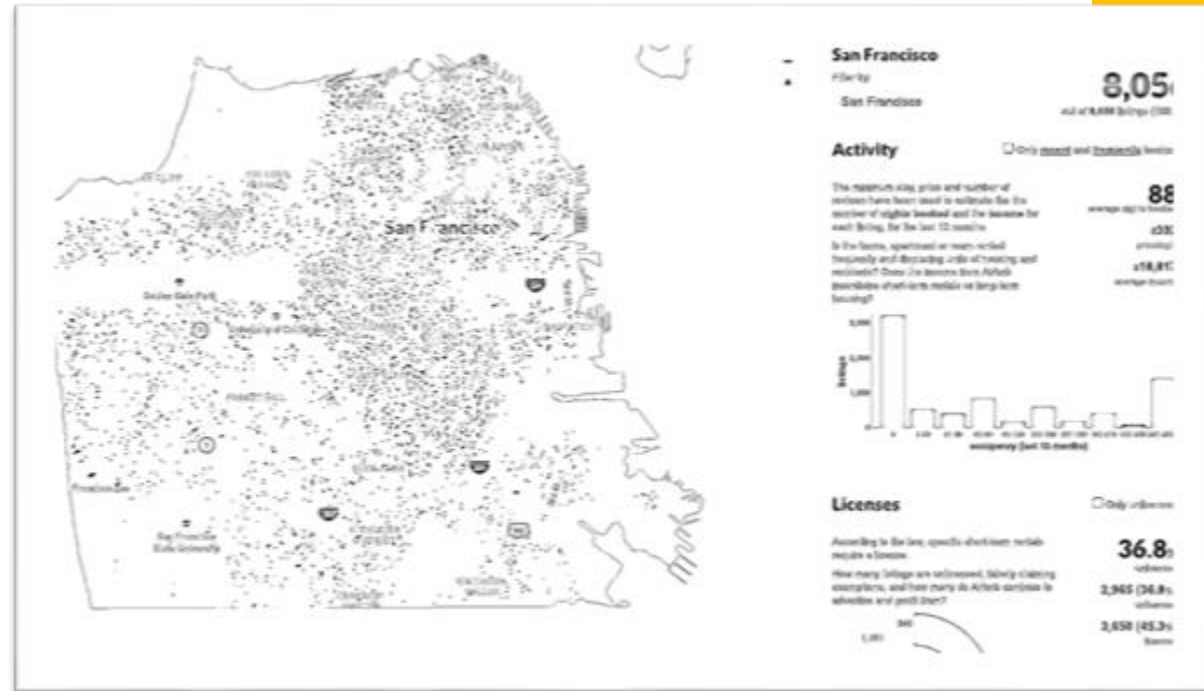


San Francisco Airbnb: A Visual Adventure





What is the Airbnb
landscape in San
Francisco?



Who are San
Francisco's Airbnb
hosts?



How can mapping
enhance Airbnb
selection?

San Francisco, California, United States

04 December, 2023 ([Explore](#))

Country/City	File Name	Description
San Francisco	listings.csv.gz	Detailed Listings data
San Francisco	calendar.csv.gz	Detailed Calendar Data
San Francisco	reviews.csv.gz	Detailed Review Data
San Francisco	listings.csv	Summary information and metrics for listings in San Francisco (good for visualisations).
San Francisco	reviews.csv	Summary Review data and Listing ID (to facilitate time based analytics and visualisations linked to a listing).
San Francisco	neighbourhoods.csv	Neighbourhood list for geo filter. Sourced from city or open source GIS files.
San Francisco		GeoJSON file of neighbourhoods of the city.

Data source

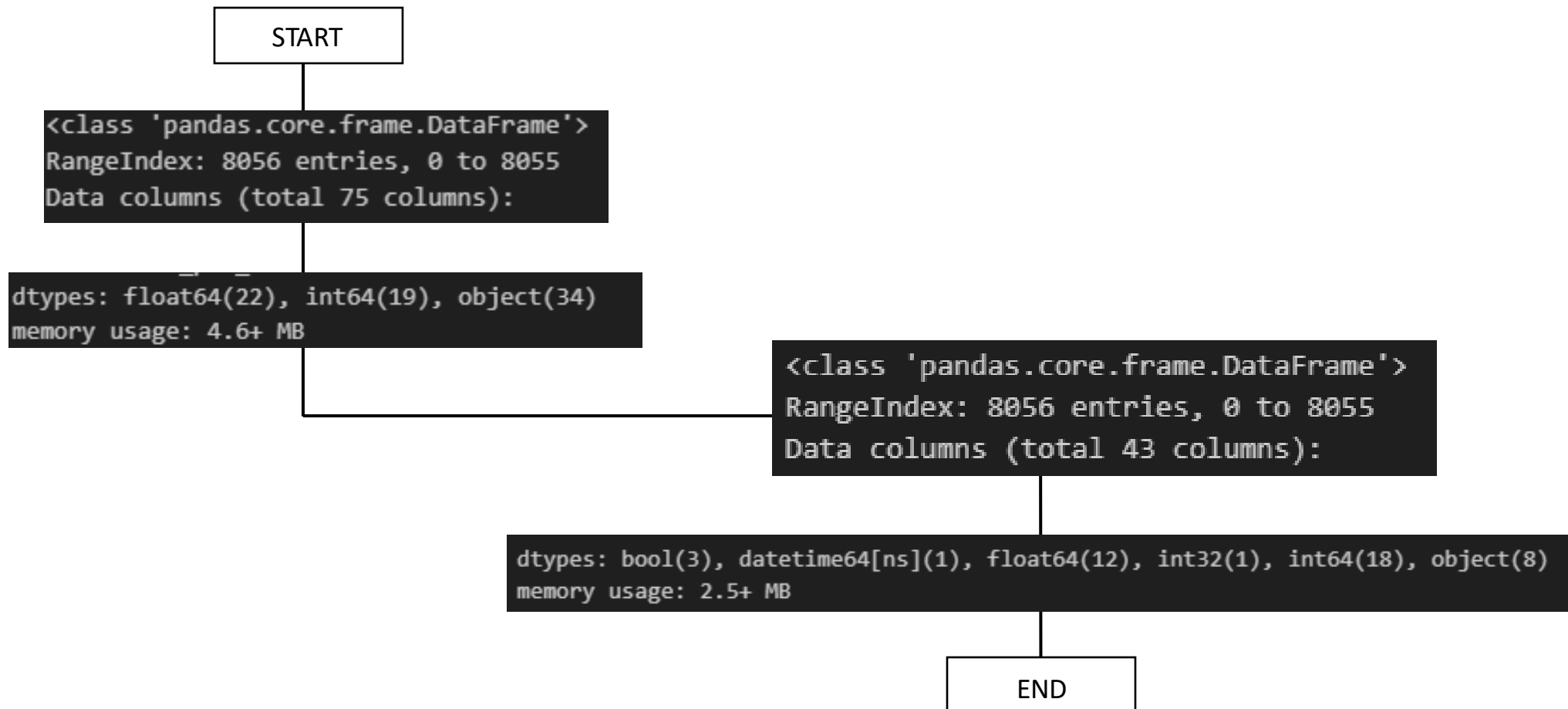
- <http://insideairbnb.com/get-the-data/>

Inside Airbnb is a mission driven project that provides data and advocacy about Airbnb's impact on residential communities.



To the extent possible under law, Murray Cox has waived all copyright and related or neighboring rights to **Inside Airbnb Data**.

Data





```
# Dependencies and Setup
import pandas as pd
from pathlib import Path
```

[57] ✓ 0.0s

Python

+ Code + Markdown

```
# Read csv data into Pandas DataFrame
listings_df = pd.read_csv("Resources/listings.csv")
```

[]

Python

```
# Checking for null values on the column level
listings_df.info()
```

[]

Python

```
# Dropping all fully null columns
listings_df = listings_df.drop(['description', 'neighbourhood_group_cleansed', 'bathrooms', 'calendar_updated'], axis=1)
```

[]

Python

```
# Re-checking for null values on the column level
listings_df.info()
```

[]

Python

```
# Dropping unneeded partially null columns
listings_df = listings_df.drop(['neighborhood_overview', 'host_location',
                                'host_about', 'host_response_time',
                                'host_response_rate', 'host_acceptance_rate',
                                'host_neighbourhood', 'neighbourhood', 'bedrooms',
                                'first_review', 'last_review', 'review_scores_accuracy',
                                'review_scores_checkin', 'review_scores_communication',
                                'review_scores_location', 'reviews_per_month'], axis=1)
```

[]

Python

```
# Checking for unneccarry columns to drop
listings_df.info()
```

[]

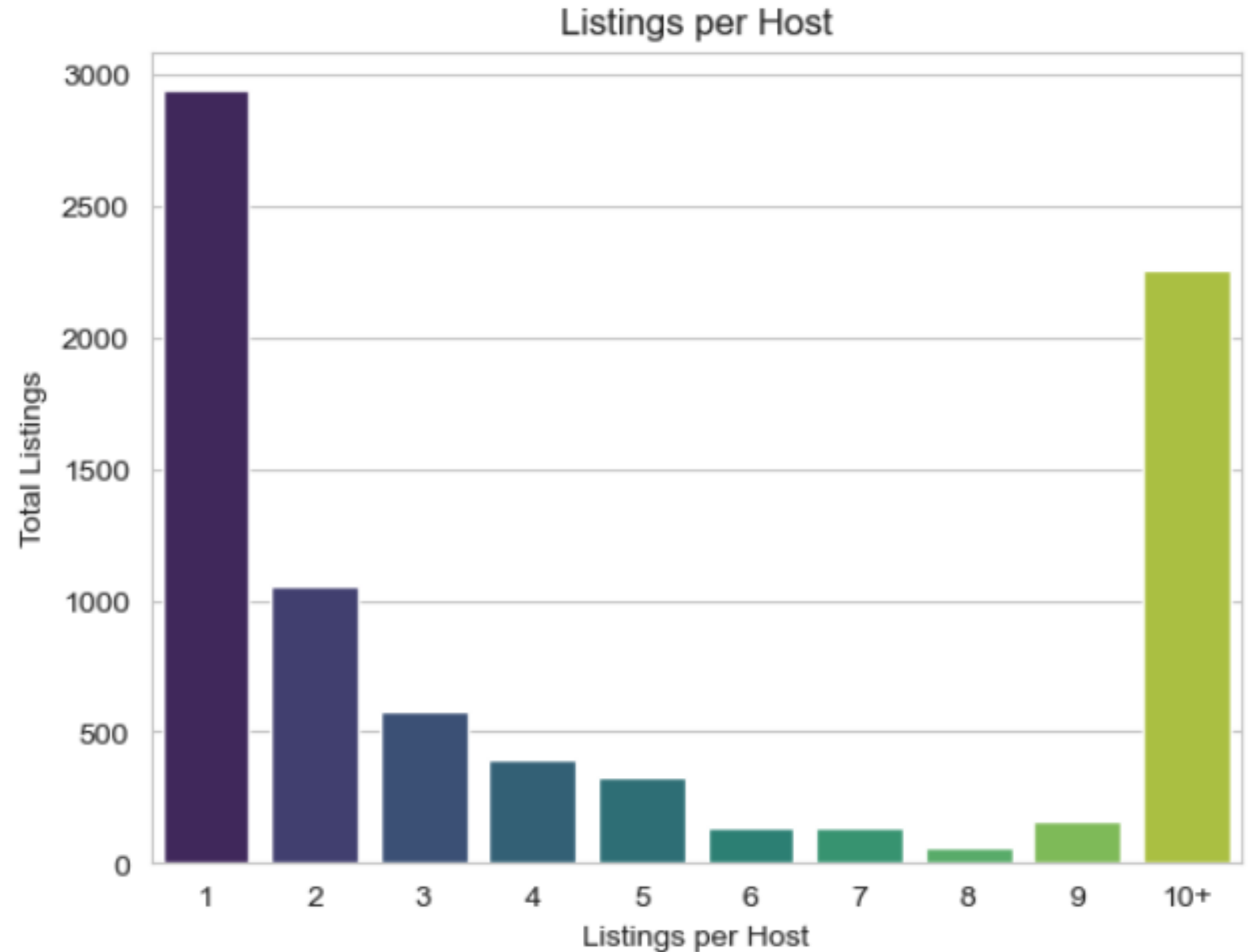
Python

```
# Creating a new coloumn for visulization by converting license values into four categories -> pending, unlicensed, licensed or exempt.

# creating a empty list for the values for our new column
license_status = []

# iterrating through license column and conditions
for index, row in listings_df.iterrows():
    if row['license'] == 'Pending Application':
        license_status.append('Pending')
```

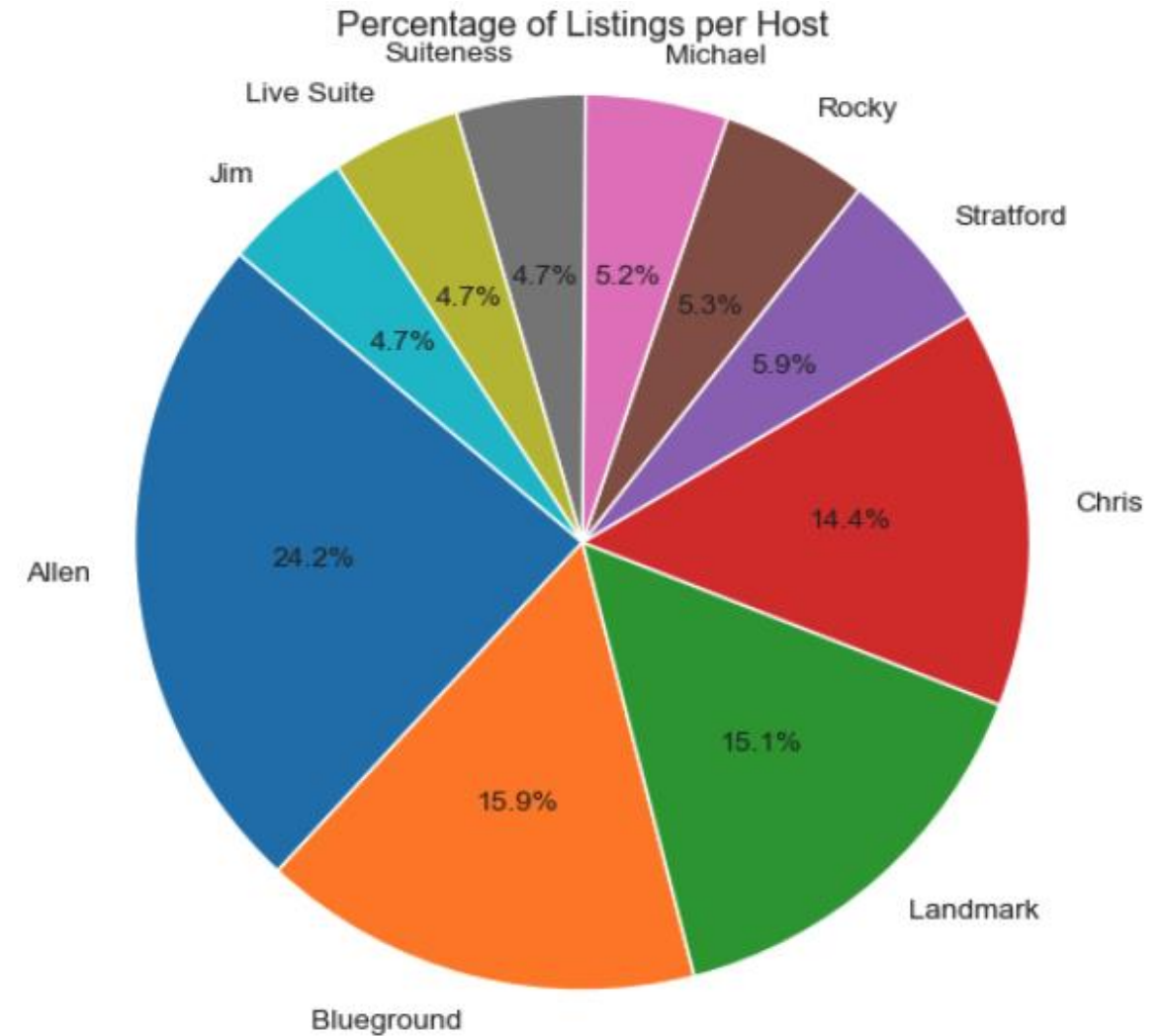
- Some Airbnb hosts have single listings or multiple listings
- Out of 8,056 listings, 2,940 are single listings while 5,116 are multi-listings
- Although 63.4% make up multi-listings and 36.6% are only single listings, I found it interesting that there were more hosts with just one listing versus hosts with 2, 3, 4 or 10+ according to this bar chart.
- A host may list separate rooms in the same apartment, or multiple apartments or homes in their entirety.
- Hosts with multiple listings are more likely to be running a business.

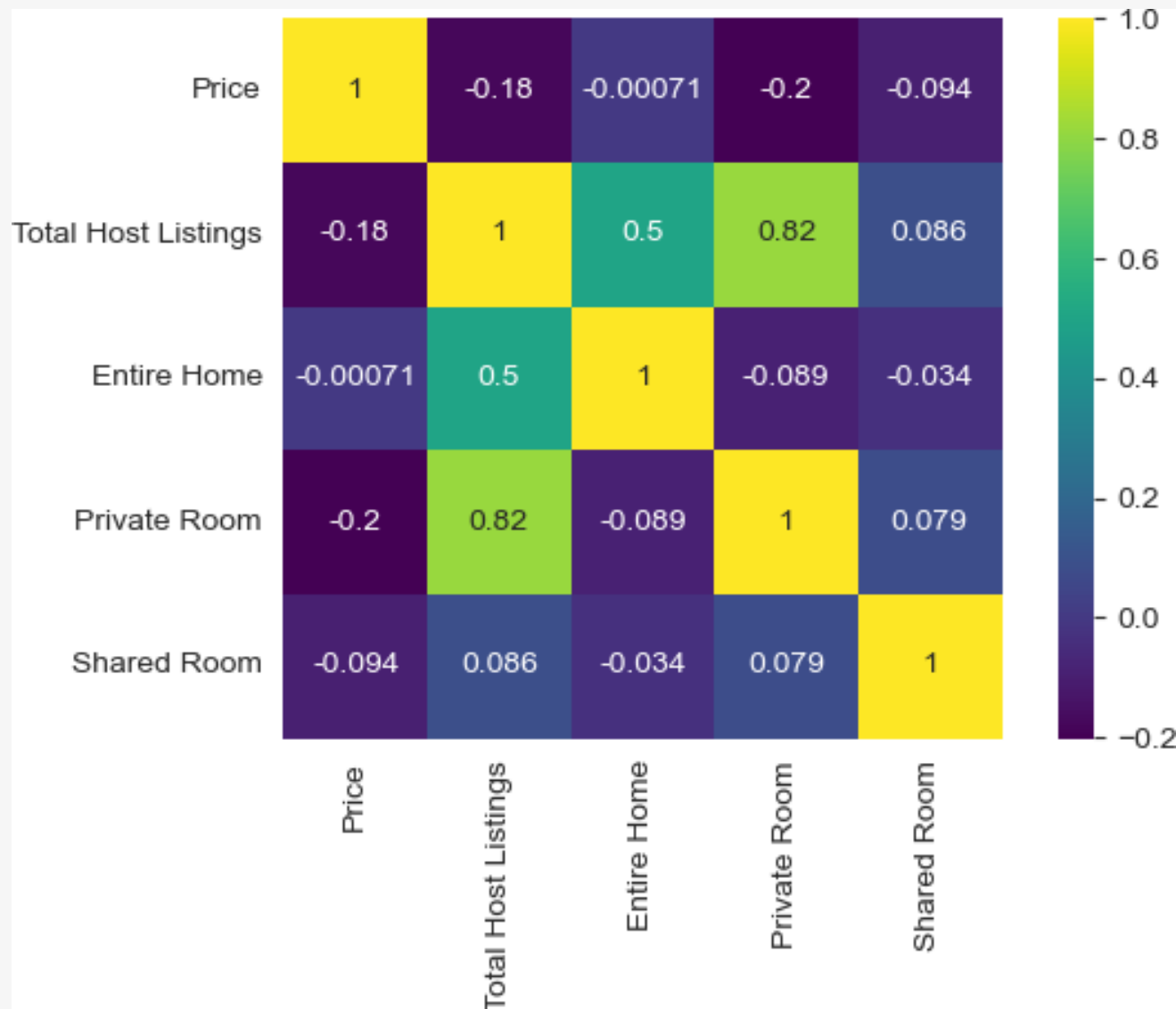


The Host with the Most

- However, after analyzing all 3,968 hosts, I created a top 10 DF featuring San Francisco's top hosts based on their number of total listings.
- Surprisingly, an individual named Allen tops the chart over the likes of companies such as Blueground and Landmark making up a whopping 24% of all listings by himself amongst the top ten.
- While Allen is the host with the most, almost all of his listings are private rooms while Blueground and Landmark offer entire homes or apartments.

	Host Name	#Entire Home/Apt	#Private Rooms	#Shared Rooms	#Hotel Rooms	#Listings
0	Allen	0	248	1	0	249
249	Blueground	164	0	0	0	164
413	Landmark	154	1	0	0	155
568	Chris	0	148	0	0	148
716	Stratford	0	50	0	11	61
777	Rocky	1	54	0	0	55
832	Michael	53	0	0	0	53
885	Suiteness	0	48	0	0	48
887	Live Suite	48	0	0	0	48
890	Jim	48	0	0	0	48





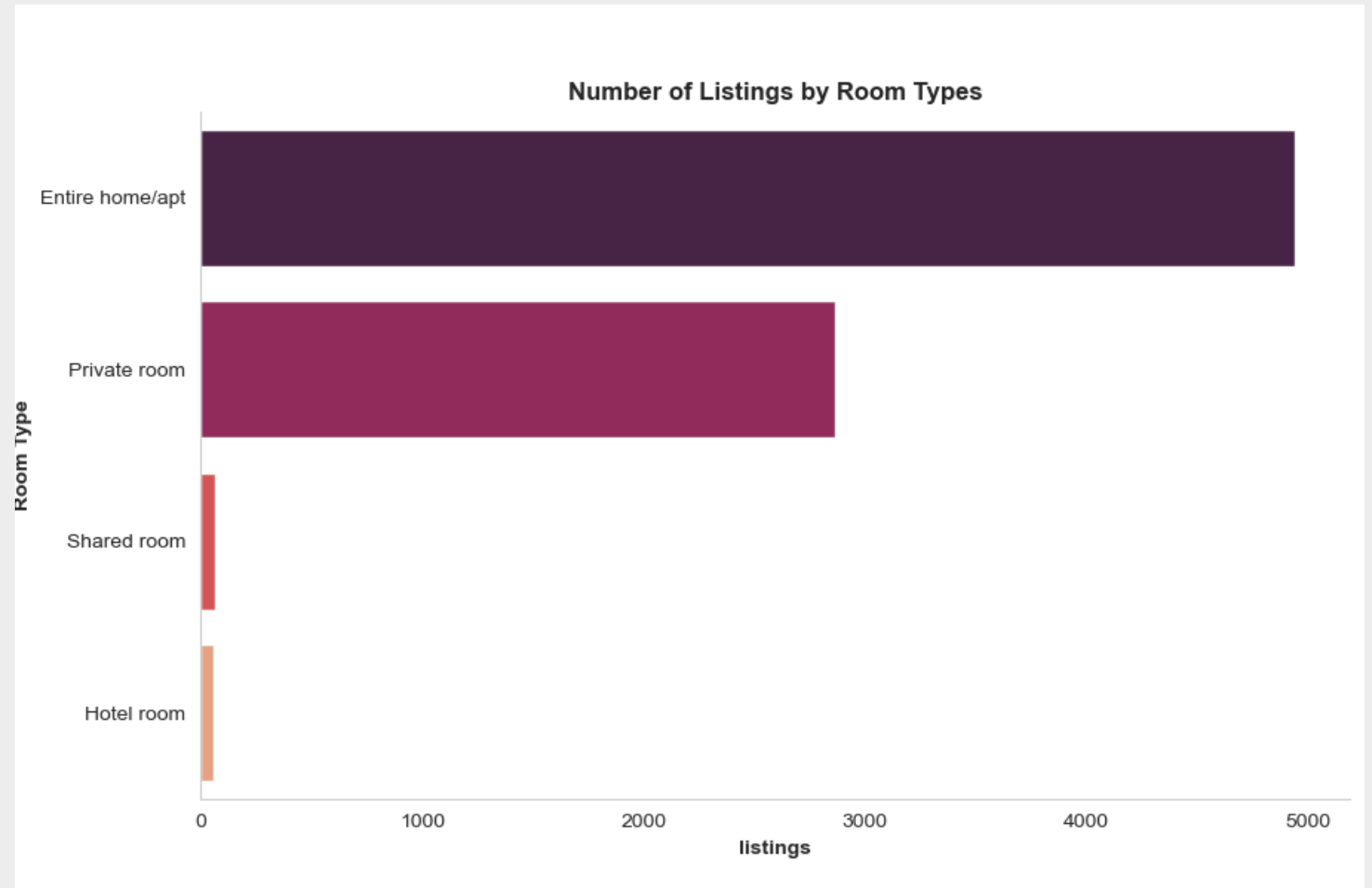
Host Listings Correlate with Private Rooms

- Calculated a correlation matrix to create a seaborn heatmap
- Strong relationship between the total host listings and private rooms. The more listings a host has, the more likely they are to be private rooms.
 - Allen with 249 listings - 99% are private rooms
- Moderate relationship between total host listings and entire home offerings. Hosts with multiple listings tend to have a moderate proportion of those listings offered as entire homes.
 - Blueground with 164 listings – all entire home/apt

Guests Prefer Privacy and Entire Spaces

- The most popular Airbnb listing offered in San Francisco are entire homes or apartments.
- Private rooms within hosts' residences are the second most popular offerings.
- Shared rooms and hotel-style accommodations are the least popular.
- This shows that guests have a preference for privacy and prefer to have an entire space to themselves.

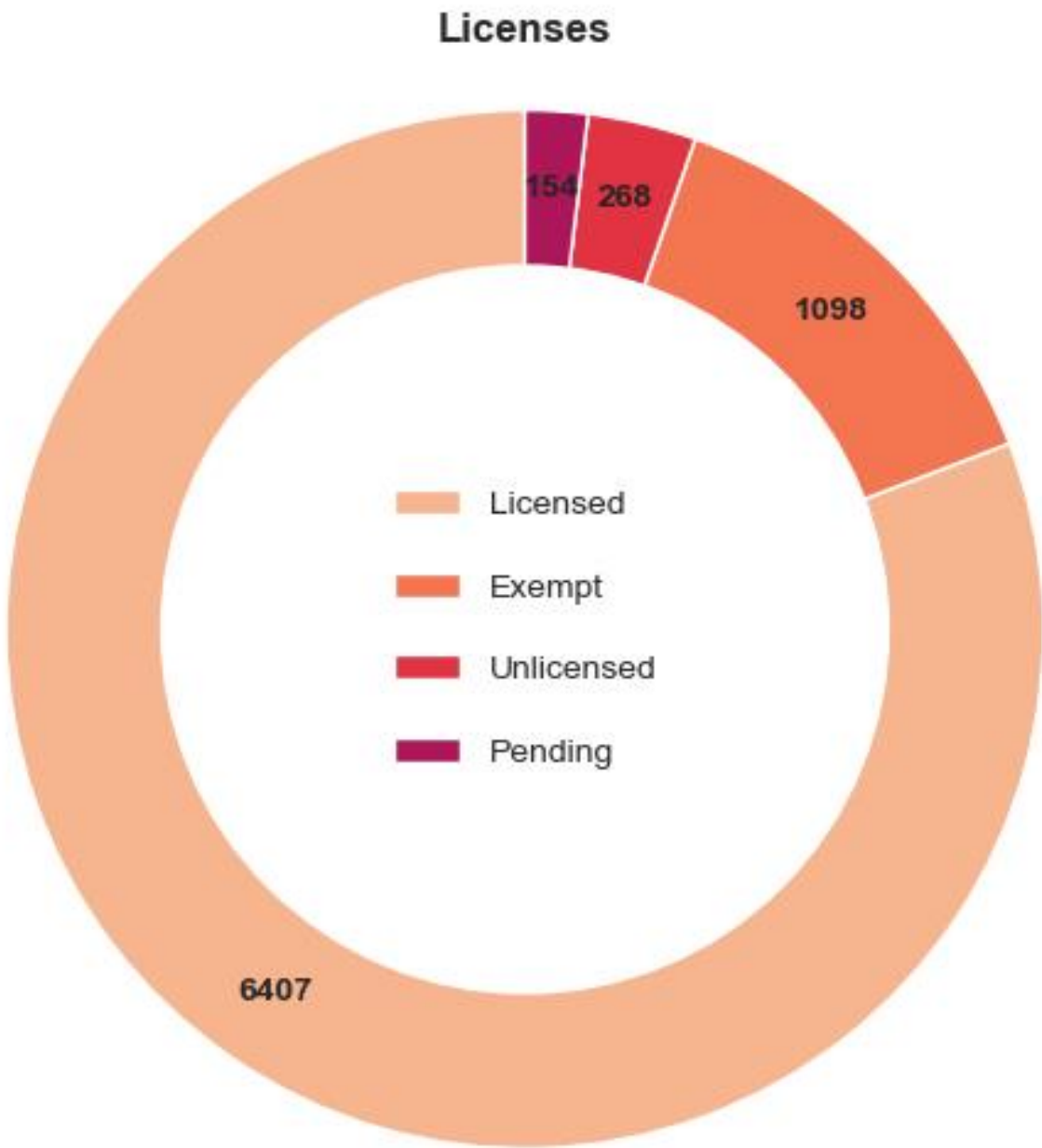
	Total	Percent
Entire home/apt	4939	62%
Private room	2862	36%
Shared room	68	1%
Hotel room	58	1%



Licensed Listings: Airbnb's Rule Followers!

- In San Francisco, hosts offering short term listings of less than 30 days are required to obtain a license.
- Stays longer than 30 days are exempt.
- Most Airbnb listings are licensed.
- This indicates that most Airbnb hosts adhere to short-term rental regulations.

	Total	Percent
Licensed	6407	81%
Exempt	1098	14%
Unlicensed	268	3%
Pending	154	2%



Average Daily Price by San Francisco Neighborhood

Average Daily Price in Dollars

220
200
180
160
140
120
100

Financial District

North Beach

Presidio

Castro/Upper Market

Chinatown

Twin Peaks

Russian Hill

Glen Park

Presidio Heights

Noe Valley

Marina

Potrero Hill

Diamond Heights

Bernal Heights

West of Twin Peaks

Inner Richmond

Pacific Heights

South of Market

Seacliff

Downtown/Civic Center

Outer Richmond

Haight Ashbury

Mission

Inner Sunset

Western Addition

Parkside

Outer Mission

Outer Sunset

Golden Gate Park

Nob Hill

Visitacion Valley

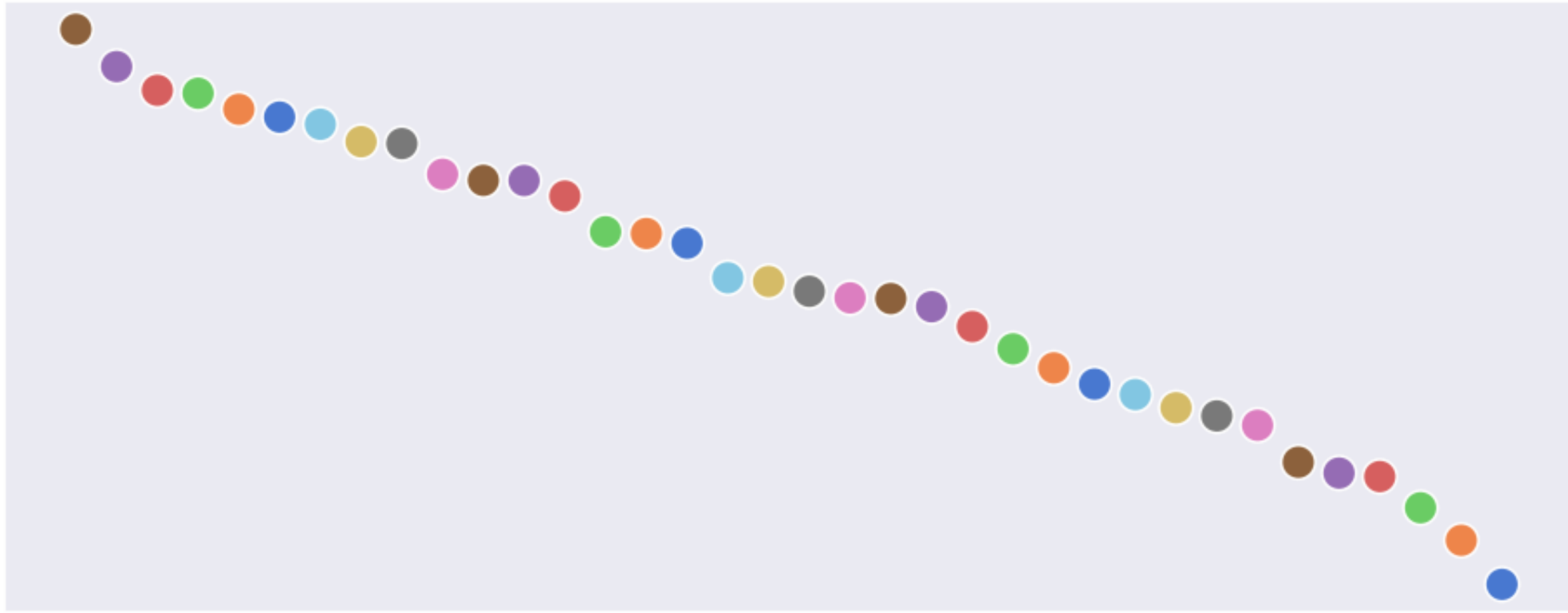
Ocean View

Lakeshore

Bayview

Excelsior

Crocker Amazon



```

Center point
r mapAirBnb = L.map("map", {
  center: [37.7544, -122.4477],
  zoom: 13,
});

Base tile layers
r streetMapLayer = L.tileLayer('https://{s}.tile.openstreetmap.org/{z}/{x}/{y}.png', {
  attribution: '&copy; <a href="https://www.openstreetmap.org/copyright">OpenStreetMap</a>',
}).addTo(mapAirBnb);

Define price categories and corresponding colors
r priceCategories = [
  { min: 0, max: 100, color: 'green' },    // Lower price range
  { min: 100, max: 300, color: 'yellow' }, // Low-medium price range
  { min: 300, max: 600, color: 'purple' }, // Medium price range
  { min: 600, max: 1000, color: 'blue' },  // Medium-high price range
  { min: 1000, max: Infinity, color: 'red' }, // High-medium price range

];

r markersLayer = L.layerGroup(); // Layer group for markers

Add district boundaries
tch('../Resources/listings.geojson') // Replace 'listings.geojson' with the path to y
  .then(response => response.json())
  .then(data => {
    L.geoJSON(data, {
      style: {
        color: 'blue',    // Change boundary color as needed
        weight: 2,        // Change boundary weight as needed
        fillOpacity: 0.2  // Adjust opacity as needed
      }
    }).addTo(mapAirBnb);
  })
  .catch(error => console.error('Error loading district boundaries:', error));

.json('../Resources/listings_cleaned.json').then(function (data) {
  // Loop through each listing
  data.forEach(function (listing) {
    // Extract latitude and longitude
    var latitude = parseFloat(listing.latitude);
    var longitude = parseFloat(listing.longitude);
  });
});

```

•Center Point and Base Tile Layers:

- It provides the underlying map tiles.
- Show the center point of the map: San Francisco, with a zoom level of 13.
- Display the base tile layer using OpenStreetMap tiles.

•Price Categories and Markers:

- Different price ranges are represented by distinct colors.
- Utilize a JSON file containing listings information, including latitude, longitude, price, and other details.
- Create markers for each listing: Use circle markers to represent listings on the map.
- Customize marker colors based on price category: Lower prices are represented by green, while higher prices are shown in red.
- Show popup information: Display listing details such as name, price, property type, and neighborhood when clicking on a marker.

•District Boundaries:

- Fetch GeoJSON data: Retrieve boundary information for districts to provide context to the listings.

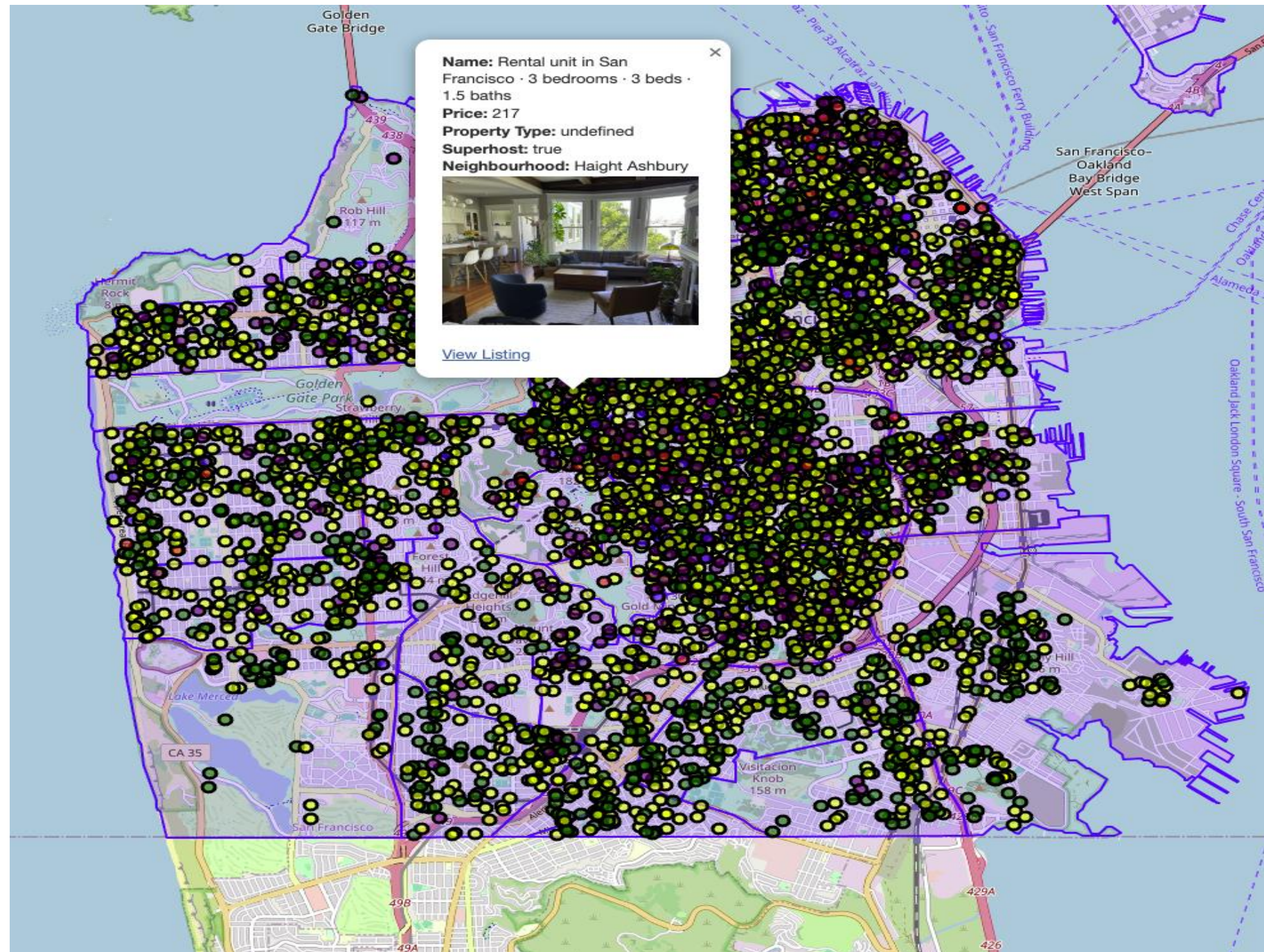
•Layer Switcher:

- Allows users to toggle between different map layers.
- Implement layer control: Provide options to switch between the base tile layer and the markers layer.

•Price Category Switcher:

- Enables users to filter listings based on price ranges.
- Implement checkboxes for price categories: Users can select multiple price ranges to view relevant listings.
- Toggle marker visibility: Show or hide markers based on the selected price categories.

- Interactive maps enhance the Airbnb experience by providing visual representations of listings based on price with the neighborhood boundaries
- Call listings and/or by street map
- Users can customize Airbnb accommodations by price
- Geographical pick where they would like to be based on price
- Quick snapshot of the listing to garnish info
- Also click directly to the listing:
- [SF Airbnb Map](#)



Minimal Viable Product (MVP) Goals

- Integrate with Flask for enhanced interaction
- Synchronize visuals with the map
- Enhance user interactivity, including additional dropdowns, such as neighborhood or room type
- Integrate live data for real-time map updates

