DLI Accelerated Data Science Teaching Kit

Lecture 9.6 - Scales and Axes

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Scales

(e.g., sizing a circle based on data value)

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```
.attr("height", function(d){ return d; })
```

can blow up really quickly…

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Scales

- D3 has many types of scales
- I am only going to cover two:
  - Linear Scales
  - Ordinal Scales

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Linear Scales

```
var xscale = d3.scale.linear( )
     .domain( [min, max] )
     .range( [minOut, maxOut] )

group.attr("x", function(d,i){
     return xscale(d.size);
})
```


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Min and Max

But how do you figure out the min and max for the domain?

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D3

A really powerful for-loop with a ton of useful helper functions

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Min and Max

- d3.min([ ]) → number
- d3.max([ ]) → number
- d3.extent([ ]) → [number,number]

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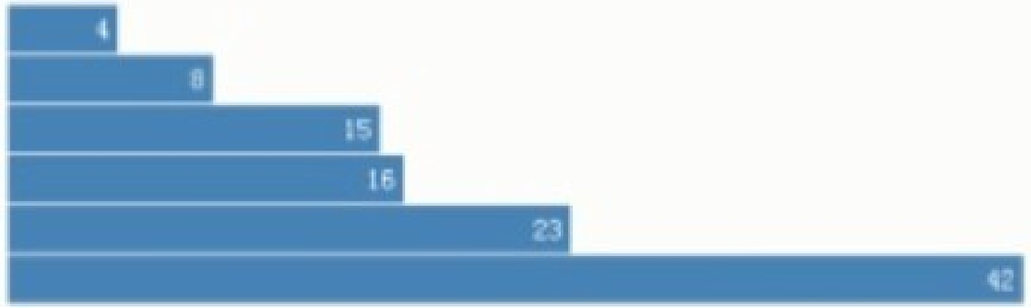
Domain & Range

D3.js – scale (Domain and Range)

```
var data = [4, 8, 15, 16, 23, 42];
```




```
var x = d3.scale.linear()
      .domain([0,d3.max(data)])
      .range([0, 420]);
```

Value range of the dataset

Value range for the visualized graph

http://image.slidesharecdn.com/d3-140708145630-phpapp02/95/d3-17-638.jpg?cb=1404831405

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An optional accessor function may be specified, which is equivalent to calling array.map(accessor) before computing the maximum value.

```
d3.max(
    data.map( function(d){ return d.age; })
) // returns the maximum age
```

https://github.com/d3/d3-3.x-api-reference/blob/master/Arrays.md

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```
var maxAge = d3.max(
   data.map( function(d){ return d.age; })
) // returns the maximum age

var yscale = d3.scale.linear( )
     .domain( [0, maxAge] )
     .range( [0, 100] )
```


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Ordinal Scales

- D3 has built-in color scales!
  - (And they're easy!)
- var colorscale = d3.scale.category10( )
- Also available are:
  - category20( )
  - category20b( )
  - category20c( )
  - (and even a few more)

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~~Ordinal~~ Categorical Scales

- D3 has built-in color scales!
  - (And they're easy!)
- var colorscale = d3.scale.category10( )
- Also available are:
  - category20( )
  - category20b( )
  - category20c( )
  - (and even a few more)

Think carefully before using a rainbow palette for ordinal data!

http://www.mathworks.com/tagteam/81137_92238v00_RainbowColorMap_57312.pdf

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~~Ordinal~~ Categorical Scales

- `[ {type:'Bird'},{type:'Rodent'},{type:'Bird'} ]`
- `var colorscale = d3.scale.category10( )`
- ```
  .attr("fill",function(d,i){
      return colorscale(d.type)
   }
  ```

- `<rect fill="blue"></rect>`
- `<rect fill="orange"></rect>`
- `<rect fill="blue"></rect>`

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  ```

D3 also has visual helper-functions

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Axes

```
yaxisglyph = vis.append("g")

yaxis = d3.svg.axis( )
    .scale( yscale )  // must be a numerical scale
    .orient( 'left' ) // or 'right', 'top', or 'bottom'
    .ticks( 6 )       // number of ticks, default is 10
yaxisglyph.call(yaxis)
```


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Thank You

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