VISUALIZATION ON THE WEB

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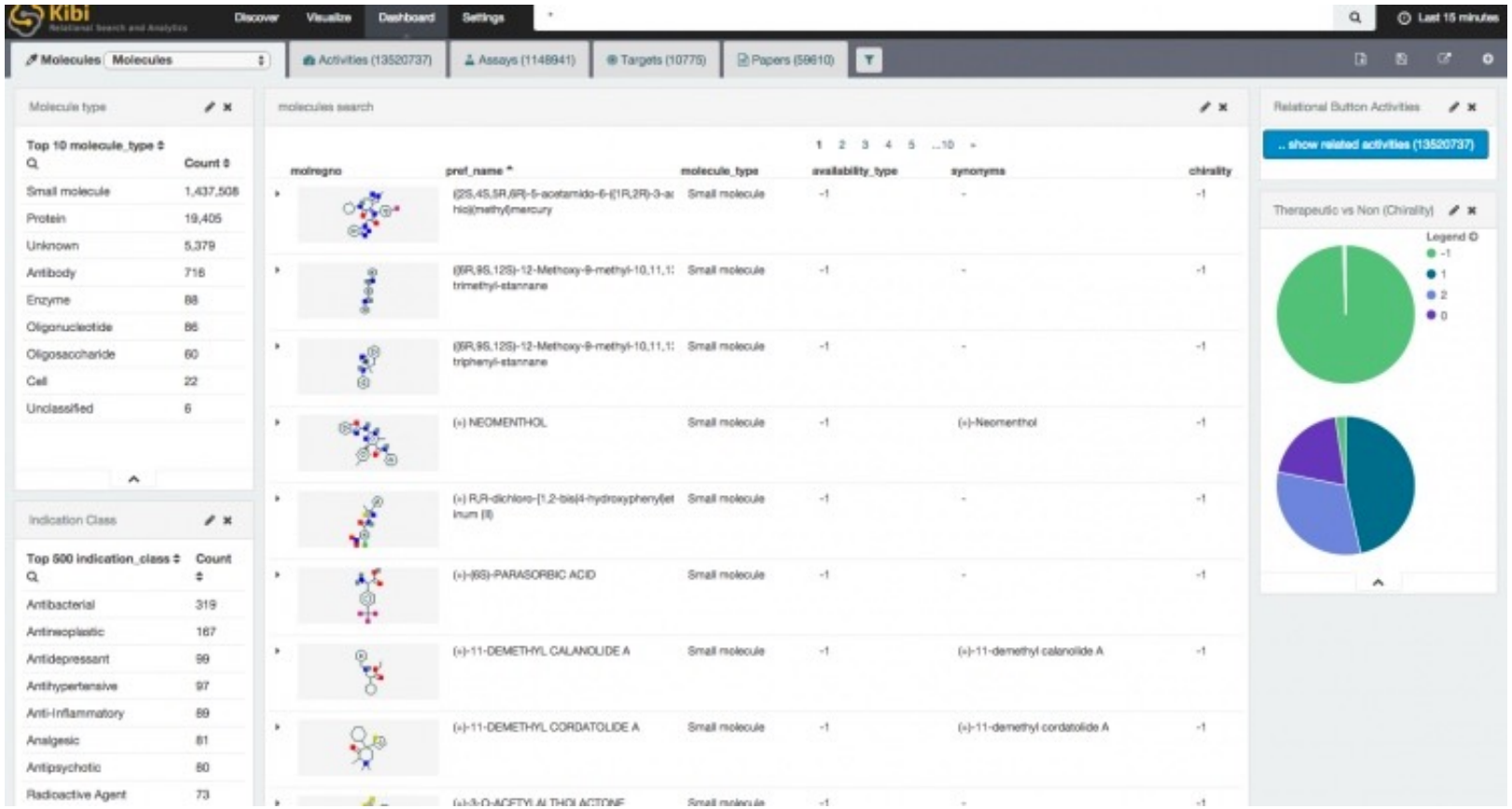
KIBANA GA

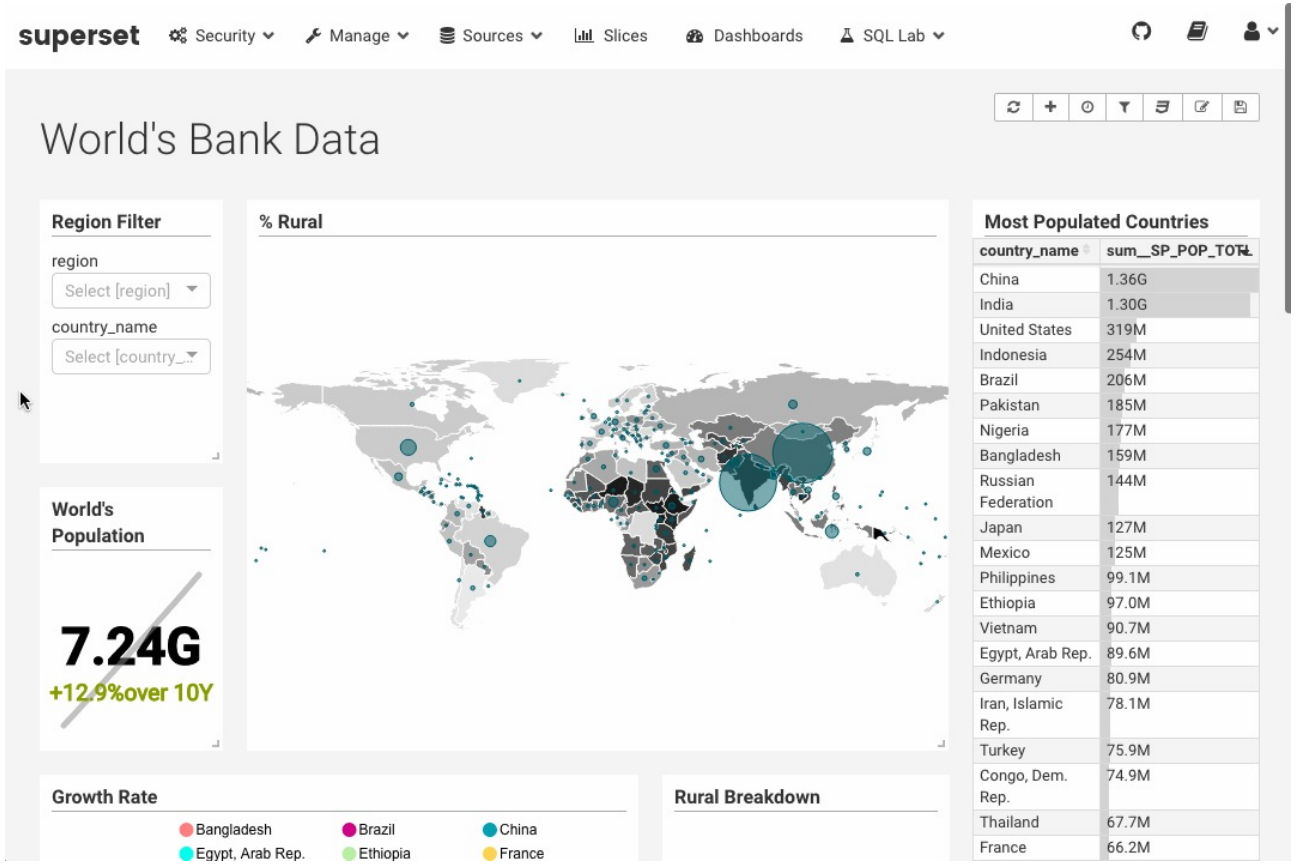

Logstash Search
2 days ago to 3 minutes ago
bytes:[0 TO 4000000] AND @tags:success
EVENTS OVER TIME
MAP
REVENUE
22%
VOLUME
9%
TOP DESTINATIONS
TOP SOURCES
GEO PAIRS
ALL EVENTS
0 to 100 of 500 available for paging

KIBI



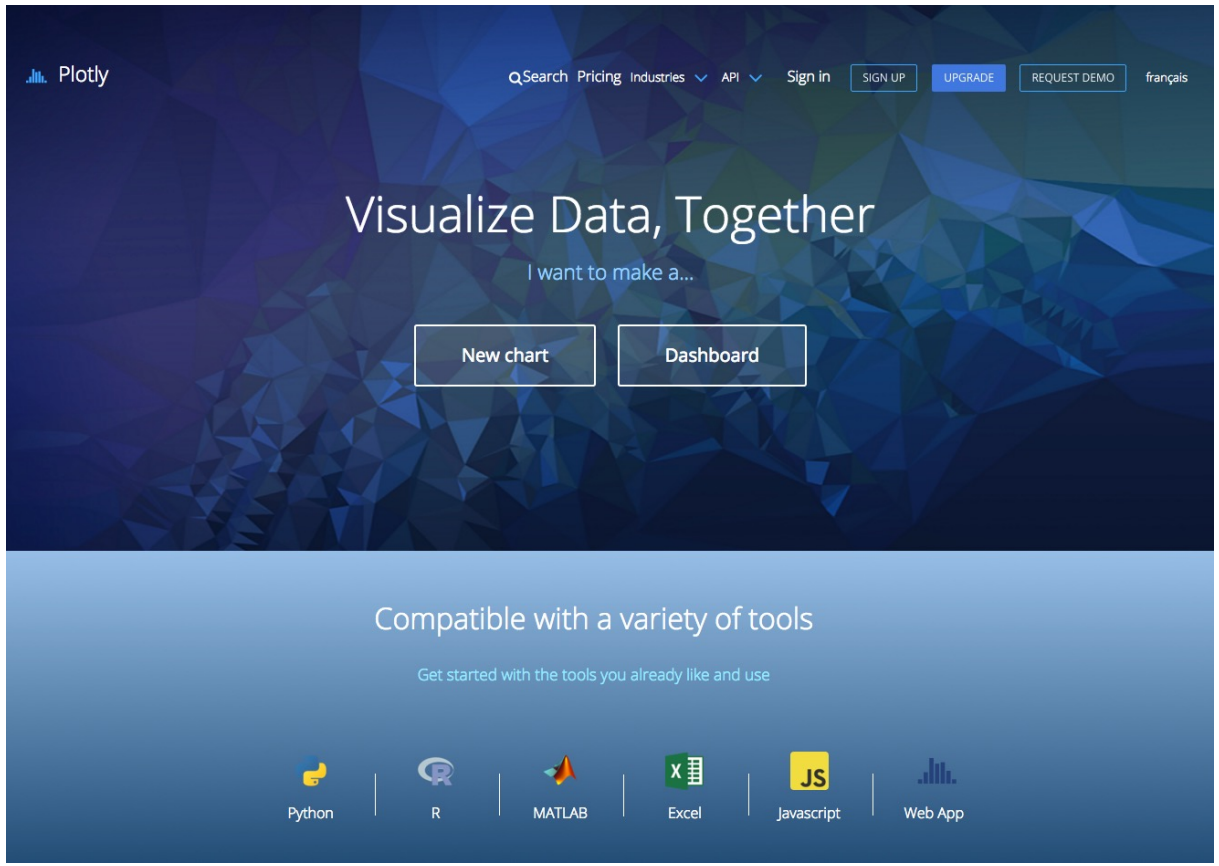
https://sirensolutions/kibi/

Superset

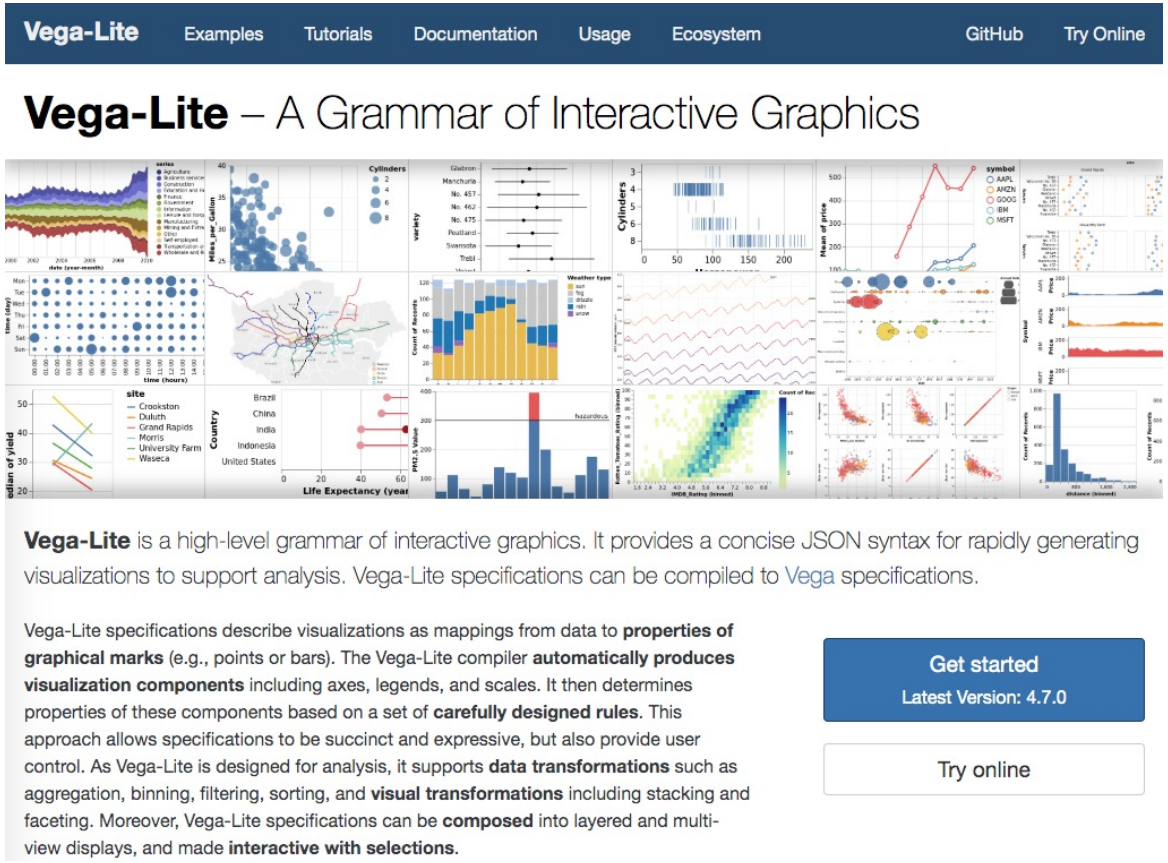


https://github.com/airbnb/superset

PLOT.LY


Plotly
Search Pricing Industries API Sign in SIGN UP UPGRADE REQUEST DEMO français
Visualize Data, Together
I want to make a...
New chart
Dashboard
Compatible with a variety of tools
Get started with the tools you already like and use
Python
R
MATLAB
Excel
Javascript
Web App

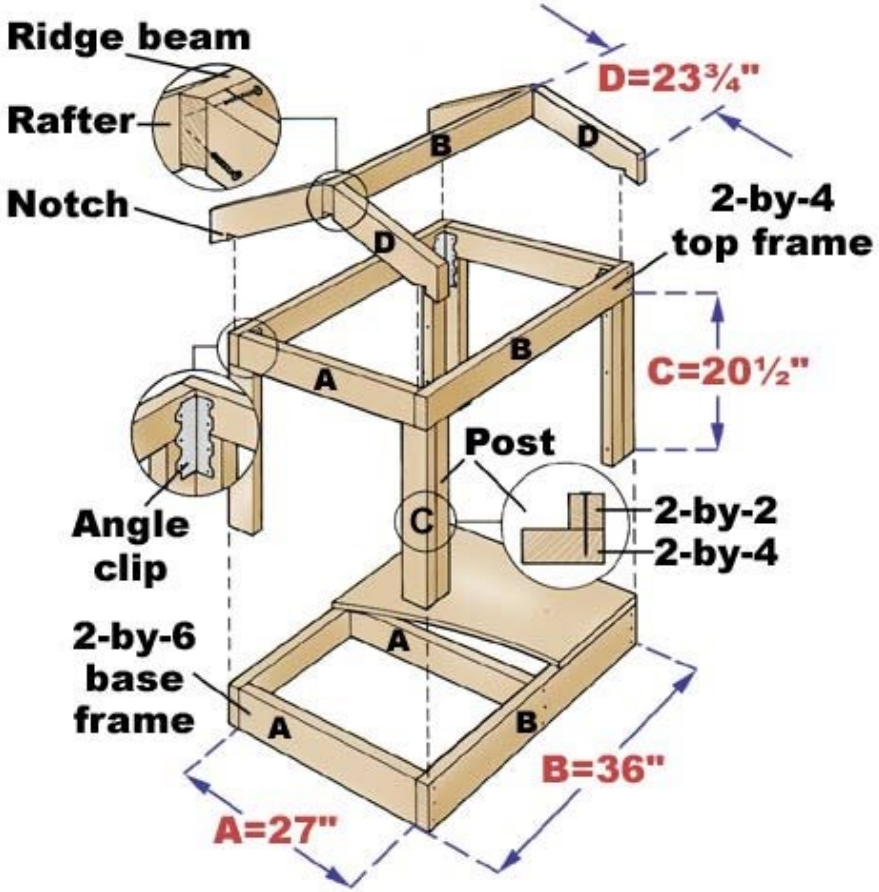
VEGA AND VEGA-LITE



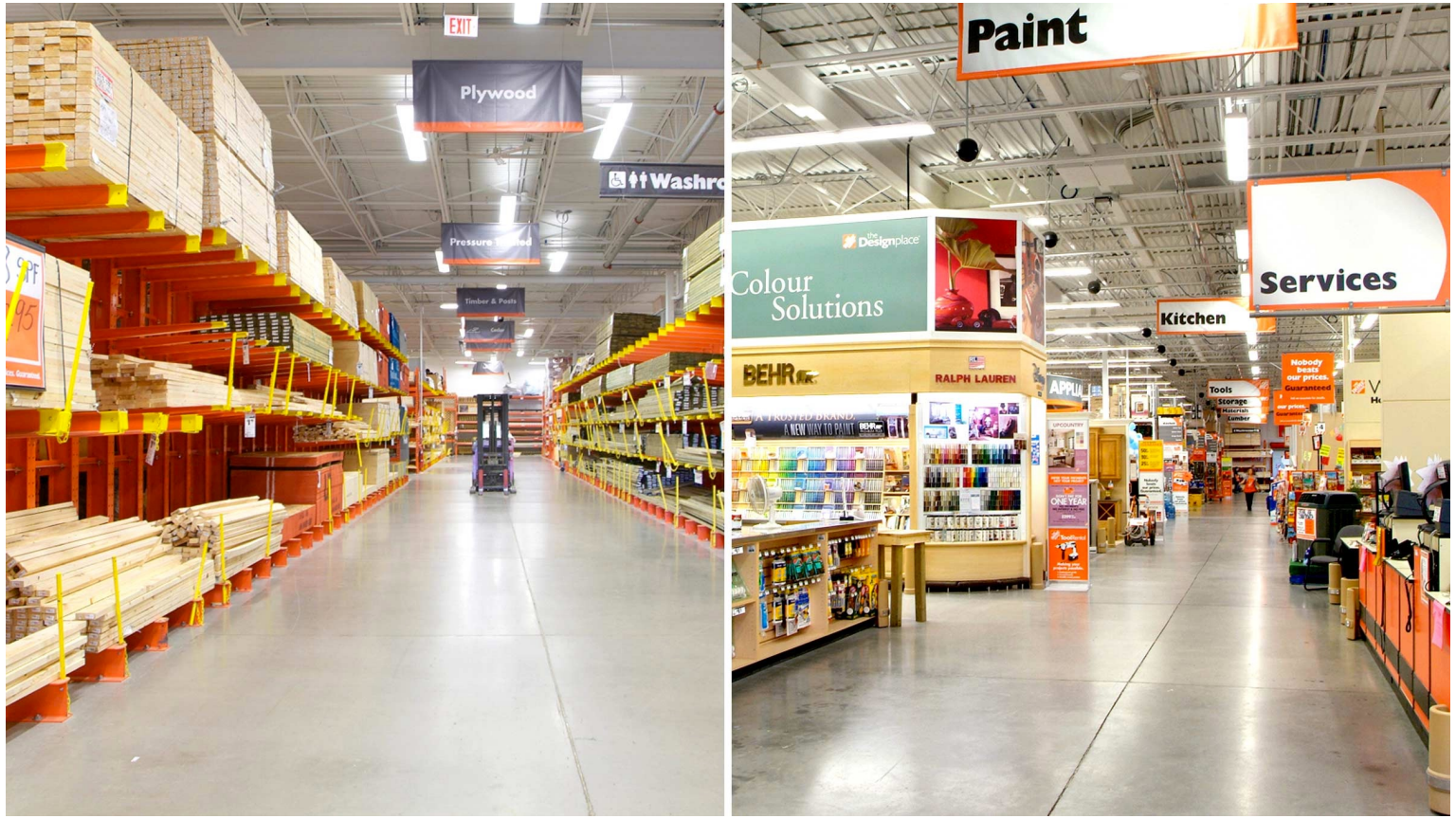
Data-Driven Documents

VISUAL ANALYTICS
D3.JS

WHAT IS D3?

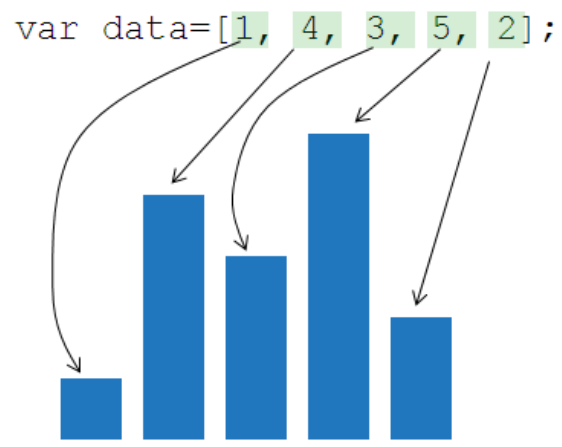

Ridge beam
Rafter
Notch
D=23¾"
2-by-4
top frame
C=20½"
Post
2-by-2
2-by-4
Angle
clip
2-by-6
base
frame
B=36"
A=27"
A
B
C
D

WHAT IS D3?


EXIT
Plywood
Paint
Colour Solutions
Services
Kitchen
BEHR
RALPH LAUREN

WHAT IS D3?

- JavaScript library to make beautiful, interactive, browser-based data visualizations.
- D3 stands for **D**ata **D**riven **D**ocuments
- D3.js is a low level visualization library based on Web standards (HTML, CSS, JS, SVG)
- D3.js is Open Source library written by Mike Bostok
- Mike Bostock Github Profile
- d3js.org

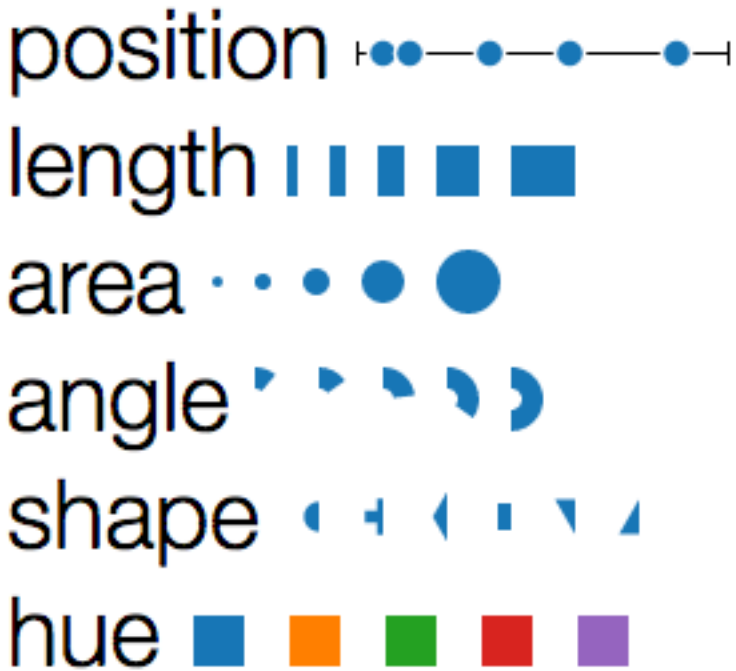


VISUALIZATION AND DATA GRAPHICS

Data Types

- Categorical
- Ordinal
- Quantitative

Visual Variables



VISUAL VARIABLES -> DOCUMENTS

- Datum -> Element
  - Associate a graphical mark to each data point
- Data Attribute -> Element Attribute
  - Adjust properties of mark to encode properties of datum

GETTING STARTED

SELECTIONS

CSS SELECTORS

- CSS provides an efficient way to refer to specific elements in a DOM

- `#foo // <any id="foo">`
- `foo  // <foo>…</foo>`
- `.foo // <any class="foo">`
- `[foo=bar] // <any foo="bar">`
- `foo bar //<foo><bar/></foo>`

SELECTOR FUNCTIONS

W3C

- `document.querySelectorAll("h1")`

D3.js / JQuery

- `d3.selectAll("h1")`

Selections are Arrays.
Explore selections with Developer Tools

attr AND style METHODS

```
// select all <h1> elements
var H1s = d3.selectAll("H1");

H1s.attr("class","newClass");
H1s.style("fill","yellow");
H1s.style("font-color","black");
```

CHAINING METHODS

```
d3.selectAll("H1")
      .attr("class","newClass")
      .style("fill","yellow")
      .style("font-color","black");
```

APPEND NEW ELEMENTS

```
var body = d3.select("body");

var h1 = body.append("h1");
h1.text("Hello!");
```

MODIFY EXISTING ELEMENTS

```
var section = d3.selectAll("section");

var h1 = section.append("h1");
h1.text("Hello!");
```

EXERCISE #1

- Create the ladder design of the previous lesson, using only D3.js manipulation of DOM

```
<!DOCTYPE html>
<html>
<head>
  <meta charset="utf-8">
  <title>Stairs example - Multiple implementation</title>
  <style>
    svg{
      background:#fff;
    }

    svg circle{
      fill:#e34a33
    }
  </style>
</head>
<body>
  <!--
  Draw a polyline using the polyline element
  -->
  <svg width="200" height="200">
    <polyline points="0,40 40,40 40,80 80,80 80,120 120,120 120,160" fill="white"
stroke="#BBC42A" stroke-width="6" />
  </svg>
</body>
</html>
```

DATA TO ELEMENTS

SELECTION SHOULD CORRESPOND TO DATA

```
var numbers =
[5,10,15,20,25];
var lines =
svg.selectAll(”line")
      .data(numbers)
      .enter().append(”line
");
```

Data SVG

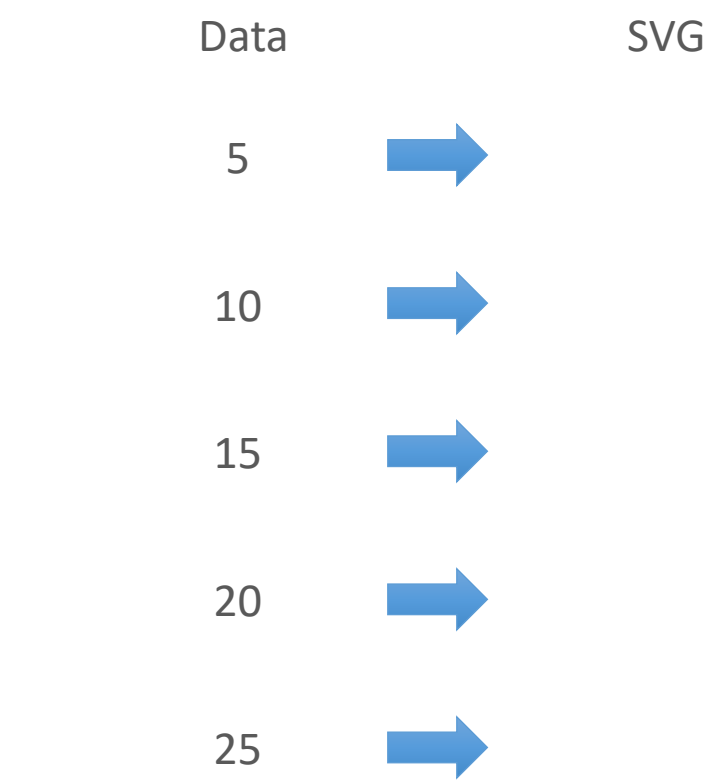
SELECTION SHOULD CORRESPOND TO DATA

```
var numbers =
[5,10,15,20,25];
var lines =
svg.selectAll(”line")
      .data(numbers)
      .enter().append(”line
");
```

Method data joins data with document elements

SELECTION SHOULD CORRESPOND TO DATA

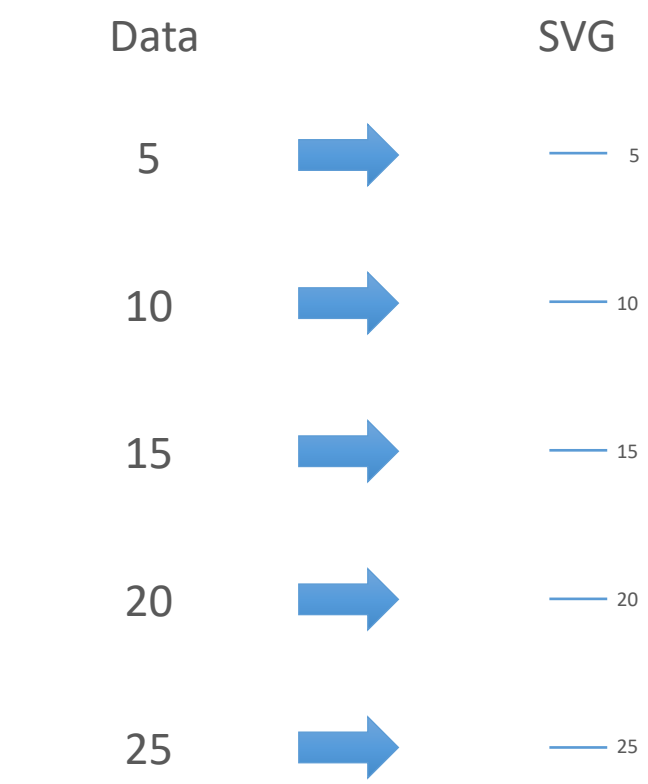
```
var numbers =
[5,10,15,20,25];
var lines =
svg.selectAll(”line")
      .data(numbers)
      .enter().append(”line
");
```



Method enter specifies the action for missing elements

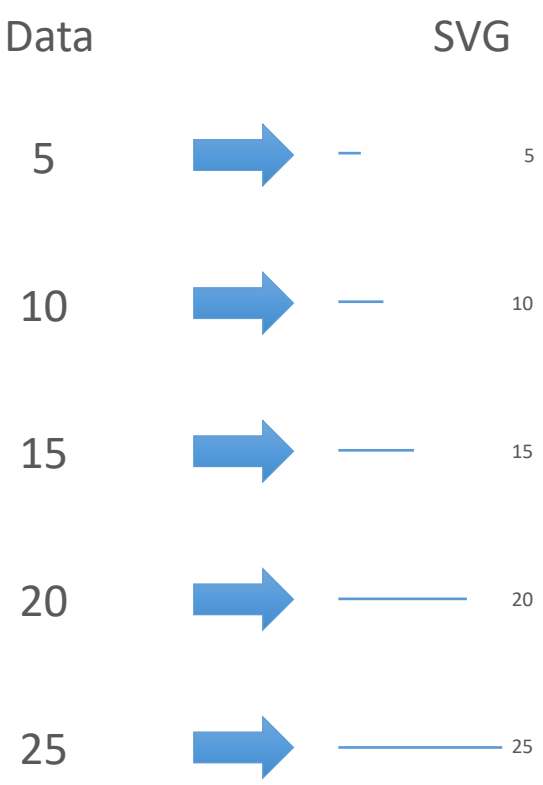
SELECTION SHOULD CORRESPOND TO DATA

```
var numbers =
[5,10,15,20,25];
var lines =
svg.selectAll(”line")
      .data(numbers)
      .enter().append(”line
");
```



SELECTION SHOULD CORRESPOND TO DATA

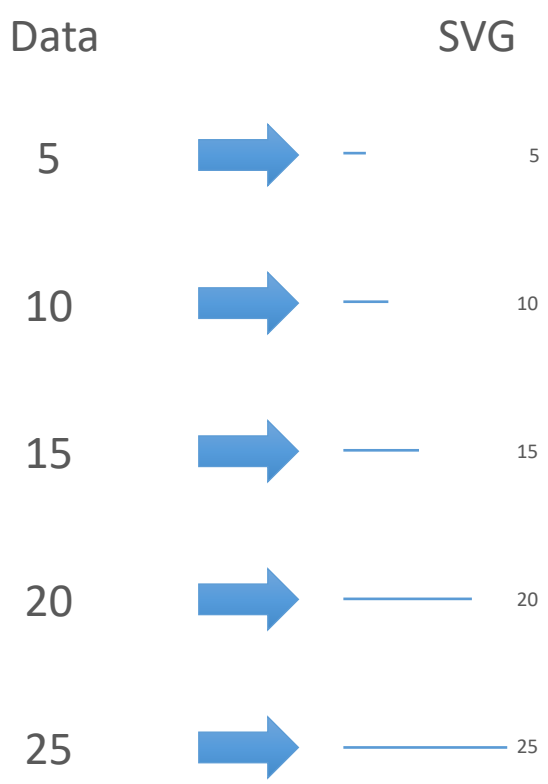
```
var numbers =
[5,10,15,20,25];
var lines =
svg.selectAll("line")
      .data(numbers)
      .enter().append("line
");

lines.attr("x1",10)
      .attr("y1",posy(d,i))
      .attr("x2",posx(d,i))
      .attr("y2",posy(d,i))
```



The new elements are bound to data. Data can be used to compute attributes

SELECTION SHOULD CORRESPOND TO DATA

```
lines.attr("x1",10)
      .attr("y1",posy(d,i))
      .attr("x2",posx(d,i))
      .attr("y2",posy(d,i));

var posy = function(d,i){
      return i*10;
}

var posx = function(d,i){
      return d * 10;
}
```



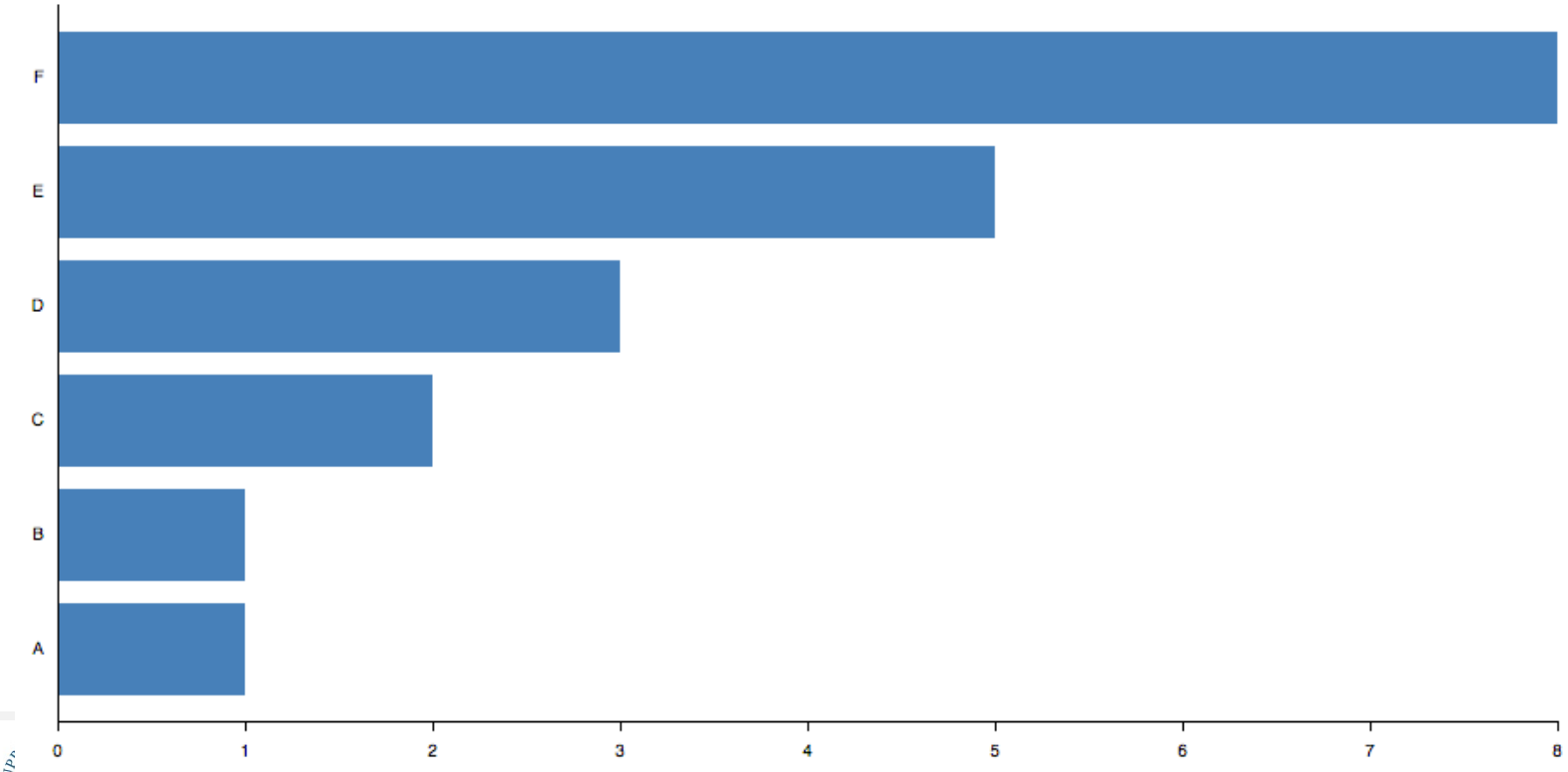
The attr functions takes in input a constant value or a function. The function is called automatically by d3, passing the data (__data__) bound to the element and a progressive counter

EXERCISE #2

- Use length visual variable to represent a set of numbers
  - Map numbers to a set of lines
  - Make each line length proportional to the number it represents

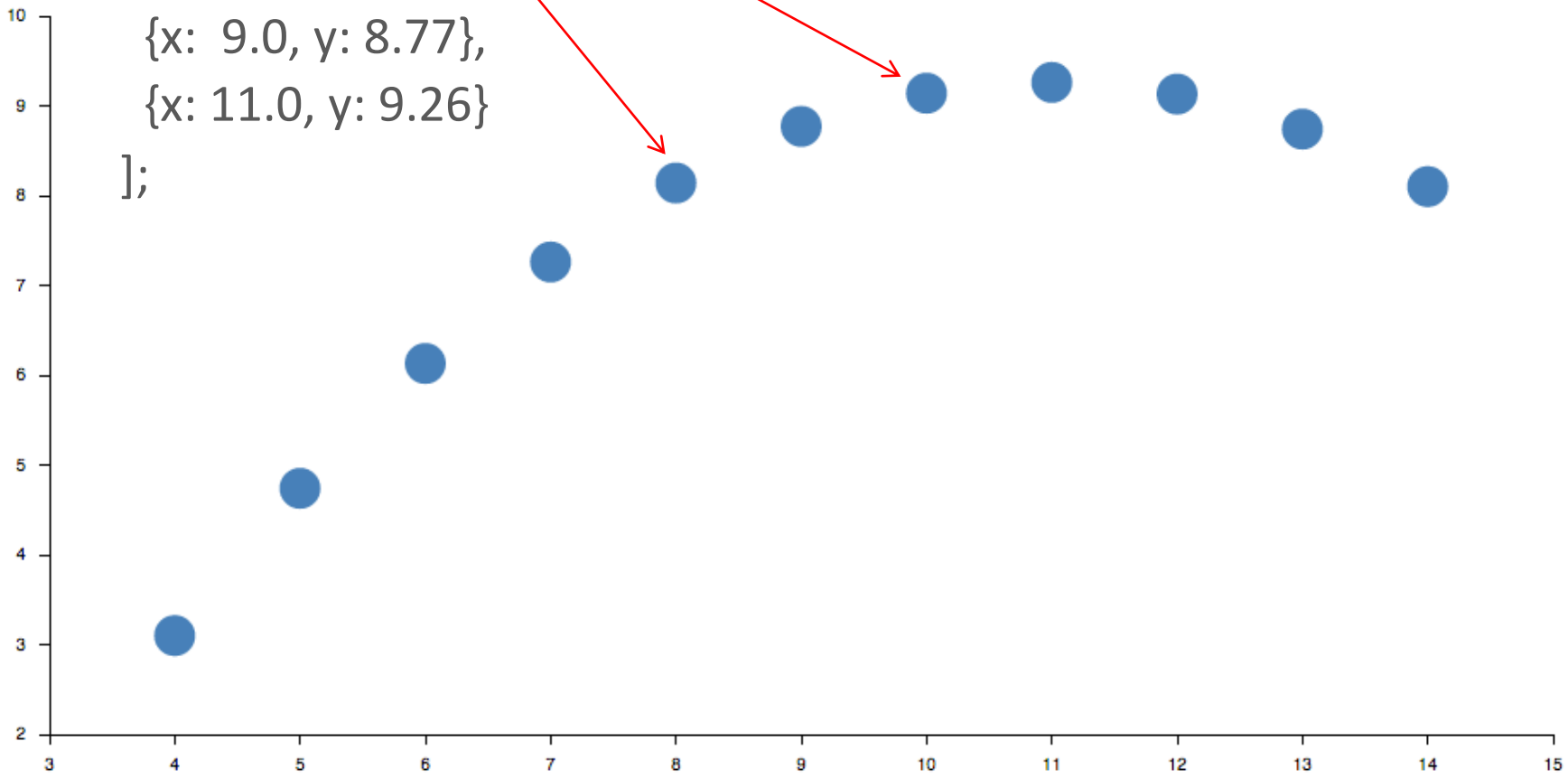
DATA CAN BE NUMBERS

```
var numbers= [1, 1, 2, 3, 5, 8];
```



DATA CAN BE OBJECTS.

```
var data = [
  {x: 10.0, y: 9.14},
  {x:  8.0, y: 8.14},
  {x: 13.0, y: 8.74},
  {x:  9.0, y: 8.77},
  {x: 11.0, y: 9.26}
];
```

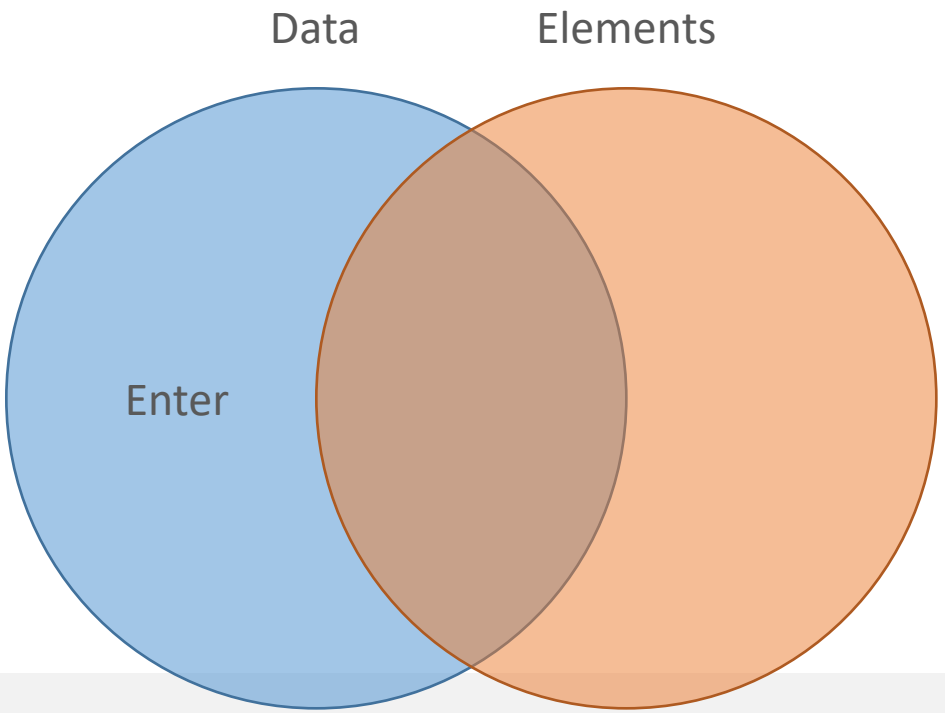


ENTER, EXIT, AND UPDATE

Thinking with Joins

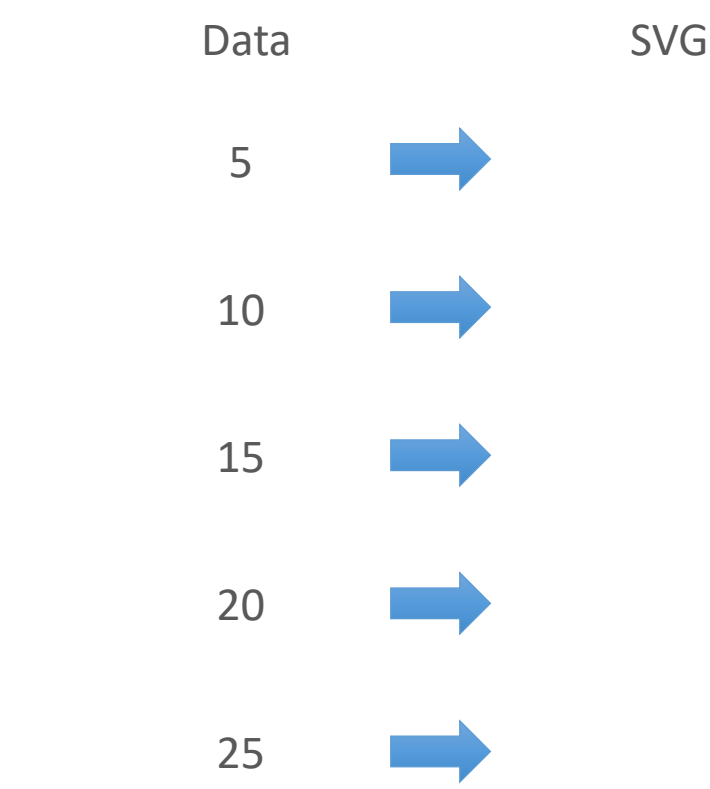
ENTER

- New data, for which there were no existing elements.



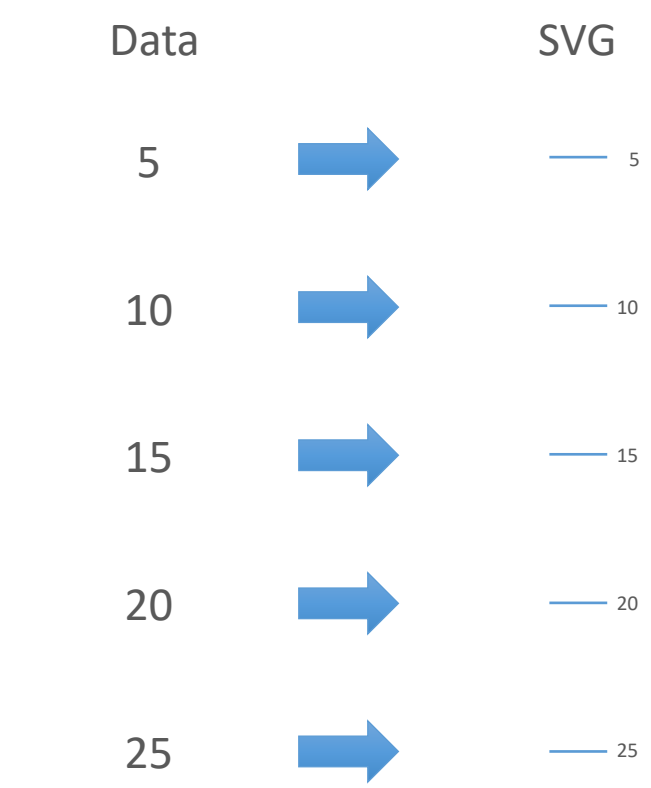
ENTERING NEW ELEMENTS

```
var numbers =
[5,10,15,20,25];
var lines =
svg.selectAll(”line")
      .data(numbers);


lines
      .enter().append(”line
");
```



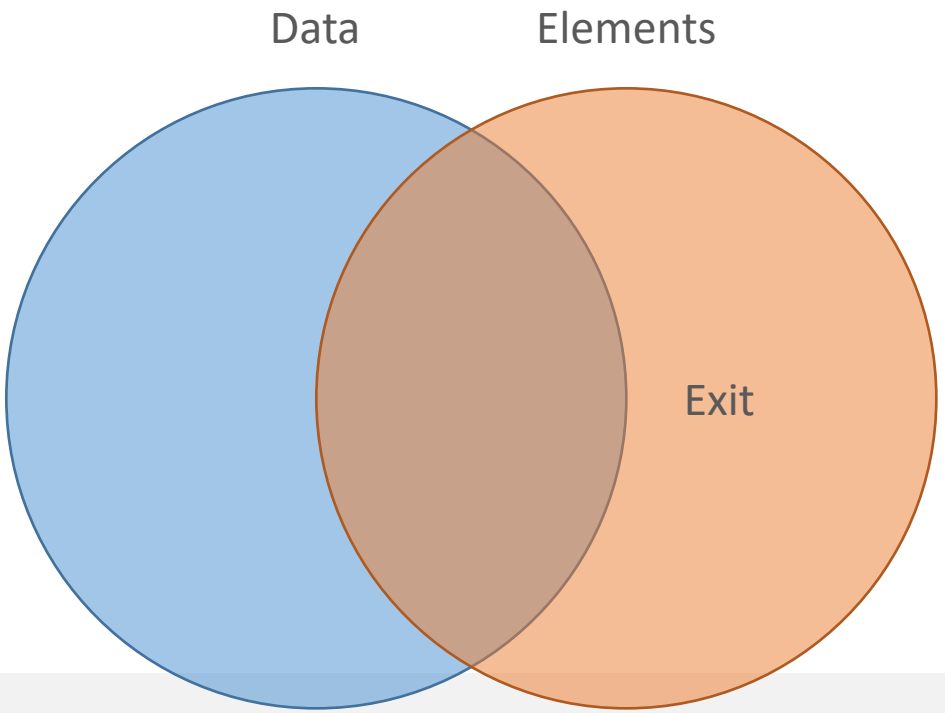
ENTERING NEW ELEMENTS

```
var numbers =
[5,10,15,20,25];
var lines =
svg.selectAll(”line")
      .data(numbers);


lines
      .enter().append(”line
");
```



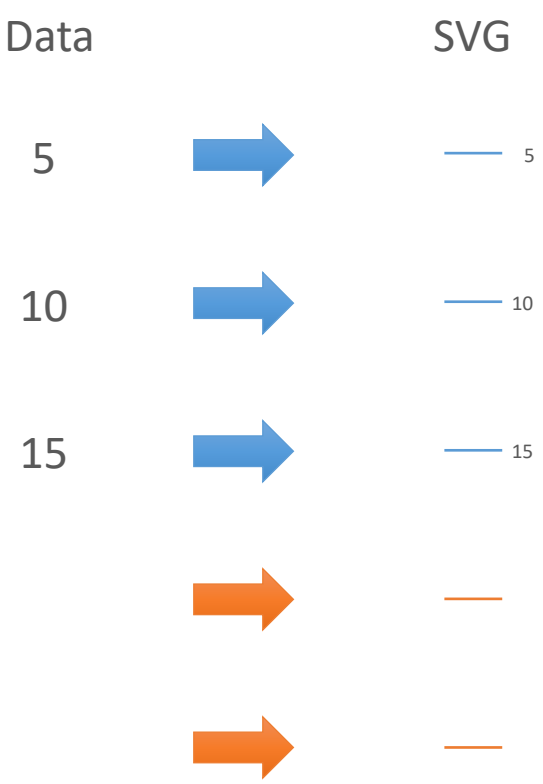
EXIT

- Elements that are associated with no data



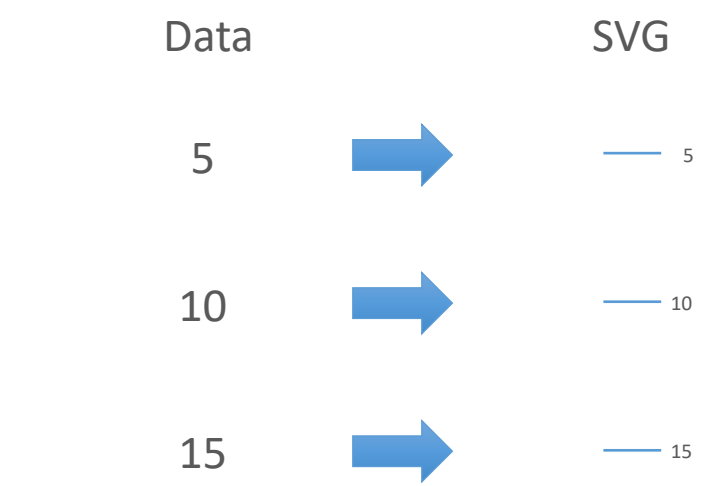
EXITING UNNECESSARY ELEMENTS

```
var numbers = [5,10,15];
var lines =
svg.selectAll(”line")
      .data(numbers);


lines
      .exit().remove();
```



ENTERING NEW ELEMENTS

```
var numbers =
[5,10,15,20,25];
var lines =
svg.selectAll(”line")
      .data(numbers);


lines
      .exit().remove();
```

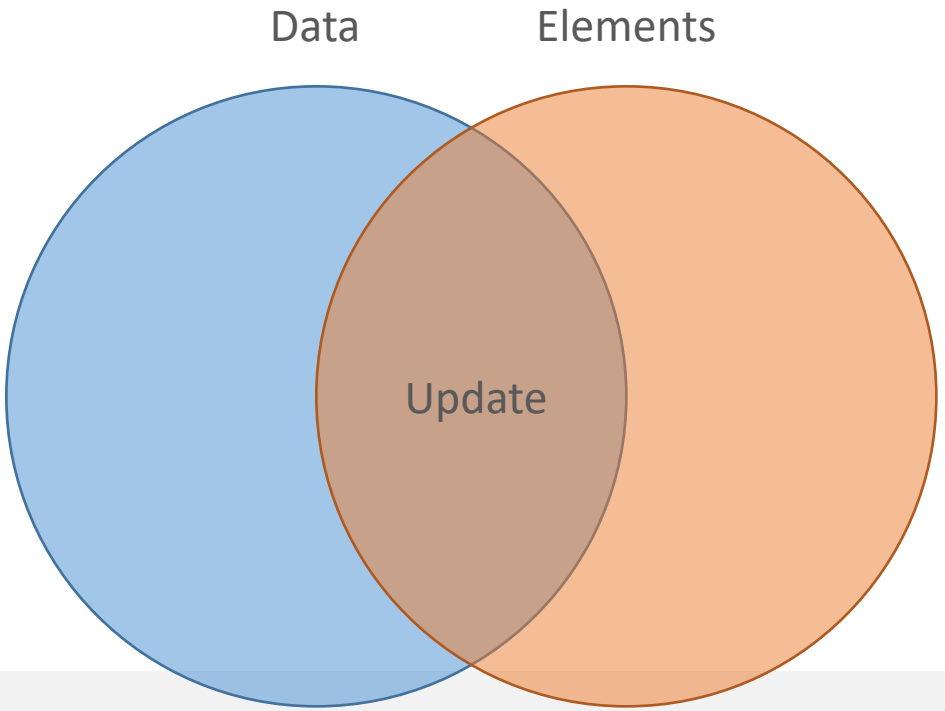


DATA ATTRIBUTES TO ELEMENTS ATTRIBUTES

Step 2

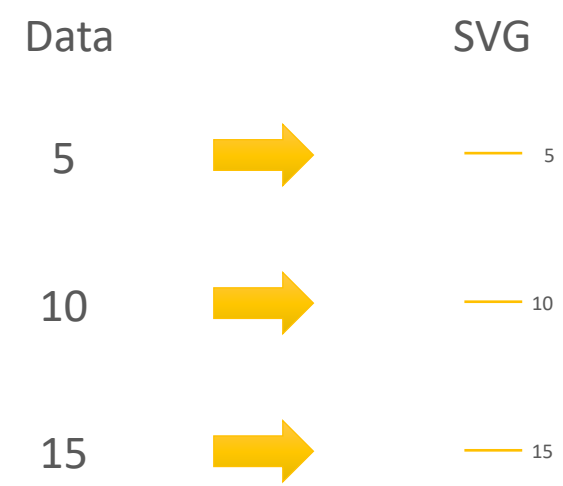
UPDATE

- Data already joined with previous elements



UPDATE EXISTING AND NEW ELEMENTS WITH NEW DATA

```
var numbers =
[5,10,15,20,25];
var lines =
svg.selectAll("line")
      .data(numbers);

lines = lines.enter()
      .append("line")
      .merge(lines);

lines.attr("x1",10)
      .attr("y1",posy(d,i))
      .attr("x2",posx(d,i))
      .attr("y2",posy(d,i));
```



JOINING WITH KEY FUNCTION

```
var data = [
  {name: "Locke", number: 4},
  {name: "Reyes", number: 8},
  {name: "Ford", number: 15},
  {name: "Jarrah", number: 16},
  {name: "Shephard", number: 31},
  {name: "Kwon", number: 34}
];

d3.selectAll("div")
  .data(data, function(d) { return d ? d.name : this.id; })
    .text(function(d) { return d.number; });
```

USEFUL RESOURCES

- https://d3js.org

- https://www.dashingd3js.com/
- https://github.com/mbostock/d3/wiki/API-Reference

- Tutorials
- http://bost.ocks.org/mike/d3/workshop/
- https://www.oliviavane.co.uk/tutorials/d3/about/tutorial-about

DEVELOPMENT CHECKLIST

TOOLS

- A modern browser (Chrome, Firefox, etc)
- An integrated IDE, like WebStorm for example
- Node.js and NPM installed

USING VUE.JS AND VUE.CLI

- `npm install –g vue-cli`
  - Create a command to manage Vue.js projects
- `vue init webpack-simple my-project`
- `cd my-project`
- `npm install`
- `npm run dev`
- These commands create a skeleton project configured with Vue.js

WEB PAGE PREPARATION

- Create a file HTML
- Create content for the page
- Include an empty DIV for the visualization
- Install and link D3
- Construct SVG element within the DIV element
- Optionally
  - Create and init git repository