

D3 Tutorial

Manipulation of DOM

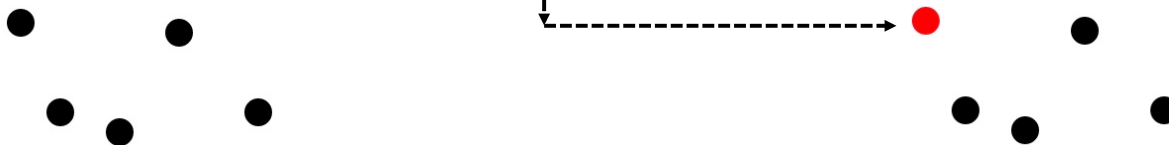
Edit by Jiayi Xu and Han-Wei Shen, The Ohio State University

Selections - `d3.select(selector)`

- `d3.select(selector)`
 - selects only the first element that matches the specified *selector* string

```
<svg>
  <g id="group_1">
    <circle cx="30" cy="30" r="7" />
    <circle cx="50" cy="75" r="7" />
    <circle cx="80" cy="85" r="7" />
  </g>
  <g id="group_2">
    <circle cx="150" cy="75" r="7" />
    <circle cx="110" cy="35" r="7" />
  </g>
</svg>
```

```
d3.select("circle").style("fill", "red");
```



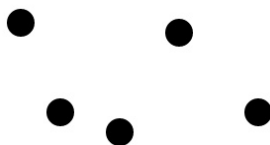
Selections - `d3.selectAll(selector)`

- `d3.selectAll(selector)`
 - selects all elements that matches the specified *selector* string

```
<svg>
  <g id="group_1">
    <circle cx="30" cy="30" r="7" />
    <circle cx="50" cy="75" r="7" />
    <circle cx="80" cy="85" r="7" />
  </g>

  <g id="group_2">
    <circle cx="150" cy="75" r="7" />
    <circle cx="110" cy="35" r="7" />
  </g>
</svg>
```

```
d3.selectAll("circle").style("fill", "red");
```



Selections - Selectors

- `.select(selector)` or `.selectAll(selector)`
- D3 uses CSS Selectors
- Selectors
 - “TagName”
 - Select web objects with the specified tag name
 - `<TagName></TagName>`
 - E.g., `select("circle")` is to select web objects of “`<circle> </circle>`”
 - “#idName”
 - Select web objects with the specified id name
 - `<AnyTag id="idName"></AnyTag>`
 - E.g., `select("#5thBook")` is to select web objects of “`<AnyTag id="5thBook"></AnyTag>`”

Selections - Selectors

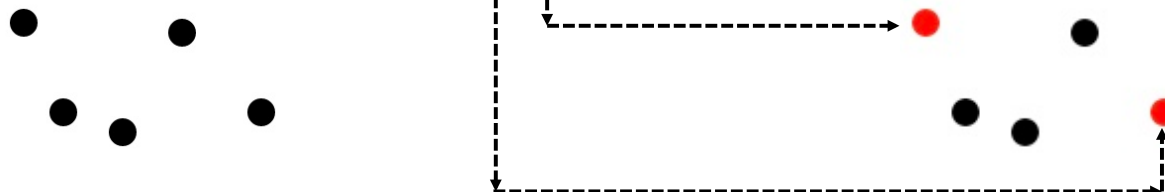
- Selectors
 - “.className”
 - Select web objects with the specified class name
 - `<AnyTag class="className"></AnyTag>`
 - E.g., `select(".Book")` is to select web objects of `<AnyTag class="Book"></AnyTag>`
 - “[AttributeName=‘Value’]”
 - Select web objects with the attribute value
 - `<AnyTag AttributeName="Value"></AnyTag>`
 - E.g., `select("[width='500']")` is to select web objects of `<AnyTag width="500"></AnyTag>`
- More information of CSS Selectors
 - https://www.w3schools.com/cssref/css_selectors.asp
 - https://developer.mozilla.org/en-US/docs/Learn/CSS/Introduction_to_CSS/Selectors

Selections - *selection.select(selector)*

- *selection.select(selector)*
 - For each selected element, selects the first descendant element that matches the specified *selector* string

```
<svg>
  <g id="group_1">
    <circle cx="30" cy="30" r="7" />
    <circle cx="50" cy="75" r="7" />
    <circle cx="80" cy="85" r="7" />
  </g>
  <g id="group_2">
    <circle cx="150" cy="75" r="7" />
    <circle cx="110" cy="35" r="7" />
  </g>
</svg>
```

```
var selection_1 = d3.selectAll("g");
selection_1.select("circle").style("fill", "red");
```



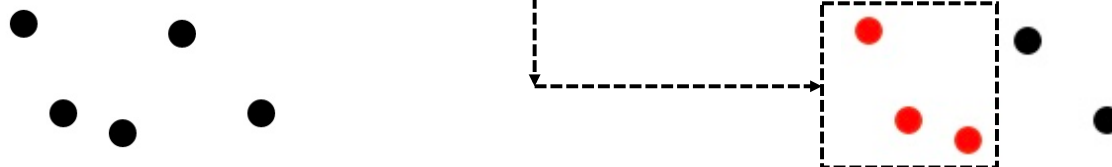
Selections - *selection.selectAll(selector)*

- *selection.selectAll(selector)*
 - For each selected element, selects all the descendant elements that match the specified *selector* string

```
<svg>
  <g id="group_1">
    <circle cx="30" cy="30" r="7" />
    <circle cx="50" cy="75" r="7" />
    <circle cx="80" cy="85" r="7" />
  </g>

  <g id="group_2">
    <circle cx="150" cy="75" r="7" />
    <circle cx="110" cy="35" r="7" />
  </g>
</svg>
```

```
var selection_2 = d3.select("#group_1");
selection_2.selectAll("circle").style("fill", "red");
```



Selections - *selection.style(StyleName, value)*

- Set the **CSS** style property to the specified value on the selected elements

```
<svg>
  <g id="group_1">
    <circle cx="30" cy="30" r="7" />
    <circle cx="50" cy="75" r="7" />
    <circle cx="80" cy="85" r="7" />
  </g>

  <g id="group_2">
    <circle cx="150" cy="75" r="7" />
    <circle cx="110" cy="35" r="7" />
  </g>
</svg>
```

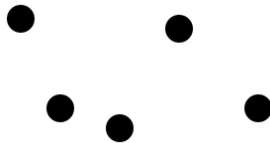
```
var selection_3 = d3.select("circle");
selection_3.style("stroke", "red");
selection_3.style("stroke-width", "2px");
```



Selections - *selection.attr(AttrName, value)*

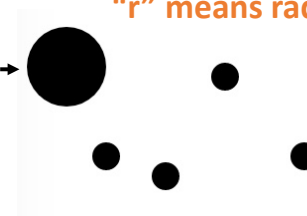
- Set the attribute to the specified value on the selected elements

```
<svg>
  <g id="group_1">
    <circle cx="30" cy="30" r="7" />
    <circle cx="50" cy="75" r="7" />
    <circle cx="80" cy="85" r="7" />
  </g>
  <g id="group_2">
    <circle cx="150" cy="75" r="7" />
    <circle cx="110" cy="35" r="7" />
  </g>
</svg>
```



```
var selection_3 = d3.select("circle");
selection_3.attr("r", "20");
```

"r" means radius



Selections - *selection.classed(className, value)*

- If we have defined a CSS style for the *hollow_circle* class to describe the appearance of hollow circles, e.g.

```
<style>
  .hollow_circle {
    fill: white;
    stroke: red;
    stroke-width: 2px;
  }
</style>
```

- When we want to apply this *hollow_circle* style to circles, we can use *selection.classed(className, value)* function

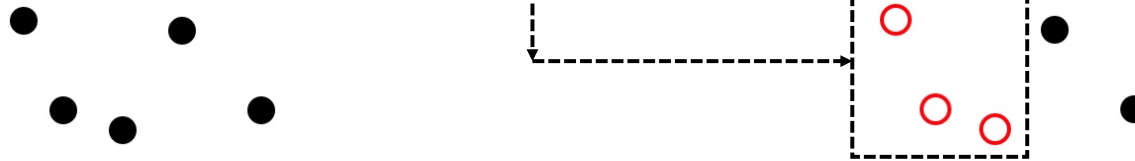
Selections -

selection.classed(className, value)

```
<svg>
  <g id="group_1">
    <circle cx="30" cy="30" r="7" />
    <circle cx="50" cy="75" r="7" />
    <circle cx="80" cy="85" r="7" />
  </g>

  <g id="group_2">
    <circle cx="150" cy="75" r="7" />
    <circle cx="110" cy="35" r="7" />
  </g>
</svg>
```

```
var selection_4 = d3.select("#group_1").selectAll("circle");
selection_4.classed("hollow_circle", true);
```



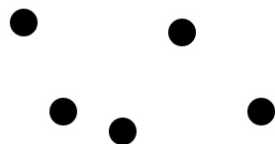
- The *value* in the function can only be *true* or *false*
 - *true* means making selected circles belong to the *hollow_circle* class
 - *false* means removing selected circles from the *hollow_circle* class

Selections - *selection.append(tagName)*

- Append a new element as the last child of each selected element

```
<svg>
  <g id="group_1">
    <circle cx="30" cy="30" r="7" />
    <circle cx="50" cy="75" r="7" />
    <circle cx="80" cy="85" r="7" />
  </g>

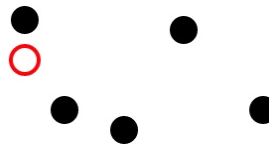
  <g id="group_2">
    <circle cx="150" cy="75" r="7" />
    <circle cx="110" cy="35" r="7" />
  </g>
</svg>
```



```
var newCircle = d3.select("#group_1").append("circle");
newCircle
  .attr("cx", "30")
  .attr("cy", "50")
  .attr("r", "7")
  .classed("hollow_circle", true);
```

The codes above append a new *circle* tag to the first *g* tag.

```
<circle cx="30" cy="50" r="7" class="hollow_circle"></circle>
```



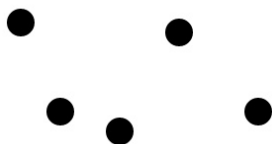
Selections - *selection.remove()*

- Removes the selected elements from the document

```
<svg>
  <g id="group_1">
    <circle cx="30" cy="30" r="7" />
    <circle cx="50" cy="75" r="7" />
    <circle cx="80" cy="85" r="7" />
  </g>

  <g id="group_2">
    <circle cx="150" cy="75" r="7" />
    <circle cx="110" cy="35" r="7" />
  </g>
</svg>
```

```
var selection_5 = d3.select("#group_2");
selection_5.remove();
```



Selections - *selection.text(value)*

- Sets the text content to the specified value on all selected elements
 - Replacing any existing child elements.

```
<div>
  <p>
    Not
  </p>
  <p>
    good!
  </p>
</div>
```

+

```
<script type="text/javascript">
  var selection = d3.select("div");
  selection.text("Hello World! ");
</script>
```

=

```
<div>Hello World! </div>
```

Not

good!

Hello World!