

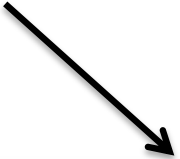
D3.js

1st Lecture

What is a library

- a collection of resources used by computer programs;
- is a set of code that was previously written, that can be called upon when building your own code;
- work that was previously done by someone else that you can now make use of;

arithmetic_average([0,9,5,4,3,2])



```
219     public static float[] arithmetic_average(int[] [] mat) {
220         float [] vec = new float [mat.length];
221         float temp=0;
222
223         for (int i=0;i<=mat.length-1;i++){
224             for (int j=0;j<=mat[0].length-1;j++){
225                 temp+=mat[i][j];
226             }
227             temp=temp/mat[0].length;
228             vec[i]=temp;
229             temp=0;
230         }
231         return vec;
232     }
```



3,83

We must specify libraries in our code

```
<!DOCTYPE html>
<html lang = "en">
  <head>
    <script src = "/path/to/d3.min.js"></script>
  </head>

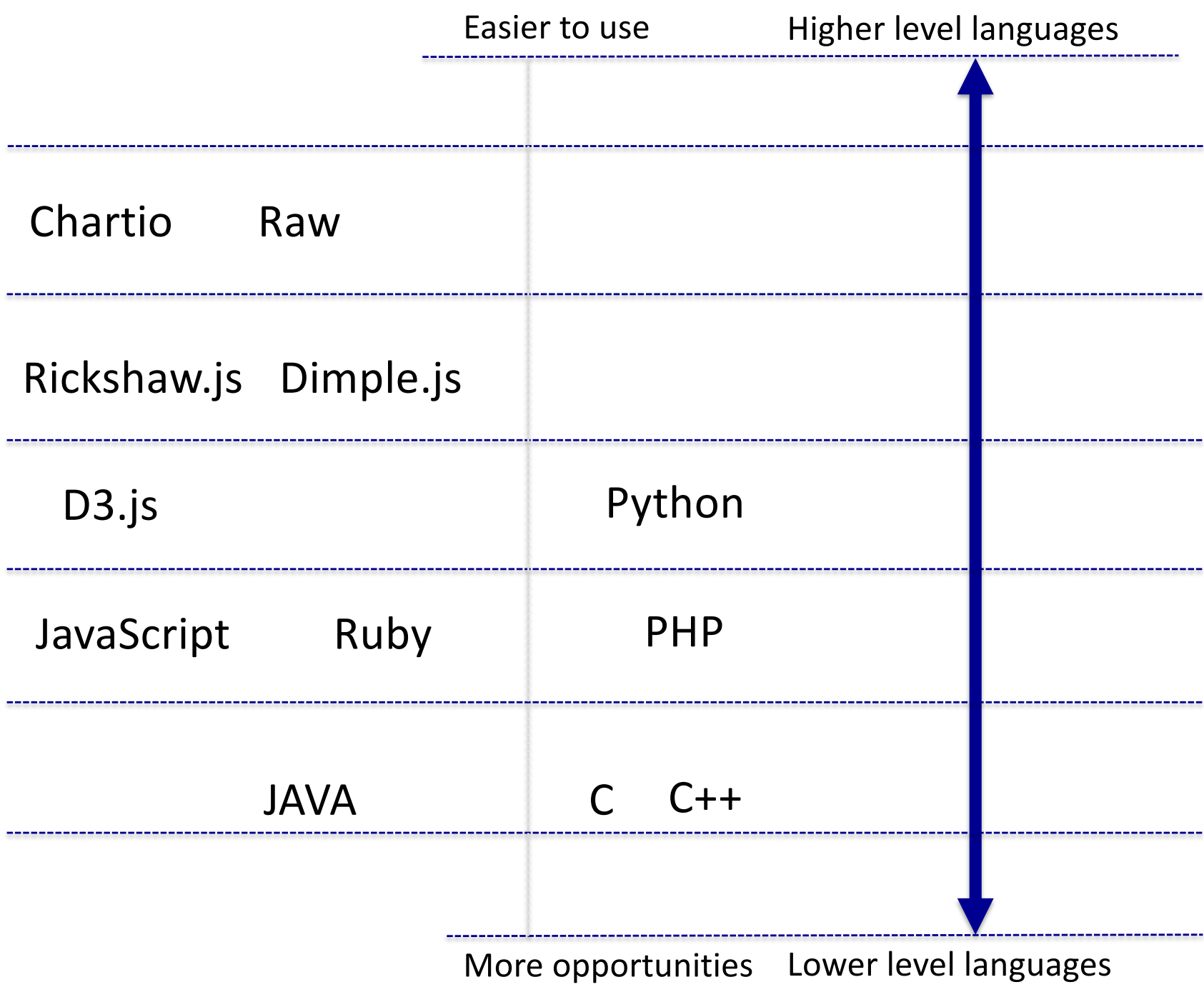
  <body>
    <script>
      // write your d3 code here..
    </script>
  </body>
</html>
```

Can be distant library:

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

or saved on your disc:

```
<script src = "/libs/d3.v4.min.js"></script>
```



D3 utilizes **JavaScript** and converts data into **HTML, SVG** and **CSS** elements

HTML:

is the main markup language for displaying web pages. HTML elements are the building blocks of the web pages. The elements consist of a pair of tags (starting and ending tags) and the textual or graphical content inside of the tags.

```
<span>Hello D3</span>
```

The starting **HTML** page usually looks like this

```
<!DOCTYPE html>  
<html>  
  <head>  
    <title>Hello D3</title>  
  </head>  
  <body>  
    <span>Hello D3</span>  
  </body>  
</html>
```

HTML:

is the main markup language for displaying web pages. HTML elements are the building blocks of the web pages. The elements consist of a pair of tags (starting and ending tags) and the textual or graphical content inside of the tags.

```
<span>Hello D3</span>
```

The starting **HTML** page usually looks like this

```
<!DOCTYPE html>  
<html>  
  <head>  
    <title>Hello D3</title>  
  </head>  
  <body>  
    <span>Hello D3</span>  
  </body>  
</html>
```


JavaScript:

a programming language used to give sophisticated functionality to webpages

```
alert("Hello World!");
```

The **JavaScript** code can be placed in **<head>** section in the **.js file** or in the **<body>** section inside the **<script>** tags as the code

```
<!DOCTYPE html>
<html>
  <head>
    <title>Hello D3</title>
    <script src="hellod3.js" type="text/javascript" ></script>
  </head>
  <body>
    <span>Hello D3</span>
    <script type="text/javascript">    alert("Hello D3");
    </script>
  </body>
</html>
```

Canvas

to draw



Call d3 lib.

Add "canvas" to the tag

```
d3.select("body").append("svg")
```

Find "body" tag

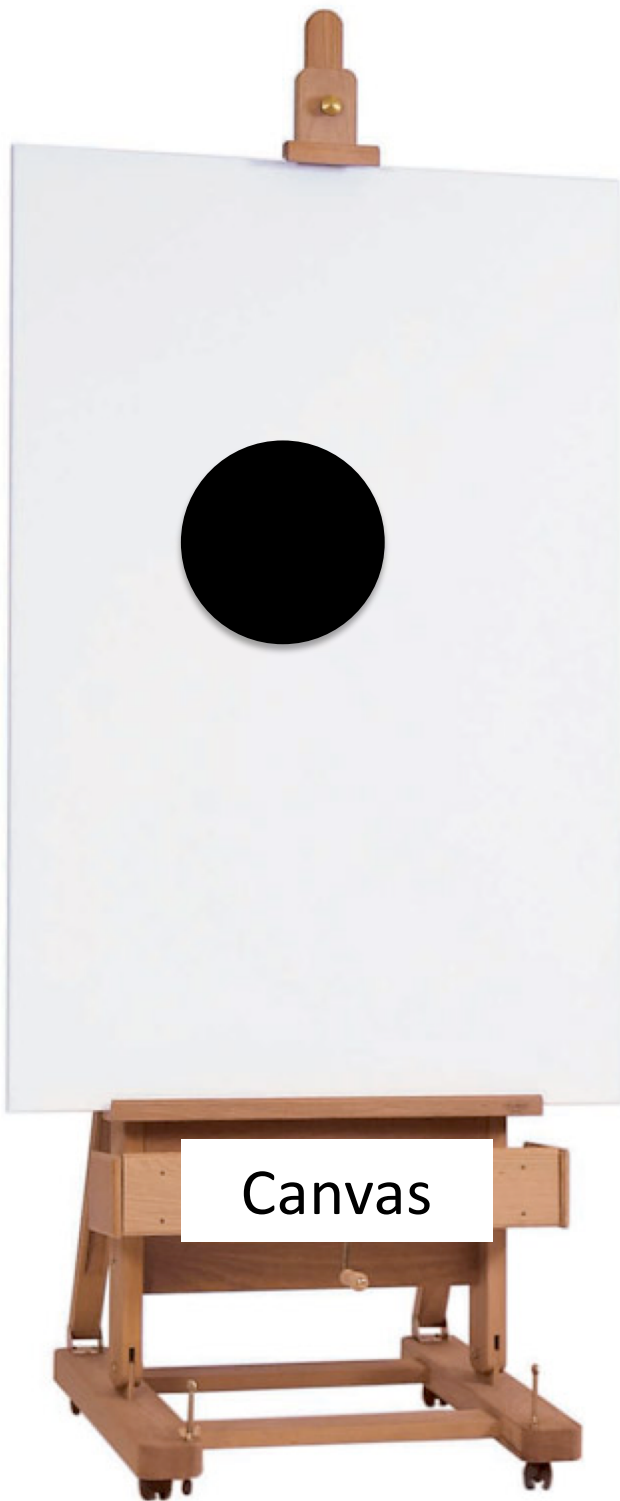
Set size of the canvas

```
.attr("width",100)  
.attr("height",200)
```



Give to our canvas a name

```
var Canvas = d3.select("body")  
              .append("svg")  
              .attr("width",100)  
              .attr("height",200)
```



```
var Canvas = d3.select("body")  
                .append("svg")  
                .attr("width",100)  
                .attr("height",200)
```

Draw a circle on our canvas

```
Canvas .append("circle")
```

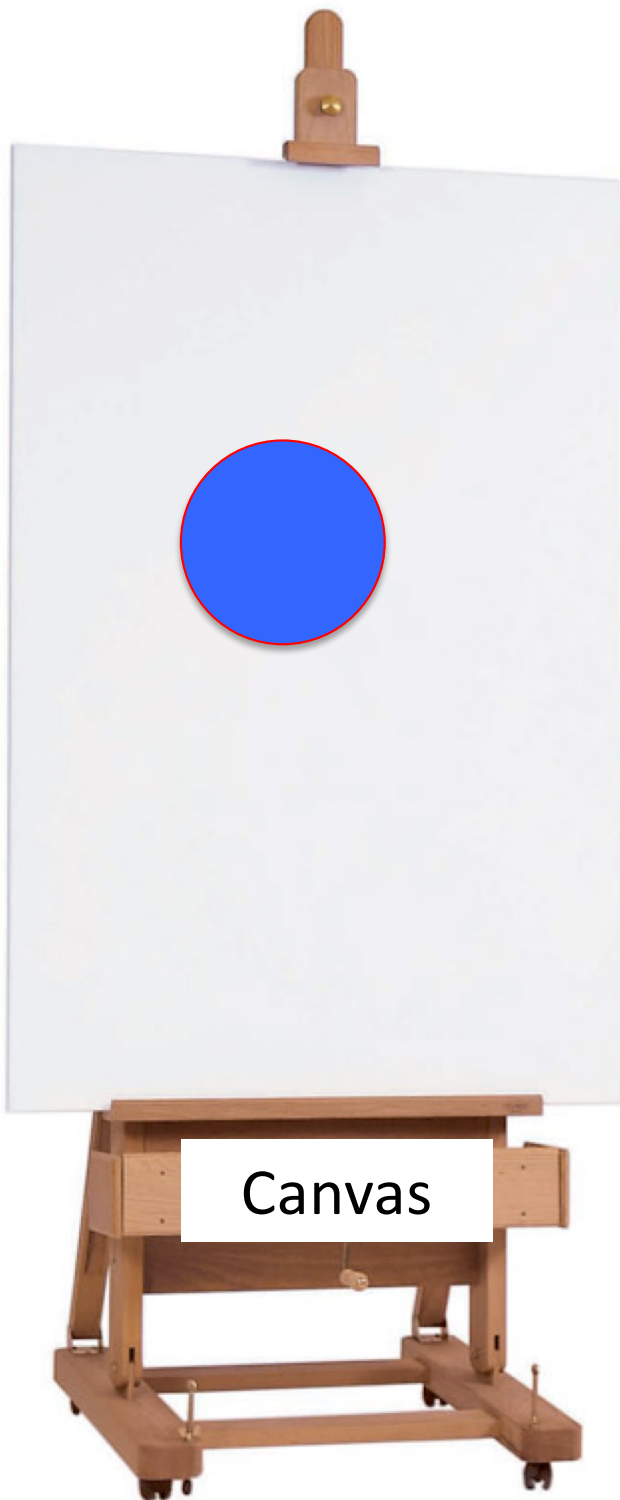
```
.attr("r", 55)
```

Set size of the circle

```
.attr("cx", 55)
```

Set position

```
.attr("cy", 105)
```



```
var Canvas = d3.select("body")  
                .append("svg")  
                .attr("width",100)  
                .attr("height",200)
```

```
Canvas .append("circle")
```

```
    .attr("r", 55)
```

```
    .attr("cx", 55)
```

```
    .attr("cy", 105)
```

```
    .attr("fill", "blue")
```

```
    .attr("stroke", "red")
```

Set colors

“circle” attributes:

- “r” – size/radius (number)
- “cx” – x position (number)
- “cy” – y position (number)
- “stroke” – exterior color (text)
- “stroke-width” – size of stroke (number)
- “fill” - interior color (text)

“ellipse” attributes:

- “rx” – vertical size/radius (number)
- “ry” – horizontal size/radius (number)
- “cx” – x position (number)
- “cy” – y position (number)
- “stroke” – exterior color (text)
- “stroke-width” – size of stroke (number)
- “fill” - interior color (text)

“rect” attributes:

- “x” – x position (number)
- “y” – y position (number)
- “width” – length of rectangle (number)
- “height” – height of rectangle (number)
- “stroke” – exterior color (text)
- “stroke-width” – size of stroke (number)
- “fill” - interior color (text)

“line” attributes:

- “x1” – one end x position (number)
- “y1” – one end y position (number)
- “x2” – other end x position (number)
- “y2” – other end y position (number)
- “stroke” – exterior color (text)
- “stroke-width” – size of stroke (number)

What is a variable

an element that holds a value;
Identified as “var” with equal sign

var variable1 = “this is the text”

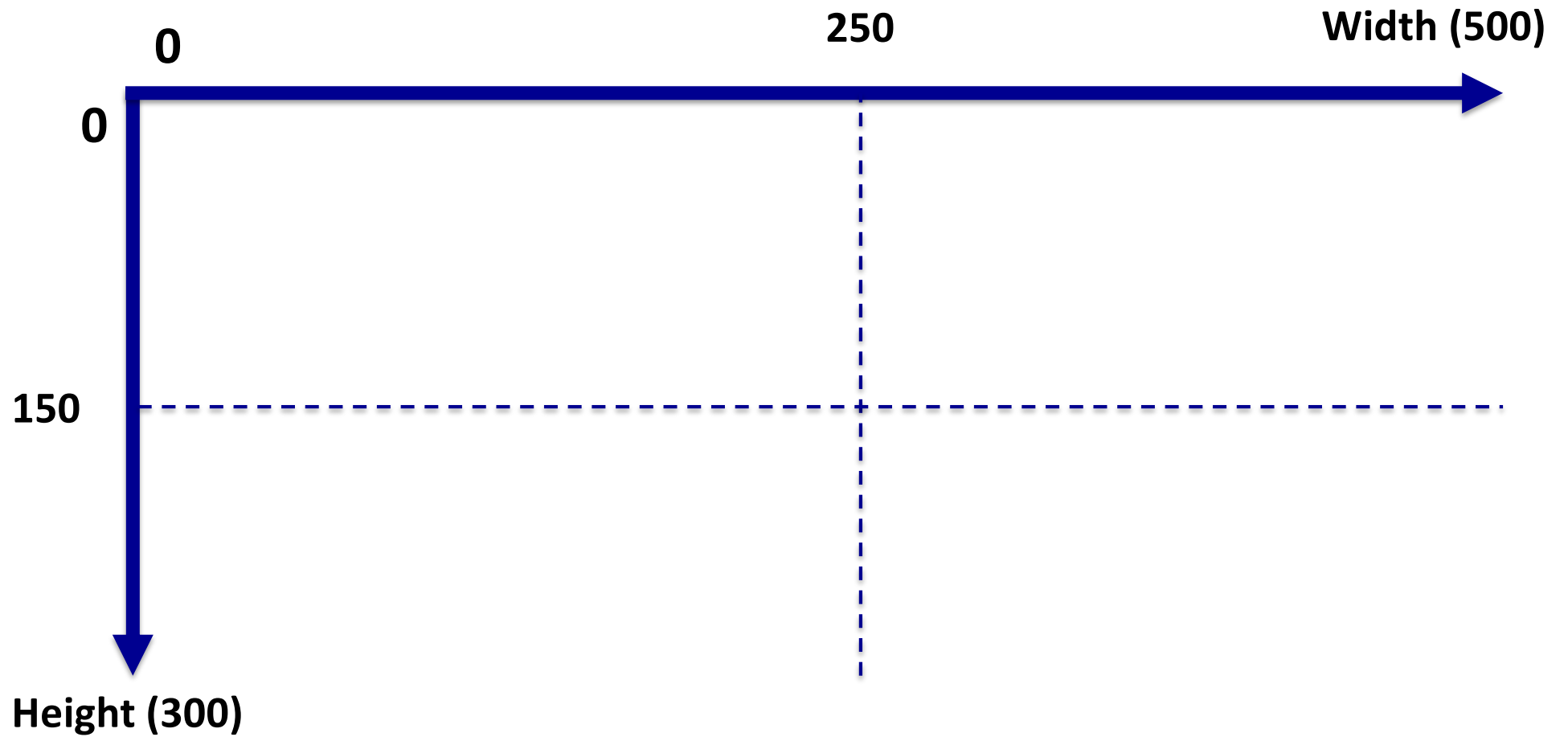
var numberVar = 500;

var anothernumber = 300;

var anotherNumber = 200;


```
var variable1 = 400;
```

```
d3.select("body")  
  .append("svg")  
  .attr("width",100)  
  .attr("height", variable1)
```



```
d3.select("body")  
  .append("svg")  
  .attr("width",500)  
  .attr("height",300)
```

Homework 1

- Draw any 3 figures with 3 different colors
- Draw a line crossing all of them
- Upload to mycourses before the next lecture
Jan 9th 9:00.