



DEEP
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DLI Accelerated Data Science Teaching Kit

Lecture 9.4 - Enter-Update-Exit



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Enter-Update-Exit

- The most critical facet of how D3 works
- If you remember nothing else from today, remember this...
- “Enter-Update-Exit”
- “Enter-Update-Exit”
- “Enter-Update-Exit”

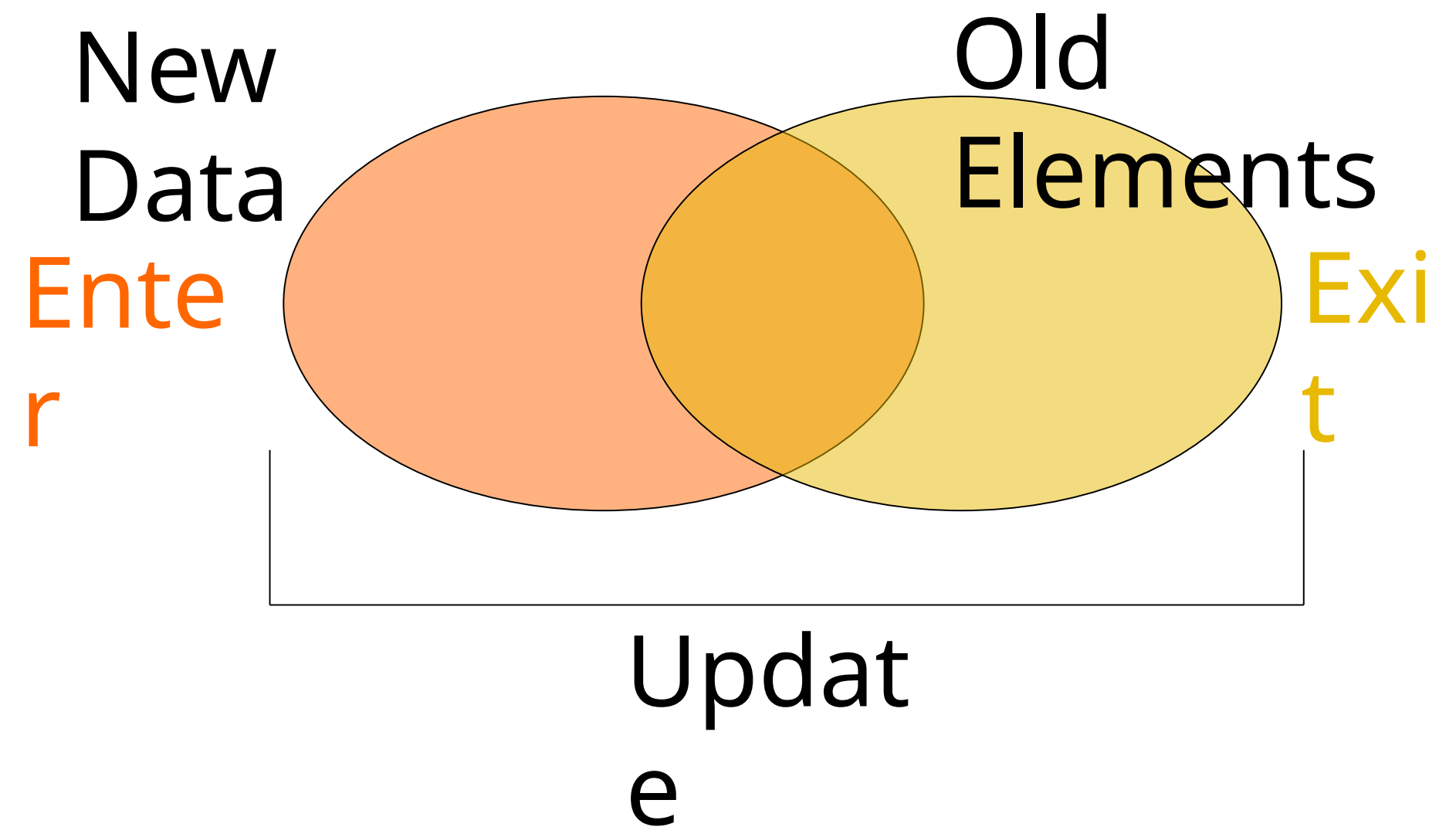
Enter-Update-Exit

Pattern:

- Select a “group” of “elements” (e.g., circles)
- Assign data to the group
- Enter: Create new elements for data points not associated with any elements yet (and set constant or initial attribute values)
- Update: Set the attributes of all the elements based on the data
- Exit: Remove elements that don't have data anymore

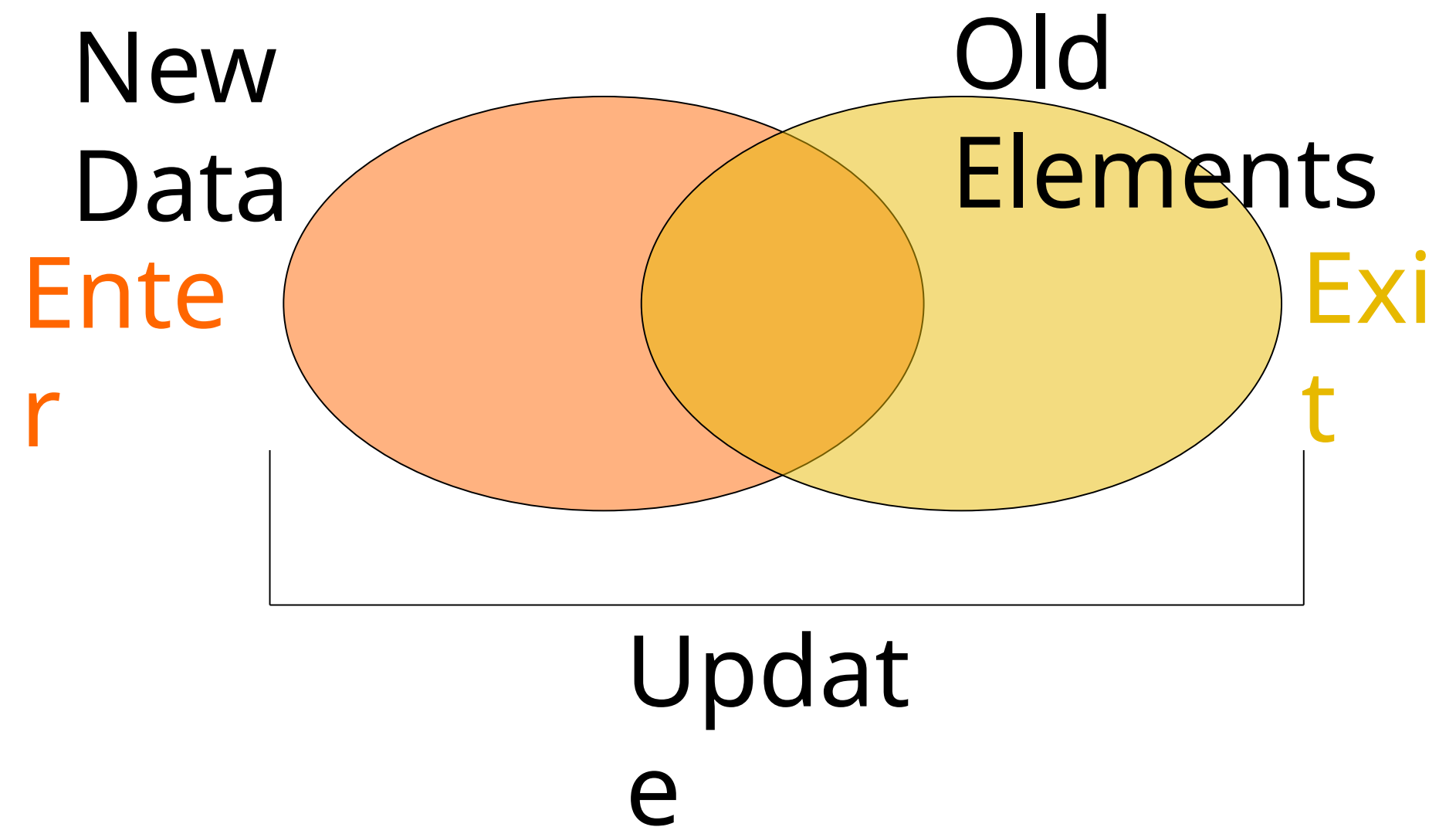
.enter() and .exit()

- `.data([1,2,3,4])`
 - Enter: `[1,2,3,4]`
 - Update: `[1,2,3,4]`
 - Exit: `[]`
- `.data ([1,2,3,4,5,6])`
 - Enter: `[5,6]`
 - Update: `[1,2,3,4,5,6]`
 - Exit: `[]`
- `.data ([1,2,3])`
 - Enter: `[]`
 - Update: `???`
 - Exit: `[4,5,6]`



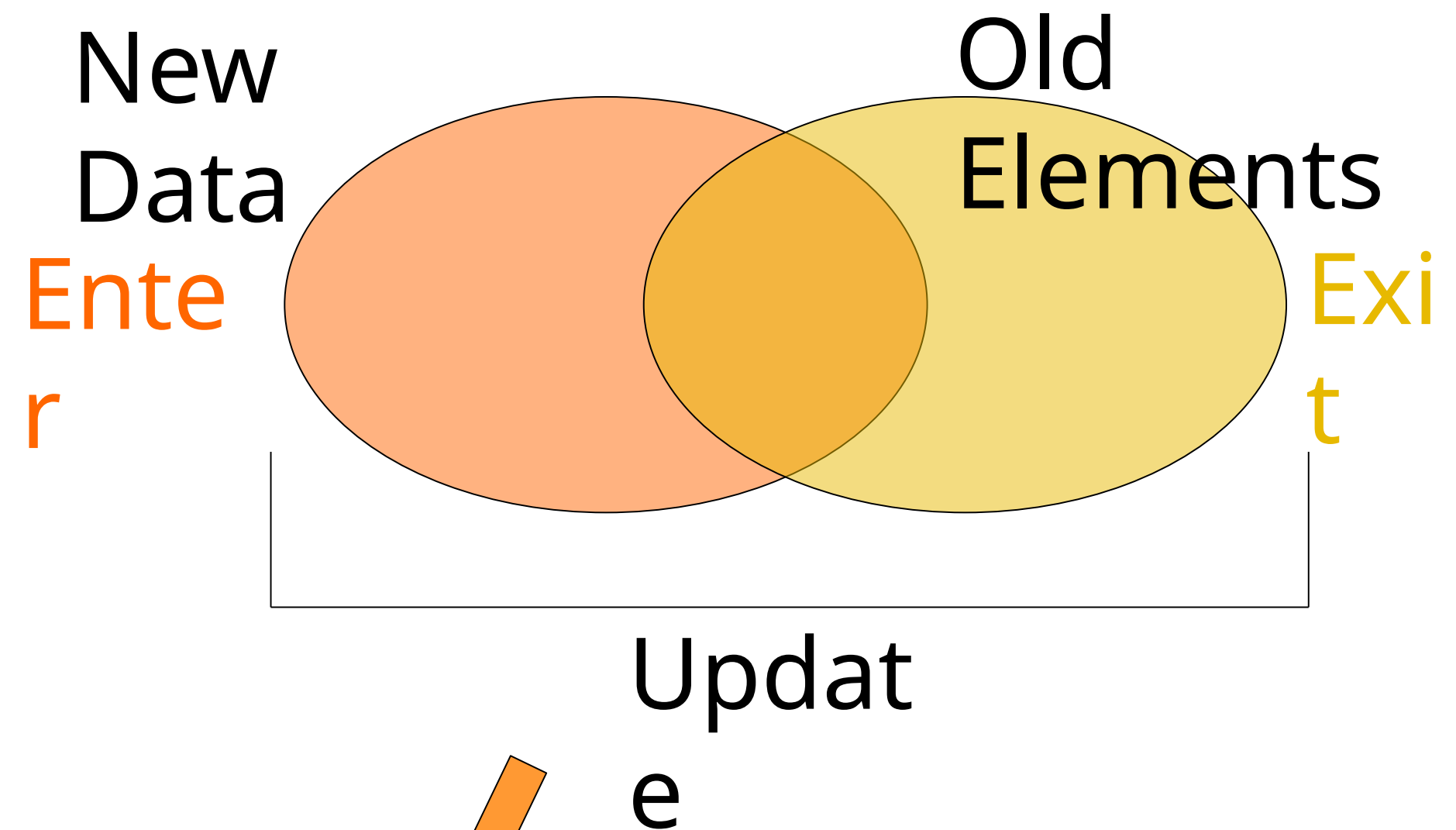
.enter() and .exit()

- `.data([1,2,3,4])`
 - Enter: [1,2,3,4]
 - Update: [1,2,3,4]
 - Exit: []
- `.data ([1,2,3,4,5,6])`
 - Enter: [5,6]
 - Update: [1,2,3,4,5,6]
 - Exit: []
- `.data ([1,2,3])`
 - Enter: []
 - Update: [1,2,3,4,5,6]
 - Exit: [4,5,6]



.enter() and .exit()

- .enter()
 - New data points
- .exit()
 - Elements to be removed
- .enter() and .exit() only exist when **.data()** has been called



Can be hard to grok:
You can select groups of elements that
DON'T EXIST YET

<http://bost.ocks.org/mike/join/>

Data Key Functions

- `.data(rawdata)` defaults to assuming that the **index of the point is the key**
- `.data(rawdata, function(d,i){ })` allows you to **set a key functions**
- e.g.
 - `.data(rawdata, function(d,i) { return d.id; })`
 - `.data(rawdata, function(d,i) { return d.name; })`

E-U-E Pattern Template

```
var group = vis.selectAll("rect")  
    .data(rawdata) //rawdata must be an  
    array!  
group.enter( ).append("rect") //ENTER!  
    .attr( )  
    .style( )  
group //UPDATE!  
    .attr( )  
    .style( )  
group.exit( ).remove( ) //EXIT!
```

WARNING!!!!

E-U-E Pattern Template

```
var group = vis.selectAll("rect")  
    .data(rawdata) //rawdata must be an  
    array!  
group.enter( ).append("rect") //ENTER!  
    .attr( )  
    .style( )  
group //UPDATE!  
    .attr( )  
    .style( )  
group.exit( ).remove( ) //EXIT!
```

Many online examples

E-U-E Pattern Template

```
var group = vis.selectAll("rect")  
    .data(rawdata) //rawdata must be an  
    array!
```

```
group.enter( ).append("rect") //ENTER!  
    .attr( )  
    .style( )
```

Many online examples
drop the variable name
before .enter()

```
group //UPDATE!  
    .attr( )  
    .style( )
```

```
group.exit( ).remove( ) //EXIT!
```

E-U-E Pattern Template

```
var group = vis.selectAll("rect")  
    .data(rawdata) //rawdata must be an  
    array!
```

```
group.enter( ).append("rect") //ENTER!
```

```
.attr( )
```

```
.style( )
```

```
group //UPDATE!
```

```
.attr( )
```

```
.style( )
```

```
group.exit( ).remove( ) //EXIT!
```

Many online examples
drop the variable name before
.enter()

I highly recommend you don't!



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Thank You

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