INF554 lab 7

Animated transitions

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Reinstall xcode tools for git to work in VSCode by running in the terminal:

```
xcode-select --install
```

In your A7 repository create an ex1.html.

- Use data from your A1 for 10 countries and 1 year and load as JSON with d3:

```
data = [{key: "United States", value: 0.4},  //example data object after load
 {key: "Turkey", value: 0.6},
 {key: "France", value: 0.2},
 {key: "Italy", value: 0.1},
 {key: "Spain", value: 0.3},
 {key: "Algeria", value: 0.9},
 {key: "Mexico", value: 0.4},
 {key: "Brazil", value: 0.3},
 {key: "China", value: 0.1},
 {key: "Japan", value: 0.8}]
```

- Use d3 and `JSON.stringify` to print in the page:
    1. A copy of the array (use `array.slice`)
    2. The min key (use `d3.min`)
    3. The max value (use `d3.max`)
    4. Array sorted in ascending order by key (use `array.sort`, `d3.ascending`)
    5. Array sorted in descending order by value (use `array.sort`, `d3.descending`)
    6. Array containing the top 5 items sorted by value (use `array.slice`)
    7. Array with a label key as shown (use `array.map`)

```
data = [{key: "United States", value: 0.4, label: "United States (0.4)"},
 {key: "Turkey", value: 0.6, label: "Turkey (0.6)"},
 {key: "France", value: 0.2, label: "France (0.2)"},
 {key: "Italy", value: 0.1, label: "Italy (0.1)"},
 {key: "Spain", value: 0.3, label: "Spain (0.3)"},
 {key: "Algeria", value: 0.9, label: "Algeria (0.9)"},
 {key: "Mexico", value: 0.4, label: "Mexico (0.4)"},
 {key: "Brazil", value: 0.3, label: "Brazil (0.3)"},
 {key: "China", value: 0.1, label: "China (0.1)"},
 {key: "Japan", value: 0.8, label: "Japan (0.8)"}]
```

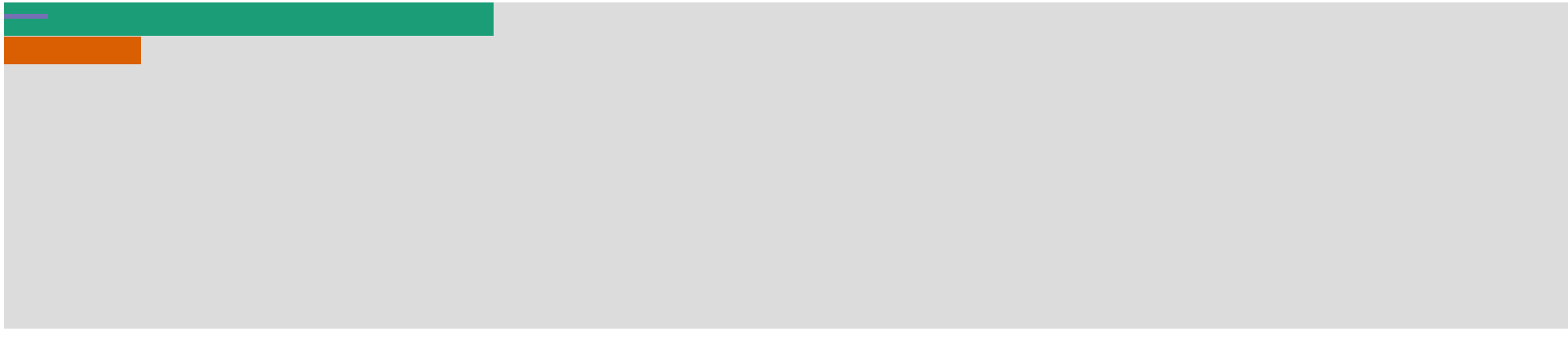
```
var array0 = [1, 4, 9, 16];
JSON.stringify(array0)  //prints "[1,4,9,16]"

var array1 = array0.map(function(x){ return x * 3; });  //array1 = [3, 12, 27, 48]
const array2 = array0.map(x => x * 3);  //same with ES6 syntax

var array3 = array0.slice(0);  //make a copy, array3 = [1, 4, 9, 16]
array3.sort();  //default sorts according to Unicode code, array3 = [1, 16, 4, 9]

var array4 = array0.slice(0);  //make a copy
array4.splice(1, 0, 5);  //insert 5 at position 1, array4 = [1, 5, 4, 9, 16]

var array5 = array0.slice(0);  //make a copy
array5.splice(1, 2);  //delete 2 elements starting at position 1, array5 = [4, 9]

var min = d3.min(array0);  //min = 1
var max = d3.max(array0);  //max = 16

var array6 = [9, 16, 4, 1];
array6.sort(d3.ascending);  //sort in place: array6 = [1, 4, 9, 16]

var array7 = [9, 16, 4, 1];
array7.sort(d3.descending);  //array7 = [16, 9, 4, 1]

var data = [{key: 'first', val: 4}, {key: 'second', val: 5}];
var min = d3.min(data, function (d) { return d.val; });  //min = 4
var max = d3.max(data, function (d) { return d.key; });  //max = 'second'

var sorted = data.sort(function(a, b) {
    return d3.descending(a.key, b.key);  //sort alphabetically Z->A
 }); //sorted = [{key: 'second', val: 5}, {key: 'first', val: 4}]
```

Sample JavaScript and D3 functions to updated data arrays

Implement the data join with general update pattern in ex2.html:

- Implement the code shown in the next page
- Adapt the code to the dataset you used in ex1.html
- Update the span background color to indicate which one is selected

dataset1 dataset2 dataset3

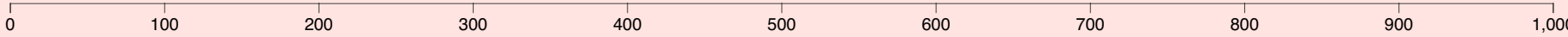


Rendering of starter code

```
<svg width="100%" height="200" style="background-color: gainsboro" id="svg_ex2"></svg>
<script>
dataset1 = [{k: "A", v: 3}, {k: "B", v: 1}, {k: "C", v: 2}];
dataset2 = [{k: "A", v: 4}, {k: "B", v: 1}, {k: "X", v: 4}];
dataset3 = [{k: "A", v: 3}, {k: "C", v: 4}, {k: "D", v: 1}, {k: "E", v: 2.5}];

update(dataset1);

d3.select("#dataset1")
  .on("click", function () {
    update(dataset1)
});

d3.select("#dataset2")
  .on("click", function () {
    update(dataset2)
});

d3.select("#dataset3")
  .on("click", function () {
    update(dataset3)
});

d3.select("#svg_ex2")
  .on("click", function() {
    update(dataset1);  //reset
});

function update(data) {
  var svg = d3.select("#svg_ex2");
  var rects = svg.selectAll("rect")
    .data(data, function (d) { return d.k; });

  rects.exit()  //EXIT SELECTION -- here we decide to exit first
    .transition()
    .delay(1000)
    .duration(1000)
    .style("opacity", 0)
    .remove();

  var enter = rects.enter()  //ENTER
    .append("rect")
    .attr("fill", function(d) { return d.c; })
    .merge(rects)  // UPDATE + ENTER
    .transition()
    .duration(3000)
    .delay(function(d, i) { return i * 1000; })
    .attr("x", 0)
    .attr("y", function(d, i) { return i * 25; })
    .attr("width", function(d) { return d.v * 100; })
    .attr("height", 20)
    .attr("fill", function(d, i) { return d3.schemeDark2[i]; });
}
</script>
```

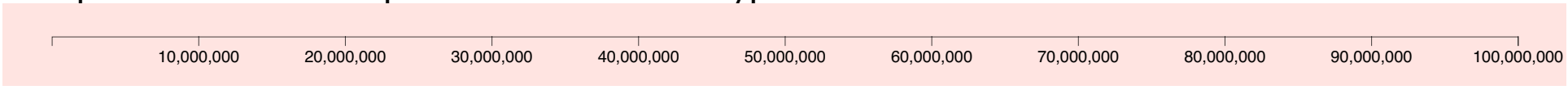
ex2.html starter code: data join with general update pattern

Complete the code to implement an axis range transition in ex3.html:




```
var x = d3.scaleLinear()
  .domain([..., ...]) //values as shown in the figure
  .range([0, 900]);

var axis1 = d3.axisBottom()
  .scale(x);

var redo = false;

var svg = d3.select("#svg");

svg.append("g")
  .attr("class", "axis0")
  .attr("transform", "translate(30,20)")
  .call(axis1);

svg.on("click", function() {
  x.domain([0, redo ? ... : ...]); //initial domain to new domain
  redo = !redo;
  d3.select(".axis0")
      .transition()
      .duration(1000)
      .call(axis1);
});
```

Complete the code to implement an axis scale type transition in ex4.html:

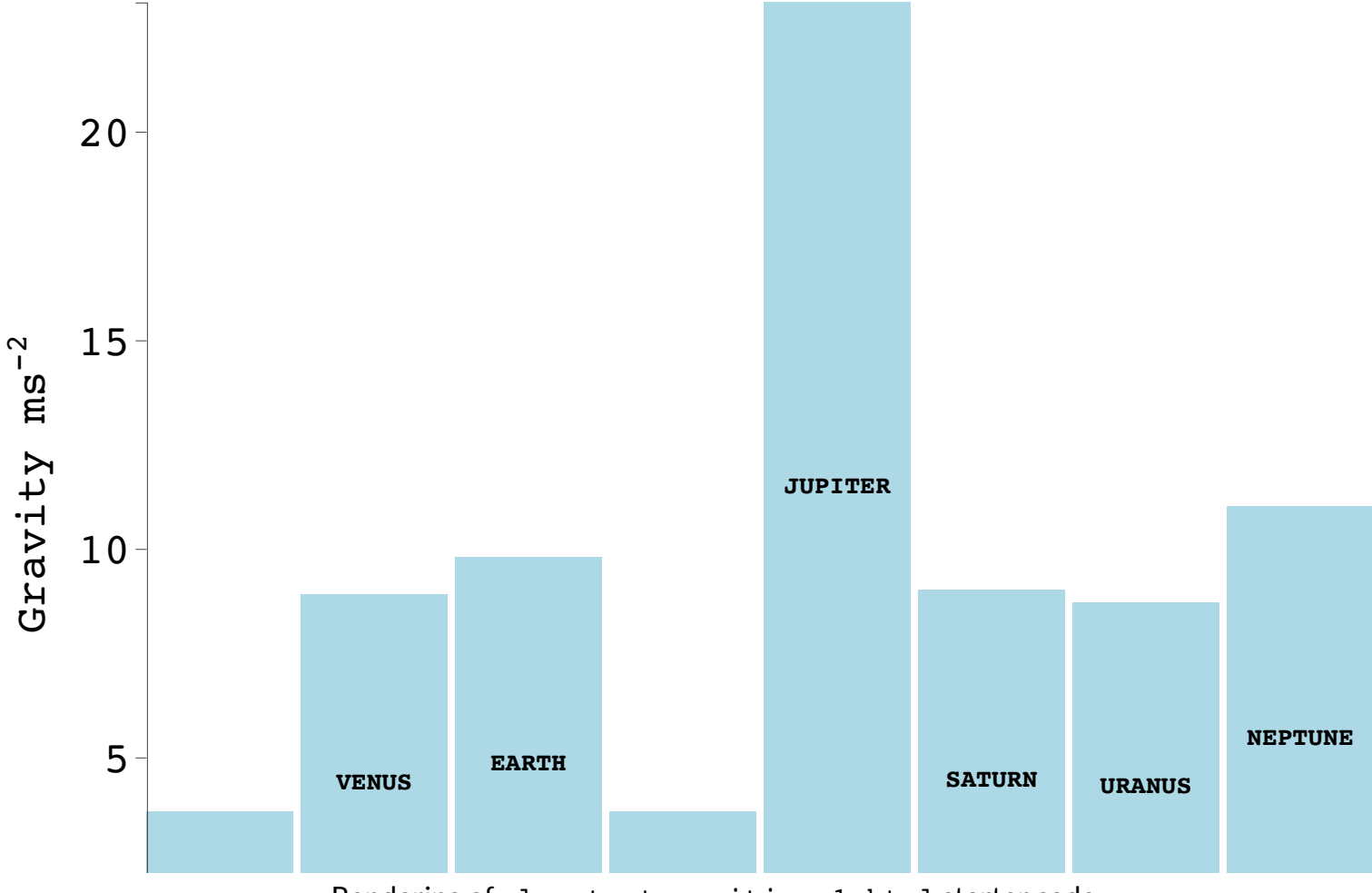



```
var x1 = d3.scaleLinear()
  .domain([..., ...])  //values as shown in the figure
  .range([0, 900]);

var x2 = d3.scaleLog()
  .domain([..., ...])  //values as shown in the figure
  .range([0, 900]);

var axis = d3.axisBottom()
  .scale(x1);

var redo = false;

var svg = d3.select("#svg");

svg.append("g")
  .attr("class", "axis0")
  .attr("transform", "translate(30,20)")
  .call(axis1);

svg.on("click", function() {
  d3.select(".axis1")
    .transition()
    .duration(1000)
    .call(redo ? axis.scale(...) : axis.scale(...)); //initial to new scale
  redo = !redo;
});
```

Implement a bar graph with transitions in ex5.html:

- Use the starter code provided in `planets_transition_1.html`
- Adapt the code to use d3 from node
- Separate the code of `ex5.html` into `ex6.html`, `ex6.css` and `ex6.js`

Order by: distance to sun, temperature, gravity ☑ Show Earth



Rendering of `planets_transition_1.html` starter code