Visualizing Complex Systems

CMPM 290A, F2017

Angus Forbes
angus@ucsc.edu

creativecoding.soe.ucsc.edu
github.com/CreativeCodingLab

D3

Web browser renders a web page by rendering the DOM

Components of a web program:

- HTML – structure of the DOM
- CSS – styling the DOM
- JS – interacting with + dynamically updating the DOM
- JSON – loading in data used by JS to update the DOM

Special DOM elements:

- SVG Canvas
- (also: media players, WebGL canvas, etc)

D3

How to debug:

- Using your browser's console

- Using JSBin (http://jsbin.com/cogagi/1/edit?html,js,console)

D3

D3.js

Overview and principles

- Look at static data arrays

- Load in data from a JSON file, requires webserver, on OSX:
i.e., python -m SimpleHTTPServer 8080

D3 from a webserver

From your terminal console, cd to the folder where your files are, i.e.:

```
cd ~/angus/classFiles/code/d3ex/
```

Start a webserver from the command line in a terminal console:

```
python -m SimpleHTTPServer 8080
```

Then from your browser you can access your project:

http://localhost:8080/barchart.html

D3 = data-driven documents

D3.js

- Use D3 to transform the data into an SVG visualization
- visualization responds when data is updated
- uses a functional style of programming, which can be a bit confusing, but makes it easy to compose data transformations

D3

Javascript overview and tutorials:

https://developer.mozilla.org/en-US/docs/Web/JavaScript

Data manipulation:

http://learnjsdata.com/iterate_data.html

SVG

Simple SVG overview:

www.w3schools.com/svg/default.asp

Shapes
Text
Transforms

D3 Examples

Vis – Using JS Bin for testing, trying out Javascript, etc

Vis – correct vs. incorrect

- Build a bar chart

Vis – languages like/dislike

- Build a pie/donut chart

D3 Examples

Data Joins:

enter = new data elements added to data array

update = existing data elements in the data array have been changed

exit = existing data elements have been removed from the data array

D3 exercise

Explore https://bl.ocks.org

Choose a block – replace with a small subset of your data