

Purpose

The purpose of this assignment is to further practice data manipulation in d3, and to use online code templates and adapt them to your data.

Stream Data

In class, Dr. Brad Johnson introduced data on streams around North Carolina. Data that he and his students have collected over time. In this assignment you will work with this time series data to present a visualization to answer a question about the data. Dr. Johnson showed numerous techniques that he uses, however you are welcome to devise your own solution. Just make sure that you follow any guidelines that we have discussed in class.

Start by downloading the data files from Moodle.

Defining a question

There are many questions that you may have about the data. Here are some possibilities:

- Are the same sites always the flashiest (have the highest peak flow)?
- Which sites have the biggest difference between different seasons (i.e., most difference between summer and winter flashiness).
- Why does conductivity behave so oddly?

There is a chance that you may change your question once you start looking at the data. However, having an idea about what you want to explore will help guide your visualization.

Starter code [20 points]

As a computer scientist you often have to start with someone else's code. Fortunately, Mike Bostock has built a library of d3 code and visualizations for everyone to use.

<https://bl.ocks.org/mbostock>

There are many ways to visualize time series data. Once you have an idea of your question pick a starting visualization. Make sure that the page has been updated recently and that the code is using d3 version 4. The code will reference the following if it is using version 4:

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

There are a lot of options. If you don't want to be overwhelmed, I have selected 5 starter visualizations below that work nicely with time series data. Feel free to use one of these five.

- <https://bl.ocks.org/mbostock/3884955>
- <https://bl.ocks.org/mbostock/4060954>
- <https://bl.ocks.org/mbostock/3885211>
- <https://bl.ocks.org/mbostock/34f08d5e11952a80609169b7917d4172>
- <https://bl.ocks.org/mbostock/8033015>

Each of these pages has a visualization, the code used to create the visualization, and an example data set. Start by recreating the visualization by setting up your `.html`, `.css`, and `.js` pages. The code between the `<style>` tags goes into your `.css` page, and the code between the `<script>` tags goes into your `.js` page.

Once you have the original code working, your task is to manipulate Dr. Johnson's data so that it works with your visualization.

Here are some hints:

You will be reading in multiple data files. Instead of calling `d3.csv` and putting all of your code in this call, use the following:

```
d3.queue() // all of the files
  .defer(d3.csv, "Locations.csv") //name of one file to open
  .defer(d3.csv, "Precipitation.csv") //name of next file to open
  .defer(d3.csv, "StreamData.csv") //name of next file to open, etc.
  .await(analyze);

//notice that the order of variables is the same as the file order above
function analyze(error, locations, precipitation, stream) {
  if(error) { console.log(error); }
  //the rest of your code goes here
```

You will need to manipulate the current data (within your `.js` file) so that it works with the visualization.

The precipitation data is odd. Remember that there is now value. It is just a date and time when the rain gauge was full with 0.2mm of rain water. Below is code that will nest and calculate your precipitation data.

```
var precip = d3.nest()
  .key(function(d){return d.location_id;})
```

```
    .entries(precipitation);

    precip.forEach(function(d){
      d.values.reduce(function(p,c){
        var sum = p + 0.2;
        c.amount = sum;
        return sum;
      }, 0) // that starting value for reduce is zero
    });
```

Make it your own [5 points]

Creativity and additional features are always encouraged. Feel free to add additional interaction (Go here

<https://bl.ocks.org/mbostock>

for ideas and code). Add buttons that change the `.style("opacity", #)` to zero if you want a line to disappear. Or, chose a different color scheme

<https://bl.ocks.org/mbostock/5577023>, etc.

Submission

Add your completed visualizations to your Assignment 2 page on your Davidson Domain. Groups will be selected at random to present their visualization to the class on September 19. Presentations will count toward your homework grade.