D3 Tutorial

Manipulation of DOM

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Selections - *d3*.select(*selector*)

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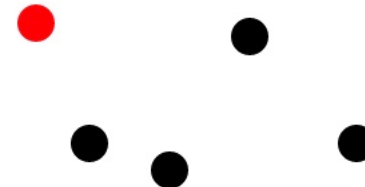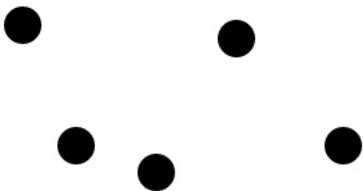 - selects only the first element that matches the specified *selector* string

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

    <g>
        <circle cx="150" cy="75" r="7" />
        <circle cx="110" cy="35" r="7" />
    </g>
</svg>
```
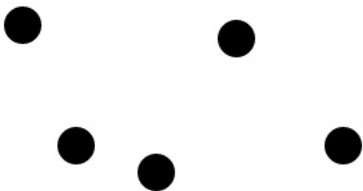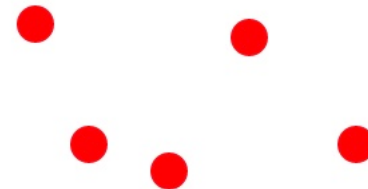
```
d3.select("circle").style("fill", "red");
```

Selections - *d3*.selectAll(*selector*)

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

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

    <g>
        <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
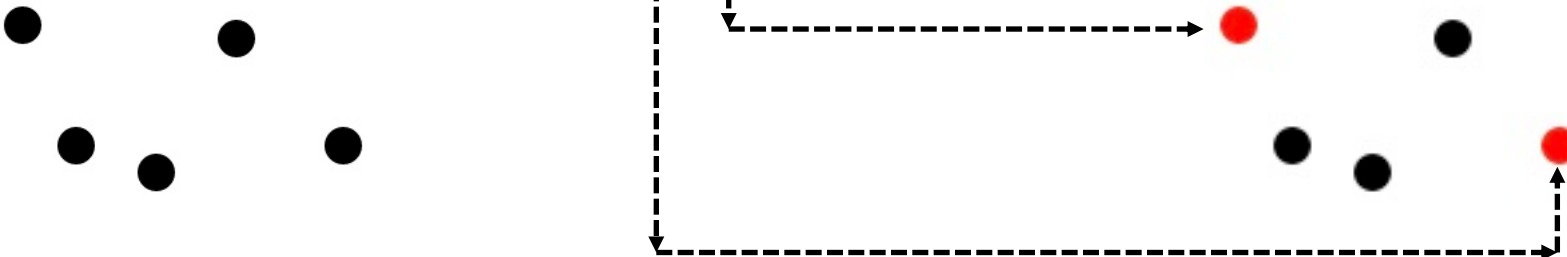 - ".className"
    - Select web objects with the specified class name
      - <AnyTag class="className"> </AnyTag>
    - E.g., select(".Book") is to select web objects of "<AnyTag class="Book"></AnyTag>"
  - "[AttributeName='Value']"
    - Select web objects with the attribute value
      - <AnyTag AttributeName="Value"> </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>
```
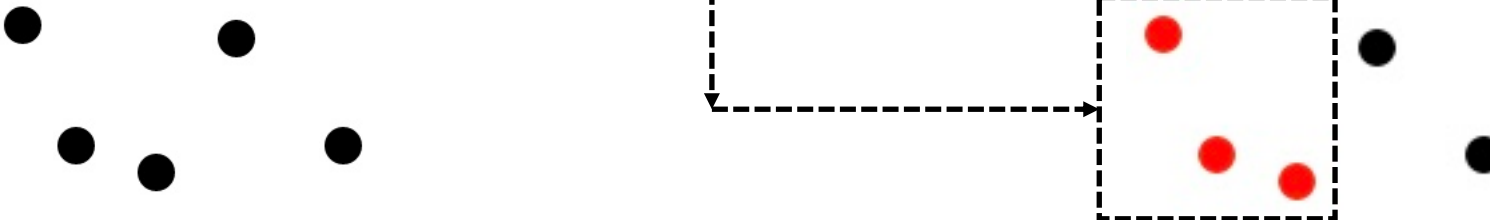
```
var selection_1 = d3.selectAll("g");
selection_1.select("circle").style("fill", "red");
```

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*)

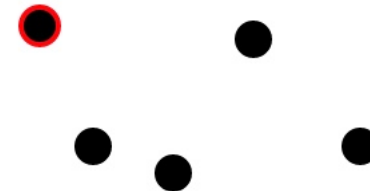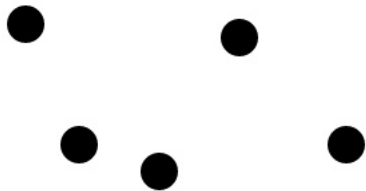- Set the **CSS** style property to the specified value on the selected elements

```
<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*)

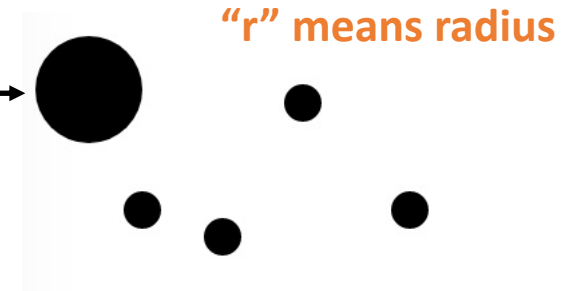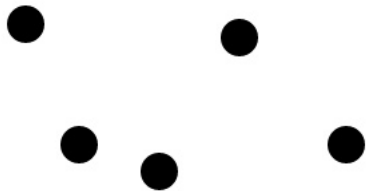- Set the attribute to the specified value on the selected elements


```
<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>
```

Attributes

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

"r" means radius

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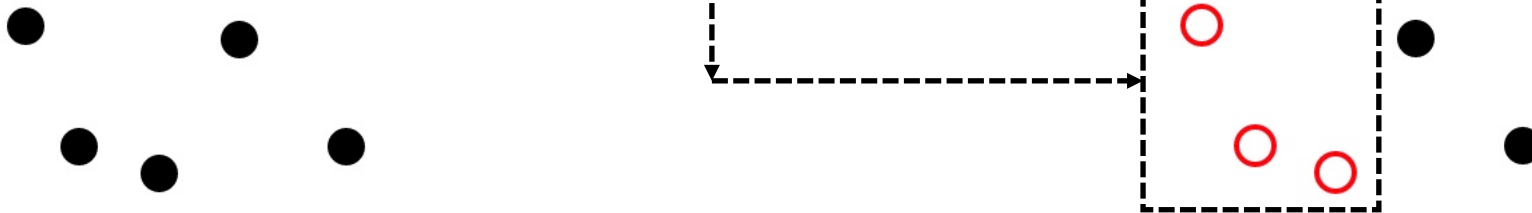
- When we want to apply this *hollow_circle* style to circles, we can use *selection*.classed(*className, value*) function

Selections - *selection*.classed(class*Name,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);
```
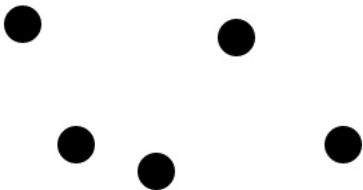
- The *value* in the function can only be *true* or *false*
  - *true* means making selected circles belong to the *hollow_circle* class
  - *false* means removing selected circles from the *hollow_circle* class

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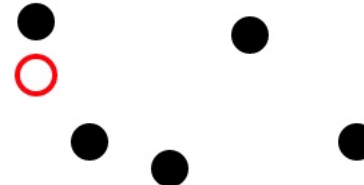
```
var newCircle = d3.select("#group_1").append("circle");
newCircle
    .attr("cx", "30")
    .attr("cy", "50")
    .attr("r", "7")
    .classed("hollow_circle", true);
```

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

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

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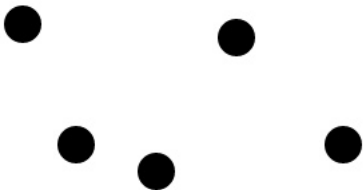
```
var selection_5 = d3.select("#group_2");
selection_5.remove();
```

Selections - *selection*.text(*value*)

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

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

+

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

=

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

Not

good!

Hello World!