How to use D3.js ?

Two methods to load D3 library:

- **Download the latest version** or the minified version from the official website
  (https://d3js.org/) or GitHub (https://github.com/d3/d3).

- **Link CDN** directly in the html. (Reminder: Keep the Internet connected.)

```html
<!DOCTYPE html>
<html>
<head>
    <title>D3 Application from Group1</title>
    <script src="http://d3js.org/d3.v3.min.js" charset="utf-8"></script><!--
    load D3 library-->
```

How to use D3.js ?

Selections: a declarative approach, operating on arbitrary sets of nodes.

There are two functions to select elements:

- **d3.select()**: Select the first of all specified elements.
- **d3.selectAll()**: Select all of the specified elements.

```
//selection example
var body = d3.select("body"); //select the body element from document
var p = body.select("p");        //select the first p element
var p = body.selectAll("p");     //select all p elements
var svg = body.select("svg");    //select the svg element in body
var rects = svg.selectAll("rect");  //select all rect elements in svg
```

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Bind data to DOM

There are two functions:

datum(): Bind a data to the selection set. (bindDataExample-example1)

data(): Bind an array to the selection set, the values of the array are bound to the elements of the selection set. (bindDataExample-example2)

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Function (d,i)

It is often required when the selection set needs to use the bound data.

It contains two parameters:

d: represents data bound to an element.

i: represents the index number of the data, starting at 0.

```html
<body>
<p>cat</p>
<p>dog</p>
<p>rabbit</p>
</body>
```

```javascript
//example 1

var str = "pet";

var body = d3.select("body");
var p = body.selectAll("p");

p.datum(str);

p.text(function(d, i){
    return i + " is binding with " + d;
});
```

0 is binding with pet

1 is binding with pet

2 is binding with pet

```javascript
//example 2
var dataset = ["My pet is a cat","My pet is a dog","My pet is a rabbit"];
var body = d3.select("body");
var p = body.selectAll("p");

p.data(dataset)
  .text(function(d, i){
      return d;
  });
```

My pet is a cat

My pet is a dog

My pet is a rabbit

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Insert elements:

There are two functions:

append(): Insert an element at the end of the selection set.

insert(): Insert an element before the selection set.

Delete elements:

remove(): Delete selected elements.

```
var p = body.select("#myid");
p.remove();
```

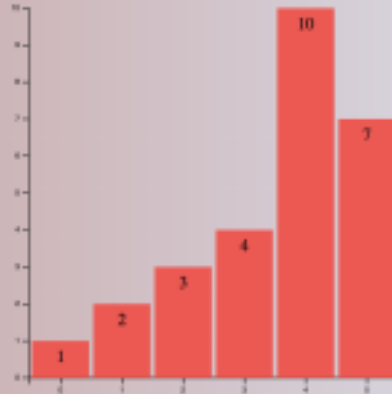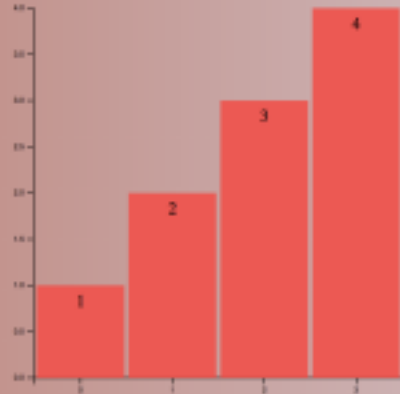# **How** to use D3.js ?

Application Demo

D3 provides a number of generators for SVG.

Therefore, we chose the SVG canvas to present data visualization.

How to use D3.js ?

Key concepts- Scale

Maps the value of one region to another, and its size relationship does not change.

Two ways to set scale :

d3.scale.linear(): Return a linear scale

d3.scale.ordinal(): The domain fields and value field may be discrete values.

domain() and range()

Set the domain and value range of the scale.

d3.max() and d3.min()

Provided by D3 that can find the maximum and minimum values of the array.

How to use D3.js ?

Key concepts- Axis

d3.svg.axis(): A component of the axis in D3 that can generate elements that make up the axes in SVG.

scale(): Specify the scale.

orient(): specifies the orientation of the scale, and bottom indicates the display below the axis.

ticks(): Specifies the number of scales.

Once defined the axis, just add a grouping element ("g") to the SVG and add the axis elements to it by call (axis).

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Key concepts- Transition

D3 uses transition() to represent dynamic effects in SVG.

transition(): starts the transition effect.

delay(): specify the delay time, which means the effect will start after a certain time, and the unit is also milliseconds.

duration(): specifies the duration of the transition in milliseconds.

ease(): specify the way to transition, there are four ways:

- **linear:** ordinary linear change
- **circle:** slowly reaches the final state of the transformation
- **elastic:** with bounce to the final state
- **bounce:** bounce several times in the final state

How to use D3.js ?

More Resources to learn how to use D3.js :

•Official documentation: https://d3js.org/ (More examples and API)

•The blog of Mike Bostock: http://bost.ocks.org/mike/

•Video tutorials on Youtube: d3Vienno