Lab 5_3.html

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="description" content="Data Visualization"/>
    <meta name="keywords" content="HTML, CSS, D3"/>
    <meta name="author" content="Dai Vy"/>
    <title>Task 5.3 D3 Adding and Removing Data</title>

    <script src="https://d3js.org/d3.v7.min.js"></script>
    <style>

    </style>
</head>
<body>

    <button id="add">Add</button>
    <button id="remove">Remove</button>
    <h1>LAB 5.3 D3 Adding and Removing Data</h1>

    <script>
        var w = 500;
        var h = 100;
        var maxValue = 25;
        var dataset = [24, 10, 29, 19, 8, 15, 20, 12, 9, 6, 21, 28];
        var duration = 2000;

        // Use scaleBand() to create an ordinal scaleable x-axis based on the range of the
data set.
        var xScale = d3.scaleBand()
                .domain(d3.range(dataset.length))
                .rangeRound([0, w])
                .paddingInner(0.05);

        // Use scaleLinear() to create a linear scaleable y-axis based on the range of the
data set.
        var yScale = d3.scaleLinear()
                .domain([0, d3.max(dataset)])
                .range([0, h]);

        var svg = d3.select("body")
                .append("svg")
                .attr("width", w)
                .attr("height", h);

        // Draw initial bars
        svg.selectAll("rect")
            .data(dataset)
```

```
            .enter()
            .append("rect")
            .attr("x", function(d, i) {
                return xScale(i);
            })
            .attr("y", function(d) {
                return h - yScale(d);
            })
            .attr("width", xScale.bandwidth())
            .attr("height", function(d) {
                return yScale(d);
            })
            .attr("fill", "steelblue");

        // Draw initial labels
        svg.selectAll("text")
            .data(dataset)
            .enter()
            .append("text")
            .text(function(d) {
                return d; // This displays the number on each bar
            })
            .attr("x", function(d, i) {
                return xScale(i) + xScale.bandwidth() / 2;
            })
            .attr("y", function(d) {
                return h - yScale(d) + 14;
            })
            .attr("text-anchor", "middle")
            .attr("fill", "white")
            .attr("font-size", "12px");

        // Add bar function
        function addBar() {
            var newValue = Math.floor(Math.random() * maxValue);
            dataset.push(newValue);
            xScale.domain(d3.range(dataset.length));
            yScale.domain([0, d3.max(dataset)]);
            var delayStep = duration / dataset.length;

            // Bars
            var bars = svg.selectAll("rect")
                .data(dataset, function(d, i) { return i; });

            // ENTER new bar
            var barsEnter = bars.enter()
                .append("rect")
                .attr("x", w) // start off right edge
                .attr("y", function(d) { return h - yScale(d); })
                .attr("width", xScale.bandwidth())
```

```
97                .attr("height", function(d) { return yScale(d); })
98                .attr("fill", "steelblue");
99
100           // MERGE and transition all bars
101           bars.merge(barsEnter)
102               .transition()
103               .duration(duration)
104               .delay(function(d, i) { return i * delayStep; })
105               .attr("x", function(d, i) { return xScale(i); })
106               .attr("y", function(d) { return h - yScale(d); })
107               .attr("width", xScale.bandwidth())
108               .attr("height", function(d) { return yScale(d); });
109
110           // Labels
111           var labels = svg.selectAll("text")
112               .data(dataset, function(d, i) { return i; });
113
114           var labelsEnter = labels.enter()
115               .append("text")
116               .text(function(d) { return d; })
117               .attr("x", w + xScale.bandwidth() / 2)
118               .attr("y", function(d) { return h - yScale(d) + 14; })
119               .attr("text-anchor", "middle")
120               .attr("fill", "white")
121               .attr("font-size", "12px");
122
123           labels.merge(labelsEnter)
124               .transition()
125               .duration(duration)
126               .delay(function(d, i) { return i * delayStep; })
127               .text(function(d) { return d; })
128               .attr("x", function(d, i) { return xScale(i) + xScale.bandwidth() / 2; })
129               .attr("y", function(d) { return h - yScale(d) + 14; });
130       }
131
132       // Remove bar function
133       function removeBar() {
134           if (dataset.length === 0) return;
135           dataset.shift();
136           xScale.domain(d3.range(dataset.length));
137           yScale.domain([0, d3.max(dataset)]);
138           var delayStep = duration / (dataset.length || 1);
139
140           // Bars
141           var bars = svg.selectAll("rect")
142               .data(dataset, function(d, i) { return i; });
143
144           // EXIT first bar
145           bars.exit()
146               .transition()
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                .duration(duration)
                .attr("x", w)
                .remove();

            // UPDATE remaining bars
            bars.transition()
                .duration(duration)
                .delay(function(d, i) { return i * delayStep; })
                .attr("x", function(d, i) { return xScale(i); })
                .attr("y", function(d) { return h - yScale(d); })
                .attr("width", xScale.bandwidth())
                .attr("height", function(d) { return yScale(d); });

            // Labels
            var labels = svg.selectAll("text")
                .data(dataset, function(d, i) { return i; });

            labels.exit()
                .transition()
                .duration(duration)
                .attr("x", w)
                .remove();

            labels.transition()
                .duration(duration)
                .delay(function(d, i) { return i * delayStep; })
                .text(function(d) { return d; })
                .attr("x", function(d, i) { return xScale(i) + xScale.bandwidth() / 2; })
                .attr("y", function(d) { return h - yScale(d) + 14; });
        }

        // Button event listeners
        d3.select("#add").on("click", addBar);
        d3.select("#remove").on("click", removeBar);
    </script>

    <br>

    <footer style="color: grey">COS30045 Data Visualization<br>
        Dai Vy
    </footer>
</body>
</html>
```