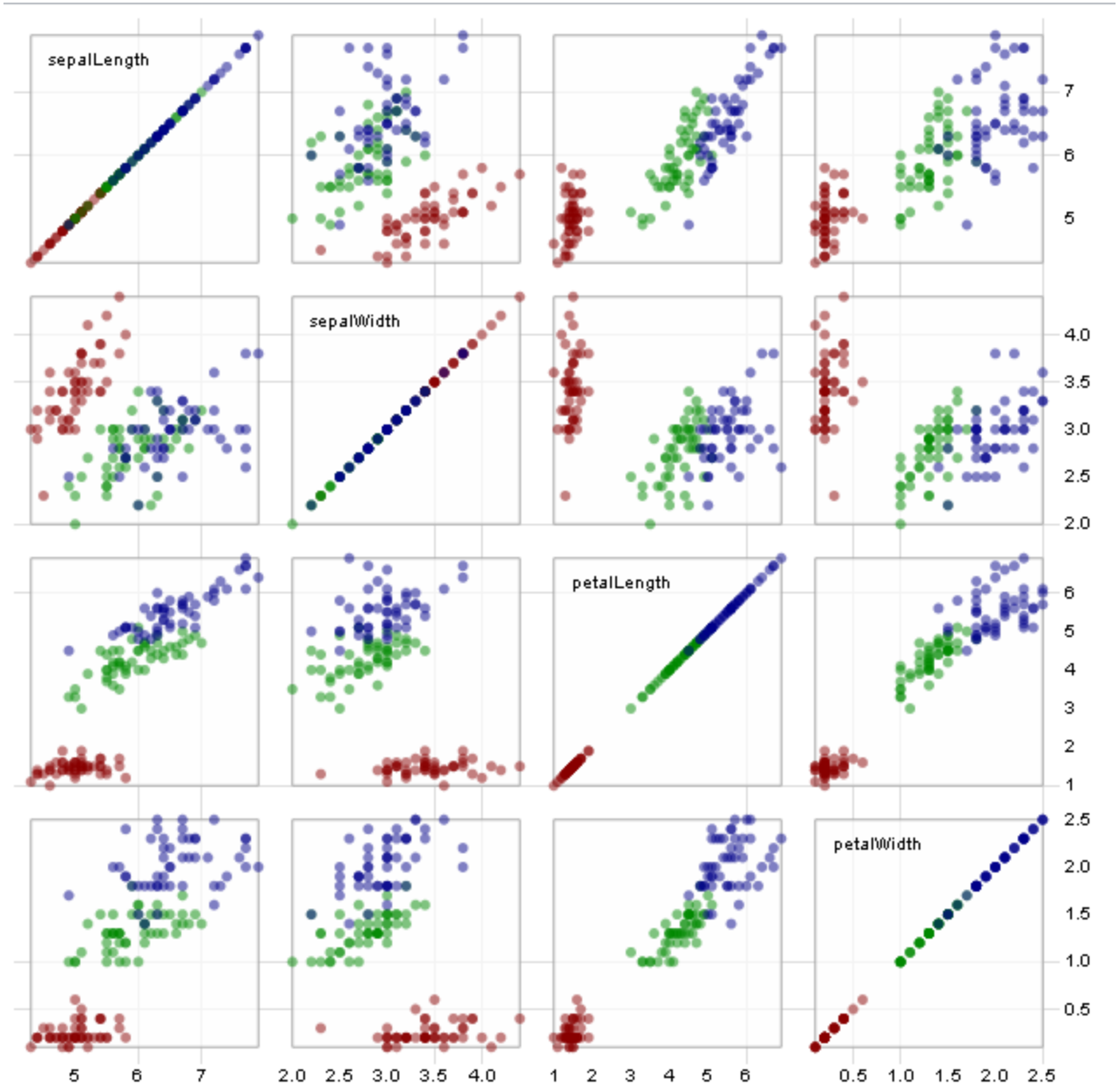
D3 and hierarchy

Visweek d3 workshop

My chart is a tree

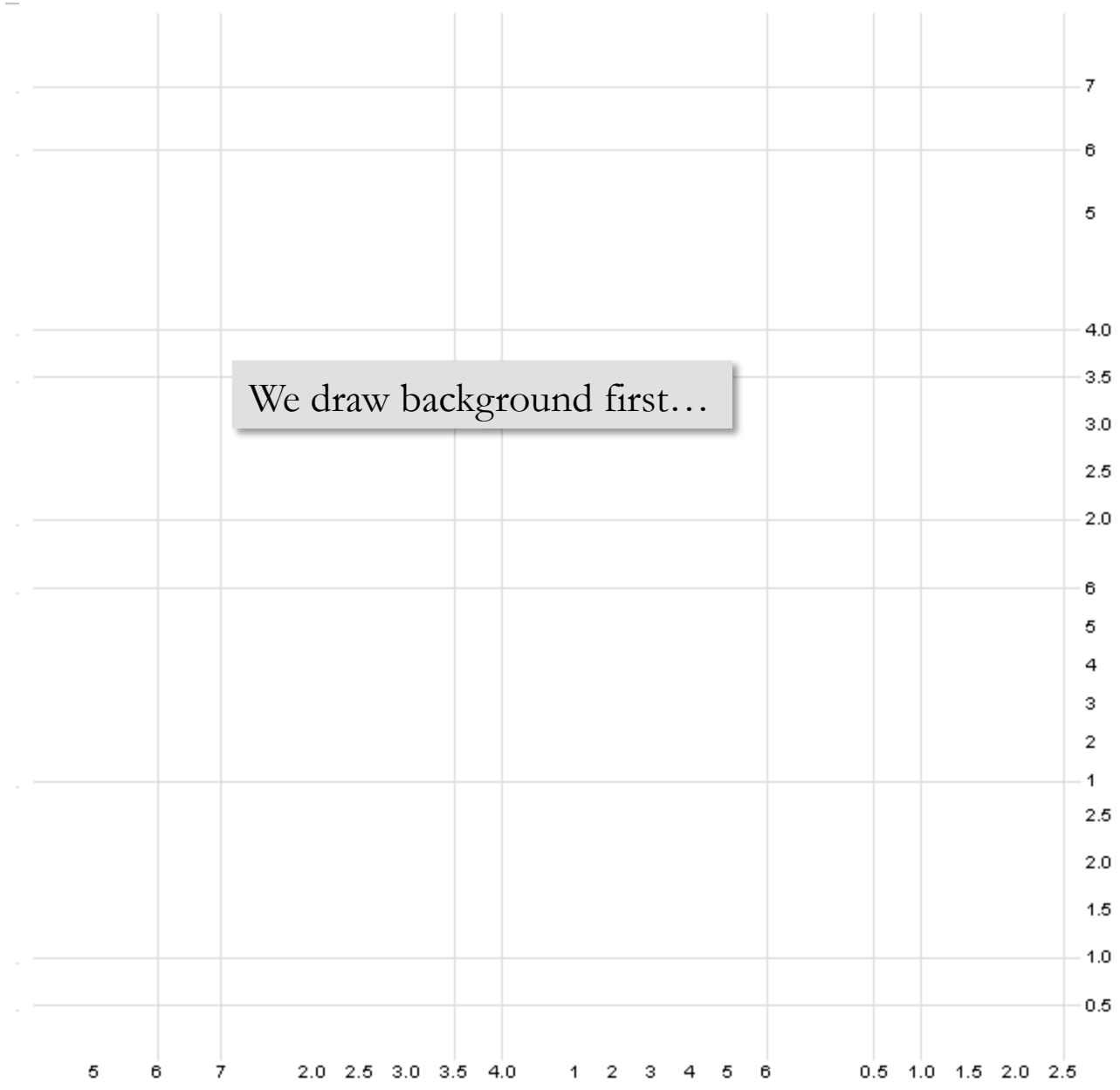
- So we saw earlier that HTML and SVG are very hierarchical by nature.
- One unique aspect of d3 is that you won't be *drawing* elements one by one, but finding a container and *adding* stuff to it.

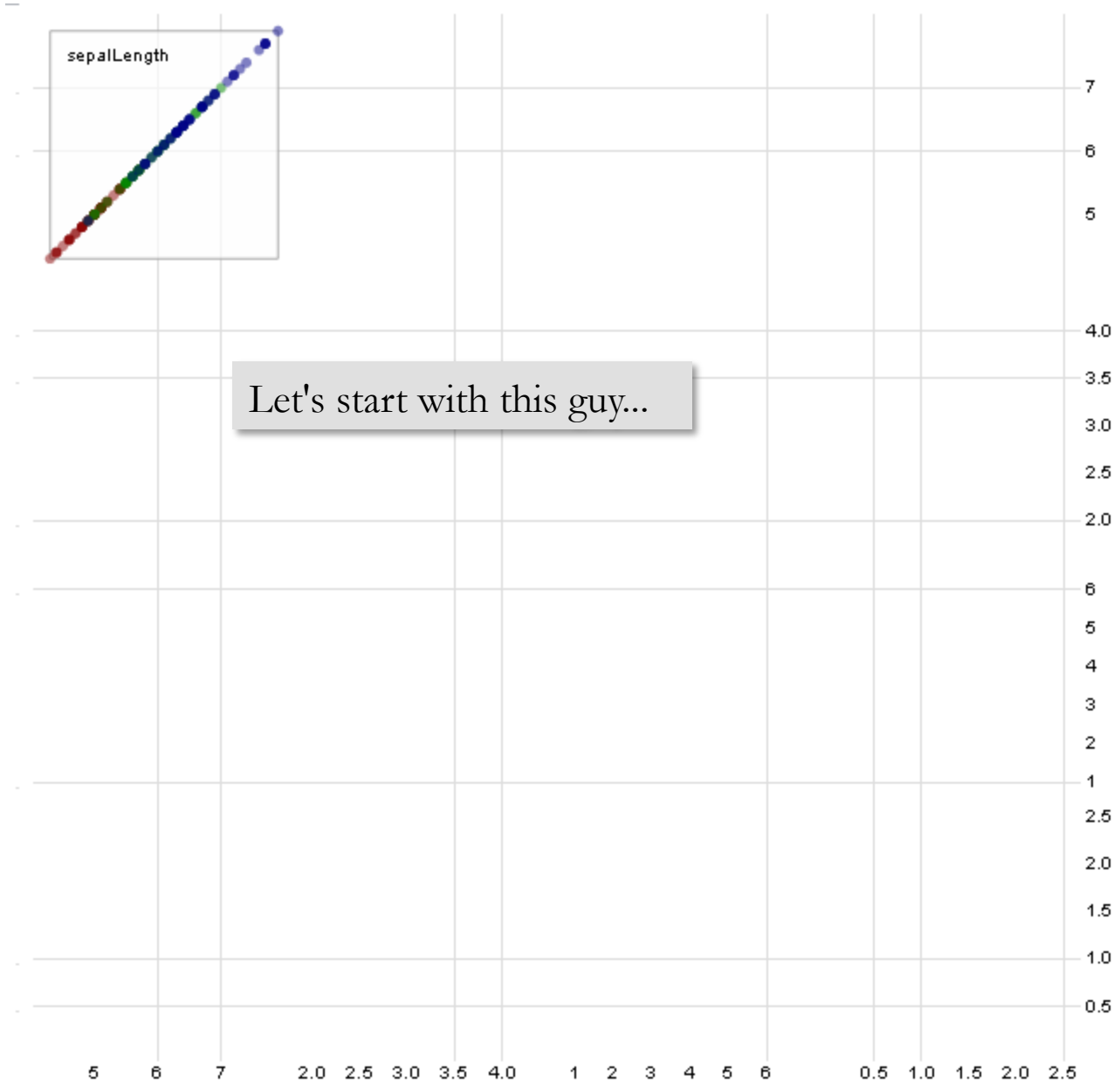
Fisher's
Iris Data

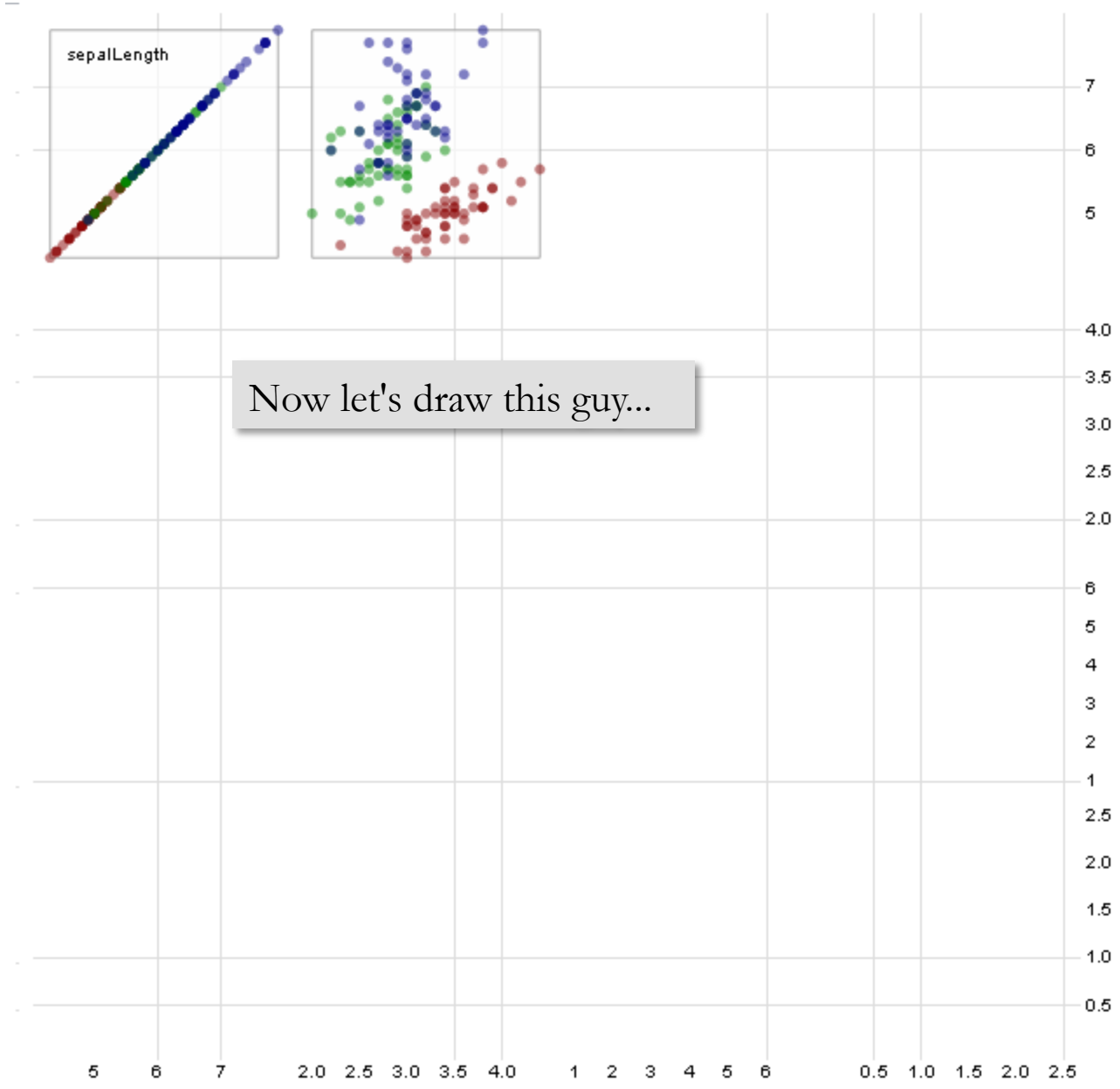


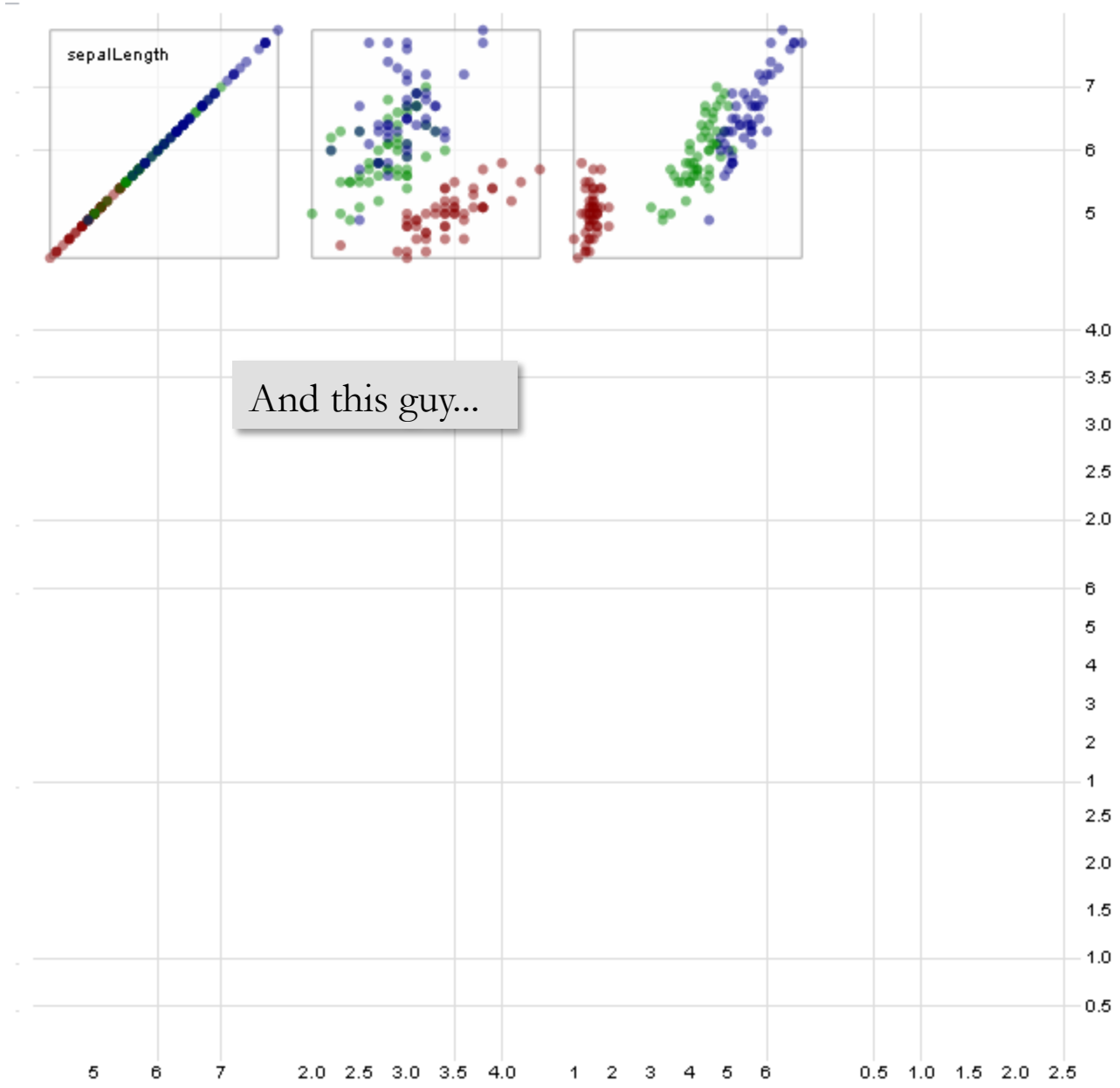
One way to do it

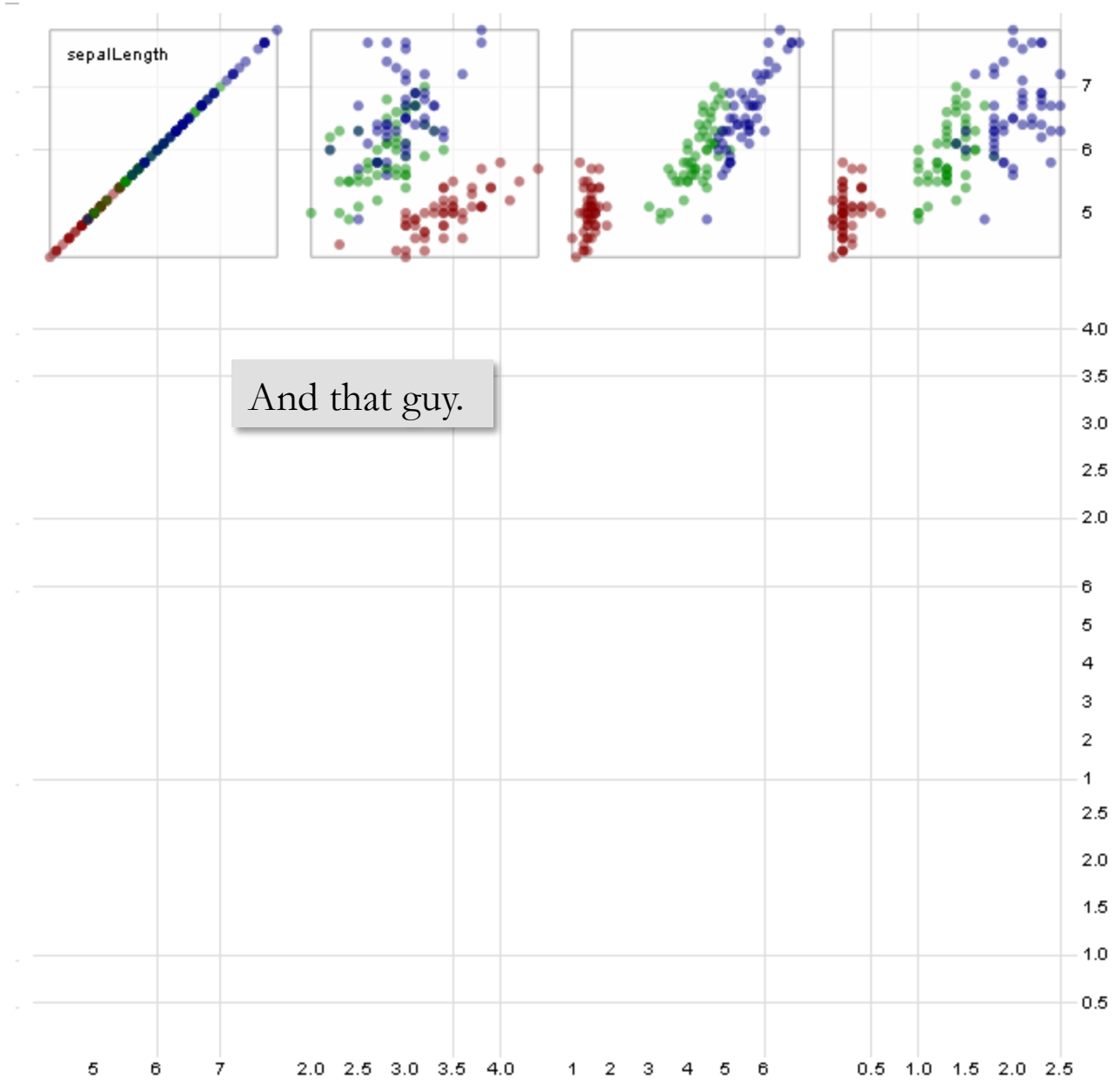
would be to draw the visualization one layer at a time, one element at a time.

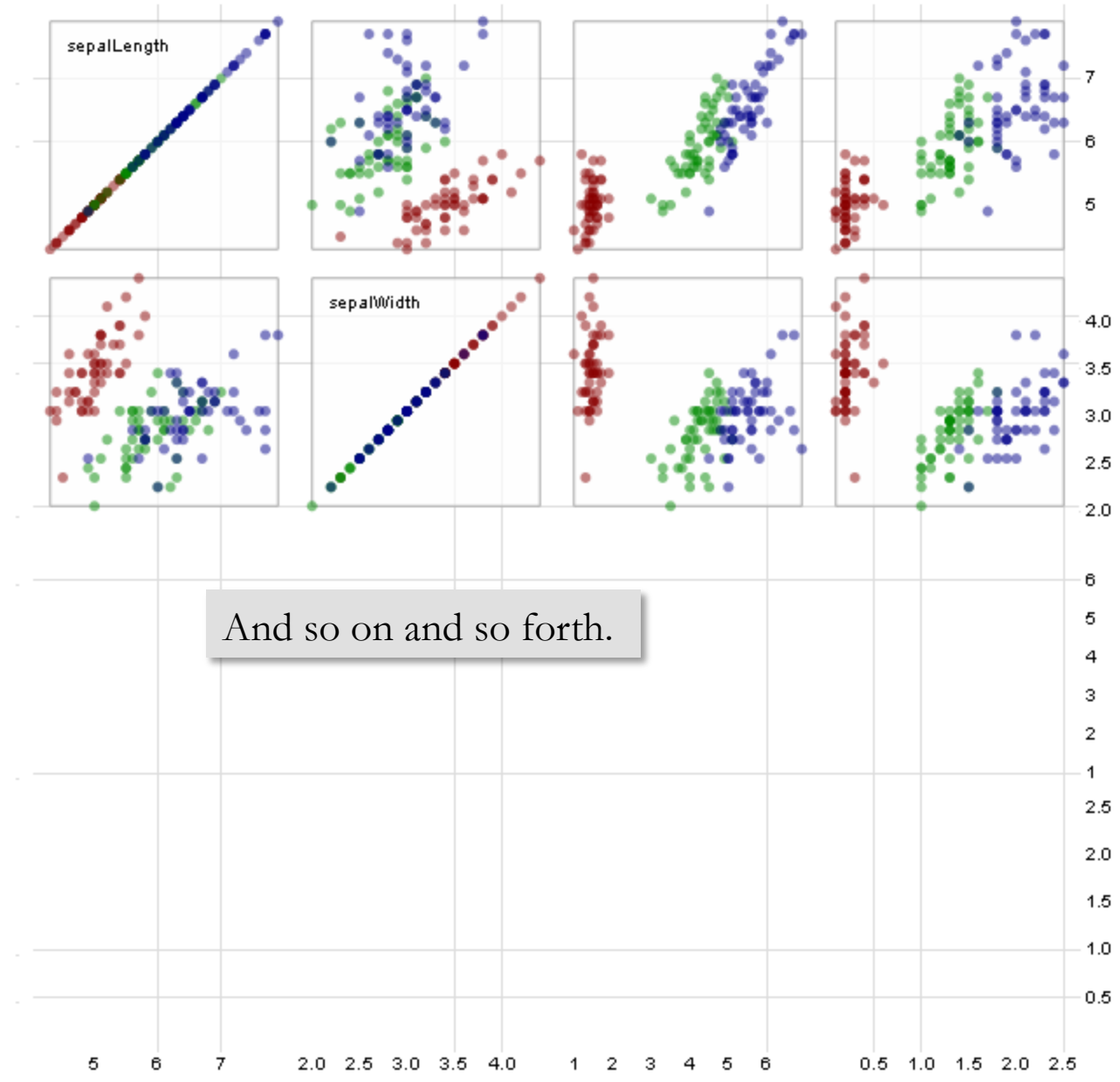

We draw background first…
7
6
5
4.0
3.5
3.0
2.5
2.0
6
5
4
3
2
1
2.5
2.0
1.5
1.0
0.5
5 6 7 2.0 2.5 3.0 3.5 4.0 1 2 3 4 5 6 0.5 1.0 1.5 2.0 2.5


sepalLength
Let's start with this guy...

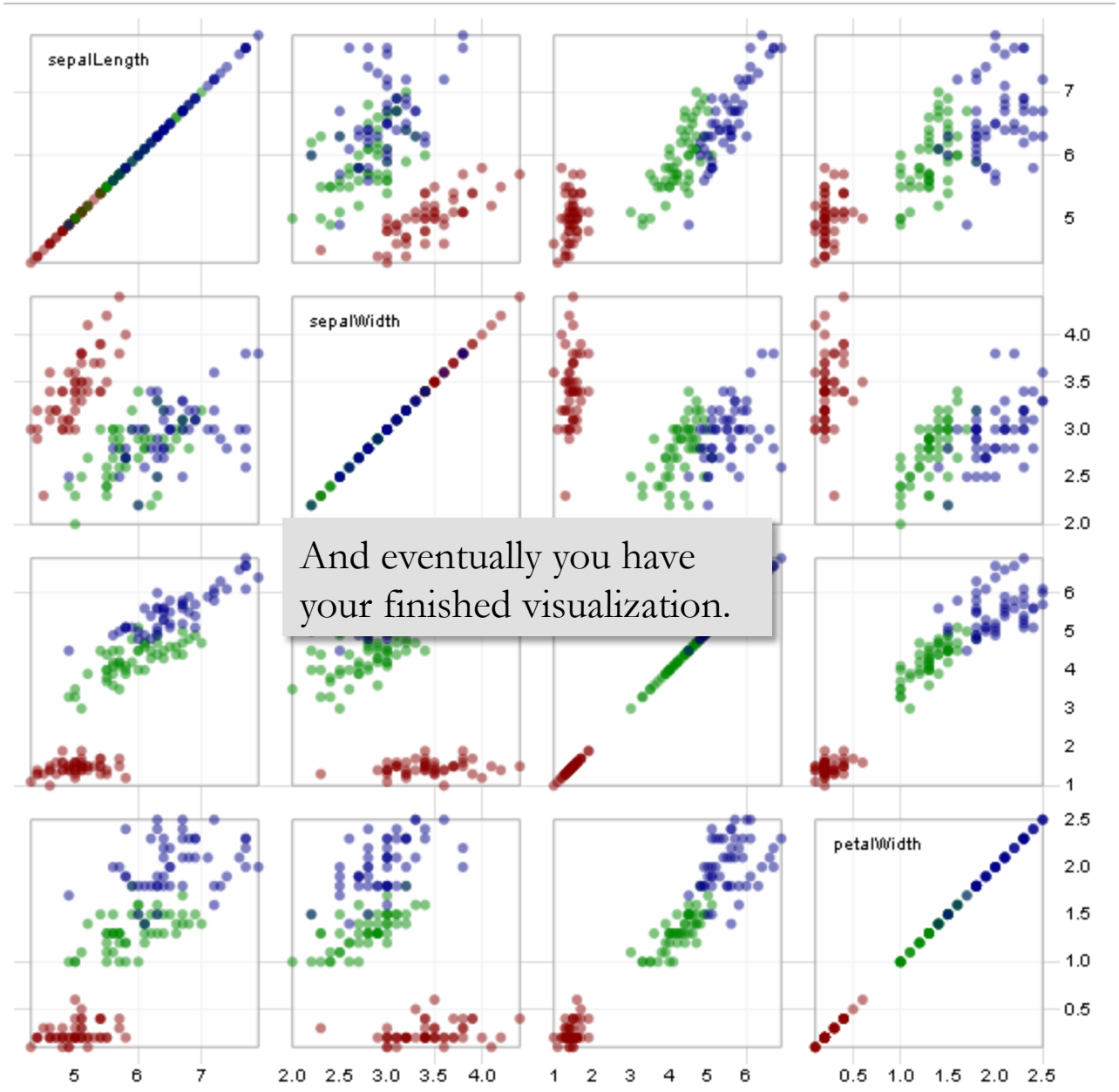

sepalLength
Now let's draw this guy...
7
6
5
4.0
3.5
3.0
2.5
2.0
6
5
4
3
2
1
2.5
2.0
1.5
1.0
0.5
5
6
7
2.0
2.5
3.0
3.5
4.0
1
2
3
4
5
6
0.5
1.0
1.5
2.0
2.5


sepalLength
And this guy...


sepalLength
And that guy.



And so on and so forth.


sepalLength
sepalWidth
petalWidth
And eventually you have your finished visualization.

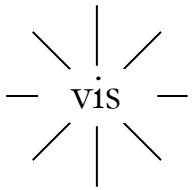
That's not how d3 works.

d3 instead looks at the *hierarchy* of elements.

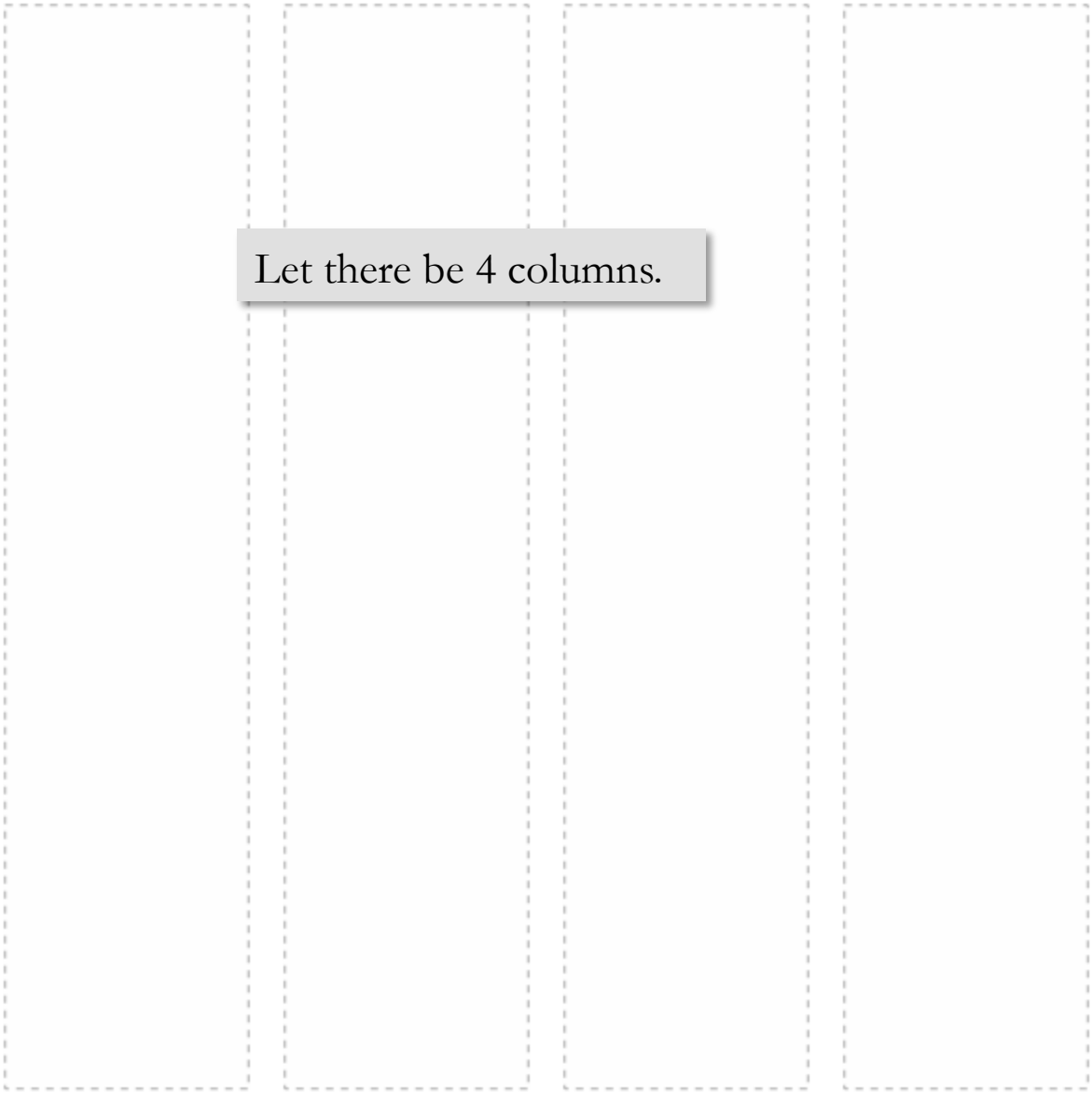
In d3, you start from your whole visualization, then you add components.

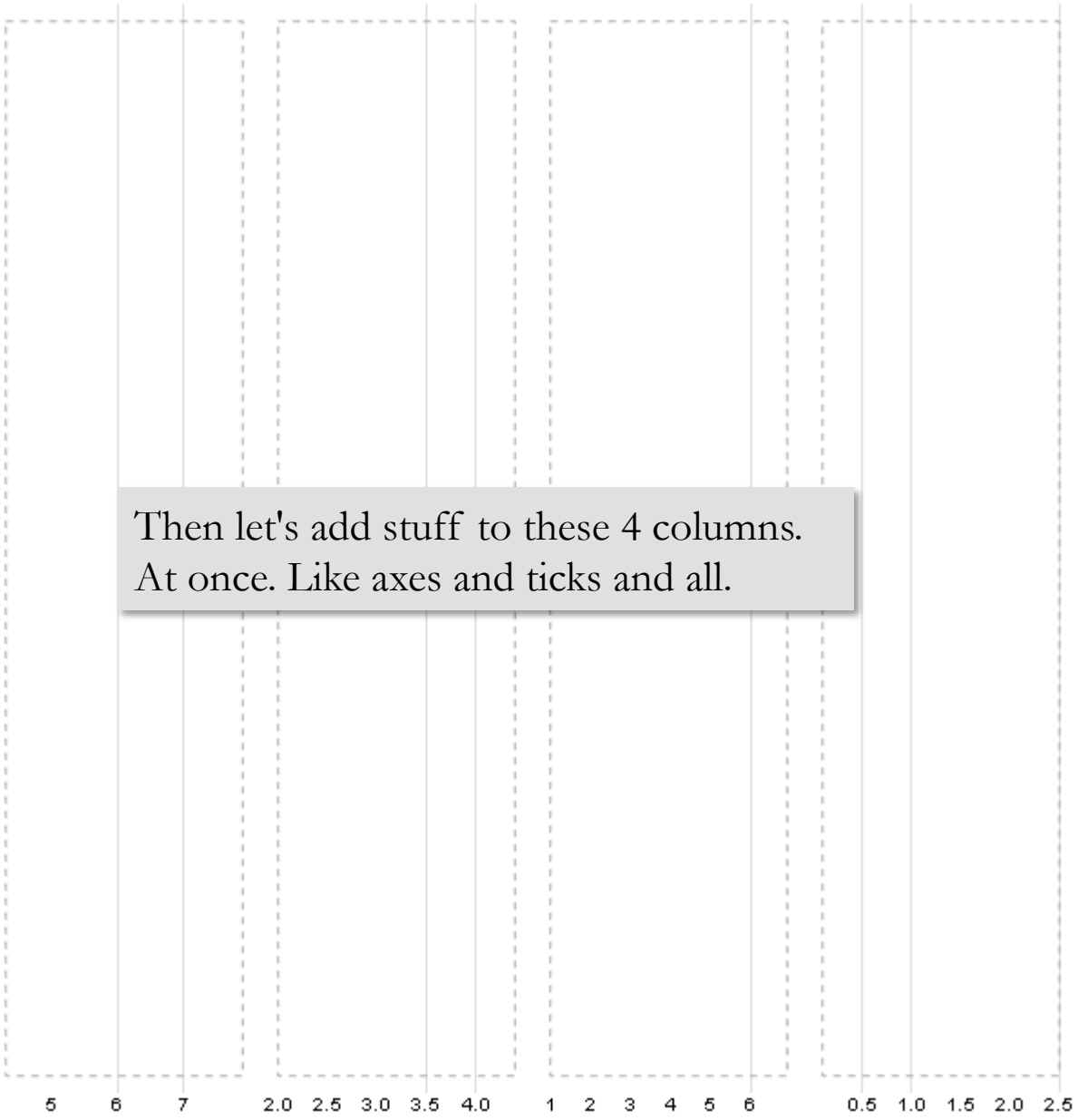
At each stage, you are considering one level of your hierarchy, you see how many children it has, and you create these children.

Let's start from the whole vis.
It's empty so far.

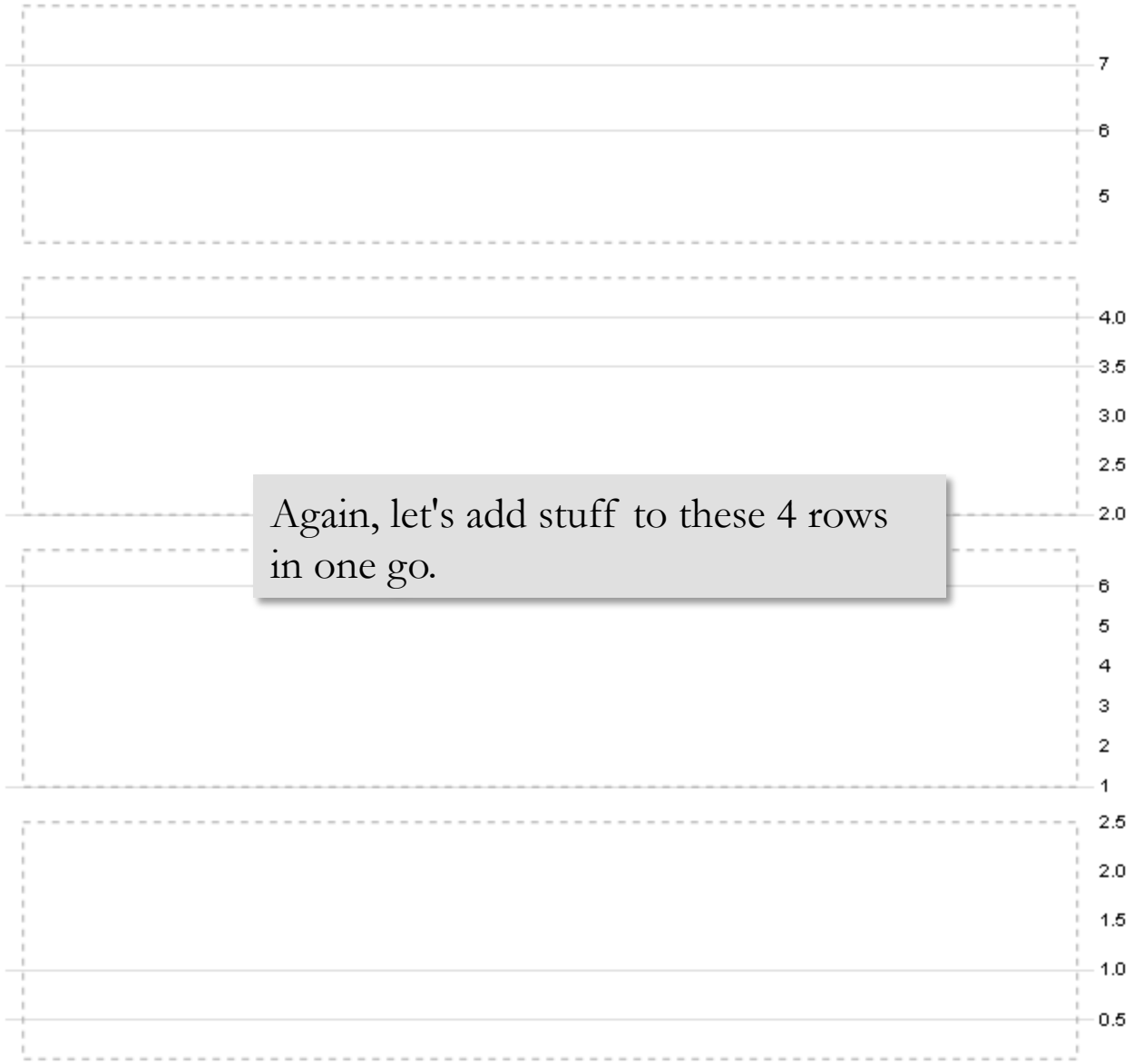


What are its children?

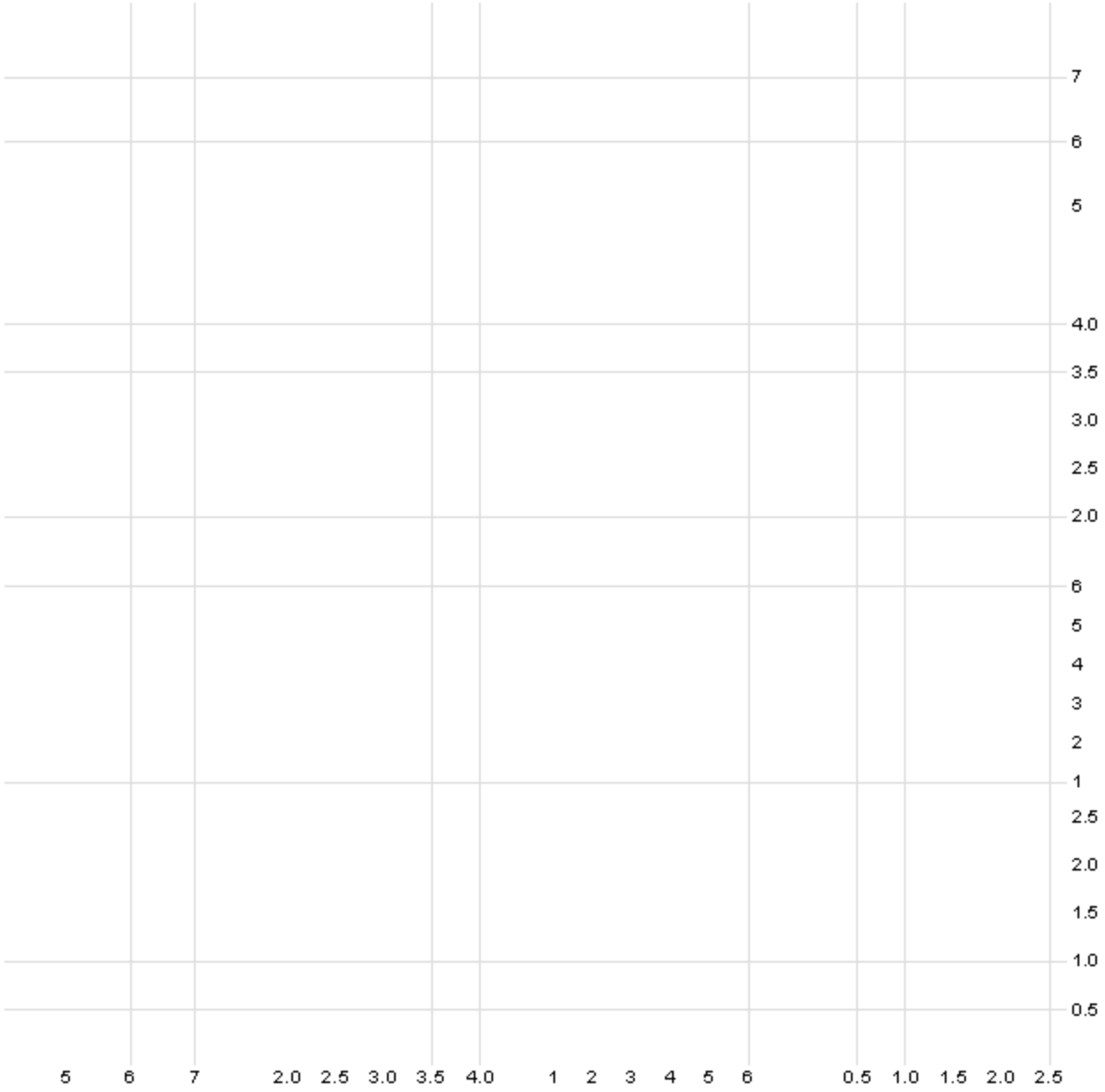

Let there be 4 columns.

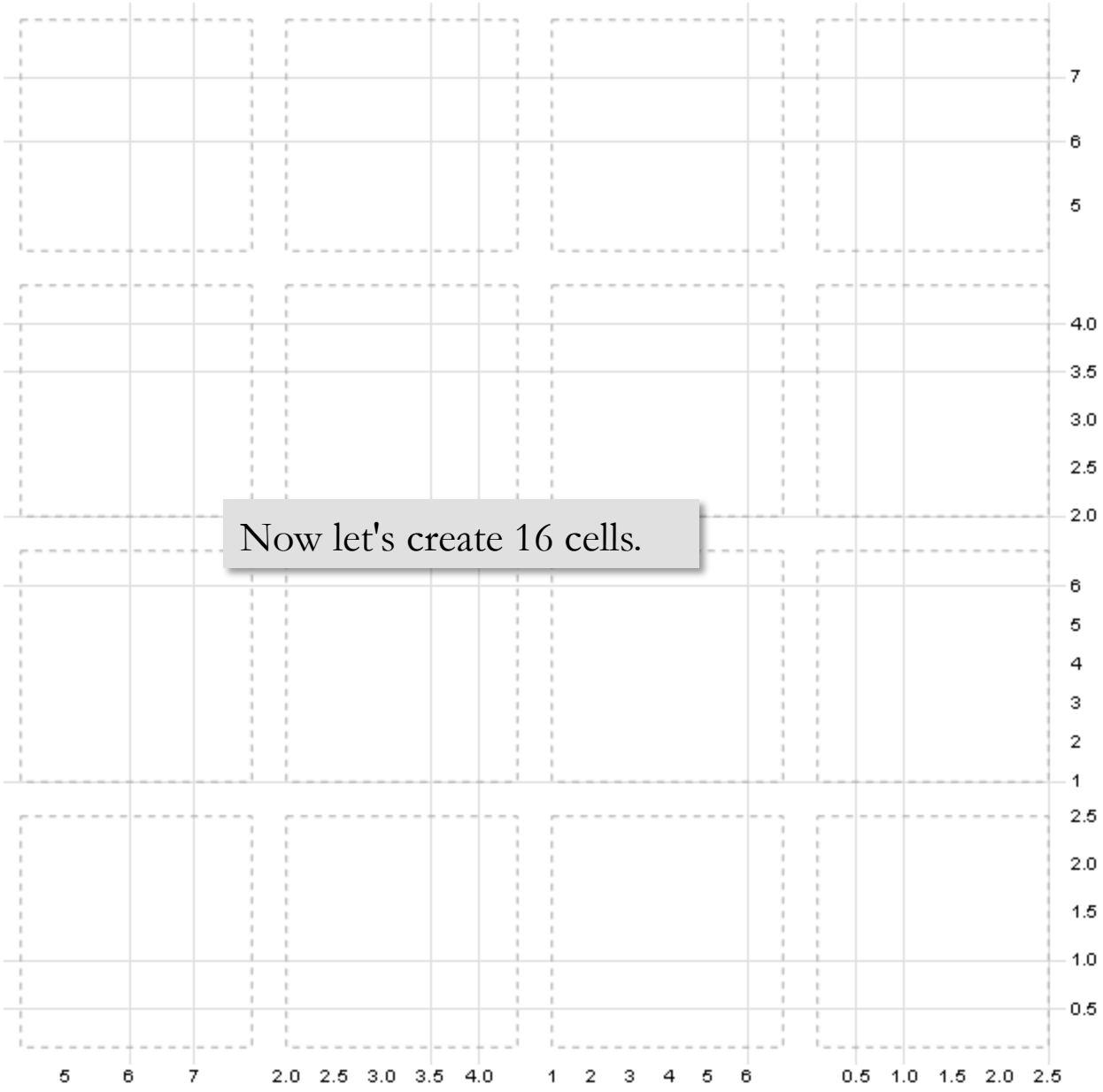

Then let's add stuff to these 4 columns.
At once. Like axes and ticks and all.
5 6 7
2.0 2.5 3.0 3.5 4.0
1 2 3 4 5 6
0.5 1.0 1.5 2.0 2.5

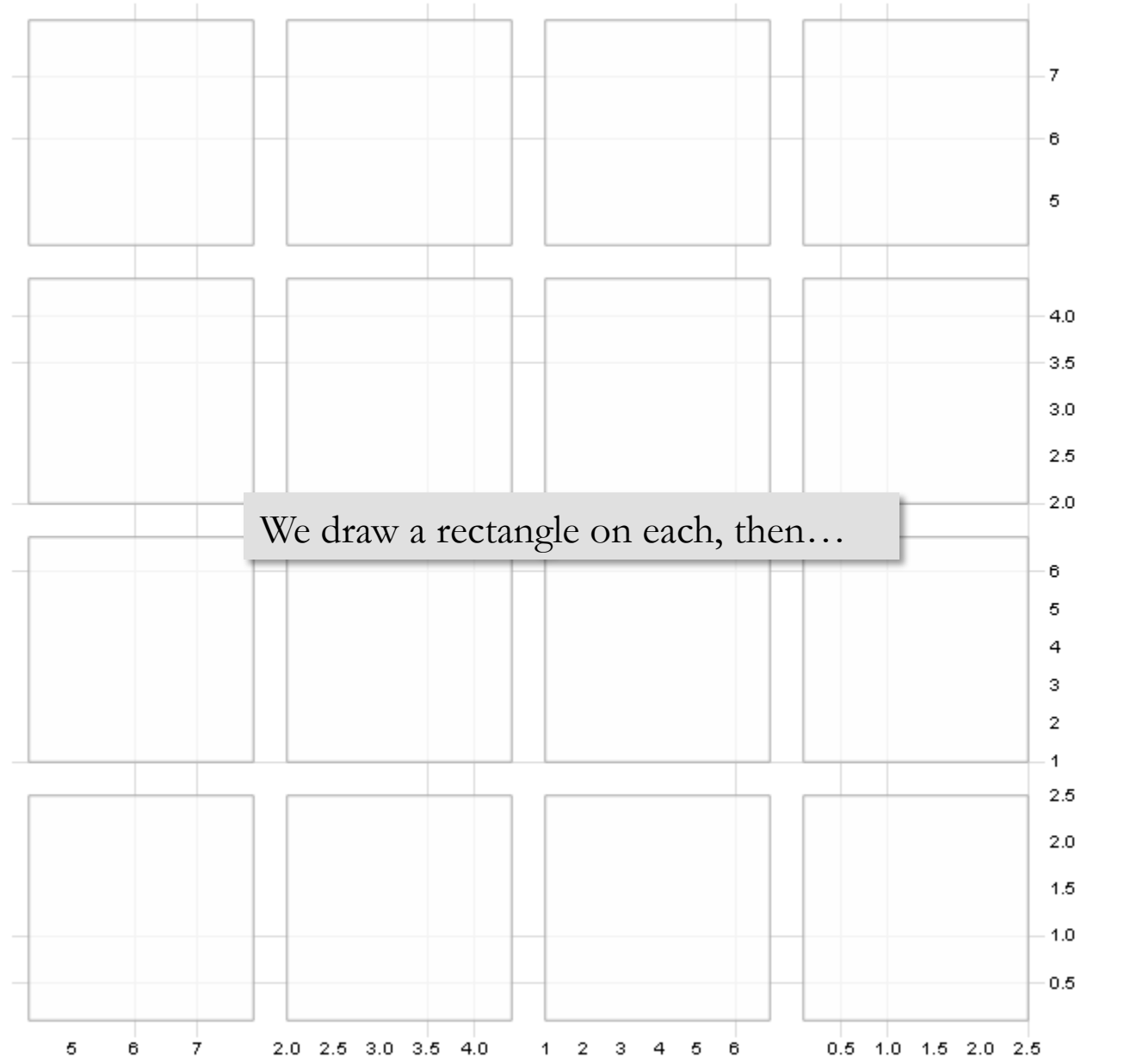
And let there be 4 rows.



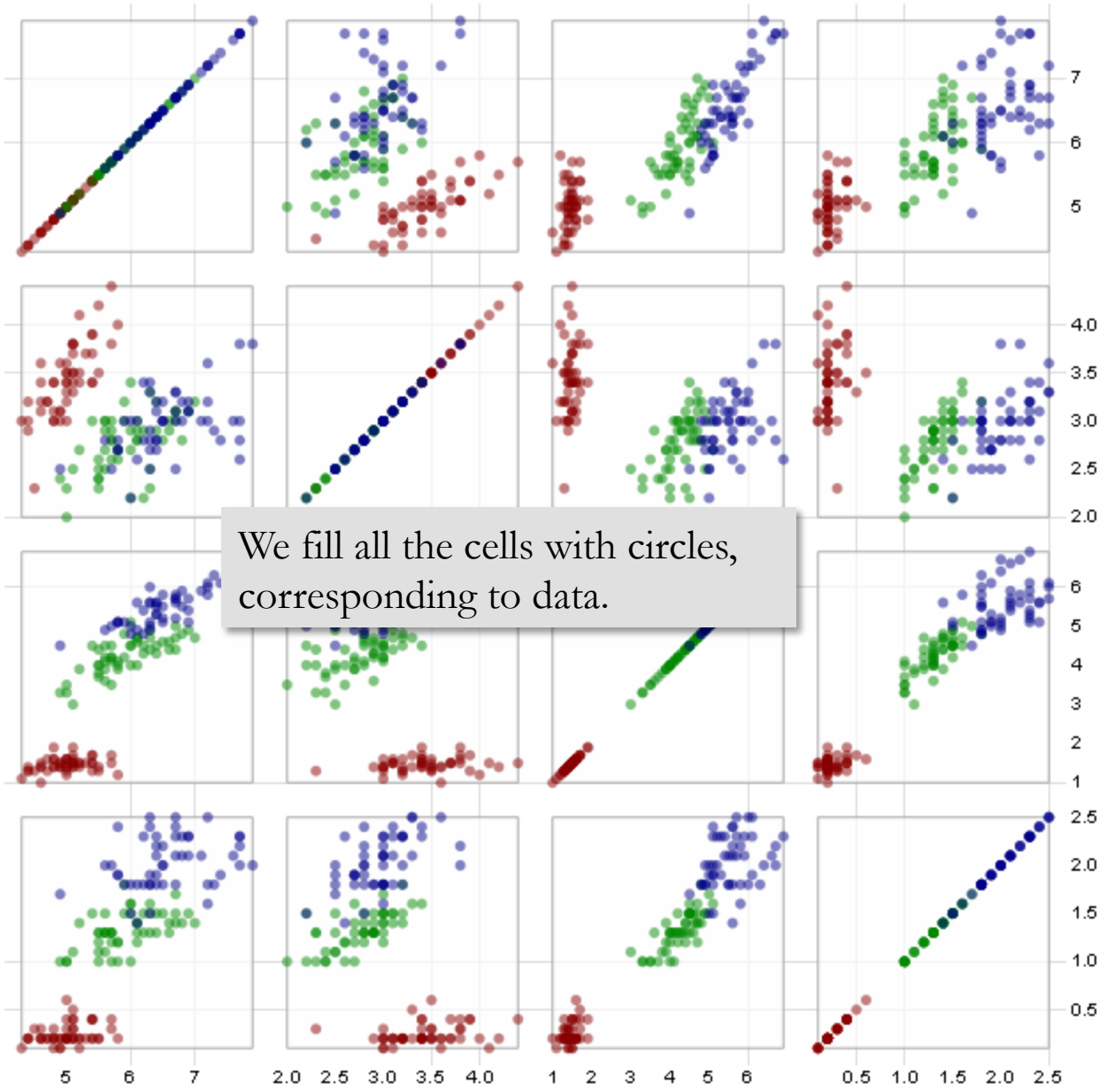
Again, let's add stuff to these 4 rows in one go.

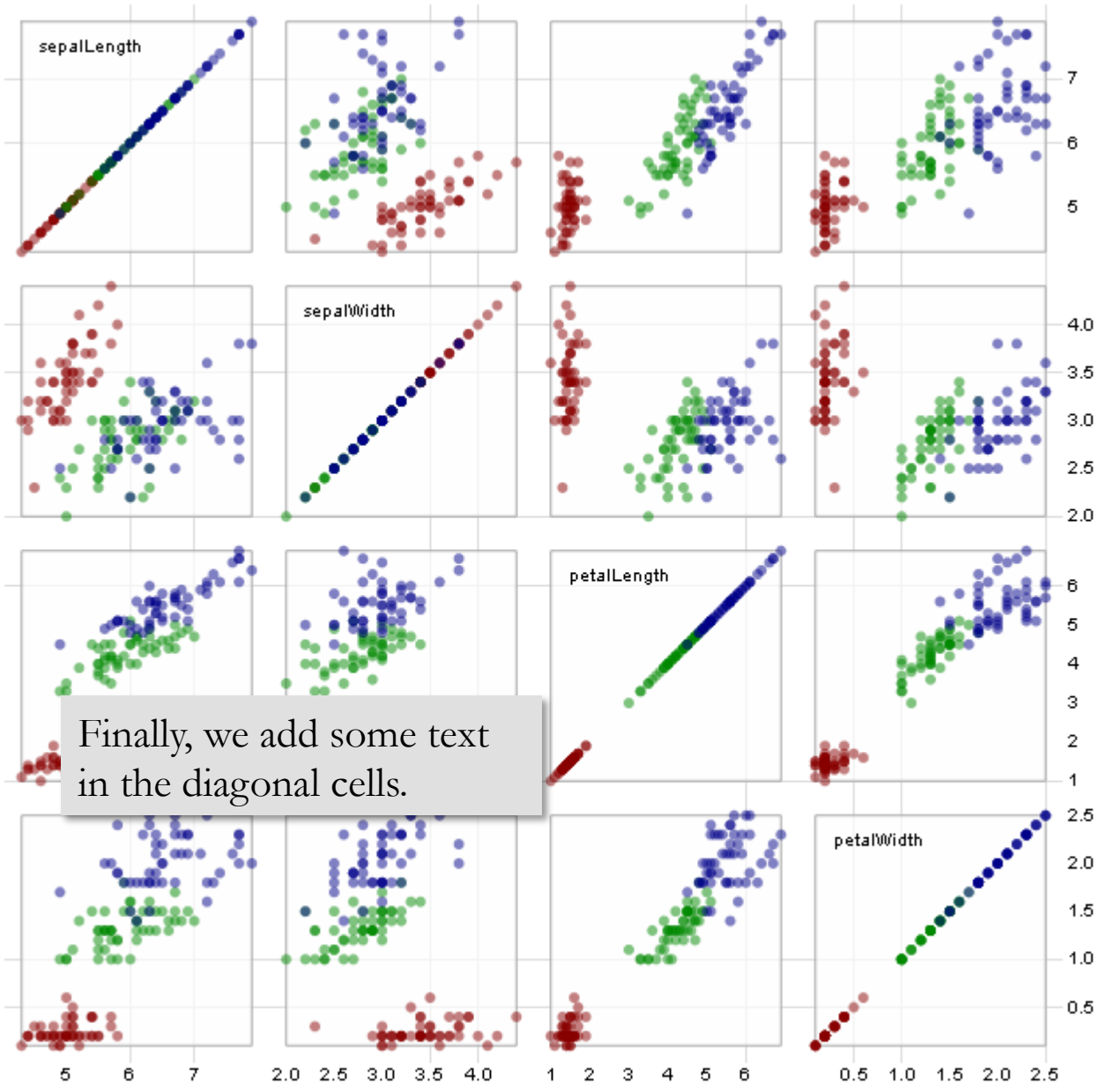

7
6
5
4.0
3.5
3.0
2.5
2.0
6
5
4
3
2
1
2.5
2.0
1.5
1.0
0.5
5 6 7 2.0 2.5 3.0 3.5 4.0 1 2 3 4 5 6 0.5 1.0 1.5 2.0 2.5


7
6
5
4.0
3.5
3.0
2.5
2.0
Now let's create 16 cells.
6
5
4
3
2
1
2.5
2.0
1.5
1.0
0.5
5 6 7
2.0 2.5 3.0 3.5 4.0
1 2 3 4 5 6
0.5 1.0 1.5 2.0 2.5



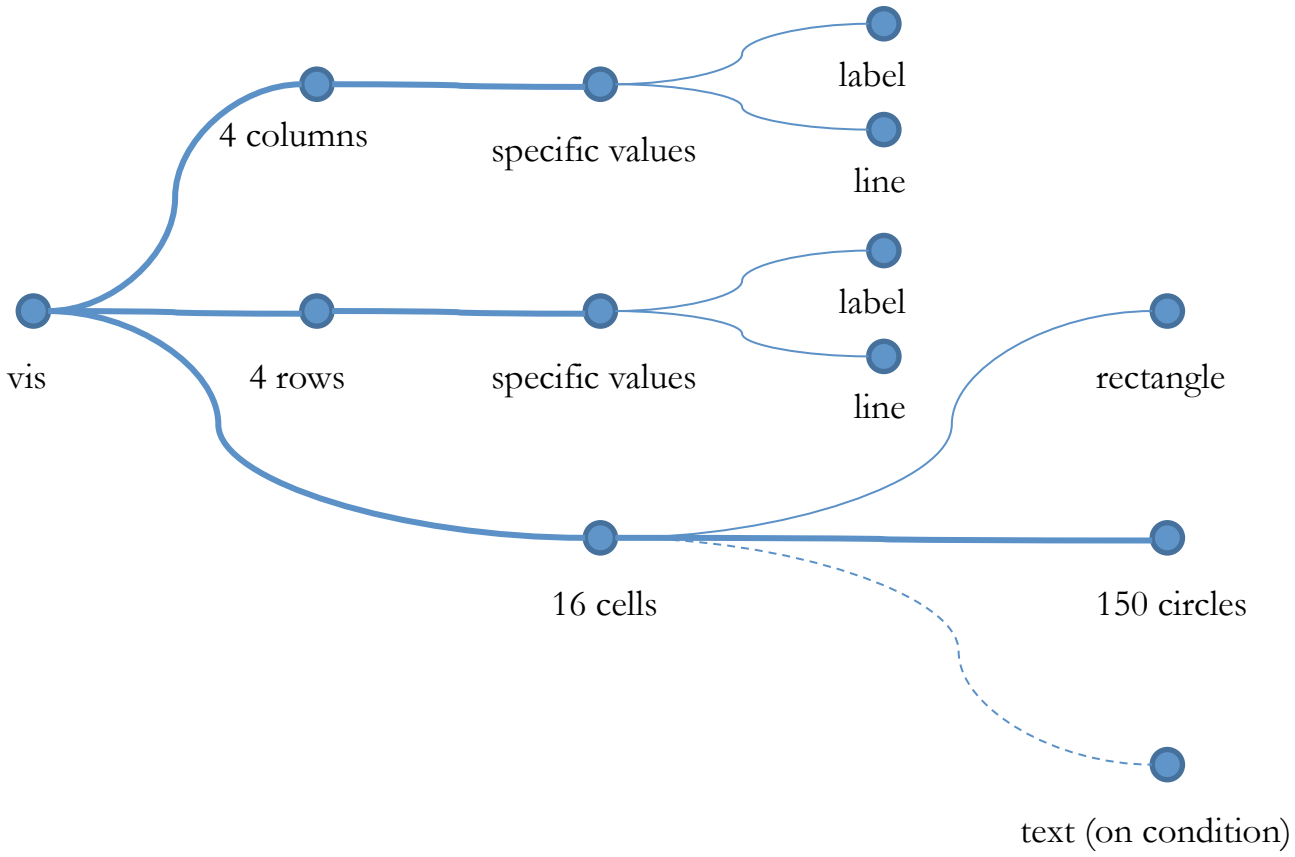
We draw a rectangle on each, then…

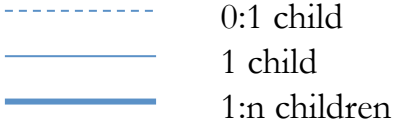

We fill all the cells with circles, corresponding to data.



Finally, we add some text in the diagonal cells.

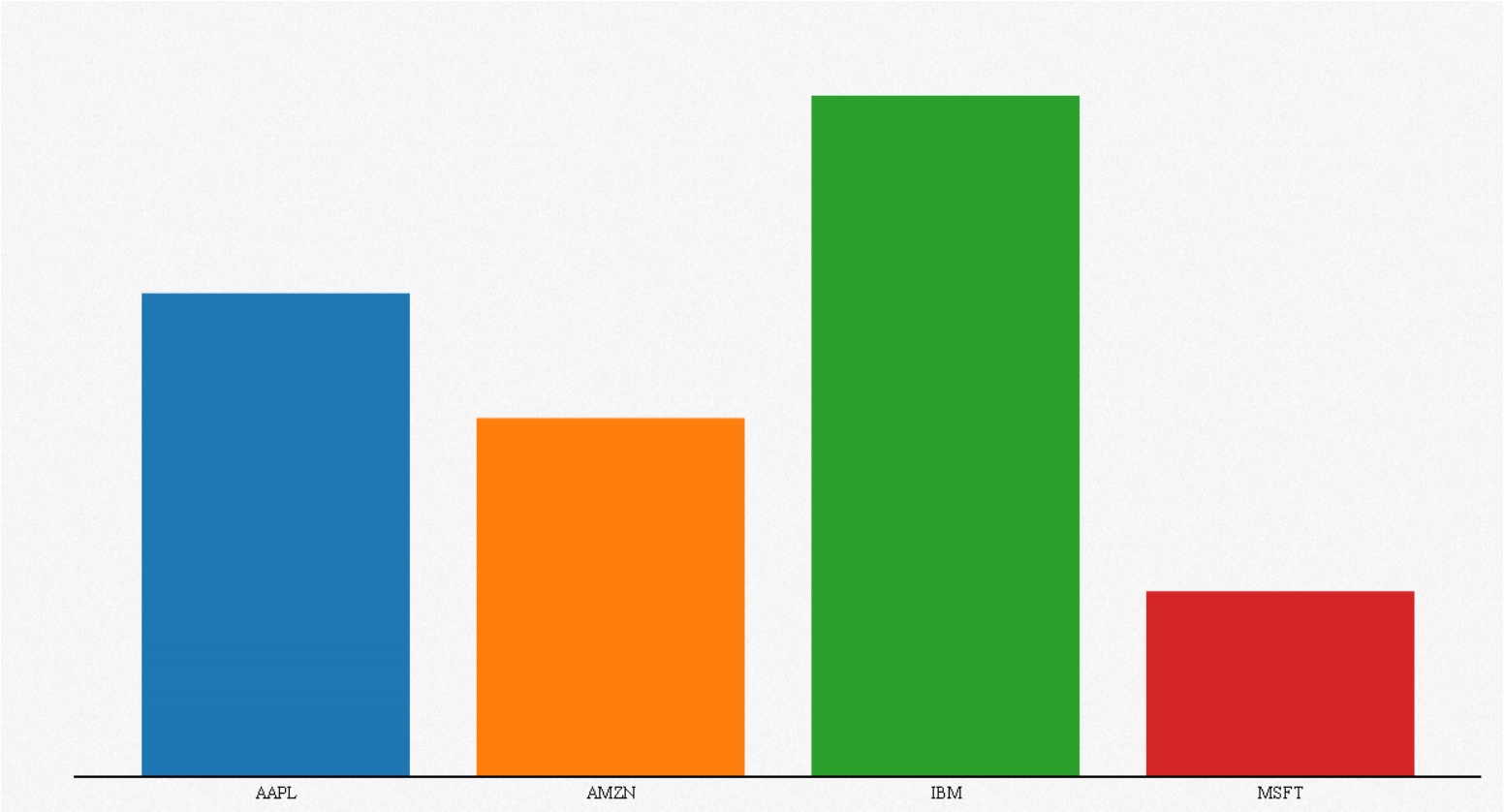
The chart hierarchy

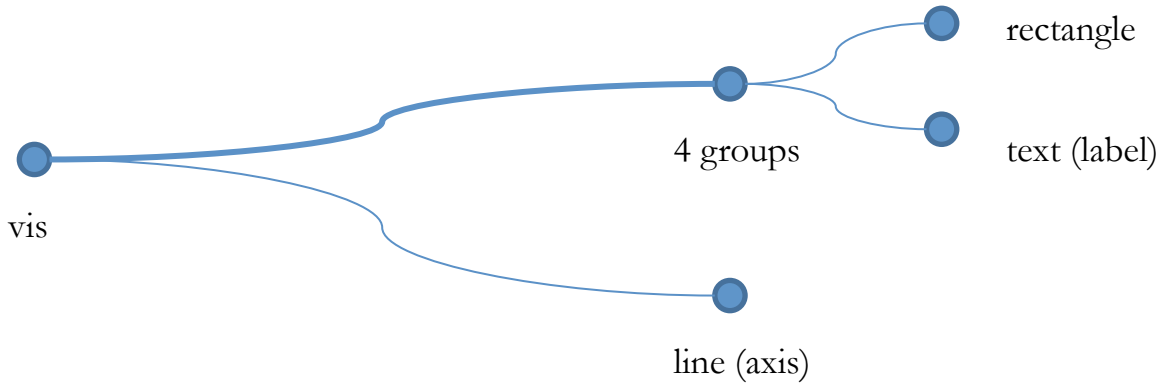


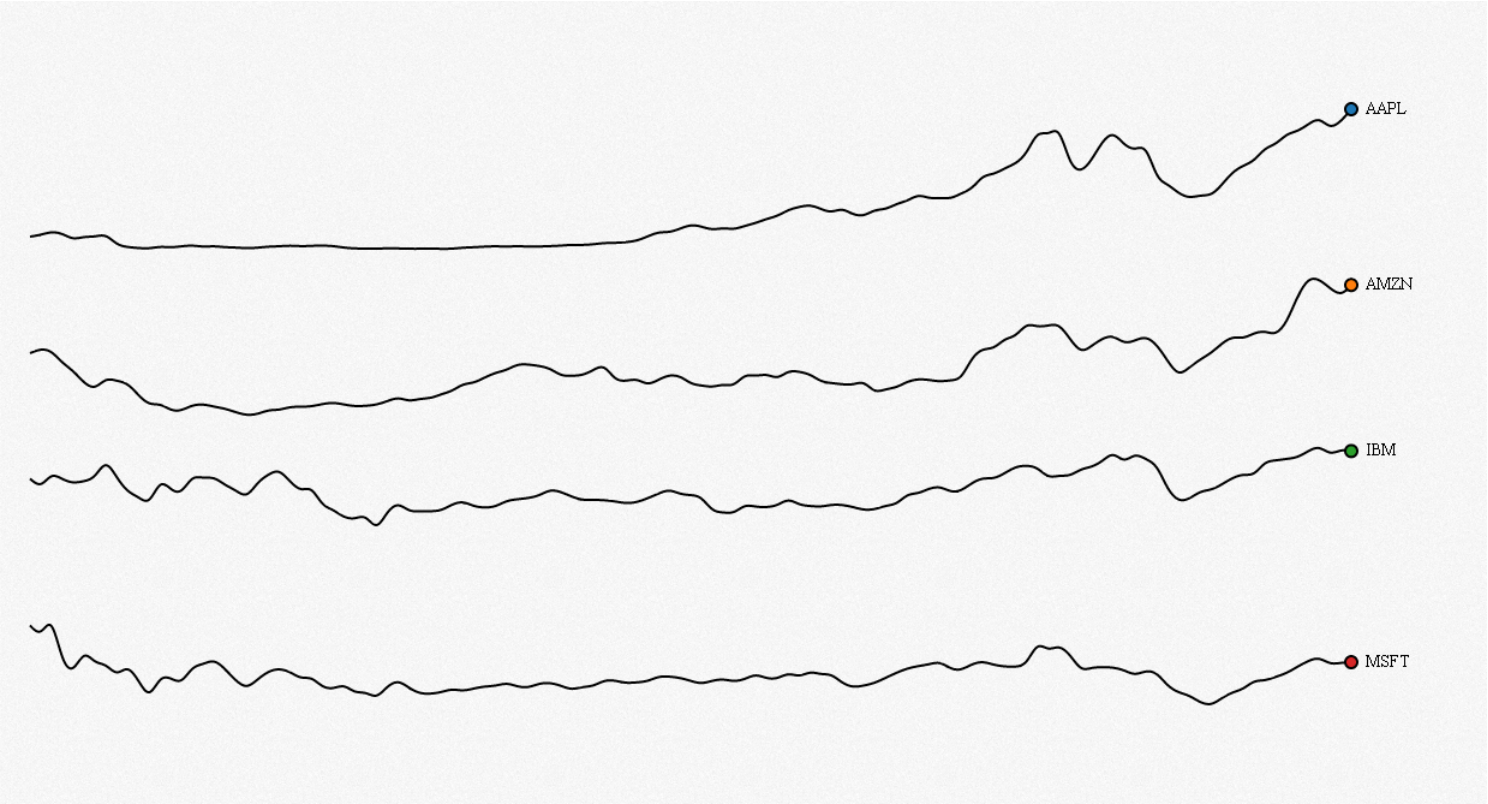


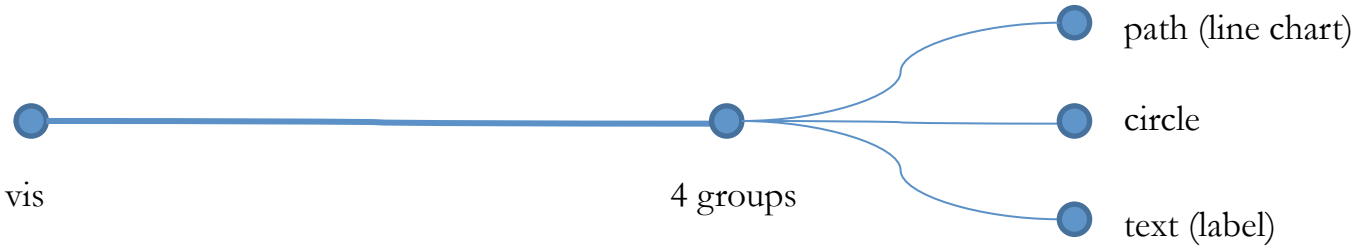
Hierarchy and charts

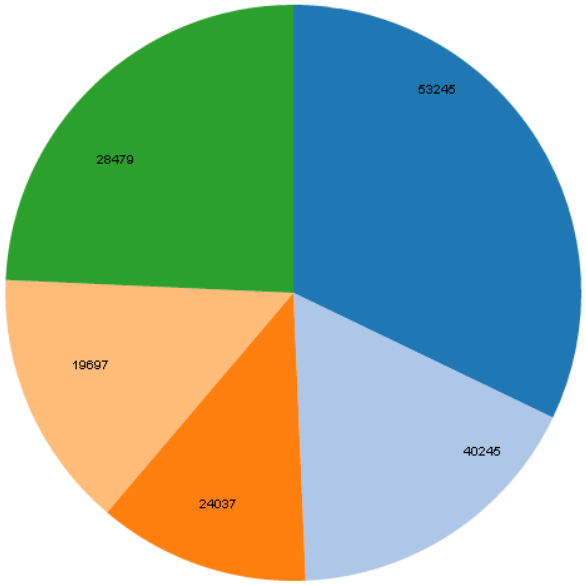
- So in d3, to create visualizations, you must first think in terms of hierarchy: what is at the top level and what comes below.
- This structure is fairly apparent for most chart types:

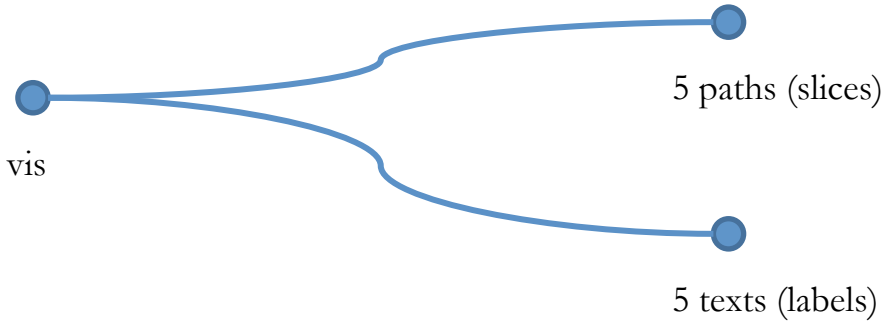

AAPL
AMZN
IBM
MSFT

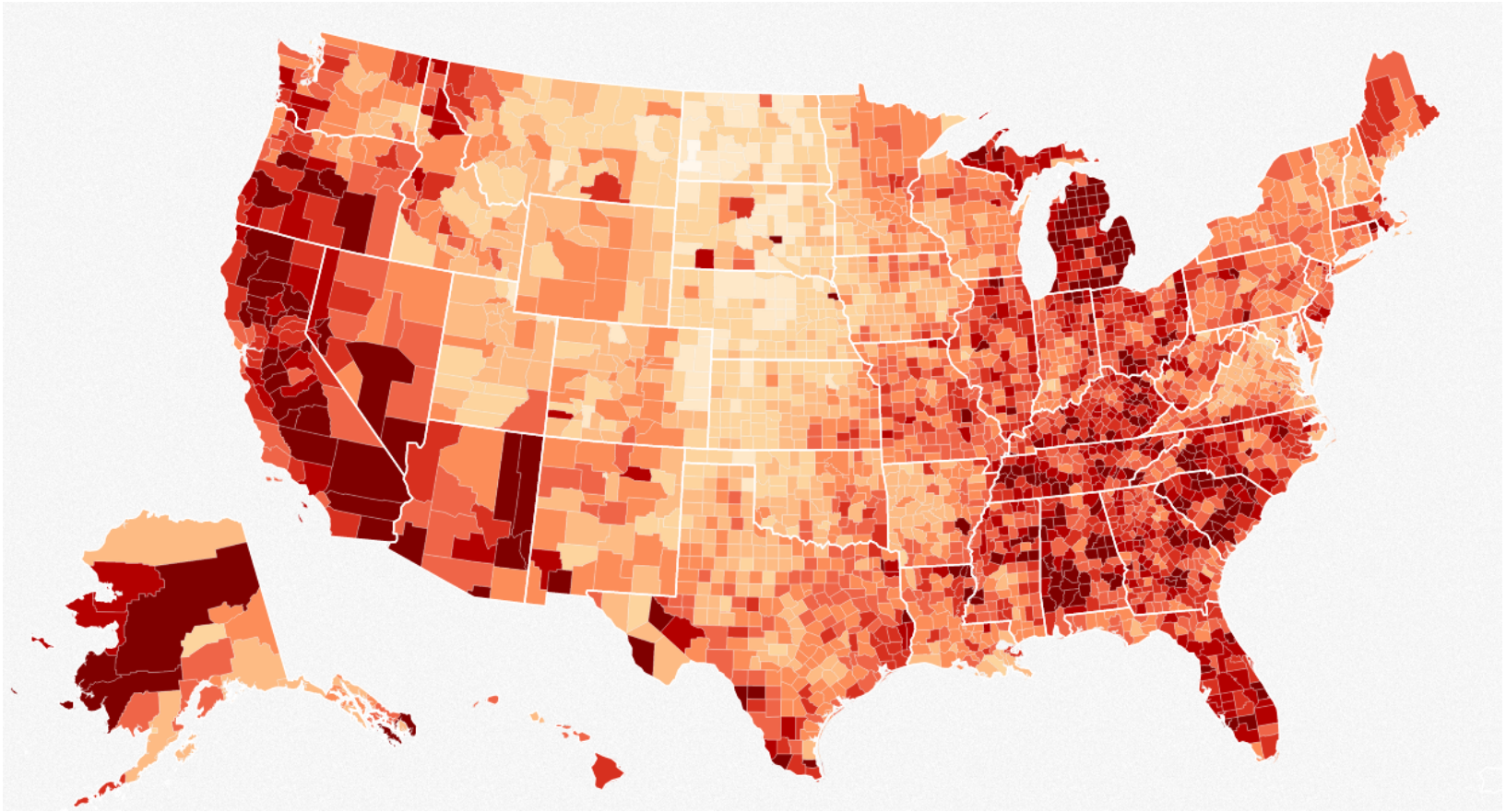

vis
4 groups
rectangle
text (label)
line (axis)

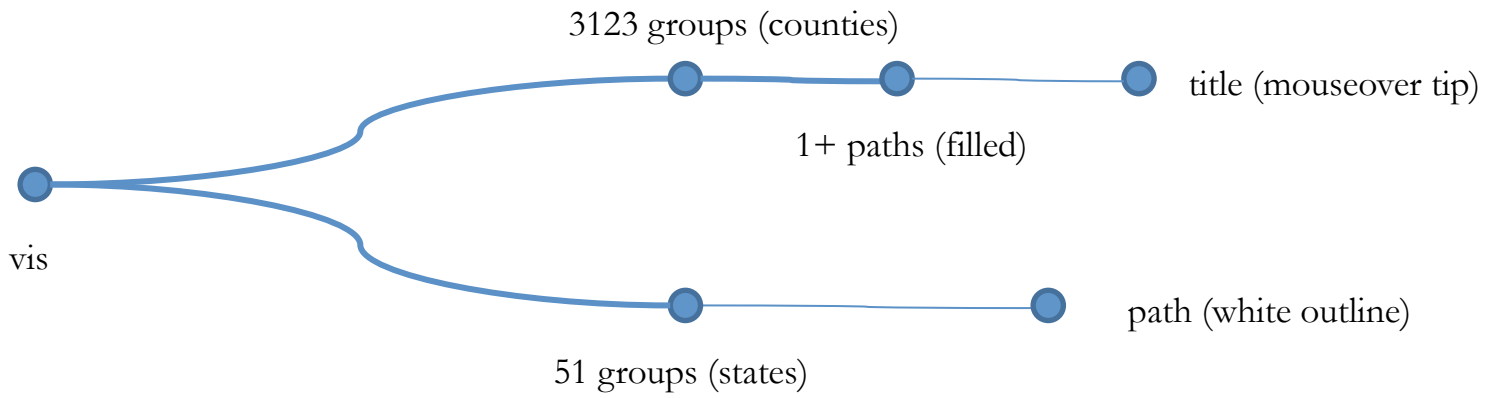

AAPL
AMZN
IBM
MSFT


path (line chart)
circle
text (label)
vis
4 groups


53245
28479
19697
40245
24037


vis
5 paths (slices)
5 texts (labels)




3123 groups (counties)
title (mouseover tip)
1+ paths (filled)
vis
path (white outline)
51 groups (states)

Hierarchy and d3

- In d3 all charts have hierarchy, starting from the top down to the finest components.
- The number of children come from the data which is associated with the component.