Week 9

Drawing Complex Shapes

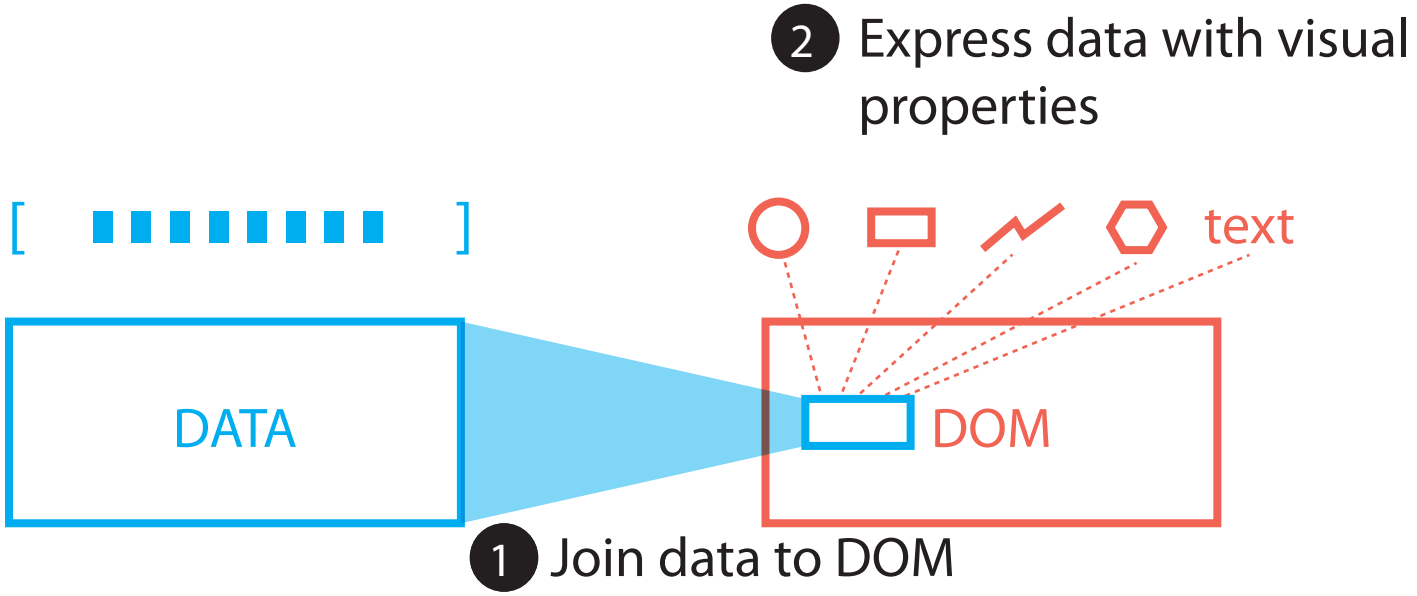
More on Generators & Data Transformation

Generalizing the Data Viz Process

Acquire
Parse
Filter
Mine
Represent
Refine
Interact

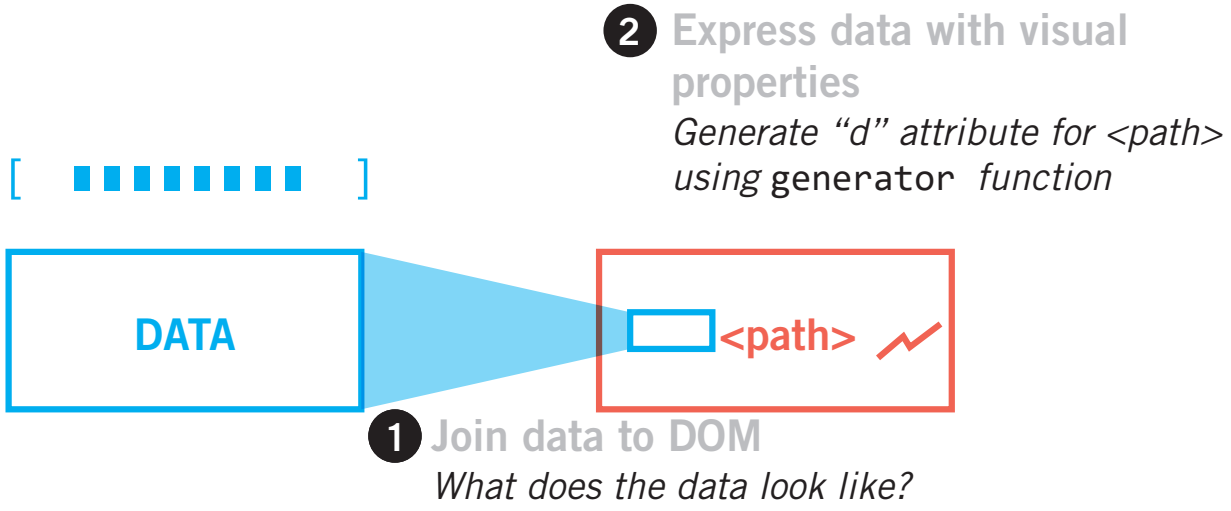
"REPRESENT" IN d3 - DESIGN INTENTION

The basic idea is to "join" a piece of data to a DOM element, and then use the visual attribute of the DOM element to express the data



Drawing More Complex Shapes

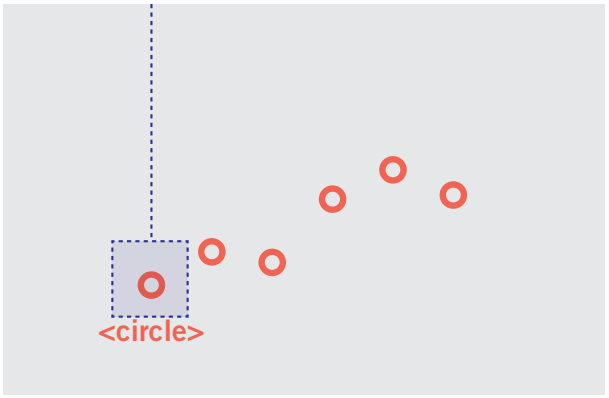
The same design intentions hold, but the implementation is a little more complicated.



DATA

array = d x 6

DOM



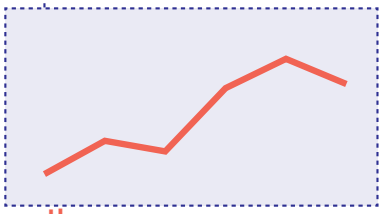
<circle> x 6

```
// “n-to-n” join

plot.selectAll(‘circle’)
     .data(dataArray)
     .enter()
     .append(‘circle’)
     ...
```

DATA

array = d x 6

DOM



<path> x 1

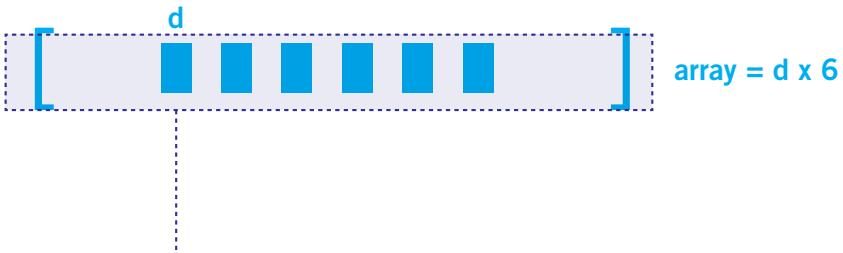
```
// “1-to-1” join

plot.append(‘path’)
     .datum(dataArray)
     .attr(‘d’,...)
```

d3.line()

```
var lineGenerator = d3.line()
    .x(function(d){ return d.year})
    .y(function(d){ return d.value})
    .curve(d3.curveCardinal);
```

In order to complete the generator function, we must know what the internal structure of the array looks like!

DATA



Where Do We Go from Here?

Representation	Data Manipulation	Interaction
Express data with more complex shapes	Manipulate data into the right form to be represented	User interaction with data

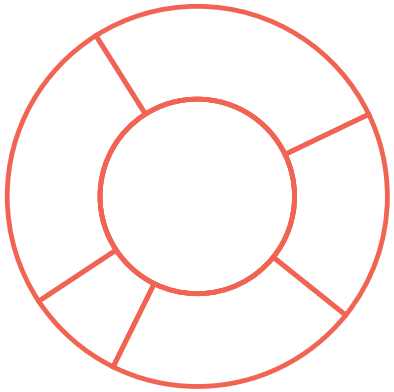
Where Do We Go from Here?

Representation	Data Manipulation	Interaction
Drawing arcs using `d3.arc()` generator	Create pie layout using `d3.pie()` Create hierarchy within data using `d3.nest()`	User interaction with data

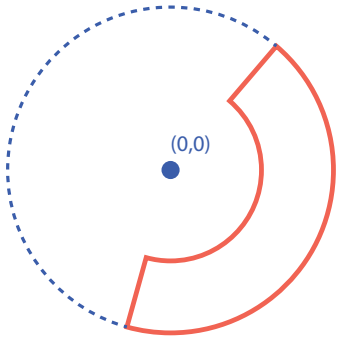
Exercise 1

Let's draw a pie chart! Open and inspect the file named "CO2 emssion.csv"

Pie charts are made of arcs



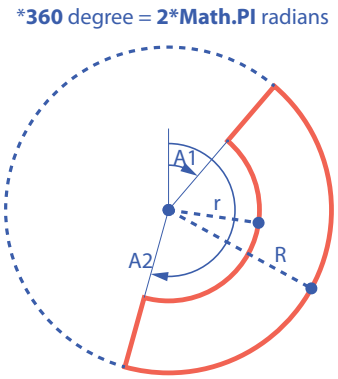
Pie charts are made of arcs



Pie charts are made of arcs

Arcs can ben specified by 4 properties:

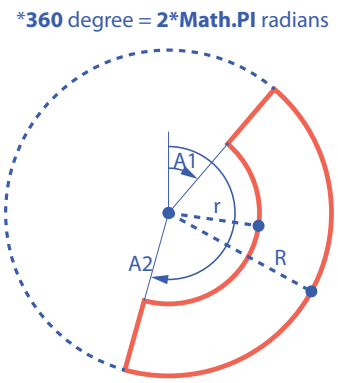
Start angle
End angle
Inner radius
Outer radius



Pie charts are made of arcs

How d3 implements the arc generator

```
var arc = d3.arc()
    .startAngle(function(d)
    {...})
    .endAngle(...)
    .innerRadius( )
    .outerRadius( );
```



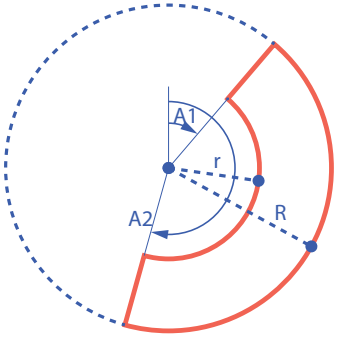
Pie charts are made of arcs

How d3 implements the arc generator

```
var arc = d3.arc()
    .startAngle(function(d)
    {...})
    .endAngle(...)
    .innerRadius( )
    .outerRadius( );
```

Requires you to know how the data is structured, what properties it has etc.

*360 degree = 2*Math.PI radians

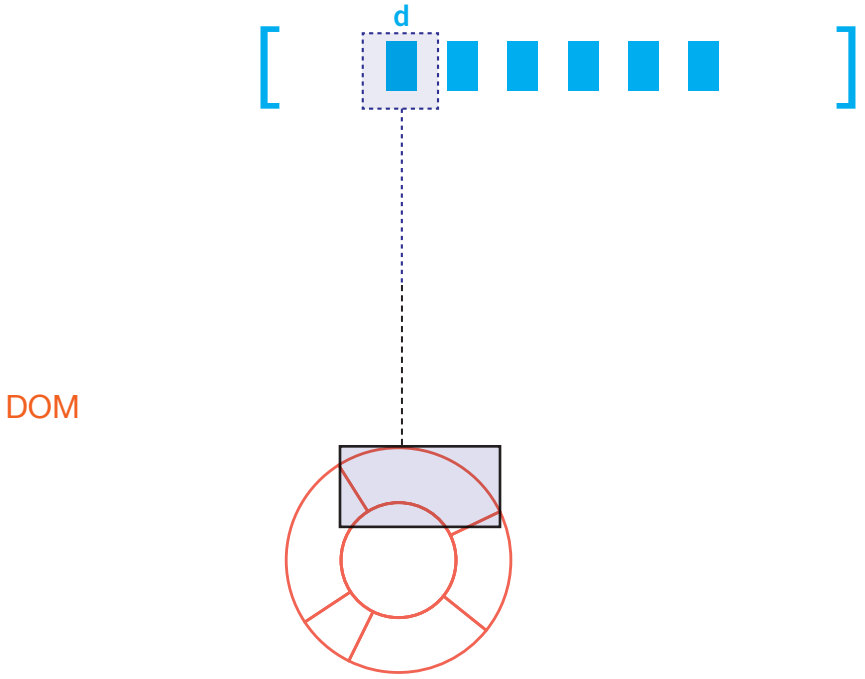


Exercise 1

Let's draw a pie chart! Open and inspect the file named "CO2 emssion.csv"

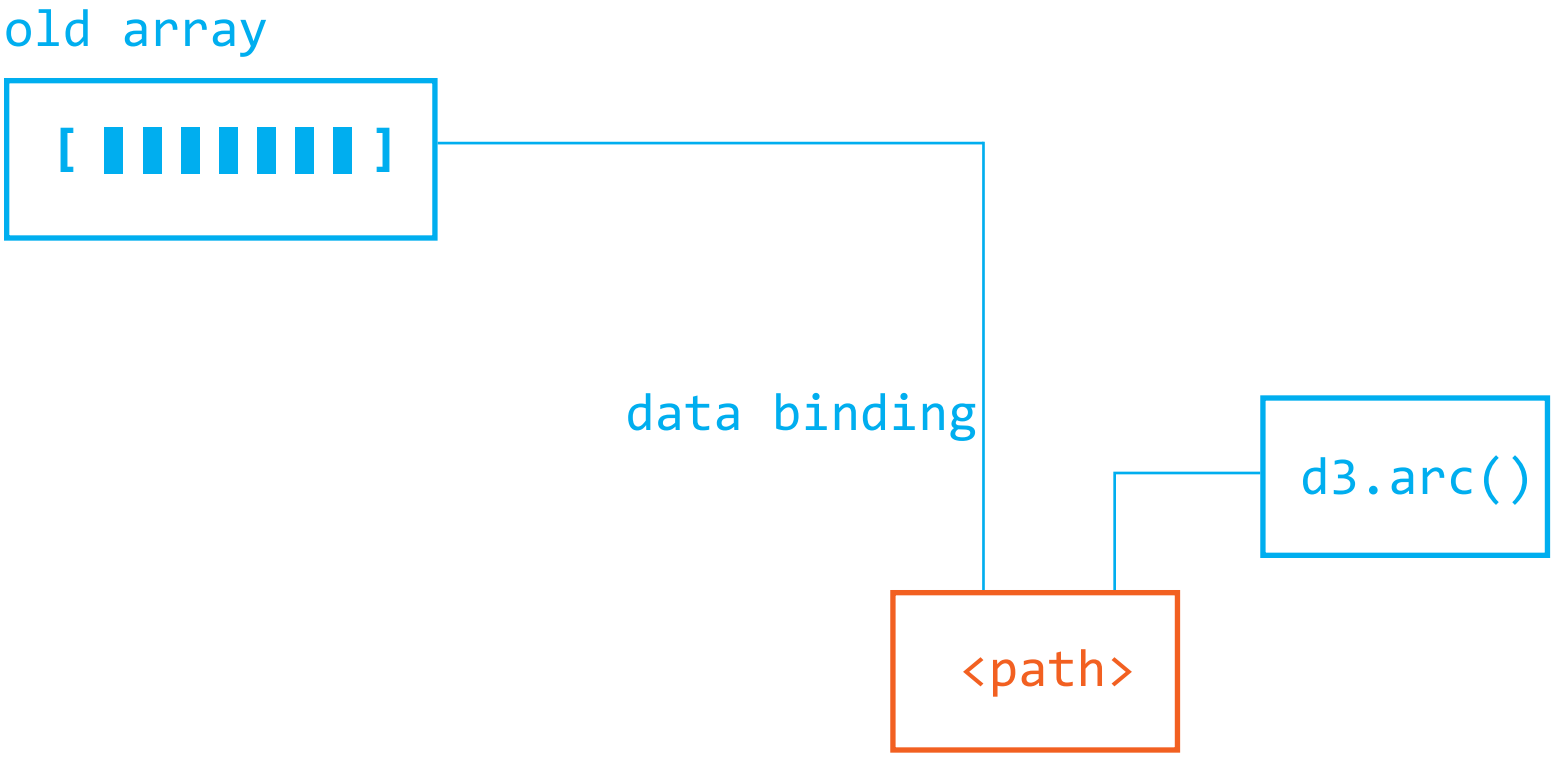
Let's begin by drawing a simple arc shape using the arc generator

How does data binding work?

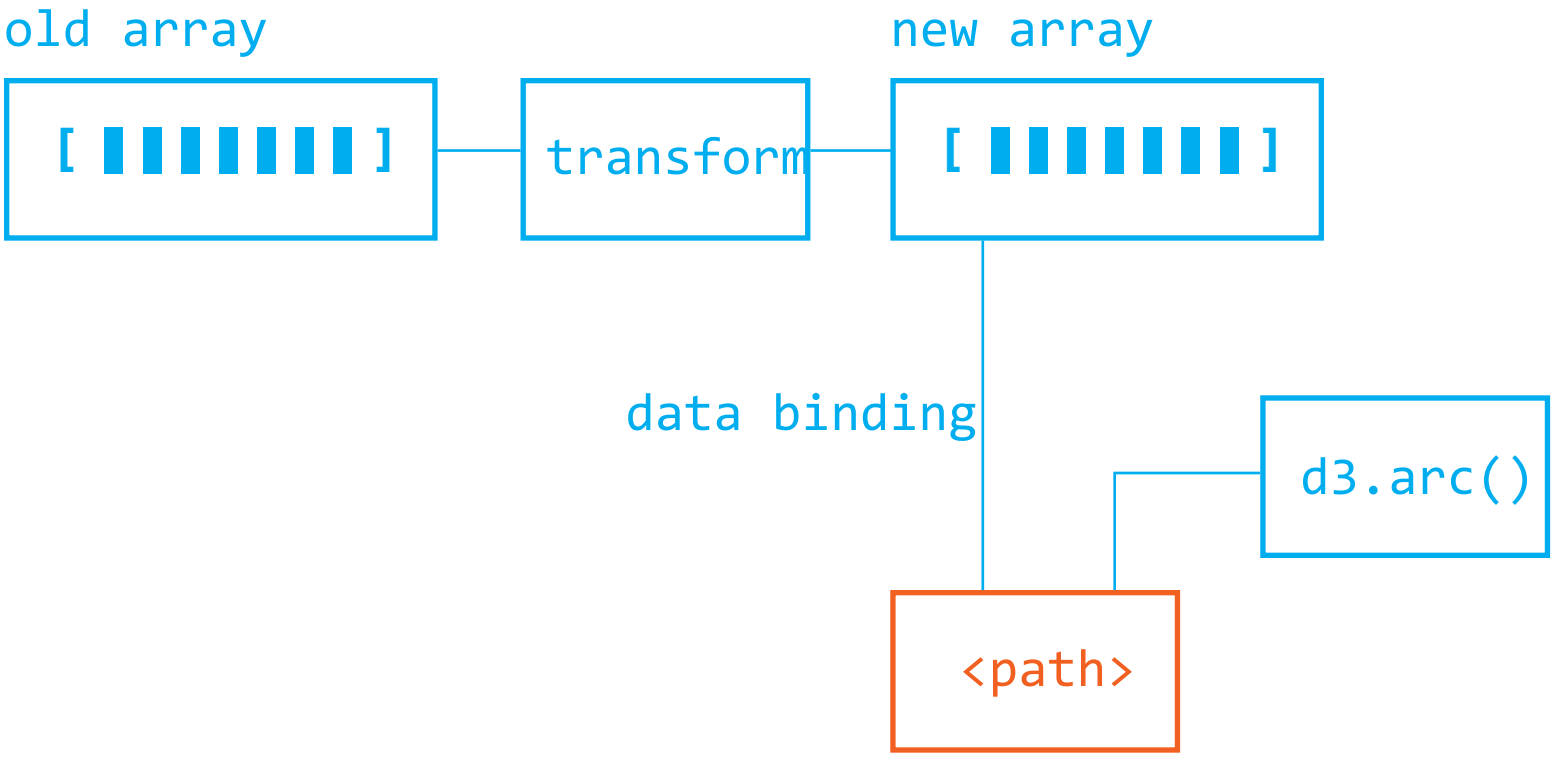



```
// “n-to-n” join

plot.selectAll(‘path’)
     .data(dataArray)
     .enter()
     .append(‘path’)
     ...
```

d3.pie()



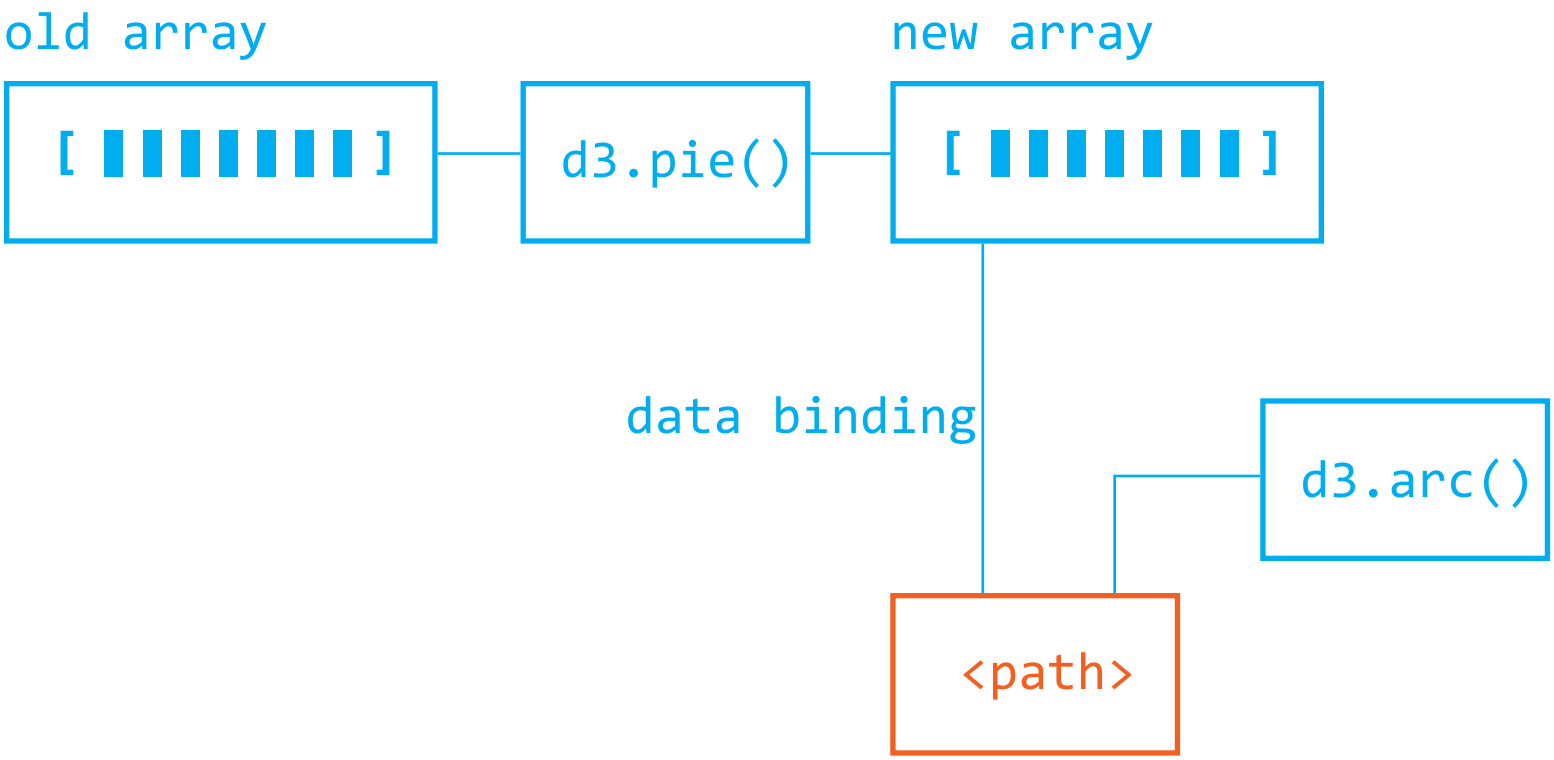
Some data transformation will be necessary



d3.pie()

```
//Configure pie layout
var pie = d3.pie()
    .value(function(d){...});

//Transform data
var newArray = pie( oldArray );
```

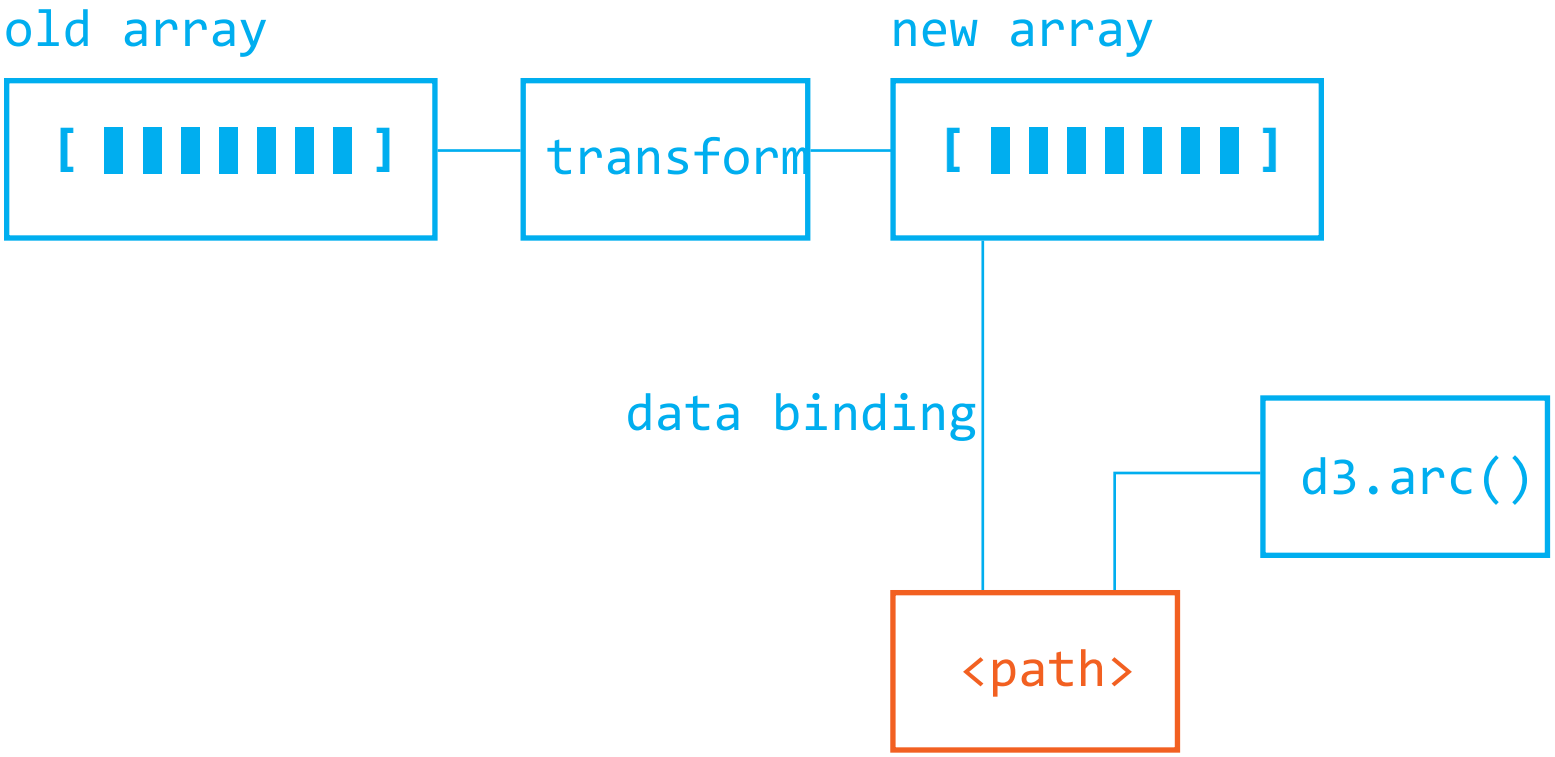
d3.pie()



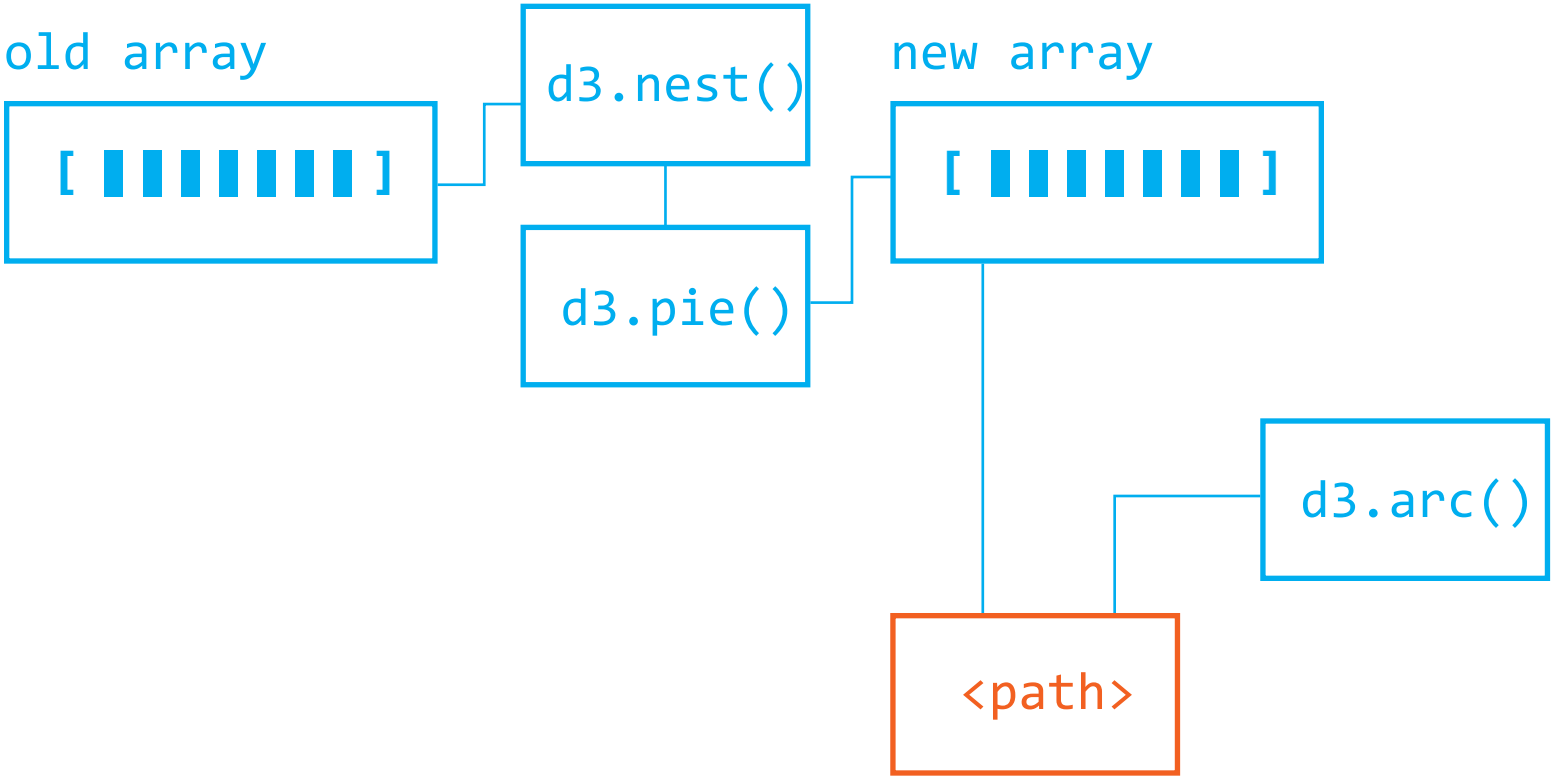
Exercise 2: Nesting Data

What if we want to aggregate CO2 emission by region?

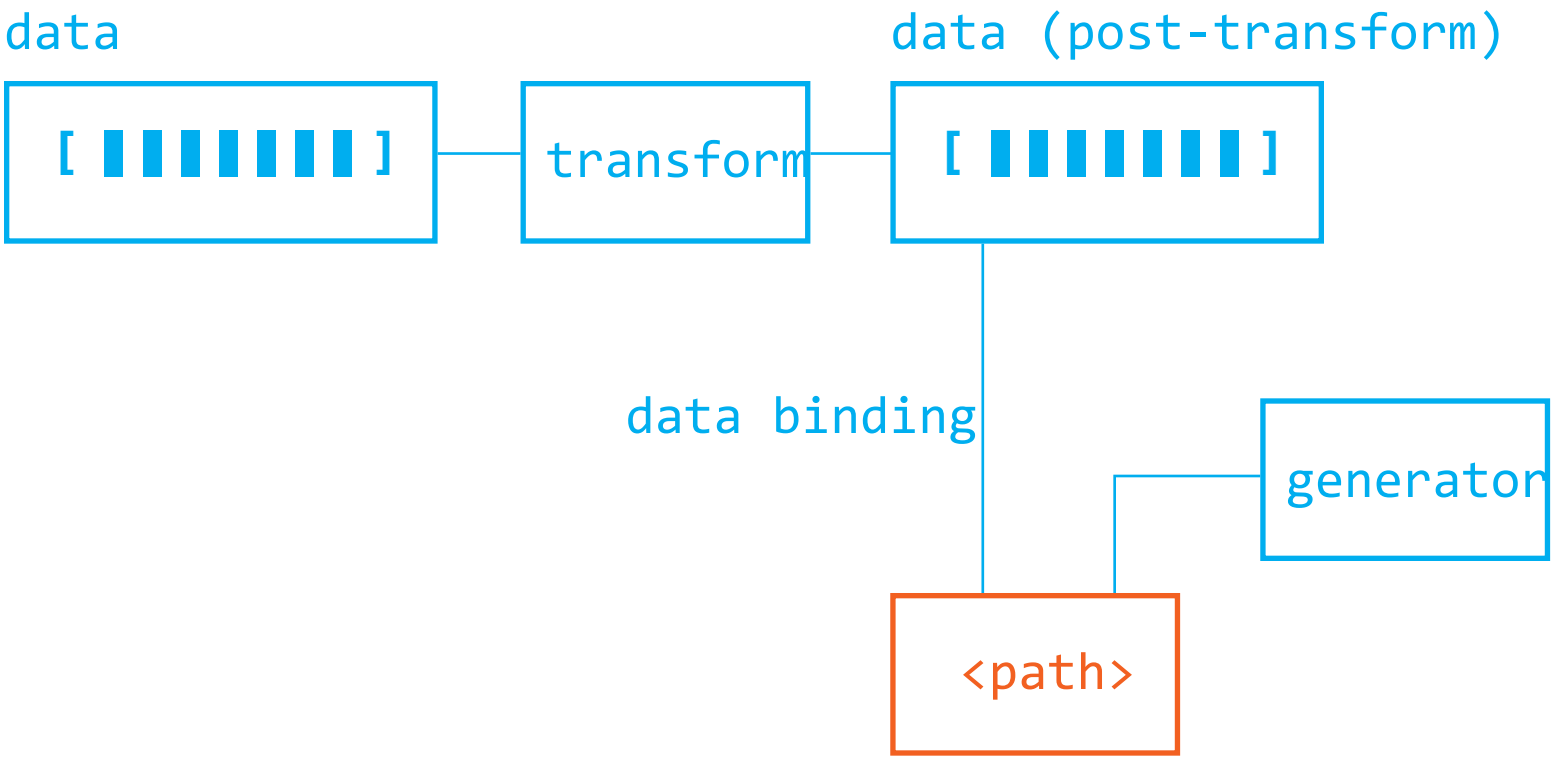
Some data transformation will be necessary



Some data transformation will be necessary



Exercise 3: Incorporate Metadata


data
[▮▮▮▮▮▮▮]
transform
data (post-transform)
[▮▮▮▮▮▮▮]
data binding
generator
<path>

Review: Week 9

Representation

```
d3.arc()
```

Data Manipulation

```
d3.nest()
d3.pie()
```

Interaction

```
selection.on( )
```

Extras

```
d3.map()
d3.schemeCategory20
```