Introduction

1. Background

Samsen Pte. Ltd. is a well known Malay and Indian restaurant in Kuala Lumpur, Malaysia. The restaurant chain decided to expand its business in Singapore.
Food industry in Singapore is a lucrative business. One in four eats out in Singapore.
Singapore is similar to Kuala Lumpur in many ways in terms of census.
The problem is to find optimal location in Singapore to open the restaurant.
Singapore is well connected city with good mix of all ethnicity - Indonesian, Malaysian, Indian, Chinese.
This project can also be used for relocation from Kuala Lumpur to Singapore

Target Audience includes the international business owners who want to open new branch in Singapore or individuals who wants to relocate to Singapore.

2. Problem Description

Finding a Neighborhood in Singapore which is similar to the location of Samsen Pte. Ltd. in Kuala Lumpur which is nearer to MRT.

3. Data Requirements

1. List of MRTs in Singapore : Web scraping wiki page https://en.wikipedia.org/wiki/List_of_Singapore_MRT_stations_by_planning_area

2. Geo Coordinates of MRT location

3. Location intelligence from Foursquare API : 1) Most Recommended venues in the neighbourhood of Kuala Lumpur where Samsen restaurant is located.
2) most recommended Venues in all neighbourhoods of Singapore within 1km of MRT
3) Planning area with highest rated asian restaurants.
4) Planning area with high Malay and Indian population

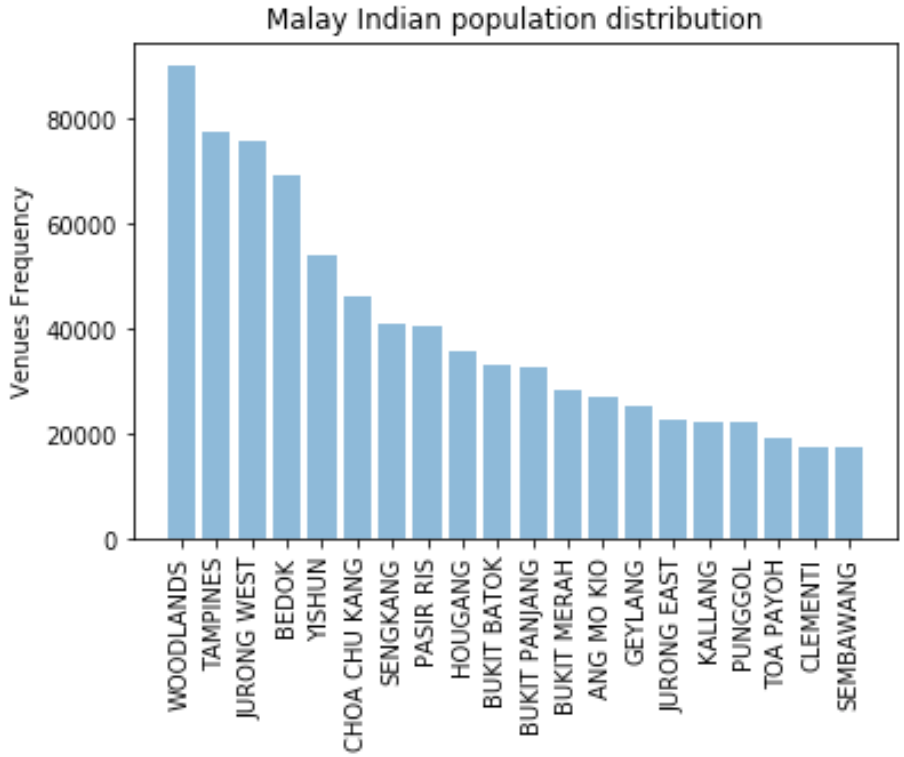
4. Methodology :-

4.1 Business Requirement
Find optimal location for opening Malay and Indian restaurant in SG.
Optimisation criteria is as flows
1) Analyse venues of successful restaurant in Kuala Lumpur, Malaysia
2) MRT should be within 500m
3) high floating population or high Malay and Indian population where restaurants are preferred choices for dining

4.2 Analytic approach
K means Clustering will be used to segment venues around MRTs in Singapore which are similar to Kuala Lumpur restaurant
Descriptive analytics will be used to find high Malay and Indian population with good number of recommended restaurants

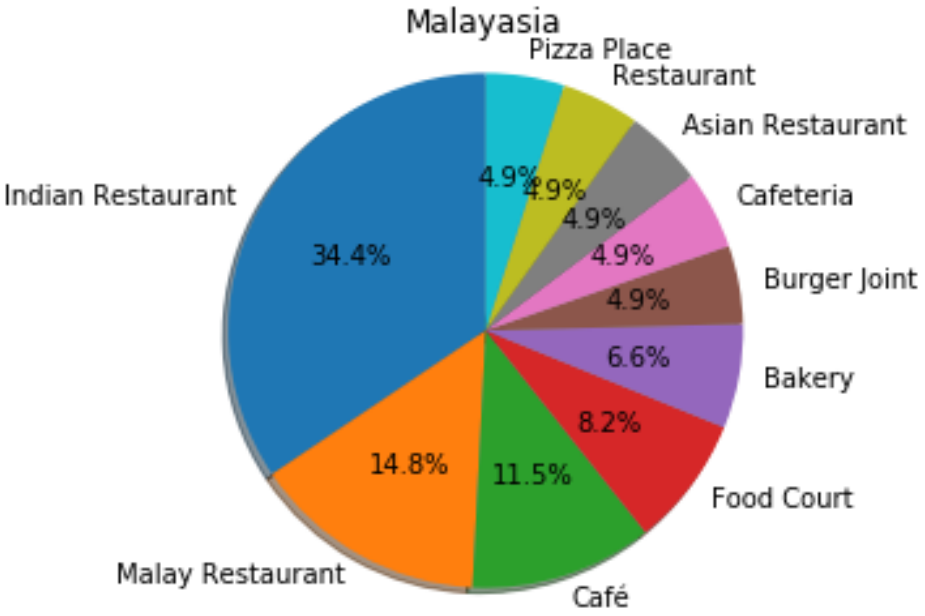
4.3 Data analysis and visualisation:

Current Malay and Indian population distribution around different areas (boroughs) in Singapore . Used oneMap API to collect the data

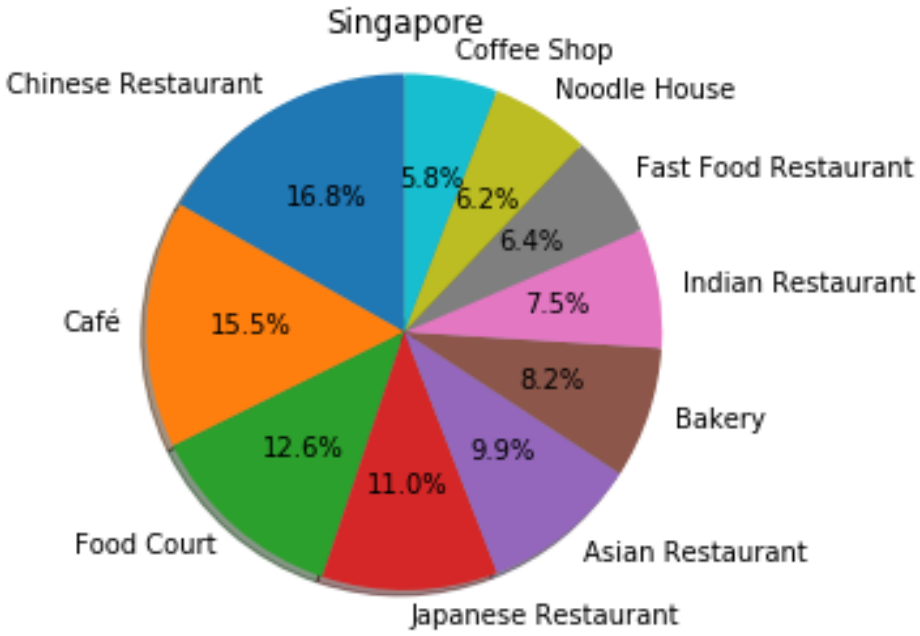


Foursquare API is used to get top recommended food and stores venues around successful Malay and Indian restaurant.

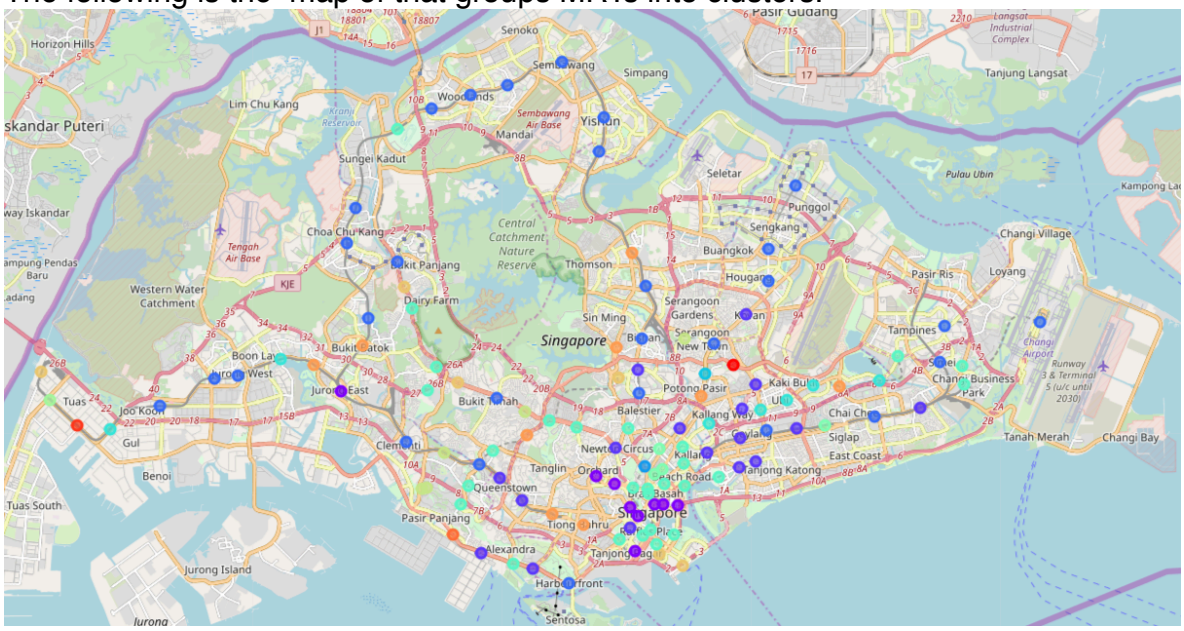
Top recommended venues around Malaysia location :-



Analysed Singapore Top recommended venues.
Statistical inference about top recommended venues in about Singapore population can be depicted in the following pie chart.

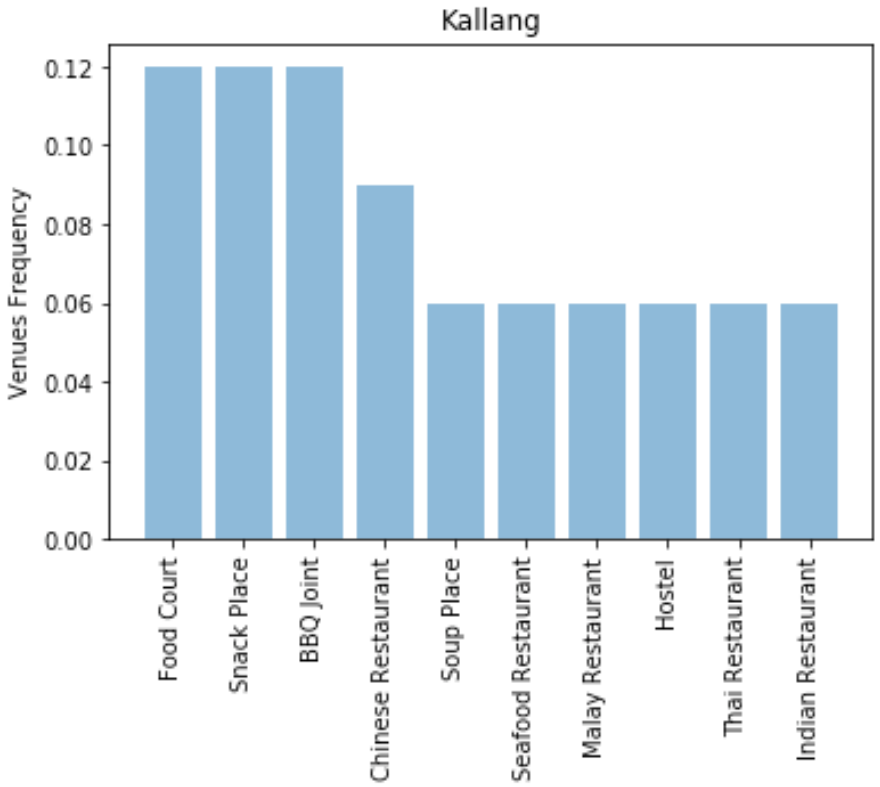


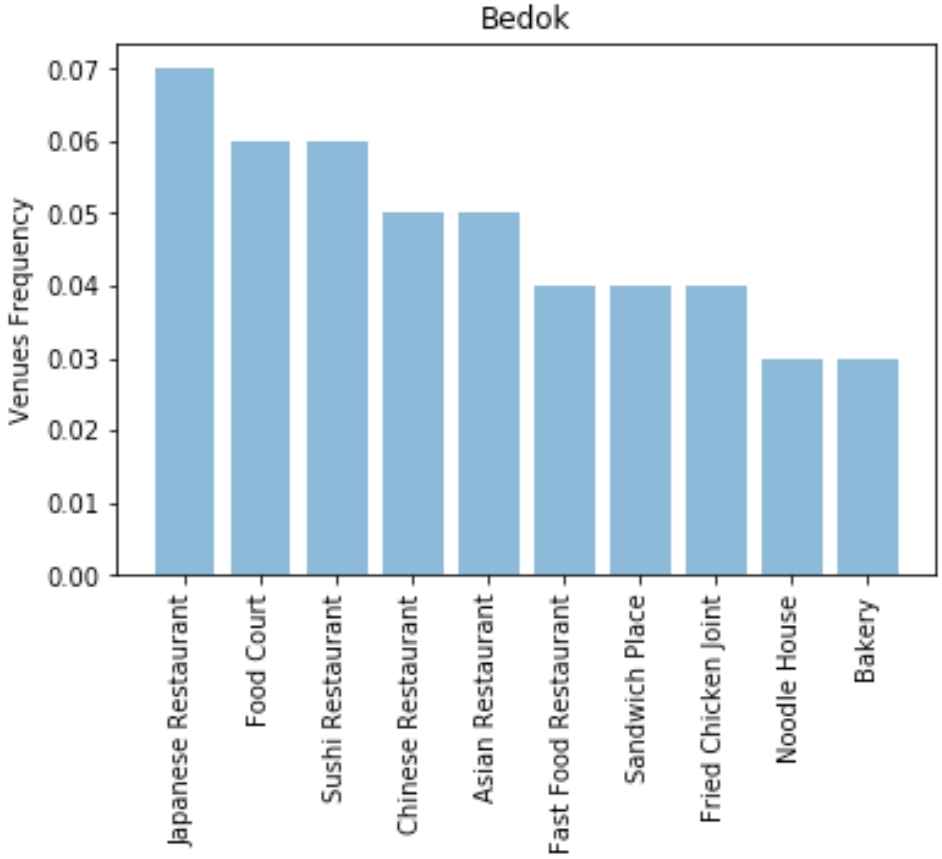
Top 100 recommended venues around Kuala Lumpur restuarant and around MRTs in Singapore is collected using Foursquare API.
One hot encoding is applied.
K means clustering algorithm is applied with K =15 clusters.
The following is the map of that groups MRTs into clusters.

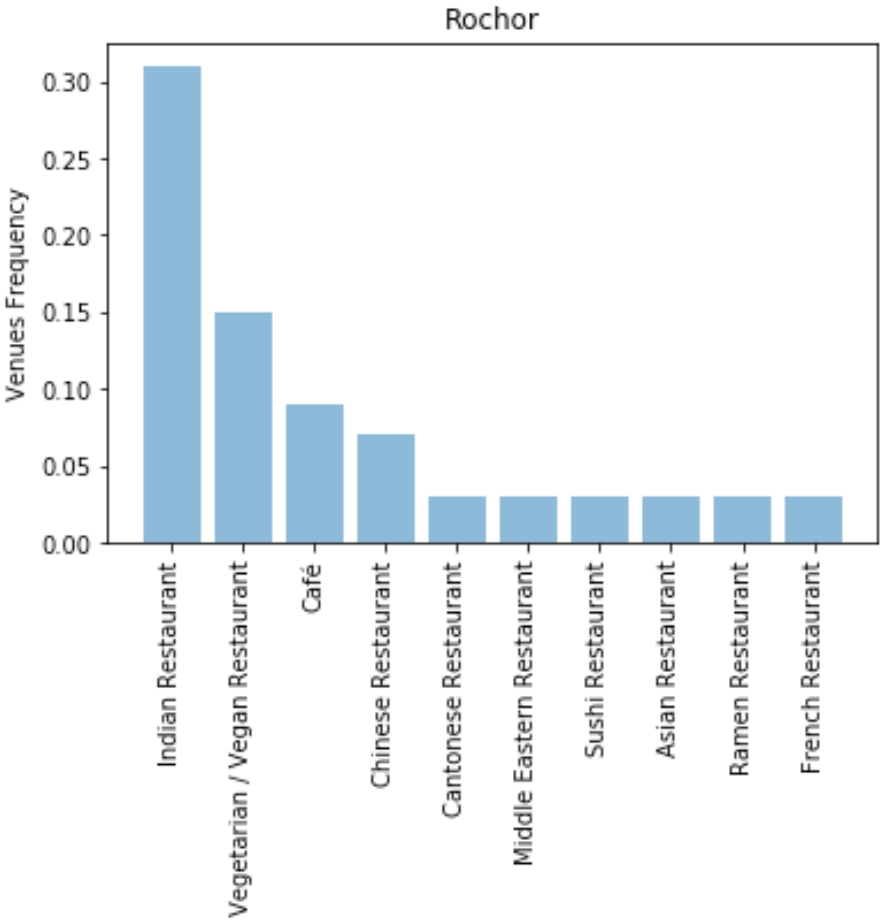


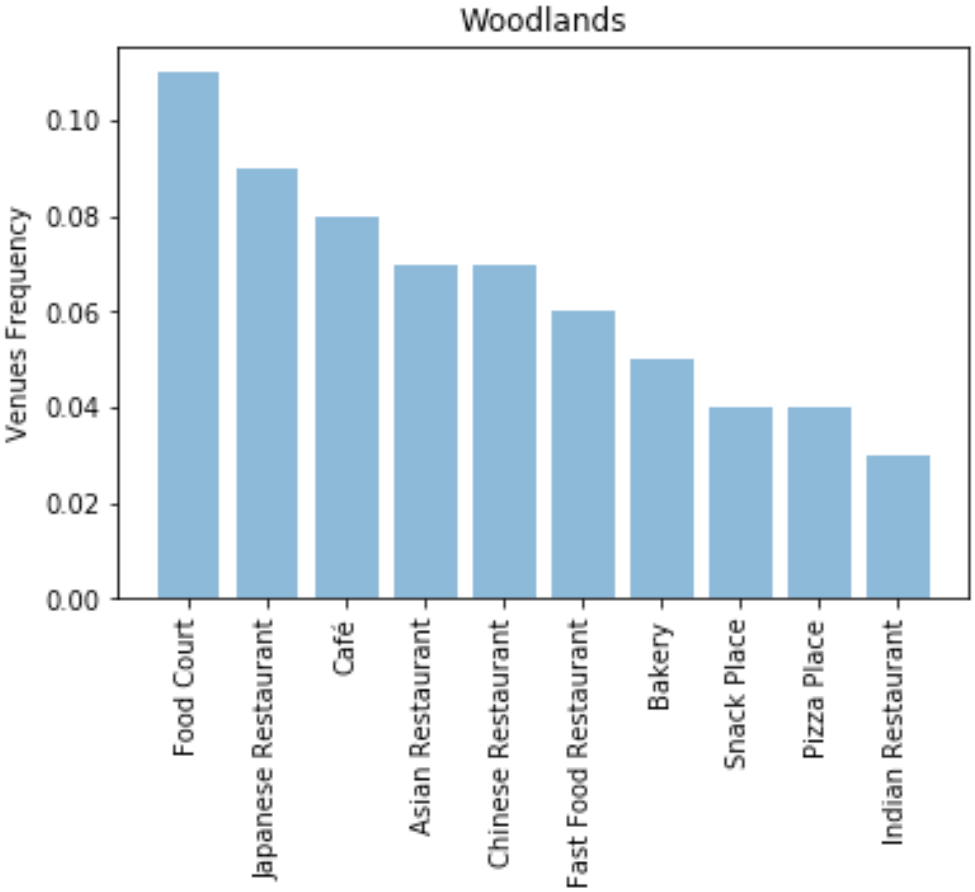
The following is snapshot of most recommended venues .

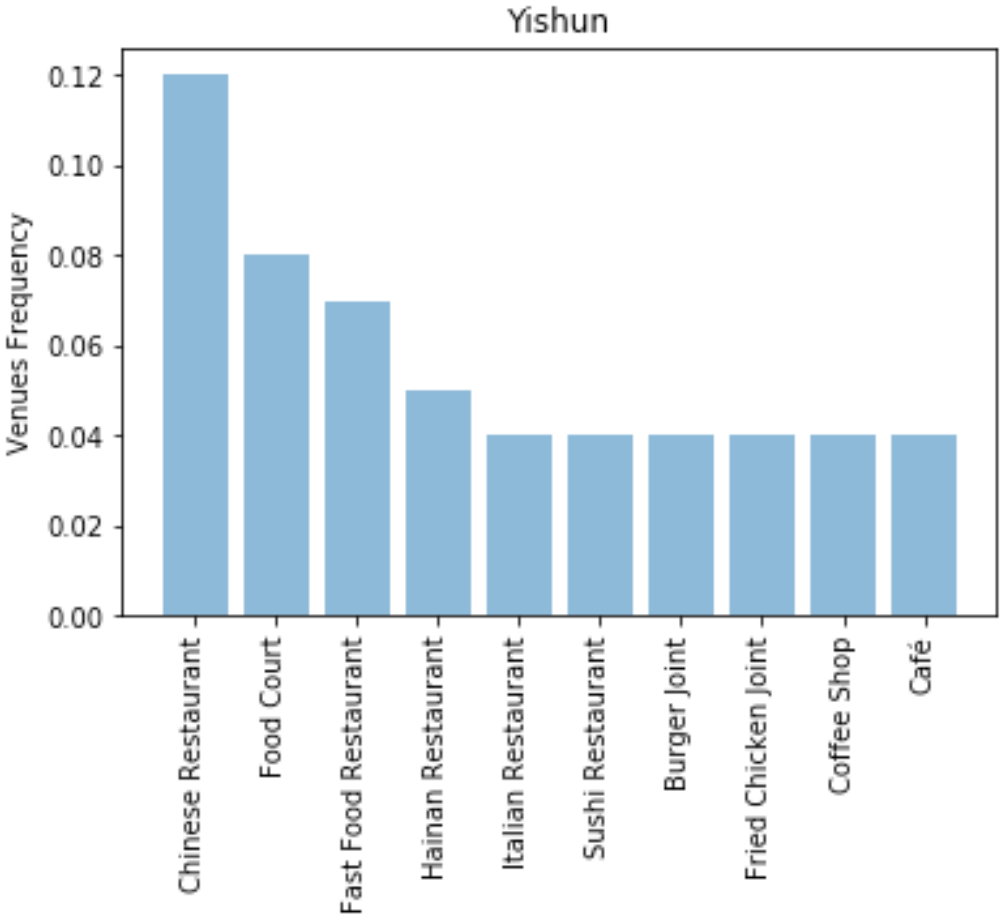
	Name of MRT	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	50100 Kuala Lumpur	Indian Restaurant	Malay Restaurant	Café	Food Court	Bakery	Asian Restaurant	Restaurant	Cafeteria	Speakeasy	Athletics & Sports
1	Admiralty	Fast Food Restaurant	Café	Bakery	Food Court	Sushi Restaurant	Supermarket	ATM	Halal Restaurant	Asian Restaurant	Snack Place
2	Aljunied	Chinese Restaurant	Food Court	Asian Restaurant	Noodle House	Dim Sum Restaurant	Seafood Restaurant	Vegetarian / Vegan Restaurant	Café	Coffee Shop	Indian Restaurant
3	Ang Mo Kio	Food Court	Japanese Restaurant	Fast Food Restaurant	Sushi Restaurant	Sandwich Place	Noodle House	Dessert Shop	Snack Place	Halal Restaurant	Coffee Shop
4	Bartley	Noodle House	Café	Bus Stop	Bus Station	Metro Station	Korean Restaurant	Asian Restaurant	Pet Store	Indian Restaurant	Food Truck

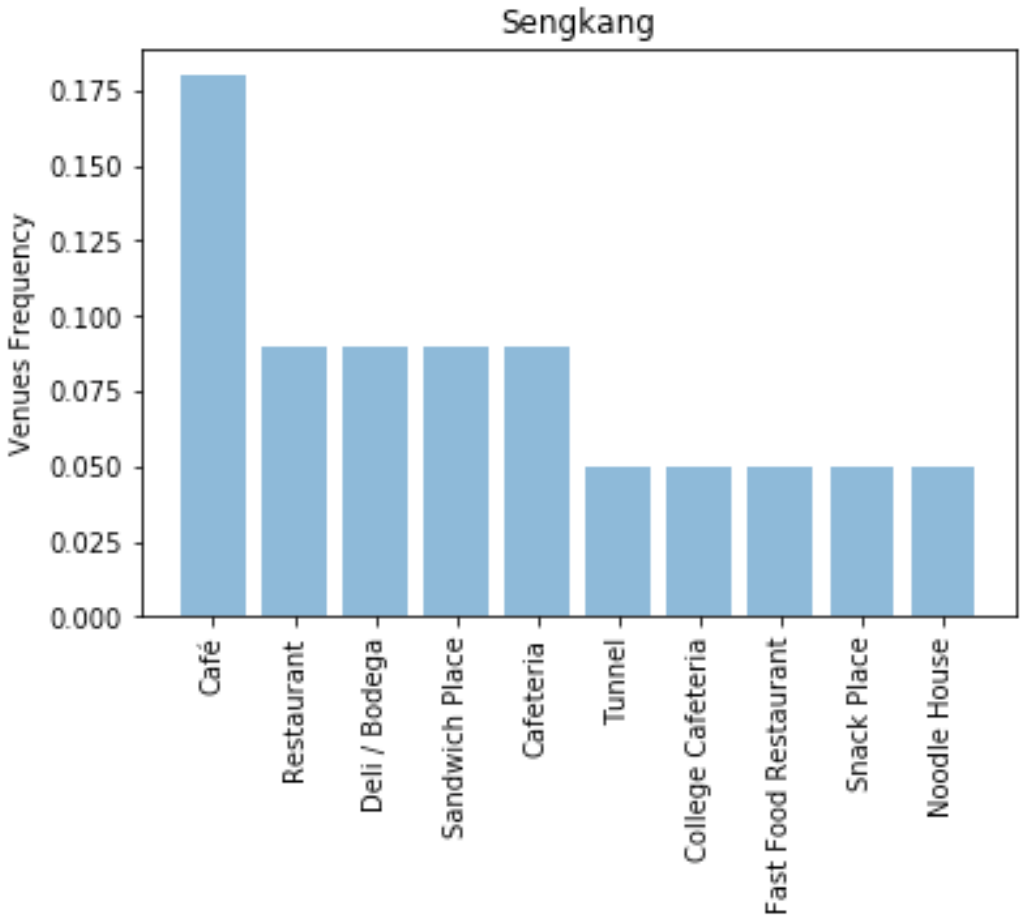



Bedok
Venues Frequency
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
Japanese Restaurant
Food Court
Sushi Restaurant
Chinese Restaurant
Asian Restaurant
Fast Food Restaurant
Sandwich Place
Fried Chicken Joint
Noodle House
Bakery


Rochor
Venues Frequency
0.30
0.25
0.20
0.15
0.10
0.05
0.00
Indian Restaurant
Vegetarian / Vegan Restaurant
Café
Chinese Restaurant
Cantonese Restaurant
Middle Eastern Restaurant
Sushi Restaurant
Asian Restaurant
Ramen Restaurant
French Restaurant


Woodlands
Venues Frequency
0.10
0.08
0.06
0.04
0.02
0.00
Food Court
Japanese Restaurant
Café
Asian Restaurant
Chinese Restaurant
Fast Food Restaurant
Bakery
Snack Place
Pizza Place
Indian Restaurant


Yishun
Venues Frequency
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Chinese Restaurant
Food Court
Fast Food Restaurant
Hainan Restaurant
Italian Restaurant
Sushi Restaurant
Burger Joint
Fried Chicken Joint
Coffee Shop
Café



5. Results :

The location in SGs which are similar to Malaysia are :-

Name of MRT	Postal Code	Planning Area	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	Cluster Labels
Farrer Park	NE8	Kallang, Rochor	Indian Restaurant	Café	Vegetarian / Vegan Restaurant	Chinese Restaurant	Fried Chicken Joint	Diner	Asian Restaurant	Restaurant	Dumpling Restaurant	Sushi Restaurant	4
Rochor	DT13	Rochor	Indian Restaurant	Vegetarian / Vegan Restaurant	Café	Chinese Restaurant	Food Court	Asian Restaurant	Hostel	French Restaurant	Dessert Shop	Sushi Restaurant	4
Jalan Besar	DT22	Rochor	Indian Restaurant	Café	Vegetarian / Vegan Restaurant	Chinese Restaurant	Asian Restaurant	Indonesian Restaurant	Hotel	Bakery	Hostel	Dumpling Restaurant	4

After descriptive analysis of population distrubution in different areas of singapore. The following areas have high malay and indian population and low malay and indian restaurant but good number of recommended for restuarants

1. Bedok

2. woodlands
3. yishun
4. Senkang

6. Discussion :

The optimal location for opening Malay and Indian restaurant is near , Ferrar park, Rochor , Jalan Besan MRT - as these areas are similar to the current successful restaurant.

Based on high demand (high Malay and Indian population) and low competition woodlands, Tampines, Yishun, Sengkang MRTs

7. Conclusion

After clustering and descriptive analytics , the following areas/MRT can be recommended :-

1. Farrer Park MRT (Area:- Kallang)
2. Rochor MRT (Area :- Rochor)
3. Jalan Besar MRT (Area :- Rochor)
4. Bedok / Bedok North / Bedok Reservoir (Area :- Bedok)
5. woodlands MRT (Area :- Woodlands)
6. Yishun MRT (Area :- Yishun)

Further based commercial property availability and rentals, the areas can be prioritised and presented to the client. Based on the budget , business owners can make final decision