Lab 5

ForEach vs Map

Enter, Update, Exit

Transitions

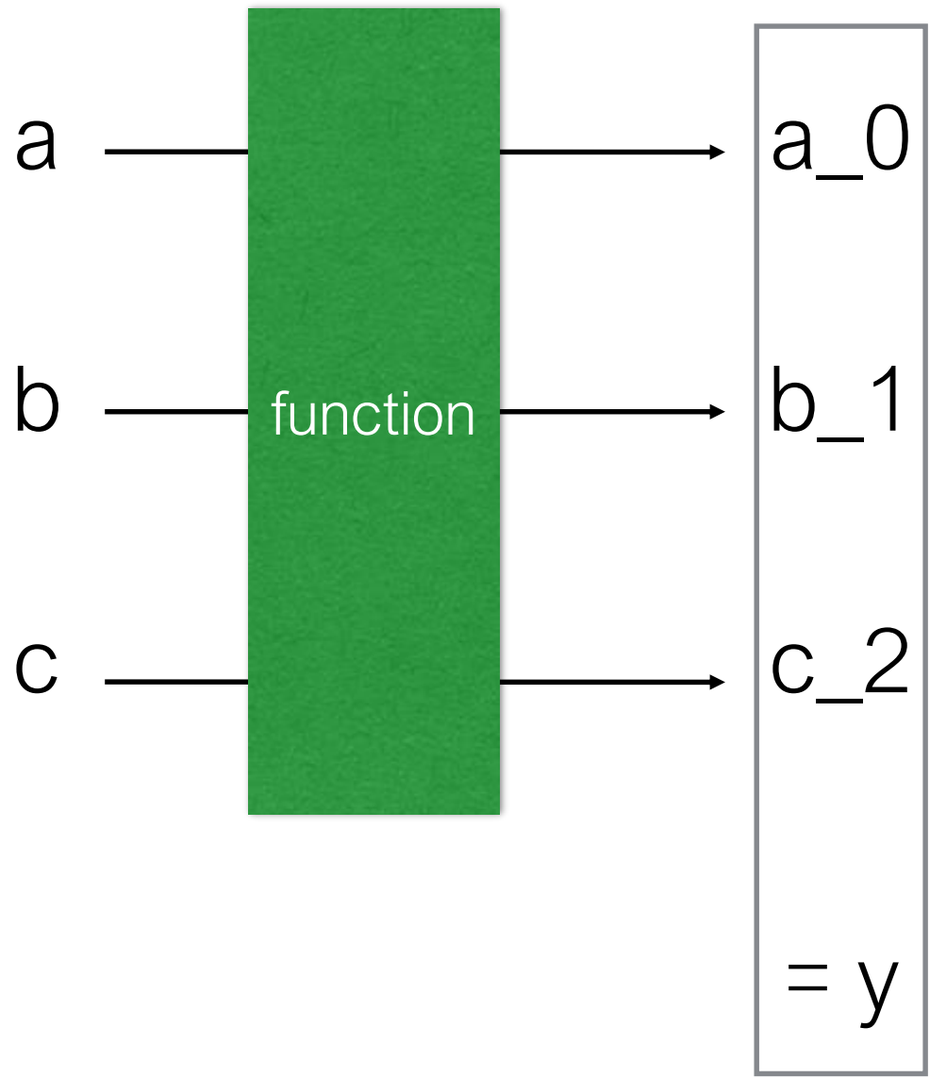
Key Function

Recap: ForEach vs. Map

```
var x = [‘a’,’b’,’c’].forEach(function(d, i){console.log(d);}
```

➡ x is ‘undefined’

```
var y = [‘a’,’b’,’c’].map(function(d, i){return d+’_’+i;}
```



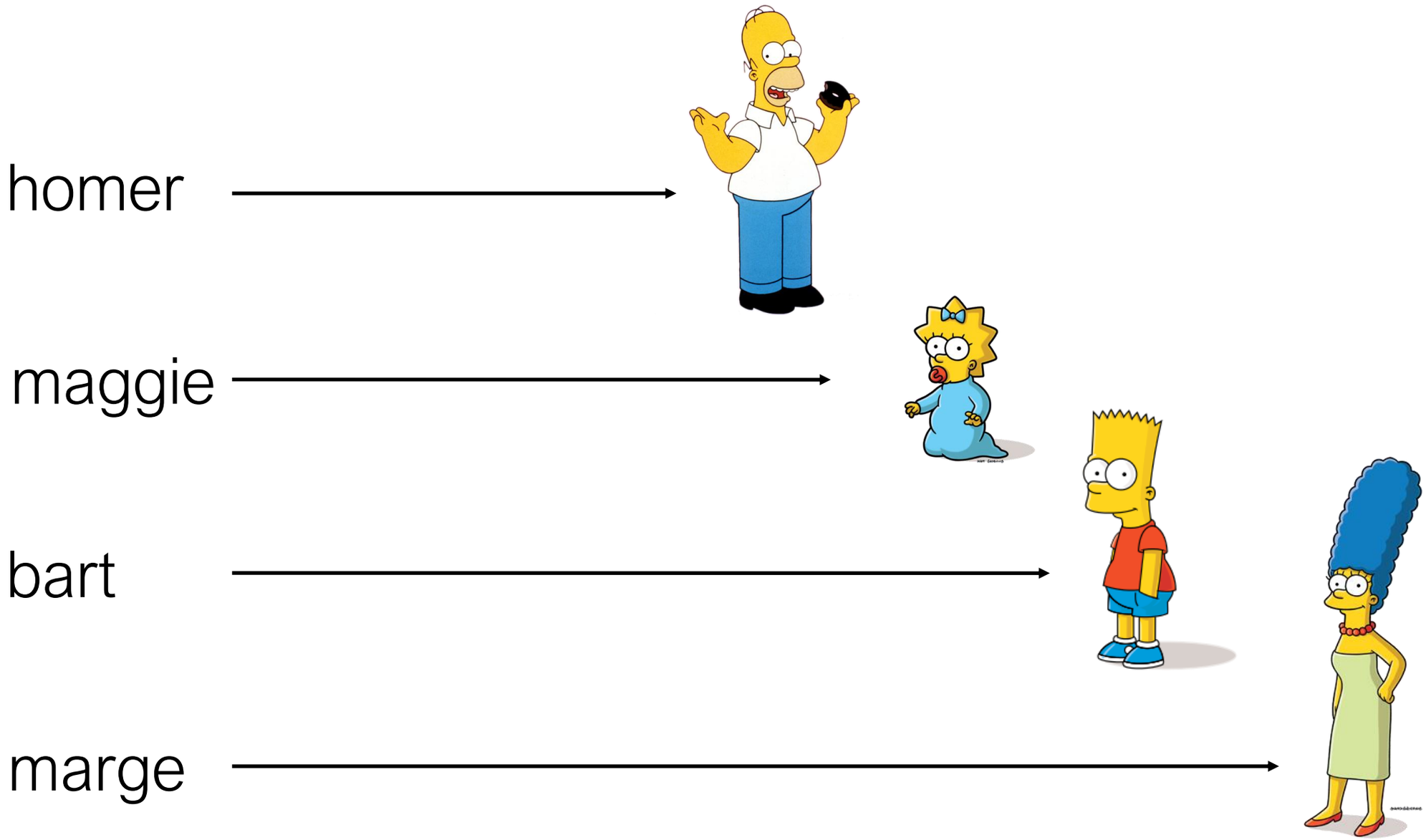
Enter, Update, Exit

A Simpsons Tale

CS 171

D3 - Data Driven Documents

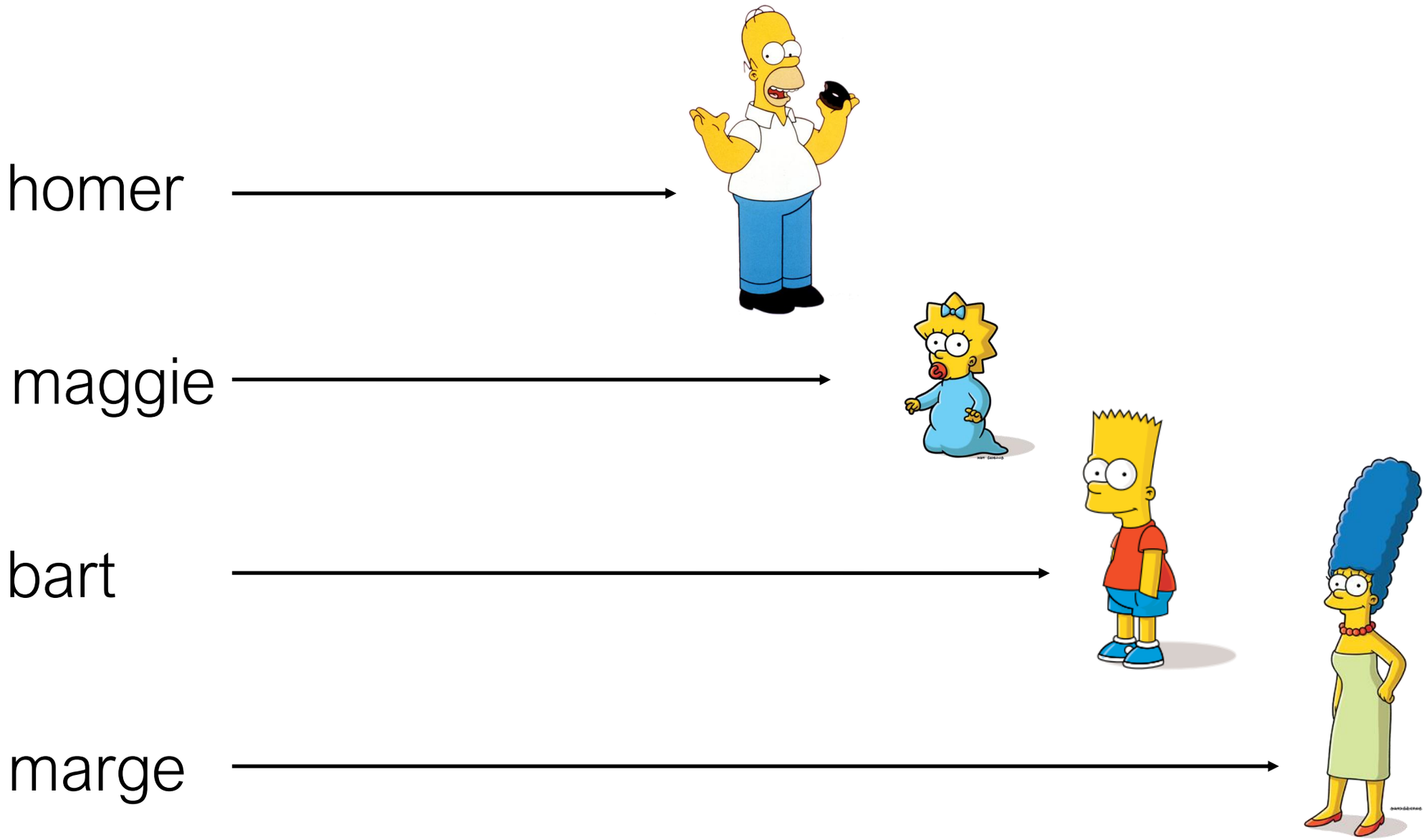
Every data item maps to a visual item.



Data **Document (Vis)**

D3 - Exit

If data disappears.



Data **Document (Vis)**

D3 - Enter

If data appears.

homer

maggie

bart

marge

Data

Document (Vis)

D3 - Update

If data changes (size is same).

homer

maggie

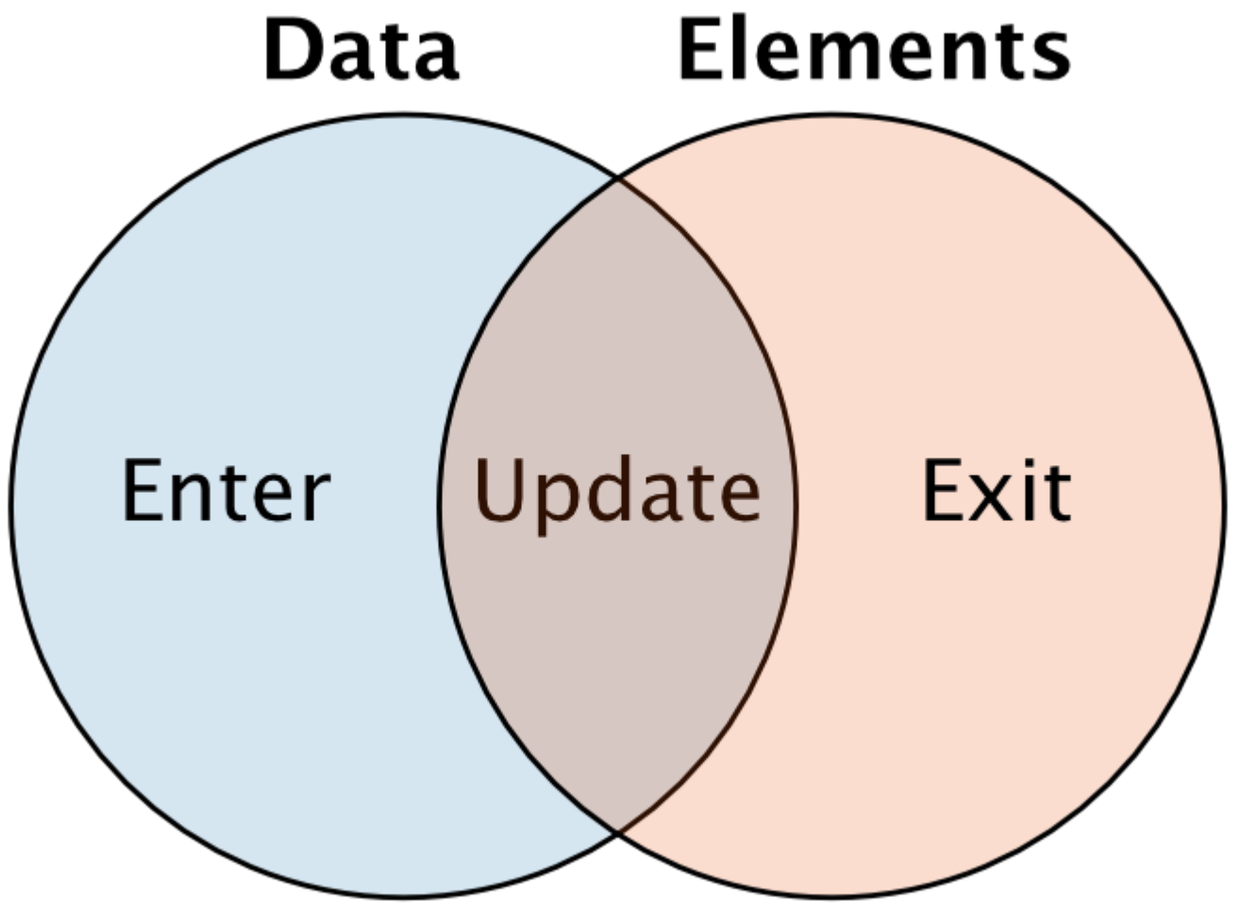
bart

marge

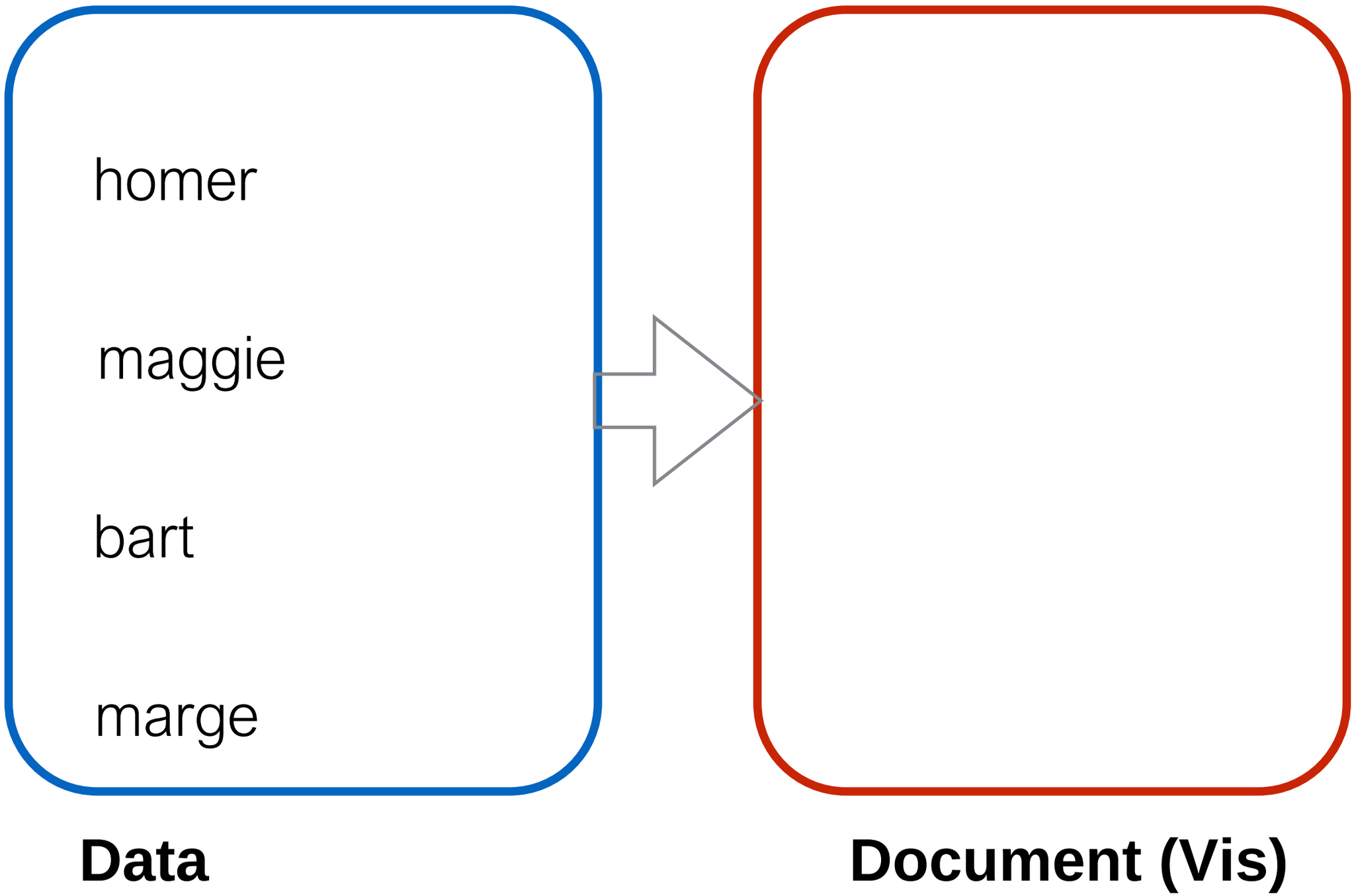
Data **Document (Vis)**

D3 – Selection depends on Data and Elements Relation

```
var selection = svg.selectAll(“.elements”).data(allData);
```

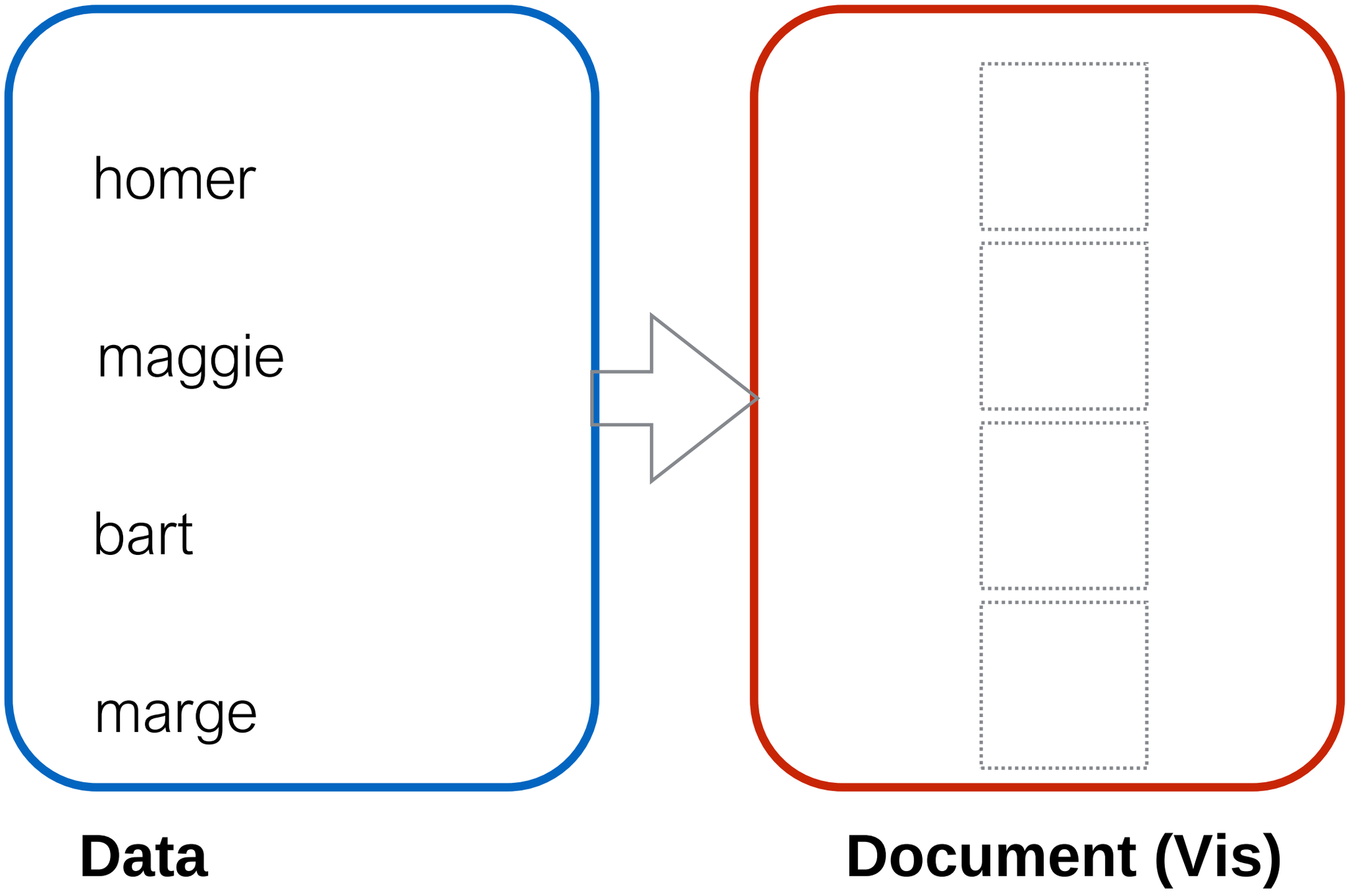


```
var allData = {‘homer’,’maggie’,’bart’,’marge’}
var simpsons = svg.selectAll(“.simpson”).data(allData);
```



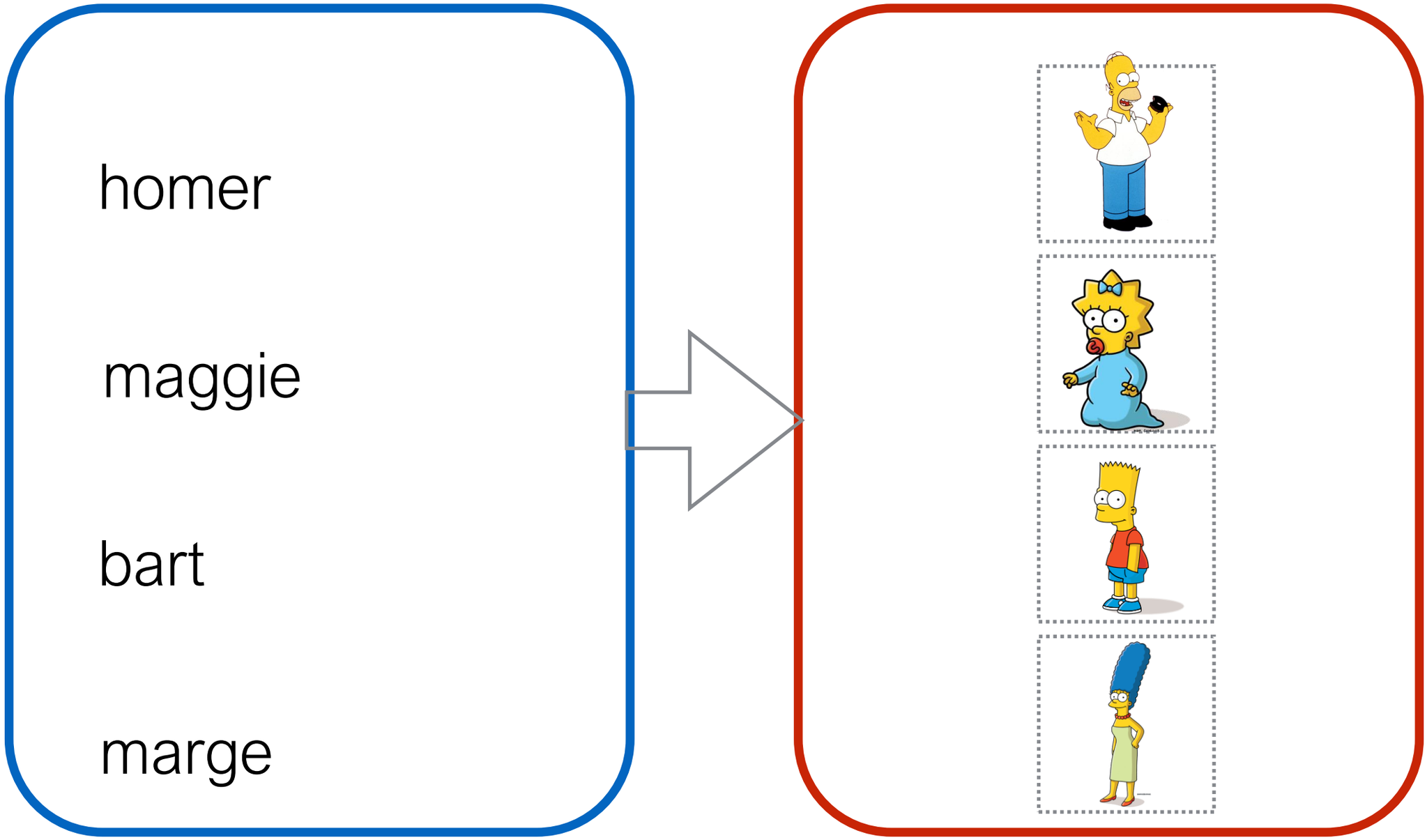
Enter

```
var allData = {‘homer’,’maggie’,’bart’,’marge’}
var simpsons = svg.selectAll(“.simpson”).data(allData);
var allThatEnter = simpsons.enter();
```



Enter

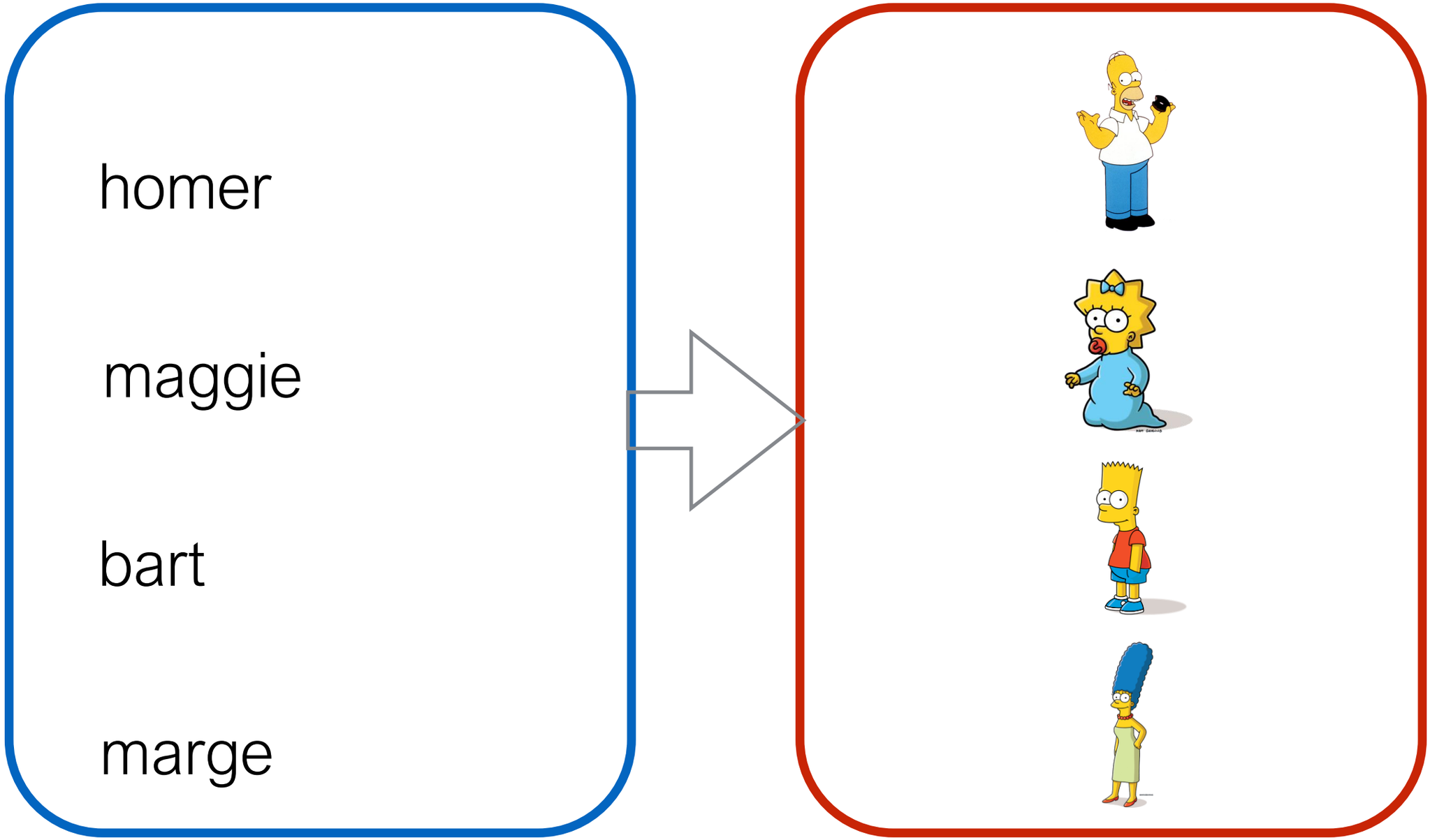
```
var allData = {‘homer’,’maggie’,’bart’,’marge’}
var simpsons = svg.selectAll(“.simpson”).data(allData);
var allThatEnter = simpsons.enter();
allThatEnter.append(‘img’).attr(…);
```



Data **Document (Vis)**

```
var allData = {‘homer’,’bart’,’marge’}
var simpsons = svg.selectAll(“.simpson”).data(allData);
```

Exit

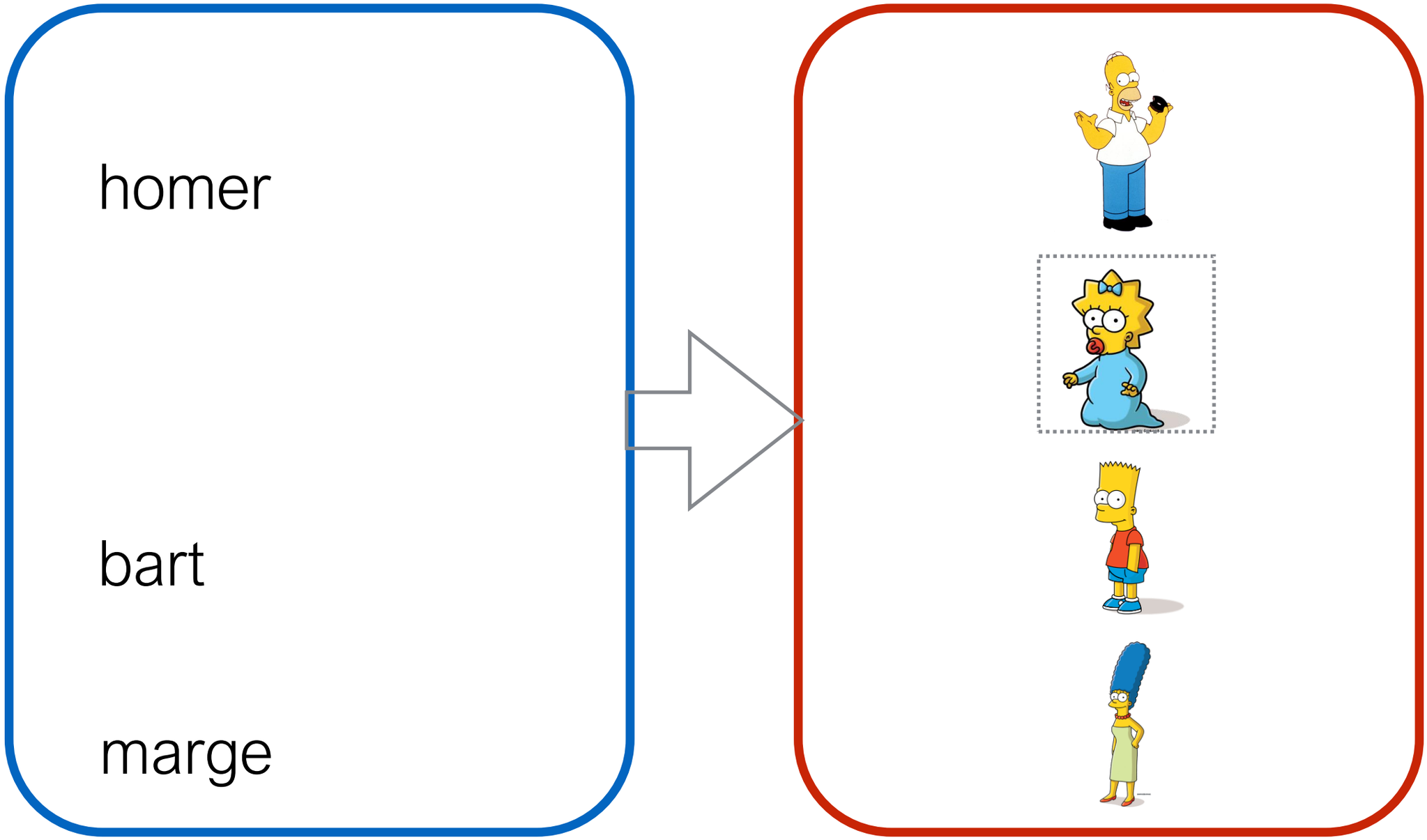


Data

Document (Vis)

Exit

```
var allData = {‘homer’,’bart’,’marge’}
var simpsons = svg.selectAll(“.simpson”).data(allData);
var allThatLeave = simpsons.exit();
```

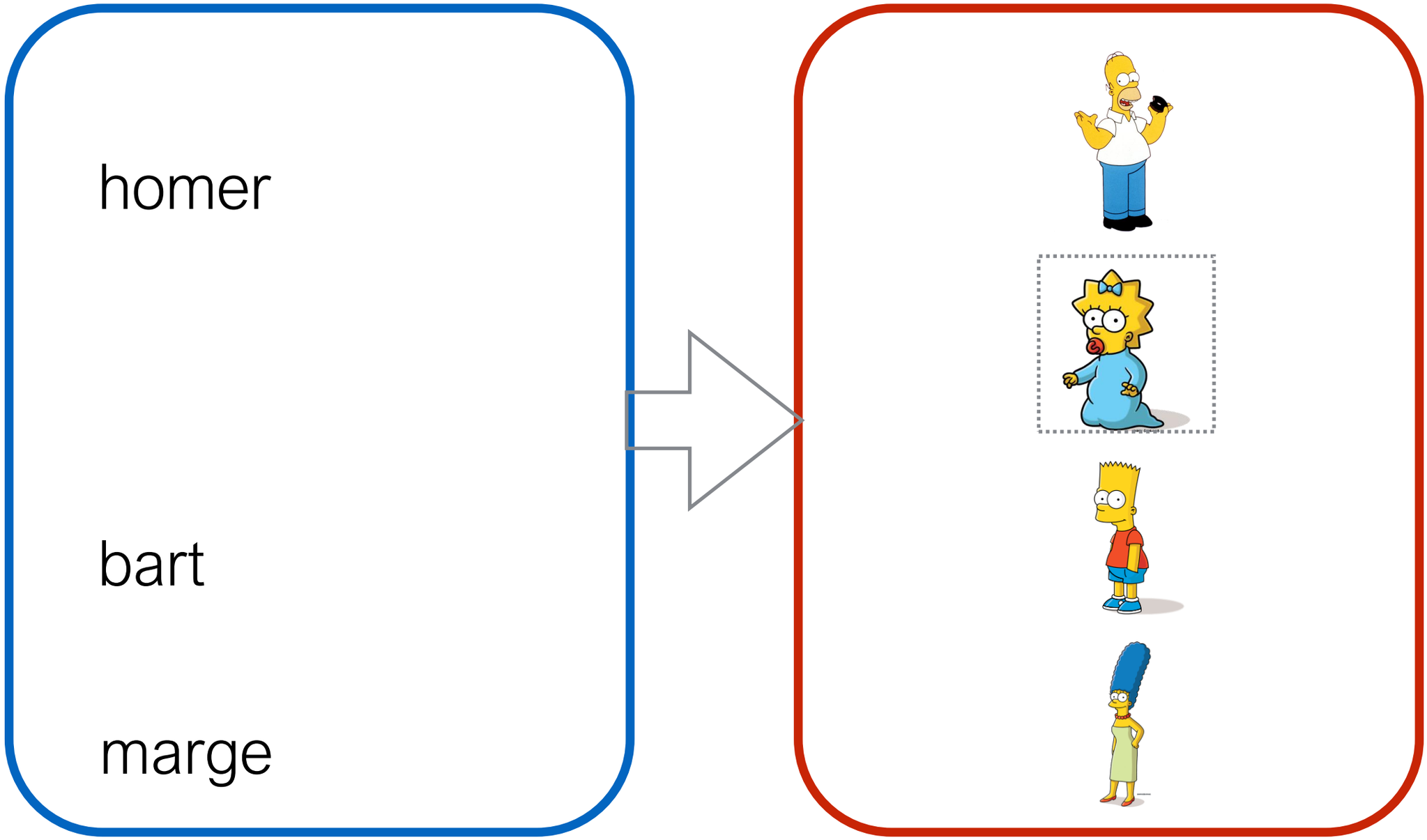


Data

Document (Vis)

Exit

```
var allData = {‘homer’,’bart’,’marge’}
var simpsons = svg.selectAll(“.simpson”).data(allData);
var allThatLeave = simpsons.exit();
allThatLeave.remove();
```

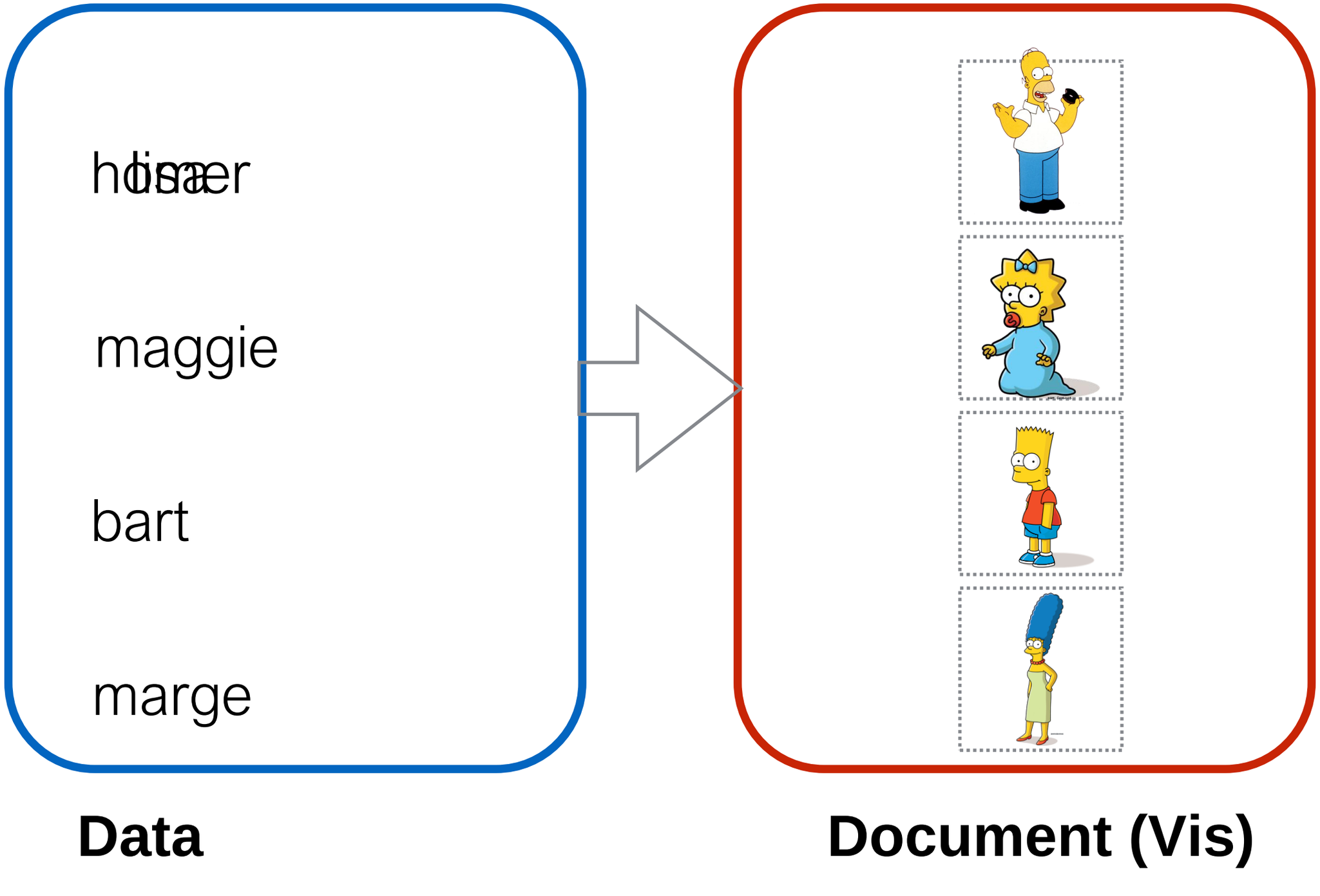


Data

Document (Vis)

Update

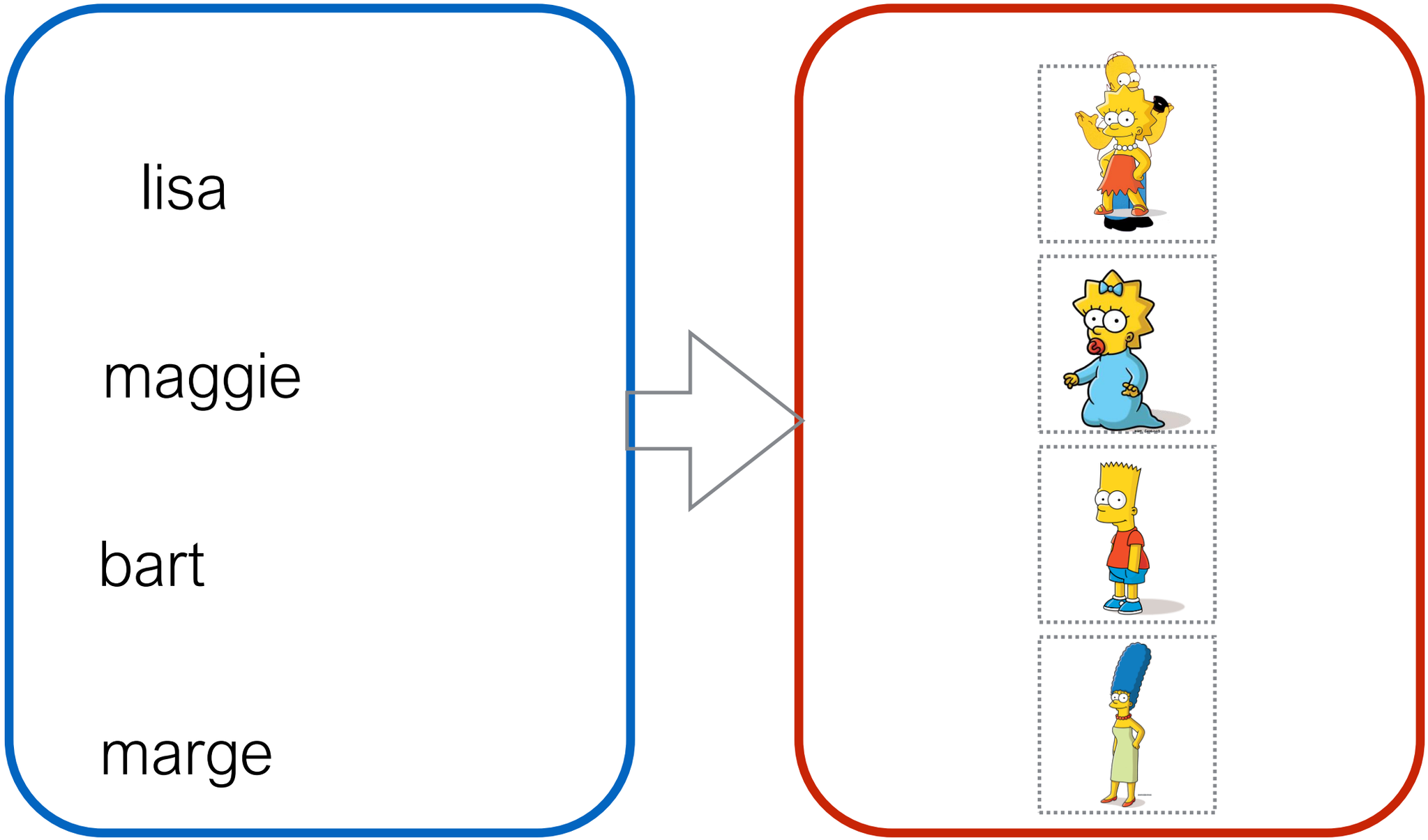
```
var allData = {‘lisa’,’maggie’,’bart’,’marge’}
var simpsons = svg.selectAll(“.simpson”).data(allData);
```



Data **Document (Vis)**

Update

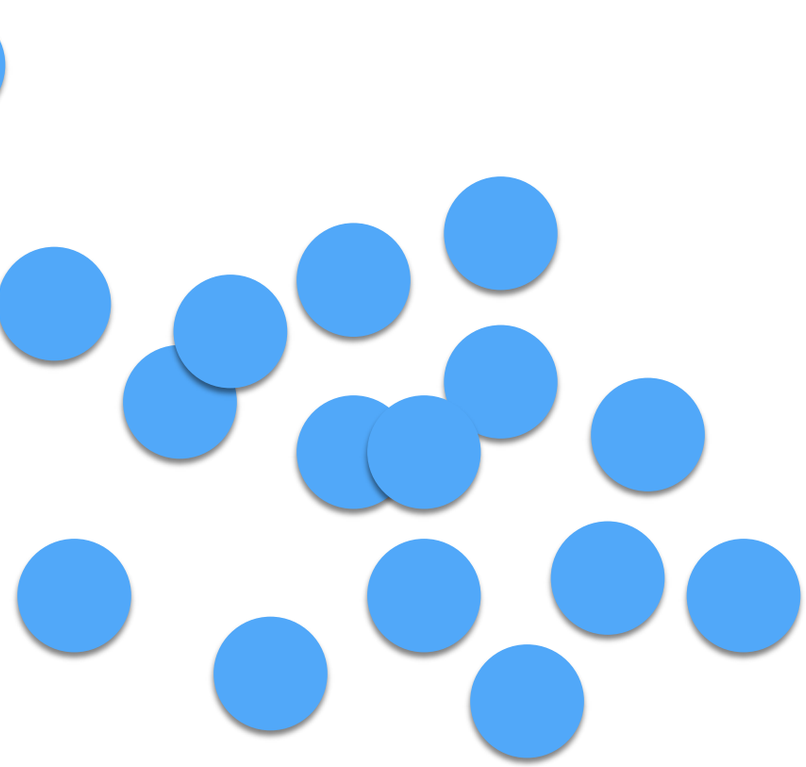
```
var allData = {‘lisa’,’maggie’,’bart’,’marge’}
var simpsons = svg.selectAll(“.simpson”).data(allData);
simpsons.attr(‘href’,function(d){return d+”.jpg”};
```



Data **Document (Vis)**

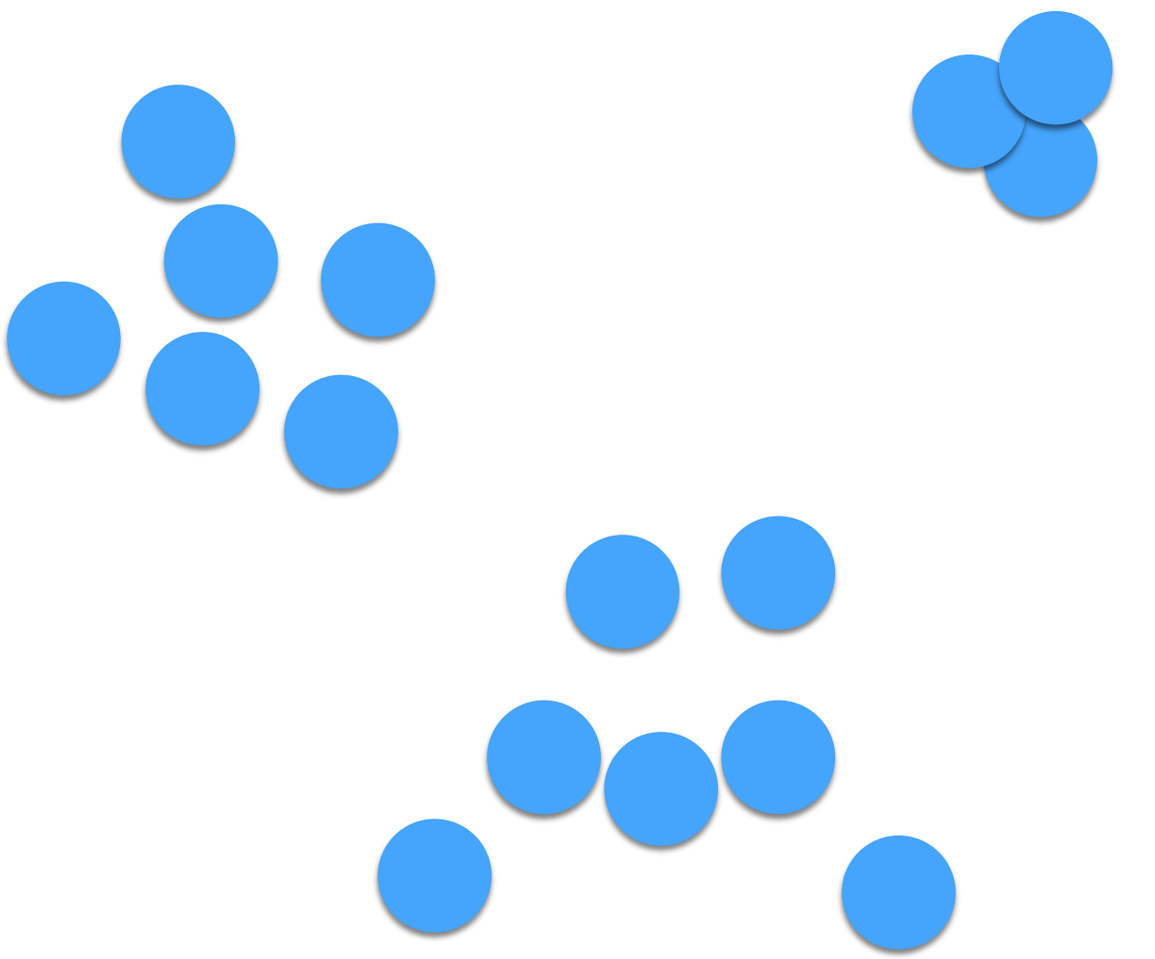
Transitions

Remember Lecture 4



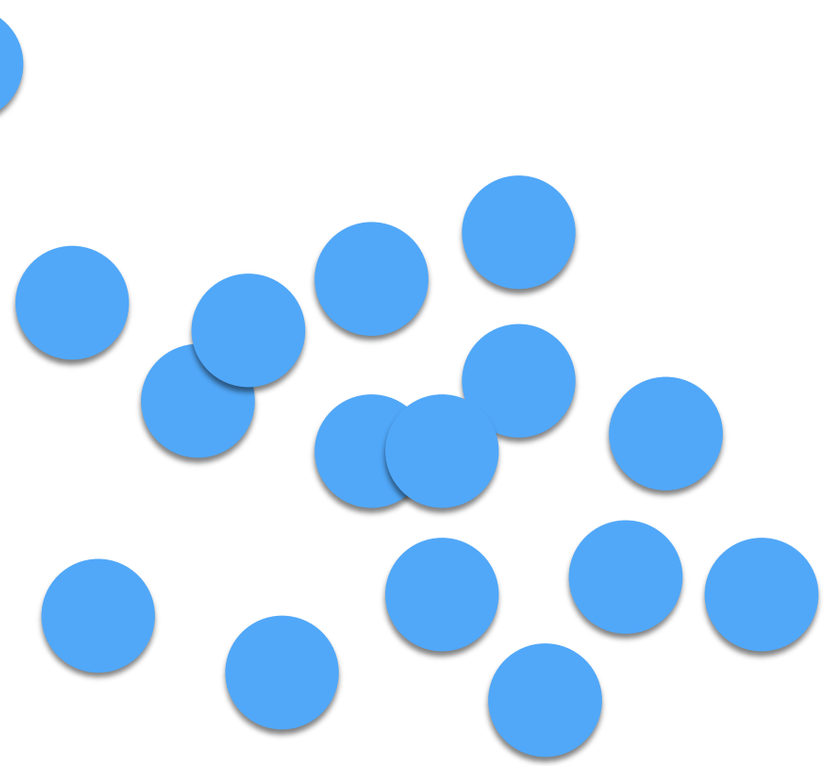
Transitions

Remember Lecture 4



Transitions

Transitions can help



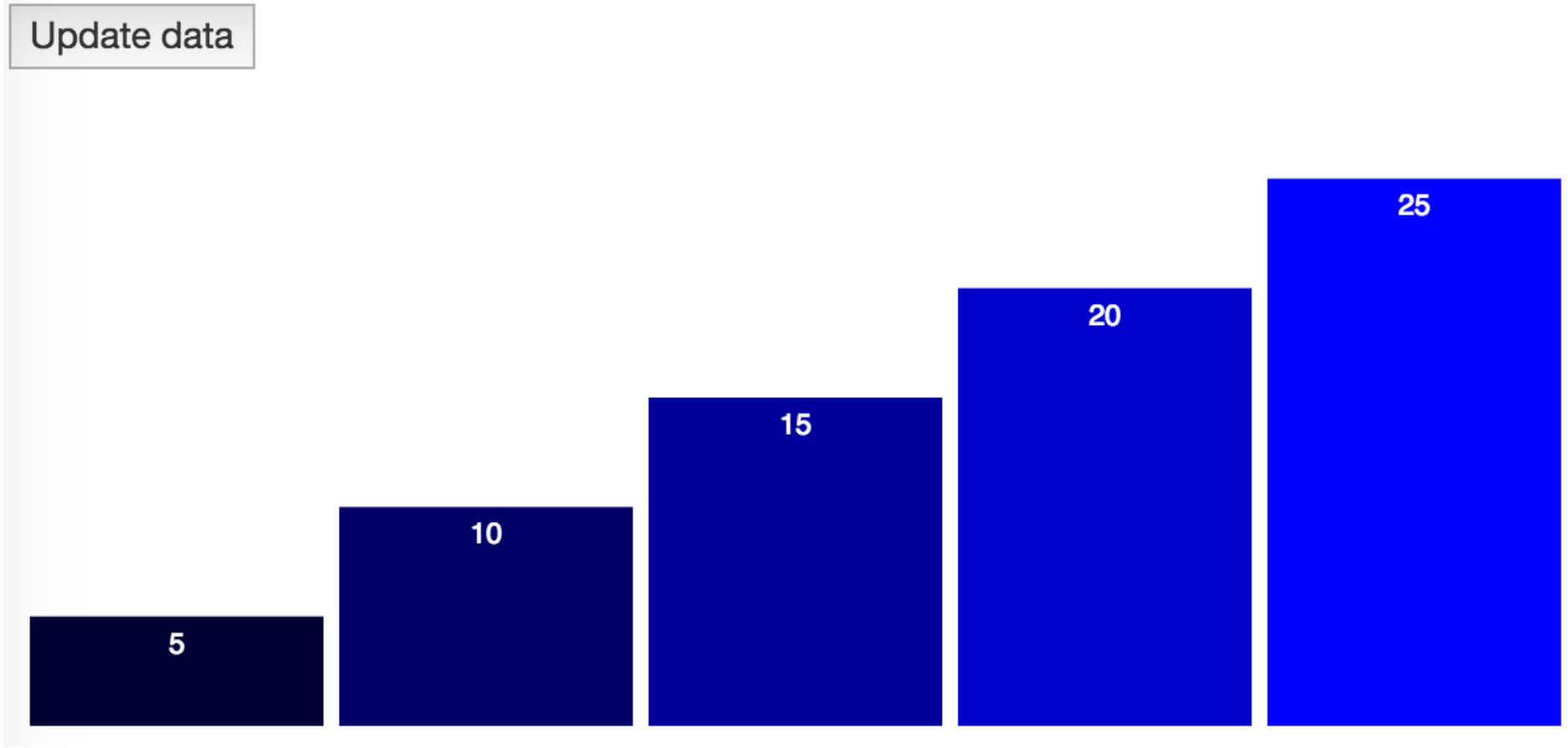
Transitions

```
// ~~~ changing nodes for simpsons
simpsons.transition().duration(2000).attr({
    r: function(d,i ){return i*20;},
    cx: function (d){return scalePosX(d);}
})
```

Use D3 key function for object constancy

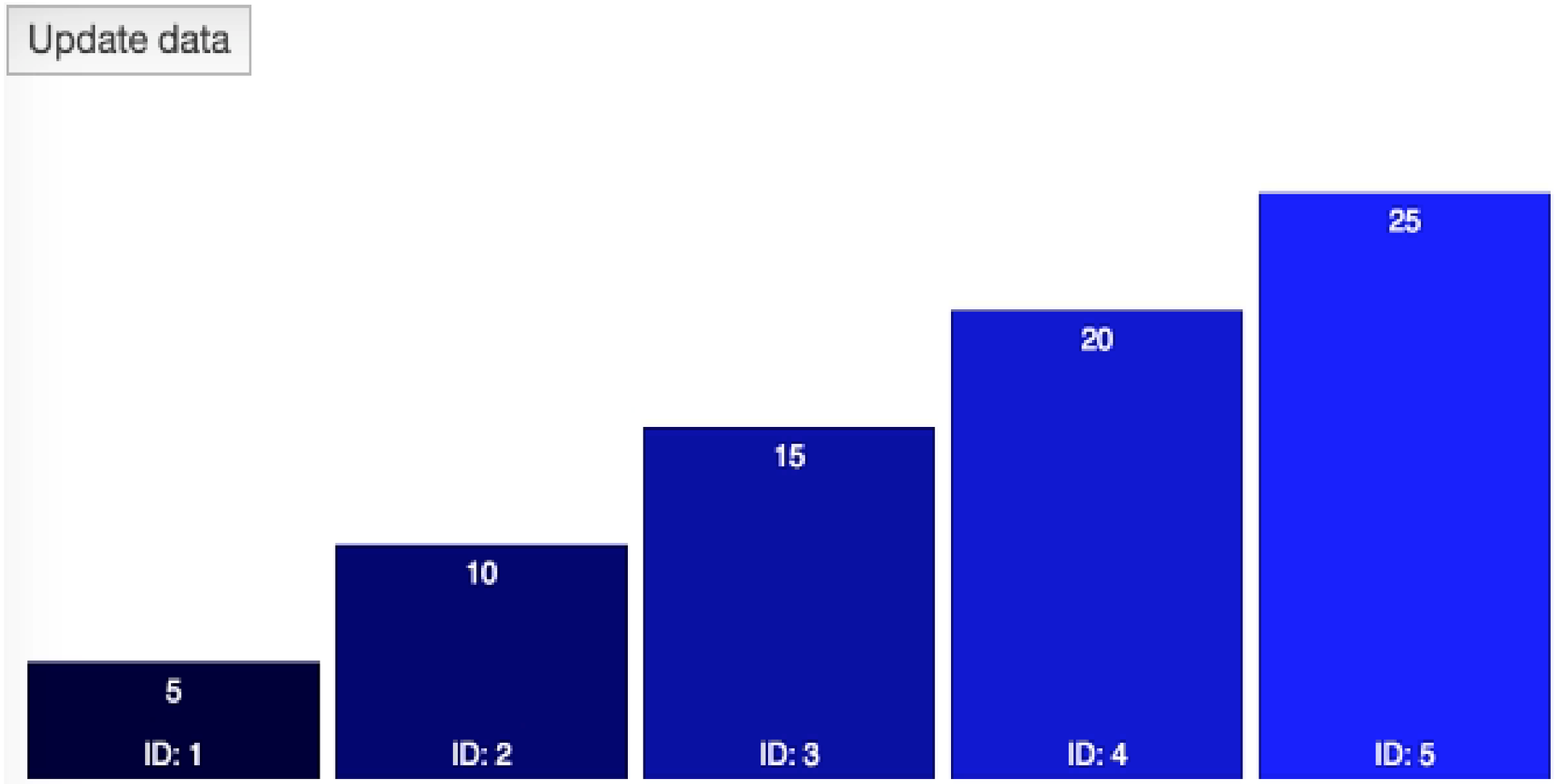
```
var allData = [ 5, 10, 15, 20, 25 ];
```

```
var allData = [ 10, 15, 20, 25, 30 ];
```



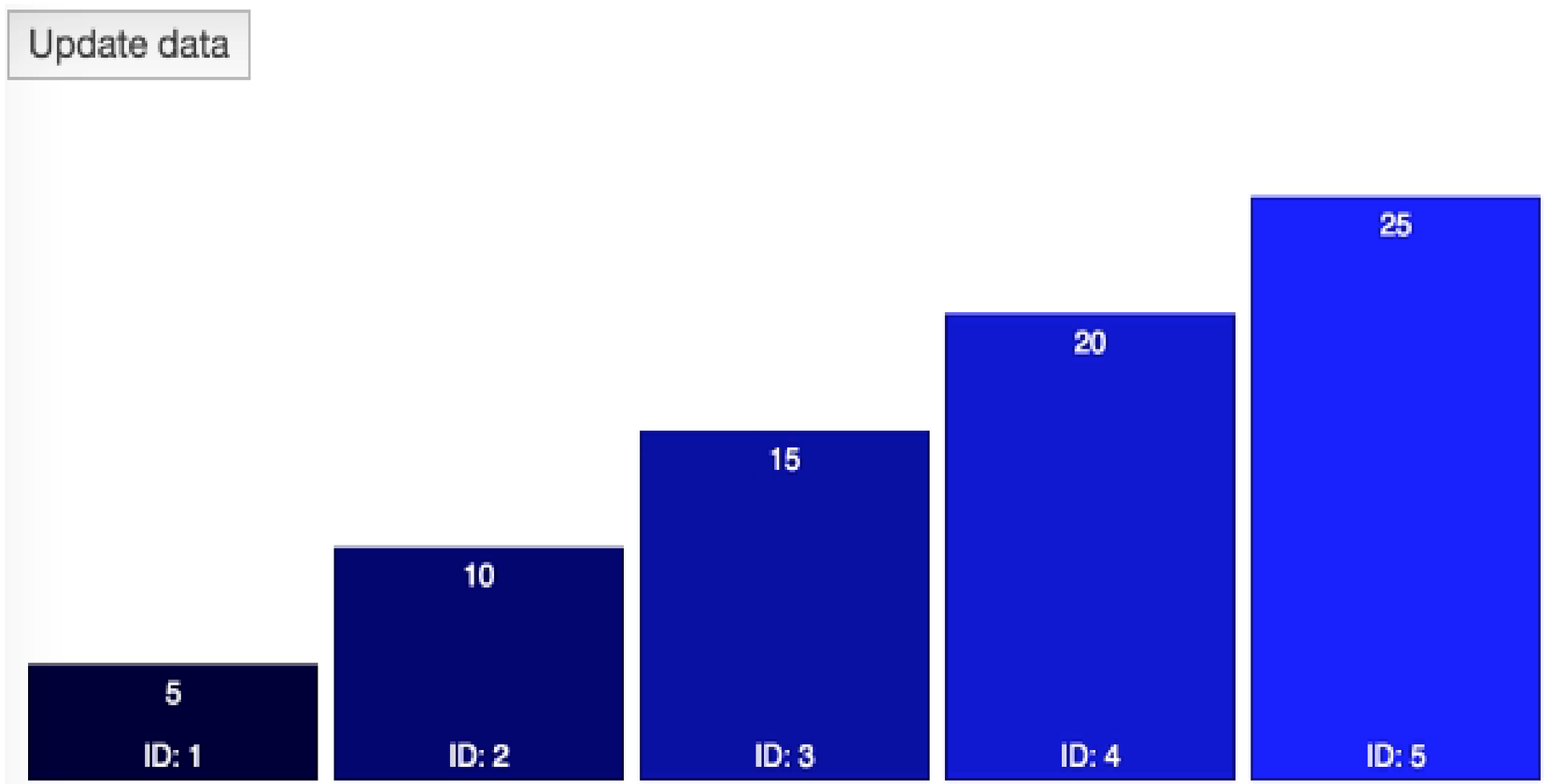
No Key Function

```
svg.selectAll('.values')
  .data(allData);
```



With Key Function

```
svg.selectAll(‘.values’)
  .data(allData, function(d){return d;});
```



Animated Examples

Includes commonly used code patterns

1) https://bl.ocks.org/mbostock/3808218
2) https://bl.ocks.org/mbostock/3808221
3) https://bl.ocks.org/mbostock/3808234

Next Tuesday

- Linked Views
- Reading: advanced JavaScript topics

This Thursday

- High-Dimensional Data and Text
- Reading: See pre-reading materials on Canvas

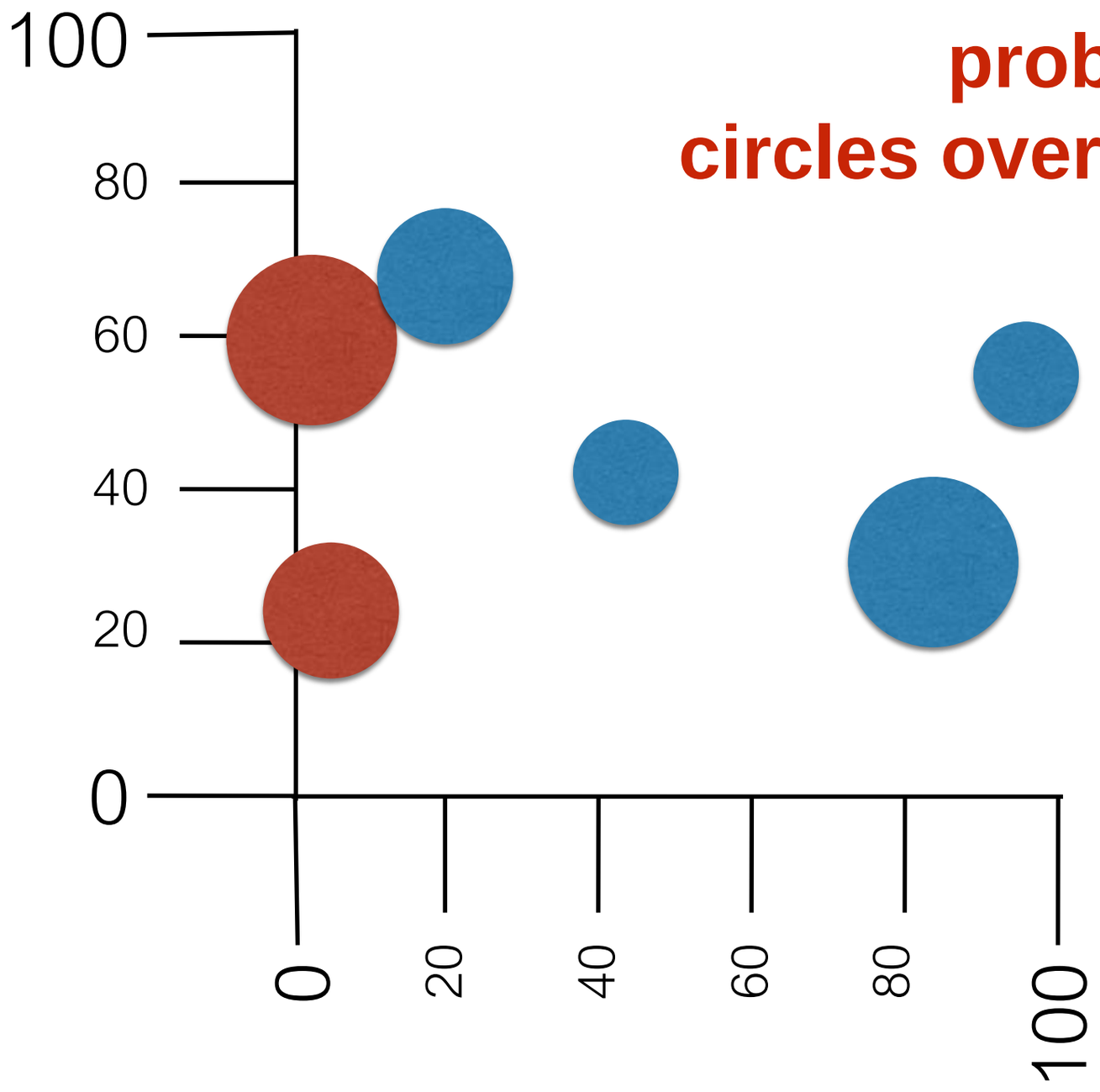
Homework (due Monday) & **Studios**

- Homework 5 - Fifa, enter-update-exit

Additional Material

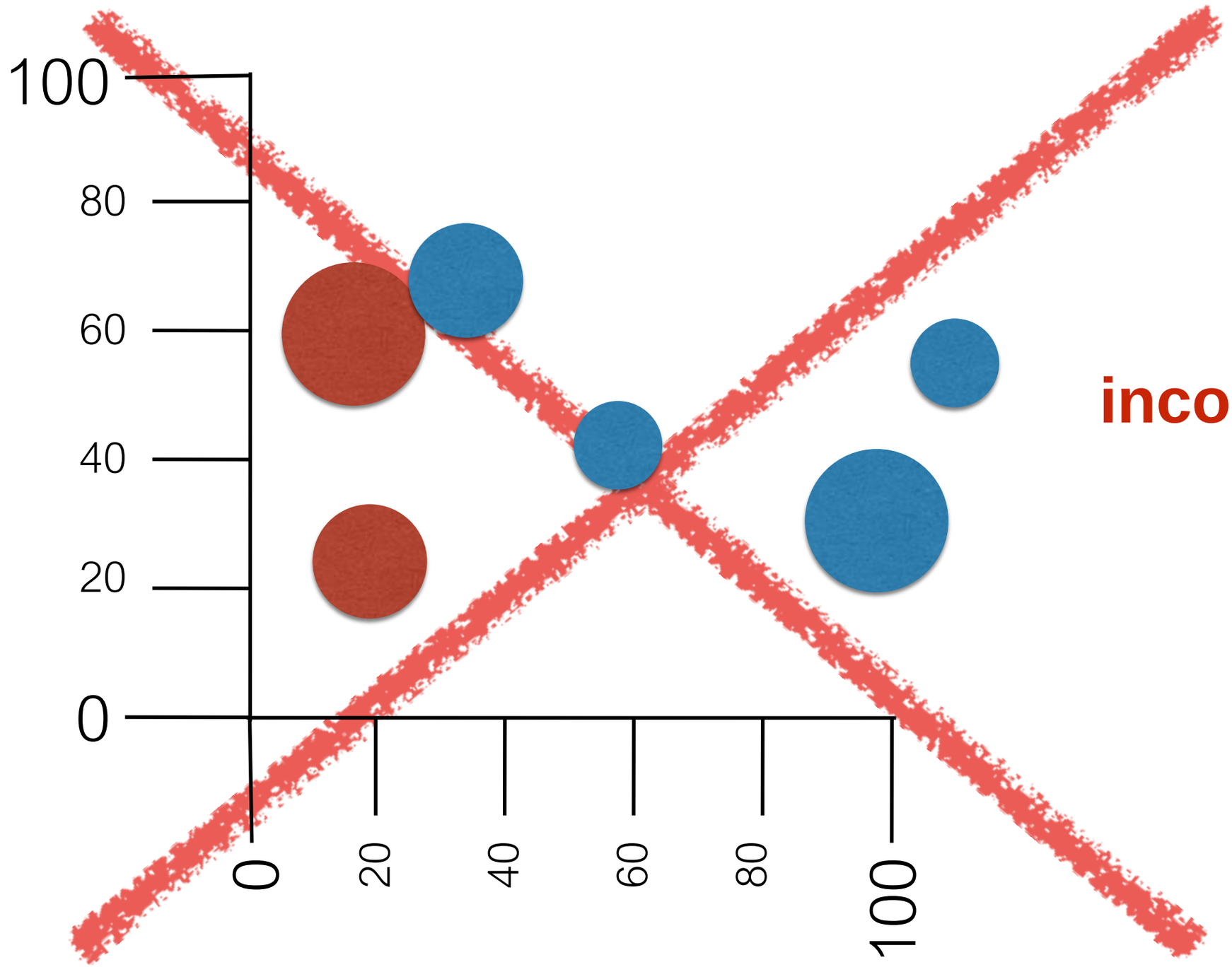
- Axis placement and drawing
- g-element

Axis Placement - Simple Axis



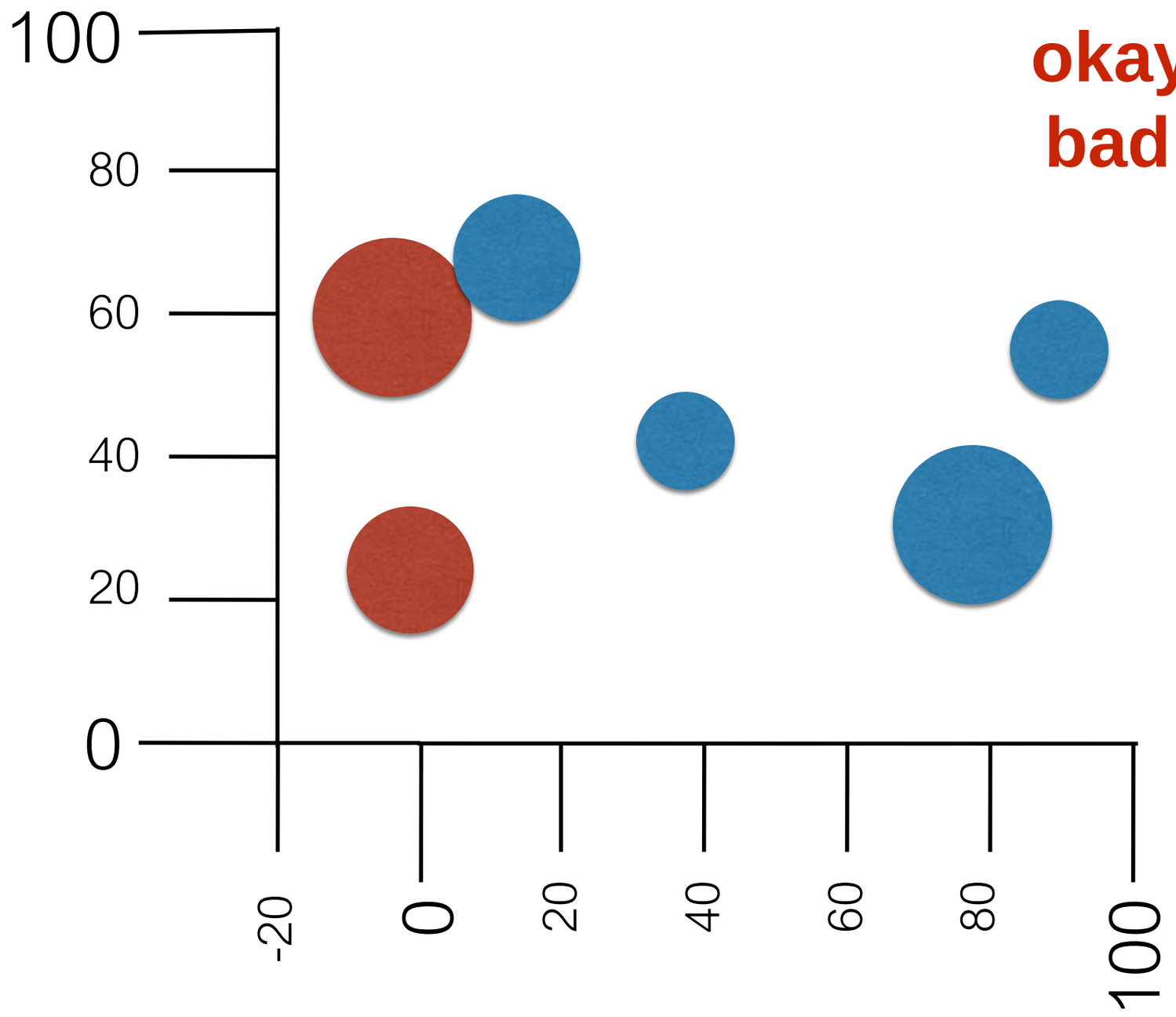
problem:
circles overlapping axis

Axis Placement - Translate?



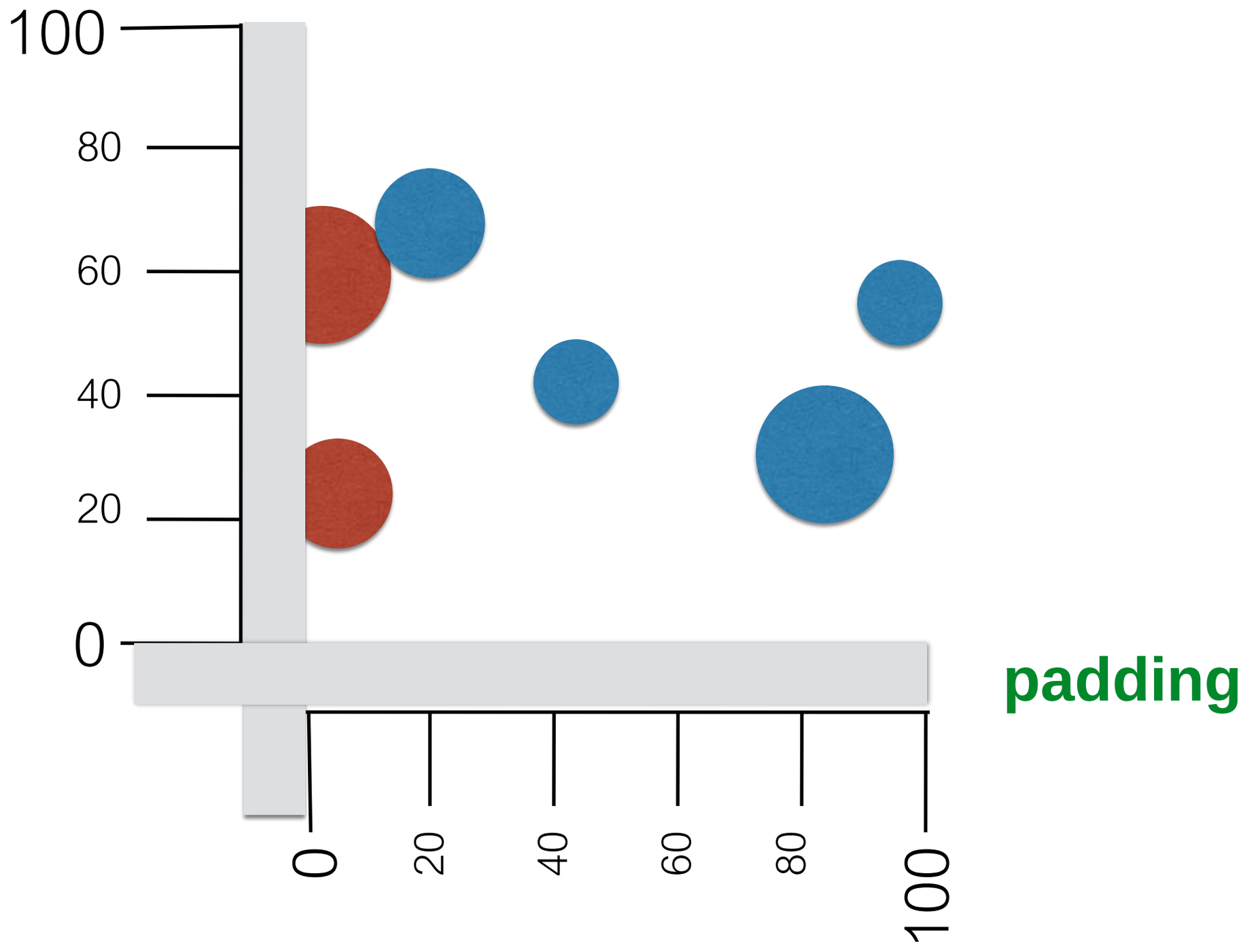
incorrect!

Axis Placement - Extend Axis?



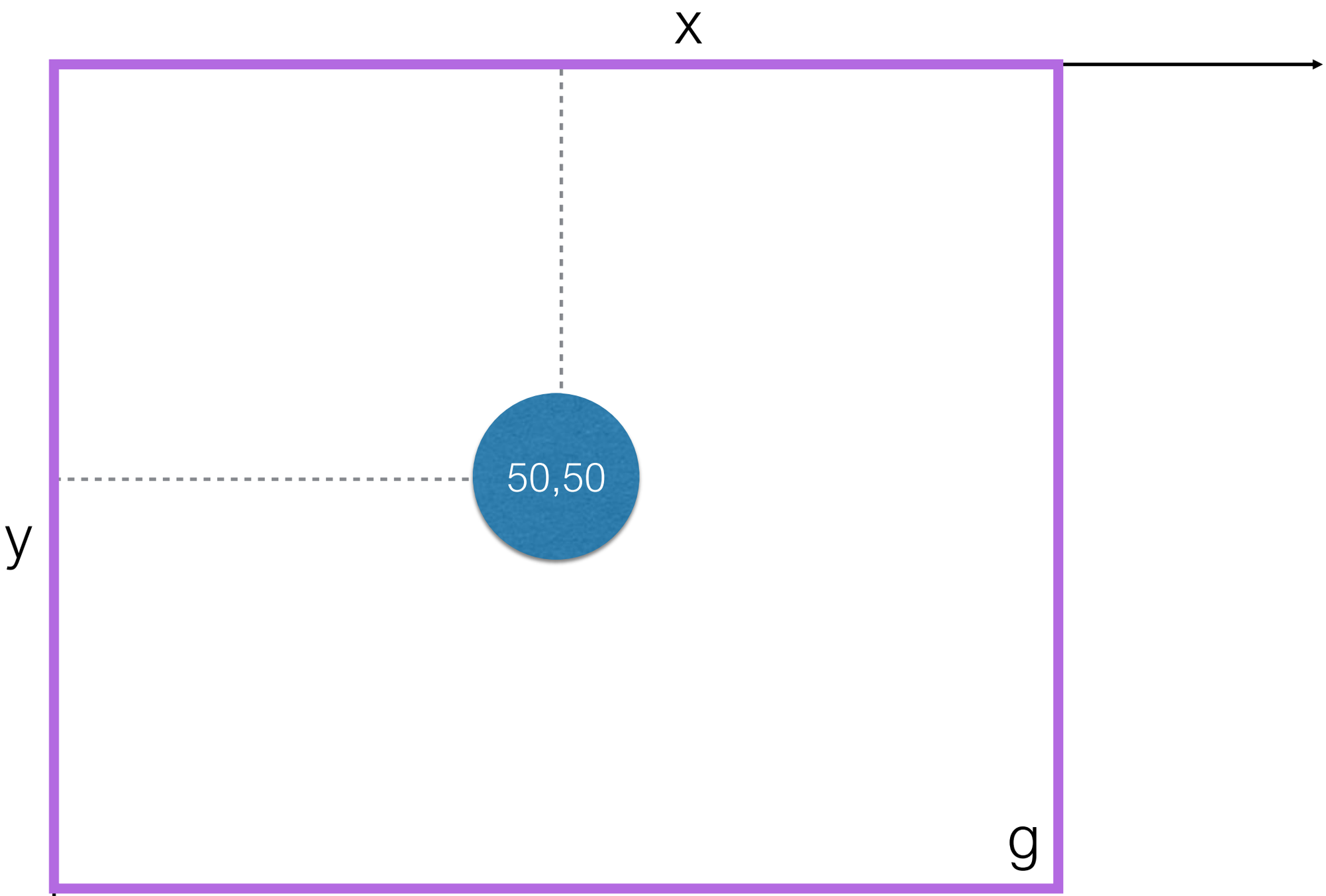
okay, but:
bad style

Axis Placement - Padding!

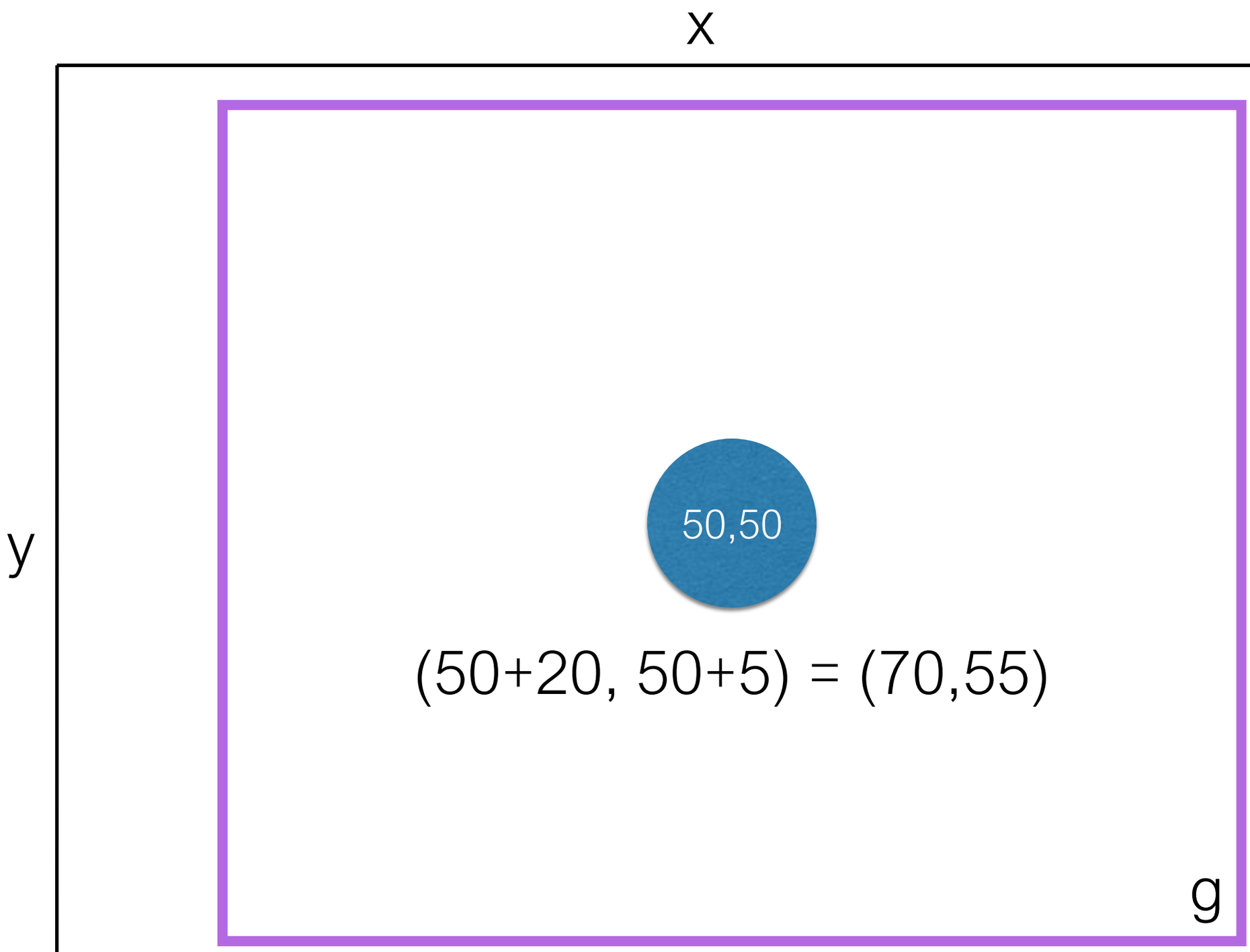


The ‘g’ element

- groups visual elements
- starts a new coordinate system
- all transformations to the ‘g’ apply to all elements in the group
- think of grouping in Keynote or Powerpoint



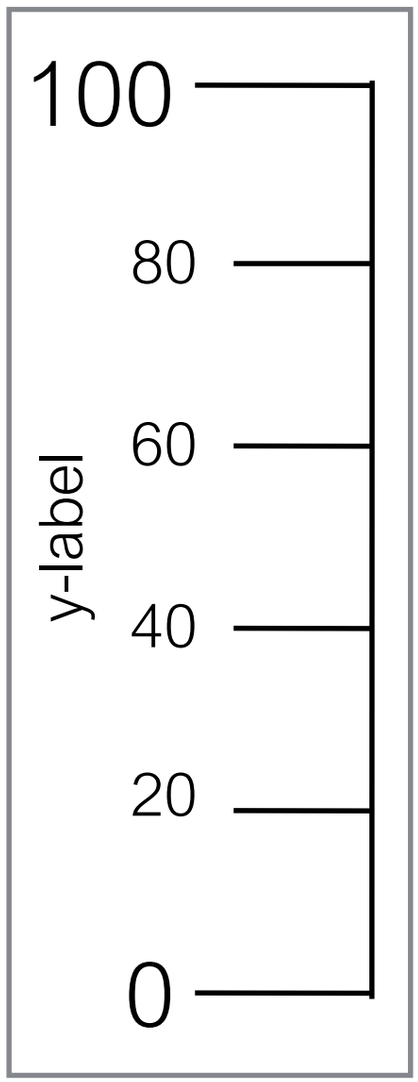

```
<g>
    <circle r="10" cx="50" cy ="50"></circle>
</g>
```




```
<g transform="translate(20,5)">
    <circle r="10" cx="50" cy ="50"></circle>
</g>
```

The ‘g’ element is a container for D3 to draw an axis into.

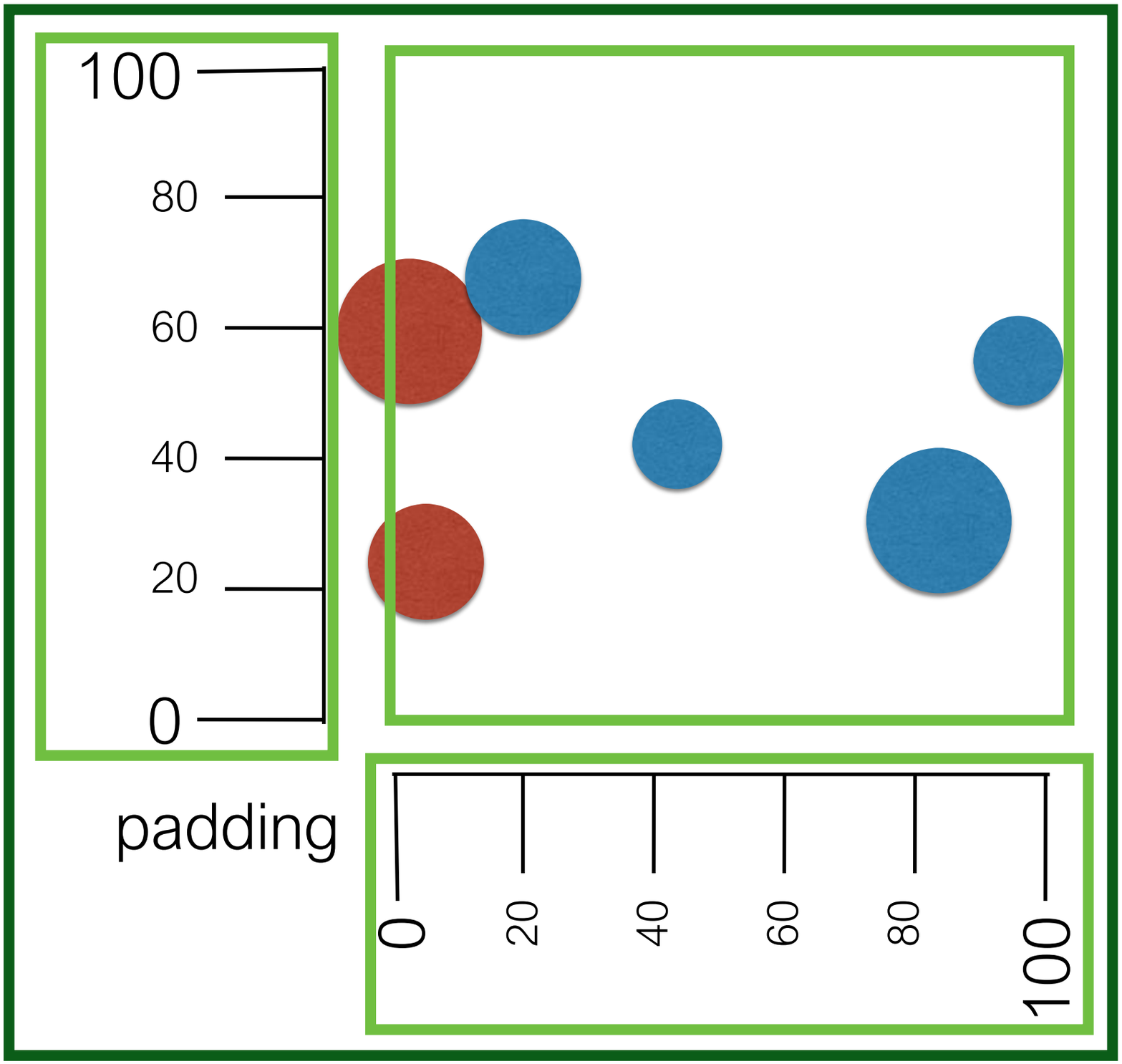
<g id=‘blob’></g>




```
d3.select('#blob').call(axis);
```

```
d3.select(‘#blob’).append(‘text’)…
```

SVG Mantra: “Groups are your friend.
You can structure your drawings with them.”



move the
whole scatterplot