

NEW CHINESE RESTAURANT IN BAY AREA – THE LOCATION PROBLEM

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April, 2019

Outline

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- Data Acquisition and Preparation
- Methodology
- Results
- Discussion
- Conclusion

Introduction

- Tech boom in the bay area
- My friend considers open a new Chinese restaurant
- Location! Location! Location!

Step 1: How many
Chinese restaurants
already opened in the
bay area?



Data Acquisition and Preparation

- Zip codes in the bay area along with the city names are available at: <https://data.sfgov.org/Geographic-Locations-and-Boundaries/Bay-Area-ZIP-Codes/u5j3-svi6>
- Download CSV or Json file.

The screenshot shows the DataSF website interface. The header includes the DataSF logo and navigation links: OPEN DATA, SHOWCASE, PUBLISHING, ACADEMY, RESOURCES, and BLOG. Below the header, there are tabs for Explore, Browse Data, Open Data Stats, Developers, and a search bar. The main content area displays the title "Bay Area ZIP Codes" and a subtitle "Based on Bay Area ZIP Codes". Below this is a map of the Bay Area showing various cities and zip codes. On the right side, there is a sidebar with a "More Views" section containing links for Export, Discuss, Embed, and About. Below this is an "Export" section with a "Download" button. Under "Download", there is a message "Download a copy of this dataset in a static format". Below this message, there are two sections: "Download Geospatial Data" with options for KML, KMZ, Shapefile, Original, and GeoJSON; and "Download a non-geospatial file type" with options for CSV and JSON. At the bottom of the page, there are links for "Terms of Use" and "Socrata Privacy Policy".

Data Acquisition and Preparation

- Cleaned data frame includes city names, zip codes, latitudes and longitudes.

Out[6]:

| | PO_NAME | ZIP | Latitude | Longitude |
|----|-------------------|---|-----------|-------------|
| 0 | ALAMEDA | 94502, 94501 | 37.609029 | -121.899142 |
| 1 | ALAMO | 94507 | 37.850203 | -122.032184 |
| 2 | ALBANY | 94706 | 37.886870 | -122.297747 |
| 3 | ALVISO | 95002 | 37.426051 | -121.975237 |
| 4 | AMERICAN CANYON | 94503 | 38.174918 | -122.260804 |
| 5 | ANTIOCH | 94509, 94531 | 38.004921 | -121.805789 |
| 6 | ATHERTON | 94027 | 37.461327 | -122.197743 |
| 7 | BELMONT | 94002 | 37.520215 | -122.275801 |
| 8 | BELVEDERE TIBURON | 94920 | 37.878023 | -122.469145 |
| 9 | BENICIA | 94510 | 38.049365 | -122.158578 |
| 10 | BERKELEY | 94708, 94720, 94707, 94710, 94709, 94703, 9470... | 37.870839 | -122.272864 |
| 11 | BIRDS LANDING | 94512 | 38.132695 | -121.870793 |
| 12 | BRENTWOOD | 94513 | 37.931777 | -121.696027 |
| 13 | BRISBANE | 94005 | 37.680766 | -122.399972 |
| 14 | BURLINGAME | 94010 | 37.584103 | -122.366083 |
| 15 | BYRON | 94514 | 37.874063 | -121.634657 |
| 16 | CASTRO VALLEY | 94546, 94552 | 37.715818 | -122.090288 |
| 17 | CLAYTON | 94517 | 37.941034 | -121.935793 |
| 18 | CONCORD | 94520, 94521, 94519, 94518 | 37.976852 | -122.033562 |
| 19 | CORTE MADERA | 94925 | 37.925481 | -122.527475 |
| 20 | CROCKETT | 94525 | 38.052604 | -122.032200 |

Methodology

- Use Foursquare API to find the top 500 venues that are within a radius of 2000 meters to all the cities.

Out[11]:

| | City | City Latitude | City Longitude | Venue | Venue Latitude | Venue Longitude | Venue Category |
|----|---------|---------------|----------------|------------------------------------|----------------|-----------------|-------------------------|
| 0 | ALAMEDA | 37.609029 | -121.899142 | Pleasanton Ridge Regional Park | 37.614761 | -121.881874 | Trail |
| 1 | ALAMEDA | 37.609029 | -121.899142 | Elliston Vineyards | 37.601171 | -121.890326 | Winery |
| 2 | ALAMEDA | 37.609029 | -121.899142 | Bosco's Bones & Brew | 37.593791 | -121.888016 | American Restaurant |
| 3 | ALAMEDA | 37.609029 | -121.899142 | Niles Canyon Farwell Trestle | 37.594598 | -121.905016 | Trail |
| 4 | ALAMEDA | 37.609029 | -121.899142 | Sunol Station Niles Canyon Railway | 37.594190 | -121.888893 | Train Station |
| 5 | ALAMEDA | 37.609029 | -121.899142 | Sunol Food & Liquor | 37.594004 | -121.887918 | Grocery Store |
| 6 | ALAMEDA | 37.609029 | -121.899142 | Casa Bella Bistro | 37.593703 | -121.888451 | Bistro |
| 7 | ALAMO | 37.850203 | -122.032184 | Alamo Cafe | 37.849932 | -122.032031 | American Restaurant |
| 8 | ALAMO | 37.850203 | -122.032184 | Extreme Pizza | 37.848096 | -122.031570 | Pizza Place |
| 9 | ALAMO | 37.850203 | -122.032184 | Safeway | 37.850845 | -122.035224 | Grocery Store |
| 10 | ALAMO | 37.850203 | -122.032184 | Panera Bread | 37.851191 | -122.033797 | Sandwich Place |
| 11 | ALAMO | 37.850203 | -122.032184 | cherubini coffee house | 37.850007 | -122.031462 | Café |
| 12 | ALAMO | 37.850203 | -122.032184 | CVS pharmacy | 37.851902 | -122.032449 | Pharmacy |
| 13 | ALAMO | 37.850203 | -122.032184 | Alamo Palace | 37.852612 | -122.035127 | Chinese Restaurant |
| 14 | ALAMO | 37.850203 | -122.032184 | Rite Aid | 37.852412 | -122.035486 | Pharmacy |
| 15 | ALAMO | 37.850203 | -122.032184 | Five Guys | 37.851432 | -122.035319 | Burger Joint |
| 16 | ALAMO | 37.850203 | -122.032184 | Peet's Coffee & Tea | 37.851114 | -122.034124 | Coffee Shop |
| 17 | ALAMO | 37.850203 | -122.032184 | The Peasant's Courtyard | 37.849670 | -122.032752 | New American Restaurant |
| 18 | ALAMO | 37.850203 | -122.032184 | Orangetheory Fitness | 37.851279 | -122.034997 | Gym / Fitness Center |
| 19 | ALAMO | 37.850203 | -122.032184 | Round Table Pizza | 37.852124 | -122.036282 | Pizza Place |
| 20 | ALAMO | 37.850203 | -122.032184 | Brass Bear Delicatessen | 37.851238 | -122.035644 | Deli / Bodega |
| 21 | ALAMO | 37.850203 | -122.032184 | The UPS Store | 37.852625 | -122.033553 | Shipping Store |

Methodology

- Filter the data frame using “Venue Category”.

Out[12]:

| | City | City Latitude | City Longitude | Venue | Venue Latitude | Venue Longitude | Venue Category |
|------|-------------------|---------------|----------------|--------------------------|----------------|-----------------|--------------------|
| 13 | ALAMO | 37.850203 | -122.032184 | Alamo Palace | 37.852612 | -122.035127 | Chinese Restaurant |
| 40 | ALAMO | 37.850203 | -122.032184 | Yan's China Bistro | 37.851542 | -122.031984 | Chinese Restaurant |
| 64 | ALBANY | 37.886870 | -122.297747 | China Village Restaurant | 37.890831 | -122.291234 | Chinese Restaurant |
| 185 | AMERICAN CANYON | 38.174918 | -122.260804 | Panda Express | 38.180866 | -122.254158 | Chinese Restaurant |
| 236 | ANTIOCH | 38.004921 | -121.805789 | China City Restaurant | 37.994895 | -121.806587 | Chinese Restaurant |
| 262 | ANTIOCH | 38.004921 | -121.805789 | Canton City | 38.016345 | -121.813927 | Chinese Restaurant |
| 358 | BELMONT | 37.520215 | -122.275801 | Panda Express | 37.519659 | -122.275432 | Chinese Restaurant |
| 372 | BELMONT | 37.520215 | -122.275801 | Blue Sky Cafe | 37.514525 | -122.268431 | Chinese Restaurant |
| 408 | BELMONT | 37.520215 | -122.275801 | Peking Alley | 37.529998 | -122.290073 | Chinese Restaurant |
| 431 | BELMONT | 37.520215 | -122.275801 | King Chuan | 37.506726 | -122.261280 | Chinese Restaurant |
| 468 | BELVEDERE TIBURON | 37.878023 | -122.469145 | Lily Kai | 37.873820 | -122.455203 | Chinese Restaurant |
| 524 | BENICIA | 38.049365 | -122.158578 | Panda Express | 38.066390 | -122.164756 | Chinese Restaurant |
| 575 | BERKELEY | 37.870839 | -122.272864 | Long Life Vegi House | 37.871144 | -122.276611 | Chinese Restaurant |
| 594 | BERKELEY | 37.870839 | -122.272864 | Great China | 37.867636 | -122.266123 | Chinese Restaurant |
| 647 | BERKELEY | 37.870839 | -122.272864 | King Dong | 37.865095 | -122.267370 | Chinese Restaurant |
| 716 | BRENTWOOD | 37.931777 | -121.696027 | Dragon City Restaurant | 37.947260 | -121.697257 | Chinese Restaurant |
| 723 | BRENTWOOD | 37.931777 | -121.696027 | Canton Garden | 37.942104 | -121.694956 | Chinese Restaurant |
| 737 | BRISBANE | 37.680766 | -122.399972 | Na Na's Kitchen | 37.682355 | -122.403598 | Chinese Restaurant |
| 758 | BRISBANE | 37.680766 | -122.399972 | Lucky House | 37.683393 | -122.403187 | Chinese Restaurant |
| 968 | CONCORD | 37.976852 | -122.033562 | Shan Shan Low | 37.974222 | -122.040852 | Chinese Restaurant |
| 1208 | DALY CITY | 37.705767 | -122.461921 | Chopstix | 37.698214 | -122.464380 | Chinese Restaurant |
| 1212 | DALY CITY | 37.705767 | -122.461921 | Egg Roll King | 37.699229 | -122.463903 | Chinese Restaurant |

Methodology

- Add “City Label” for better visualization.

Out[13]:

| | City | City Latitude | City Label | City Longitude | Venue | Venue Latitude | Venue Longitude | Venue Category |
|-----|-----------------|---------------|------------|----------------|--------------------------|----------------|-----------------|--------------------|
| 13 | ALAMO | 37.850203 | 0 | -122.032184 | Alamo Palace | 37.852612 | -122.035127 | Chinese Restaurant |
| 40 | ALAMO | 37.850203 | 0 | -122.032184 | Yan's China Bistro | 37.851542 | -122.031984 | Chinese Restaurant |
| 64 | ALBANY | 37.886870 | 1 | -122.297747 | China Village Restaurant | 37.890831 | -122.291234 | Chinese Restaurant |
| 185 | AMERICAN CANYON | 38.174918 | 2 | -122.260804 | Panda Express | 38.180866 | -122.254158 | Chinese Restaurant |
| 236 | ANTIOCH | 38.004921 | 3 | -121.805789 | China City Restaurant | 37.994895 | -121.806587 | Chinese Restaurant |
| 262 | ANTIOCH | 38.004921 | 3 | -121.805789 | Canton City | 38.016345 | -121.813927 | Chinese Restaurant |
| 358 | BELMONT | 37.520215 | 4 | -122.275801 | Panda Express | 37.519659 | -122.275432 | Chinese Restaurant |

Results

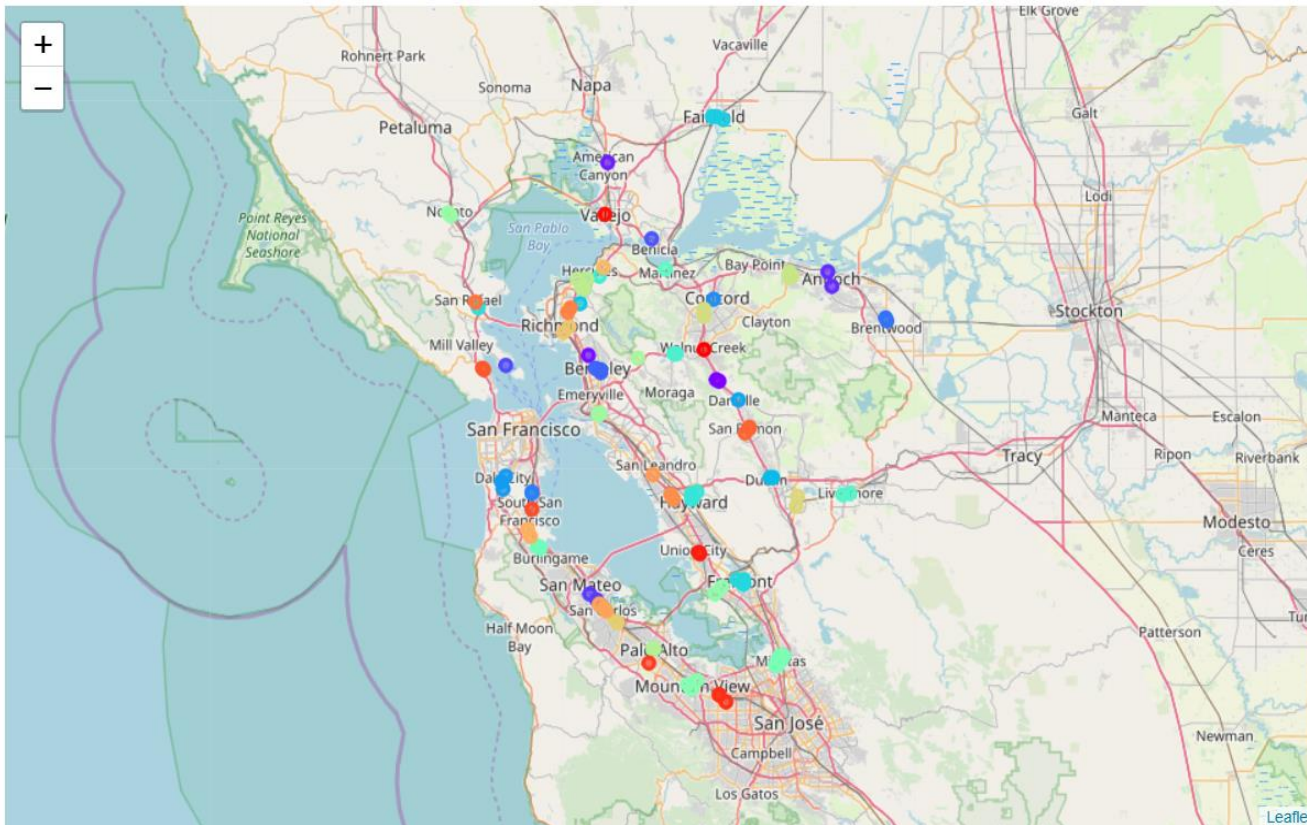
- Rank the cities based on number of Chinese restaurants.

Out[15]:

| | City Latitude | City Label | City Longitude | Venue | Venue Latitude | Venue Longitude | Venue Category |
|---------------|---------------|------------|----------------|-------|----------------|-----------------|----------------|
| City | | | | | | | |
| MILPITAS | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| MILLBRAE | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| PINOLE | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| FREMONT | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| DALY CITY | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| BELMONT | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| PITTSBURG | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| HAYWARD | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| FAIRFIELD | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| EL SOBRANTE | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| PLEASANT HILL | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| MOUNTAIN VIEW | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| SAN CARLOS | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| OAKLAND | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| BERKELEY | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| SAN RAMON | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| SUNNYVALE | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| PALO ALTO | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| REDWOOD CITY | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| PLEASANTON | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| NEWARK | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| RICHMOND | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

Discussion

- Use folium library to visualize the data.
- Most restaurants locations are along the San Francisco Bay, where most populated cities are located.



Conclusion

- we've answered the question of how many Chinese restaurants already opened in each city of bay area.
- The cities alongside the San Francisco Bay are the area where most Chinese restaurants are located.
- This is only the first step of the whole process to pick the location of my friend's proposed new restaurant.
- Other factors (competitor, neighborhood future business planning, etc.) matters too.

