

Asian Breakfast Shop: Neighborhood Battles in Edison, NJ

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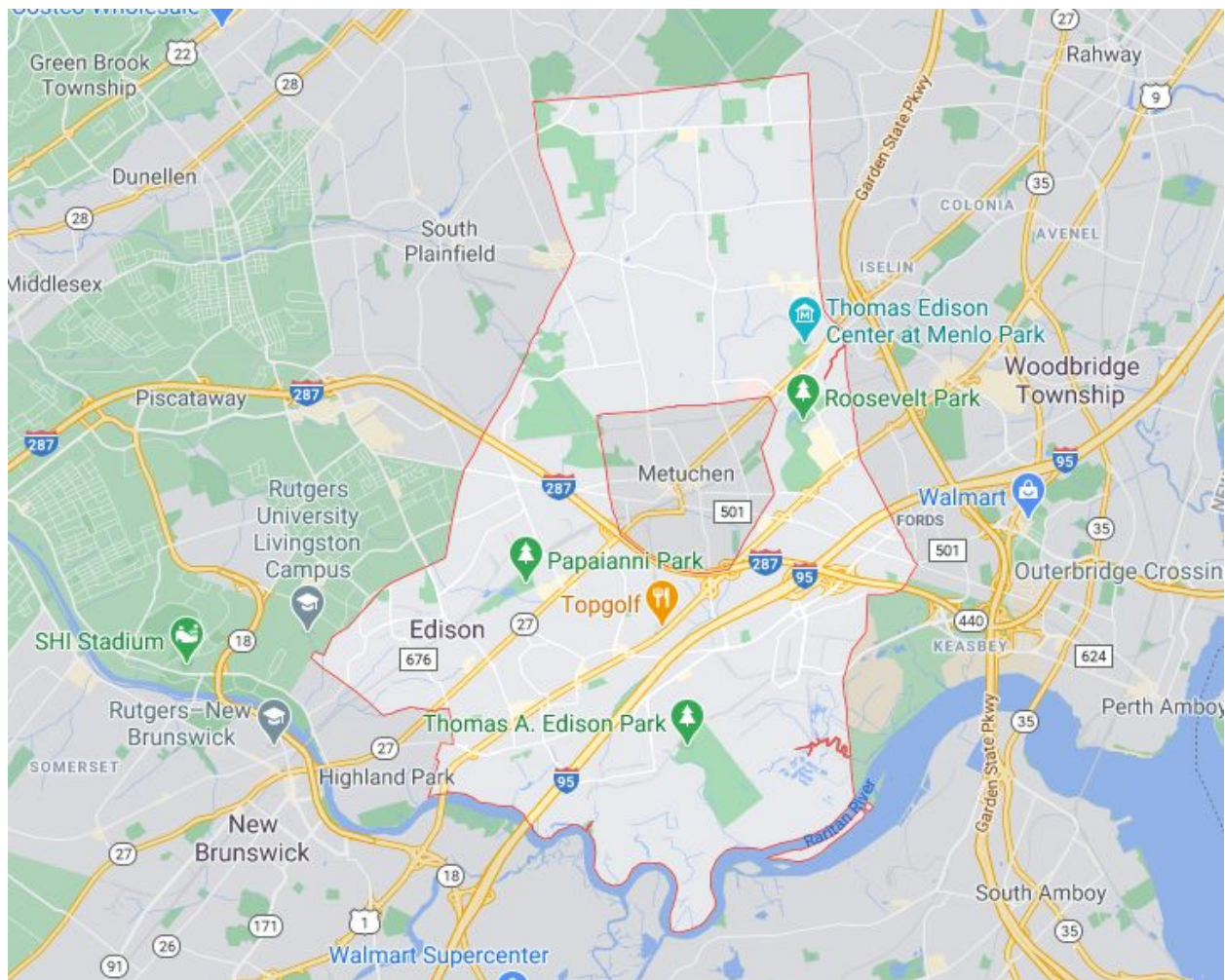


Introduction

A friend wants to start her dim sum restaurant in one of the 31 neighborhoods in Edison. She hired me as her data scientist to help her decide which neighborhood/location she should open the business.

Based on my research, Edison is the fifth-most populous municipality in New Jersey, with a population of a little more than 100K, 29.27% of Asians are residing in Edison township. It has many Asian supermarkets that Asian residents go to every week. There are at least 25 (popular) Chinese restaurants in town, only one is a dim sum place.

Edison is a huge town with a total area of 30.69 square miles (79.49 km²) and 31 sections/neighborhoods. We want to select the most popular place for the restaurant business.

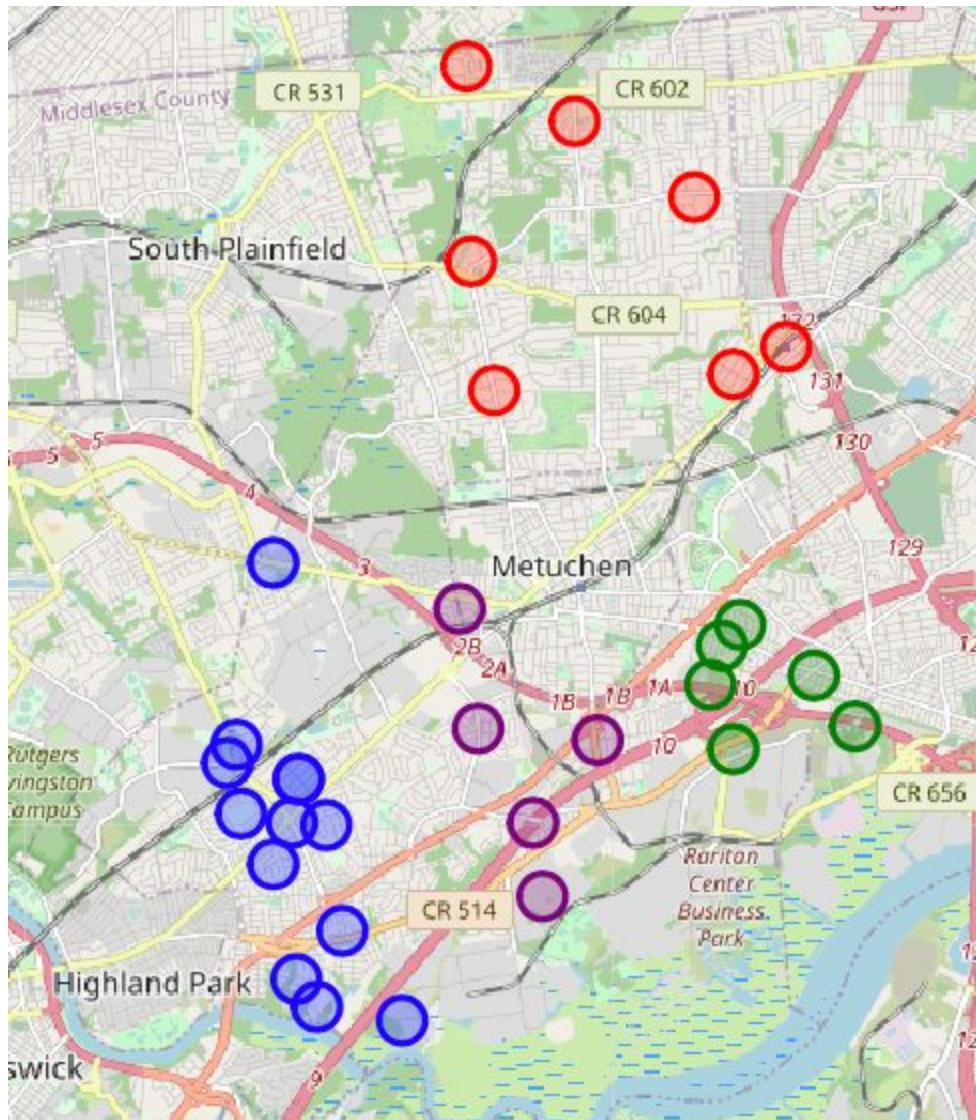


Data used in this report

Edison neighborhood data is web scraped from wiki link with neighborhood names, latitudes, and longitudes.

	Neighborhood	Notes	Latitude	Longitude
0	Bonhamtown	The neighborhood began as colonial village tha...	40.523330	-74.357780
1	Camp Kilmer site	Abutting the Livingston Campus (Rutgers Univer...	40.520830	-74.413060
2	Clara Barton	Named for Clara Barton. Located in the eastern...	40.534170	-74.339440
3	Greensand	Site of the Kin-Buc Landfill, where Edmonds Cr...	40.491670	-74.387220
4	Haven Homes	NaN	40.509440	-74.406390
5	Lahiere	Lahiere is a neighbohood in the Stelton sectio...	40.518890	-74.402500
6	Lincoln Park	For other places named Lincoln Park, New Jerse...	40.518890	-74.402500
7	Lindenau	Lindenau is a neighborhood of the Stelton secti...	40.515000	-74.411110
8	Martins Landing	Located on the northern banks of the Raritan R...	40.493060	-74.399720
9	Menlo Park	Menlo Park is where, in 1876, Thomas Edison se...	40.565000	-74.337500
10	Menlo Park Mall	Super regional shopping mall on U.S. Route 1 a...	40.538330	-74.378610
11	Metropark	Largely located in neighboring Iselin, the off...	40.568080	-74.329795
12	Middlesex County College	Sited 159 acres (64 ha) of the former Raritan ...	40.505830	-74.366110
13	New Dover	The neighborhood began as colonial village tha...	40.585000	-74.343330
14	New Durham	NaN	40.543610	-74.406110
15	Nixon	NaN	40.514170	-74.367500
16	North Edison	NaN	40.600000	-74.377500
17	Oak Tree	An area of the battlefield of the Oak Tree Eng...	40.577780	-74.376670
18	Oak Tree Road	Shopping strip runs through Edison and neighbo...	40.522964	-74.411674
19	Phoenix	Located in the eastern part of the township, P...	40.529720	-74.341110
20	Piscataway	This is the oldest neighborhood in Edison. Alo...	40.501670	-74.395830
21	Potters	In the northern part of the township Potters w...	40.593610	-74.361390
22	Pumptown	Pumptown is a residential neighborhood with a ...	40.563060	-74.373330
23	Raritan Center	Sited on part if the former Raritan Arsenal,[4...	40.522500	-74.337780
24	Raritan Manor	NaN	40.536390	-74.336670
25	Sand Hills	Sand Hills is a neighborhood straddling Edison...	40.525000	-74.319440
26	Silver Lake	A small lake of same name borders the neighbor...	40.496209	-74.402813
27	Stelton	One the oldest parts of Edison.	40.514170	-74.403610
28	Valentine	Valentine is adjacent to the Fords section of ...	40.530830	-74.325560
29	Vineyard Village	Adjacent to former Edison Assembly. Edward Ant...	40.524728	-74.375613

Using KMEANS clustering with `n_clusters = 4`, just based on each neighborhood's latitude/longitude from the above data frame, we can divide the 31 neighborhoods of Edison into 4 different regions/clusters. This is just a way to show the 31 neighborhoods in Edison.



Geo divided clusters are not enough for our business analysis purpose.

We will make calls to Four Square APIs to explore the most popular business (venues) in each neighborhood

1. Radius = 1000 m
2. Limit = 100 venues

Methodology

KMeans Clustering on Venues and Cluster Analysis

We used KMeans Clustering with n_clusters = 6, n_init = 12, algorithm = "auto". The clustering is based on the popular venues in the neighborhood.

The 31 neighborhoods are divided into 6 different regions.

Valentine	1	Hotel	Pizza Place	American Restaurant	Donut Shop	Convenience Store	Deli / Bodega	Chinese Restaurant	Bar	Miscellaneous Shop	Café
Phoenix	1	Hotel	American Restaurant	Chinese Restaurant	Pizza Place	Convenience Store	Pharmacy	Sandwich Place	Farmers Market	Hotel Pool	Miscellaneous Shop
Silver Lake	1	Pharmacy	Mexican Restaurant	Bar	Noodle House	Hookah Bar	Deli / Bodega	Donut Shop	Mobile Phone Shop	Miscellaneous Shop	Sandwich Place
Sand Hills	1	Pizza Place	Chinese Restaurant	Hotel	Donut Shop	Convenience Store	Italian Restaurant	Bar	Clothing Store	Liquor Store	Sports Bar
Raritan Manor	1	American Restaurant	Pizza Place	Pharmacy	Farmers Market	Fast Food Restaurant	Convenience Store	Fried Chicken Joint	Sandwich Place	Restaurant	Café
Raritan Center	1	Hotel	Furniture / Home Store	Hotel Pool	Deli / Bodega	Mobile Phone Shop	Coffee Shop	Clothing Store	Sandwich Place	Cafeteria	Shipping Store
Potters	1	Pizza Place	Sandwich Place	Bank	Chinese Restaurant	Ice Cream Shop	Fast Food Restaurant	Shipping Store	Construction & Landscaping	Golf Course	Cosmetics Shop
Piscataway	1	Pharmacy	Farmers Market	Video Game Store	Chinese Restaurant	Bagel Shop	Deli / Bodega	Massage Studio	Optical Shop	Rental Car Location	Pub
Bonhamtown	1	Furniture / Home Store	Park	Pizza Place	Sandwich Place	Hotel	Gym / Fitness Center	Pet Store	Salon / Barbershop	Chinese Restaurant	Rental Car Location
North Edison	1	Gymnastics Gym	Gym / Fitness Center	Pizza Place	Intersection	Italian Restaurant	Restaurant	Bagel Shop	Food & Drink Shop	Food	Fast Food Restaurant
Vineyard Village	1	Home Service	Warehouse Store	Vietnamese Restaurant	Video Store	Pizza Place	Korean Restaurant	Cosmetics Shop	Convenience Store	Shipping Store	Sandwich Place
New Durham	1	Pharmacy	Lawyer	Other Repair Shop	Pizza Place	Distribution Center	Convenience Store	Donut Shop	Clothing Store	Sandwich Place	Chinese Restaurant
Middlesex County College	1	Pizza Place	Park	Deli / Bodega	Brewery	Food & Drink Shop	Chinese Restaurant	Sandwich Place	Bakery	Convenience Store	Ice Cream Shop
Menlo Park Mall	1	Train	Auto Workshop	Burger Joint	Convenience Store	Shopping Plaza	Soccer Field	Big Box Store	Basketball Court	Intersection	Bar
Clara Barton	1	Deli / Bodega	Pharmacy	Pizza Place	Convenience Store	Farmers Market	American Restaurant	Grocery Store	Mobile Phone Shop	Café	Chinese Restaurant
Oak Tree	1	Pharmacy	Bank	Breakfast Spot	Indian Restaurant	Donut Shop	Deli / Bodega	Cosmetics Shop	Convenience Store	Salon / Barbershop	Optical Shop
Nixon	1	Chinese Restaurant	Sandwich Place	Convenience Store	Korean Restaurant	Pizza Place	Bubble Tea Shop	Warehouse Store	Donut Shop	Shoe Store	Burger Joint
Pumpstown	2	Pizza Place	Steakhouse	Golf Course	Bakery	Falafel Restaurant	Frozen Yogurt Shop	Fried Chicken Joint	Food & Drink Shop	Food	Fast Food Restaurant
Metropark	3	Indian Restaurant	Train	Pizza Place	Grocery Store	Jewelry Store	History Museum	Café	Chinese Restaurant	Asian Restaurant	Convenience Store
Menlo Park	3	Indian Restaurant	Pizza Place	Grocery Store	History Museum	Fast Food Restaurant	Train	Market	Gas Station	Donut Shop	State / Provincial Park
New Dover	4	Yoga Studio	Coffee Shop	Park	Art Gallery	Hobby Shop	Mobile Phone Shop	Fried Chicken Joint	Food & Drink Shop	Food	Fast Food Restaurant
Martins Landing	5	Mexican Restaurant	Pharmacy	Deli / Bodega	Sandwich Place	Event Space	Fried Chicken Joint	Food & Drink Shop	Food	Fast Food Restaurant	Farmers Market

Each cluster has different top popular venues

- Cluster 1: American Restaurant; Italian Restaurant; Bar, Deli
- Cluster 2: Pizza;
- Cluster 3: Indian Restaurant
- Cluster 4: Park

We will focus on cluster 0---

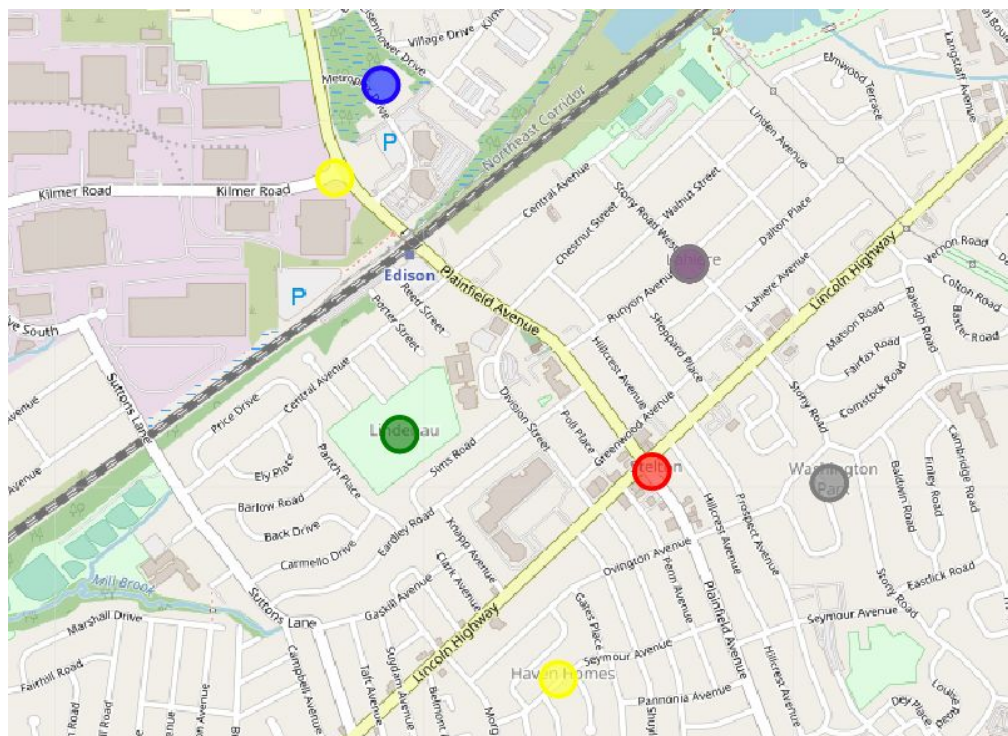
Neighborhood	Venue Label	1st Most Popular Venue	2nd Most Popular Venue	3rd Most Popular Venue	4th Most Popular Venue	5th Most Popular Venue	6th Most Popular Venue	7th Most Popular Venue	8th Most Popular Venue	9th Most Popular Venue	10th Most Popular Venue
Washington Park	0	Chinese Restaurant	Bakery	Korean Restaurant	Dessert Shop	Asian Restaurant	Bubble Tea Shop	Pharmacy	Farmers Market	Fast Food Restaurant	Sandwich Place
Lindenau	0	Chinese Restaurant	Spa	Dessert Shop	Bakery	Indian Restaurant	Bubble Tea Shop	Construction & Landscaping	Korean Restaurant	Asian Restaurant	Bank
Lincoln Park	0	Chinese Restaurant	Korean Restaurant	Asian Restaurant	Dessert Shop	Bakery	Bank	Fast Food Restaurant	Malay Restaurant	Lawyer	Bubble Tea Shop
Lahiere	0	Chinese Restaurant	Korean Restaurant	Asian Restaurant	Dessert Shop	Bakery	Bank	Fast Food Restaurant	Malay Restaurant	Lawyer	Bubble Tea Shop
Stelton	0	Bakery	Dessert Shop	Chinese Restaurant	Korean Restaurant	Indian Restaurant	Sandwich Place	Spa	Fast Food Restaurant	Bank	Supermarket
Greensand	0	Business Service	Lake	Auto Garage	Rental Service	Fast Food Restaurant	Yoga Studio	Farmers Market	Frozen Yogurt Shop	Fried Chicken Joint	Food & Drink Shop
Camp Kilmer site	0	Spa	Korean Restaurant	Bakery	Hotpot Restaurant	Indian Restaurant	Dentist's Office	Deli / Bodega	BBQ Joint	Playground	Chinese Restaurant
Haven Homes	0	Chinese Restaurant	Korean Restaurant	Bakery	Dessert Shop	Bubble Tea Shop	Wings Joint	Spa	Pharmacy	Hookah Bar	Supermarket
Oak Tree Road	0	Business Service	Dentist's Office	Playground	Indian Restaurant	Deli / Bodega	Convenience Store	Spa	Lawyer	Yoga Studio	Farmers Market

- Cluster 0 include 9 different neighborhoods: Washington Park, Lindenau, Lincoln Park, Lahiere, Stelton, Greensand, Camp Kilmer site, Haven Homes, Oak Tree Road
- Top Venues:
 - Chinese Restaurant, Korean Restaurant, Asian Restaurant
 - Bakery, Bubble Tea, Dessert shop
 - Deli/ Bodega

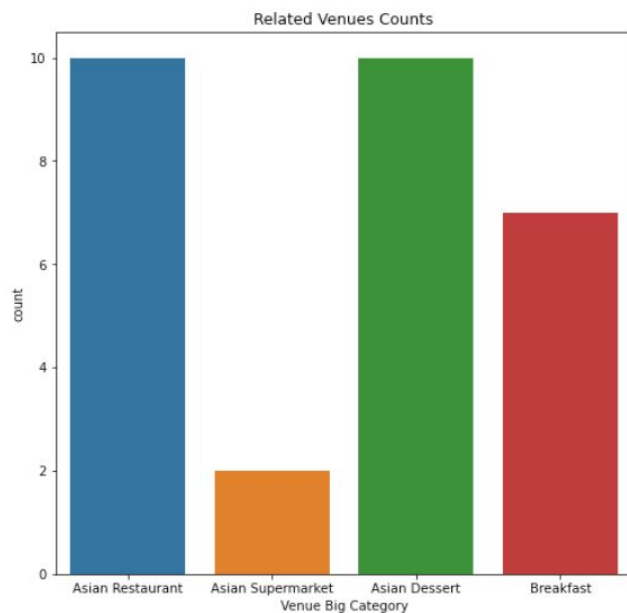
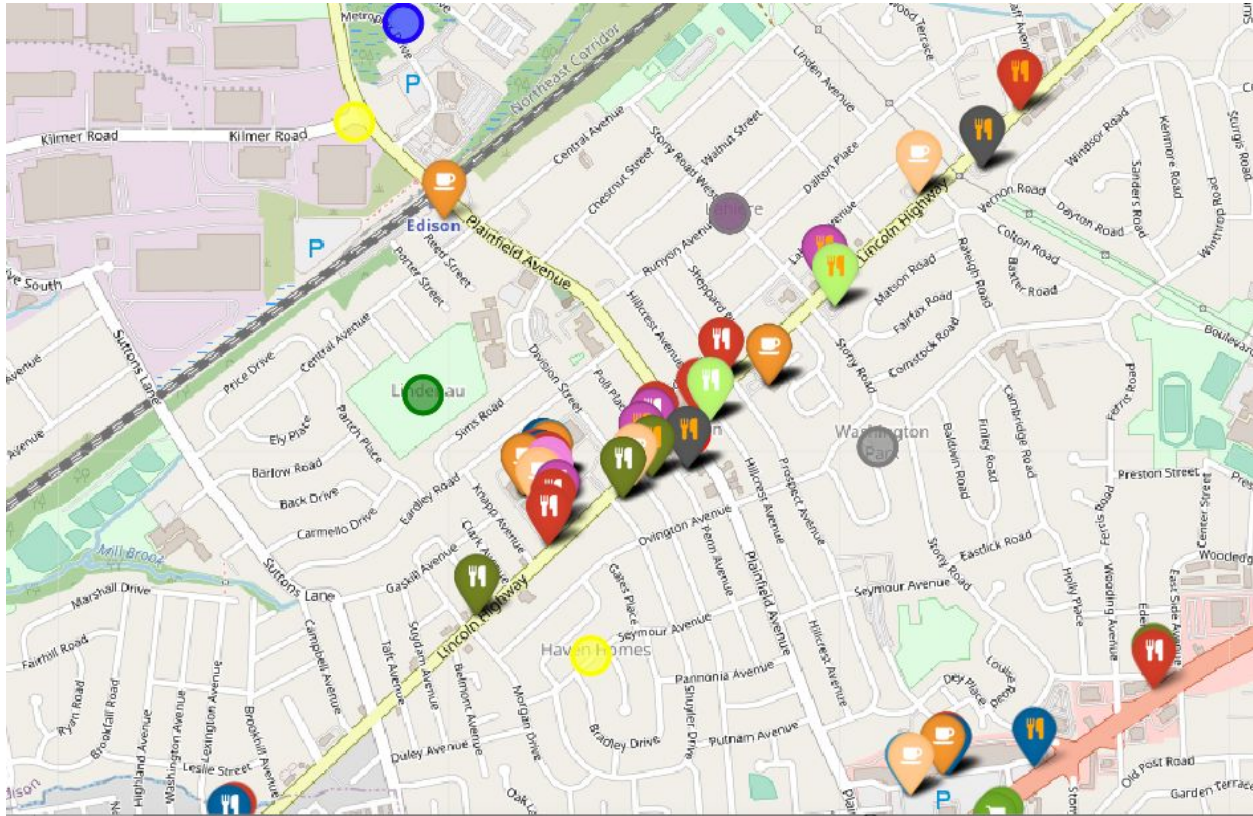
Further Analysis on Cluster 0: "Edison Chinatown" and Results

Using KMeans clustering again.

- n_clusters = 6
- n_init = 12

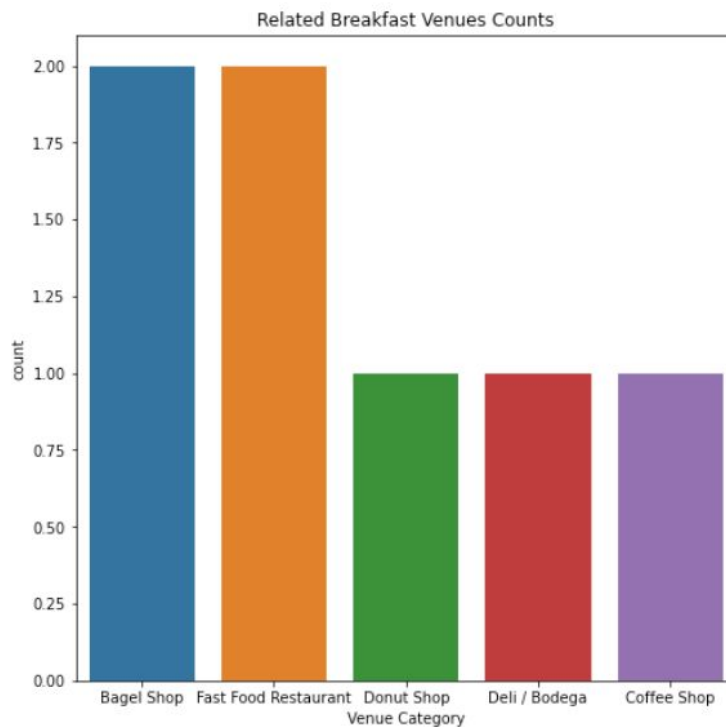


Now Stelton neighborhood (red circle marker in the map) is singled out as the center of “Edison Chinatown”.



In Stelton Neighborhood, there are

- Aisan Supermarket: 2
- Asian Restaurants: 10
- Asian Dessert: 10
- Breakfast Places: 7 (Are they Asian breakfast type?)



We further examin the breakfast related venues in Stelton, we found none of the seven breakfast related venues are Asian style.

Conclusion and Suggestions

We performed detailed analysis in 31 Neighborhoods in Edison.

We pinned our final neighborhood in Stelton, Edison.

The reason is Asian food related venues are thriving in this area.

They have Asian supermarkets, Asian restaurants and Asian dessert shops. But Asian stylpe breakfast shops are missing in this neighborhood,

We suggested to the client that she should open her dim sum in the H-Mart Mall in Stelton.

