

Welcome to Data Structures Honors: A Data-centric Dive into Data Science

Course Website: <https://courses.engr.illinois.edu/cs225/sp2019/pages/honors/>

...or from the CS 225 Website -> "Course Info" -> "Honors Section"

Interactive Visualization Using d3.js

Simple visualizations using d3.js generally follow a template of four components:

1. Boilerplate Code
 2. Scales
 3. Axes
 4. Visual Encoding of Data
-

Boilerplate Code

Boilerplate code is found in every d3.js visualization and provides the setup to begin rendering data onto an SVG canvas. Various people use slightly different boilerplate code, but this is my standard boilerplate:

```
16 var margin = { top: 50, right: 50, bottom: 50, left: 50 },
17   width = 960 - margin.left - margin.right,
18   height = 500 - margin.top - margin.bottom;
19
20 var svg = d3.select("#chart")
21   .append("svg")
22   .attr("width", width + margin.left + margin.right)
23   .attr("height", height + margin.top + margin.bottom)
24   .style("width", width + margin.left + margin.right)
25   .style("height", height + margin.top + margin.bottom)
26   .append("g")
27   .attr("transform",
    "translate(" + margin.left + "," + margin.top + ")");
```

Boilerplate Code Visualized:



Simple Visualization in d3.js Coded:

```
28 // Scale:
29 var gradeScale = d3.scaleLinear()
30     .domain([0, 100])
31     .range([0, width]);
32
33
34 // Axis:
35 var axisVariable = d3.axisTop()
36     .scale( gradeScale );
37
38 svg.append("g")
39     .call( axisVariable );
40
41
42 // Visual Encoding:
43 svg.selectAll("grade")
44     .data(data)
45     .enter()
46     .append("circle")
47     .attr("r", function (d, i) {
48         return 4;
49     })
50     .attr("cx", function (d, i) {
51         return gradeScale( d["grade"] );
52     })
53     .attr("cy", 0)
54     .attr("fill", "red")
55     .attr("stroke", "black");
```

Loading Data for the Visualization

All visualizations we create will always be backed by data. d3.js provides a library call to load this data in and format it for easy use with d3.js:

```
3 $(function() {
4     d3.csv("football.csv").then(function(data) {
9         visualize(data);
10     });
11 });
12
13
14 var visualize = function(data) {
    // ...
```

Launching your Visualization

1. Navigate to the directory of your visualization on disk
2. Run: `python -m http.server`