Jax Morgan Final Project Overview

INFO 474 Spring 2022

This multivariate visualization I made for my INFO 474 final project depicts the average temperature, record temperatures, average precipitation, and record precipitation for the major US cities of Seattle, Houston, and New York over the course of the years 2014 and 2015.

User Tasks

The nature of this visualization's design ensures that a wide variety of users can gain information regarding the temperature and precipitation patterns from different cities for various applications. Still, even though the visualization can apply to a variety of fields, it was specifically designed for travelers/travel planners and people from outside the country seeking their desired cities to live in based on weather.

Traveler User Stories

- (1) As a traveler, I want to know average precipitation levels for different cities over the course of the year so that I know what time of year to book cheaper flights to rainier destinations.

- (2) As a traveler, I want to know average temperature levels over the course of the year so that I know how to pack for my road trips across the country.

Travel Planner User Stories

- (1) As a travel planner, I want to know the most extreme precipitation and temperature levels over the course of the year so that I know the degree to which certain cities are no longer hospitable for my clients.

- (2) As a travel planner, I want to know how the average temperatures of Seattle compare to New York so I know when it is best to recommend one over another to my clients.

New Resident User Stories

- (1) As someone seeking to move to the US, I want to know the average temperature and precipitation levels over the course of the year so that I know which city best aligns with my preferred weather.

- (2) As someone seeking to move to the US, I want to know the outliers in both high temperatures and precipitation levels over the course of the year so that I understand how extreme the weather can get in different cities of my interest.

Design Overview
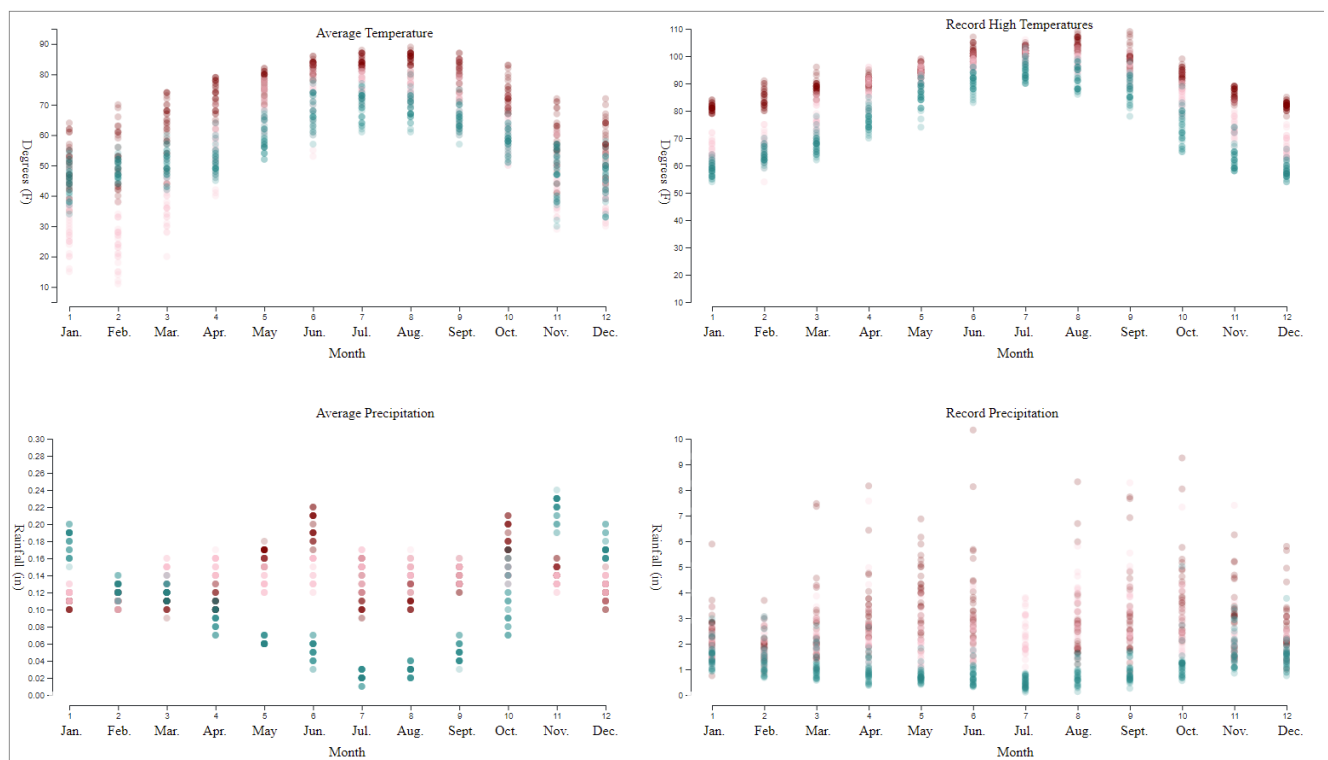
The design of this visualization is made up of 4 different individual scatter plot graphs: one for average temperature (upper left), one for record high temperatures (upper right), one for average precipitation (lower left), and one for record precipitation (lower right). For each chart, the y-axis represents the area of focus (e.g. average temperature), and the x-axis represents the months of the year. Moreover, each chart shows all 3 cities included in the dataset: Seattle, Houston, and New York, represented by the colors teal, maroon, and pink, respectively. In turn,

this visualization is multivariate because it contains the following variables: time (in months of the year), location, and average temperature, record high temperature, average temperature, and record precipitation.

I selected these specific variables because I felt they give a clear understanding of the weather patterns in different areas which can then be readily compared to one another, both in terms of comparing what is considered "average" for temperature and precipitation, as well as what is considered fairly extreme as the highest temperatures and precipitation levels. I chose to communicate the visualization's objectives through scatter plots because it is the ideal way to plot the different data points associated with each city for each month over the course of the year, with special attention to highlighting the data points that fall notably outside of the norm.

In terms of interaction, the user can engage with this visualization in their browser by hovering over any given data point and getting further information. For each chart, when the user hovers over a point, it will either give the temperature or precipitation level, in addition to the city. This interactive feature enables the user to more readily access the associated information, as opposed to just relying on reading the y and x-axis for each data point to get the related information. I chose to make the visualization interactive in this way because it is a simple way for the user to understand each data point as it stands in the charts' static form. For instance, it would not have been necessary to create a data filter for different cities to show up in the visualization separately (as I had initially envisioned for the design) because the colors naturally differentiate each city's data points from the others. Thus, I knew that the most effective way to create interaction was to maintain the simple nature of the design by adding hover states so the user can understand all that they need to for each data point just by mousing over them. *See the screenshot below for an example of the interactive feature.*

Average Temperature

56, SEA

Degrees (F)

Month

Jan. Feb. Mar. Apr. May Jun. Jul. Aug. Sept. Oct. Nov. Dec.