F21DV Data Visualisation and Analytics – Lab 1
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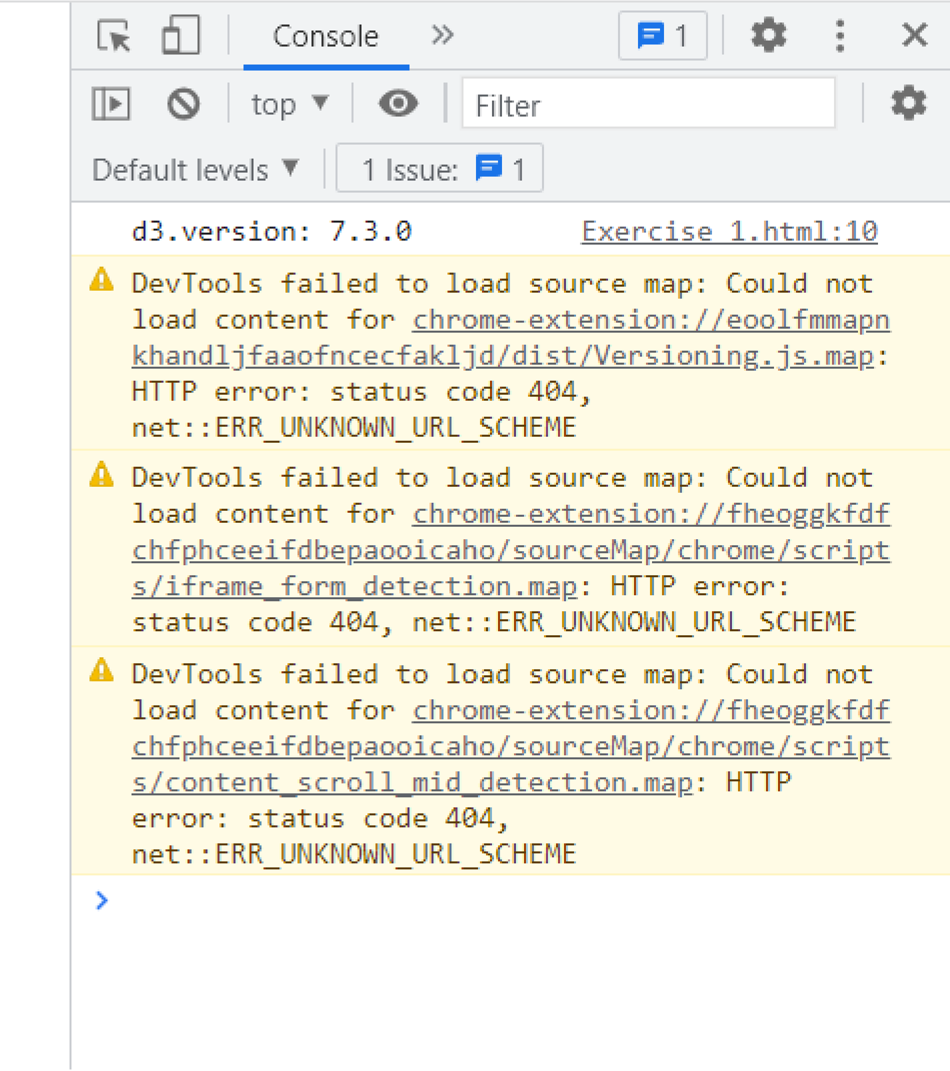
Demonstrated on 04/02/2022 to Amit Parekh.

Introduction

The following report will provide screenshots of the answers and, when relevant, context to the code developed. Every exercise is self-contained and can be run on a browser. When requested, answers can be found in the console log, and I will highlight when this occurs. To test my code is working I used the Visual Studio extension Live Server.

I have committed all my answers to a public GitHub repository which can be accessed here: https://github.com/JoshYang1/F21DV-Data-Visualisation-and-Analytics

Exercise 1



```
d3.version: 7.3.0                    Exercise 1.html:10
DevTools failed to load source map: Could not load content for chrome-extension://eoolfmmapnkhandljfaaofncecfakljd/dist/Versioning.js.map: HTTP error: status code 404, net::ERR_UNKNOWN_URL_SCHEME
DevTools failed to load source map: Could not load content for chrome-extension://fheoggkfdfchfphceeifdbepaooicaho/sourceMap/chrome/scripts/iframe_form_detection.map: HTTP error: status code 404, net::ERR_UNKNOWN_URL_SCHEME
DevTools failed to load source map: Could not load content for chrome-extension://fheoggkfdfchfphceeifdbepaooicaho/sourceMap/chrome/scripts/content_scroll_mid_detection.map: HTTP error: status code 404, net::ERR_UNKNOWN_URL_SCHEME
>
```

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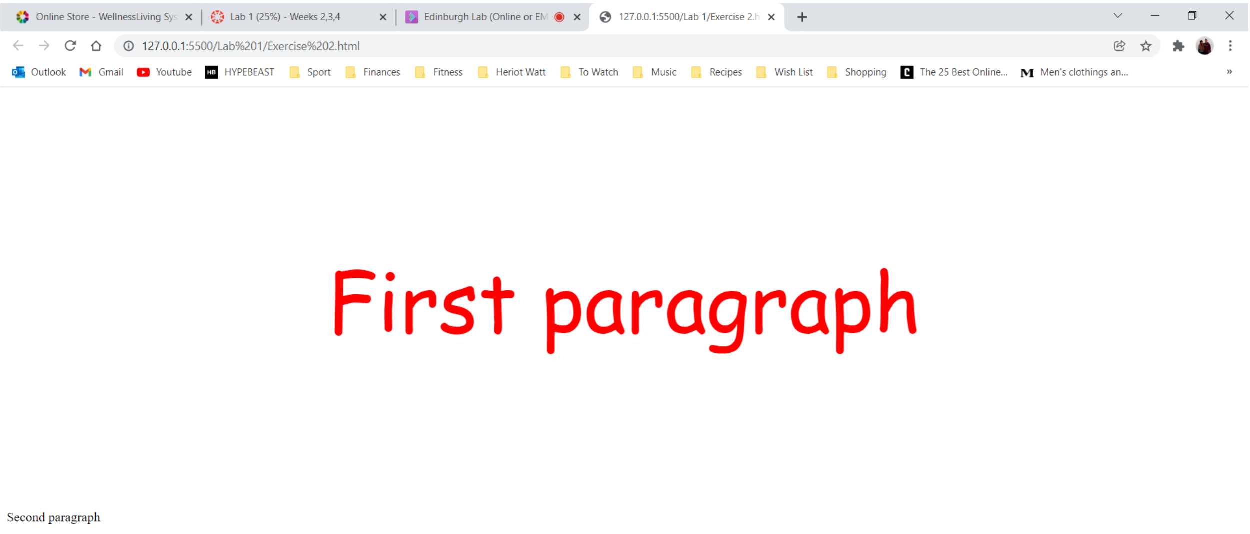
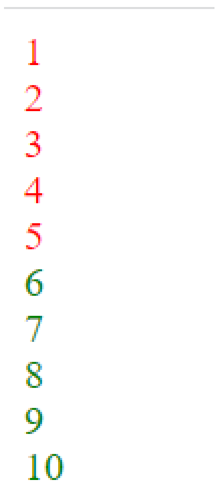
Exercise 2


Online Store - WellnessLiving Sys
Lab 1 (25%) - Weeks 2,3,4
Edinburgh Lab (Online or EM
127.0.0.1:5500/Lab 1/Exercise 2.h
127.0.0.1:5500/Lab%201/Exercise%202.html
Outlook
Gmail
Youtube
HYPEBEAST
Sport
Finances
Fitness
Heriot Watt
To Watch
Music
Recipes
Wish List
Shopping
The 25 Best Online...
Men's clothings an...

First paragraph

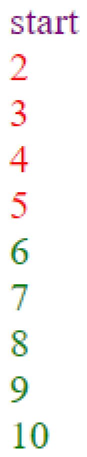
Second paragraph

Exercise 3

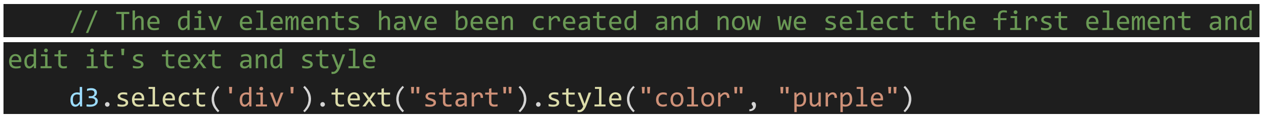


```
1
2
3
4
5
6
7
8
9
10
```

Exercise 4



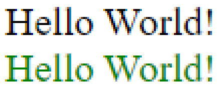
```
start
2
3
4
5
6
7
8
9
10
```



```
    // The div elements have been created and now we select the first element and
edit it's text and style
    d3.select('div').text("start").style("color", "purple")
```

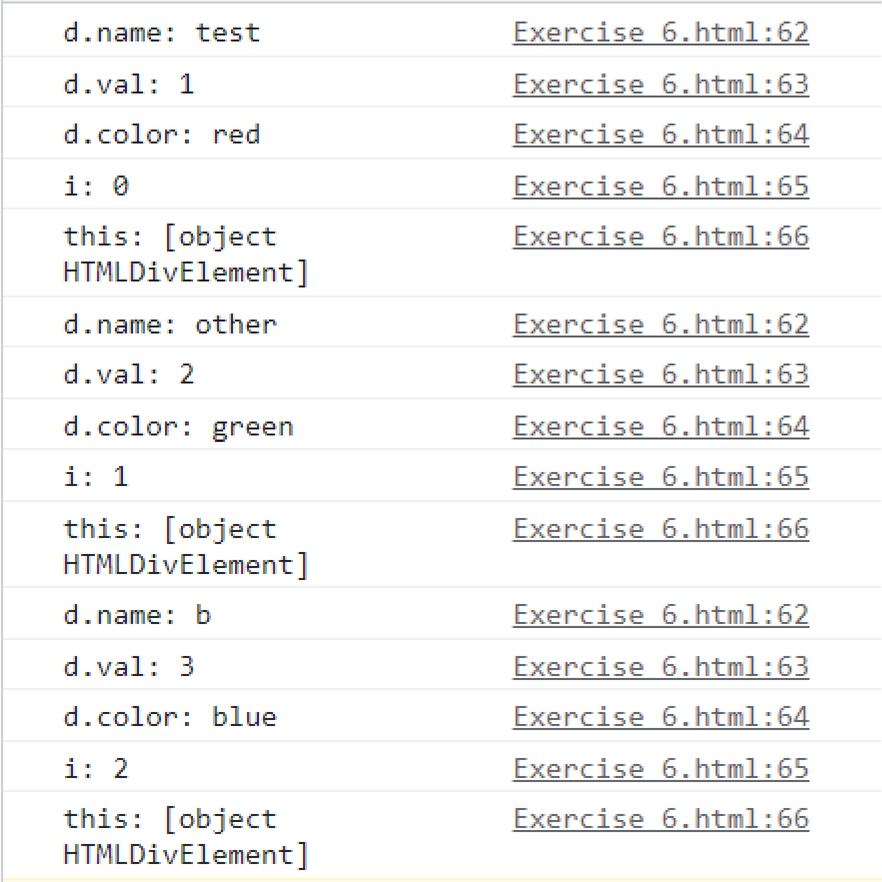
The loop creates the 10 div elements and once the loop has finished, we then select the first div element and change the text and styling.

Exercise 5



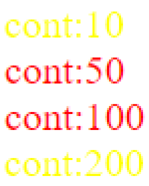
```
Hello World!
Hello World!
```

Exercise 6



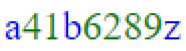
```
d.name: test                Exercise 6.html:62
d.val: 1                    Exercise 6.html:63
d.color: red                Exercise 6.html:64
i: 0                        Exercise 6.html:65
this: [object               Exercise 6.html:66
HTMLDivElement]
d.name: other               Exercise 6.html:62
d.val: 2                    Exercise 6.html:63
d.color: green              Exercise 6.html:64
i: 1                        Exercise 6.html:65
this: [object               Exercise 6.html:66
HTMLDivElement]
d.name: b                   Exercise 6.html:62
d.val: 3                    Exercise 6.html:63
d.color: blue               Exercise 6.html:64
i: 2                        Exercise 6.html:65
this: [object               Exercise 6.html:66
HTMLDivElement]
```

Exercise 7



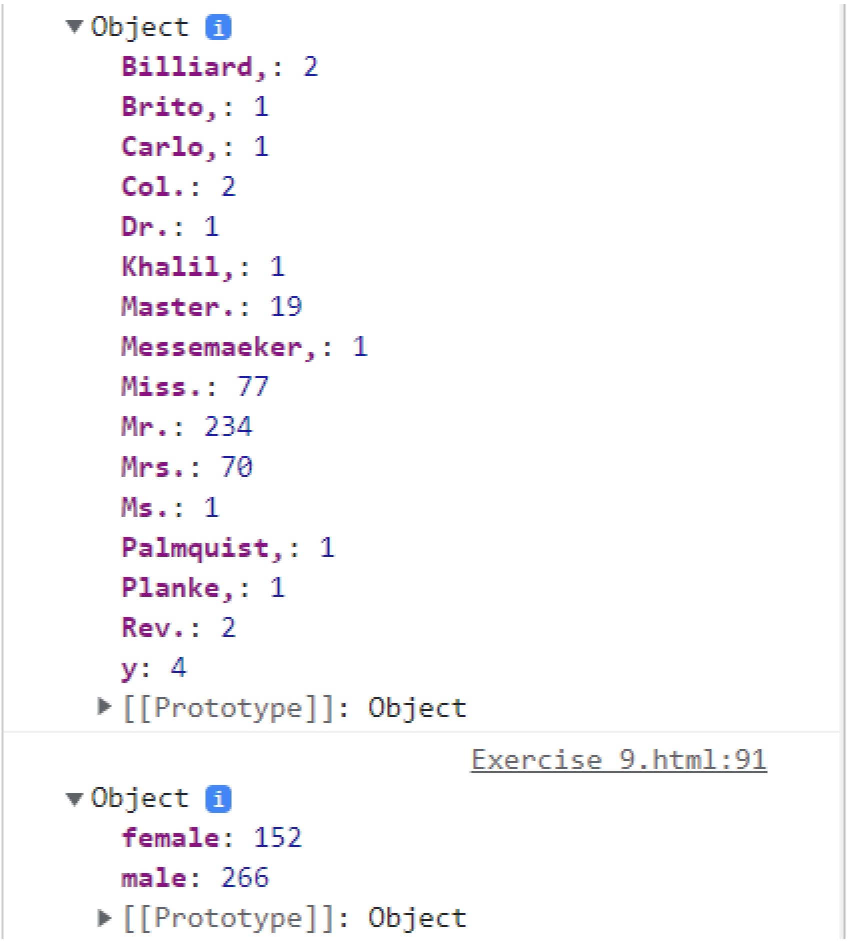
cont:10
cont:50
cont:100
cont:200

Exercise 8



a41b6289z

Exercise 9



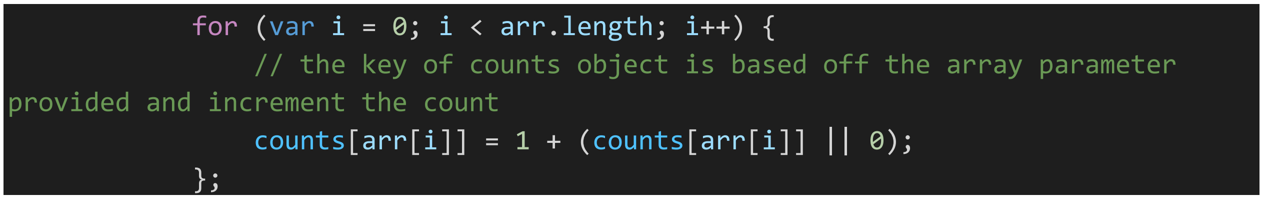
```
▼Object i
    Billiard,: 2
    Brito,: 1
    Carlo,: 1
    Col.: 2
    Dr.: 1
    Khalil,: 1
    Master.: 19
    Messemaeker,: 1
    Miss.: 77
    Mr.: 234
    Mrs.: 70
    Ms.: 1
    Palmquist,: 1
    Planke,: 1
    Rev.: 2
    y: 4
  ▶[[Prototype]]: Object
                              Exercise 9.html:91
▼Object i
    female: 152
    male: 266
  ▶[[Prototype]]: Object
```

As can be seen from the above screenshot, the count of Mr, Mrs and Other did not return a perfect answer. The reason for this is the split by whitespace function;

```
            // splitting the Name element, separated by a blank space
            var title = d.Name.split(" ")
            // adding the title of the passenger to an array which should be the
element at index 1
            arrayN.push(title[1])
```

The code is splitting the Name element in the object and creating an array. We then push the first element of the newly created array which should be the title of the person but is not perfect as can be seen by the results, for example, people may have two surnames.

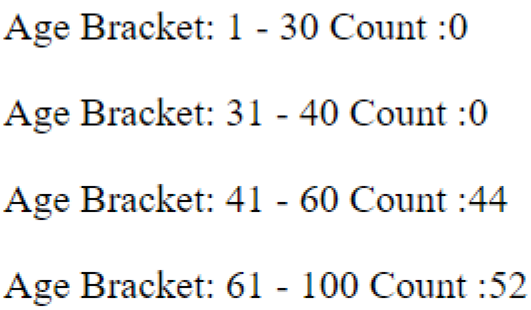
```
            const counts = {};
```



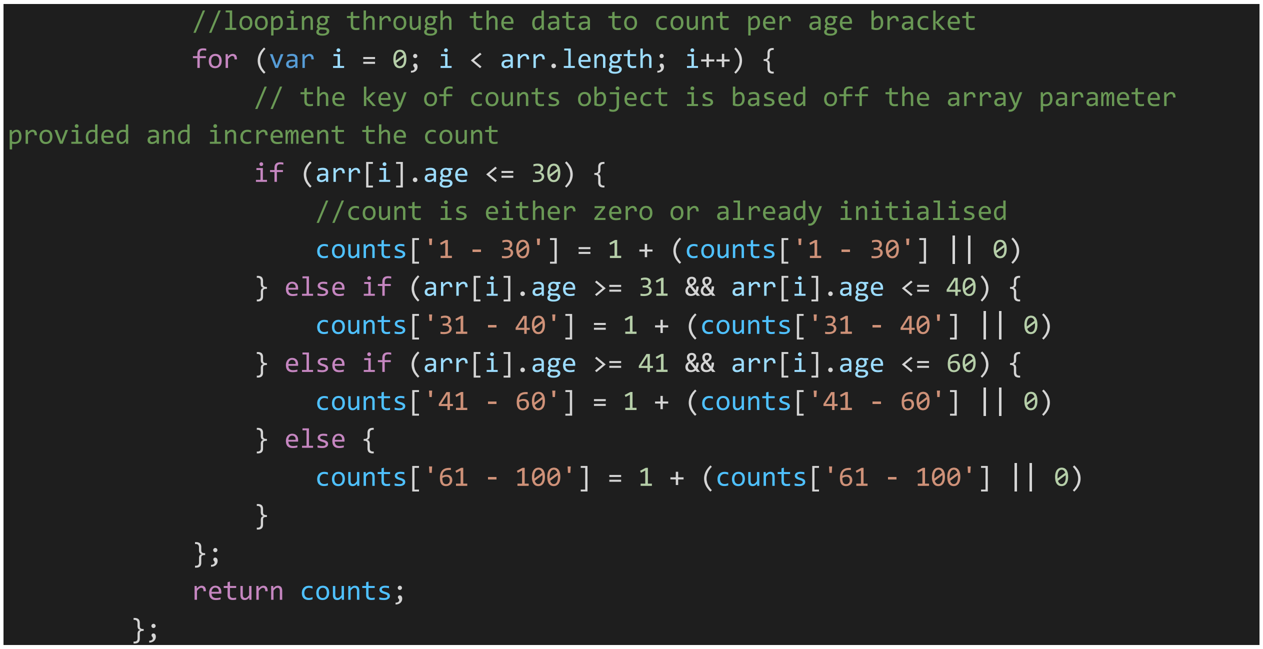
```
            for (var i = 0; i < arr.length; i++) {
                // the key of counts object is based off the array parameter
provided and increment the count
                counts[arr[i]] = 1 + (counts[arr[i]] || 0);
            };
```

We created a function to count the number of values for each unique key. An object is created and then a key is created with the key of the array that has been passed in. If that key does not exist, the count is initiated but if it already exists then we add a 1 to the value of that key.

Exercise 10

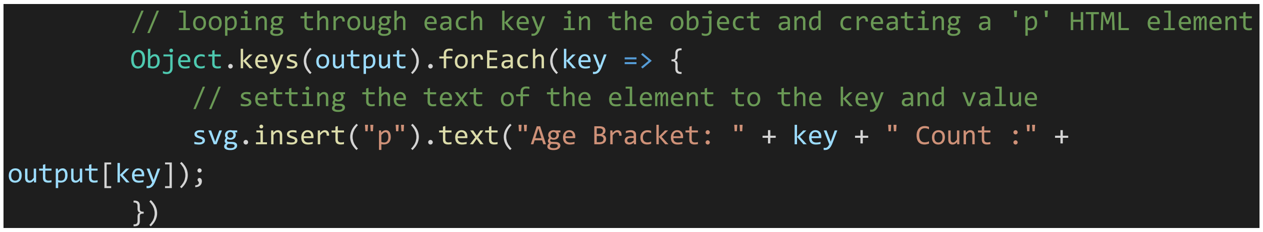


```
Age Bracket: 1 - 30 Count :0

Age Bracket: 31 - 40 Count :0

Age Bracket: 41 - 60 Count :44

Age Bracket: 61 - 100 Count :52
```



```
            //looping through the data to count per age bracket
            for (var i = 0; i < arr.length; i++) {
                // the key of counts object is based off the array parameter
provided and increment the count
                if (arr[i].age <= 30) {
                    //count is either zero or already initialised
                    counts['1 - 30'] = 1 + (counts['1 - 30'] || 0)
                } else if (arr[i].age >= 31 && arr[i].age <= 40) {
                    counts['31 - 40'] = 1 + (counts['31 - 40'] || 0)
                } else if (arr[i].age >= 41 && arr[i].age <= 60) {
                    counts['41 - 60'] = 1 + (counts['41 - 60'] || 0)
                } else {
                    counts['61 - 100'] = 1 + (counts['61 - 100'] || 0)
                }
            };
            return counts;
        };
```

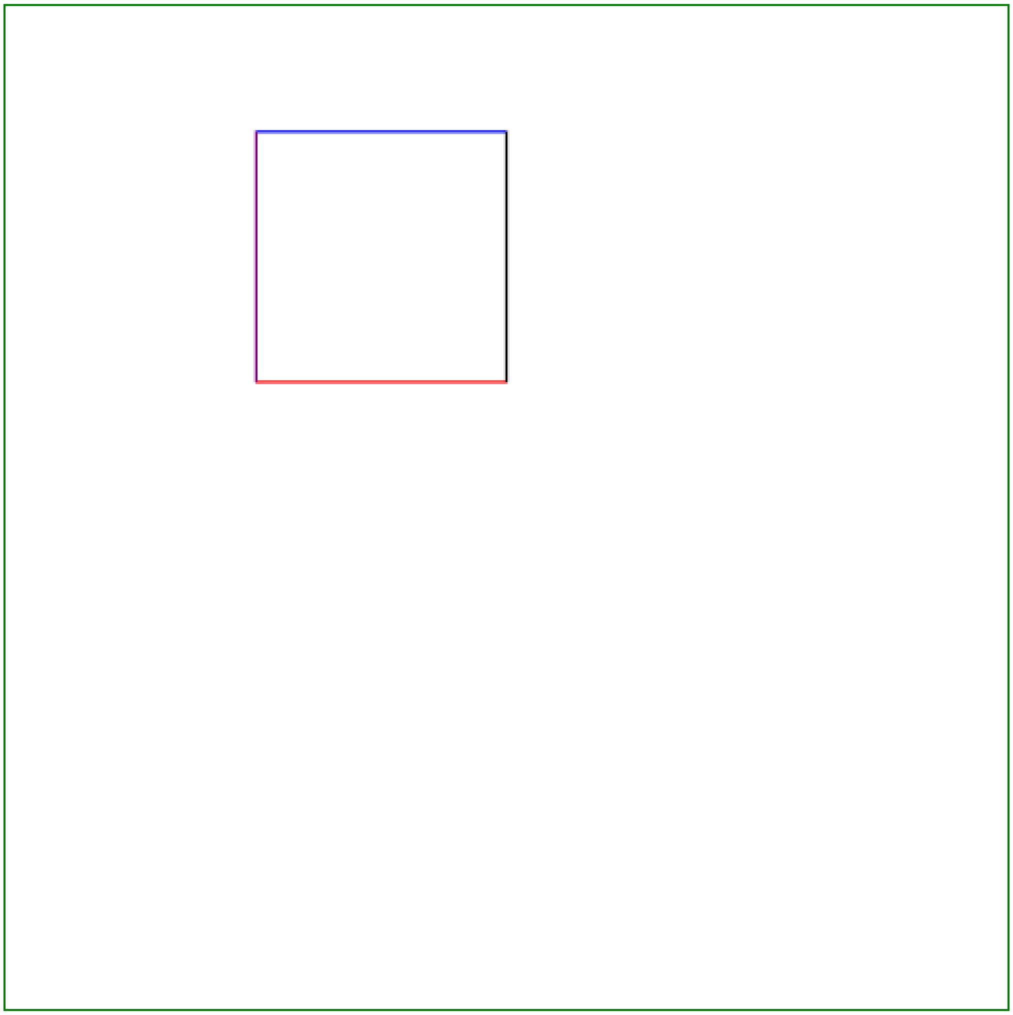
We created a loop to check the age and then store the count of each person in the relevant age group.



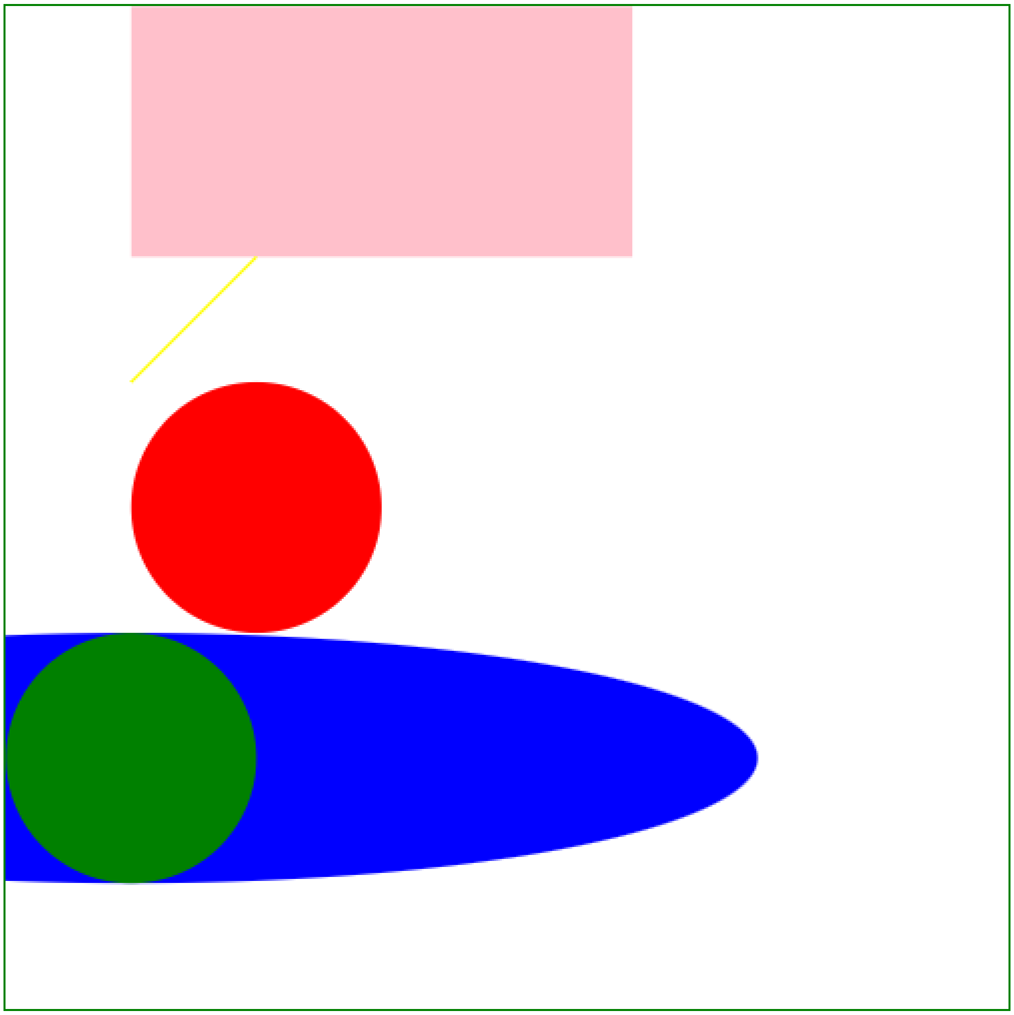
```
        // looping through each key in the object and creating a 'p' HTML element
        Object.keys(output).forEach(key => {
            // setting the text of the element to the key and value
            svg.insert("p").text("Age Bracket: " + key + " Count :" +
output[key]);
        })
```

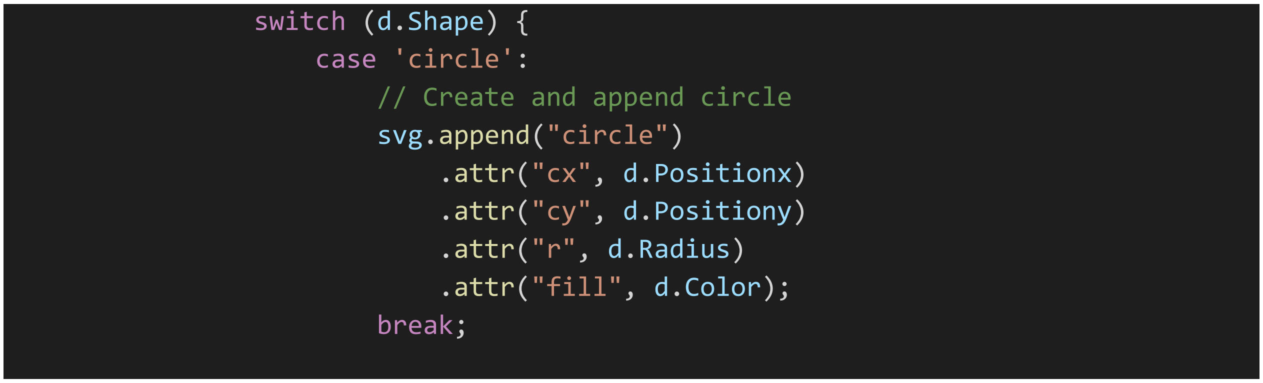
We then loop through each of the keys from the newly created object and insert a ‘p’ element with the required information.

Exercise 11



Exercise 12





```
                switch (d.Shape) {
                    case 'circle':
                        // Create and append circle
                        svg.append("circle")
                            .attr("cx", d.Positionx)
                            .attr("cy", d.Positiony)
                            .attr("r", d.Radius)
                            .attr("fill", d.Color);
                        break;
```

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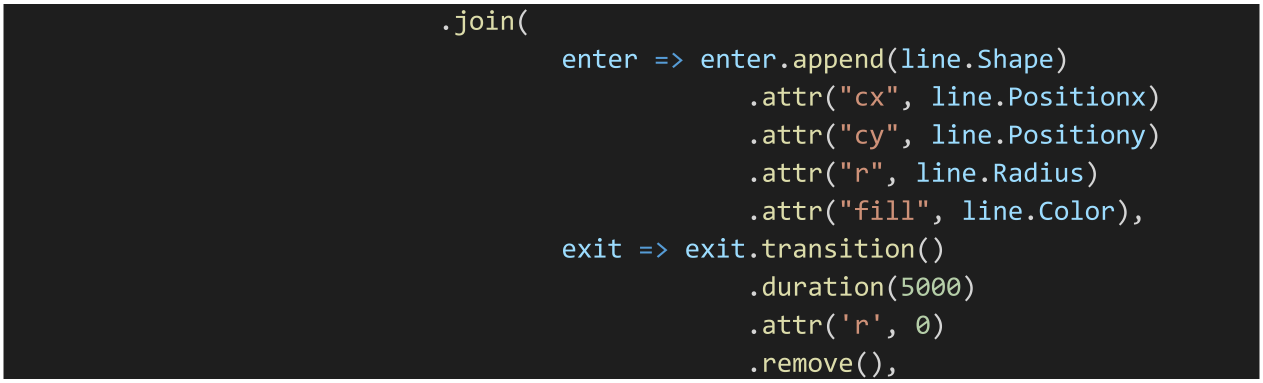
We created a switch statement which is dependent on the Shape key from the csv file.

Exercise 13

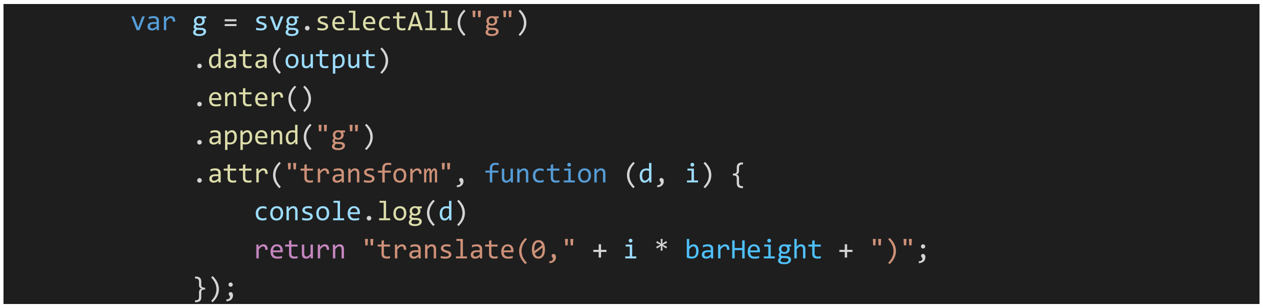


```
                            .join(
                                    enter => enter.append(line.Shape)
                                                .attr("cx", line.Positionx)
                                                .attr("cy", line.Positiony)
                                                .attr("r", line.Radius)
                                                .attr("fill", line.Color),
                                    exit => exit.transition()
                                                .duration(5000)
                                                .attr('r', 0)
                                                .remove(),
```

The join lets us specify exactly what happens to the DOM. Using the enter function, new shapes are added to the svg. Exit will then remove the shape from the svg.

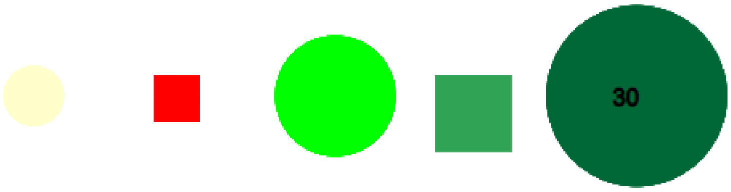
Exercise 14 & 15

We struggled to complete this exercise as we could not access the data object easily. We know the issue is with the below:

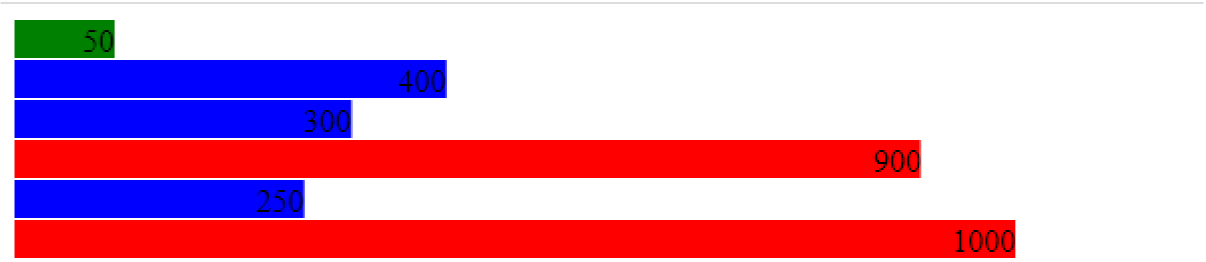


```
        var g = svg.selectAll("g")
            .data(output)
            .enter()
            .append("g")
            .attr("transform", function (d, i) {
                console.log(d)
                return "translate(0," + i * barHeight + ")";
            });
```

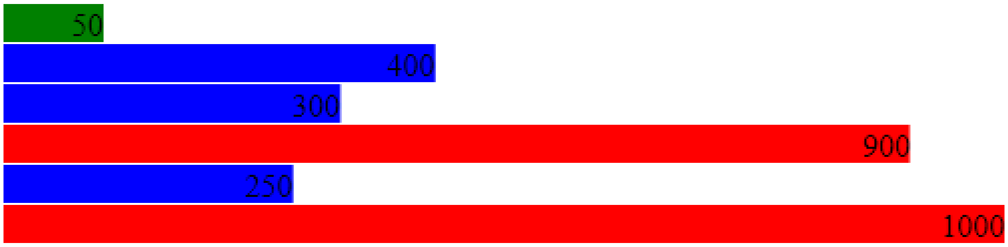
Exercise 16



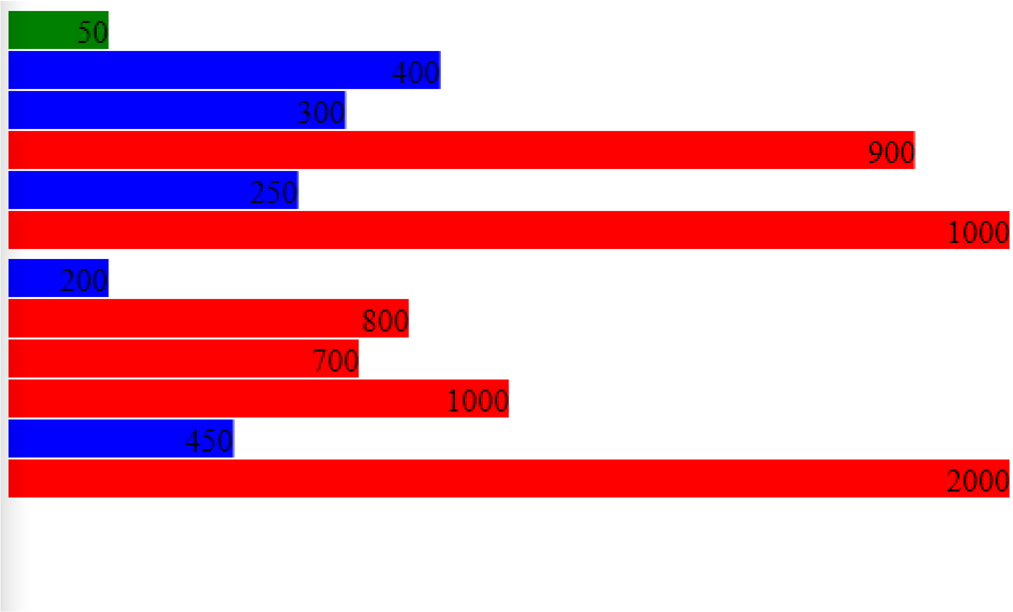
Exercise 17



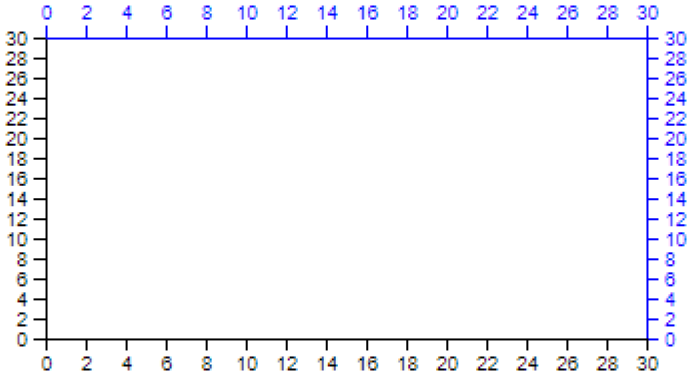
Exercise 18



Exercise 19



Exercise 20



The translate transform attribute of g specifies the number of horizontal and vertical pixels by which to translate the element.

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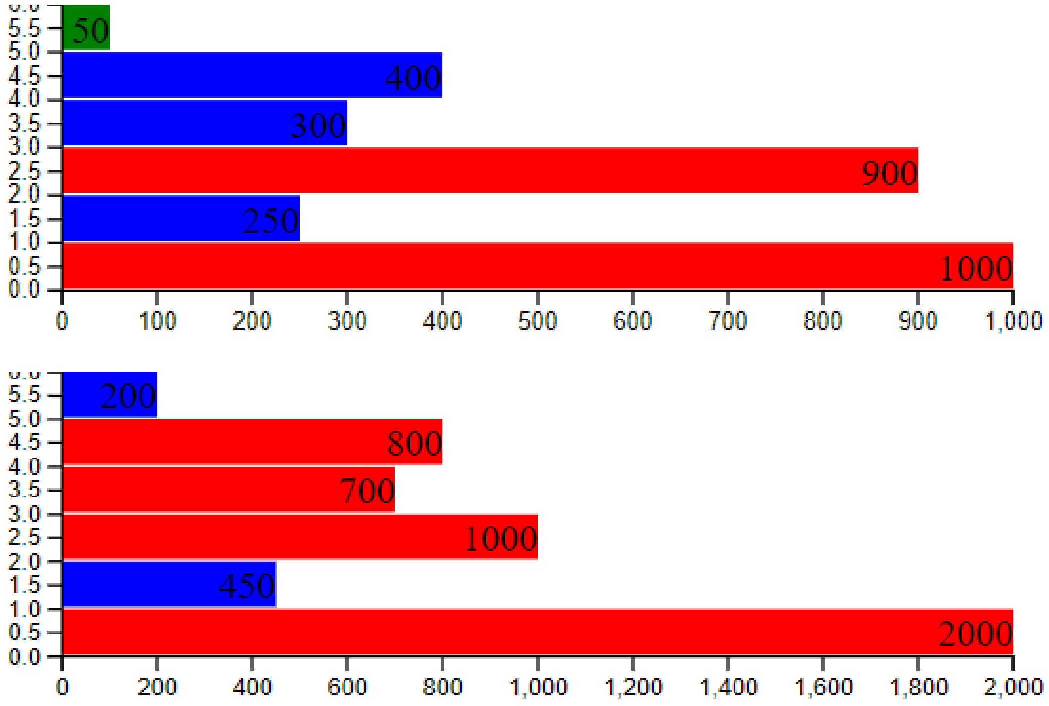
Exercise 21



Created a container element so we could centre for cleaner display.

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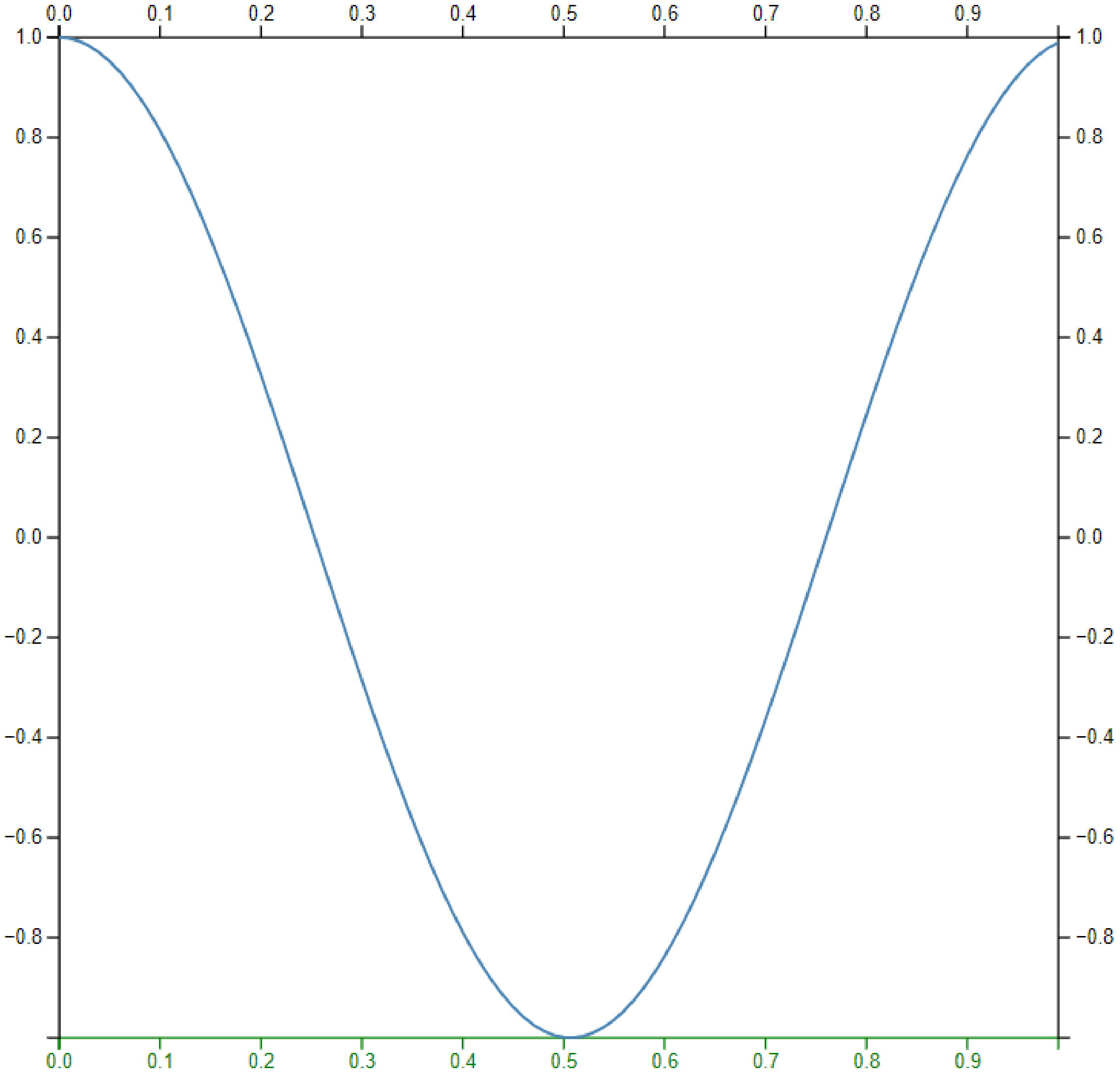
Exercise 22



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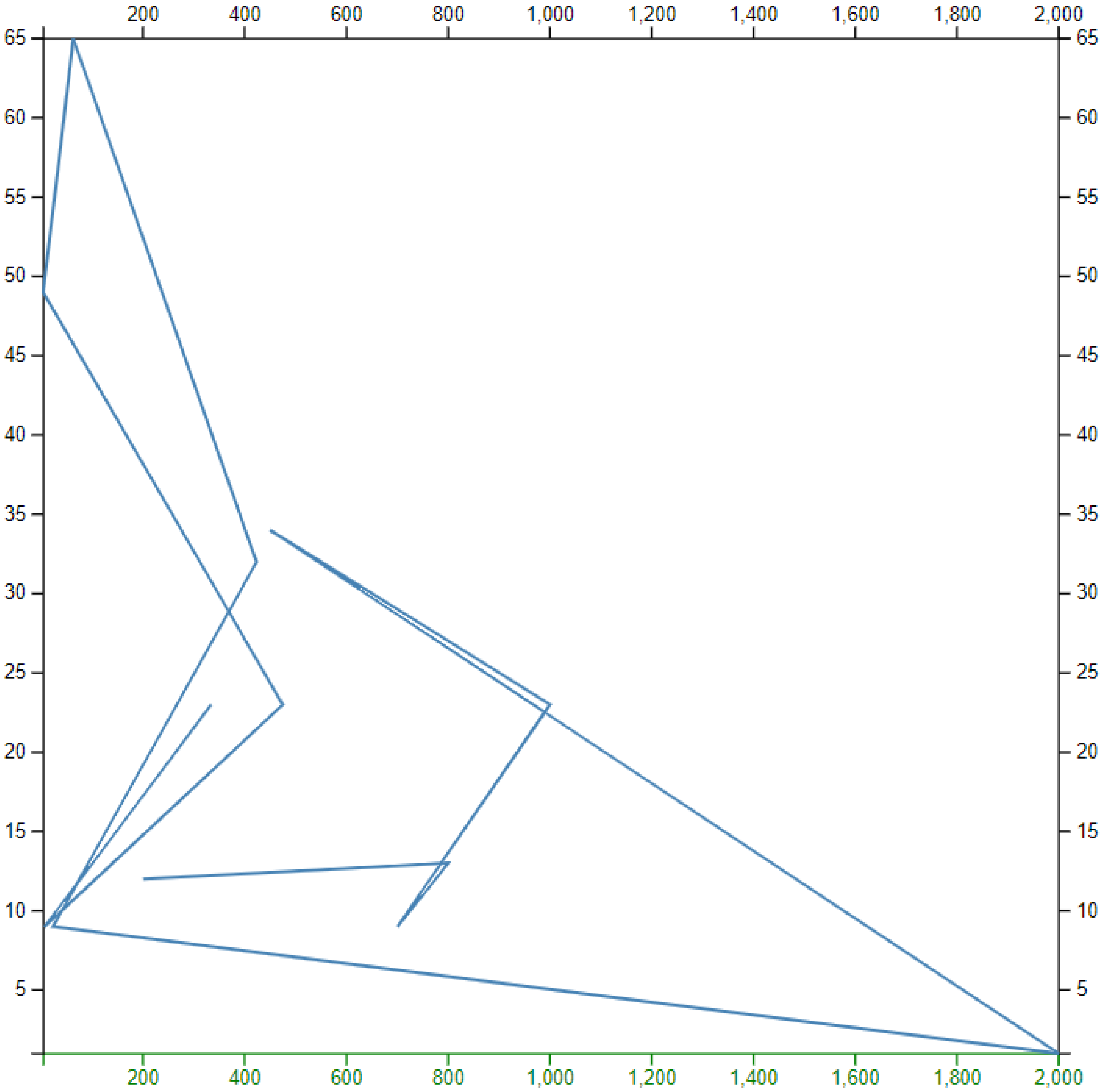
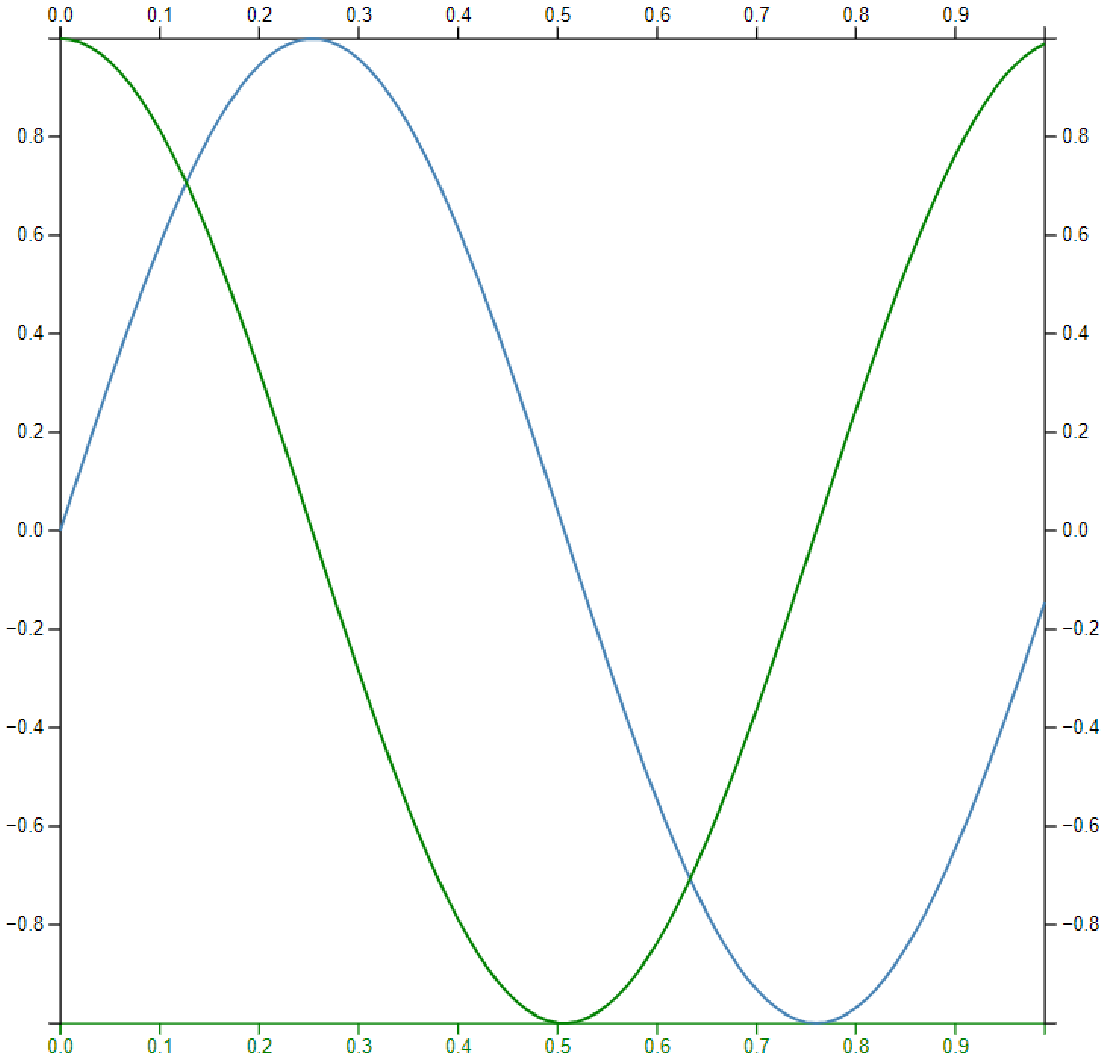
Exercise 23



Exercise 24


0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6
−0.8
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6
−0.8
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9

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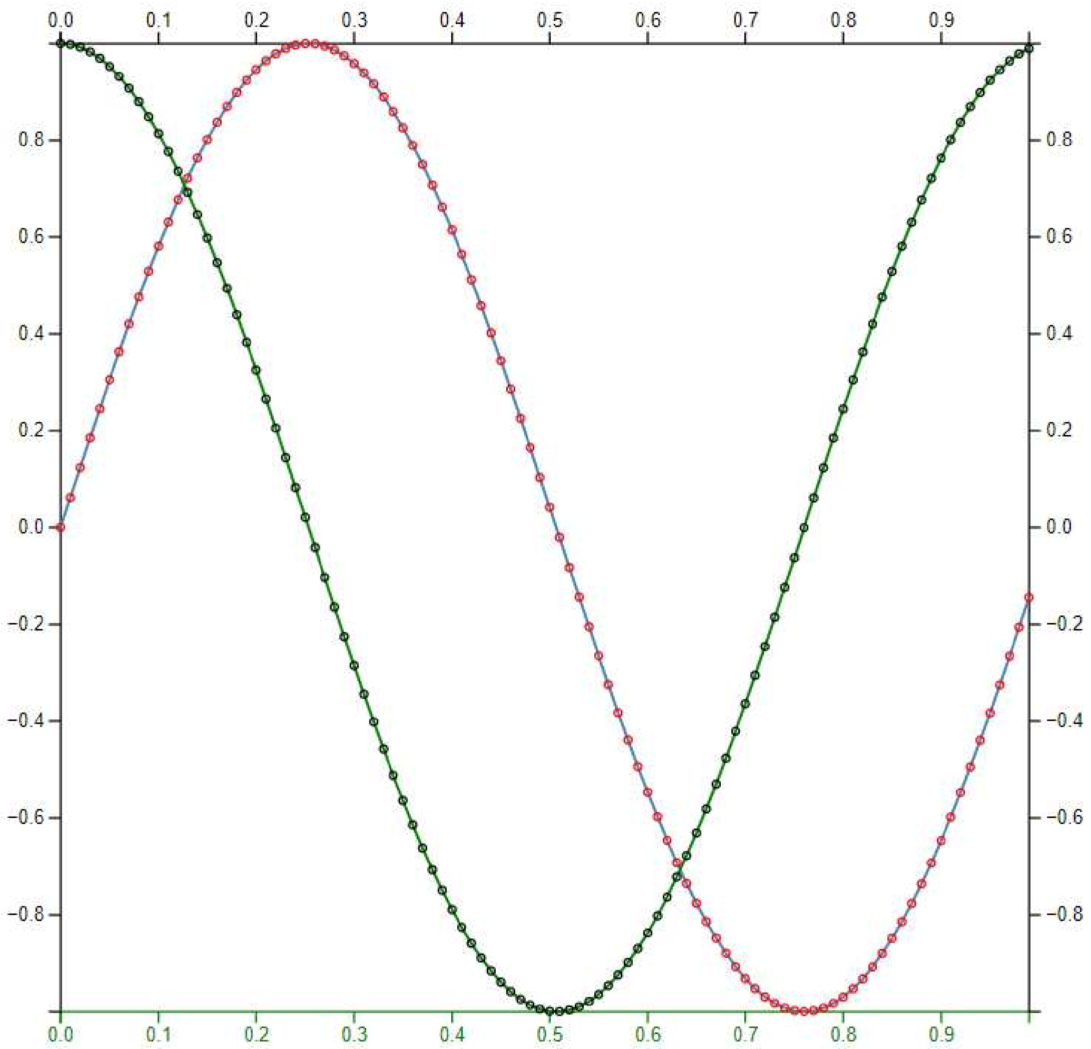
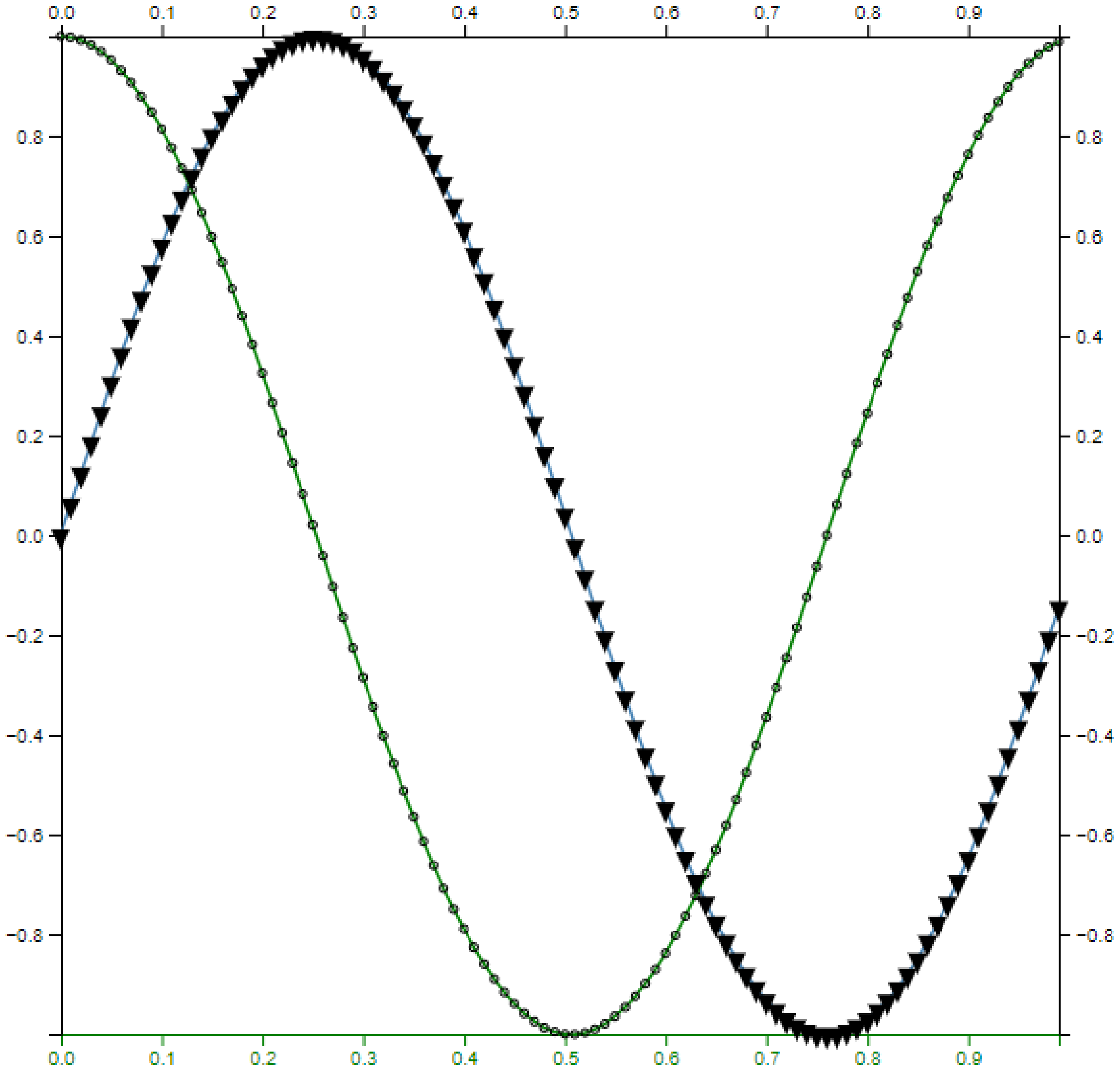
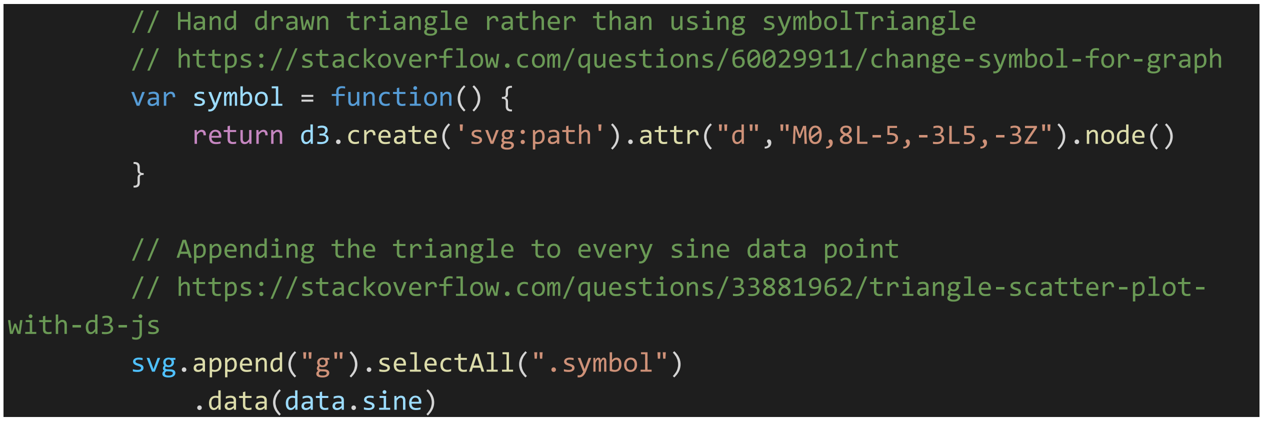
Exercise 25

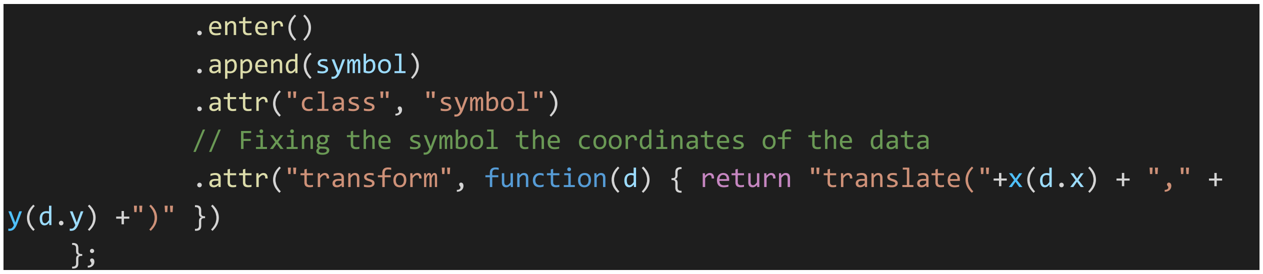


Exercise 26





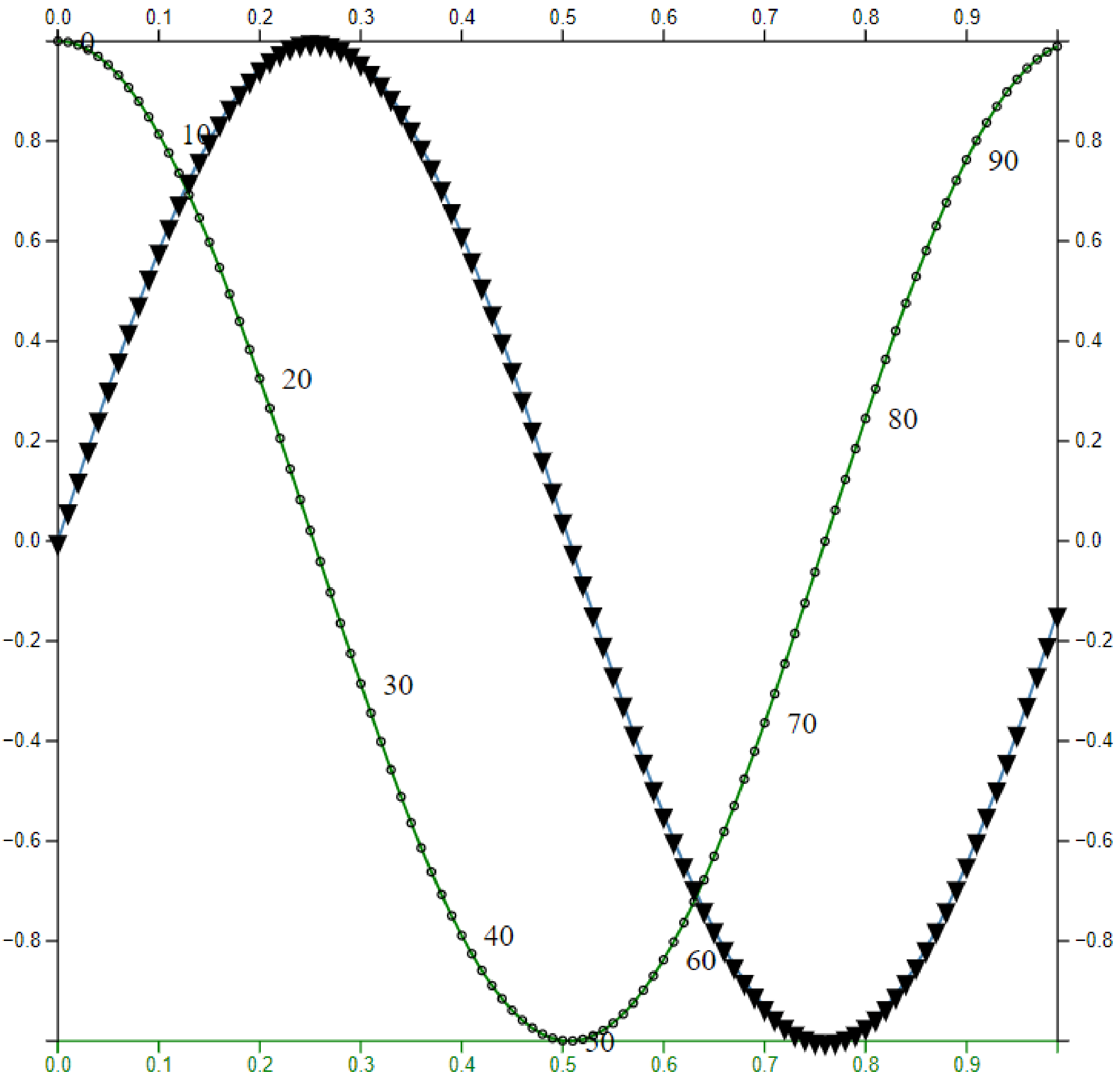
```
        // Hand drawn triangle rather than using symbolTriangle
        // https://stackoverflow.com/questions/60029911/change-symbol-for-graph
        var symbol = function() {
            return d3.create('svg:path').attr("d","M0,8L-5,-3L5,-3Z").node()
        }

        // Appending the triangle to every sine data point
        // https://stackoverflow.com/questions/33881962/triangle-scatter-plot-
with-d3-js
        svg.append("g").selectAll(".symbol")
            .data(data.sine)
```



```
            .enter()
            .append(symbol)
            .attr("class", "symbol")
            // Fixing the symbol the coordinates of the data
            .attr("transform", function(d) { return "translate("+x(d.x) + "," +
y(d.y) +")" })
    };
```

We tried to implement the symbolTriangle icon but opted to use a hand a drawn triangle instead.

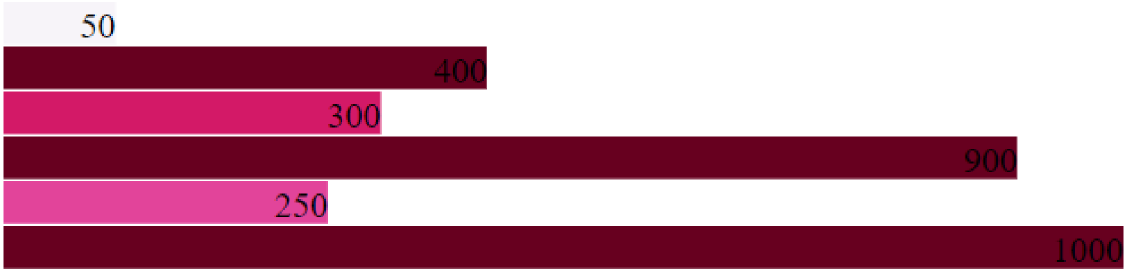
Exercise 27



```
        // Adding text to the data points by creating a new class and appending text
        // https://stackoverflow.com/questions/12266967/d3-js-how-to-add-labels-to-scatter-points-on-graph
        svg.selectAll(".dodo")
            .data(data.cosine)
            .enter().append("text")
            .attr("class", "dodo")
            .attr("x", function(d) { return x(d.x); })
            .attr("y", function(d) { return y(d.y); })
            .attr("dx", ".71em")
            .attr("dy", ".35em")
            // Only append text to every 10th data point
            .text(function(d,i) { if (i % 10 == 0) {return i}});
```

Created a new class and appended text. The dataset is the same as the line so it will be associated correctly.

Exercise 28



```
    // https://stackoverflow.com/questions/41848677/how-to-make-a-color-scale-in-d3-js-to-use-in-fill-attribute
    g.append("rect")
        .attr("width", function (d) {
            return scale(d);
        })
        .attr("height", barHeight - margin)
        // Every datapoint is given a colour from the scheme based on its value
        .attr("fill",  d => myColor(d))
```

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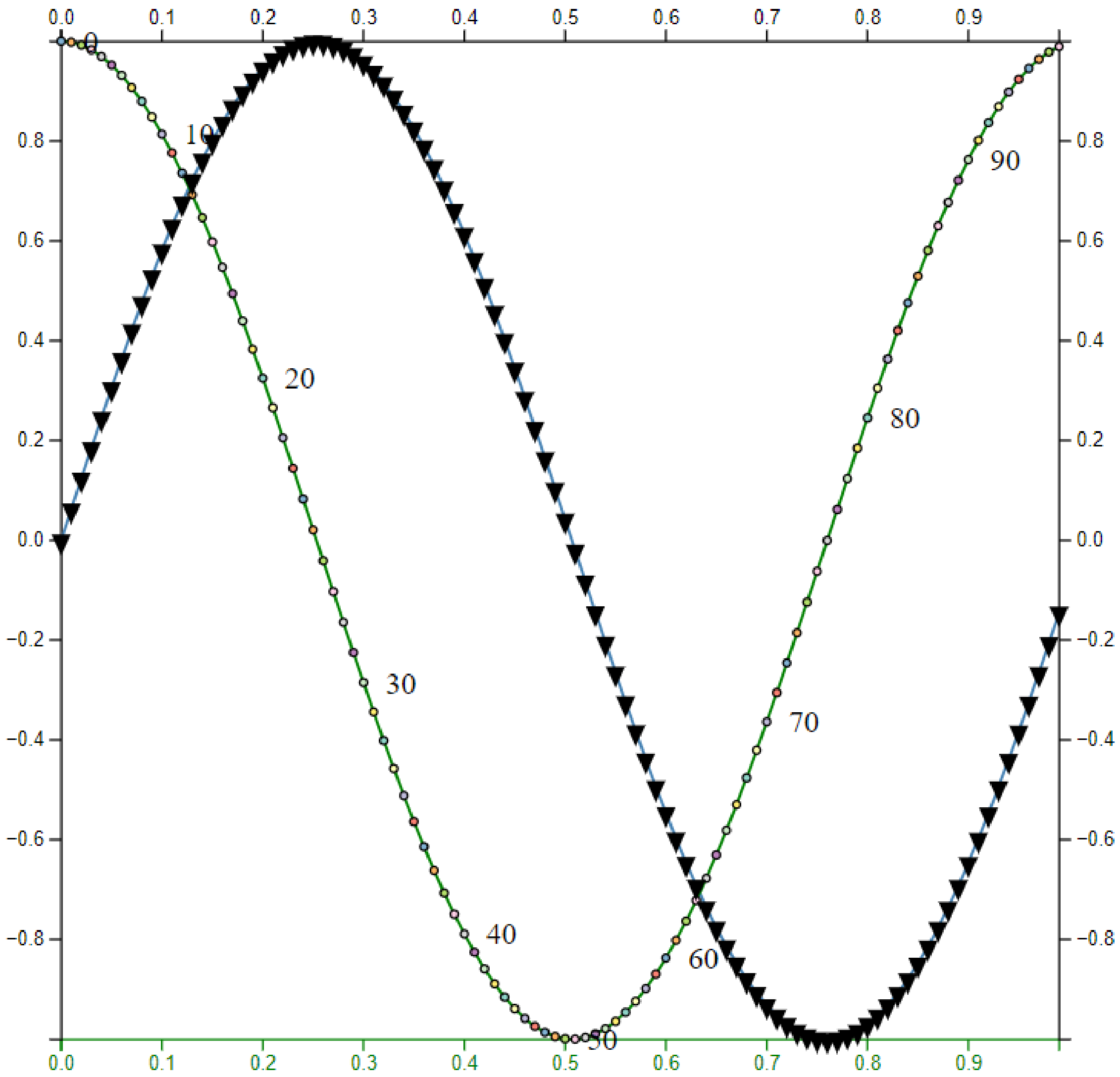
Exercise 29



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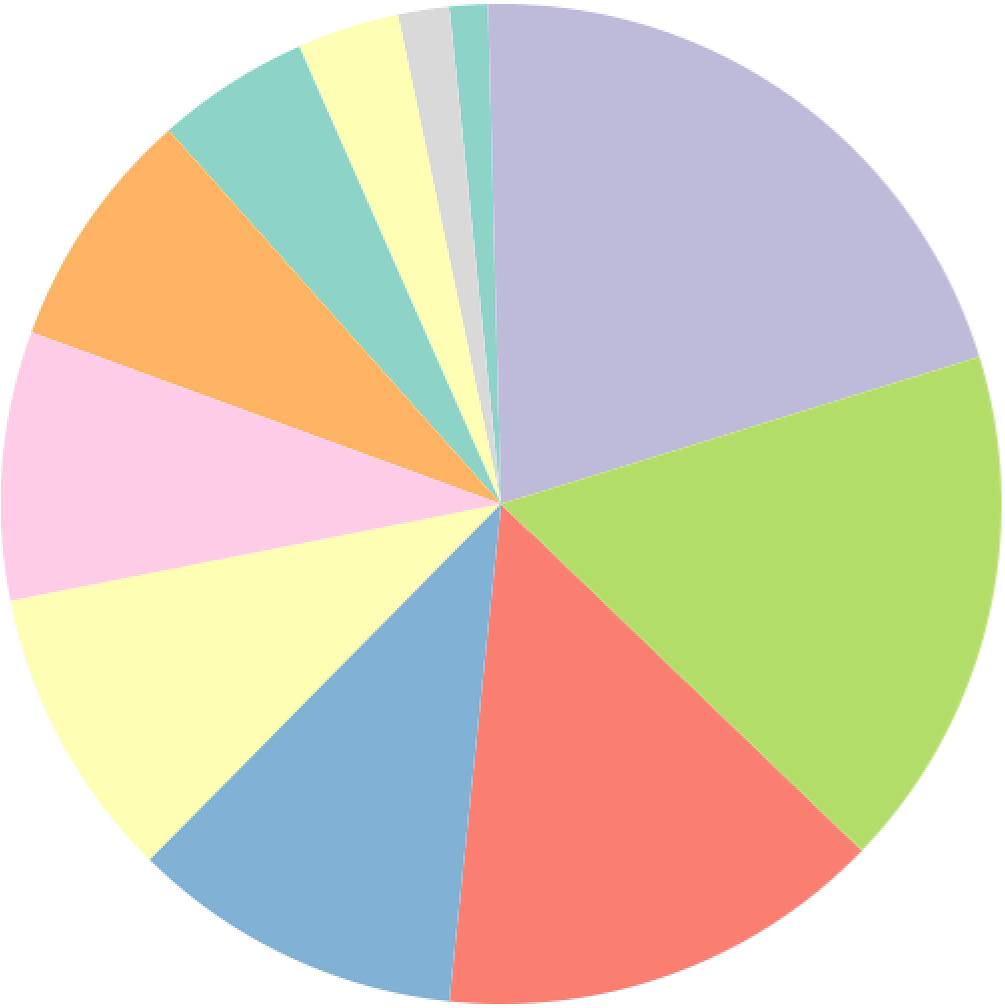
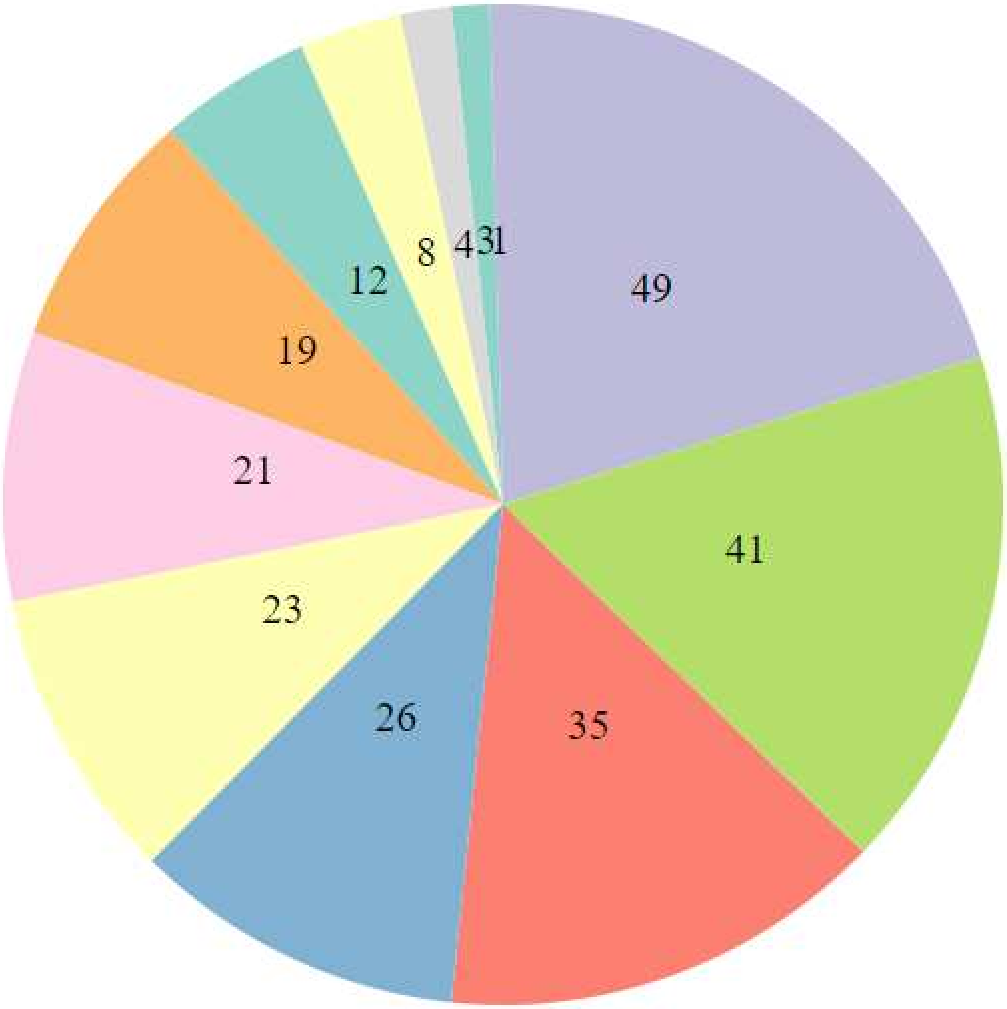
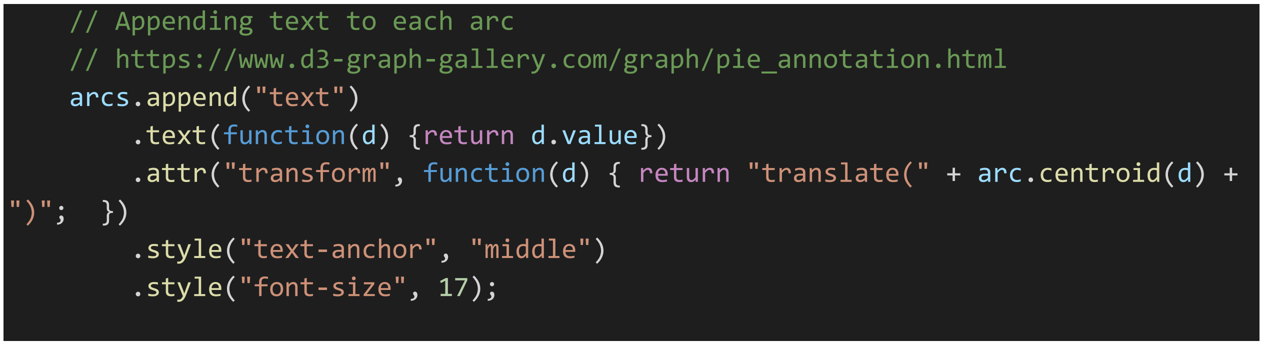
Exercise 30



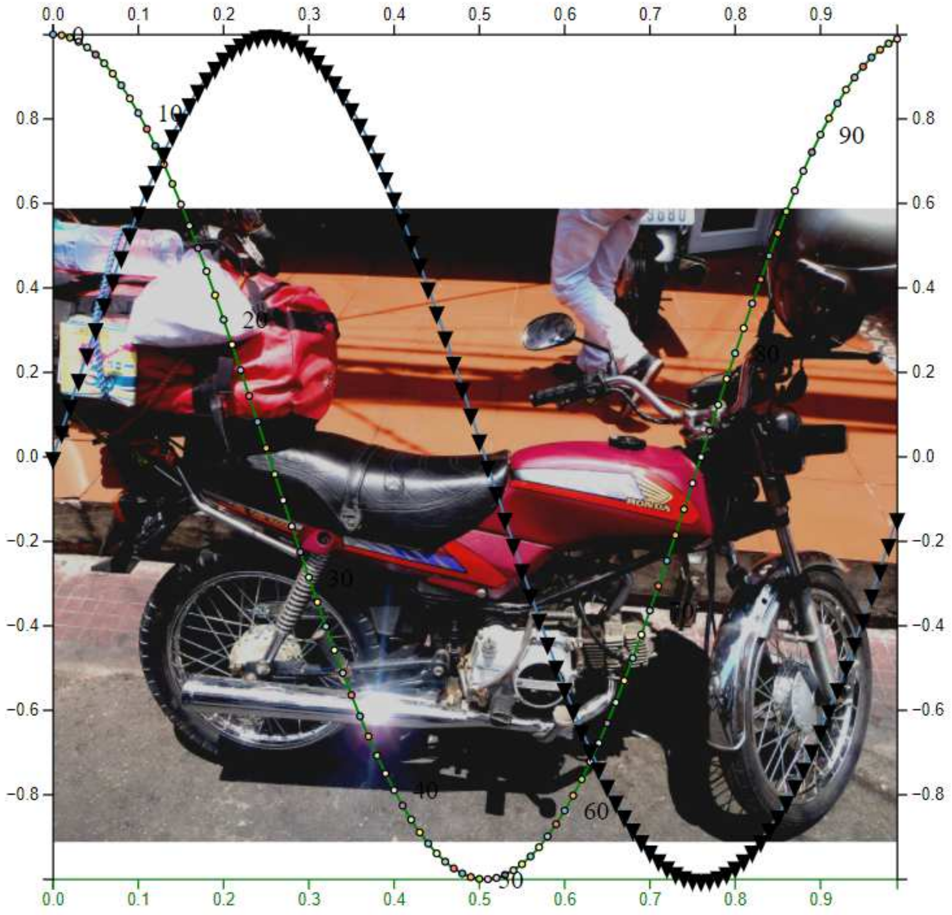
Exercise 31

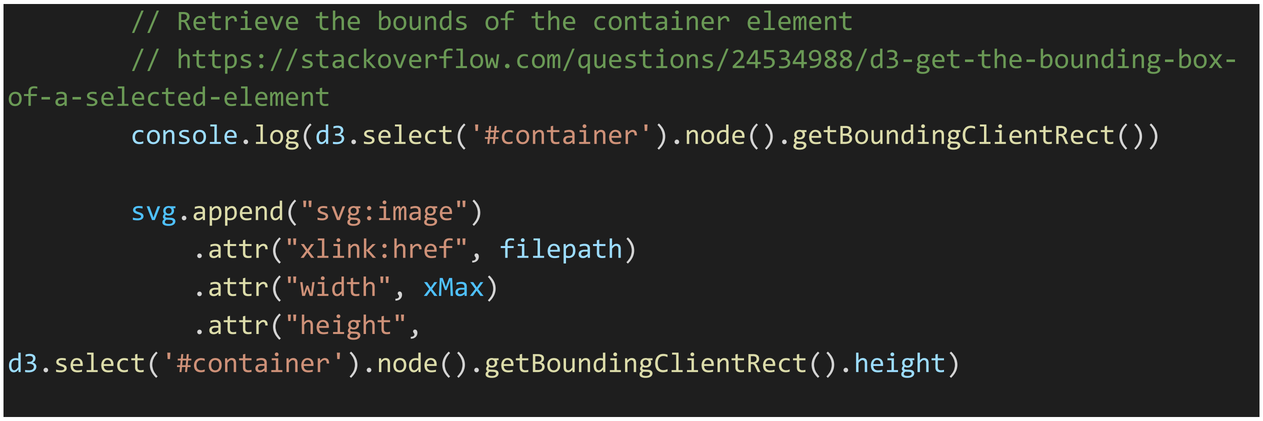




```
    // Appending text to each arc
    // https://www.d3-graph-gallery.com/graph/pie_annotation.html
    arcs.append("text")
        .text(function(d) {return d.value})
        .attr("transform", function(d) { return "translate(" + arc.centroid(d) +
")";  })
        .style("text-anchor", "middle")
        .style("font-size", 17);
```

Exercise 32





```
        // Retrieve the bounds of the container element
        // https://stackoverflow.com/questions/24534988/d3-get-the-bounding-box-
of-a-selected-element
        console.log(d3.select('#container').node().getBoundingClientRect())

        svg.append("svg:image")
            .attr("xlink:href", filepath)
            .attr("width", xMax)
            .attr("height",
d3.select('#container').node().getBoundingClientRect().height)
```

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We had an issue stretching the image (may be with the aspect ratio of the image) and tried several troubleshooting techniques to resolve it but to no avail. Although, one positive, discovered through our research, is a function that will give the bounds of any element so that the dimensions can be inferred.