Carson Essabhoy
INFO 474
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Final Deliverable Report

Project Overview

This project is an implementation of a visualization stemming from multiple CSV files containing weather data which has been taken from Wunderground for 10 different cities. Throughout the quarter of this class, we have learned many different visualization techniques and what are examples of poor visualizations. Many of these ideas have been taken into account in order to create this visualization. The visualization shows temperature data for all 10 cities, allowing the user to scroll through a list of cities and choose the city they would like to view. Another aspect of the visualization is how it allows the user to choose which data they would like to view within the visualization. An important aspect of the visualization is how it allows for the user to highlight both temperature lines and specific dates by hovering his/her mouse over the data. Hovering over a point on the line allows for the user to view information about that date. Finally, the visualization includes a button to restart the animation of the visualization. This animation is the temperature line going from left to right, visualizing the temperature changing over the year.

User Tasks

- Identify any possible temperature outliers for each city.
    - **User Story:** As a weatherman, I want to know if there are any major outliers in temperature this year so I am able to inform those viewing the weather channel about the variation.
- Identify the seasons which, on average, have the highest and lowest temperatures.
    - **User Story:** As a traveler wanting to go to a cold area, I want to find the coldest season in New York so that I can travel to New York when it is the most cold.
- Identify the cities that have the record lowest and highest temperatures.
    - **User Story:** As a history teacher studying the weather of US cities, I want to find the cities that have the lowest recorded temperature since 1880 in order to further my research.
- Compare monthly or daily temperatures between cities.
    - **User Story:** As a mother wanting to move to a warmer area, I want to find the city with the warmest seasons so that I can move there.
- Compare temperature trends between cities.
    - **User Story:** As a mother wanting to move to an area with a stable climate, I want to find the city with the least variability in temperature so that I can move there.

- Compare current temperature maximums and minimums to average maximums and minimums for each city.
    - **User Story:** As a weatherman, I want to know if the high and low temperatures have varied more than a normal year so I am able to inform those viewing the weather channel about the variation.
- Visualize temperature change for each city over the course of a year.
    - **User Story:** As a teacher, I want to be able to show my students the trends of temperature over a year so I can teach them about weather variability.

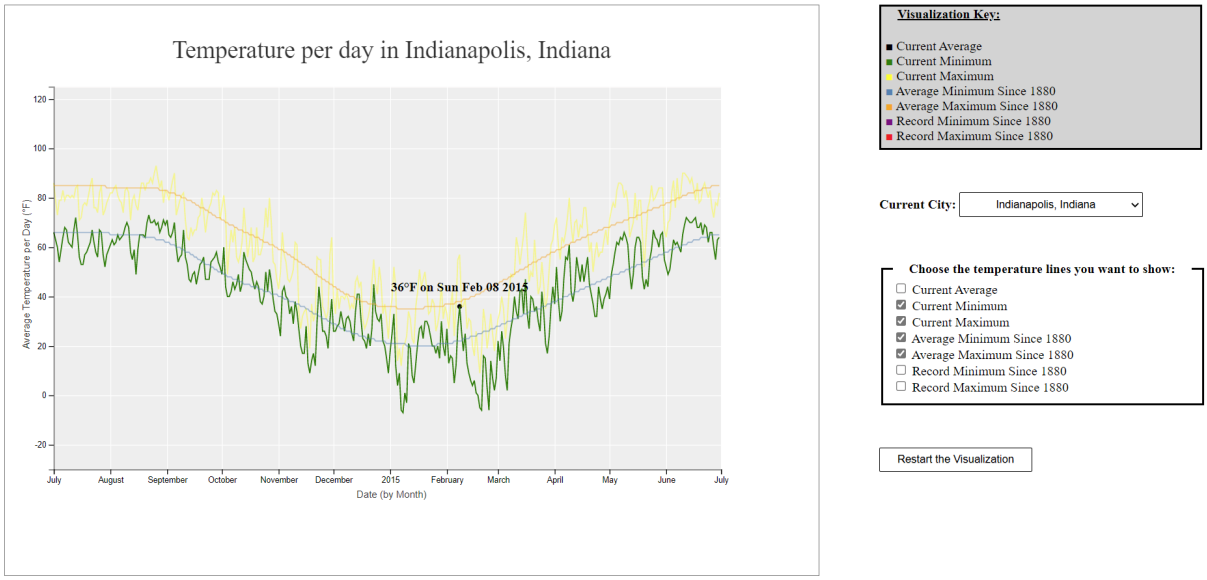
Design Overview

How is the user able to compare temperatures of cities? In order for the user to compare data between multiple cities, I needed to implement all of the weather data csv files into the visualization. By creating a dropdown menu in HTML with the text being the city name and the value within each option being the csv file name, I was able to allow the user to select different cities and change the chart accordingly. It began by changing the title and then changing the temperature lines within the chart. This was implemented into the visualization in order to give the user more options as to what they wanted to compare in order to answer more questions they may have had.

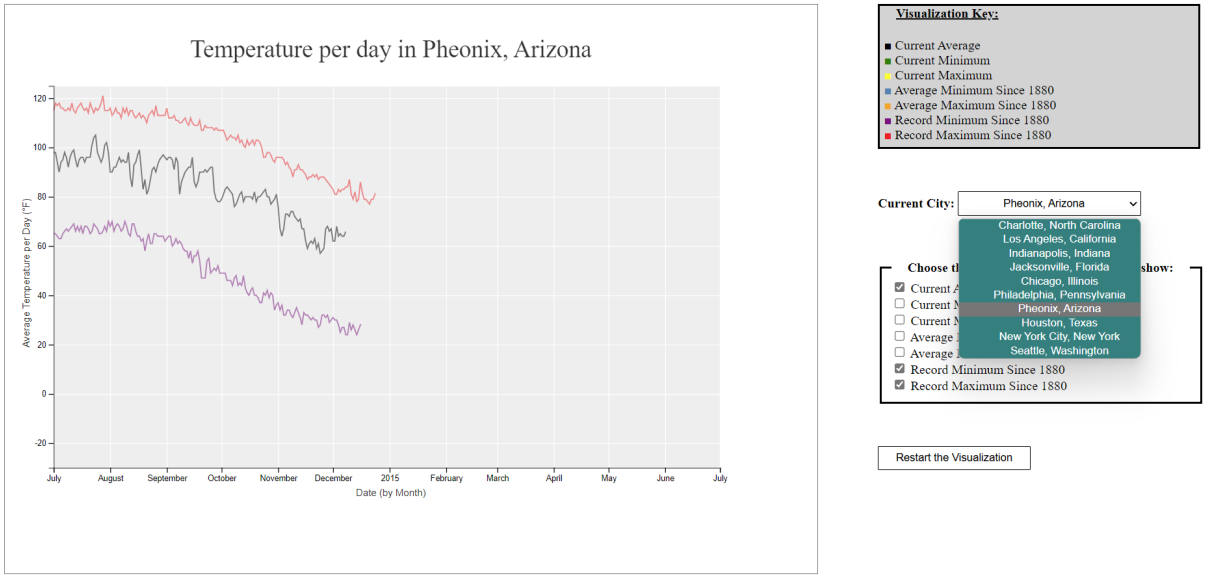
How is the user able to compare temperature maximums and minimums from current day to the average and record since 1880? Below the dropdown menu in the visualization, there is a list of checkboxes which contain the name of the different temperature data which was collected for each csv file. Selecting any of these checkboxes allows for a new temperature line to appear on the chart. Each new line that appears on the chart begins an animation of going from left to right which simulates how the temperature changes over the given time period. When a checkbox is deselected, the temperature line it corresponds to is removed from the chart. The purpose of having all of these temperature line options is in order to give the user a choice as to what they want to visualize. When all seven lines are on the chart, it can be very clustered. However, this is solved by allowing users to highlight lines by hovering over them in order to make them stand out and easier to see.

How is the user able to know the exact temperature of a certain day? Hovering over the lines to highlight them is not the only hovering feature implemented in the visualization. This visualization also allows the user to hover over a specific point on the map and this displays information about that point. This point includes the date and temperature for that specific point. This allows for the user to get more accurate information for dates they are looking at.

User Interface



This image shows how the visualization looks when the user is hovering over a specific point. The point is highlighted and then shows the temperature and date of the point. To the right of the chart, there is a gray box which is the key for the chart. This includes all of the temperature lines as well as the color of what that line is on the chart. There is also the city dropdown menu on the right side which is selected to Indianapolis, Indiana which is also shown as the header of the chart. Below that is the checkbox list which has all of the possible temperature lines that can show up. Since only four are selected, there are only four lines on the map. Finally, below the checkboxes, there is a button labeled ‘Restart the Visualization.’ When hovering over the button it highlights to a teal color, and once clicked it restarts the visualization which shows the temperature over time by going left to right.



This visualization shows how the chart looks after a new city is chosen because it is only showing half of the data. Shortly after this point, the temperature lines will go through the whole year. There is also the drop down menu which shows all of the cities that can be selected.