An Analysis of Where to Setup Shop In The Twin Cities

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Introduction

The Twin Cities in Minnesota is a major metropolitan area built around three rivers: Mississippi, Minnesota and St. Croix . The Twin Cities are known after its two largest neighboring cities in Minnesota, Minneapolis and Saint Paul, the state capital. Minneapolis-St. Paul is a vibrant community with a population of over 3,077,416 people. It is known to be a great place to raise a family. The question I raise is where to setup of shop in the Twin Cities? In particular, “Where should a business owner open an Asian Grocery Store?” This question is of interest to me because I am Asian and I like to cook different Asian cuisines. Access to Asian ingredients, spices, and fresh Asian herbs can be a challenge or very inconvenient. I would like to cook more Asian cuisines if I had better access to the ingredients that are supplied by an Asian grocery store.

So let’s look at the demographics. The Twin Cities (515.4/sq mi () is not as heavily dense as other Metropolitans areas such as Los Angeles (2,744.0/sq mi) or New York City (1,781.3/sq mi)1. Over the years more housing has expanded outwards from Minneapolis and St. Paul and is reflected the population density.

The highest percentages of immigrants came from Asia (38.2%), Latin America (25.4%), and Africa (20.1%); smaller percentages of newcomers came from Europe (13.1%), other parts of North America (3.0%), and Oceania (0.2%). There is a healthy population of Asian in Minnesota to support more Asian grocery stores. Also, see the chart below where Asians make up 7.9% of the population in the Twin Cities.

Figure 1

	Population	%
White	2,239,598	72.80%
Of Color	837,818	27.20%
Black or African American	297,581	9.70%
American Indian and Alaska Native		
Asian or Pacific Islander	241,787	7.90%
Two or more races	82,092	2.70%
Hispanic or Latino	197,089	6.40%

As an investor or entrepreneur with an interest of opening an Asian grocery store, they would want to study the areas and the population of Asians in the Twin Cities. A key indicator of where to setup shop is perhaps the population by Twin Cities zip codes. Another, indicator is to look at the clustering of they types of businesses around the existing Asian Groceries stores and learn the common neighboring venues. A good way to visualize the population density and venues is to create a map representing the population and clustering.

Data Description

The following describes the data used for the analysis:

- For the population of Asians by zip code in Minnesota, I used the data from the site 'http://zipatlas.com/us/mn/zip-code-comparison/percentage-asian-population.1.htm'. The data had to be scraped as it was contained in the HTML code.
- For mapping the Minnesota zip code boundaries, the site the contained the geojson file was https://github.com/OpenDataDE/State-zip-code-GeoJSON/blob/master/mn_minnesota_zip_codes_geo.min.json.

- In order to limit the zip codes to the ones belonging to the Twin Cities, I used a file downloaded from https://gist.github.com/Radcliffe/5ba82ed06ba92fa5e27e.
- To obtain the current Asian groceries stores I used the **Yelp** API to search for the businesses in each of the Twin Cities zip codes.
- After retrieving the Asian store data from Yelp, I used the store coordinates to search **Foursquare** for nearby businesses. These were used for clustering and examination of the zip codes.

Methodology

The code and data files used are on my GitHub repository, https://github.com/ckevi/DS_Code. The driving data was the population of Asians by zip code in Minnesota. This data was scraped from zipatlas.com and contains the following information.

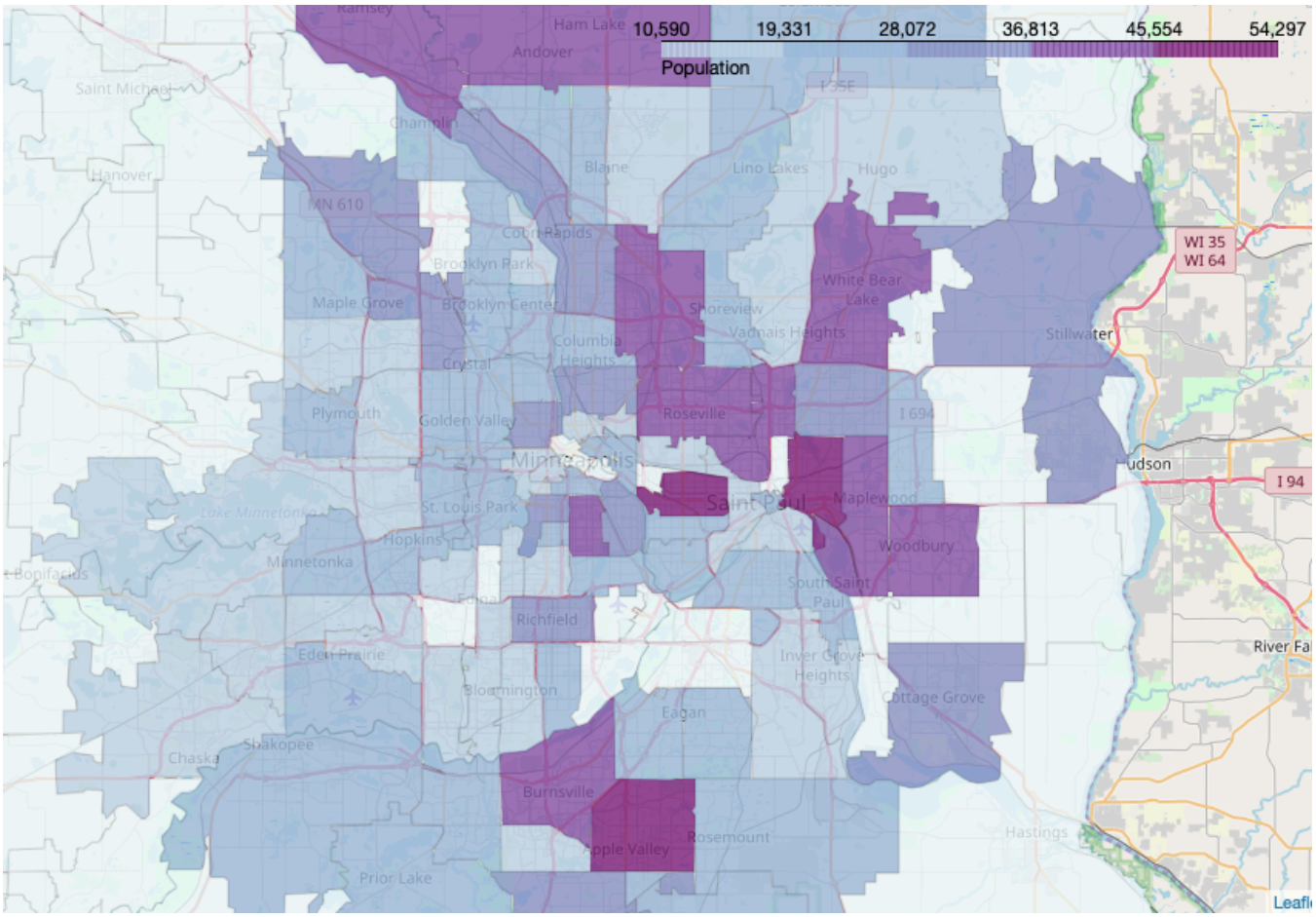
Figure 2

	Zipcodes	Population	% Asians	National Rank	Latitude	Longitude	City	State
3	55014	26384.0	1.37 %	#6,109	45.161745	-93.127980	Circle Pines	Minnesota
4	55016	30141.0	1.39 %	#6,055	44.826135	-92.926328	Cottage Grove	Minnesota
5	55024	21125.0	1.93 %	#4,788	44.628546	-93.138429	Farmington	Minnesota
6	55025	19659.0	0.59 %	#10,586	45.256176	-93.029098	Forest Lake	Minnesota
7	55038	10687.0	1.27 %	#6,455	45.165641	-92.971909	Hugo	Minnesota

The data from zipatlas.com contained data from most of the Minnesota zip codes which needed to be pared down to only the Twin Cities zip codes.

I decided to further filter the data by Population > 10,000 to narrow down the potential zip codes. A choropleth map was generated using the folium library to show the density of Asians by zip code where population is greater than 10,000.

Figure 3



I utilized the Yelp API to search for businesses in each of the 130 Twin Cities zip codes and exported to a CSV file for manual checking and filtering. There is a count of 43 Asian grocery stores currently in the Twin Cities after cleaning up duplicate results from the Yelp results. Below is a sample of the dataframe.

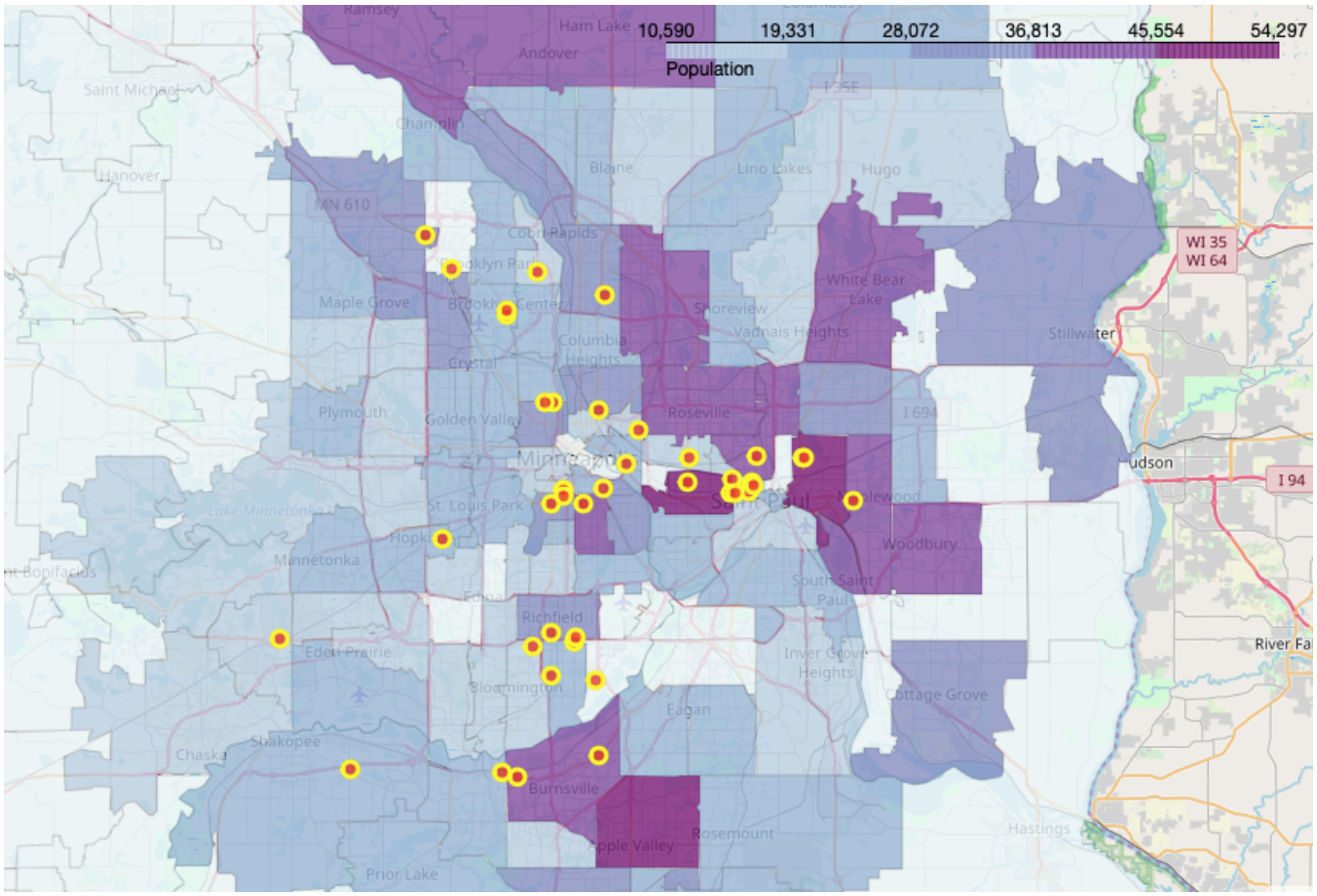
Note: I chose the Yelp API over Foursquare for searching for Asian grocery store because I found the categorization of Asian Grocery to be more correct on Yelp than Foursquare. When I search for “Asian Grocery”, not much is returned by Foursquare and other venues are returned that are not of interest for this study.

Figure 4

	Business	Zipcodes	City	Biz Latitude	Biz Longitude
0	Spice Bazaar	55016	Woodbury	44.926034	-92.966741
2	Ha Tien Super Market	55055	Saint Paul	44.950500	-93.017929
4	Hoa Mei Supermarket & Deli	55055	Saint Paul	44.977261	-93.064293
5	Golden Harvest Foods	55055	Saint Paul	44.977261	-93.062241
6	52 Market & Trading	55055	Saint Paul	44.970985	-93.065704

The following is a map of where the Asian Stores exist and in relation to the Asian population.

Figure 5



I utilized the Foursquare API to explore the business zip codes and segment them. The API call was limited to 100 results and the search radius of 700 meters for each of its given latitude and longitude. The following is a sample list of venues, category, latitude and longitude informations from Foursquare results.

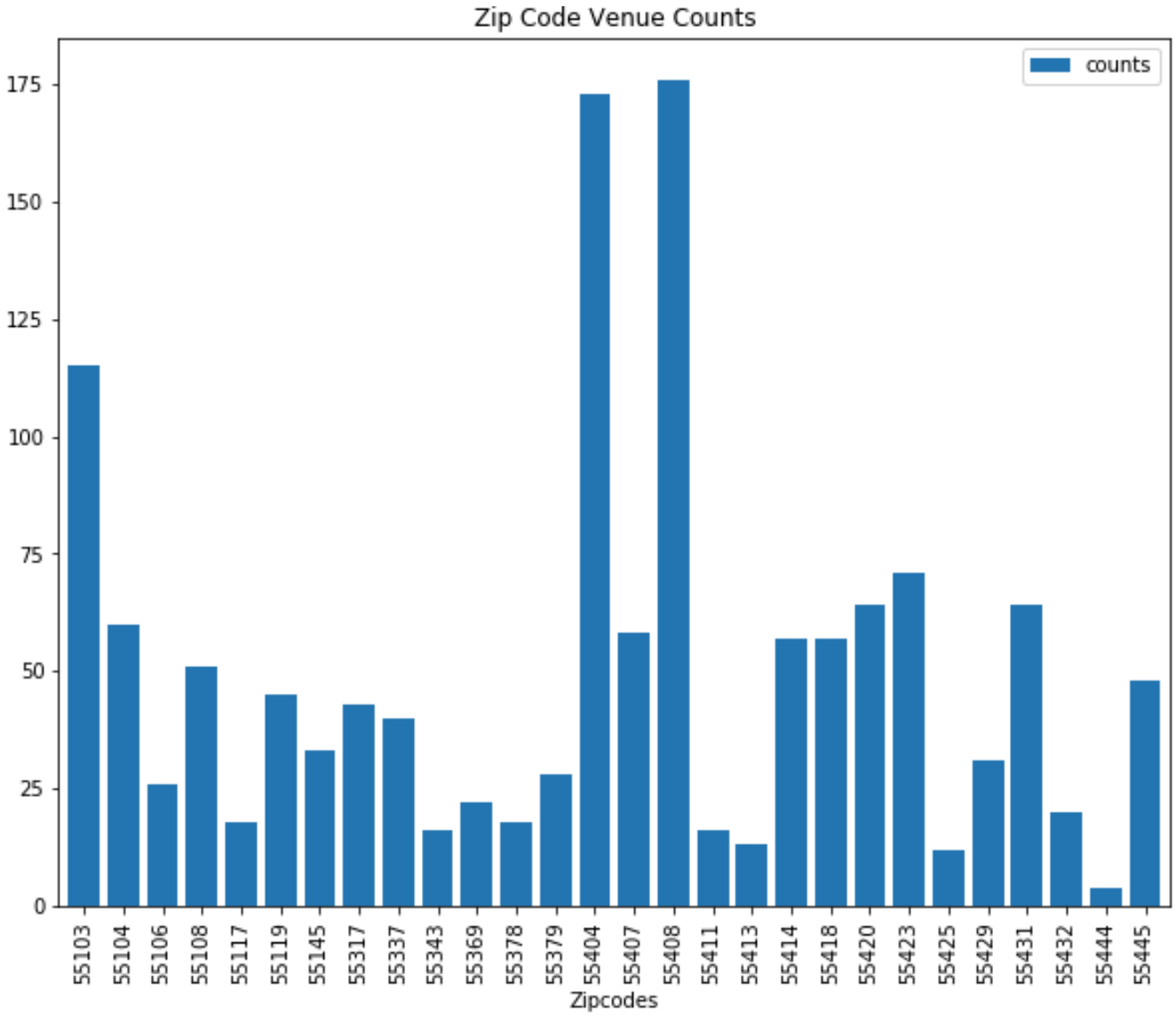
Figure 6

	Zipcodes	Zipcode Latitude	Zipcode Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	55104	44.96358	-93.12704	Dragon Star Oriental Foods	44.963309	-93.126906	Grocery Store
1	55104	44.96358	-93.12704	West Minnehaha Recreation Center	44.963286	-93.129738	Baseball Field
2	55104	44.96358	-93.12704	Warners' Stellian Appliance	44.966798	-93.124652	Electronics Store
3	55104	44.96358	-93.12704	Ryan Park	44.959788	-93.133721	Park
4	55104	44.96358	-93.12704	Willard's Liquors	44.959222	-93.131305	Dive Bar

Foursquare returned a total of 1379 Venues. For the zip codes of the current Asian grocery establishments, zip codes 55013, 55404, 55408 had a high number of venues nearby. The rest of the establishments had between 4 - 75 venues nearby. This suggests there are really dense areas where there are a lot of businesses in the

surrounding downtown areas.

Figure 7



Foursquare returned 229 unique categories. For each zip code I then created a table which shows list of top 10 venue category for each borough in below table.

Figure 8

	Zipcodes	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	55103	Thai Restaurant	Asian Restaurant	Vietnamese Restaurant	Grocery Store	Fast Food Restaurant	Video Store	Bakery	Ice Cream Shop	Park	Cosmetics Shop
1	55104	Bar	Pizza Place	Coffee Shop	Liquor Store	Fast Food Restaurant	Asian Restaurant	Korean Restaurant	Park	Dive Bar	Gymnastics Gym
2	55106	Pharmacy	Dive Bar	Grocery Store	American Restaurant	Asian Restaurant	Pizza Place	Chinese Restaurant	Video Store	Wings Joint	Basketball Court
3	55108	Snack Place	Ice Cream Shop	Italian Restaurant	Restaurant	Food	Theme Park	Music Venue	French Restaurant	Beer Garden	Art Gallery
4	55117	Pub	IT Services	Gym / Fitness Center	Deli / Bodega	Cosmetics Shop	Sandwich Place	Chinese Restaurant	Food Court	Café	Breakfast Spot

Results

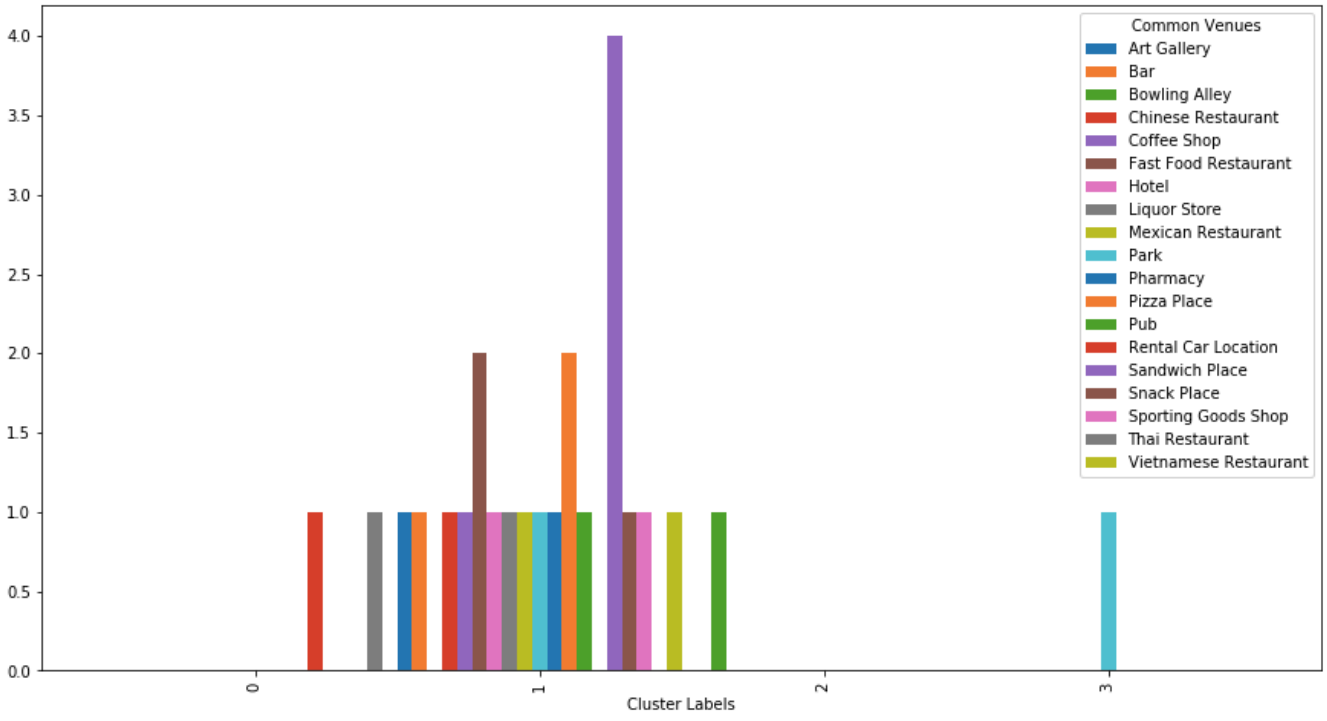
We have some common venue categories in the zip codes. The K-means algorithm to cluster the zip codes was used. Four clusters were used to group the types of venues. Here is my merged table with cluster labels for each zip code.

Figure 9

	Zipcodes	Population	% Asians	Latitude	Longitude	City	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th M Comn Ve
0	55103	14728.0	27.96 %	44.964258	-93.122627	Saint Paul	0	Thai Restaurant	Asian Restaurant	Vietnamese Restaurant	Grocery Store	Fast Food Restaurant	Video Store	Bak
1	55104	46133.0	9.97 %	44.954158	-93.159601	Saint Paul	1	Bar	Pizza Place	Coffee Shop	Liquor Store	Fast Food Restaurant	Asian Restaurant	Kor Restau
2	55106	54296.0	19.83 %	44.959966	-93.047108	Saint Paul	1	Pharmacy	Dive Bar	Grocery Store	American Restaurant	Asian Restaurant	Pizza Place	Chin Restau
3	55108	15914.0	10.31 %	44.980341	-93.174961	Saint Paul	1	Snack Place	Ice Cream Shop	Italian Restaurant	Restaurant	Food	Theme Park	Mu Ve
4	55117	39578.0	13.39 %	45.003562	-93.091280	Saint Paul	1	Pub	IT Services	Gym / Fitness Center	Deli / Bodega	Cosmetics Shop	Sandwich Place	Chin Restau
5	55119	37778.0	6.38 %	44.942599	-93.005601	Saint Paul	1	Fast Food Restaurant	Pizza Place	Sandwich Place	Chinese Restaurant	Discount Store	Liquor Store	Thi Vint S
6	55317	17114.0	3.21 %	44.858704	-93.550209	Chanhassen	1	Sandwich Place	Pizza Place	American Restaurant	Supermarket	Mexican Restaurant	Fast Food Restaurant	H
7	55337	45174.0	4.43 %	44.778472	-93.272269	Burnsville	1	Liquor Store	Sandwich Place	Grocery Store	Furniture / Home Store	Mexican Restaurant	Lingerie Store	Sports
8	55343	24475.0	4.99 %	44.914356	-93.411657	Hopkins	1	Chinese Restaurant	Park	Electronics Store	Athletics & Sports	Café	Grocery Store	G

The bar graph below shows the number of “1st Most Common Venue” in each cluster.

Figure 10



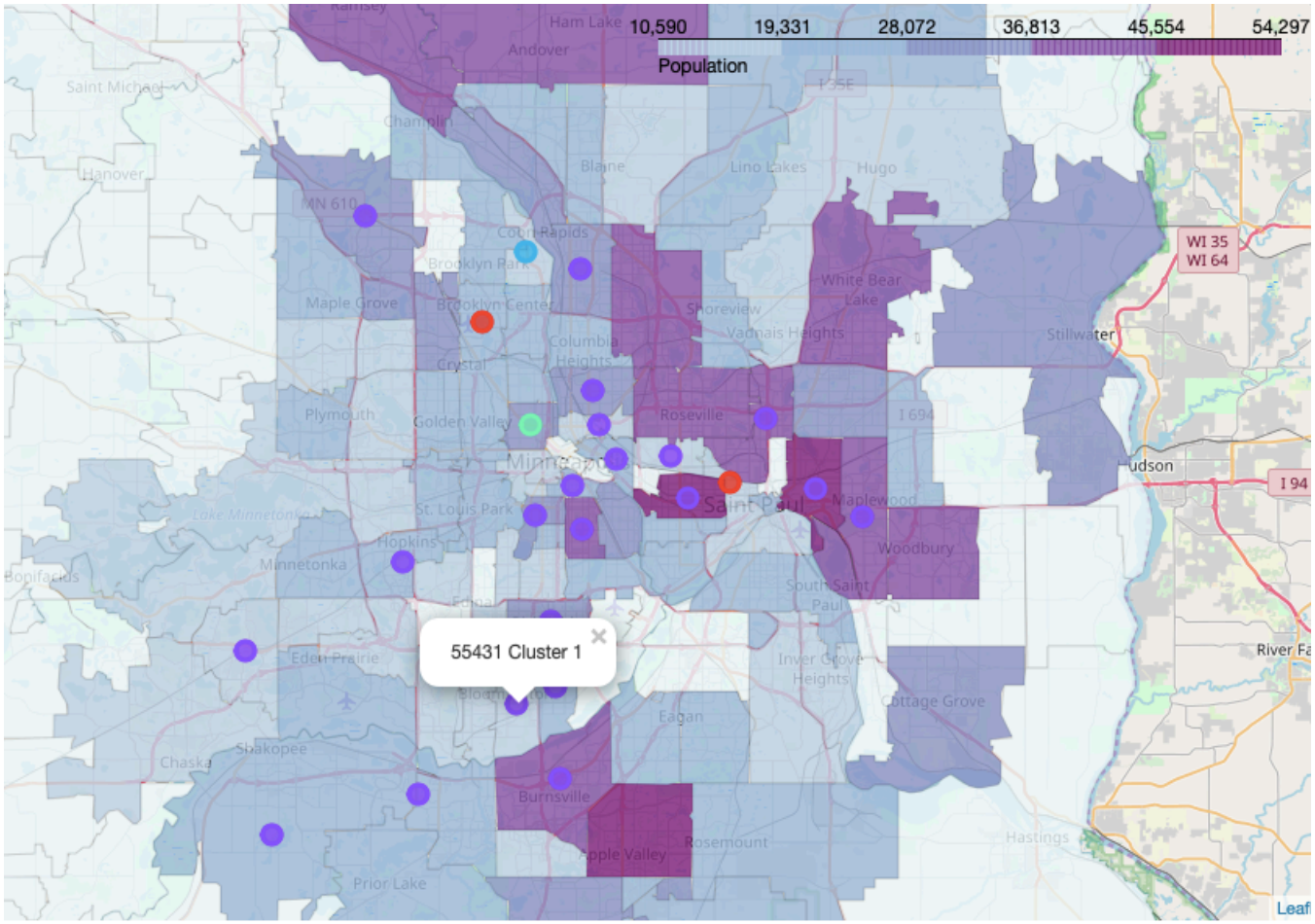
When we examine above graph we can label each cluster as follows:

- Cluster 0 : “Asian Restaurants and Misc Venues”
- Cluster 1 : “Rich in a variety of Venues: Ethnic Restaurants, Bars, Cafes, Groceries”
- Cluster 2 : “Entertainment, Non-Asian Venues”
- Cluster 3 : “Park, Asian Restaurant”

As depicted below:

- Cluster 1 (blue dots) exists in most of the zip code of the current establishments. This suggests it’s a good idea to choose a location that has a rich mix of ethnic venues, bars, and cafes.
- Cluster 0 (red dots) exists where there are Asian restaurants nearby.

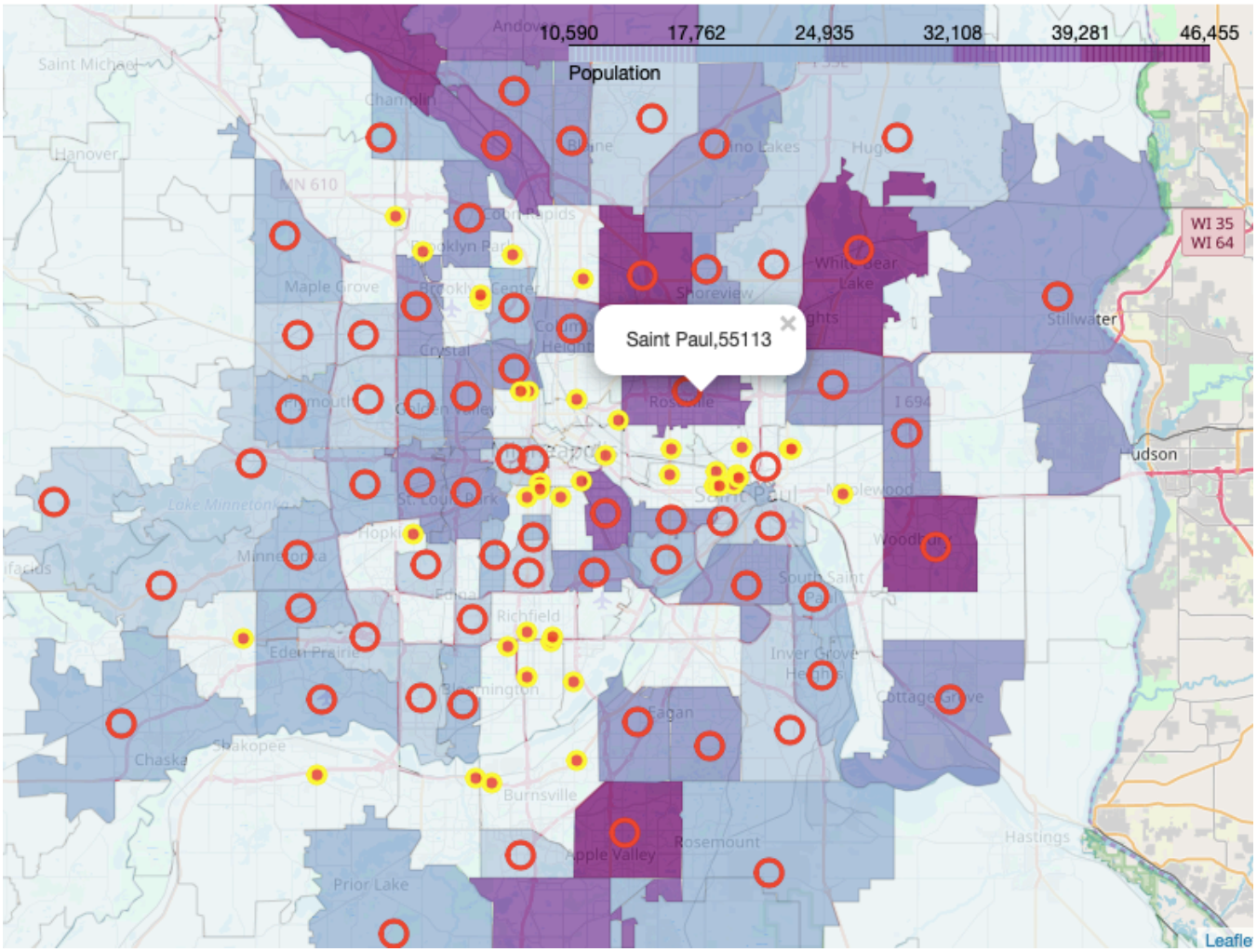
Figure 11



Discussion

From the data, we see that it is beneficial to open a new Asian grocery market where there are venues profiles as in cluster 0 and 1 as these clusters represent the current successful establishments.

Figure 12



We can use this data along with the choropleth map above to look at potential zip codes to setup shop. The map above shows the zip codes with density of Asians. The red circle and popup markers show zip codes having the Asian population > 10K. The yellow/red circles indicate the current establishments. We can choose to look at the red circles that have a high density of Asian and where there are not current establishments.

For example, we can choose to investigate a St. Paul zip code, 55113. The zip code seems to have a dense population of Asian and there is not Asian grocery establishment within the zip code. Also, the north side of the zip code borders other zip codes with a high density of Asians.

Once we have zip codes of interested we can further investigate each potential zip code by using Yelp and Foursquare to search for all the businesses can pin point a more accurate location for the new Asian grocery market.

I used the approach of existing studies such as exploring New York and Toronto venues with some modification. The Twin Cities is not as dense as those areas. And, the GEO data is not classified in boroughs. So instead, I had to use the zip codes.

Since the Twin Cities is not as dense, the data from Foursquare is not as rich. An alternative, approach could be to use geo data by city but that would mean increasing the search parameter to an average city radius. Running the K-means algorithm will likely yield different results and it would not be as granular.

Conclusion

The Twin Cites is a vibrant community that is not as heavily populated has other major metropolitans. It is a great place to start a new business especially, the type of business focused in this study. Minneapolis-St. Paul metro area has a healthy population of Asians. From the map in Figure 12, there are a good number of zip codes that could support a new Asian grocery market. As an investor or business owner, having this data gives great insight on where to setup shop for an Asian grocery market.

References:

[1] Wikipedia- https://en.wikipedia.org/wiki/Minneapolis%E2%80%93Saint_Paul
[2] Twin Cities Demographics https://www.mncompass.org/profiles/region/twin-cities
[3] Forsquare API
[4] Yelp API
[5] Figure 1 - https://www.mncompass.org/profiles/region/twin-cities
[6] http://zipatlas.com/us/mn/zip-code-comparison/percentage-asian-population.1.htm