The Battle of Neighborhoods

- The Best Coffee Shop Location in San Francisco

INTRODUCTION

Business Problem

Finding the best business location is one of the key decisions the business owner needs to make to ensure profitability. For someone who plans to open a coffee shop in San Francisco, the ideal business location should be accessible by large number of customers in the surrounding areas. Meanwhile, it's essential to find an area with less existing coffee shops to reduce potential competition.

Objective

Ranking neighborhoods in San Francisco based on the weighted scores for opening a new coffee shop. The numbers of nearby high schools, universities, and offices, as well as the number of coffee shops in each neighborhood will be considered as the key factors in the weighted score calculation.

DATA SOURCE

The following data are used in this project

1. List of Neighborhoods in San Francisco
   http://www.healthysf.org/bdi/outcomes/zipmap.htm
2. Foursquare venue data for various categories (i.e., coffee shop, high school, university, and offices)
3. json geographical data
4. San Francisco coordinates
   https://www.latlong.net/place/san-francisco-ca-usa-594.html

METHODOLOGY

The following steps were performed during the analysis

Step 1. Import source data (i.e., neighborhood, zip code, and geographical location).

Step 2. Filter null data and create a new data frame combining target features, leaving a total of 20 neighborhoods.

Step 3. Request nearby venues information (i.e., coffee shop, high school, university, and offices) from Foursquare.

Step 4. Count the number of venues in each category and combine the values in a new data frame.

Step 5. Assign weights to each venue category.

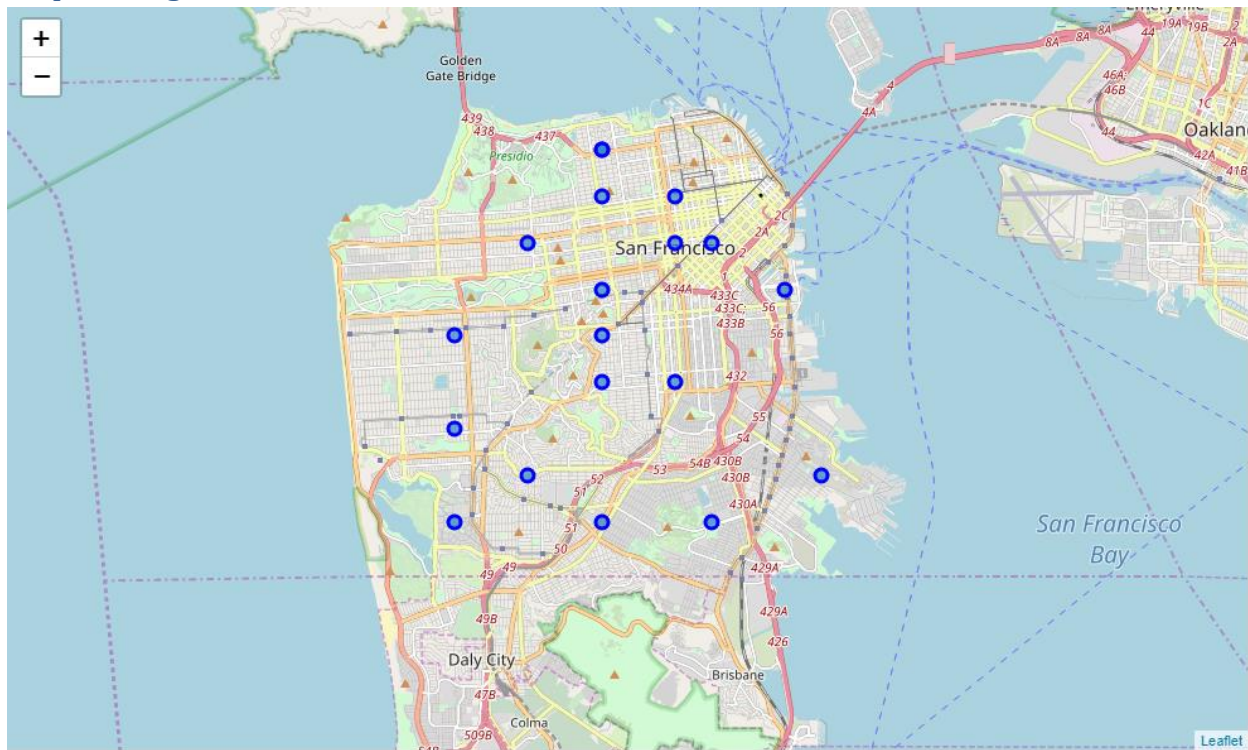Step 6. Calculate weighted score for each neighborhood.

Step 7. Rank neighborhoods based on weighted scores and display the top 5 winners.

RESULTS

List of Neighborhoods in SF

	Zip Code	Neighborhood	Latitude	Longitude
3	94107	Potrero Hill	37.77	-122.39
17	94127	St. Francis Wood/Miraloma/West Portal	37.73	-122.46
15	94123	Marina	37.80	-122.44
2	94103	South of Market	37.78	-122.41
19	94132	Lake Merced	37.72	-122.48
20	94133	North Beach/Chinatown	37.80	-122.44
18	94131	Twin Peaks-Glen Park	37.75	-122.44
1	94102	Hayes Valley/Tenderloin/North of Market	37.78	-122.42
8	94114	Castro/Noe Valley	37.76	-122.44
9	94115	Western Addition/Japantown	37.79	-122.44

Map of Neighborhoods in SF

Nearby Coffee Shops

	Localidad	Localidad Latitude	Localidad Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Potrero Hill	37.77	-122.39	Starbucks	37.771196	-122.389364	Coffee Shop
1	Potrero Hill	37.77	-122.39	Spro Coffeelab	37.770835	-122.391400	Coffee Shop
2	Potrero Hill	37.77	-122.39	Starbucks	37.777057	-122.393659	Coffee Shop
3	Potrero Hill	37.77	-122.39	Chat's Roasting Company	37.762384	-122.398287	Coffee Shop
4	Potrero Hill	37.77	-122.39	Réveille Coffee Co.	37.773309	-122.391508	Coffee Shop

Nearby High Schools

	Localidad	Localidad Latitude	Localidad Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Potrero Hill	37.77	-122.39	International Studies Academy	37.761814	-122.401238	High School
1	Potrero Hill	37.77	-122.39	ISAH	37.761955	-122.401107	High School
2	St. Francis Wood/Miraloma/West Portal	37.73	-122.46	Archbishop Riordan High School	37.727942	-122.453227	High School
3	St. Francis Wood/Miraloma/West Portal	37.73	-122.46	Stratford School	37.723121	-122.461527	High School
4	St. Francis Wood/Miraloma/West Portal	37.73	-122.46	ARHS RSP Coordinator Office	37.725999	-122.449298	High School

Nearby Universities

	Localidad	Localidad Latitude	Localidad Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Potrero Hill	37.77	-122.39	UCSF Mission Bay	37.769028	-122.395933	Medical School
1	Potrero Hill	37.77	-122.39	UCSF Mission Bay - Sandler Neurosciences Bldg	37.768982	-122.391918	University
2	Potrero Hill	37.77	-122.39	Mission Hall Hub	37.767685	-122.390748	College Library
3	Potrero Hill	37.77	-122.39	Acadamy Of Art - Sculpture Building	37.774545	-122.399022	College Arts Building
4	Potrero Hill	37.77	-122.39	UCSF Mission Bay OR	37.766147	-122.390055	University

Nearby Offices

	Localidad	Localidad Latitude	Localidad Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Potrero Hill	37.77	-122.39	Thrive City	37.767912	-122.388709	Event Space
1	Potrero Hill	37.77	-122.39	Cisco Meraki	37.770252	-122.387388	Tech Startup
2	Potrero Hill	37.77	-122.39	UCSF Mission Bay	37.769028	-122.395933	Medical School
3	Potrero Hill	37.77	-122.39	UCSF Benioff Children's Hospital San Francisco	37.764813	-122.390091	Hospital
4	Potrero Hill	37.77	-122.39	Oracle Park Parking Lot A	37.775371	-122.388886	Parking

Venue Summary Table and Weights

	Zip Code	Localidad	Latitude	Longitude	Coffee	High Schools	Universities	Offices
3	94107	Potrero Hill	37.77	-122.39	43.0	2.0	6.0	50.0
17	94127	St. Francis Wood/Miraloma/West Portal	37.73	-122.46	8.0	3.0	1.0	45.0
15	94123	Marina	37.80	-122.44	27.0	11.0	1.0	50.0
2	94103	South of Market	37.78	-122.41	50.0	3.0	18.0	50.0
19	94132	Lake Merced	37.72	-122.48	8.0	1.0	8.0	47.0

Category	Weight
Coffee shop	-1
High Schools	+1
University	+2
Office	+3

Weighted Scores and Ranking (Top 5)

	Localidad	Score
10	Parkside/Forest Hill	150.0
19	Lake Merced	150.0
2	South of Market	139.0
7	Ingelside-Excelsior/Crocker-Amazon	139.0
8	Castro/Noe Valley	137.0

DISCUSSION AND CONCLUSION

- Two neighborhoods, **Parkside/Forest Hill and Lake Merced**, are likely the best locations for a new coffee shop in San Francisco.

- Changing the weights of categories will likely result in different ranking.

- Depending on the data availability, more factors (e.g., rental cost, labor cost, parking, public transportation, etc.) can be considered to make more informed decision.