



DEEP
LEARNING
INSTITUTE



DLI Accelerated Data Science Teaching Kit

Lecture 9.3 - D3 Overview



The Accelerated Data Science Teaching Kit is licensed by NVIDIA, Georgia Institute of Technology, and Prairie View A&M University under the [Creative Commons Attribution-NonCommercial 4.0 International License](https://creativecommons.org/licenses/by-nc/4.0/).

Mike Bostock and Jeff Heer

2009 - Protovis

2011- D3.js

New York Times

Univ. of Washington

Mike Bostock and Jeff Heer

2009 - Protovis

2011- D3.js

D3

- Grand Reductionist Statements
- Loading Data
- Enter-Update-Exit Paradigm
- Scales
- Axes
- Layouts
- Transitions and Interaction
- Where to go from here

D3.js in a Nutshell

D3 is a really powerful for-loop
with a ton of useful helper functions

D3


Declarative, domain-specific specification
language for manipulating the DOM

Importing D3

```
<html >
  <head>
    <script src='lib/d3.js' charset='utf-8'></script>
    <script src='js/project.js'></script>
  </head>
  <body>
    <div id="vis"></div>
  </body>
</html>
```


Importing D3

```
<html >
  <head>
    <script src='lib/d3.js' charset='utf-8'></script>
    <script src='js/project.js'></script>
  </head>
  <body>
    <div id="vis"></div>
  </body>
</html>
```



Importing D3

```
<html >
```

```
  <head>
```

```
    <script src='lib/d3.js' charset='utf-8'></script>
```

```
    <script src='js/project.js'></script>
```



```
  </head>
```

```
  <body>
```

```
    <div id=
```

```
  </body>
```

```
</html>
```



```
    .. .. }) : [];  
    .. .. };  
    .. var ε = 1e-6, ε2 = ε * ε, π = Math.PI, τ =  
    .. function d3_sgn(x) {  
    ..   return x > 0 ? 1 : x < 0 ? -1 : 0;  
    .. }  
    .. function d3_cross2d(a, b, c) {  
    ..   return (b[0] - a[0]) * (c[1] - a[1]) - (b[1] - a[1]) * (c[0] - a[0]);  
    .. }
```

Importing D3

```
<html >
  <head>
    <script src='lib/d3.js' charset='utf-8'></script>
    <script src='js/project.js'></script>
  </head>
  <body>
    <div id="vis"></div>
  </body>
</html>
```

Assigning the Canvas to a Variable

```
var vis = d3.select("#vis")  
    .append("svg")
```

```
<body>  
    <div id="vis"><svg></svg></div>  
</body>
```

Loading Data

- `d3.csv(fileloc, callback)`
- `d3.tsv(fileloc, callback)`
- `d3.json(fileloc, callback)`

- **fileloc:** string file location
 - “data/datafile.csv”
- **callback:** `function(rawdata) { }`

Rawdata from a CSV file

```
[
  {
    'name': 'Adam',
    'school': 'GT',
    'age': '18'
  },
  {
    'name': 'Barbara',
    'school': 'Emory',
    'age': '22'
  },
  {
    'name': 'Calvin',
    'school': 'GSU',
    'age': '30'
  }
]
```

name	school	age
Adam	GT	18
Barbara	Emory	22
Calvin	GSU	30

Problem

```
[
  {
    'name': 'Adam',
    'school': 'GT',
    'age': '18'
  },
  {
    'name': 'Barbara',
    'school': 'Emory',
    'age': '22'
  },
  {
    'name': 'Calvin',
    'school': 'GSU',
    'age': '30'
  }
]
```

- Ages are Strings!
- They should be ints!
- We can fix that:

```
for (var d: data) {
    d = data[d]
    d.age = +d.age
}
```

Problem

```
[
  {
    'name': 'Adam',
    'school': 'GT',
    'age': '18'
  },
  {
    'name': 'Barbara',
    'school': 'Emory',
    'age': '22'
  },
  {
    'name': 'Calvin',
    'school': 'GSU',
    'age': '30'
  }
]
```

- Ages are Strings!
- They should be ints!
- We can fix that:

```
for (var d: data) {
    d = data[d]
    d.age = +d.age
}
```

WAIT

rawdata from a CSV file

```
[  
  {  
    'name': 'Adam',  
    'school': 'GT',  
    'age': 18  
  },  
  {  
    'name': 'Barbara',  
    'school': 'Emory',  
    'age': 22  
  },  
  {  
    'name': 'Calvin',  
    'school': 'GSU',  
    'age': 30  
  }  
]
```

name	school	age
Adam	GT	18
Barbara	Emory	22
Calvin	GSU	30

rawdata from a CSV file

```
[  
  {  
    'name': 'Adam',  
    'school': 'GT',  
    'age': 18  
  },  
  {  
    'name': 'Barbara',  
    'school': 'Emory',  
    'age': 22  
  },  
  {  
    'name': 'Calvin',  
    'school': 'GSU',  
    'age': 30  
  }  
]
```

name	school	age
Adam	GT	18
Barbara	Emory	22
Calvin	GSU	30

Ok, so let's map
this data to visual
elements!

D3

Declarative, domain-specific specification
language for manipulating the DOM

Define a **template** for each element
D3 draws one element for each data point



DEEP
LEARNING
INSTITUTE



DLI Accelerated Data Science Teaching Kit

Thank You

We thank Dr. Chad Stolper for sharing teaching materials for visualization and D3.