User Tasks Analysis

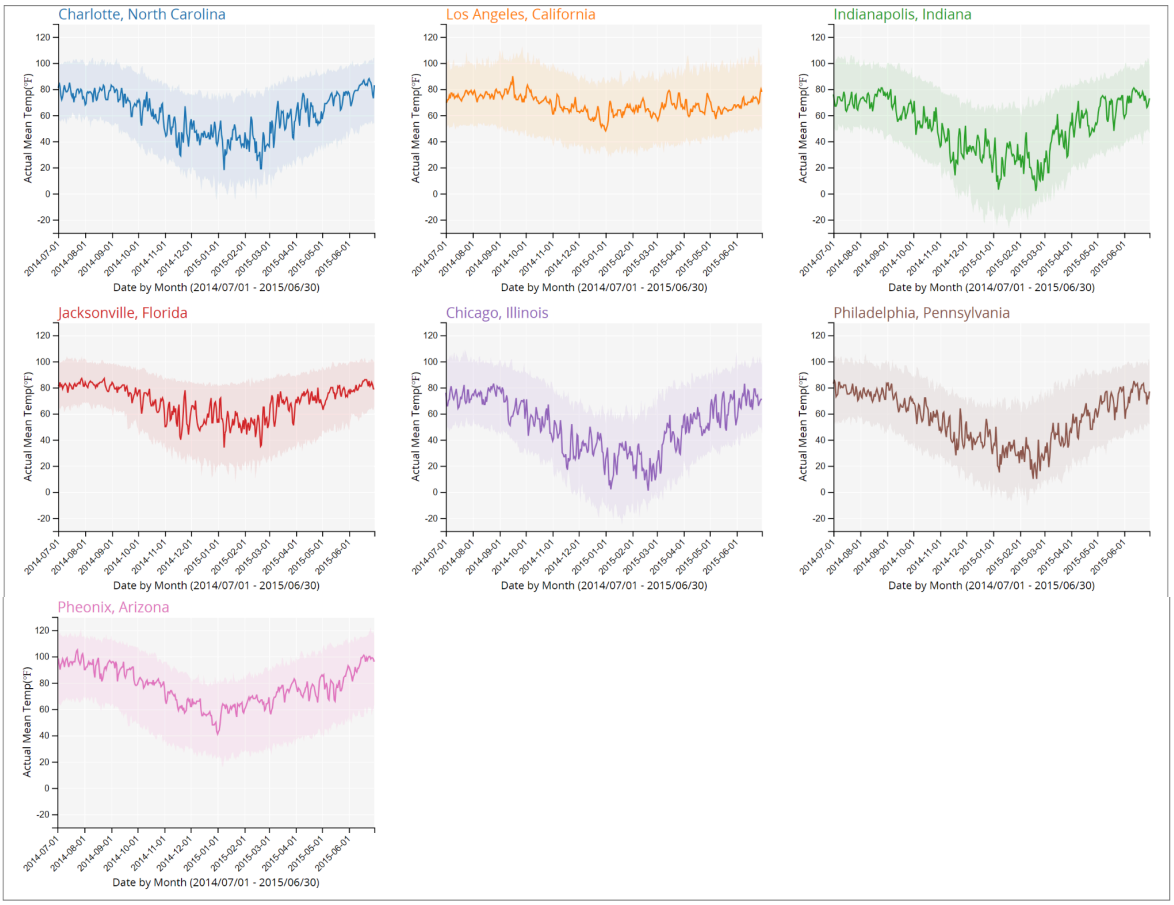
- Discover the overall trends
    - As a meteorologist, I want to predict or forecast future weather patterns to find out the weather trends in different cities to stay informed and conduct my research based on the evolving atmospheric conditions.
- Comparative analysis
    - As a traveler, I want to compare several cities' temperatures to decide which city to take my trip in different seasons.
- Seasonal trends recognition
    - As a ski resort manager, I want to figure out the seasonal pattern and weather trends in the season to adjust the price and reallocate the resources (employees, food inventory, rooms, etc.) that promise our service quality and revenue maximization.
- Compare shape
    - As a high school student who has received admission offers from two colleges, I want to compare the weather patterns in Seattle and Los Angeles to guide my decision-making on choosing the college in which the local weather conditions and climate patterns are suitable for my lifestyle and preferences.

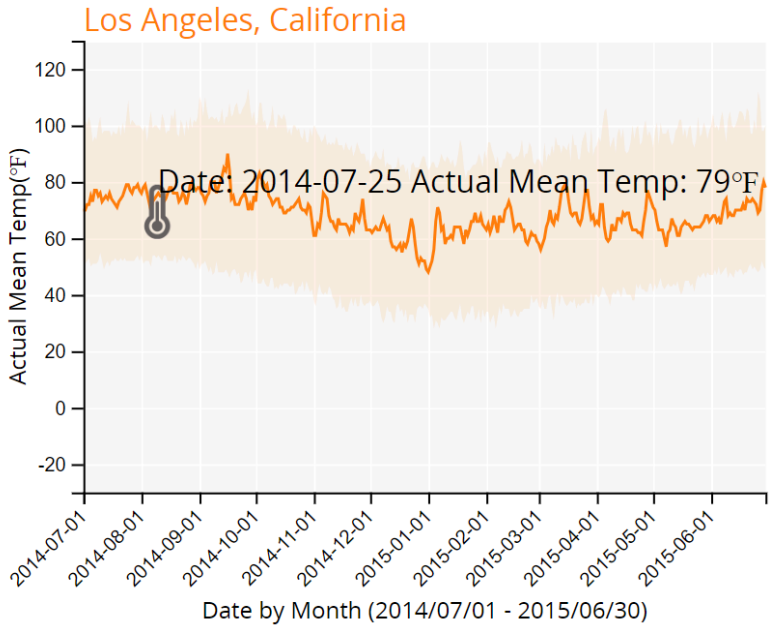
Design Overview

- Analytical questions
  - Are there any seasonal patterns among all these sub-plots?
  - Which city has the biggest actual temperature difference?
  - Which city has a more stable actual temperature range?
  - What is the temperature trend for each city in this year?
  - How does the temperature trend of each city compare?
  - Which months would be suitable for ski season?
- Communicative objectives about the data
  - This visualization makes sub-line charts for each city with clearly labeled city and state names. In this way, the overplotting could be avoided since there are no multiple lines on the same plot that stop audiences from reading each in detail. The x-axis is the actual mean temperature ℉ from -30℉ to 130℉, and the y-axis is the date from 2014/07/01 to 2015/06/30. What's more, by dividing them into small multiples with the same scale on each graph, audiences would still compare the shape of the temperature trend line among cities easily. Each city's actual mean temperature trend changes are represented by lines with distinguishable colors(categorical color set), which makes this visualization accessible for vision weaknesses. In addition, there is a shaded area representing the actual minimum and maximum temperature range on each graph. One interactive I did was showing the date and actual mean temperature when the cursor is hovering over the data points on the line. One creativity I did was to change the cursor to a thermometer, which I think fits the topic for this visualization.

User interface screenshots

Actual Mean Temperature(°F) overview in seven cities in the U.S. from 2014/07/01 to 2015/06/30





Additional Description

- Code source:
  - INFO474 Lab code
  - Small multiple line charts: https://d3-graph-gallery.com/graph/line_smallmultiple.html
  - Line chart with confidence-interval: https://d3-graph-gallery.com/graph/line_confidence_interval.html
  - Line chart with the cursor: https://d3-graph-gallery.com/graph/line_cursor.html
  - Thermometer.png: https://www.svgrepo.com/svg/115717/thermometer