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CS416 – Data Visualization Summer 2021

Narrative Visualization

### **Messaging:**

The message that I was trying to convey with this narrative visualization is to show the current trend of increasing world temperatures. I chose to convey this with a dataset provided from NOAA located at <https://www.ncdc.noaa.gov/cag/global/time-series>. This dataset shows the differential of the mean temperatures (positive or negative and as measured from 1901-2000) over a period of 1880 until 2020. My goal with the visualization is to break up the temperature readings into chunks to clearly show the data increasing in temperature.

### **Narrative Structure:**

My narrative visualization was designed to follow an interactive slideshow setup. This visualization is set as a series of slides, broken up by three time frames: 1880-1920, 1921-1980, 1981-2020. At the end of the slide show is an overall slide with data points for all years shown. Through the course of the slide show, the user can hover over individual data points to see specific year and deviation values – this is communicated to the user with annotations shown on the SVG element. The slide show can be advanced by the user using navigation buttons at the top of the SVG element, which also provides the user a way to go backwards or forwards to a specific date range.

### **Visual Structure:**

Each scene of the narrative visualization utilizes a scatter plot to display data points to the user. The graph contains tick marks on the Y axis displaying the range of deviations of temperatures, from -2 to 2 degrees Celsius. This is clearly labeled “Deviation from Average in Celsius” for user clarity. On the X axis, there are tick marks for years and is labeled as “Year”. On the upper left of the scatterplot, there is an annotation telling the user they can hover over data points to explore the data further using tooltips.

Navigation buttons have also been provided for the user so that they can navigate through the periods. The user can follow the natural order, select a particular period to explore, or use the forward and back buttons to go forward or back to previous scenes. I kept the exact same layout between scenes for visual consistency as well as coloring and styling using CSS.

### **Scenes:**

My narrative visualization has been presented using four separate scenes. These scenes are data from 1880-1920, 1921-1980, 1981-2020 and All Years. I kept these scenes ordered chronographically to show

the user how the temperature of the world over this dataset has consistently been increasing based on the mean temperature. This helps convey the message of increasing temperatures to the user.

### **Annotations:**

I chose to keep a basic annotation template using the library from <https://rawgit.com/susielu/d3-annotation/master/d3-annotation.min.js>. I chose to use this annotation library as it made it easy to create annotations for the visualization and move them around if I didn't like where they were presented. For each annotation I give a brief title, as well as a descriptive label. While one of the annotations is used to tell the user they can look at particular data points (shown in the top left of every scene), I have provided annotations on each scene to show highlights of each time period to convey the message of increasing temperatures. As you navigate through the visualization, you will see the annotation message and positioning changes to support the dataset for that particular scene. Within each scene, the annotations do not change.

### **Parameters:**

The "state" parameter in my code is used to track what the current state of the visualization is. Whenever a new scene is displayed, this parameter is updated so the page always knows where the user is in the narrative visualization. The states of the narrative visualization are described in the "triggers" section below. I did keep the tick marking for the years and temperatures the same, so I did not have to make global parameters for these, rather they are used within the drawSVG method. All coloring and styling parameters have been contained within my CSS file and control the styling of the scene. Depending on which state is clicked, the parameter of state is used to dictate what scene for the SVG to redraw.

### **Triggers:**

Changes of state are controlled by when the user presses a navigation button above the scatterplot. This "onclick" action is defined on each of the button elements. Each of these buttons is associated to a particular state: 1880-1920 (1), 1921-1980 (2), 1981-2020 (3), All Years (4). When these four buttons is clicked, the state for that scene is passed to the changeToState method which will then in turn invoke the DrawSVG and present the updated scene to the user. For the forward and back buttons, the user clicking on these will invoke the moveStateForward() and moveStateBack() methods, respectively. When a data element is hovered over, the info for that element is displayed using the .on("mouseover", function(d)) trigger. The user is clearly shown through text in the buttons and through the use of annotations that these actions are available.