

Exploring Tree Species Diversity in San Francisco Neighborhoods

My visualization strives to highlight the diversity of tree species in San Francisco and give users the opportunity to determine the diversity in their own neighborhoods. The initial visualization offers a broader, bird's-eye view of the city, highlighting the areas where the variety of tree species is noticeably denser compared to others. By examining this visualization, it becomes evident that urban centers such as the financial district, have a much lower tree species diversity as compared to other neighborhoods. Viewers can identify their own neighborhoods using the map to study how diverse their neighborhoods are. My goal is also to offer viewers a deeper understanding of which neighborhoods in the city have the richest tree diversity, which I strive to do through my second visualization of the top five diverse neighborhoods.

For my visualizations, I used the filtered tree dataset and the San Francisco Geo datasets. After loading the two datasets, I started by calculating the longitude and latitude of each tree in the city using a Mercator projection. Because my main goal was to determine the tree species in each neighborhood, I started by determining the neighborhood name associated with each tree. I did this by using `geoContains()` to check if the tree's location fell within the bounds of a particular neighborhood.

I also calculated the number of unique species in each neighborhood by creating an object that keeps track of the total number of species and its associated neighborhood name.

Further data processing was done when I created the bar chart; I sorted the data in descending data and sliced it to get the top five neighborhoods with the largest number of species.

Map

- In my first visualization, I used a **choropleth map** to showcase the tree species diversity in San Francisco. My main reason for using a map was because I wanted users to gain a comprehensive overview of the overall tree diversity in San Francisco, as well as be able to compare different neighborhoods.
- When choosing the number of colors to represent the tree species diversity in each neighborhood, I felt like there was a fine line between providing enough detail to accurately convey the information, while also making sure I'm not overwhelming users with too many colors. Due to the fact that there were only 36 total neighborhoods, and the most species any had were 200, I thought four colors provided enough detail without

making the map too cluttered. This is why I used a `scaleThreshold()` with intervals of 50 having different shades of colors.

- Furthermore, I decided on a diverging scale because it adds an extra level of clarity for the viewer; Darker colors are associated with higher diversity values and lighter with lower values. To provide further context and clarity, I added a color legend that offers more information about the different shades of color, i.e what the number of tree species it represented.

Bar Chart

- In my second visualization, I present the top five neighborhoods in San Francisco with the highest tree species diversity. I chose to use a bar chart to allow users to easily compare the tree diversity between different neighborhoods. Each bar is represented by a unique color to make it intuitive for the viewer to recognize the different neighborhoods being compared. The height of the bars indicates the level of diversity, allowing the user to quickly identify which neighborhoods have the most tree species.

Before settling on my final visualizations, I considered some others too. For my initial map visualization, I had started by creating little dots for each tree and mapping a color based on each tree's species (attached below in the document). The resulting image showed different colored dots in each neighborhood, showcasing which species it had. However, as seen in the image, this led to a very cluttered and confusing view, making it very difficult to draw any meaningful insights.

My current map visualization offers an intuitive and easy way for viewers to get an idea of overall tree diversity in SF neighborhoods, as well as draw insights about specific ones.

Furthermore, the bar chart gives them more insightful information about which neighborhoods in the city are the most tree species diverse.



My initial map visualization

Resources used:

- <https://www.geeksforgeeks.org/d3-js-array-from-method/>
- https://www.w3schools.com/jsref/jsref_filter.asp
- https://www.w3schools.com/jsref/jsref_find.asp