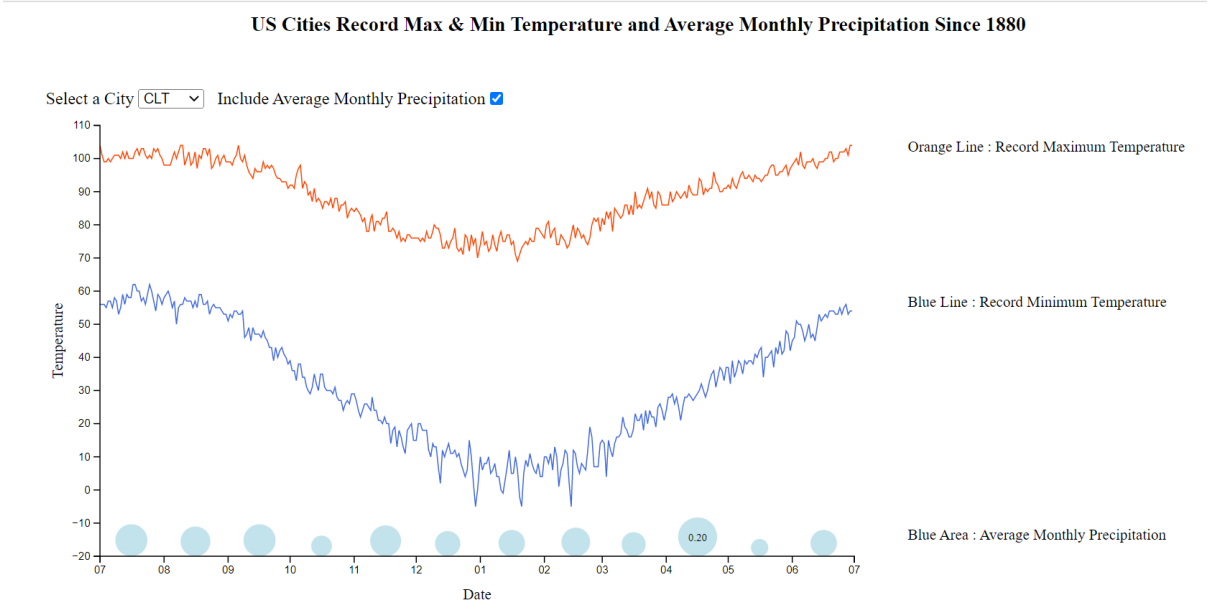
Final Deliverable

User Tasks:

1. As a meteorologist, I want to identify and analyze the extreme temperature of a specific city, so that I can understand the local weather patterns.
2. As a farmer, I want to monitor the mean precipitation levels of multiple cities during a particular month, so that I can plan my crop irrigation and harvesting.
3. As a city planner, I want to analyze the extreme temperature and precipitation trends of a specific region over the past decade, so that I can understand the impact of climate change on the local environment.
4. As a traveler who doesn't like rainy days, I want to check the monthly precipitation of each city so that I can avoid traveling to cities with high precipitation

Design Overview:

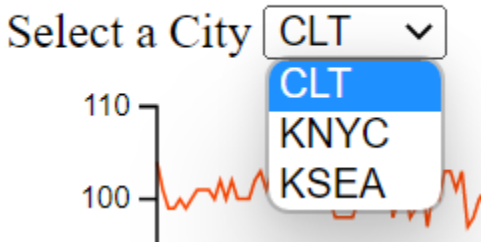
- **User Interface**



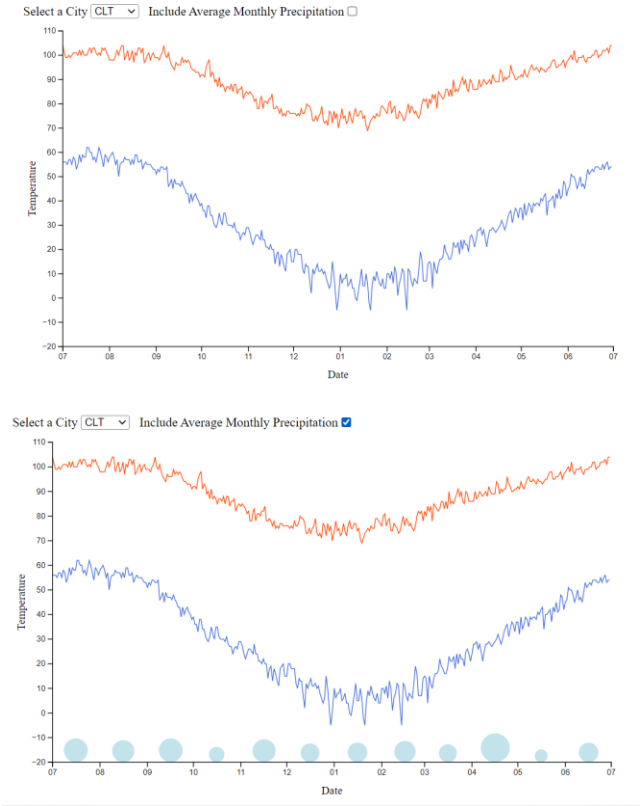
In this design, I used data from CLT, KNY, and KSEA to create a line graph visualization illustrating extreme temperature and average monthly precipitation since 1880. The x-axis represents the month, and the y-axis represents the temperature. The variables I have selected to analyze are record_max_temp,

record_min_temp, and actual_precipitation. For the record maximum and minimum temperatures for these cities, I have created two line segments to show their distributions over the time. For precipitation, I chose to group it by month and calculate the average of monthly precipitation and present it's value using the size of a circle. This visualization also has the following interactive features:

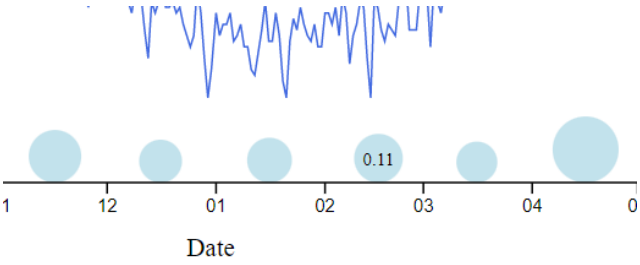
a. User can select the city they want to access from the drop down menu at the top



b. The check box at the top allows the user to hide the precipitation data.



c. User can hover over the precipitation circle to see the exact value.



- **Analytical Questions & Communicative Objectives**

For the above design choices, the reason for showing the record maximum and minimum temperatures is that the line trend allows the user to see the extreme temperature values in the cities each month since year 1880, and the different color encoding (line segments with orange/blue color) allows the user to easily distinguish which line is the highest or lowest temperature. The drop down menu for changing cities allows the user to compare the trend of temperature distribution and precipitation more visually across different locations. The reason that precipitation and temperature are placed on the same graph is that the user can better compare the temperature and precipitation regarding to their relationship. Using checkboxes to hide the precipitation is a way to simplify this visualization and hide unwanted information from users. In the traditional graph, precipitations are depicted as lines in each month, which allow users to understand the changes of precipitation within each month. However, the traditional graph is unable to provide users with the mean precipitation value each month. So I decided to group precipitation by month into different sized circles to help user understand the average precipitation each month.