# Lecture Exercise 4 (4/25)

## Submit your team number

**Question** *Submitted Apr 25th 2023 at 4:54:41 pm*

Please enter your team number.

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# 1. Refine your first plot with D3

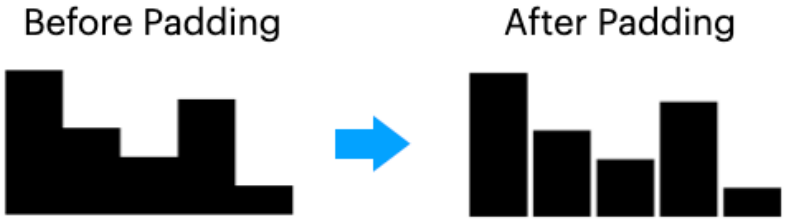
Download exercise4.html. The default code generates a `<svg>` with a specific width and height. Your job is to draw a barchart that visualizes the array dataset.

- Step1: Write a method chain which generates 5 <rect> elements whose class is “a1bar” . Then add attr() to the method chain above to set the width, height, x, and y of each <rect>. You might need to use anonymous function to modify the "x", "y", "width" and "height". Your output should look similar to this:

**Hint** : You can refer to the example code on the slides today, as a starting point.

- Step3: Adjust the height of the bar, so that the length of each bar is more readable. You can do so by scaling up the length of the attribute by a constant factor: e.g. **multiply 10 to the each y and height value.**


- Step4: You can also add some empty space by refining the x attribute further. This enhances the “separability” of each line mark. **Modify the x attribute accordingly.**




**Question** *Submitted Apr 25th 2023 at 5:15:19 pm*

Copy and paste your final code that create the barchart that has been scaled and padded.

```
        let dataset =[5, 3, 2, 4, 1];
```

```
        let svgwidth_a1 = 400;
        let svgheight_a1 = 100;
        let barWidth = 20;
        let heightScale = 10;
        let padding = 1;

        let svg_a1 = d3.select("#activity1").append("svg")
            .attr("width", svgwidth_a1)
            .attr("height", svgheight_a1);

        // add your code
        svg_a1.selectAll(".a1bar")
            .data(dataset).enter()
            .append("rect")
            .attr("class", "a1bar")
            .attr("x", (d, i) => (i * barWidth) + i * padding)
            .attr("y", d => svgheight_a1 - d * heightScale)
            .attr("width", barWidth)
            .attr("height", d => d * heightScale);
```

## 2. Draw your first Scatterplot

Notice that there is an array of objects, Sports, in `<script>` of exercise4.html.

```
let Sports=[
 {"Name":"Player1","Age":19,"Sport":"sport1","cat":"cat1","Rating":100},
 {"Name":"Player2","Age":29,"Sport":"sport1","cat":"cat2","Rating":80},
 {"Name":"Player3","Age":39,"Sport":"sport1","cat":"cat1","Rating":10},
 {"Name":"Player4","Age":15,"Sport":"sport2","cat":"cat2","Rating":90},
 {"Name":"Player5","Age":18,"Sport":"sport2","cat":"cat1","Rating":100},
 {"Name":"Player6","Age":23,"Sport":"sport3","cat":"cat2","Rating":25},
 {"Name":"Player7","Age":19,"Sport":"sport2","cat":"cat1","Rating":70}
 ]
```

Draw a 2D scatter plot with two Values, Age (as X) and Rating (as Y). We have defined a new SVG for this new plot, under the definition of the Sports variable.

**Question** *Submitted Apr 25th 2023 at 5:23:55 pm*

Copy and paste the part of your code which draws the scatter plot.

```
        let svgwidth_a2 = 200;
        let svgheight_a2 = 200;
        let pointRadius = 3;
        let xScale = 4;
        let yScale = 1;

        let svg_a2 = d3.select("#activity2").append("svg")
            .attr("width", svgwidth_a2)
            .attr("height", svgheight_a2);

        // add your code
```

```
        svg_a2.selectAll(".a2point")
            .data(Sports).enter()
                .append("circle")
            .attr("class", "a2point")
            .attr("cx", d => d.Age * xScale)
            .attr("cy", d => svgheight_a2 - (d.Rating * yScale))
            .attr("r", pointRadius)
            .attr("fill", "#84b1a3")
```

## 3. (Bonus) Maximize the use of the SVG canvas

If you have time to spare, here are things you can do!

1. Adjust the width and height of the bars on the barchart from Activity 1 to **maximize** the use of the canvas. Your code should utilize the canvas fully even if we change 1) the svg width and height; and/or 2) the values in the data array.

**Hint:** Think about how you can formulate the width and height of the bars, given the max value of the array = [5, 3, 2, 4, 1]. You will find d3.max() also useful to actually calculate the max value within an array.

2. Add some style to your plots (colors, borderline, highlight the color of the bars (or dots) whose value is over a certain threshold, etc.)

**Question** *Submitted Apr 25th 2023 at 5:33:18 pm*

Copy/paste your code that you used. If you haven't done this activity, you can just say NA.

```
let svgwidth_a2 = 500;
let svgheight_a2 = 400;
let pointRadius = 3;

let maxHeight = Math.max(...Sports.map(o => o.Rating));
let maxWidth = Math.max(...Sports.map(o => o.Age));

// Looks best if innerPadding >= pointRadius
let innerPadding = 5;
const xScale = (svgwidth_a2 - innerPadding) / maxWidth
const yScale = (svgheight_a2 - innerPadding) / maxHeight

let svg_a2 = d3.select("#activity2").append("svg")
    .attr("width", svgwidth_a2)
    .attr("height", svgheight_a2);

// add your code
svg_a2.selectAll(".a2point")
    .data(Sports).enter()
        .append("circle")
    .attr("class", "a2point")
    .attr("cx", d => d.Age * xScale)
    .attr("cy", d => svgheight_a2 - (d.Rating * yScale))
    .attr("r", pointRadius)
    .attr("fill", "#84b1a3")
```

# Upload Your Files

**Question 1** *Submitted Apr 25th 2023 at 5:33:51 pm*

Upload the screenshot of your resulting webpage. You will need to click the "clip" button to upload a file into the Answer box.

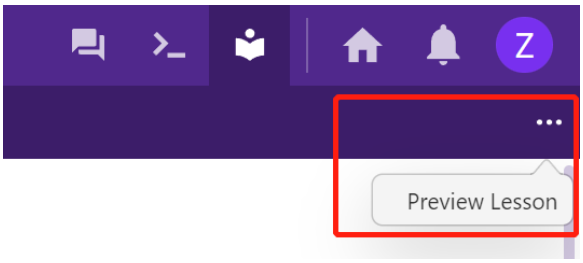
Activity 1: Draw a barchart with an array [1, 2, 3, 4, 5]

Activity 2: Draw a scatterplot with Sports

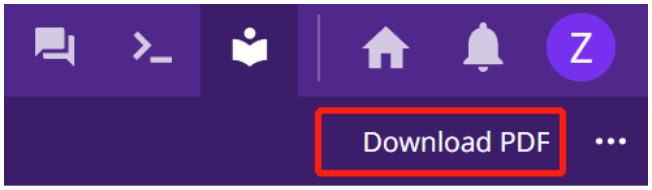
**Question 2**

You need to download the PDF of lecture exercise 3 and upload it with other files to the Gradescope. Follow the instructions on how to download PDF file:

1. Click on the ellipsis button and the Preview Lesson.




2. After that, click on the Download PDF button.




- ( ) PDF downloaded!
- ( ) Haven't done yet!

**Question 3**

Upload the following files to Gradescope. You need to make **a group submission,adding all present members in your team**, so that the present members get the participation credit.

Files to upload:

- exercise4.html
- PDF you downloaded as Q2

- ( ) Our team uploaded the the files on gradescope!
- ( ) Oops, our team did not upload the files on gradescope!

# Feedback

**Question**

Was the activity today clear? If not, please share how the course can improve it. Your comments will help us design future lab content (and also future students).

*No response*