

Capstone Project - The Battle of
Neighbourhoods

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Selecting the best location to open an SUSHI BAR IN
Manhattan, New York

Introduction/Business Problem

The City of New York is famous for its excellent cuisine. It's food culture includes an array of international cuisines influenced by the city's immigrant history.

Sushi restaurants have become so popular in the United States now it seems that there is one on every corner, not only in major cities but also in smaller cities. Starting a sushi restaurant can be a great business opportunity, but you need to distinguish yourself from others to enjoy long-term success.

Business Problem

My client desires to open his business in the Manhattan area, thus I concentrate on that borough throughout my analysis. we tend to outline potential neighborhoods supported by the number of dish bars that are operative right in every neighborhood. Manhattan has full potential but is also an awfully difficult district to open a business thanks to high competition. The new bar ought to be open in a part that inadequate neighborhood during this means the bar will attract additional customers. Therefore, this analysis necessary to make sure that we've got enough customers which we tend to don't seem to be so on the brink of alternative dish places.

Data Selection

To identify the characteristics of our competitors' venues in Manhattan, we would first need to find out the number of sushi bars in Manhattan currently and their location.

We then used Google Map API to find their geographic coordinates based on their postal code addresses.

https://geo.nyu.edu/catalog/nyu_2451_34572

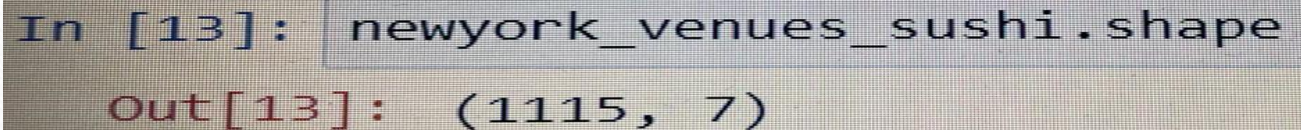
for venues from foursquare

<https://api.foursquare.com>

and for sushi category

<https://developer.foursquare.com/docs/resources/categories>

In Manhattan, there is 1115 sushi bars are currently operating.



```
In [13]: newyork_venues_sushi.shape
Out[13]: (1115, 7)
```


Data Selection

Next, we also used Google Map API to find their geographic coordinates of the 5 locations shortlisted for our sushi bar:

t[12]:

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Marble Hill	40.876551	-73.910660	Planet Tokyo	40.886233	-73.909479	Sushi Restaurant
1	Chinatown	40.715618	-73.994279	Nakaji	40.715912	-73.996597	Sushi Restaurant
2	Chinatown	40.715618	-73.994279	Shinsen	40.715608	-73.996611	Japanese Restaurant
3	Chinatown	40.715618	-73.994279	Quan Sushi	40.720323	-73.996257	Sushi Restaurant
4	Chinatown	40.715618	-73.994279	Bondi Bar	40.721247	-73.996264	Sushi Restaurant

Methodology

Addresses are transformed into their equivalent latitude and longitude values.

Foursquare API is used to explore neighborhoods in Manhattan, New York.

After that, explore function to get sushi restaurant categories in each neighborhood.

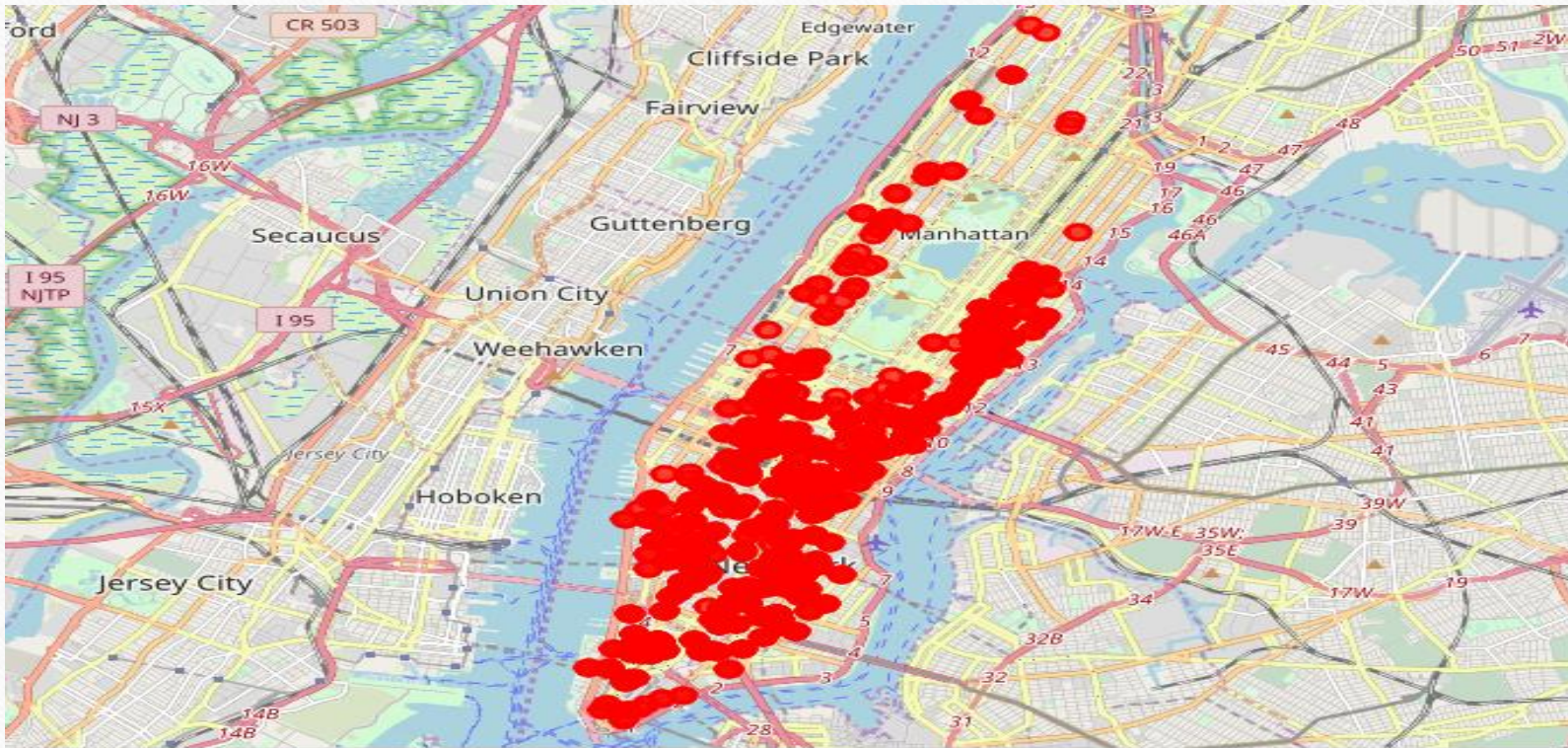
Methodology

[18]:

	Neighborhood	Asian Restaurant	Bakery	Chinese Restaurant	Cocktail Bar	Deli / Bodega	Fish Market	Grocery Store	Hawaiian Restaurant	Indian Chinese Restaurant	Japanese Restaurant	Noodle House	Ramen Restaurant	Restaurant	Sake Bar	Sandwich Place	Seafood Restaurant	Smoothie Shop	Steakhouse	Rest
0	Marble Hill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	Chinatown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	Chinatown	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
3	Chinatown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	Chinatown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

```
9]: manhattan_grouped = manhattan_onehot.groupby('Neighborhood').mean().reset_index()
```


Methodology



Sushi bars in Manhattan

Methodology

Then using this feature to group the neighborhoods into clusters K-means clustering algorithm will be use to complete this task. And also, the Folium library to visualize the neighborhoods in Manhattan and its emerging clusters.

Out[21]:

	Neighborhood	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	Battery Park City	Sushi Restaurant	Japanese Restaurant	Noodle House	Indian Chinese Restaurant	Bakery	Chinese Restaurant	Cocktail Bar	Deli / Bodega	Fish Market	Grocery Store
1	Carnegie Hill	Sushi Restaurant	Japanese Restaurant	Indian Chinese Restaurant	Vegetarian / Vegan Restaurant	Asian Restaurant	Seafood Restaurant	Sandwich Place	Sake Bar	Restaurant	Ramen Restaurant
2	Central Harlem	Sushi Restaurant	Vegetarian / Vegan Restaurant	Bakery	Chinese Restaurant	Cocktail Bar	Deli / Bodega	Fish Market	Grocery Store	Hawaiian Restaurant	Indian Chinese Restaurant
3	Chelsea	Sushi Restaurant	Japanese Restaurant	Asian Restaurant	Vegetarian / Vegan Restaurant	Fish Market	Hawaiian Restaurant	Bakery	Chinese Restaurant	Cocktail Bar	Deli / Bodega
4	Chinatown	Sushi Restaurant	Japanese Restaurant	Bakery	Chinese Restaurant	Cocktail Bar	Deli / Bodega	Fish Market	Grocery Store	Hawaiian Restaurant	Indian Chinese Restaurant

Results

Using K-mean to clustering data area with less number of sushi bars

Cluster 0

Out[23]:

	Borough	Neighborhood	Latitude	Longitude	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 Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	Manhattan	Marble Hill	40.876551	-73.910660	1	Sushi Restaurant	Vegetarian / Vegan Restaurant	Bakery	Chinese Restaurant	Cocktail Bar	Deli / Bodega	Fish Market	Grocery Store	Hawaiian Restaurant	Indian Chinese Restaurant
1	Manhattan	Chinatown	40.715618	-73.994279	3	Sushi Restaurant	Japanese Restaurant	Bakery	Chinese Restaurant	Cocktail Bar	Deli / Bodega	Fish Market	Grocery Store	Hawaiian Restaurant	Indian Chinese Restaurant
2	Manhattan	Washington Heights	40.851903	-73.936900	1	Sushi Restaurant	Vegetarian / Vegan Restaurant	Bakery	Chinese Restaurant	Cocktail Bar	Deli / Bodega	Fish Market	Grocery Store	Hawaiian Restaurant	Indian Chinese Restaurant
3	Manhattan	Inwood	40.867684	-73.921210	1	Sushi Restaurant	Vegetarian / Vegan Restaurant	Bakery	Chinese Restaurant	Cocktail Bar	Deli / Bodega	Fish Market	Grocery Store	Hawaiian Restaurant	Indian Chinese Restaurant
4	Manhattan	Hamilton Heights	40.823604	-73.949688	1	Sushi Restaurant	Vegetarian / Vegan Restaurant	Bakery	Chinese Restaurant	Cocktail Bar	Deli / Bodega	Fish Market	Grocery Store	Hawaiian Restaurant	Indian Chinese Restaurant

Result

Cluster 1

```
In [27]: manhattan_merged.loc[manhattan_merged['Cluster Labels'] == 1, manhattan_merged.columns[[1] + list(range(5, manhattan_merged.shape[1]))]]
```

Out[27]:

	Neighborhood	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	Marble Hill	Sushi Restaurant	Vegetarian / Vegan Restaurant	Bakery	Chinese Restaurant	Cocktail Bar	Deli / Bodega	Fish Market	Grocery Store	Hawaiian Restaurant	Indian Chinese Restaurant
2	Washington Heights	Sushi Restaurant	Vegetarian / Vegan Restaurant	Bakery	Chinese Restaurant	Cocktail Bar	Deli / Bodega	Fish Market	Grocery Store	Hawaiian Restaurant	Indian Chinese Restaurant
3	Inwood	Sushi Restaurant	Vegetarian / Vegan Restaurant	Bakery	Chinese Restaurant	Cocktail Bar	Deli / Bodega	Fish Market	Grocery Store	Hawaiian Restaurant	Indian Chinese Restaurant
4	Hamilton Heights	Sushi Restaurant	Vegetarian / Vegan Restaurant	Bakery	Chinese Restaurant	Cocktail Bar	Deli / Bodega	Fish Market	Grocery Store	Hawaiian Restaurant	Indian Chinese Restaurant
5	Manhattanville	Sushi Restaurant	Vegetarian / Vegan Restaurant	Bakery	Chinese Restaurant	Cocktail Bar	Deli / Bodega	Fish Market	Grocery Store	Hawaiian Restaurant	Indian Chinese Restaurant
6	Central Harlem	Sushi Restaurant	Vegetarian / Vegan Restaurant	Bakery	Chinese Restaurant	Cocktail Bar	Deli / Bodega	Fish Market	Grocery Store	Hawaiian Restaurant	Indian Chinese Restaurant
7	East Harlem	Sushi Restaurant	Vegetarian / Vegan Restaurant	Bakery	Chinese Restaurant	Cocktail Bar	Deli / Bodega	Fish Market	Grocery Store	Hawaiian Restaurant	Indian Chinese Restaurant
18	Greenwich Village	Sushi Restaurant	Japanese Restaurant	Sake Bar	Indian Chinese Restaurant	Bakery	Chinese Restaurant	Cocktail Bar	Deli / Bodega	Fish Market	Grocery Store
21	Tribeca	Sushi Restaurant	Noodle House	Vegetarian / Vegan Restaurant	Indian Chinese Restaurant	Bakery	Chinese Restaurant	Cocktail Bar	Deli / Bodega	Fish Market	Grocery Store

Result

Cluster 2

```
In [28]: manhattan_merged.loc[manhattan_merged['Cluster Labels'] == 2, manhattan_merged.columns[[1] + list(range(5, manhattan_merged.shape[1]))]]
```

Out[28]:

	Neighborhood	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
8	Upper East Side	Sushi Restaurant	Japanese Restaurant	Asian Restaurant	Vegetarian / Vegan Restaurant	Fish Market	Hawaiian Restaurant	Bakery	Chinese Restaurant	Cocktail Bar	Deli / Bodega
9	Yorkville	Sushi Restaurant	Japanese Restaurant	Fish Market	Indian Chinese Restaurant	Vegetarian / Vegan Restaurant	Asian Restaurant	Sandwich Place	Sake Bar	Restaurant	Ramen Restaurant
10	Lenox Hill	Sushi Restaurant	Asian Restaurant	Japanese Restaurant	Vegetarian / Vegan Restaurant	Fish Market	Hawaiian Restaurant	Bakery	Chinese Restaurant	Cocktail Bar	Deli / Bodega
15	Midtown	Sushi Restaurant	Asian Restaurant	Seafood Restaurant	Japanese Restaurant	Sandwich Place	Restaurant	Ramen Restaurant	Bakery	Vegetarian / Vegan Restaurant	Smoothie Shop
17	Chelsea	Sushi Restaurant	Japanese Restaurant	Asian Restaurant	Vegetarian / Vegan Restaurant	Fish Market	Hawaiian Restaurant	Bakery	Chinese Restaurant	Cocktail Bar	Deli / Bodega
30	Carnegie Hill	Sushi Restaurant	Japanese Restaurant	Indian Chinese Restaurant	Vegetarian / Vegan Restaurant	Asian Restaurant	Seafood Restaurant	Sandwich Place	Sake Bar	Restaurant	Ramen Restaurant
34	Sutton Place	Sushi Restaurant	Japanese Restaurant	Asian Restaurant	Deli / Bodega	Steakhouse	Seafood Restaurant	Smoothie Shop	Grocery Store	Bakery	Chinese Restaurant

Result

Cluster 3

```
In [29]: manhattan_merged.loc[manhattan_merged['Cluster Labels'] == 3, manhattan_merged.columns[[1] + list(range(5, manhattan_merged.shape[1]))]]
```

Out[29]:

	Neighborhood	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
1	Chinatown	Sushi Restaurant	Japanese Restaurant	Bakery	Chinese Restaurant	Cocktail Bar	Deli / Bodega	Fish Market	Grocery Store	Hawaiian Restaurant	Indian Chinese Restaurant
13	Lincoln Square	Sushi Restaurant	Japanese Restaurant	Smoothie Shop	Chinese Restaurant	Grocery Store	Indian Chinese Restaurant	Bakery	Cocktail Bar	Deli / Bodega	Fish Market
14	Clinton	Sushi Restaurant	Japanese Restaurant	Chinese Restaurant	Cocktail Bar	Asian Restaurant	Seafood Restaurant	Sandwich Place	Sake Bar	Restaurant	Ramen Restaurant
16	Murray Hill	Sushi Restaurant	Japanese Restaurant	Asian Restaurant	Vegetarian / Vegan Restaurant	Bakery	Restaurant	Ramen Restaurant	Grocery Store	Chinese Restaurant	Cocktail Bar
20	Lower East Side	Sushi Restaurant	Japanese Restaurant	Bakery	Chinese Restaurant	Cocktail Bar	Deli / Bodega	Fish Market	Grocery Store	Hawaiian Restaurant	Indian Chinese Restaurant
24	West Village	Sushi Restaurant	Japanese Restaurant	Sake Bar	Fish Market	Vegetarian / Vegan Restaurant	Asian Restaurant	Sandwich Place	Seafood Restaurant	Restaurant	Ramen Restaurant
25	Manhattan Valley	Sushi Restaurant	Japanese Restaurant	Hawaiian Restaurant	Bakery	Chinese Restaurant	Cocktail Bar	Deli / Bodega	Fish Market	Grocery Store	Indian Chinese Restaurant
26	Morningside Heights	Sushi Restaurant	Japanese Restaurant	Hawaiian Restaurant	Bakery	Chinese Restaurant	Cocktail Bar	Deli / Bodega	Fish Market	Grocery Store	Indian Chinese Restaurant
27	Gramercy	Sushi Restaurant	Japanese Restaurant	Deli / Bodega	Vegetarian / Vegan Restaurant	Seafood Restaurant	Sandwich Place	Sake Bar	Restaurant	Ramen Restaurant	Noodle House
28	Battery Park City	Sushi Restaurant	Japanese Restaurant	Noodle House	Indian Chinese Restaurant	Bakery	Chinese Restaurant	Cocktail Bar	Deli / Bodega	Fish Market	Grocery Store
29	Financial District	Sushi Restaurant	Japanese Restaurant	Bakery	Chinese Restaurant	Cocktail Bar	Deli / Bodega	Fish Market	Grocery Store	Hawaiian Restaurant	Indian Chinese Restaurant
33	Midtown South	Sushi Restaurant	Japanese Restaurant	Asian Restaurant	Vegetarian / Vegan Restaurant	Bakery	Restaurant	Ramen Restaurant	Grocery Store	Chinese Restaurant	Cocktail Bar
38	Flatiron	Sushi Restaurant	Japanese Restaurant	Deli / Bodega	Vegetarian / Vegan Restaurant	Asian Restaurant	Seafood Restaurant	Sandwich Place	Sake Bar	Restaurant	Ramen Restaurant

Result

Cluster 4

```
In [30]: manhattan_merged.loc[manhattan_merged['Cluster Labels'] == 4, manhattan_merged.columns[[1] + list(range(5, manhattan_merged.shape[1]))]]
```

```
Out[30]:
```

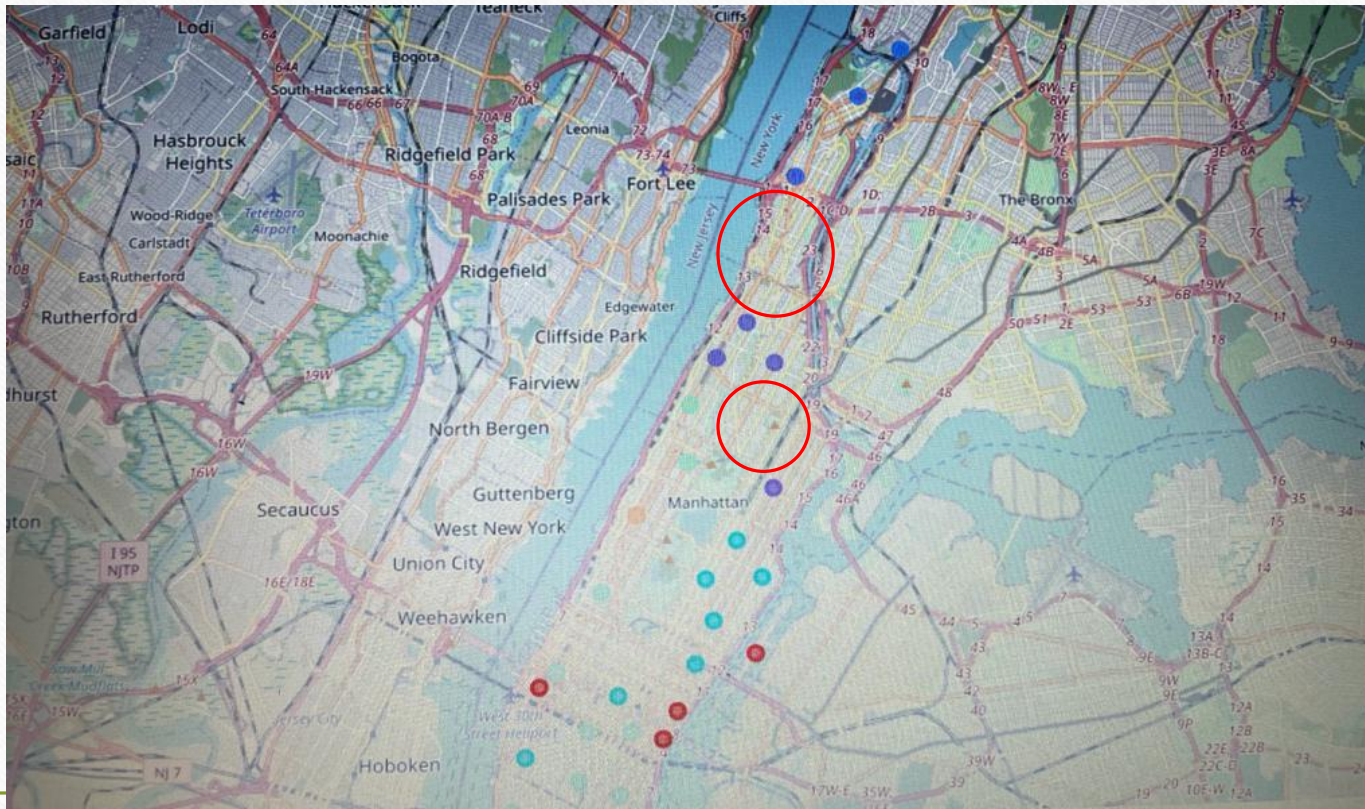
	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
12	Upper West Side	Sushi Restaurant	Japanese Restaurant	Grocery Store	Asian Restaurant	Seafood Restaurant	Sandwich Place	Sake Bar	Restaurant	Ramen Restaurant	Noodle House

```
In [ ]:
```


Result



Result



Based on dataframe analysis
this areas are the best places to
open a new sushi bar business.

Discussion

This analysis is performed on limited data. This may be right or may be wrong. But if good amount of data is available there is scope to come up with better results.

There is high competition in south and mid of town so it is very risky to open business in these areas.

It can be done more detailed analysis by adding other factors such as transportation, demographics of inhabitants.

Conclusion

although all of the goals of this project were met there is positively space for any improvement and development as noted below. However, the goals of the project were met and, with some a lot of work, could simply be developed into a totally pledged application that would support the gap a business the idea in associate degree unknown location.