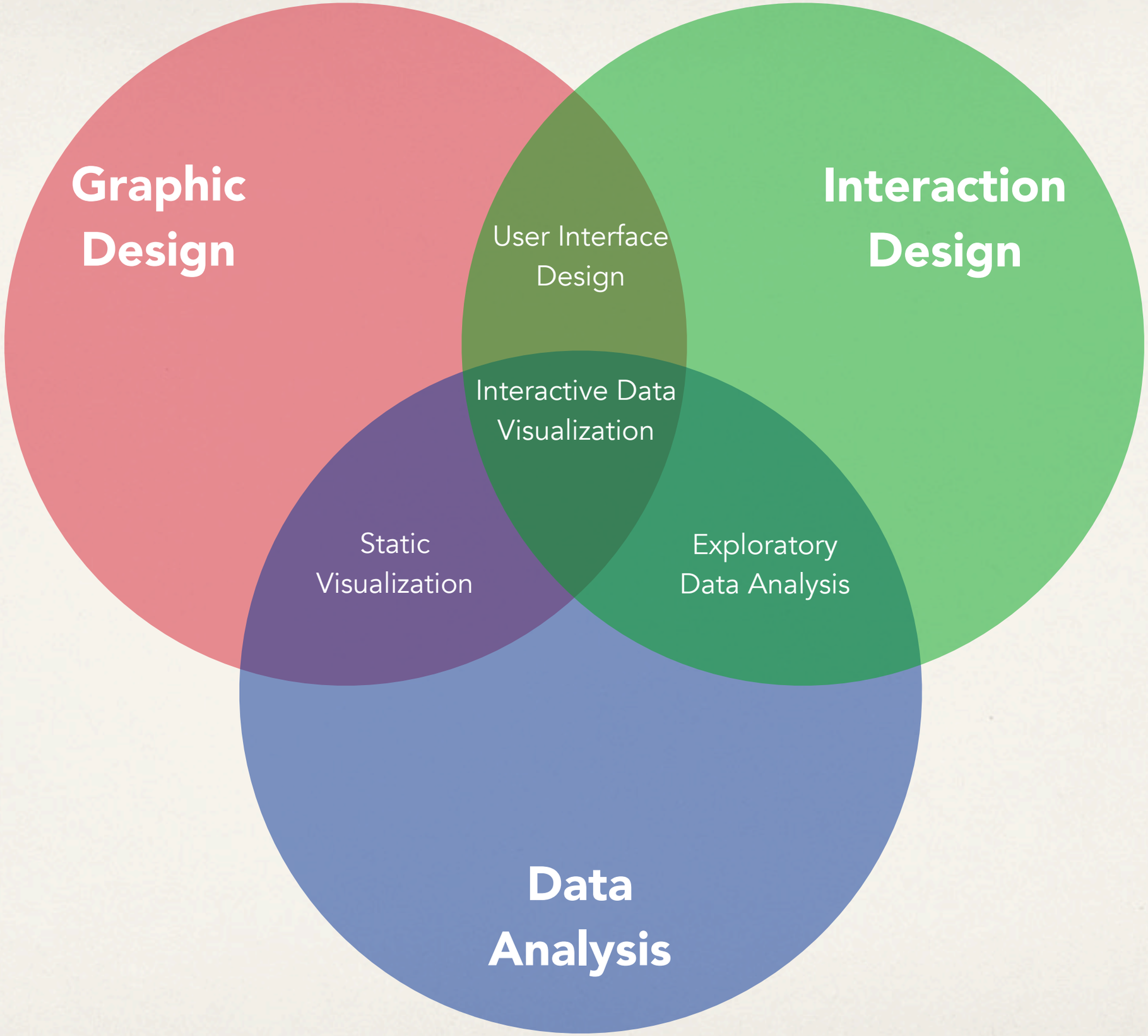


borrowed from Micheal Porath

Why interaction?

When is (static) representation not enough?

Scale

- Too many data points
- Too many dimensions

Exploration

Learning

Storytelling

borrowed from Micheal Porath

Textbook's taxonomy

Operators

navigation, selection, filtering, reconfiguring, encoding, connecting, abstracting/elaborating, distorting

Space of interaction

screen space, data value space, data structure space, attribute space, object space, visualization structure space

Parameters of the interaction operators

focus, extents, transformation, blender

Stephen Few's Principles

comparing

sorting

filtering

highlighting

aggregating

zooming and panning

details

annotating

re-encoding

selecting

Yi et al.'s Interactive Vis Techniques

Select
- mark something as interesting

Explore
- show me something different

Reconfigure
- show me a different arrangements

Encode
- change the visual representations

Abstract/Elaborate
- show me more or less detail

Filter
- conditionally show me something

Connect
- show me related items

Yi, et al, 2007

Select

mark something as interesting

This takes the reference to all `circles` and sets the `cx` attribute for each one. (Remember that, in SVG lingo, `cx` is the `x` position value of the *center* of the circle.) Our data has already been bound to the `circle` elements, so for each `circle`, the value `d` matches the corresponding value in our original dataset (5, 10, 15, 20, or 25).

Another value, `i`, is also automatically populated for us. (Thanks, D3!) Just as with `d`, the name `i` here is arbitrary and could be set to whatever you like, such as `counter` or `elementID`. I prefer to use `i` because it is concise, it alludes to the convention of using `i` in `for` loops, and it is very common, as you'll see it in all the online examples.

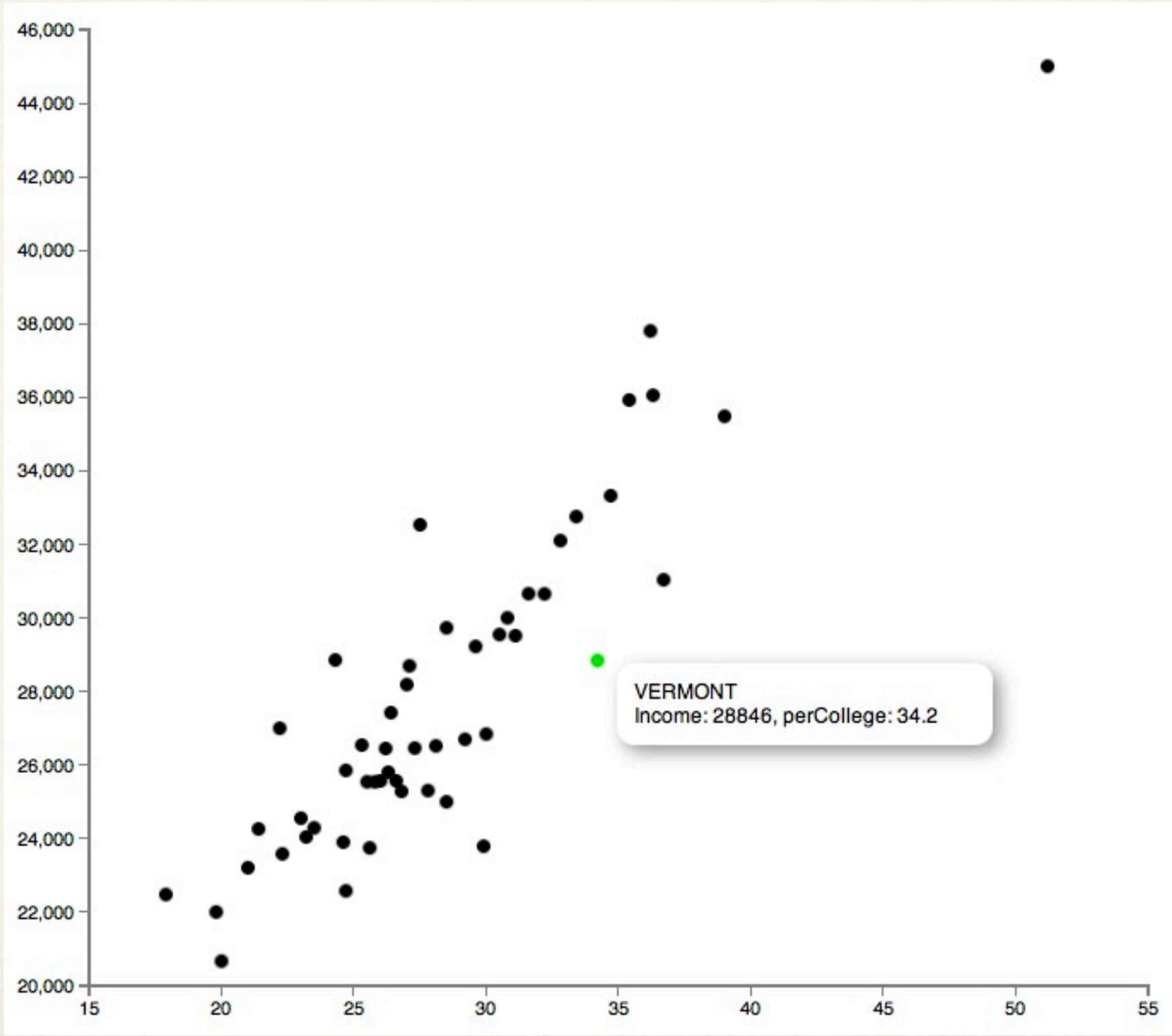
So, `i` is a numeric index value of the current element. Counting starts at zero, so for our "first" circle `i == 0`, the second circle's `i == 1`, and so on. We're using `i` to push each subsequent circle over to the right, because each subsequent loop through, the value of `i` increases by one:

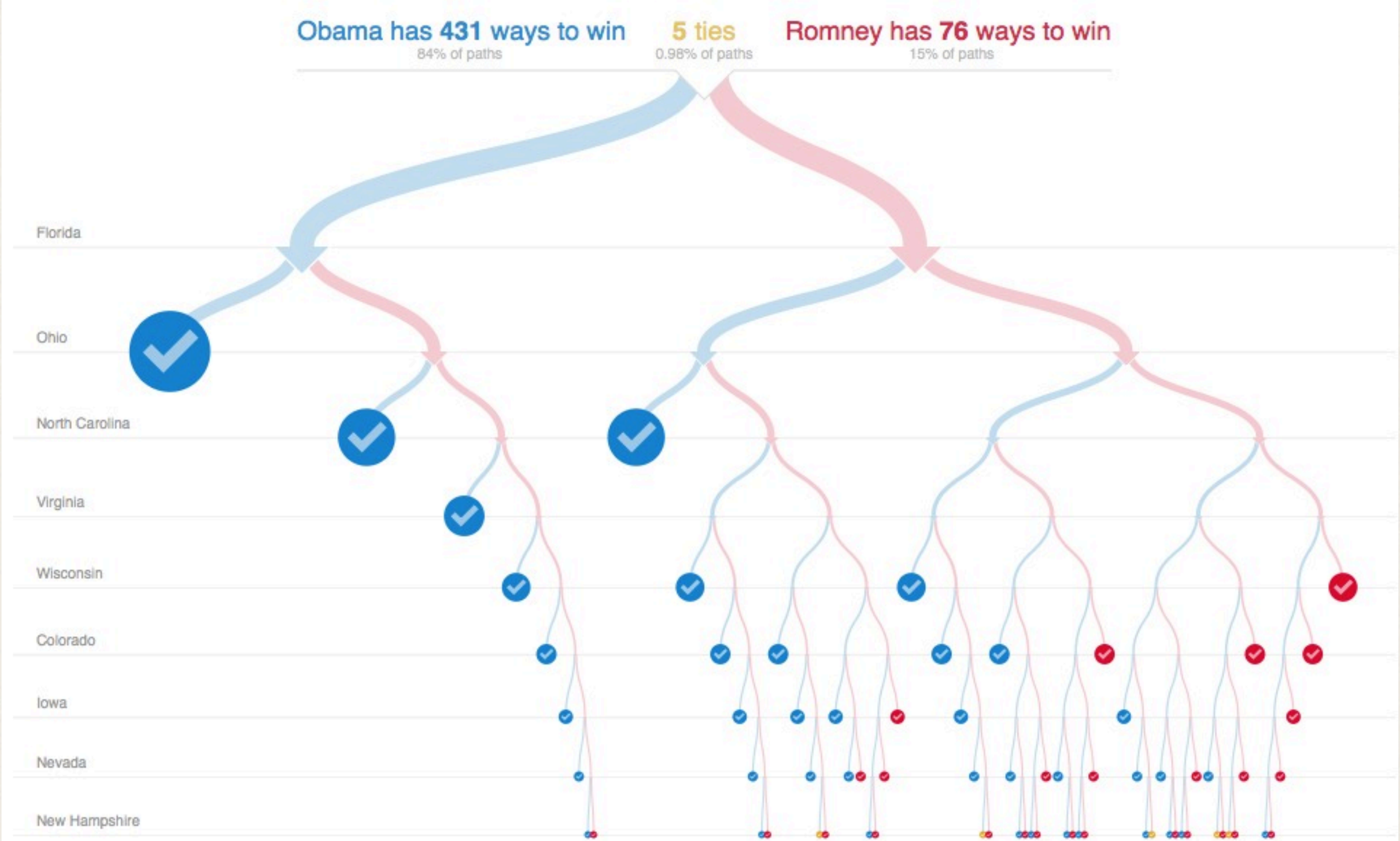
Select

mark something as interesting

Select

mark something as interesting

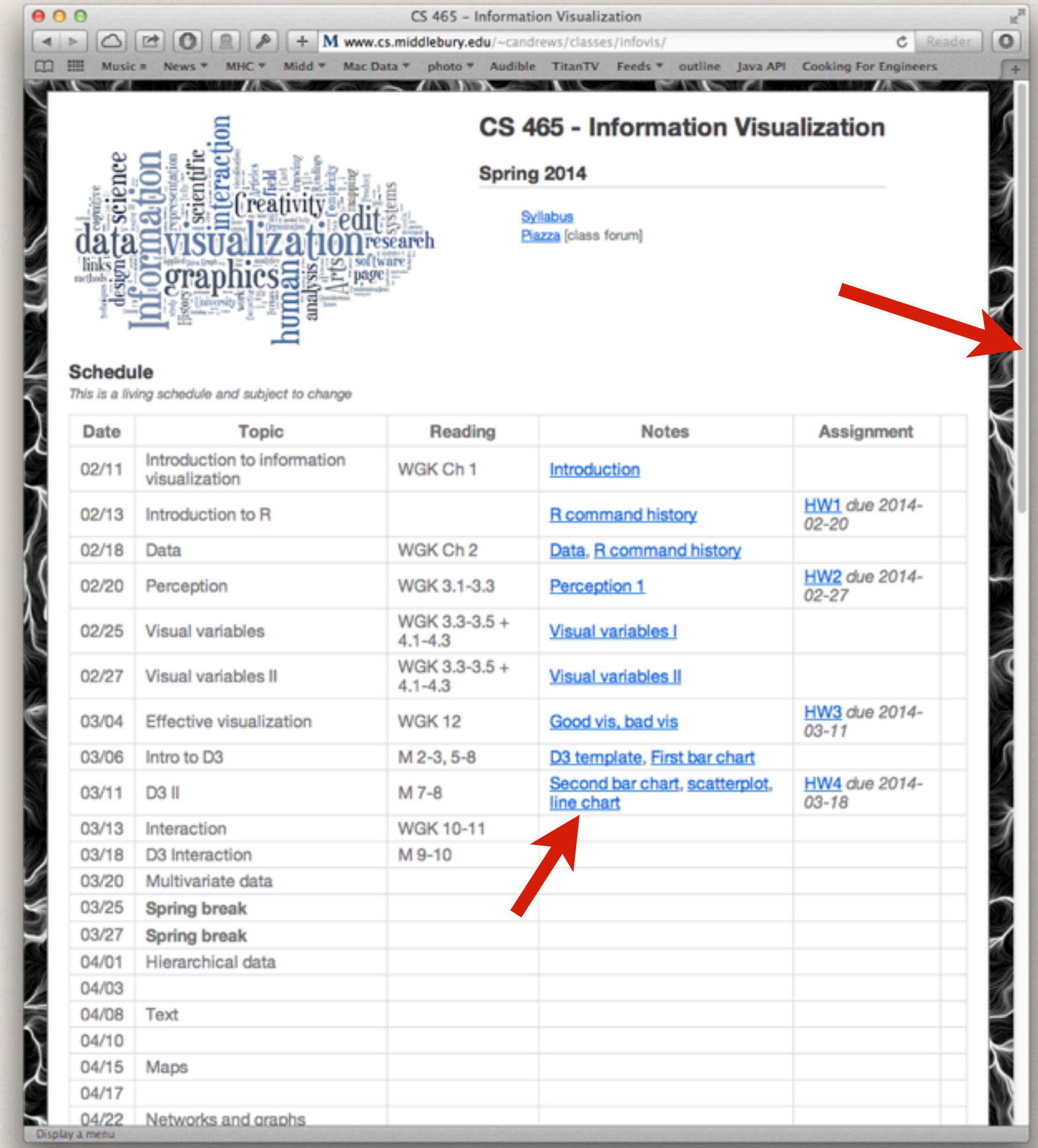




http://www.nytimes.com/interactive/2012/11/02/us/politics/paths-to-the-white-house.html?_r=0

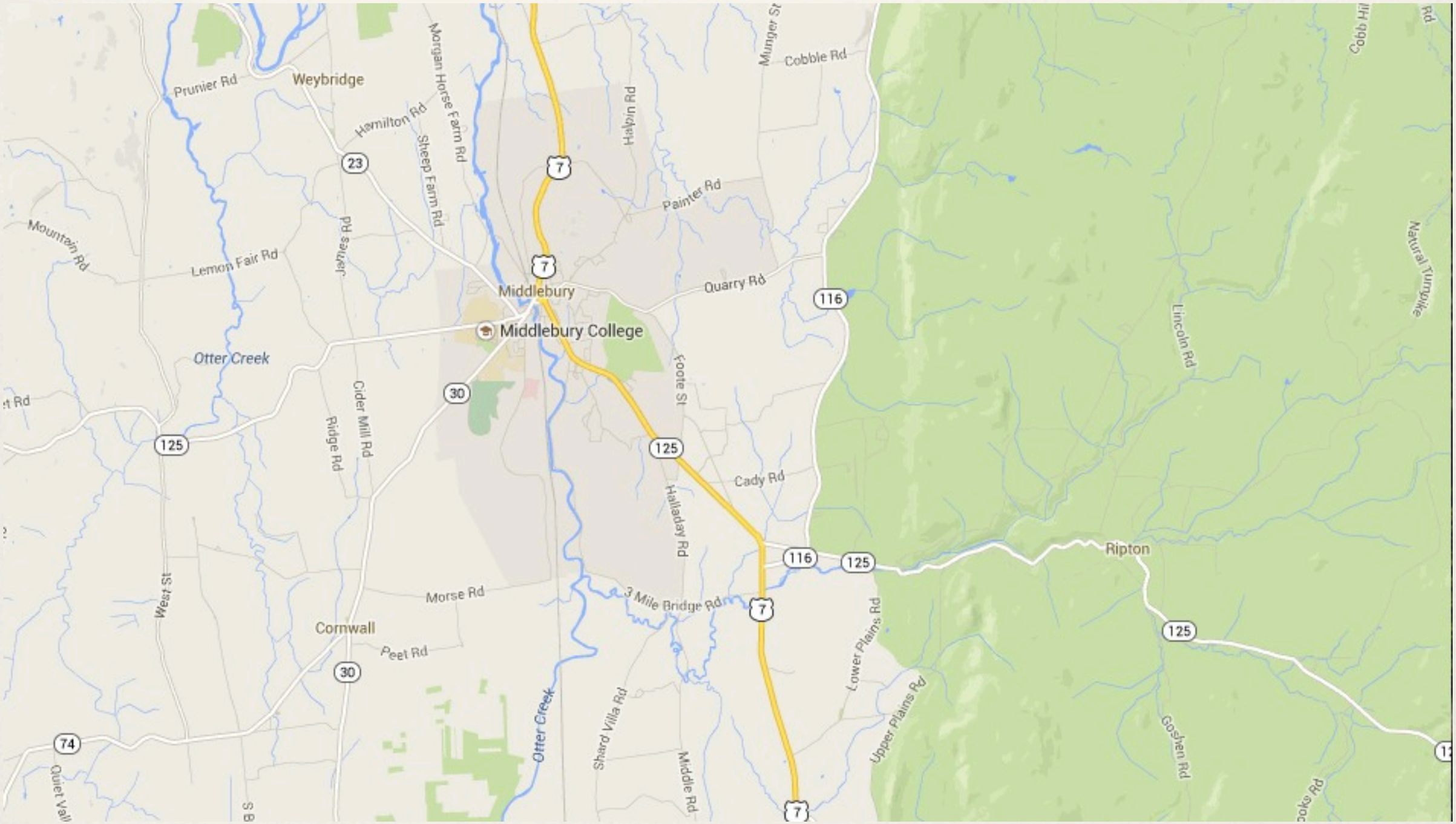
Explore

show me something different



Explore

show me something different



Explore

show me something different

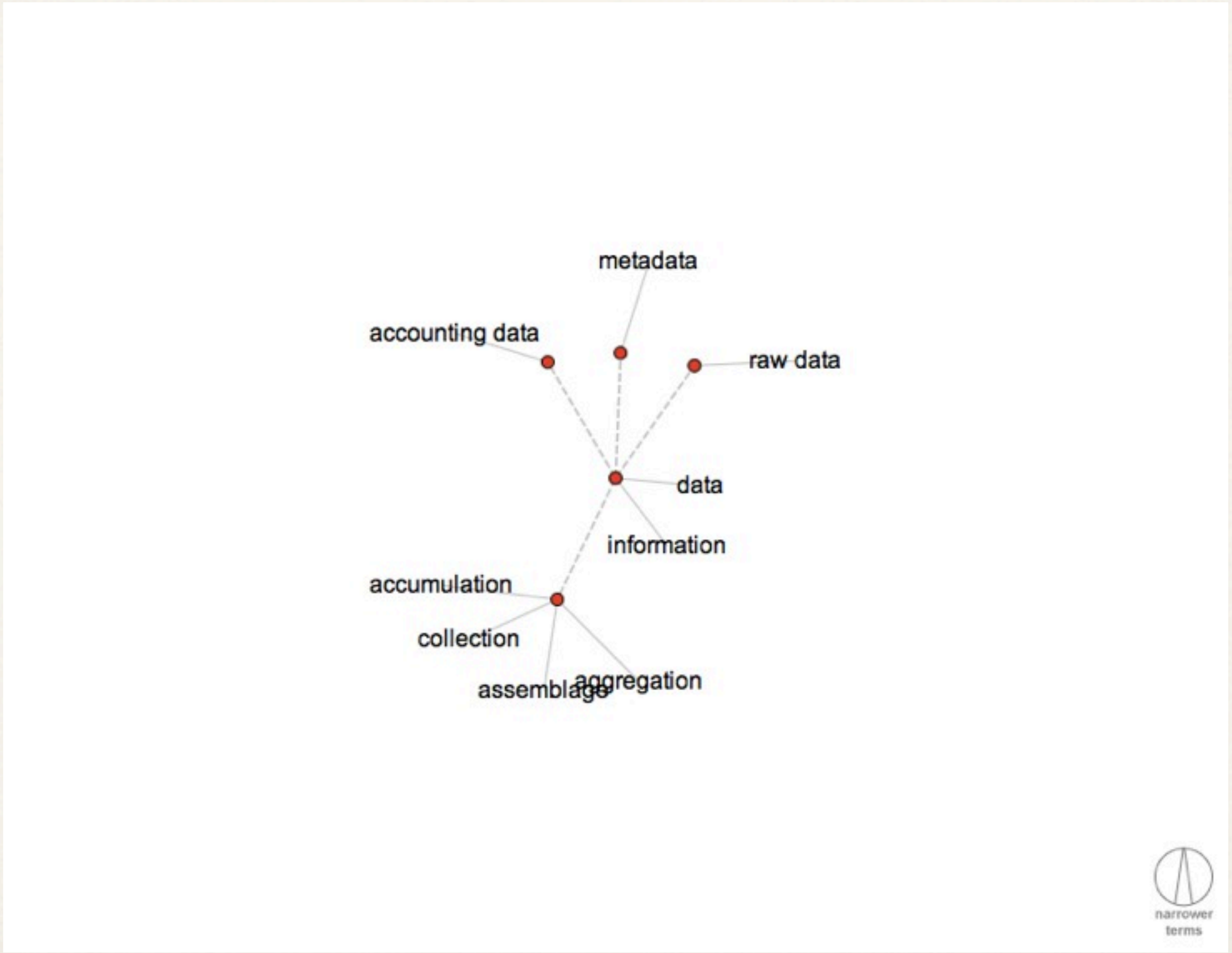
Explore

show me something different

http://www.visualtheaurus.com

Explore

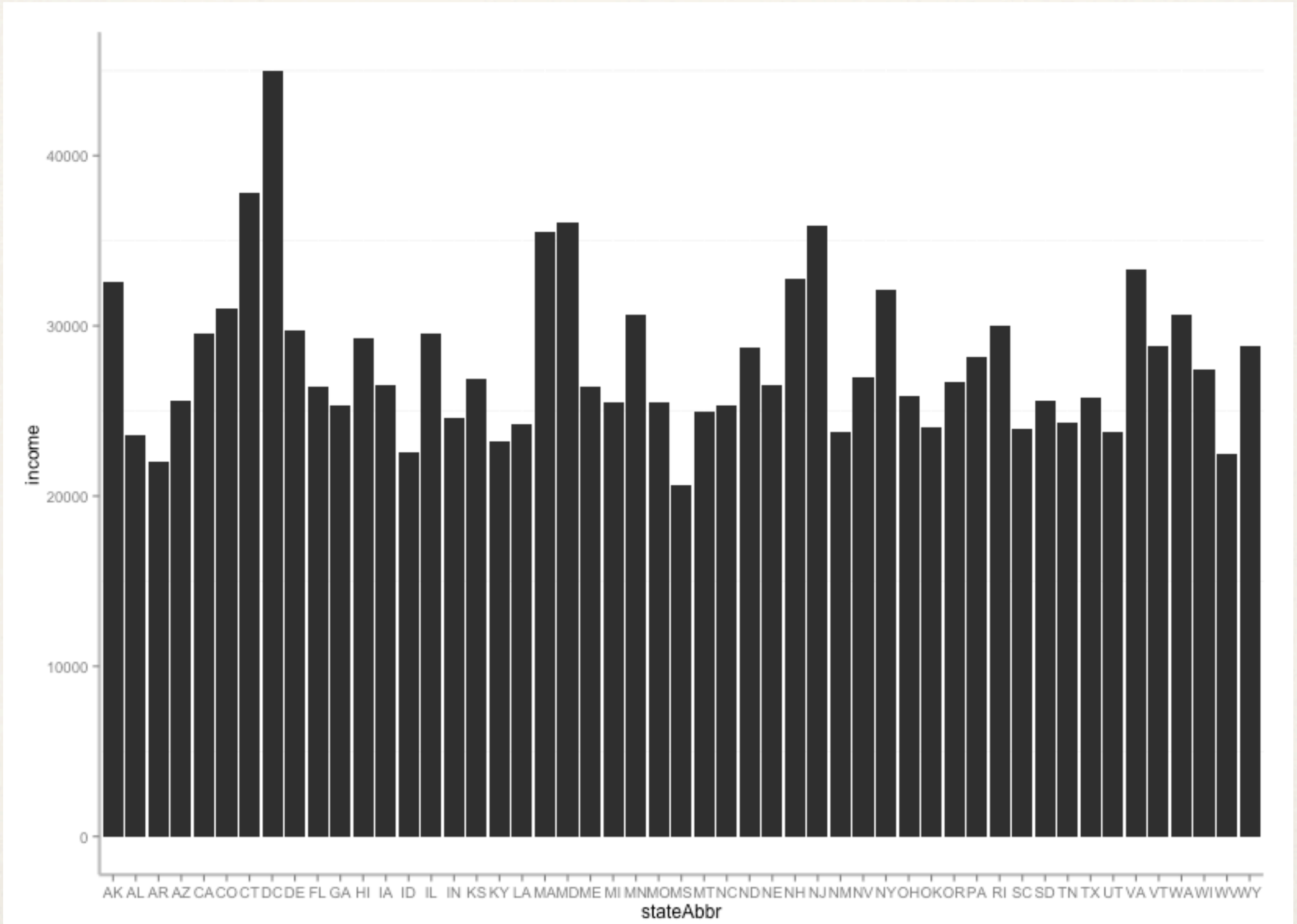
show me something different



http://www.visualtheaurus.com

Reconfigure

show me different arrangements



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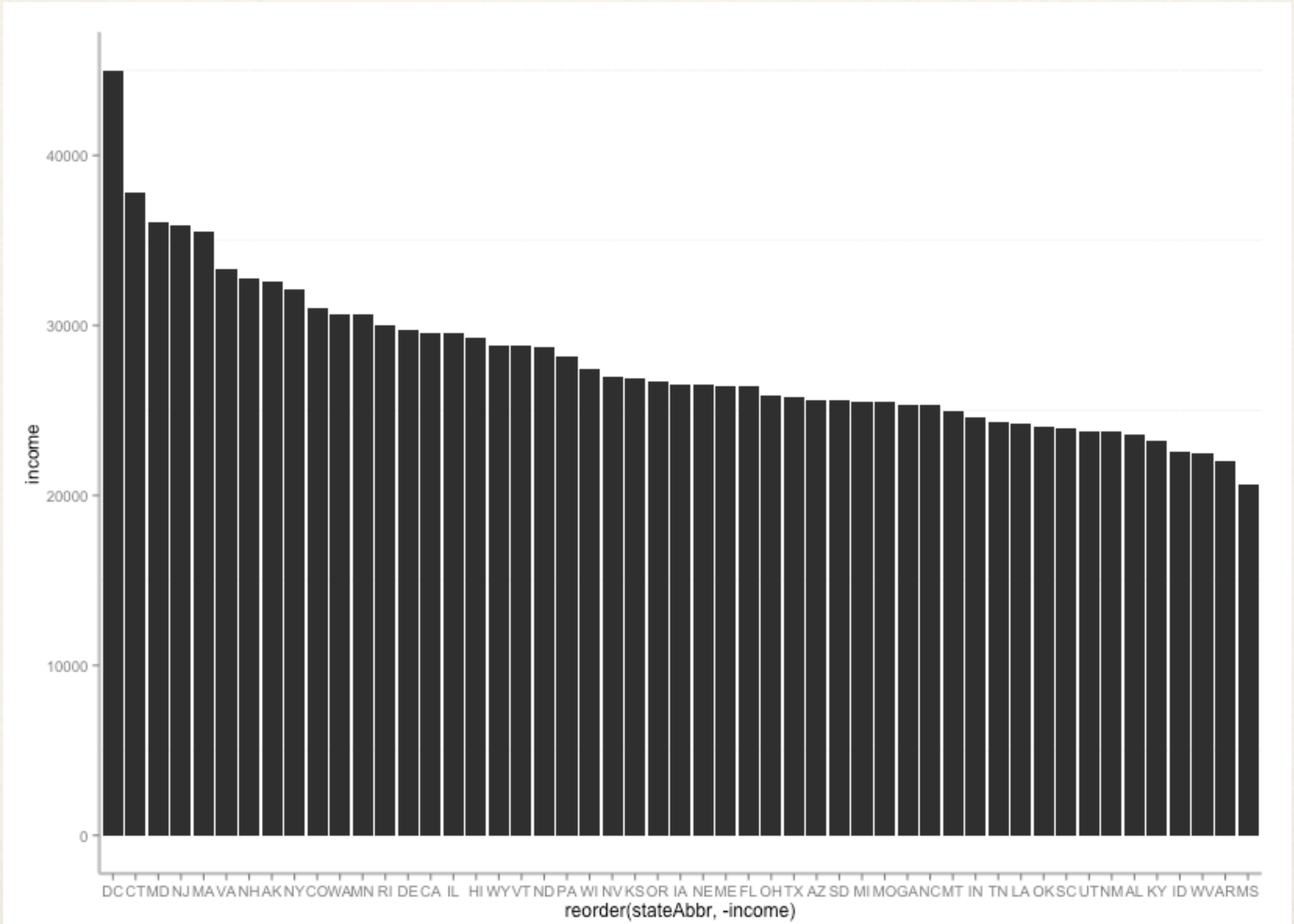
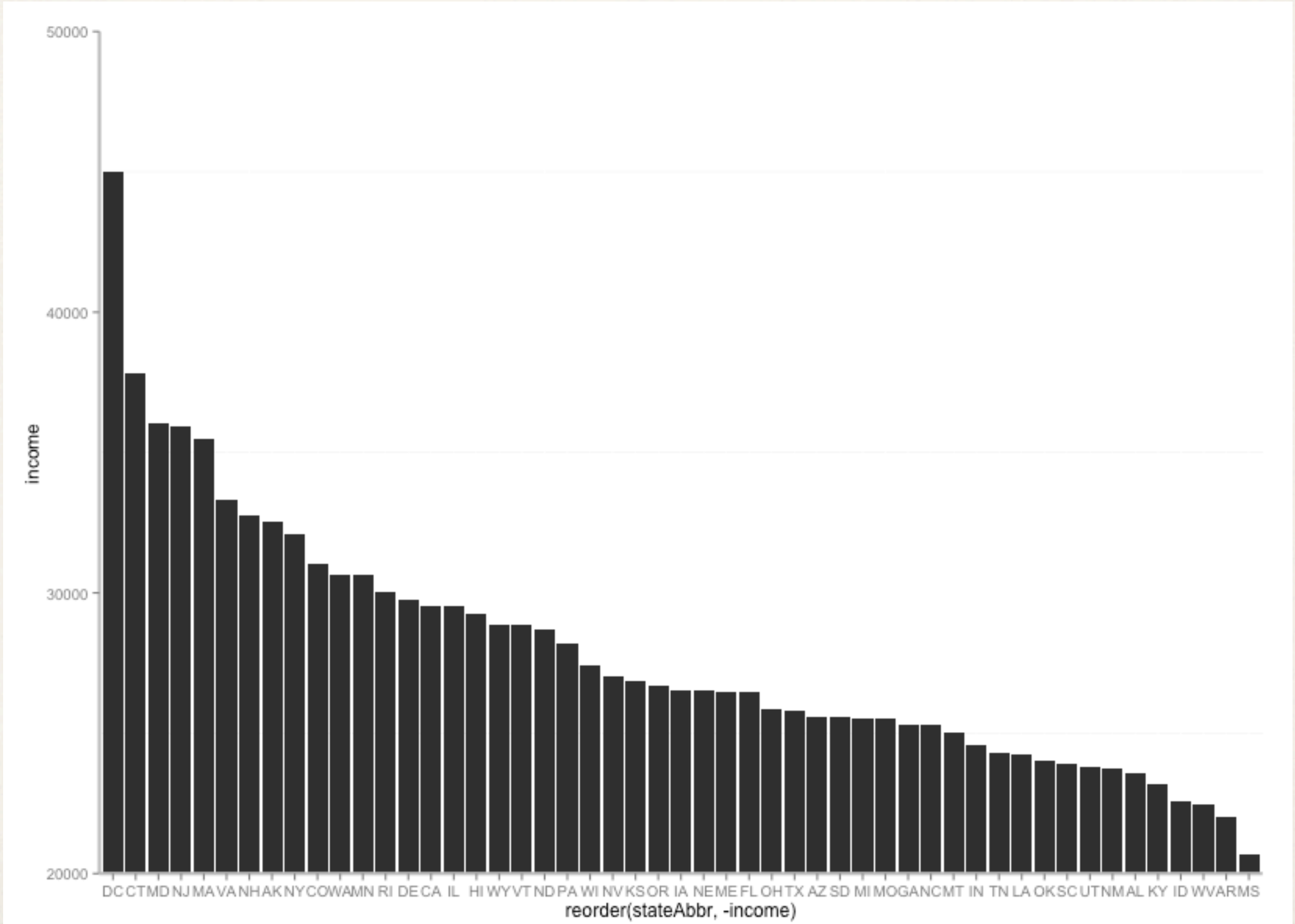
show me different arrangements



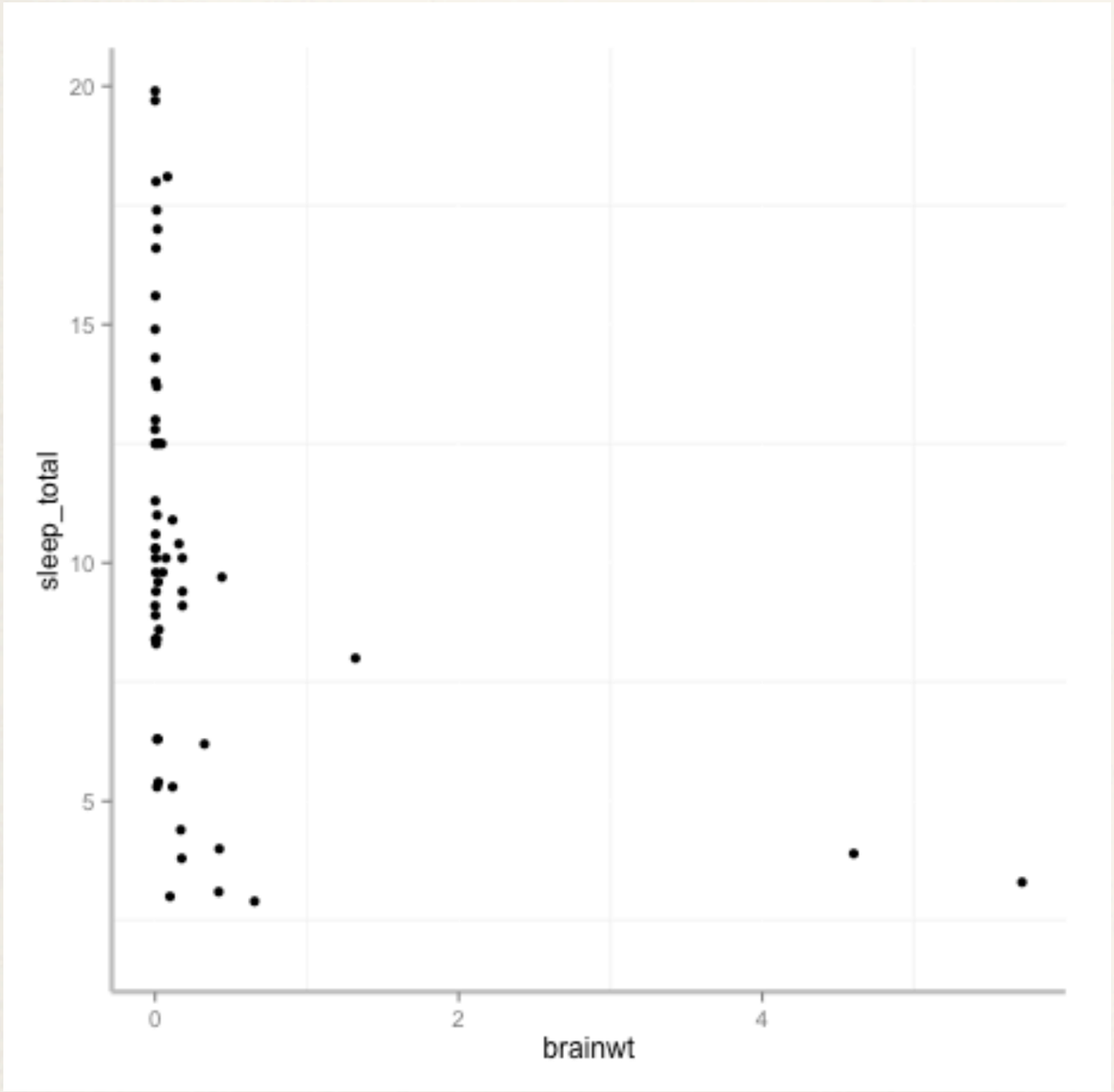
Reconfigure

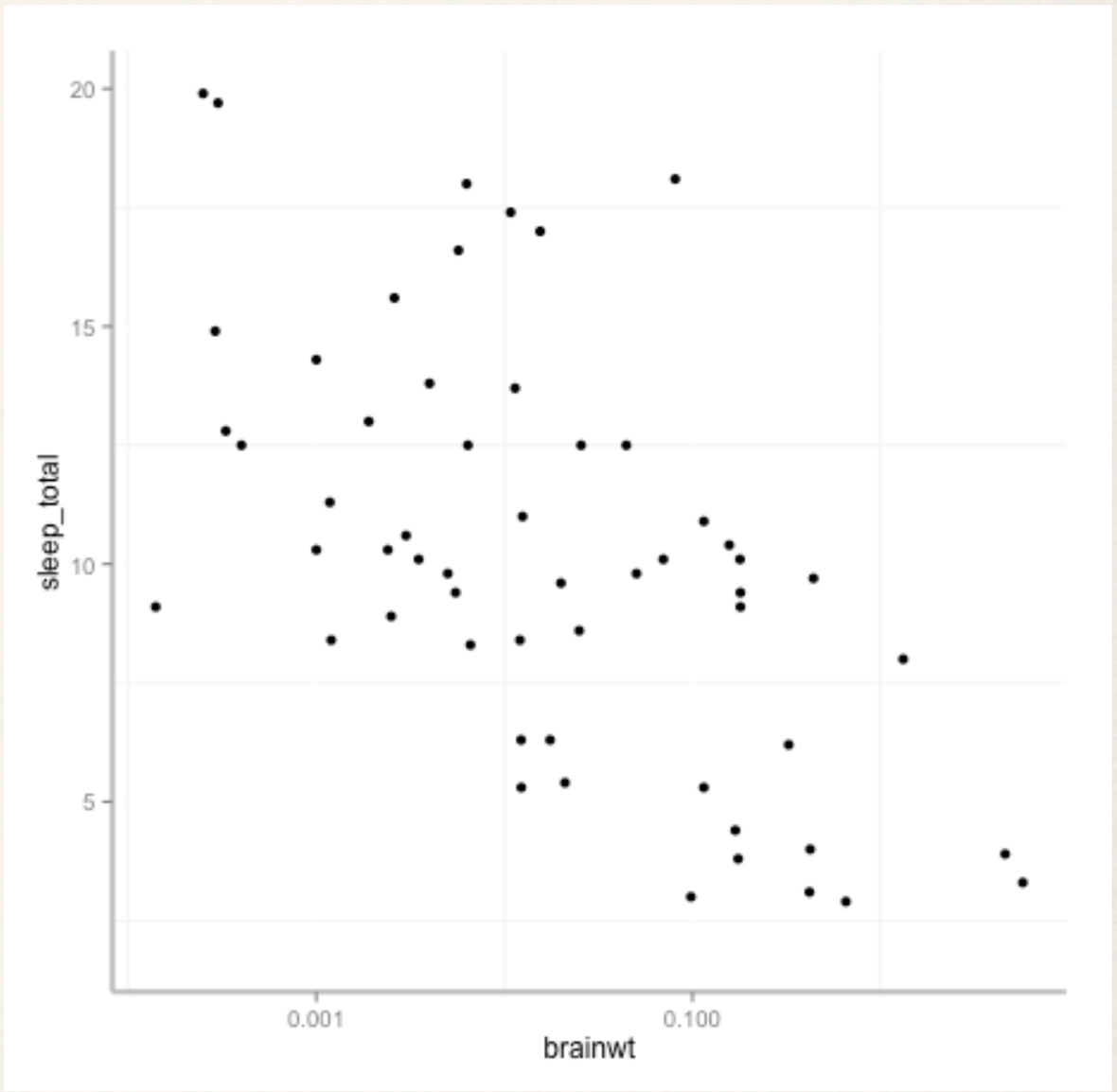
show me different arrangements



Reconfigure

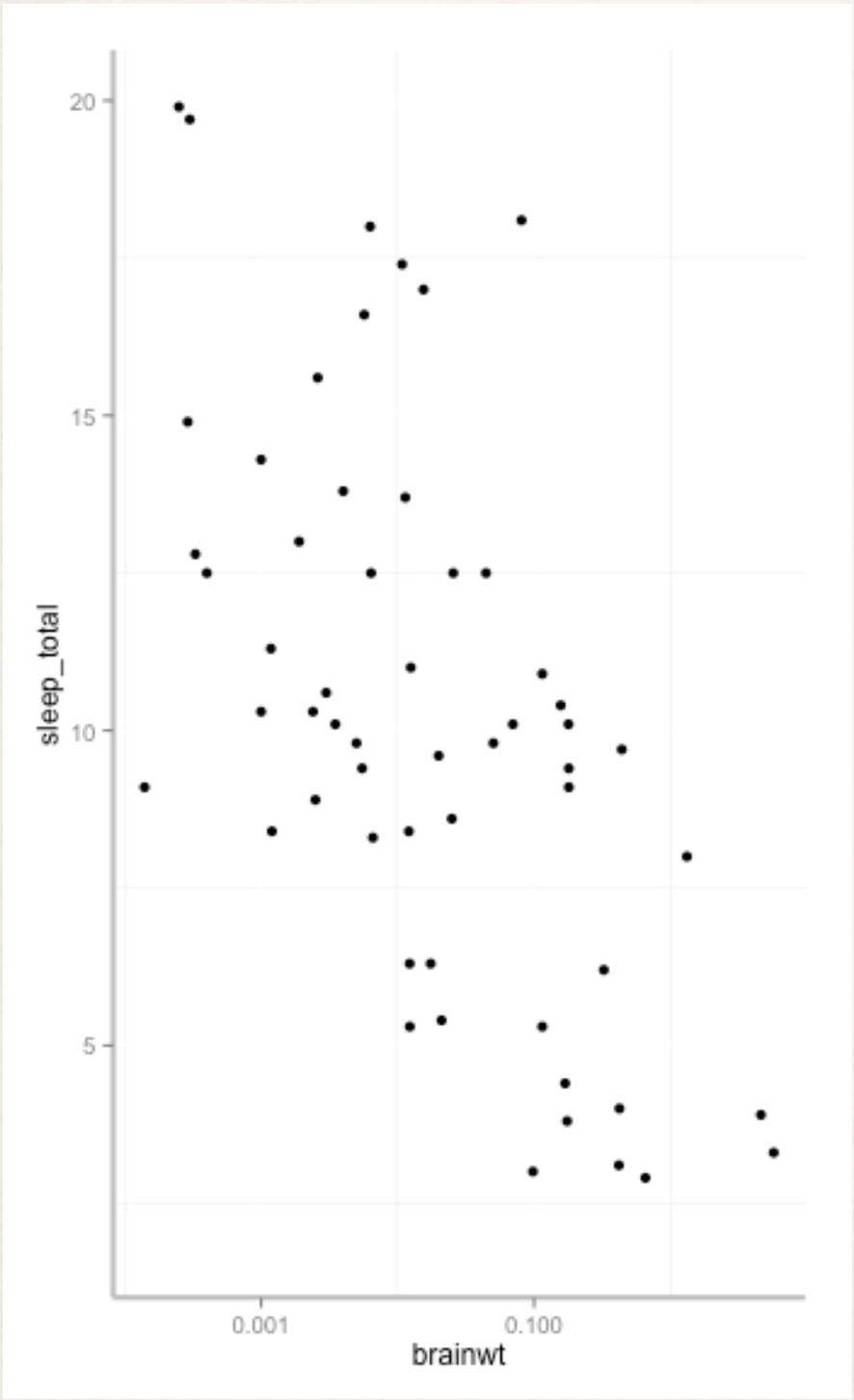
show me different arrangements

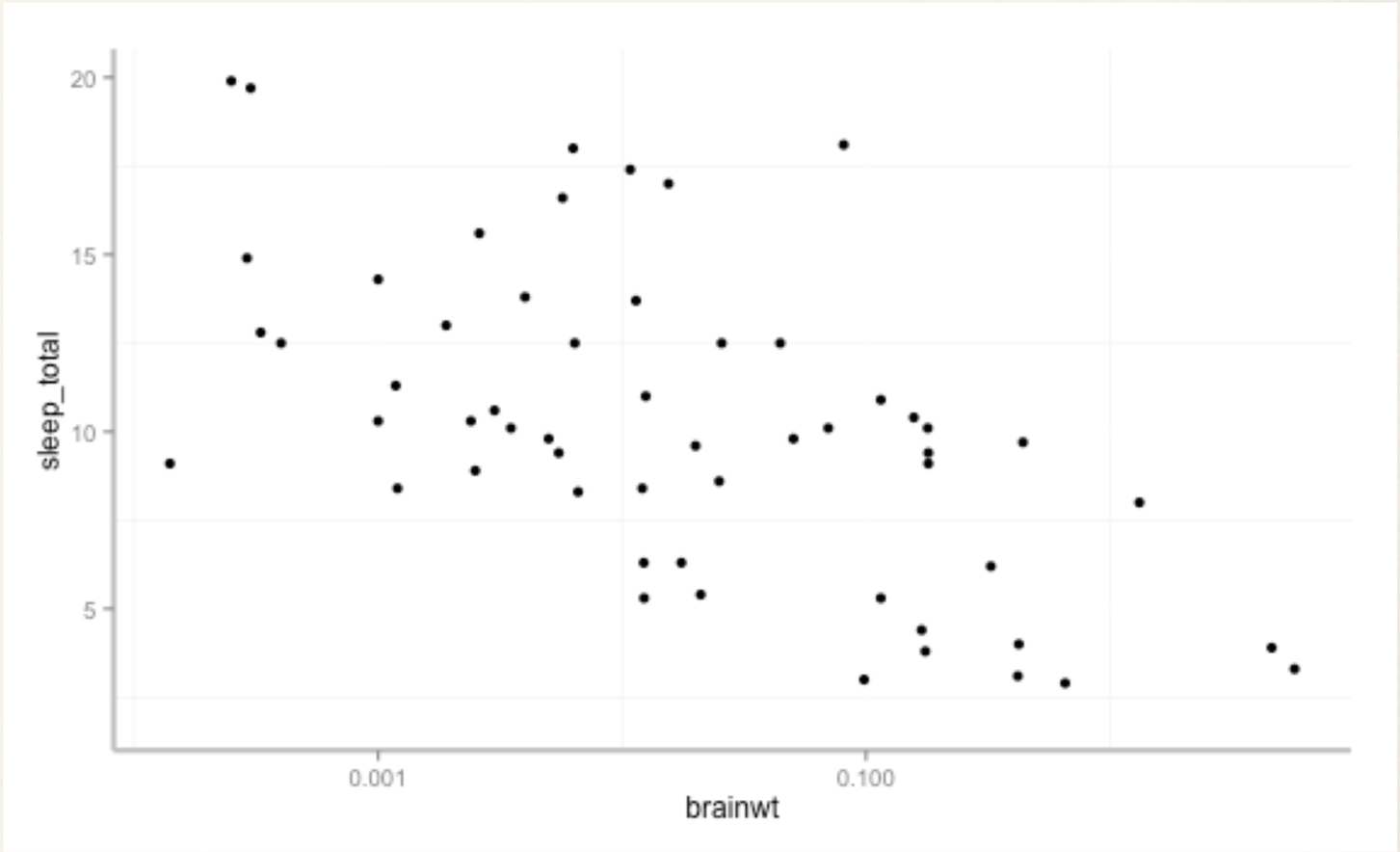




Reconfigure

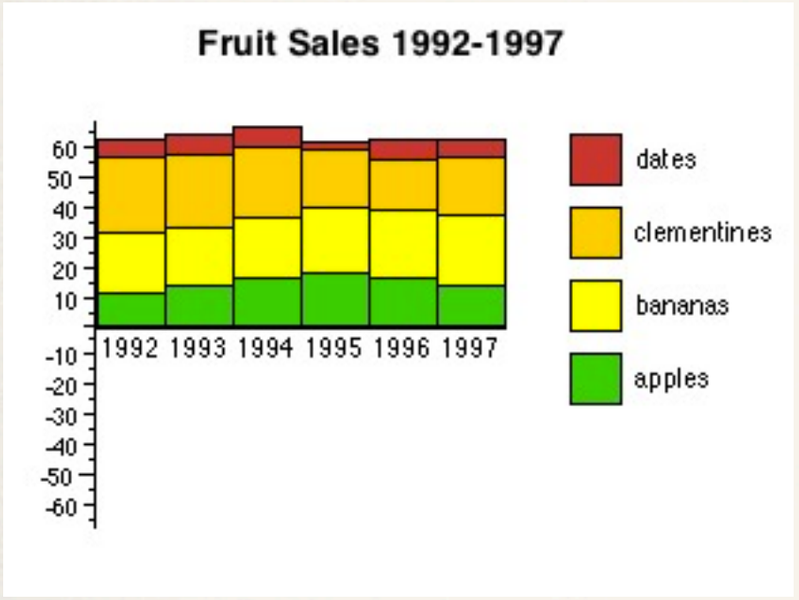
show me different arrangements

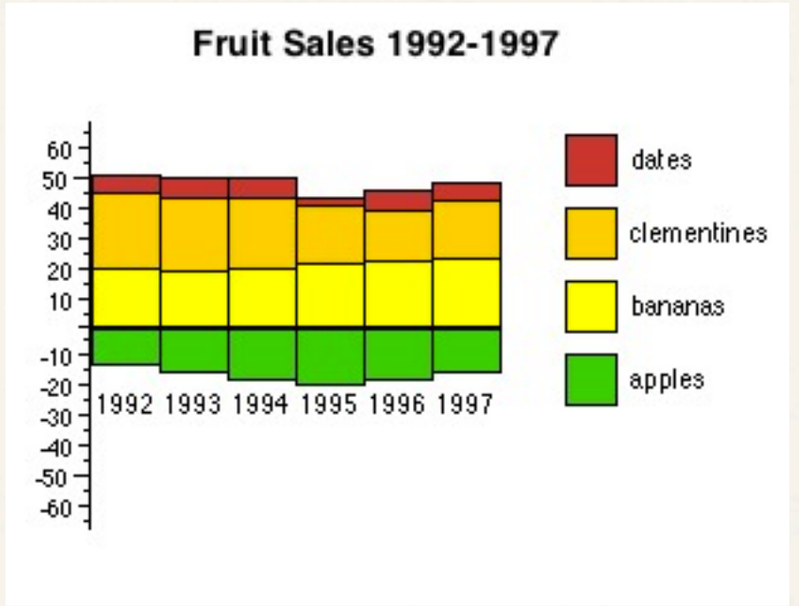


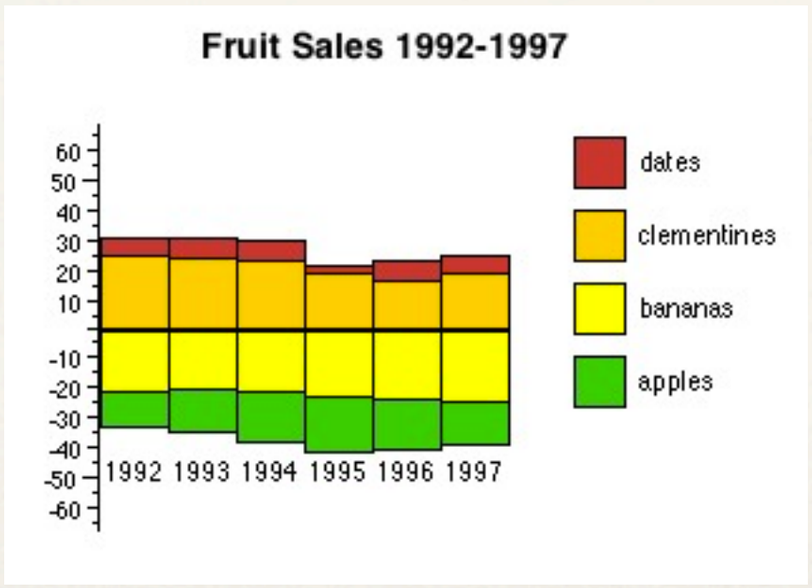


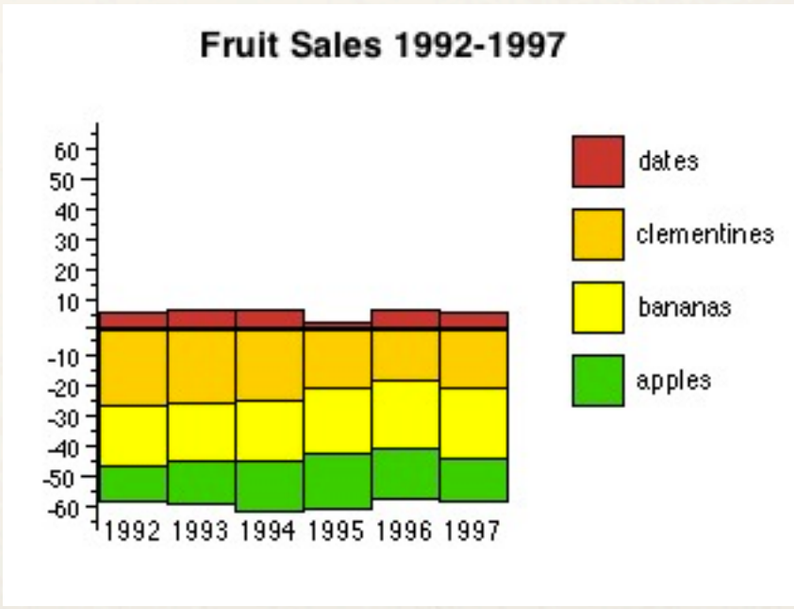
Reconfigure

show me different arrangements





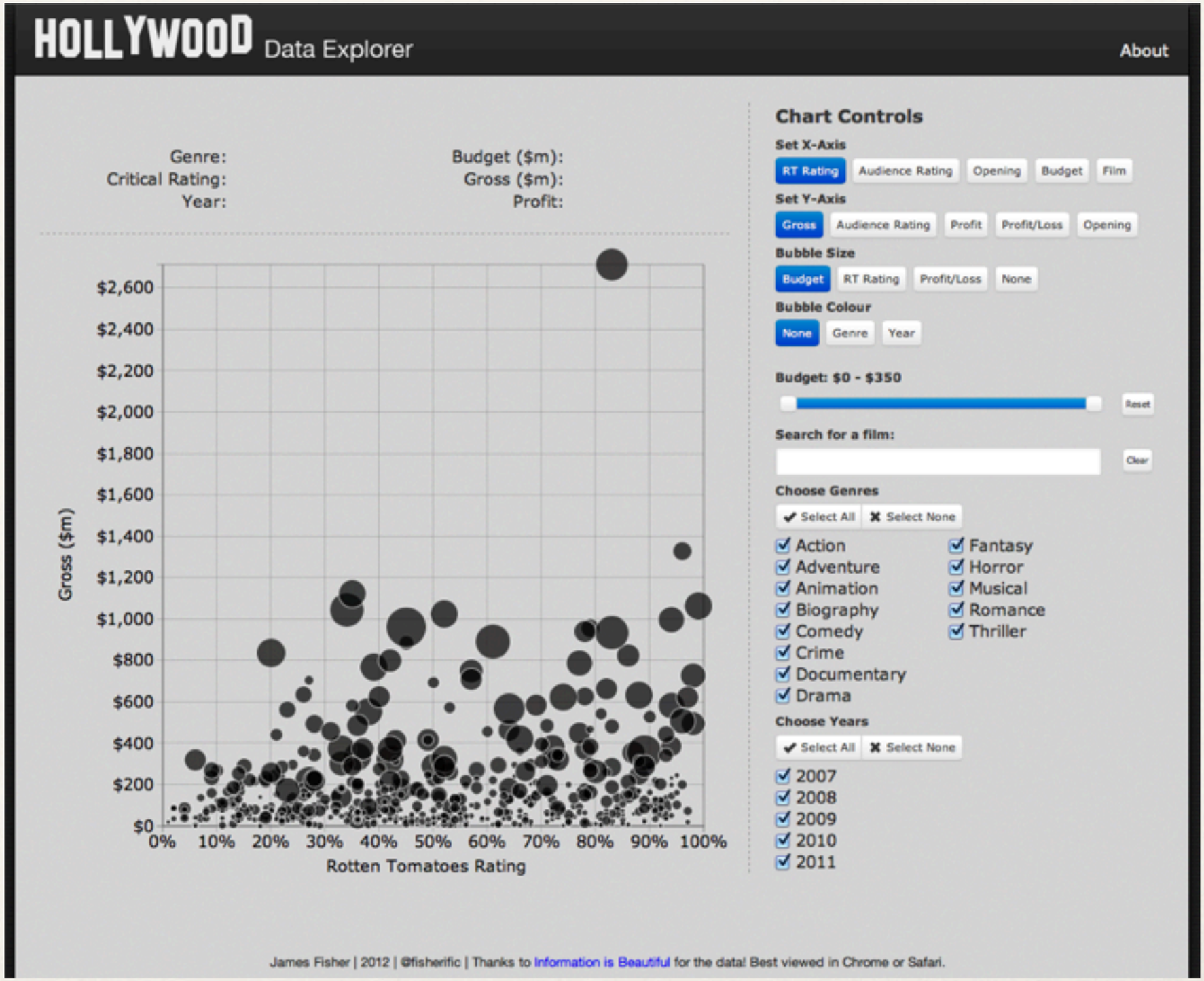




http://www.meandeviation.com/dancing-histograms/

Reconfigure

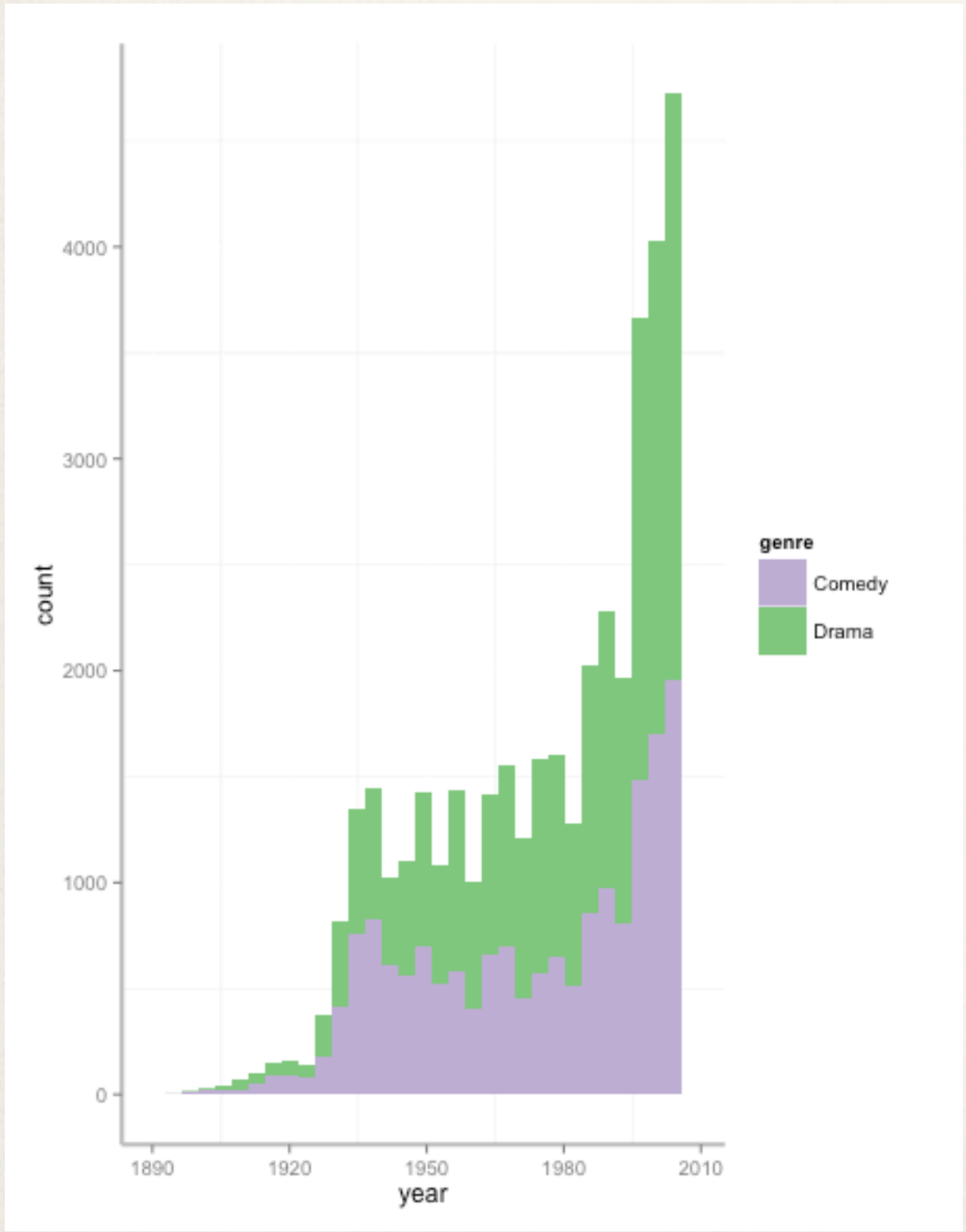
show me different arrangements

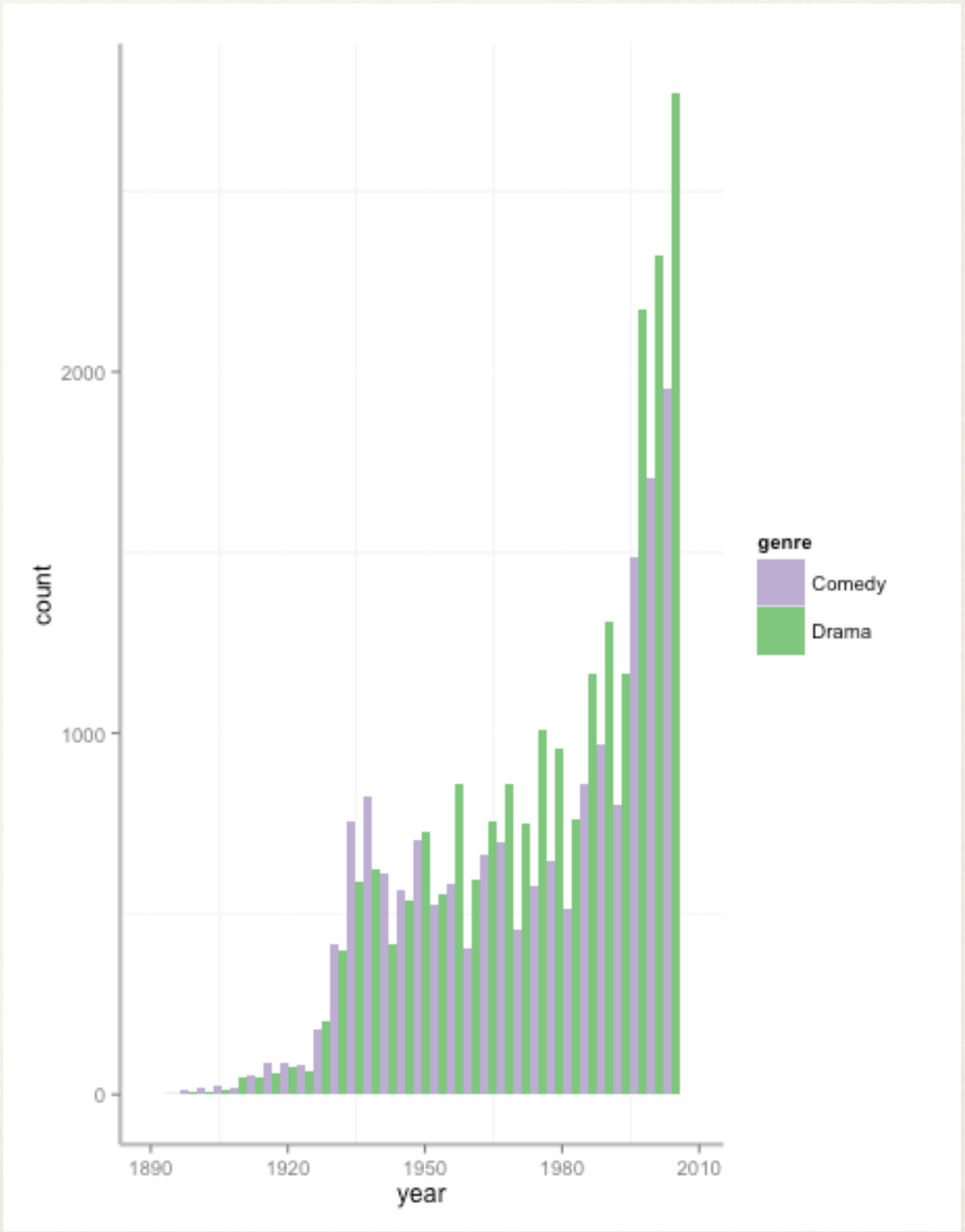


http://indexity.net/vis/hw/

Encode

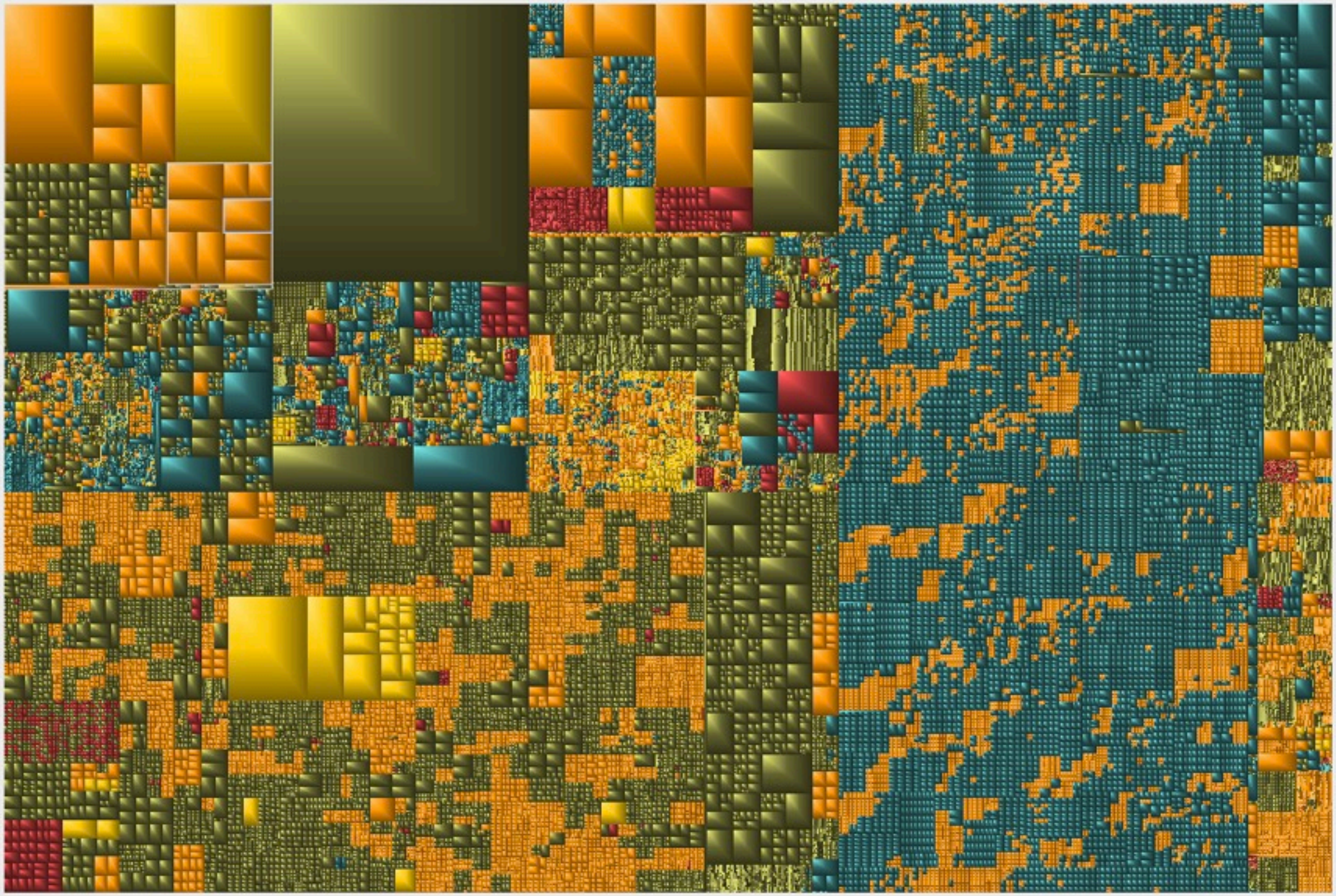
change the visual representations





Abstract/Elaborate

show me more or less detail

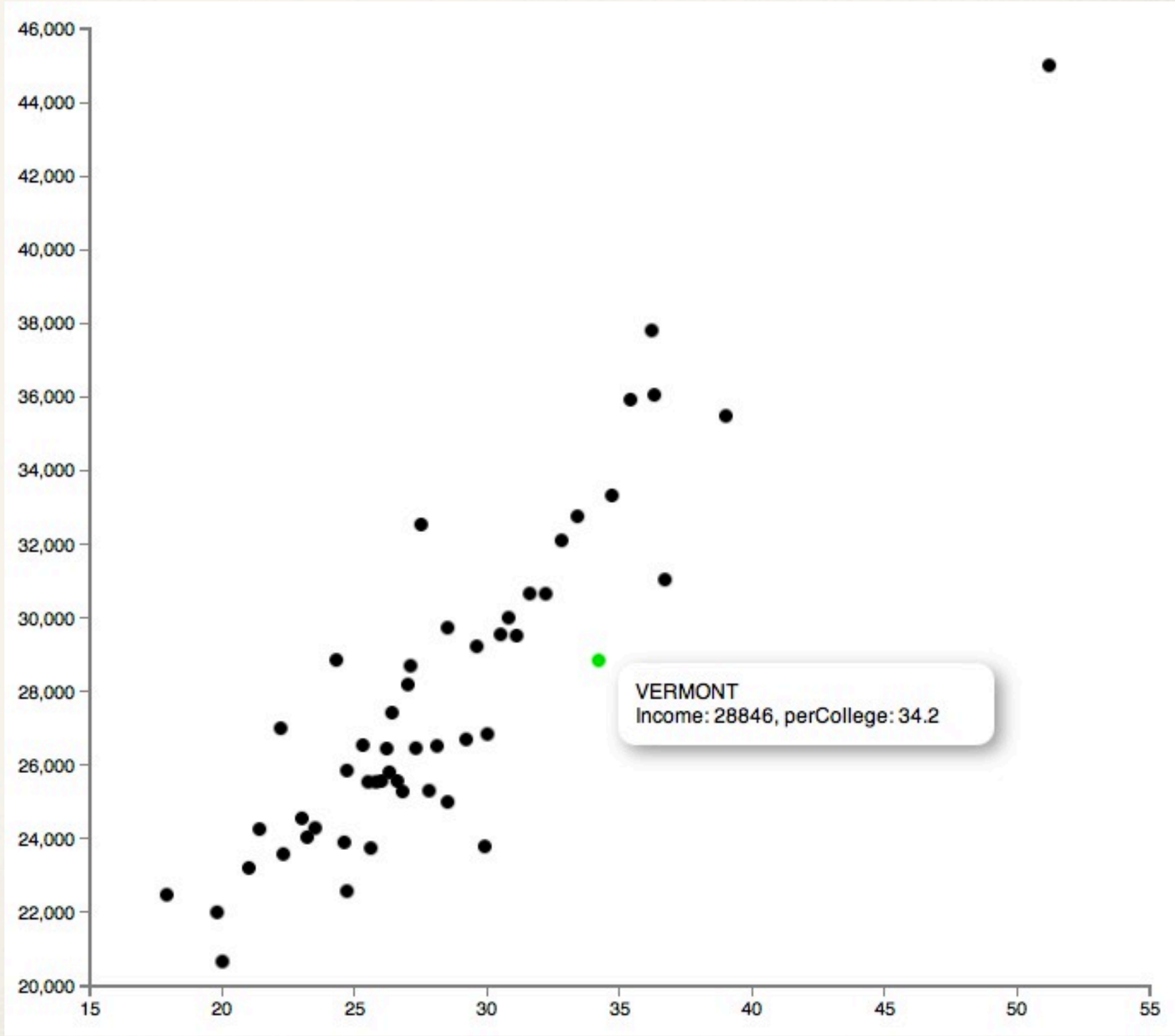


Grand Perspective

Abstract/Elaborate

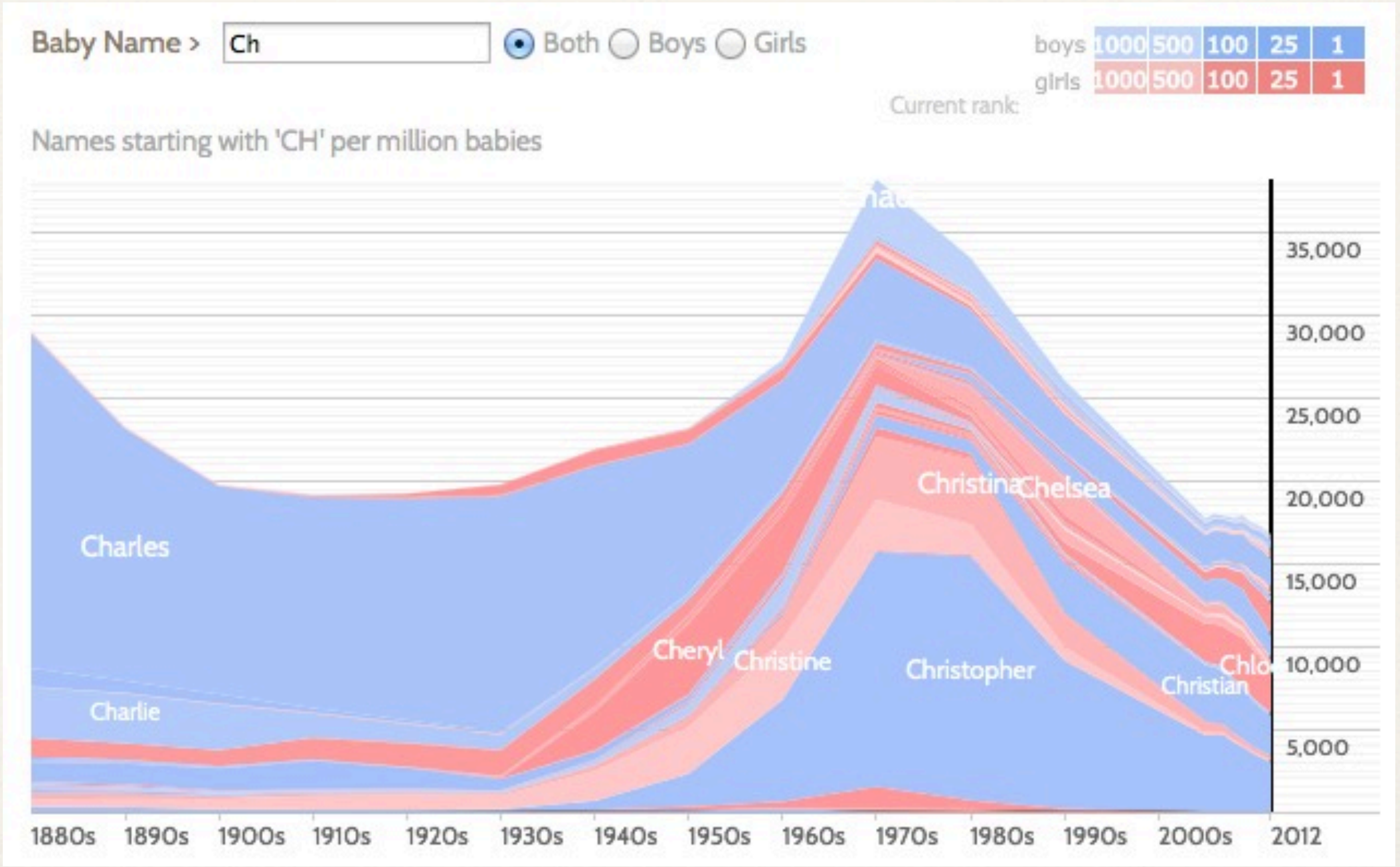
show me more or less detail

"details on demand"



Filter

conditionally show me something



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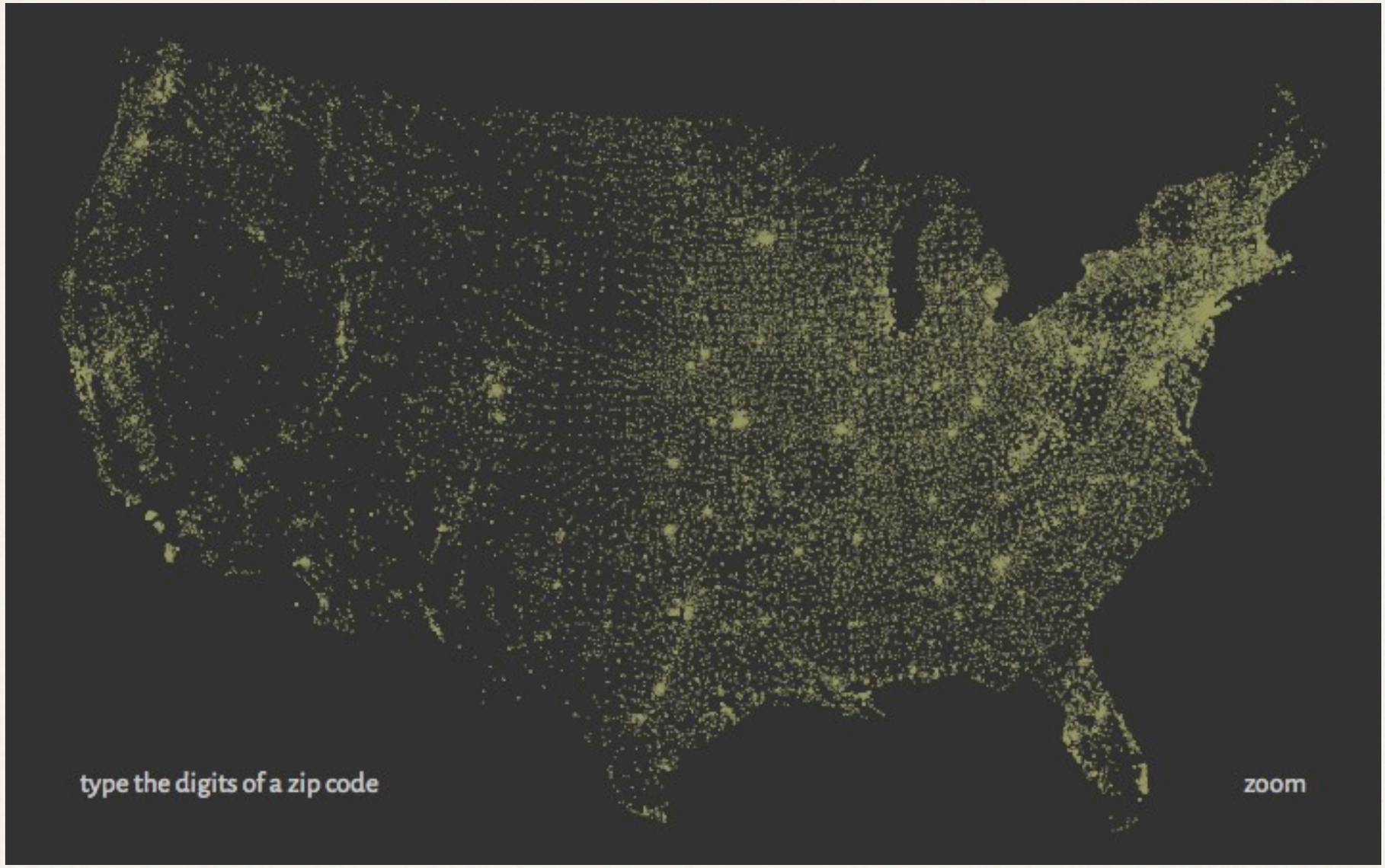


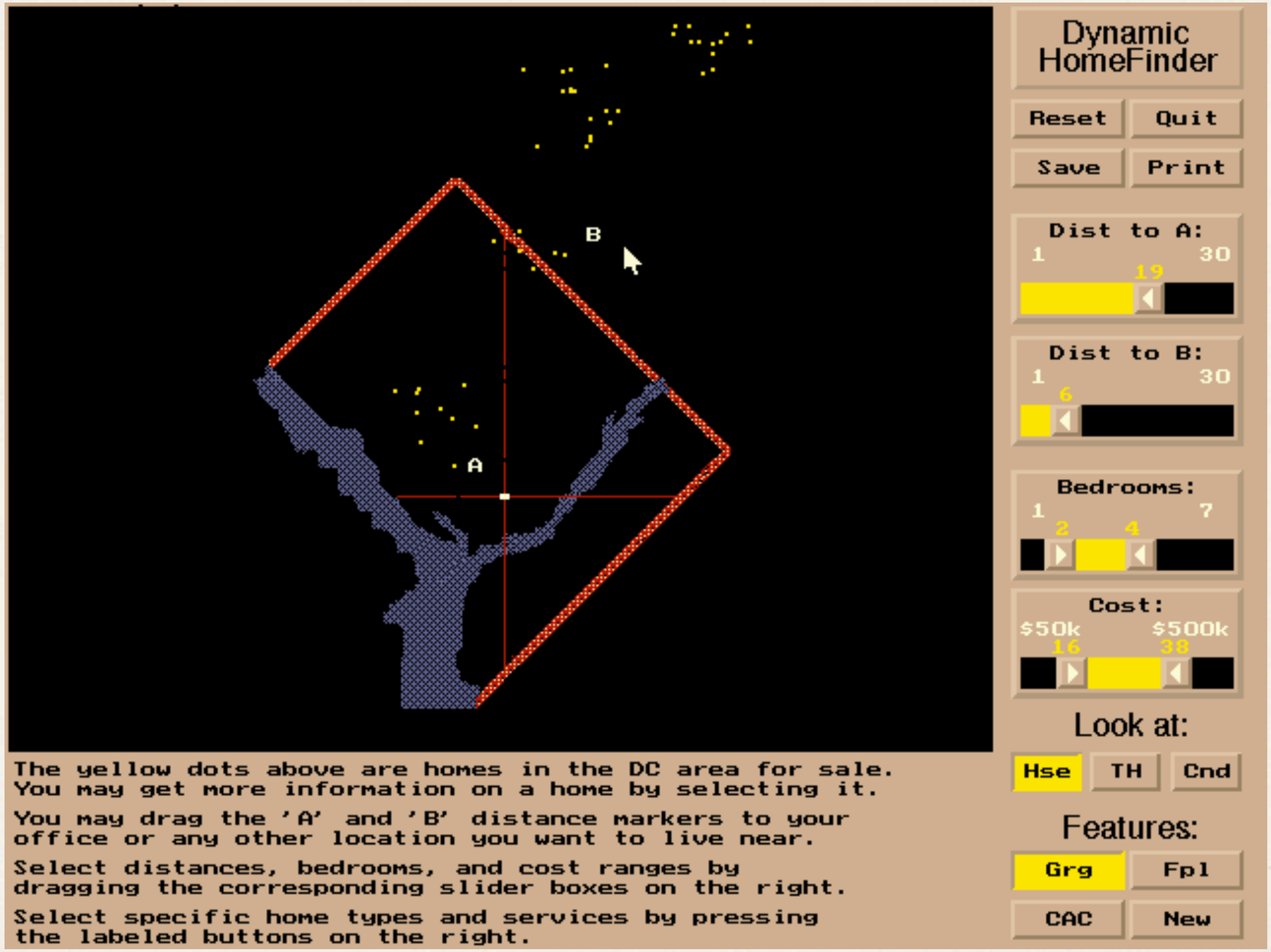
http://benfry.com/zipdecode/

Query language

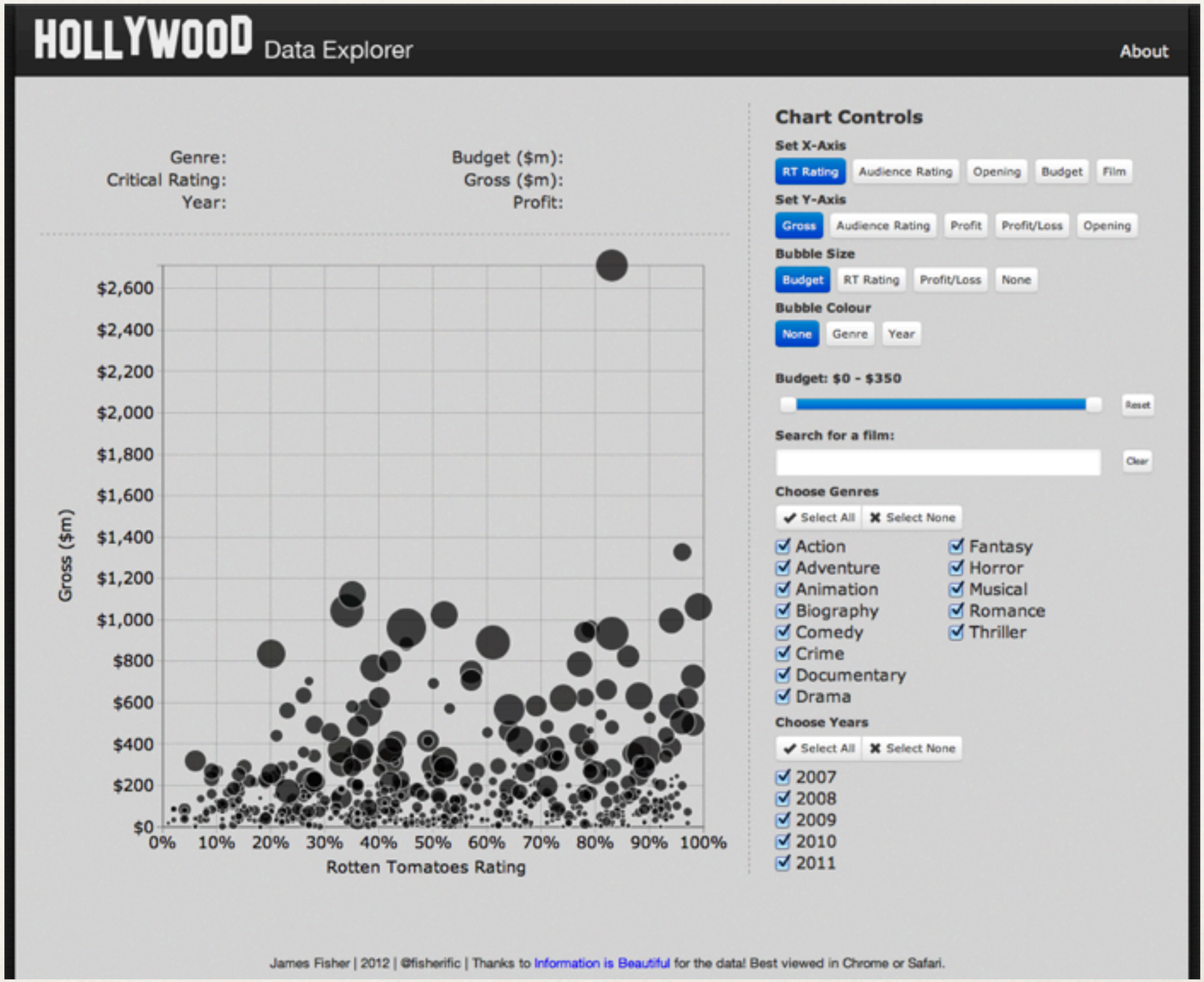
```
SELECT address FROM realestateDB WHERE sqFoot >= 1500
AND bedrooms >= 3 AND garage == TRUE AND price <=
$300000
```

```
movies90 <- subset(movies, year>=1990 & year <2000)
```

Dynamic queries

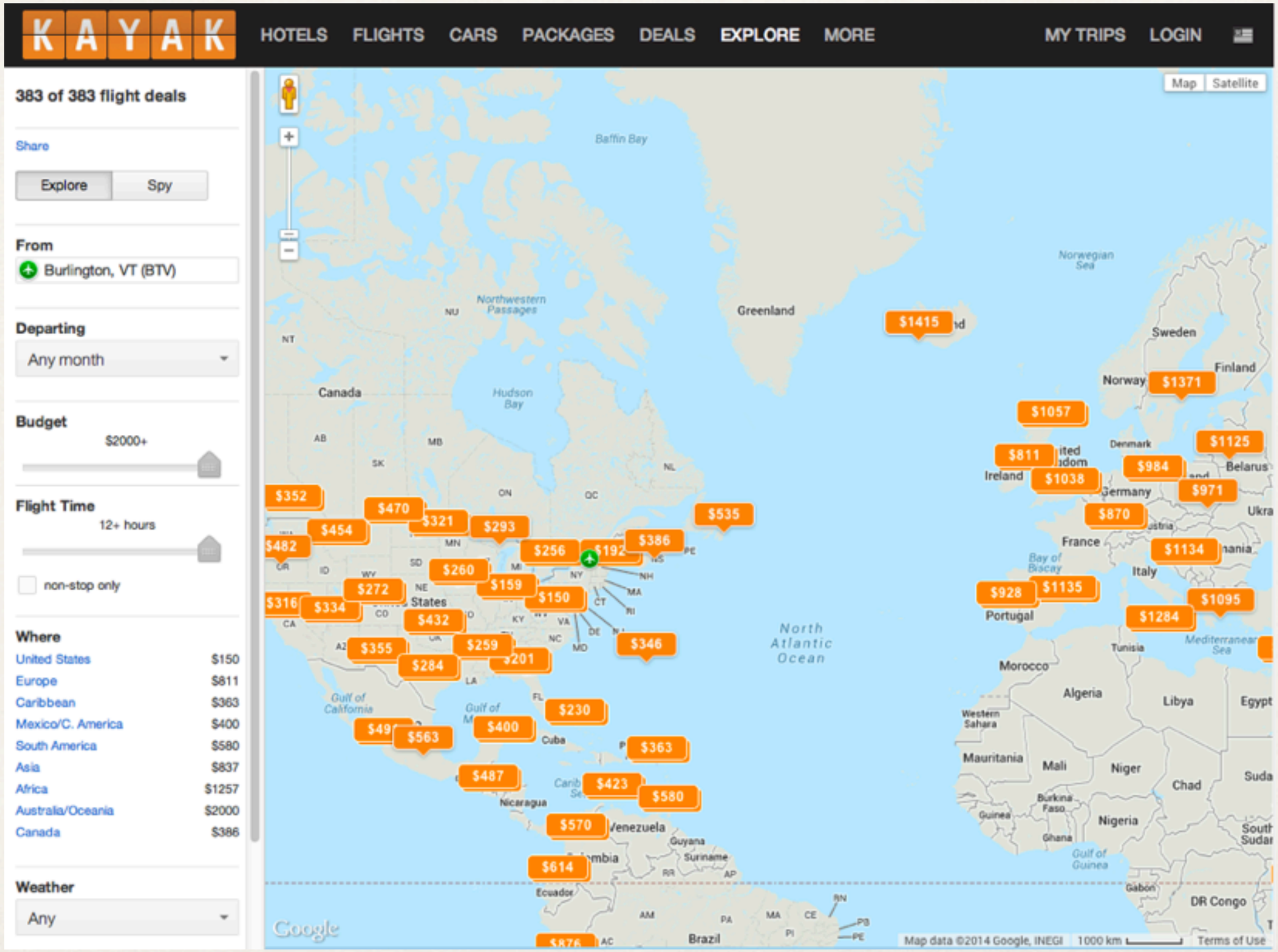


Dynamic queries



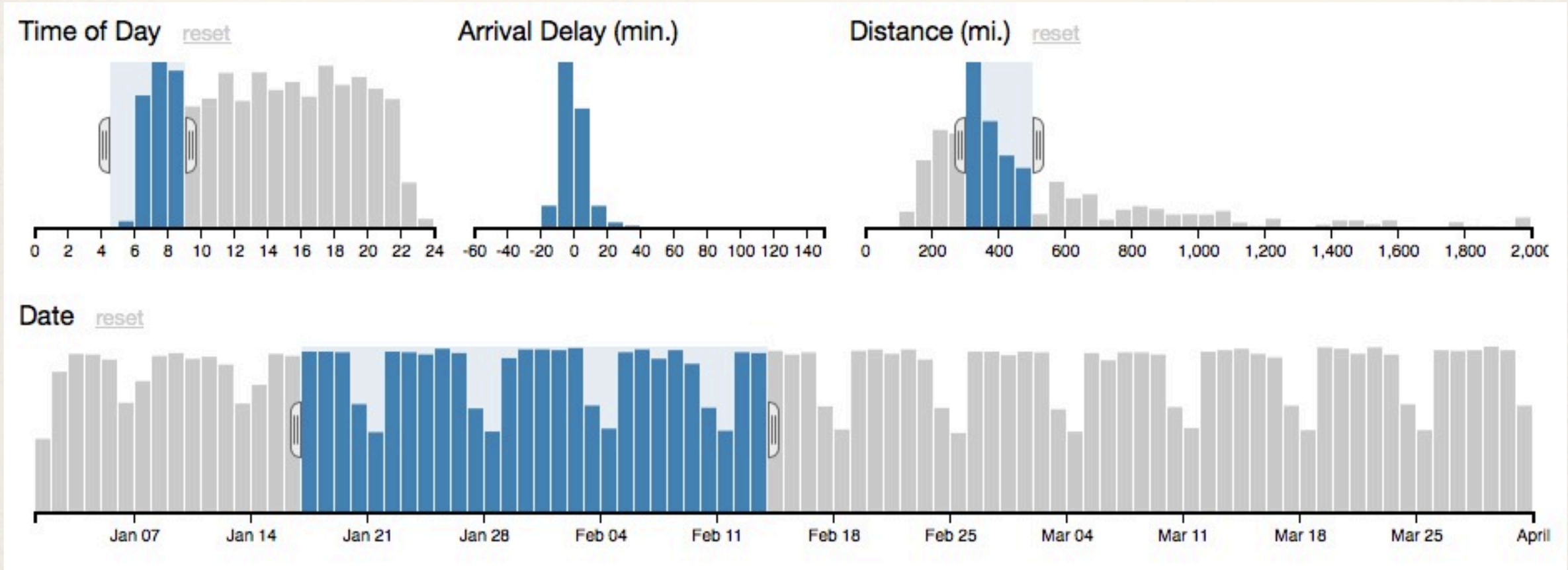
http://indexity.net/vis/hw/

Dynamic queries



http://www.kayak.com/explore/

Brushed histograms

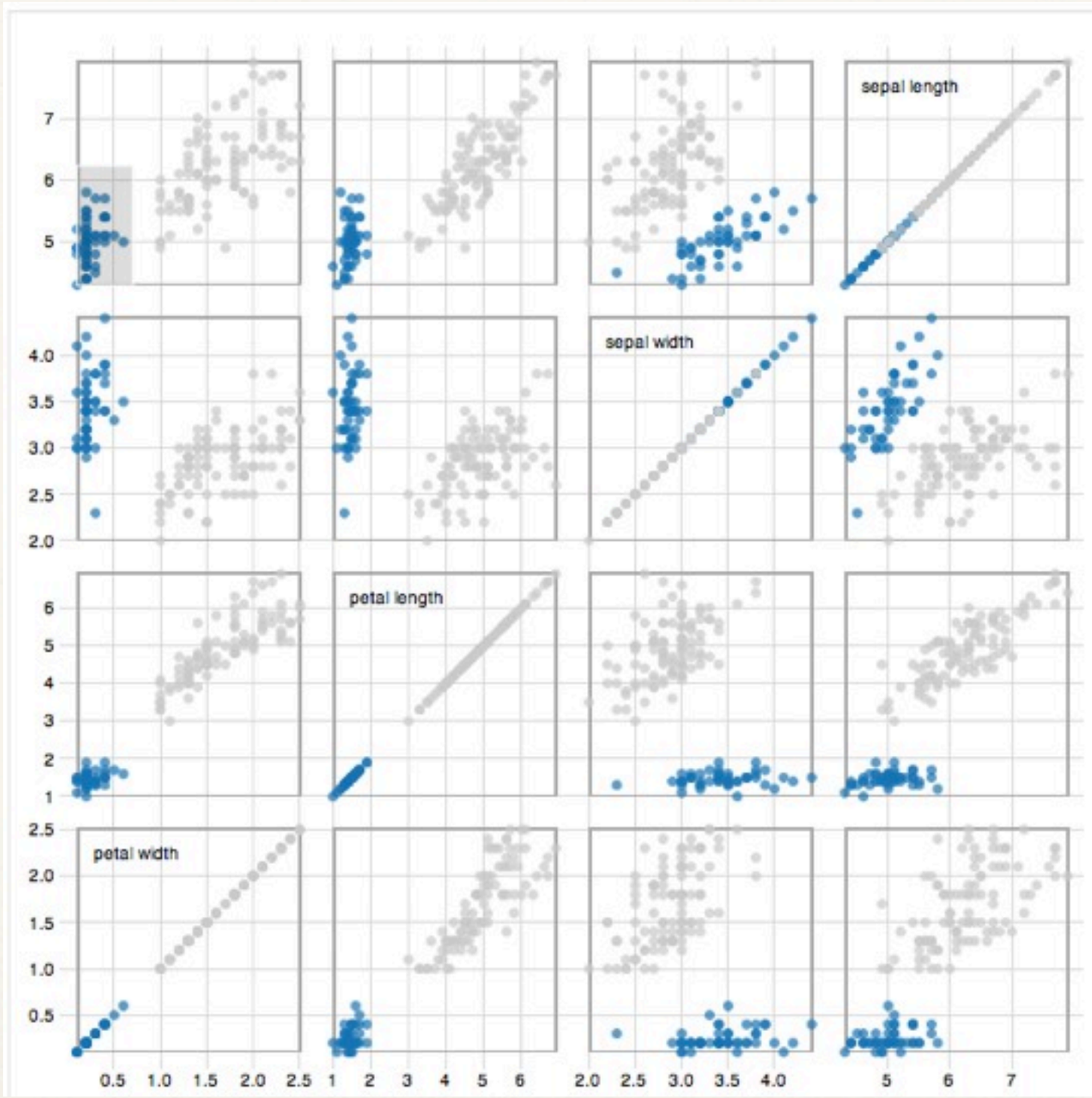


http://square.github.io/crossfilter/

Connect

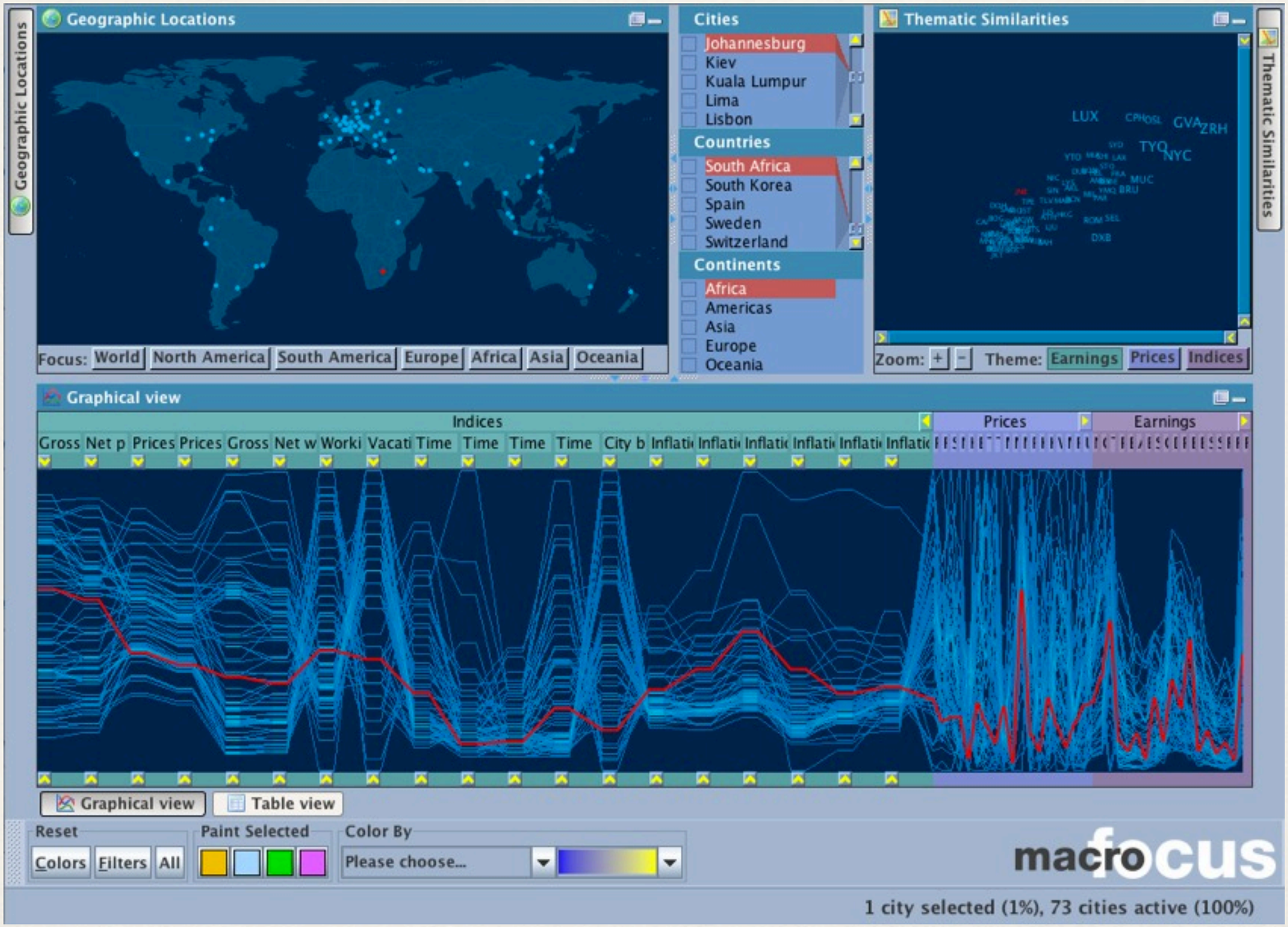
show me related items

brush and link



http://bl.ocks.org/mbostock/4063663

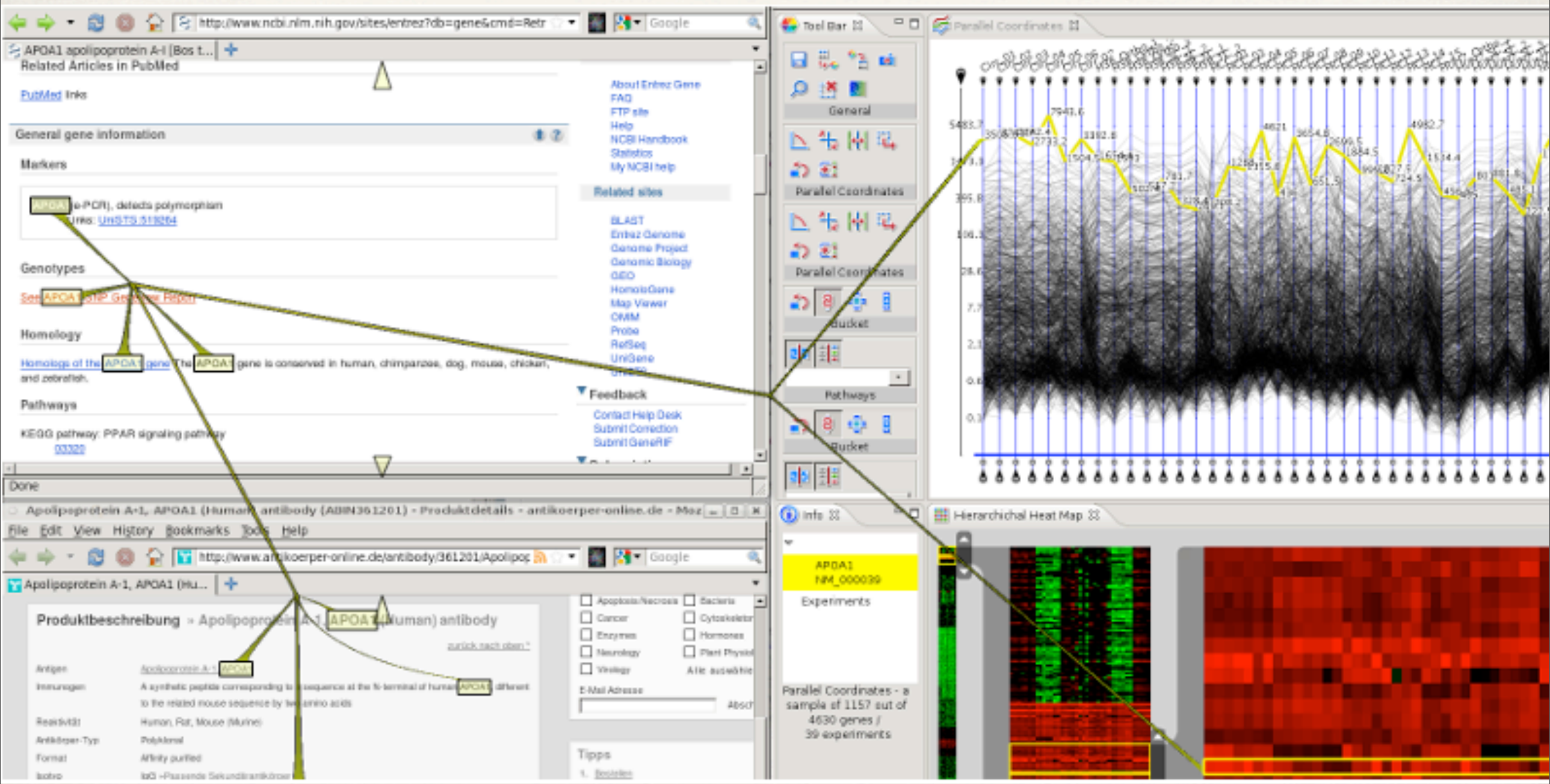
Connect



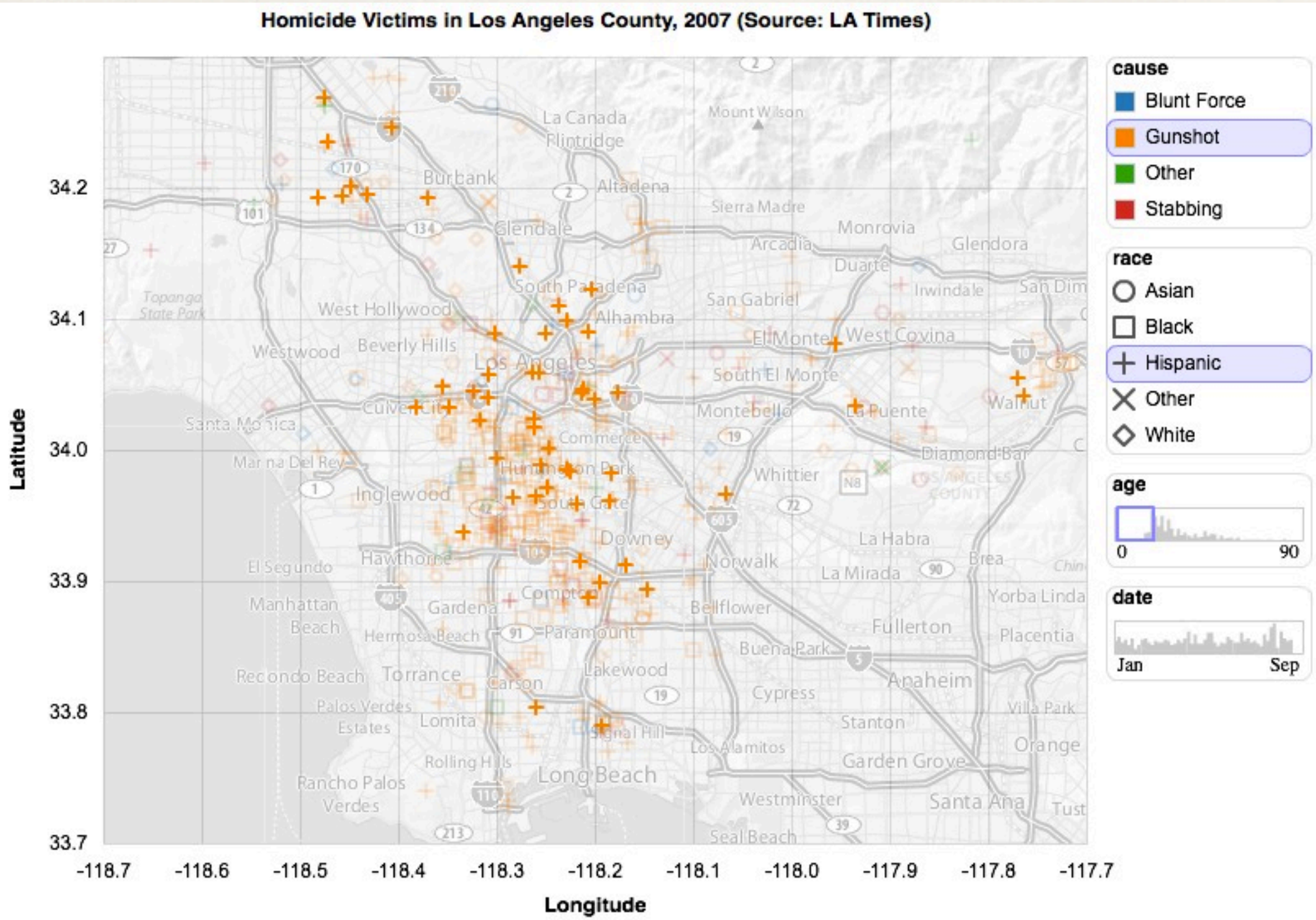
InfoScope

Connect

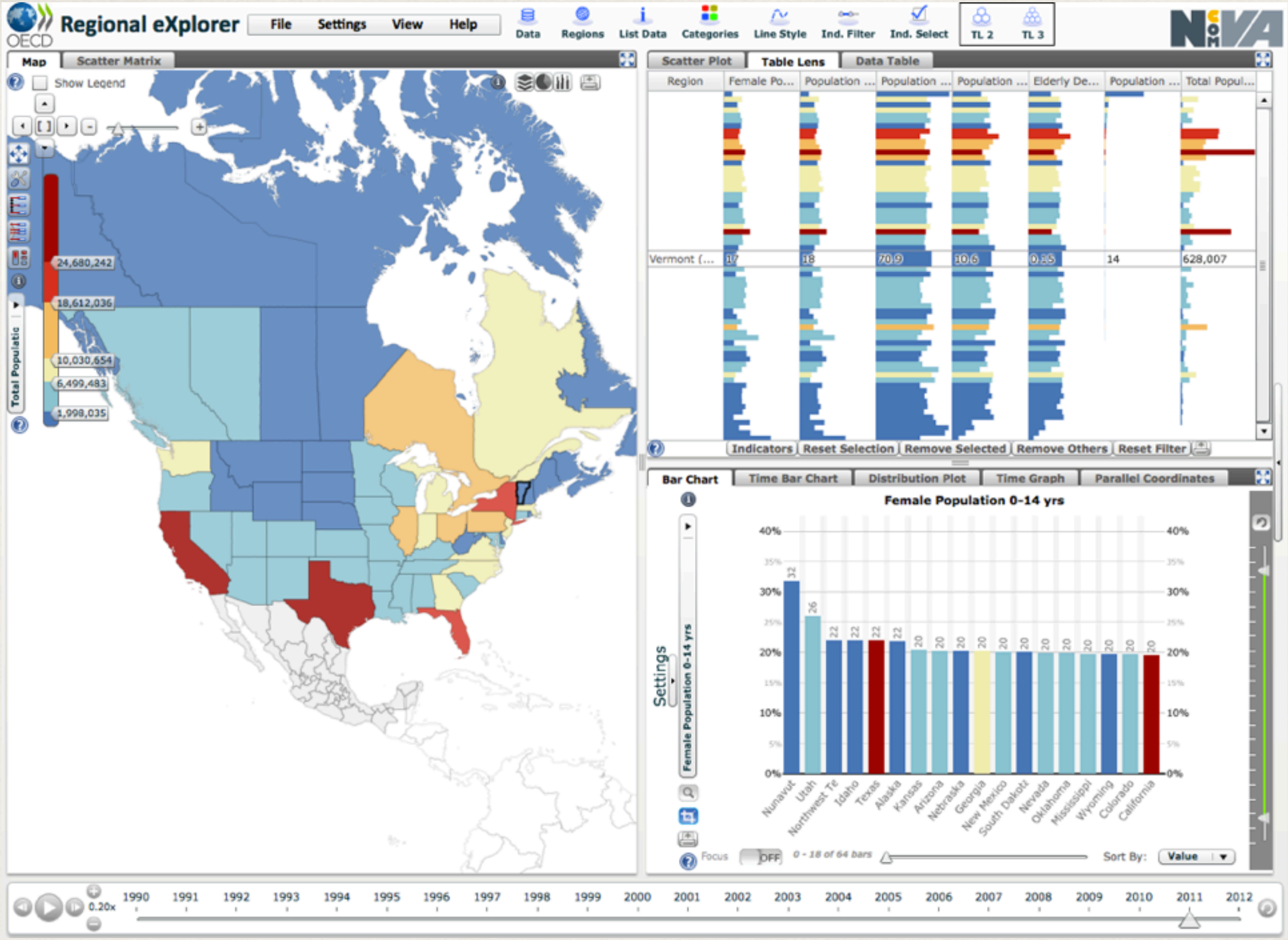
show me related items



Waldner et al. “Visual Links Across Applications”, 2010



http://hci.stanford.edu/courses/cs448b/demos/gensel/homicides/



http://stats.oecd.org/OECDregionalstatistics/