12.4.2

Create a Dynamic Plotly Chart

Having become more comfortable with using an event listener with a dropdown menu, Roza is now ready to create a dynamic chart in Plotly.

She'll now create a dynamic line chart: there will be a dropdown menu in the browser with two options. When an option is selected, the browser will display the graph for the dataset associated with that option.

This skill will help Roza with a major task in her project: to create a dashboard in which her volunteers can select their anonymized ID from a dropdown menu in the browser in order to display information about their belly button critters.

We'll first help Roza create a simple dynamic line chart in Plotly. As before, we'll create an `index.html` page with the appropriate links to CDNs and a JavaScript file `(plots.js)`. The page also has a dropdown menu with an `id` of `dropdownMenu`:

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <meta http-equiv="X-UA-Compatible" content="ie=edge">
  <title>Events</title>
  <script src="https://d3js.org/d3.v5.min.js"></script>
  <script src="https://cdn.plot.ly/plotly-latest.min.js"></script>
</head>
<body>
  <div id="plot"></div>
  <select id="dropdownMenu">
    <option value="dataset1">DataSet1</option>
    <option value="dataset2">DataSet2</option>
  </select>
```

```
  <script src="plots.js"></script>
</body>
</html>
```

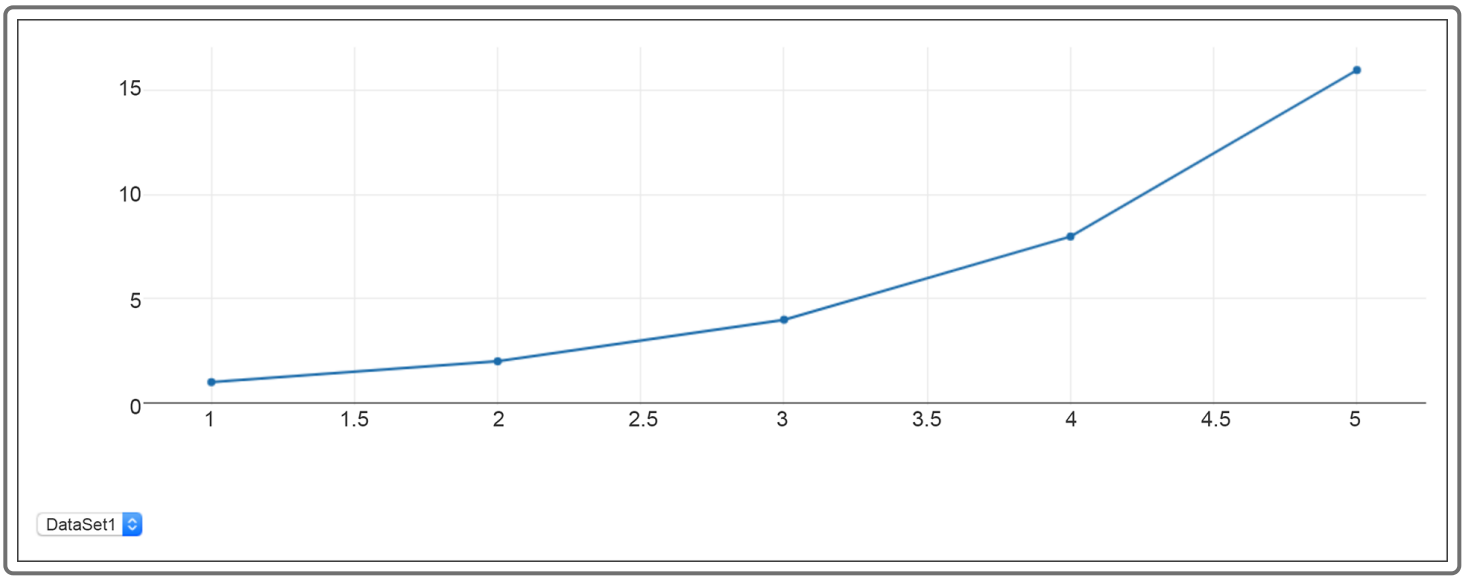
Take a moment to examine `plots.js` in detail:

```
function init() {
  data = [{
    x: [1, 2, 3, 4, 5],
    y: [1, 2, 4, 8, 16]
  }];
  Plotly.newPlot("plot", data);
};

d3.selectAll("#dropdownMenu").on("change", updatePlotly);
function updatePlotly() {
  var dropdownMenu = d3.select("#dropdownMenu");
  var dataset = dropdownMenu.property("value");

  var xData = [1, 2, 3, 4, 5];
  var yData = [];

  if (dataset === 'dataset1') {
    yData = [1, 2, 4, 8, 16];
  };

  if (dataset === 'dataset2') {
    yData = [1, 10, 100, 1000, 10000];
  };

  var trace = {
    x: [xData],
    y: [yData],
  };
  Plotly.restyle("plot", trace);
};

init();
```

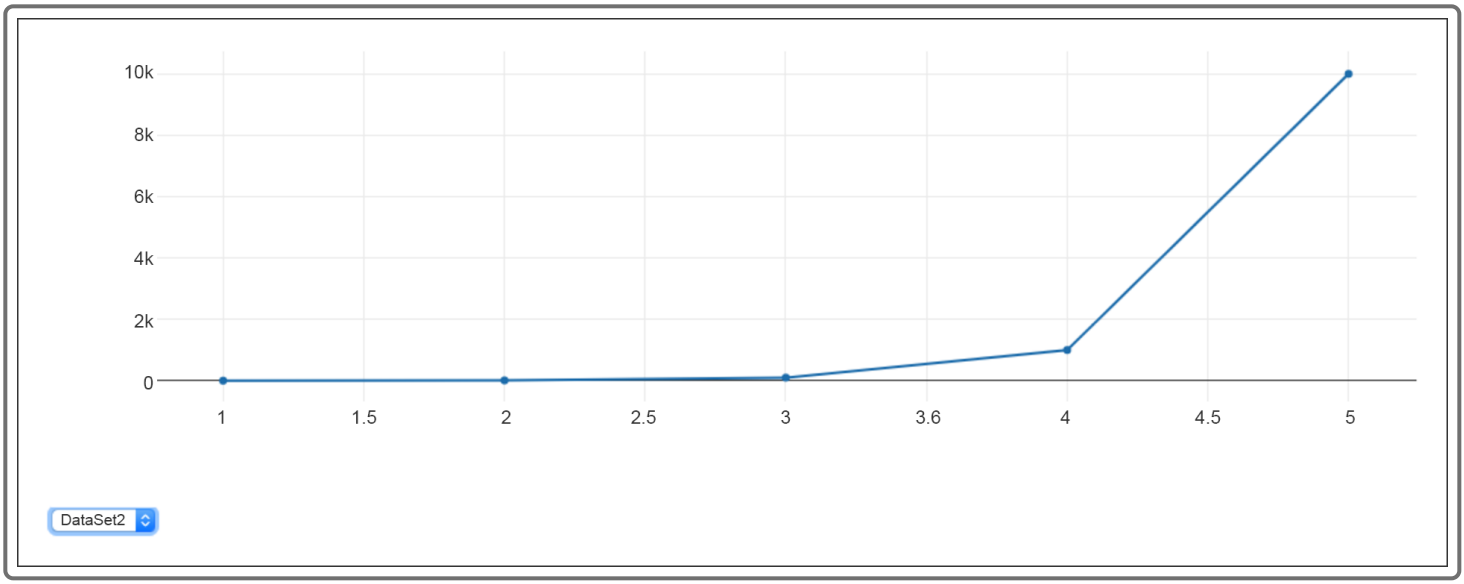
The first function to execute is `init()`, which renders the initial visualization:

```
function init() {
  data = [{
    x: [1, 2, 3, 4, 5],
    y: [1, 2, 4, 8, 16]
  }];
  Plotly.newPlot("plot", data);
};
init();
```

In this part of the code, a simple line chart, with `x` and `y` axes, is rendered with `Plotly.newPlot()`. By default, when a user opens `index.html` in a browser, this is the chart that is displayed:



Notice, however, that there is a dropdown menu, and that the visualization changes when the `DataSet2` option is selected:



Retake

When the user first loads the page, `init()` is called, and the initial plot is rendered. However, when the user selects a dropdown menu option, the `updatePlotly()` function is called:

```
d3.selectAll("#dropdownMenu").on("change", updatePlotly);
```

Specifically, through the `d3.selectAll()` function, when a change takes place to the HTML DOM element with the `id` of `dropdownMenu`, the `upDatePlotly()` function is triggered.

Let's now dissect the `updatePlotly()` function:

```
function updatePlotly() {
  var dropdownMenu = d3.select("#dropdownMenu");
  var dataset = dropdownMenu.property("value");

  var xData = [1, 2, 3, 4, 5];
  var yData = [];

  if (dataset === 'dataset1') {
```

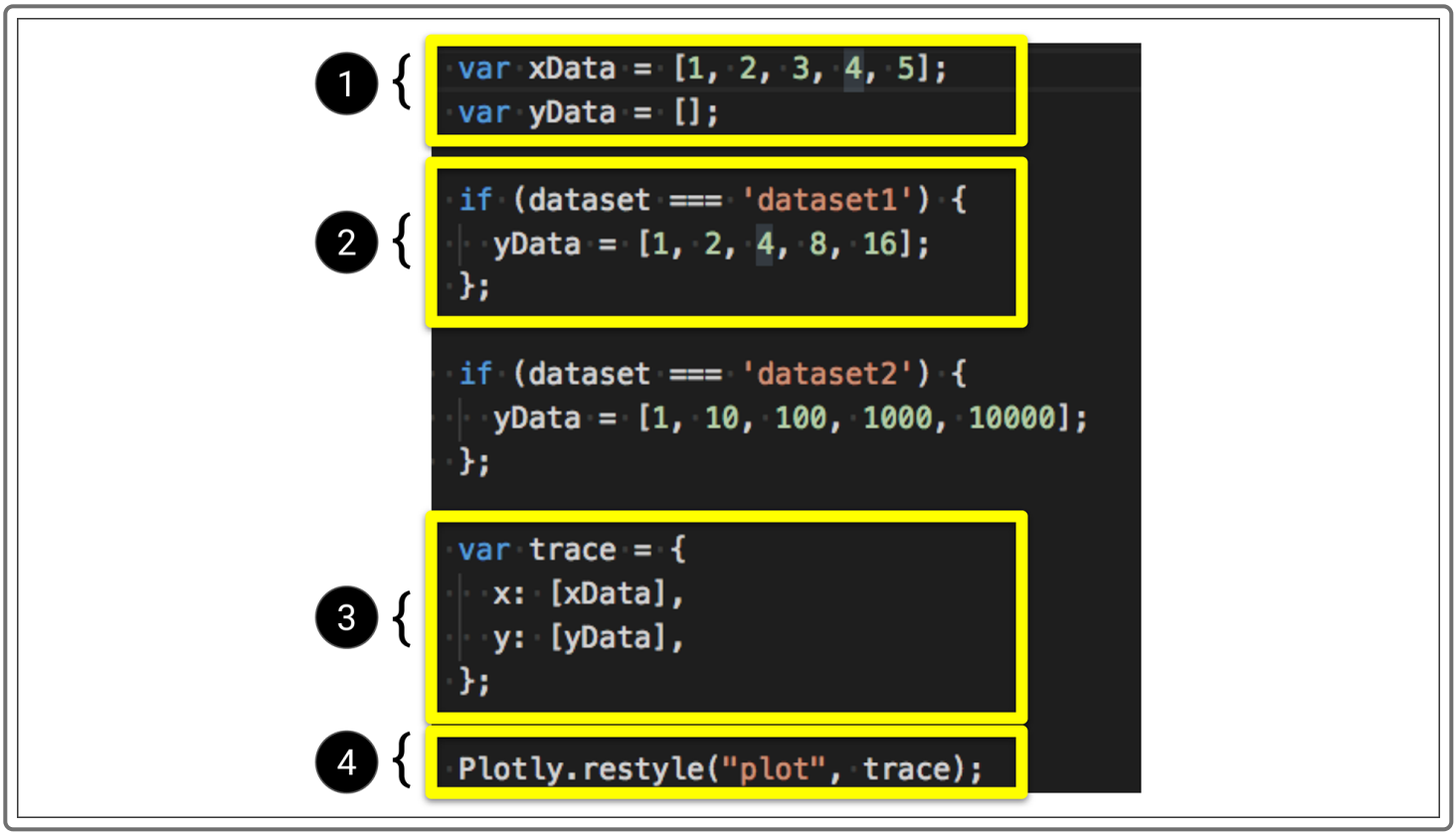
```
    yData = [1, 2, 4, 8, 16];
  };

  if (dataset === 'dataset2') {
    yData = [1, 10, 100, 1000, 10000];
  };

  var trace = {
    x: [xData],
    y: [yData],
  };

  Plotly.restyle("plot", trace);
};
```

The variable `dropdownMenu` is assigned to the DOM element with the `id` of `dropdownMenu`. Recall that it's the dropdown menu from `index.html`:

```
<select id="dropdownMenu">
  <option value="dataset1">DataSet1</option>
  <option value="dataset2">DataSet2</option>
</select>
```

The variable `dataset` is assigned to the value of the dropdown menu option selected by the user. Here, it is either `"dataset1"` or `"dataset2"`.

The rest of `updatePlotly()` function is concerned with switching between two datasets:



Let's break down this code:

1. The x-axis values, or `xData`, remain the same. However, the y-axis values, or `yData`, depend on which dropdown menu option was selected. `yData` is initially a blank array.
2. If the value of the dropdown menu option is `'dataset1'`, `yData` is assigned an array of integers. If `'dataset2'` is chosen, another array of integers is assigned to `yData`.
3. The `xData` and `yData` arrays are assembled inside the trace object. Unlike the `Plotly.newPlot()` method, the `Plotly.restyle()` method defaults to accepting an object (`trace` in this case) as its data argument, rather than an array.
4. The `Plotly.restyle()` method is used to re-render the page on the browser. This method is more efficient than calling the `Plotly.newPlot()` method, as it does not create a brand new chart from scratch, but instead modifies the previously displayed chart with the updated information.

Retake