Basic Dataviz with D3

2016.11.09

Logistics

- Assignment 5 due tonight
- Any last minute questions?

Today

- All about Data visualization & D3 (a Dataviz tool)

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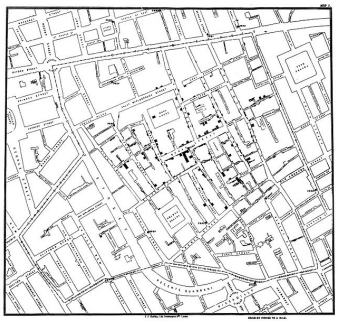
- All about Data visualization & D3 (a Dataviz tool)
- By the end of the lab, you will:
  - understand how d3 works
  - know how to use d3 to add visual elements onto html

D3 and Dava Visualization

- A picture is worth 1000 words



D3 setup

Just one line of code

```
<script src="https://d3js.org/d3.v4.min.js"></script>
```

How D3 works

- Remember js and jQuery can select, add, and delete DOM elements, like div?
- d3 works the same way, just using its own language

JavaScript	JQuery	d3
`document.querySelector("#hi");`	`$( "#hi" );`	`.select("#hi")`
`parent.appendChild(el);`	`$(parent).append(el);`	`.append(el)`

- It draws svgs

Let's try it out

Let's add a circle

```
d3.select("#myChart").append("svg").attr("width", 50).attr("height", 50)
  .append("circle").attr("cx", 25).attr("cy", 25).attr("r", 25);
```

Let's try it out

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  .attr("cx", 25).attr("cy", 25)
  .attr("r", 25)
  .attr("fill", "red");
```

Practice: Add another circle to the SVG div

With center at (80, 80), radius of 25

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```
d3.select("svg")
   .append("circle")
   .attr("cx", 80).attr("cy", 80)
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   .attr("fill", "yellow");
```

Practice: Add another circle to the SVG div

With center at (80, 80), radius of 25

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```

Where is the second circle?

Practice: Add another circle to the SVG div

With center at (80, 80), radius of 25

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d3.select("svg")
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   .attr("cx", 80).attr("cy", 80)
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```

Where is the second circle?

Make the svg larger to show the circle

SVG groups

All our circles can get messy real fast

SVG groups can help us organize them (a group)

```
d3.select("#myChart")
  .append("svg")
  .append("g")
  .append("circle")
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  .attr("r", 25)
  .attr("fill", "red")
  .append("circle")
    .attr("cx", 80).attr("cy", 80)
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```

Let's check out the DOM structure now

Why should we use groups? Thoughts?

You can interact with each element

Let's move the two circles simultaneously by (20, 20) when mouse over

```
d3.select("circle")
.on("mouseover", mouseover);

function mouseover(d) {
    d3.select(this)
        .transition()
        .attr("transform", "translate(20, 20)")
}
```

Show color of circle on mouse over

```
//mouseover works for all circle elements
d3.selectAll("circle")
    .on("mouseover", mouseover);

//what will show up when hover over
var tooltip = d3.select("#myChart")
                .append("div")
                .style("position", "absolute")
                .style("z-index", "10")
                .style("visibility", "hidden");

function mouseover(d) {
     // Create a text box on hover
     tooltip.text(d3.select(this).attr("fill"))
             .style("visibility", "visible")
             .style("top", event.pageY+"px")
             .style("left", event.pageX+"px");
     };
```


Let's make a pie chart with pseudo data

My data:

```
var MHCIday = [
  { item: 'UCRE',  hours: 8 },
  { item: 'PUI',  hours: 3 },
  { item: 'courses for kicks and giggles', hours: 4 },
  { item: 'bond with other students', hours: 4 },
  { item: 'sleep', hours: 5}
];
```

Let's make a pie chart with pseudo data

Take the data and convert it to a format for d3 pie chart

```
var pie = d3.pie()
  .value(function(d) { return d.hours })

var slices = pie(MHCIday);
```


Let's make a pie chart with pseudo data

Take the data and convert it to a format for d3 pie chart

```
var pie = d3.pie()
  .value(function(d) { return d.hours })

var slices = pie(MHCIday);
```

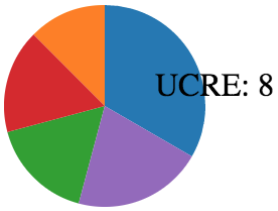
Let's do console.log to see what format the data are.

Settings for a pie chart

We will learn from an example to see how to setup for a pie chart

http://square.github.io/intro-to-d3/examples/

Practice: When mouse move, show details of slice



Let's scale the pie when mouse over

```
d3.select(d).attr("transform", "scale(1.2)");
```


Let's scale the pie when mouse over

```
d3.select(d).attr("transform", "scale(1.2)");
```

ERROR!

```
d3.min.js:3 Uncaught TypeError: this.getAttribute is not a function(...)
```

Why?

What does d refer to?

What type of object is it?

Why?

What does d refer to?

What type of object is it?

A html object or a d3 object?

Fix

```
d3.select(this).attr("transform", "scale(1.2)");
```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```
d3.select(this).attr("transform", "scale(1.2)");
```

Always check your object. Console.log is your best friend.

Useful links

http://bl.ocks.org/mbostock

Jen Mankoff's Data Pipeline course in spring: http://data.cmubi.org/