Project Overview

User Tasks Supported

1. Annotate the plot point to the day it represents.
2. Annotate a plot point to its recorded high.
3. Annotate a plot point to its recorded low.
4. Derive temperature abnormalities by the difference between recorded temperature and historical average temperature.
5. Derive temperature range abnormalities by measuring the distance from a point to the line:

$$y = x$$

6. Browse for dates with abnormally cold temperatures.
7. Browse for dates with abnormally hot temperatures.
8. Explore average recorded temperatures in a city.
9. Explore abnormally hot/cold temperatures in a city.
10. Identify the date and location connected with plotted data.
11. Identify the record high and low associated with plotted data.
12. Compare recorded highs to average highs over the course of a year.
13. Compare recorded lows to average lows over the course of a year.

Design Overview

The objective of this viz is to show people how temperatures over a year compare with historical averages. Instead of just showing the recorded highs and lows, each scatterplot shows the difference between the recorded high/low and the historical

average high/low. To highlight different patterns between cities, the viz is a set of scatterplot multiples with each plot representing a different city.

With this design, the X and Y axes are paramount as they represent an average high/low at any given time of year. This makes each quadrant of the plot represent a specific kind of trend. These four trends are as follows:

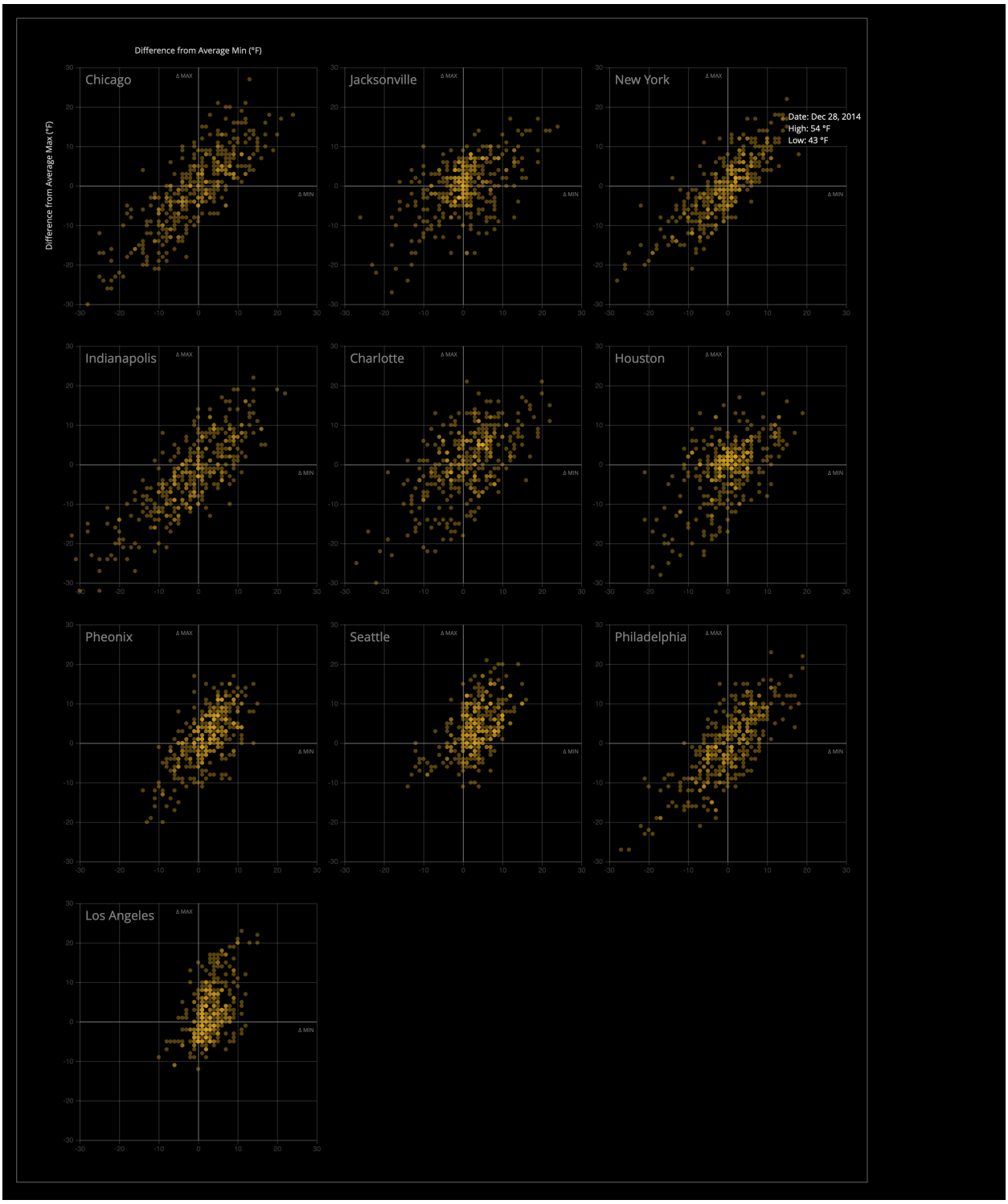
1. Upper-right: The temperature is hotter than average.
2. Upper-left: The temperature had more variance than average.
3. Bottom-left: The temperature is colder than average.
4. Bottom-right: The temperature had less variance than average.

These axes are emphasized by brighter strokes and by being placed in the center of the scatter plot. Also, with each multiple having the same domain and range, each plot is comparable along rows and columns.

Each plot point also has a 0.4 opacity to afford 4 shades of color, giving a heat-map-like effect with brighter yellows representing a higher density of data points. By being able to see the density of data points, users can better infer the variance in temperature variance without needing a specific viz like a histogram.

User interface

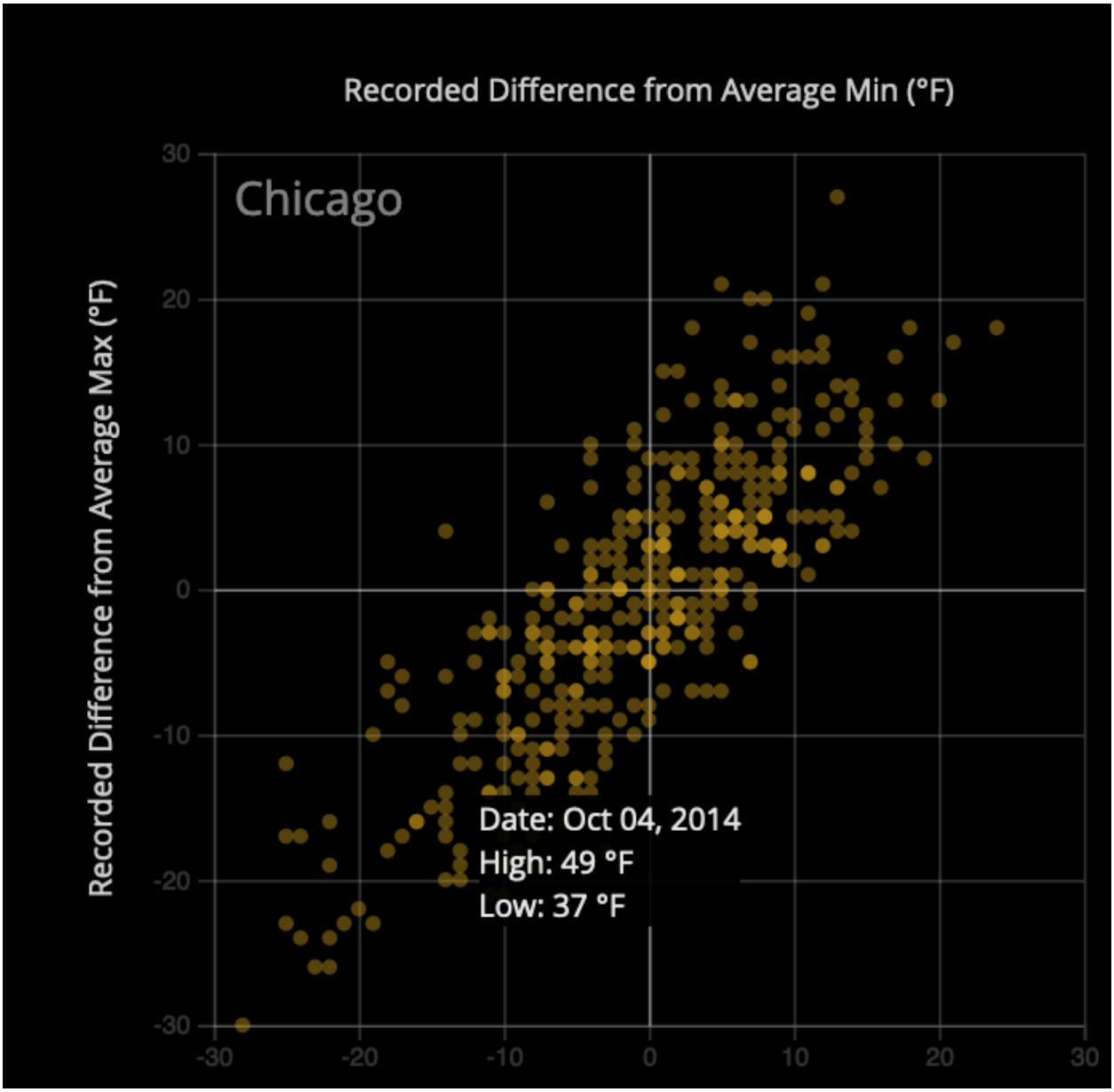
Full interface



The full interface is composed of 10 scatter plot multiples, each representing a different city. The horizontal and vertical axes on each multiple covers the same range, making every city's viz comparable to another.

When the user hovers over a data point, they see the day the data was recorded, the day's high, and the day's low. Because points are plotted over each other, there are some dates that will be unable to be seen with the tooltip.

Scatter plot



Each multiple is comprised of a city name, axes, grid lines, horizontal and vertical scales, and plotted points. Unlike in a scatterplot matrix, each point on each plot is unique, not appearing elsewhere in the viz.