

LAB EXERCISE 4

Learning Outcomes:

1. To create pie and donut charts using d3.js

Lesson 1: Creating Pie Chart

Create new HTML file in VS Code. Type ! and press Tab key to get skeleton of HTML code.

Step 1: Load d3.js in <head> section of HTML

```
<head>

<!-- Load d3.js -->
<script src="https://d3js.org/d3.v4.js"></script>

<!-- Color scale -->
<script src="https://d3js.org/d3-scale-chromatic.v1.min.js"></script>

</head>
```

Step 2: Create a div to put the graph in <body> section of HTML

```
<body>

<div id="my_dataviz"></div>

...
```

Start writing the scripts in <body> section of HTML. There are few code fragments within the <script> compound.

1. Open script
2. Dimension and margin of the graph
3. Set the radius of pie chart
4. Append the SVG
5. Create data
6. Set the color scale
7. Compute the position of each group on the pie
8. Build arcs
9. Build the pie chart
10. Add annotation
11. Close script

Step 3: Set the dimensions and margins of the graph

```
<script>

var width = 450
    height = 450
    margin = 40

</script>
```

Step 4: Set the radius of the pie chart

The radius of the pie chart is half the width or half the height (smallest one). Adjust it by subtracting the margin.

```
var radius = Math.min(width, height) / 2 - margin
```

Step 5: Drawing graph with SVG

Append the SVG object to the body of the page. Add the following code to the script. The coordinate is based on the margin set in Step 3.

```
var svg = d3.select("#my_dataviz")
  .append("svg")
  .attr("width", width)
  .attr("height", height)
  .append("g")
  .attr("transform", "translate(" + width / 2 + "," + height / 2 + ")");
```

Step 6: Create the data to plot

```
var data = {'Dengue and dengue haemorrhagic fever':1923, 'Malaria':
416, 'Typhoid': 43, 'Cholera': 51}
```

Step 7: Set the color scale

```
var color = d3.scaleOrdinal()
  .domain(data)
  .range(d3.schemeSet2);
```

Step 8: Compute the position of each group

```
var pie = d3.pie()
  .value(function(d) {return d.value; })

var data_ready = pie(d3.entries(data))
```

Step 9: Build arcs

```
var arcGenerator = d3.arc()
  .innerRadius(0)
  .outerRadius(radius)
```

The **d3.arc()** function is used to generate an arc generator that produce a circular chart. It is based on the difference between the start angle and the end angle.

Step 10: Build Pie chart

```
svg
```

```

.selectAll('mySlices')
.data(data_ready)
.enter()
.append('path')
  .attr('d', arcGenerator)
  .attr('fill', function(d){ return color(d.data.key) })
  .attr("stroke", "black")
  .style("stroke-width", "2px")
  .style("opacity", 0.7)

```

Step 11: Add the annotation

```

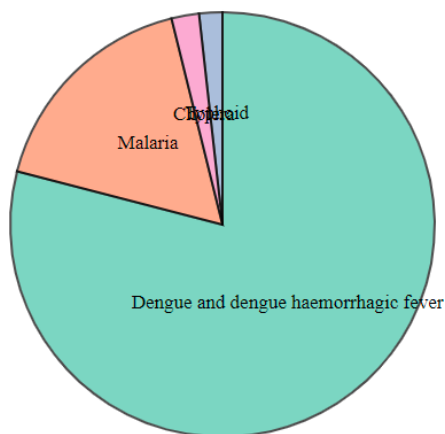
svg
.selectAll('mySlices')
.data(data_ready)
.enter()
.append('text')
  .text(function(d){ return "grp " + d.data.key})
  .attr("transform", function(d) { return "translate(" +
arcGenerator.centroid(d) + ")"; })
  .style("text-anchor", "middle")
  .style("font-size", 17)

```

Step 12: Close the script

```
</script>
```

Sample Output



Observe the output. How to improve the chart?

Modify the inner radius in Step 9 to create a DONUT chart.

```

.outerRadius(radius * 0.8)

.innerRadius(radius * 0.4);

```

Lesson 2: Creating Interactive Pie Chart Using d3Pie.min.js

“**D3pie** is a simple, highly configurable script built on [d3.js](#) for creating simple, attractive pie charts. It’s free, *open source*.”

Step 1: Include two resources; d3.min.js and d3Pie.min.js

Download d3Pie.min.js from:

<https://raw.githubusercontent.com/benkeen/d3pie/0.2.1/d3pie/d3pie.min.js>

```
<head>
  <script src="https://d3js.org/d3.v4.min.js"></script>
  <script src="d3pie.min.js"></script>
</head>
```

Step 2: Create div in <body> section

```
<div id = "myPie"></div>
```

Step 3: Create new pie chart in <script>

The header part contains title and create content in data compound.

```
var pie = new d3pie("myPie", {
  header: {
    title: {
      text: "Number Of Deaths By Type Of Diseases, Malaysia (2000-2016)"
    }
  },
  data: {
    content: [
      { label: "Dengue and dengue haemorrhagic fever", value: 1923 },
      { label: "Malaria", value: 416 },
      { label: "Typhoid", value: 43},
      { label: "Cholera", value: 51},
    ]
  },
});
```

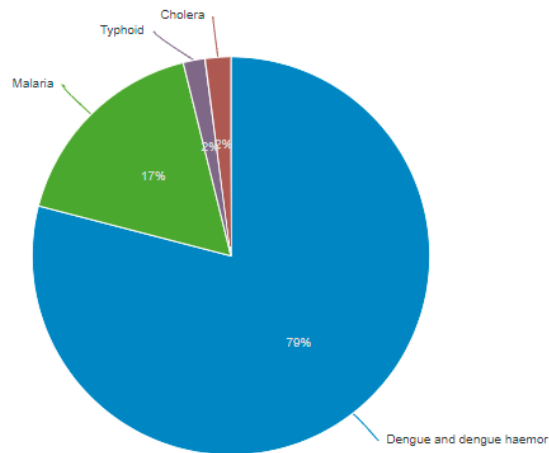
Step 5: Continue with further operation with interactive elements

```
callbacks: {
  onmouseoverSegment: function(info) {
    console.log("mouse in", info);
  },
  onmouseoutSegment: function(info) {
    console.log("mouseout:", info);
  }
}

});
```

Sample Output

Number Of Deaths By Type Of Diseases, Malaysia (2000-2016)



Try complex pie chart:

<https://medium.com/knoldus/d3js-pie-charts-made-super-easy-d3pie-d601fd167087>

More libraries > <https://project-awesome.org/wbkd/awesome-d3>

LAB TASK

Download any data from <https://www.data.gov.my/>

- Create ONE static donut chart and ONE interactive pie chart based on the downloaded dataset.
- Consider appropriate pre-attentive attributes such as label, color etc.
- Write a summary of insights based on the graphs created in (a).

Submission item: HTML file.

Submission platform: MS Teams

Deadline: 1st. July 2022