D3 Data Bind

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   .data([12, 23, 42, 18, 7])
```

- Data values are bound to DOM elements

- An update, enter, *and* exit selection is returned

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Data Bind Matching Game

DATA

12

23

42

18

DOM Elements

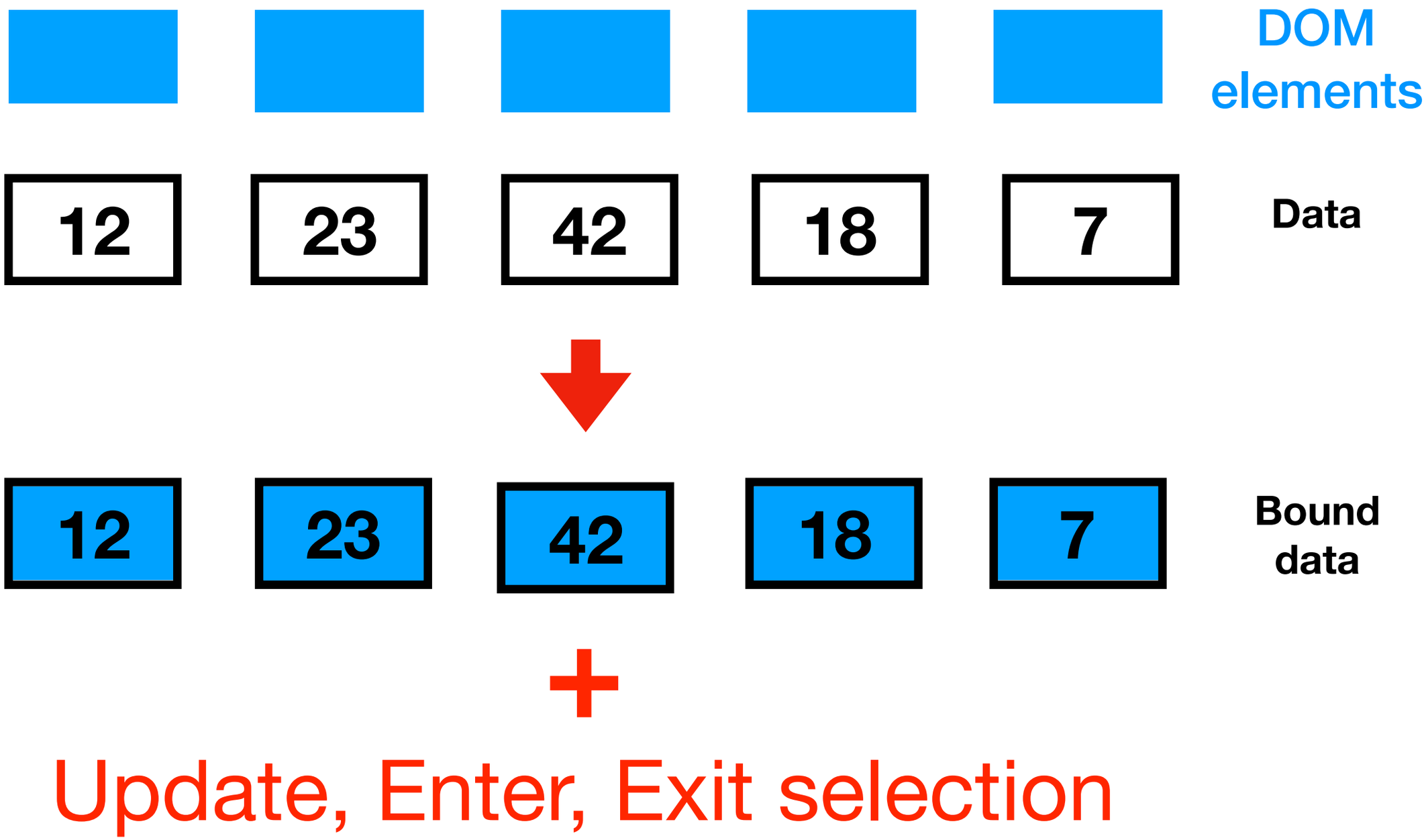
Update, Enter, Exit Selections

- **Matched data/DOM elements --> Update selection**

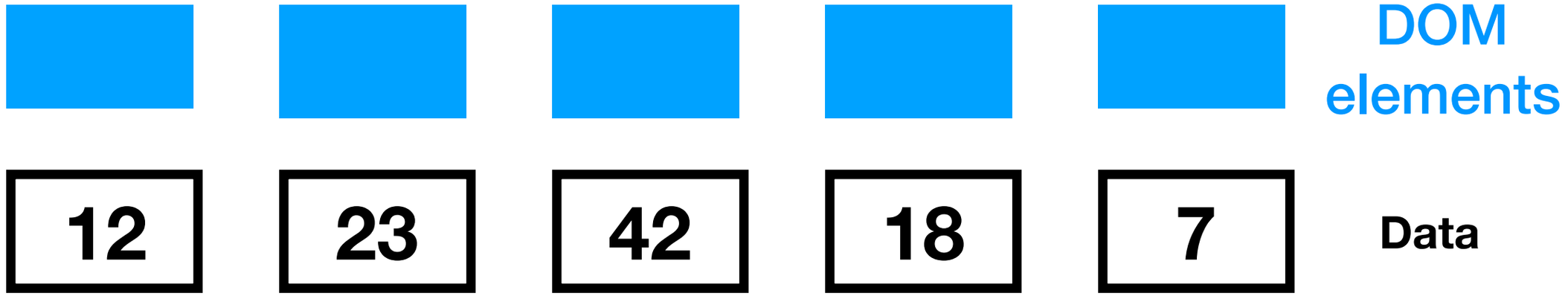
- **DOM elements that don't find matches --> Exit selection**

- **"Placeholder" non-existent DOM elements for data that don't find matches --> Enter selection**

Data bind


DOM elements
12
23
42
18
7
Data
12
23
42
18
7
Bound data
Update, Enter, Exit selection

Before data bind



Number of elements (after data bind)?

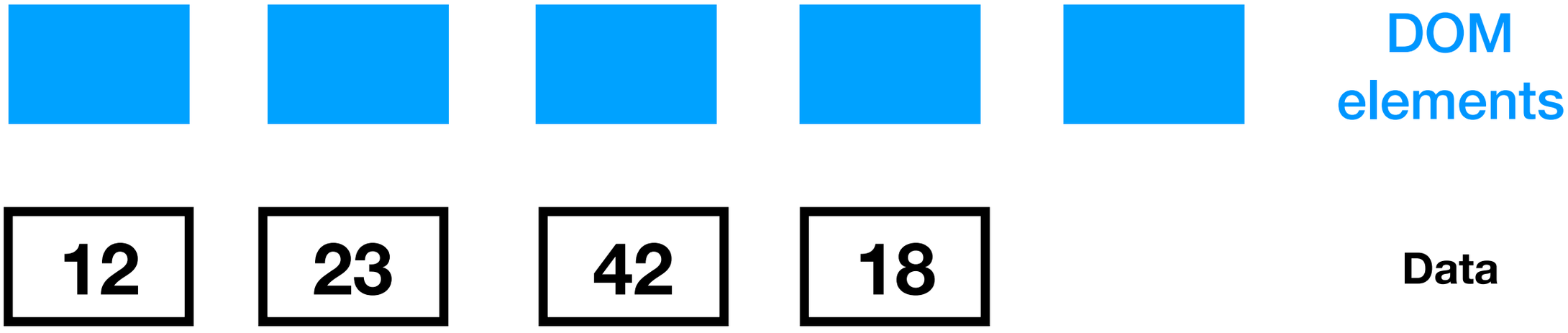
UPDATE **ENTER** **EXIT**

After data bind

Number of elements:

UPDATE	ENTER	EXIT
5	0	0

Before data bind



Number of elements (after data bind)?

UPDATE **ENTER** **EXIT**

After data bind

Number of elements:

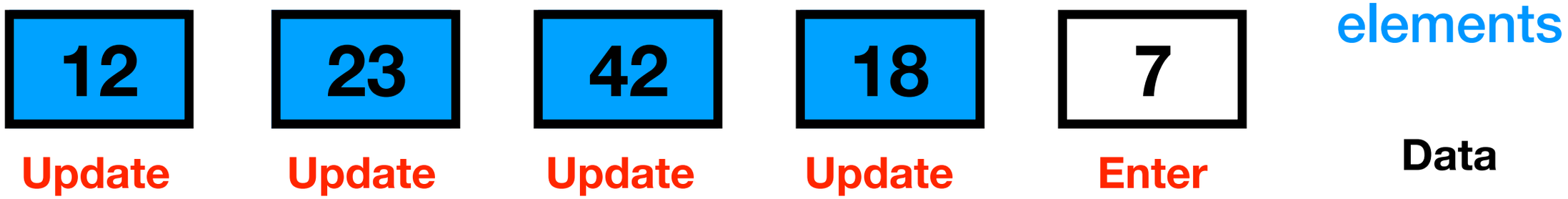
UPDATE	ENTER	EXIT
4	0	1

Before data bind

Number of elements (after data bind)?

UPDATE **ENTER** **EXIT**

After data bind



Number of elements:

UPDATE	ENTER	EXIT
4	1	0

Before data bind

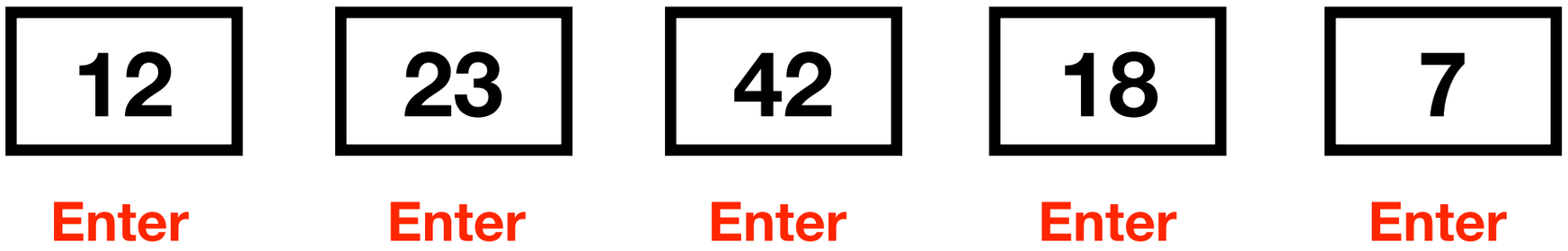
DOM elements

12	23	42	18	7	Data

Number of elements (after data bind)?

UPDATE **ENTER** **EXIT**

After data bind



Number of elements:

UPDATE	ENTER	EXIT
0	*5*	0

Before data bind

Data

Number of elements (after data bind)?

UPDATE **ENTER** **EXIT**

After data bind

Number of elements:

UPDATE	ENTER	EXIT
0	0	5

D3 Data Bind

```
d3.select("svg").selectAll("rect")
   .data([12, 23, 42, 18, 7])
```

- Data values are bound to DOM elements
- An update, enter, *and* exit selection is returned

How do we access selections?

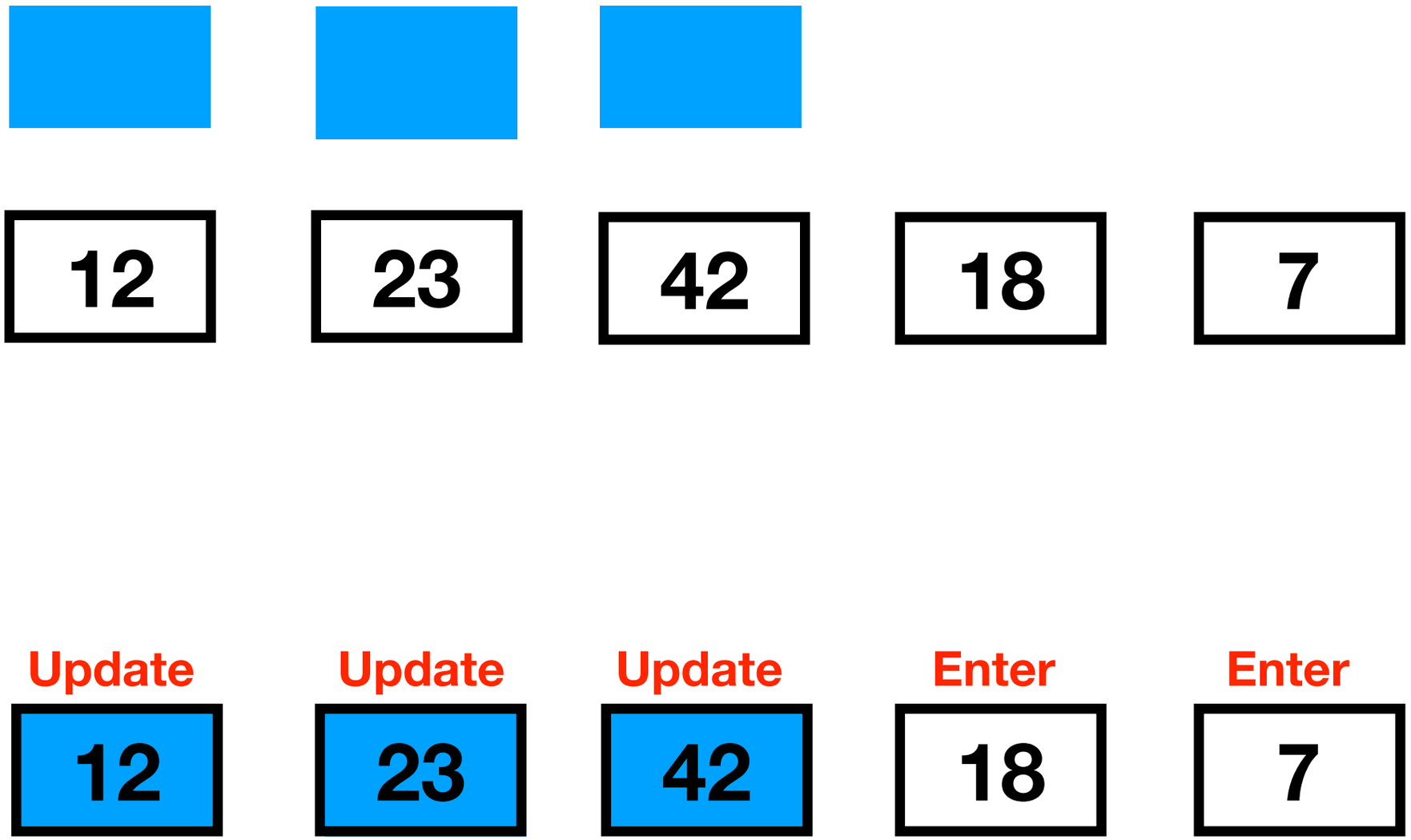
Accessing selections

Update: *selection*.***data***([*data*])

Enter: *selection*.***enter***()

Exit: *selection*.***exit***()

Scenario 1:
More data than DOM elements



Update, enter, exit selections

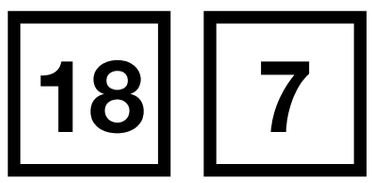
```
var svg = d3.select("svg");

svg.selectAll("rect")
    .data([12, 23, 42, 18, 7]);
```

UPDATE


```
svg.selectAll("rect")
    .data([12, 23, 42, 18, 7])
    .enter();
```

ENTER




```
svg.selectAll("rect")
    .data([12, 23, 42, 18, 7])
    .exit();
```

EXIT

∅

Update selection

```
> svg.selectAll("rect").data([12, 23, 42, 18, 7]);
< ▼ ut {_groups: Array(1), _parents: Array(1), _enter: Array(1), _exit: Array(1)} i
    ▶ _enter: [Array(5)]
    ▶ _exit: [Array(3)]
    ▼ _groups: Array(1)
      ▶ 0: (5) [rect, rect, rect, empty × 2]
        length: 1
      ▶ __proto__: Array(0)
    ▶ _parents: [svg]
    ▶ __proto__: Object
```

Matches

Enter selection

```
> svg.selectAll("rect")
      .data([12, 23, 42, 18, 7])
      .enter();
```

```
◀ ▼ut {_groups: Array(1), _parents: Array(1)}
    ▼ _groups: Array(1)
    ▶ 0: (5) [empty × 3, U, U]
      length: 1
```

Placeholders

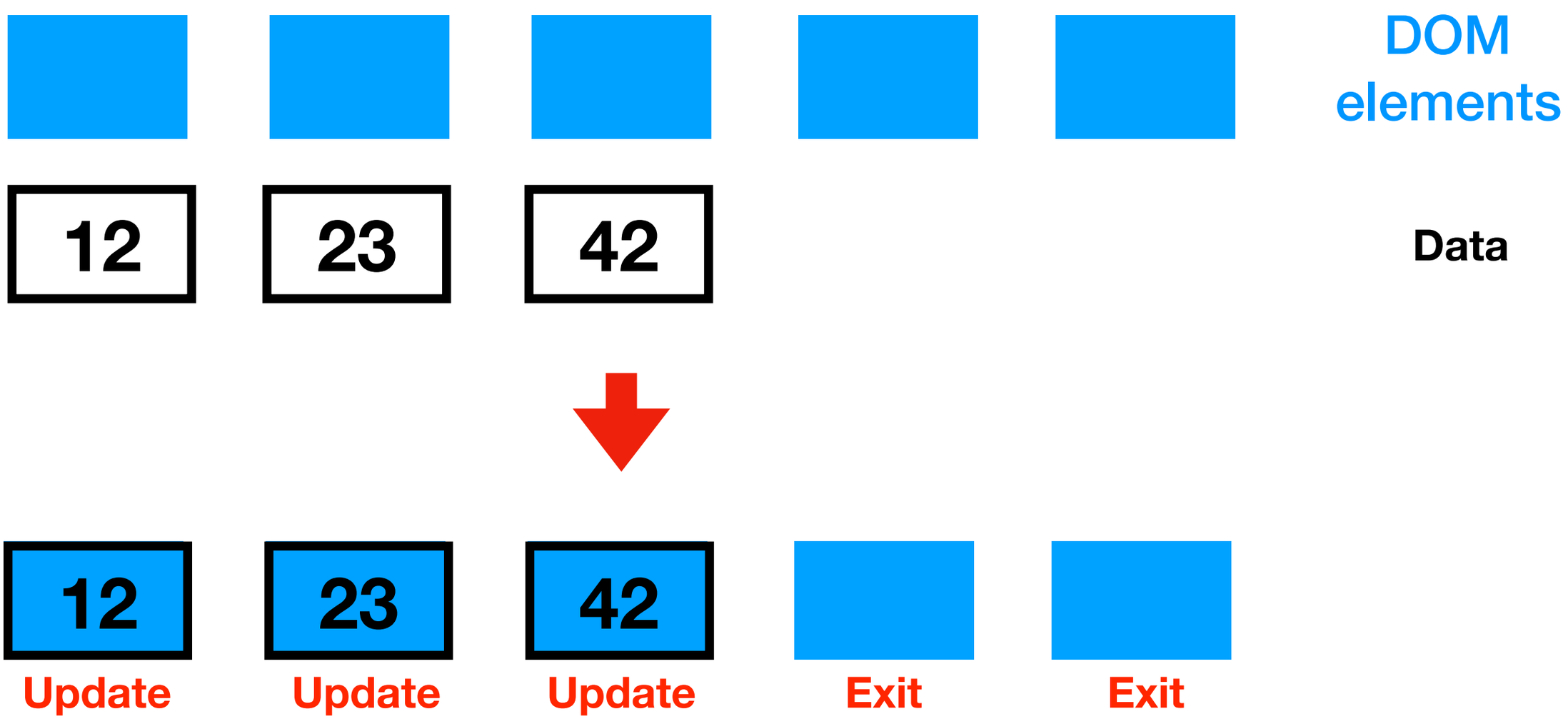
Exit selection

```
> svg.selectAll("rect")
      .data([12, 23, 42, 18, 7])
      .exit();
```

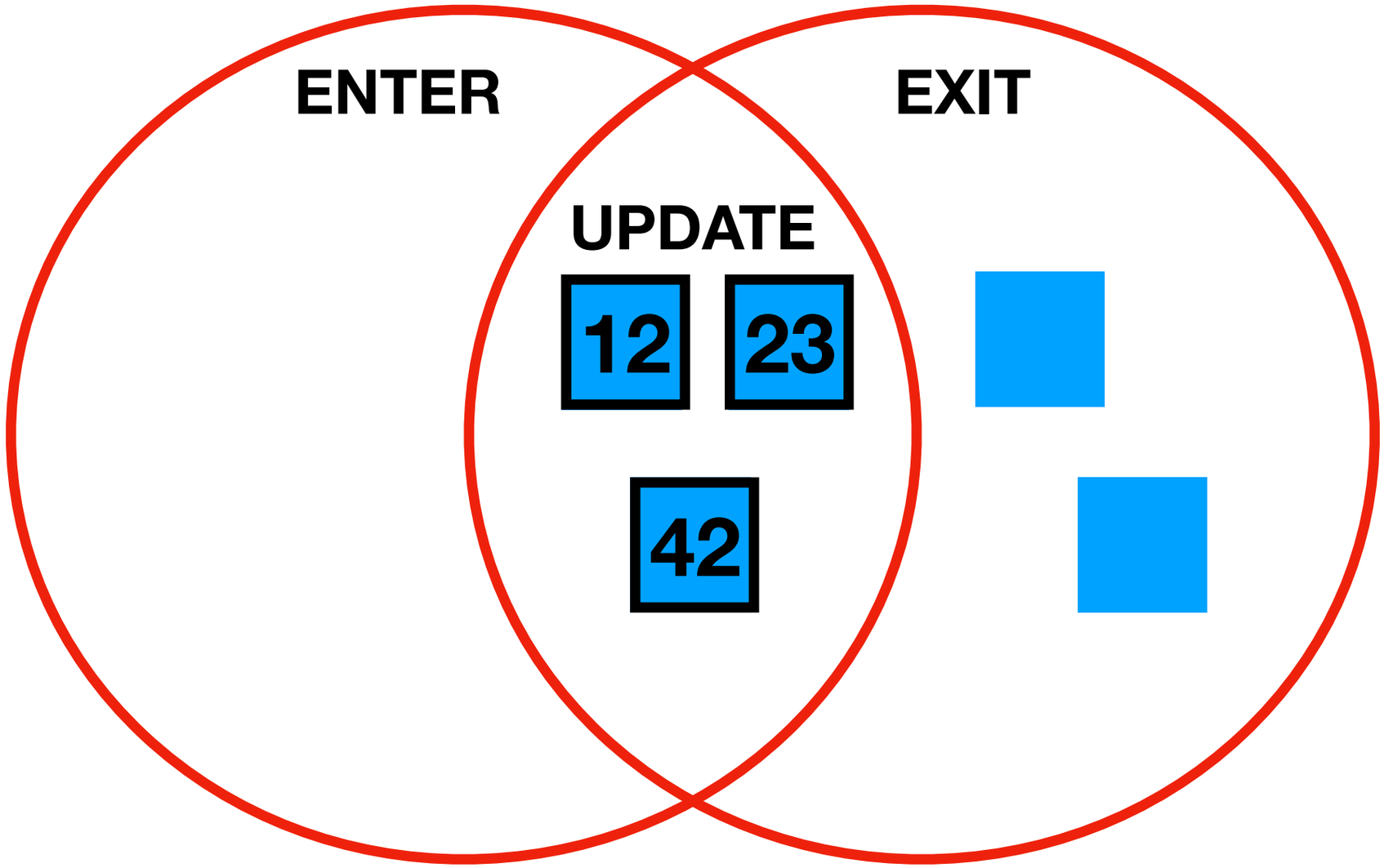
```
◀ ▼ut {_groups: Array(1), _parents: Array(1)}
    ▼ _groups: Array(1)
      ▶ 0: (3) [empty × 3]
        length: 1
```

Extra DOM elements

Scenario 2:
More DOM elements than data



Scenario 2:
More DOM elements than data



Venn Diagram

Update, Enter, Exit selections

```
> svg.selectAll("rect").data([12, 23, 42]);
    ▼ _groups: Array(1)
      ▶ 0: (3) [rect, rect, rect]
```

← Matches

```
> svg.selectAll("rect").data([12, 23, 42]).enter();
    ▼ _groups: Array(1)
      ▶ 0: (3) [empty × 3]
```

← Placeholders

```
> svg.selectAll("rect").data([12, 23, 42]).exit();
    ▼ _groups: Array(1)
      ▶ 0: (5) [empty × 3, rect, rect]
```

← Extra DOM elements

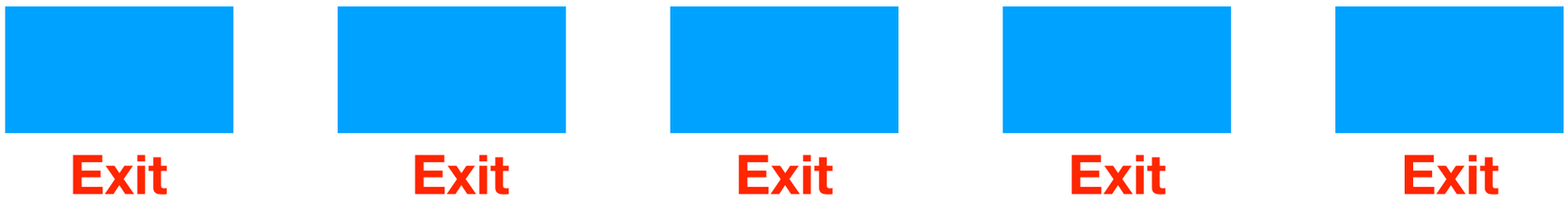
Adding elements

Usually we use the *enter* selection to add DOM elements:

```
var rects = svg.selectAll("rect")
    .data(dataset)

rects.enter()
    .append("rect");
```

Removing elements



Usually we use the *exit* selection to remove DOM elements:

```
var rects = svg.selectAll("rect")
    .data(dataset)

rects.exit()
    .remove();
```