

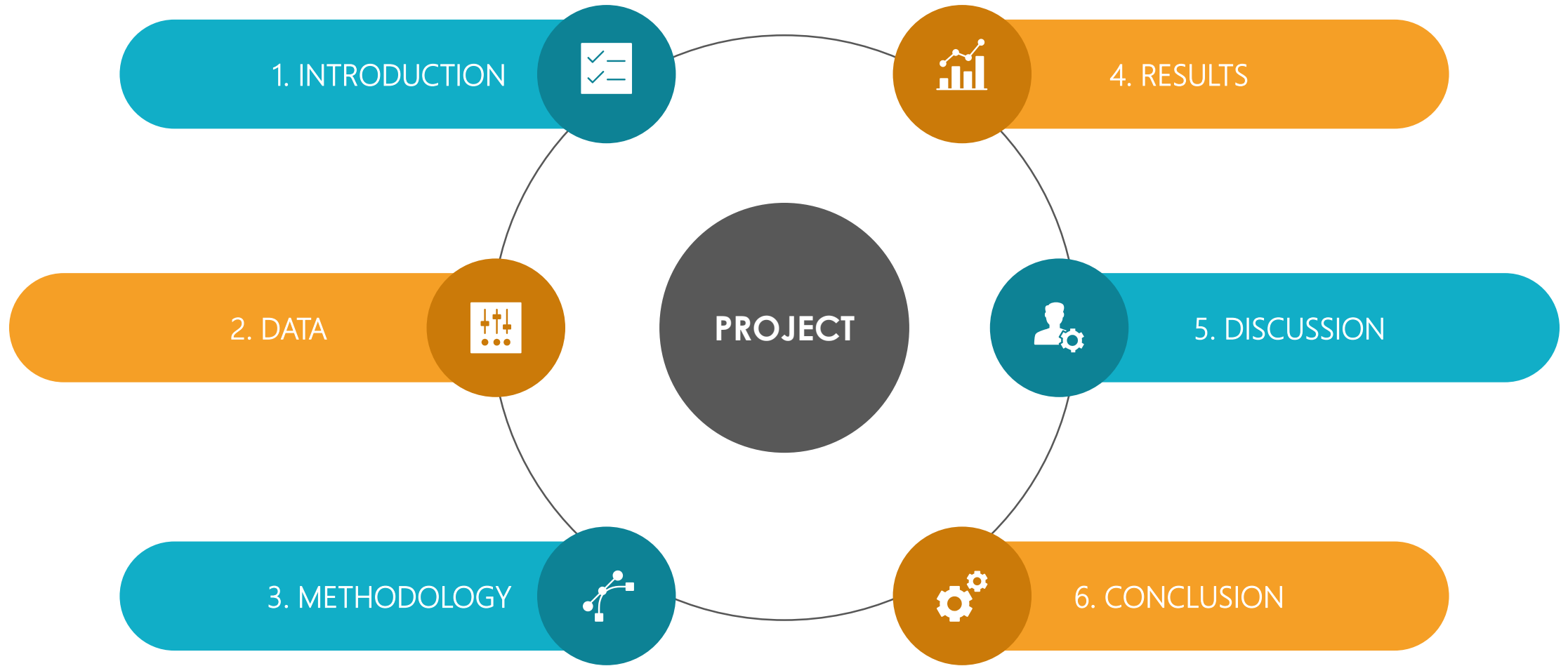


The Battle of The Neighborhoods – Singapore edition

Presentation

Leung Sau Yee
15 January 2020

CONTENTS



1. Introduction

- In Singapore, food courts popular dining option for the locals. They consist of a number of food stalls operating in the same premise, and offer affordable everyday meals.
- Key food courts operators in the market such as Koufu, Food Republic and Kopitiam have food courts that are similar and not well differentiated.



1. Introduction

- The Timbre Group is new entrant in the food court scene.
- Its first food court Timbre+, has a more modern and hip vibe as compared to other food courts.
- Timbre+ is located in Ayer Rajah neighbourhood, which is in postal district 05 in Singapore.
- Suppose Timbre Group would like to launch a second food court.
- The ideal locations for the new food court should be neighbourhoods with other food and beverage venues (which is indicative of good foot fall) but have fewer food court businesses.



2. Data

1. List of neighbourhoods based on postal districts

- Scraped using BeautifulSoup package from Wikipedia:

https://en.wikipedia.org/wiki/Postal_codes_in_Singapore

	PostalDist	Postal Sector	Neighborhood
0	1	01, 02, 03, 04, 05, 06	Raffles Place, Cecil, Marina, People's Park
1	2	07, 08	Anson, Tanjong Pagar
2	3	14, 15, 16	Bukit Merah, Queenstown, Tiong Bahru
3	4	09, 10	Telok Blangah, Harbourfront
4	5	11, 12, 13	Pasir Panjang, Hong Leong Garden, Clementi New...

2. Geographical location data of each neighbourhood

- Excel file

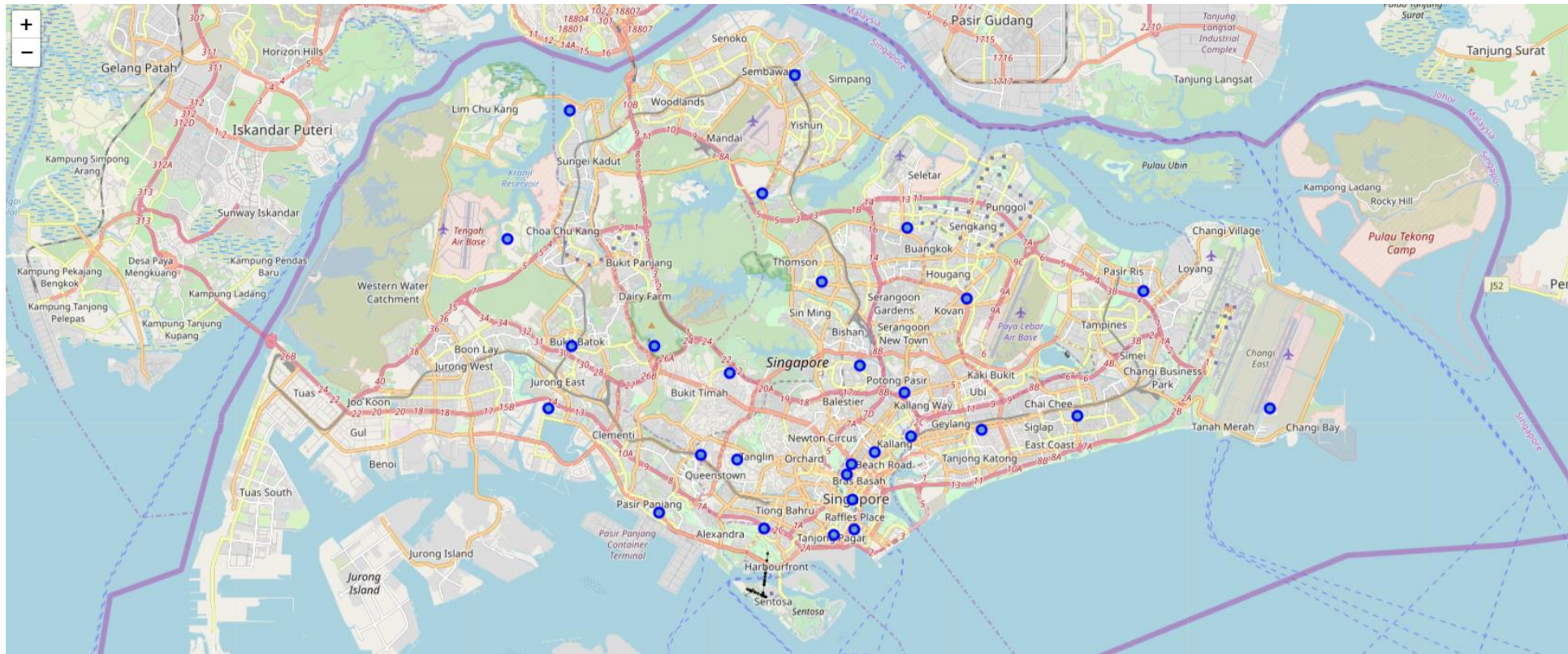
	Postcode	Latitude	Longitude
0	1	1.279114	103.851259
1	2	1.276904	103.843854
2	3	1.306456	103.794766
3	4	1.279457	103.817898
4	5	1.285272	103.779117

3. Venue information from Foursquare API

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Raffles Place, Cecil, Marina, People's Park	1.279114	103.851259	Pure Fitness	1.278631	103.851487	Gym
1	Raffles Place, Cecil, Marina, People's Park	1.279114	103.851259	The Westin Singapore	1.278275	103.850772	Hotel
2	Raffles Place, Cecil, Marina, People's Park	1.279114	103.851259	Lau Pa Sat Satay Street	1.280261	103.850235	Street Food Gathering
3	Raffles Place, Cecil, Marina, People's Park	1.279114	103.851259	Sofitel So Singapore	1.280124	103.849867	Hotel
4	Raffles Place, Cecil, Marina, People's Park	1.279114	103.851259	Lobby Lounge Westin	1.277811	103.850966	Bar

2. Data

- A map to visualise the 28 neighbourhoods in Singapore



3. Methodology

1. Explore the venue information obtained from Foursquare API through grouping by neighbourhoods

	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
Neighborhood						
Anson, Tanjong Pagar	100	100	100	100	100	100
Ardmore, Bukit Timah, Holland Road, Tanglin	71	71	71	71	71	71
Balestier, Toa Payoh, Serangoon	90	90	90	90	90	90
Bedok, Upper East Coast, Eastwood, Kew Drive	100	100	100	100	100	100
Bishan, Ang Mo Kio	72	72	72	72	72	72
Bukit Merah, Queenstown, Tiong Bahru	100	100	100	100	100	100

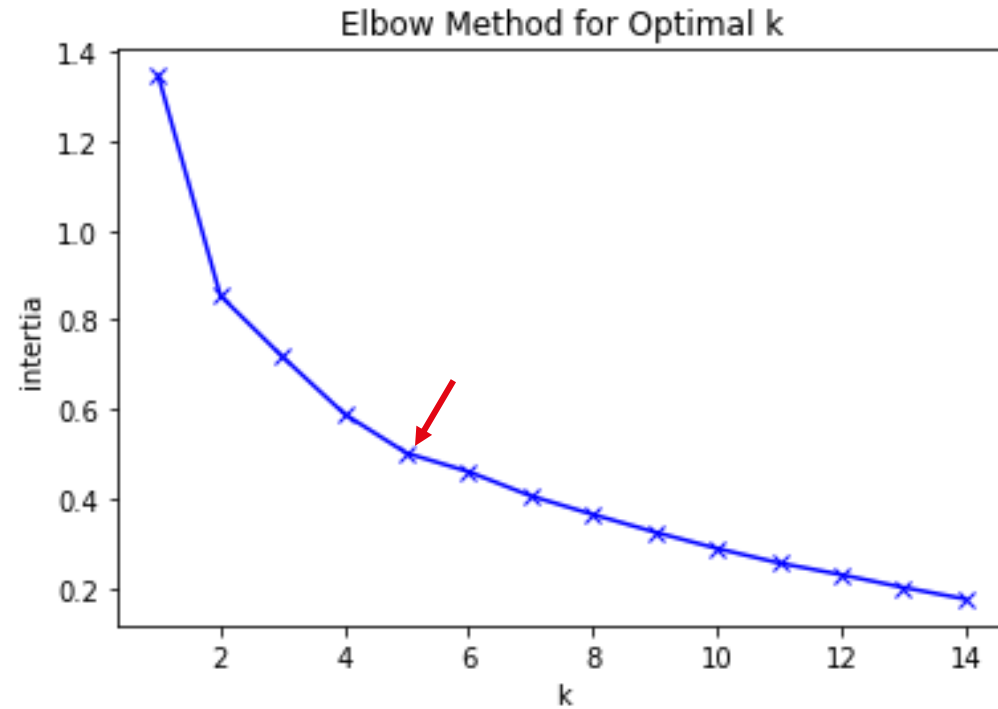
3. Methodology

2. Apply one-hot key to venue category to segregate different types of venues into columns for further analysis

	Neighborhood	Yoga Studio	American Restaurant	Arcade	Art Gallery	Art Museum	Arts & Crafts Store	Asian Restaurant	Athletics & Sports	Australian Restaurant	BBQ Joint
0	Anson, Tanjong Pagar	0.01	0.000000	0.000000	0.01	0.000000	0.000000	0.020000	0.000000	0.020000	0.010000
1	Ardmore, Bukit Timah, Holland Road, Tanglin	0.00	0.000000	0.000000	0.00	0.014085	0.000000	0.014085	0.000000	0.000000	0.000000
2	Balestier, Toa Payoh, Serangoon	0.00	0.000000	0.000000	0.00	0.000000	0.000000	0.044444	0.000000	0.000000	0.011111
3	Bedok, Upper East Coast, Eastwood, Kew Drive	0.01	0.010000	0.000000	0.00	0.000000	0.000000	0.030000	0.010000	0.000000	0.000000
4	Bishan, Ang Mo Kio	0.00	0.000000	0.000000	0.00	0.000000	0.000000	0.013889	0.000000	0.013889	0.000000

3. Methodology

3. Find optimal k value for k-means clustering using the elbow method
 - The optimal k value = 5, after which the inertias start decreasing in a linear fashion



4. Results

- Cluster 1 (Cluster Label = 0, Red)

PostalDist		Neighborhood	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
17	18	Simei, Tampines, Pasir Ris	0	Coffee Shop	Supermarket	Food Court	Seafood Restaurant	Bus Line	Convenience Store	Asian Restaurant	Gym / Fitness Center	Café	General Entertainment
21	22	Jurong, Tuas	0	Coffee Shop	Malay Restaurant	Food Court	Bus Stop	Supermarket	Cafeteria	Café	Grocery Store	Tech Startup	Park
22	23	Hillview, Dairy Farm, Bukit Panjang, Choa Chu ...	0	Coffee Shop	Food Court	Chinese Restaurant	Bus Station	Bus Line	Fast Food Restaurant	Convenience Store	Bowling Alley	Frozen Yogurt Shop	Multiplex
24	25	Kranji, Woodgrove, Woodlands	0	Food Court	Coffee Shop	Arcade	Park	Soup Place	Asian Restaurant	Bus Station	Women's Store	French Restaurant	Food

- Cluster 2 (Cluster Label = 1, Purple)

PostalDist		Neighborhood	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
2	3	Bukit Merah, Queenstown, Tiong Bahru	1	Chinese Restaurant	Bakery	Indian Restaurant	Food Court	Japanese Restaurant	Coffee Shop	Café	Salad Place	Italian Restaurant	Ice Cream Shop
3	4	Telok Blangah, Harbourfront	1	Chinese Restaurant	Food Court	Coffee Shop	Café	Scenic Lookout	Trail	Park	Fast Food Restaurant	Noodle House	Pool
4	5	Pasir Panjang, Hong Leong Garden, Clementi New...	1	Café	Asian Restaurant	Bar	Port	Kebab Restaurant	Bus Station	Miscellaneous Shop	Food Court	Pier	Metro Station
9	10	Ardmore, Bukit Timah, Holland Road, Tanglin	1	Café	Chinese Restaurant	Seafood Restaurant	Bar	Lounge	Gastropub	Lake	Thai Restaurant	French Restaurant	Indian Restaurant
10	11	Watten Estate, Novena, Thomson	1	Italian Restaurant	Pool	Chinese Restaurant	Bakery	Restaurant	Japanese Restaurant	Gym	Nightclub	Tennis Court	Seafood Restaurant
11	12	Balestier, Toa Payoh, Serangoon	1	Chinese Restaurant	Coffee Shop	Noodle House	Seafood Restaurant	Food Court	Bakery	Fast Food Restaurant	Asian Restaurant	Snack Place	Café
12	13	Macpherson, Braddell	1	Coffee Shop	Chinese Restaurant	Food Court	Bus Station	Convenience Store	Gym	Restaurant	Indian Restaurant	Fast Food Restaurant	Café
13	14	Geylang, Eunos	1	Coffee Shop	Chinese Restaurant	Hotel	Indian Restaurant	Food Court	Noodle House	Supermarket	BBQ Joint	Café	Dim Sum Restaurant
14	15	Katong, Joo Chiat, Amber Road	1	Asian Restaurant	Noodle House	Chinese Restaurant	Coffee Shop	Food Court	Fast Food Restaurant	Vegetarian / Vegan Restaurant	Vietnamese Restaurant	Supermarket	Snack Place
15	16	Bedok, Upper East Coast, Eastwood, Kew Drive	1	Food Court	Coffee Shop	Chinese Restaurant	Bus Stop	Noodle House	Sandwich Place	Indian Restaurant	Asian Restaurant	Café	Bakery
18	19	Serangoon Garden, Hougang, Punggol	1	Chinese Restaurant	Coffee Shop	Food Court	Noodle House	Asian Restaurant	Café	Fast Food Restaurant	Snack Place	Bakery	Dessert Shop
19	20	Bishan, Ang Mo Kio	1	Chinese Restaurant	Food Court	Fast Food Restaurant	Dessert Shop	Japanese Restaurant	Bus Station	Bubble Tea Shop	Park	Coffee Shop	Gym
20	21	Upper Bukit Timah, Clementi Park, Ulu Pandan	1	Trail	Korean Restaurant	Chinese Restaurant	Café	Food Court	Rest Area	Asian Restaurant	Thai Restaurant	Seafood Restaurant	Scenic Lookout
25	26	Upper Thomson, Springleaf	1	Café	Chinese Restaurant	Bus Station	Asian Restaurant	Indian Restaurant	Golf Course	Beer Garden	Italian Restaurant	Grocery Store	Convenience Store
26	27	Yishun, Sembawang	1	Chinese Restaurant	Asian Restaurant	Coffee Shop	Thai Restaurant	Indian Restaurant	Fast Food Restaurant	Shop & Service	Bus Station	Bus Stop	Spa
27	28	Seletar	1	Coffee Shop	Café	Chinese Restaurant	Asian Restaurant	Food Court	Diner	Shopping Mall	Supermarket	Playground	Thai Restaurant

4. Results

- Cluster 3 (Cluster Label = 2, Blue)

PostalDist	Neighborhood	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	
16	17	Loyang, Changi	2	Military Base	Gym	Women's Store	Garden Center	Gaming Cafe	Furniture / Home Store	Fruit & Vegetable Store	Frozen Yogurt Shop	Fried Chicken Joint	French Restaurant

- Cluster 4 (Cluster Label = 3, Green)

PostalDist		Neighborhood	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
23	24	Lim Chu Kang, Tengah	3	Farm	Flower Shop	Pet Store	Garden	Café	Farmers Market	Garden Center	Coffee Shop	Spa	Fried Chicken Joint

- Cluster 5 (Cluster Label = 4, Orange)

PostalDist		Neighborhood	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	1	Raffles Place, Cecil, Marina, People's Park	4	Coffee Shop	Hotel	Café	Japanese Restaurant	Korean Restaurant	Gym / Fitness Center	Cocktail Bar	Restaurant	Waterfront	Food Court
1	2	Anson, Tanjong Pagar	4	Japanese Restaurant	Coffee Shop	Bakery	Café	Hotel	Cocktail Bar	Ramen Restaurant	Tapas Restaurant	Italian Restaurant	Korean Restaurant
5	6	High Street, Beach Road (part)	4	Hotel	Japanese Restaurant	Cocktail Bar	Café	Italian Restaurant	Coffee Shop	Concert Hall	Waterfront	Supermarket	Gym / Fitness Center
6	7	Middle Road, Golden Mile	4	Café	Indian Restaurant	Hotel	Bakery	Vegetarian / Vegan Restaurant	Arts & Crafts Store	Japanese Restaurant	Shopping Mall	Whisky Bar	Coffee Shop
7	8	Little India, Farrer Park, Jalan Besar, Lavender	4	Indian Restaurant	Chinese Restaurant	Café	Hotel	Bakery	Coffee Shop	Restaurant	Vietnamese Restaurant	Hostel	Indonesian Restaurant
8	9	Orchard, Cairnhill, River Valley	4	Hotel	Café	Japanese Restaurant	Coffee Shop	Art Gallery	Arts & Crafts Store	Sushi Restaurant	French Restaurant	Movie Theater	Clothing Store

5. Discussion

- Cluster 1, Cluster 2 and Cluster 5 contain neighbourhoods which have food and beverages outlets as their top common venues.
- Cluster 3 and Cluster 4 have neighbourhoods with very specific types of venues as listed below and are not ideal locations for Timbre+ to launch its new food court:
 - Cluster 3: Military base, gym
 - Cluster 4: Farm, flower shop

5. Discussion

Diving into Cluster 1, Cluster 2 and Cluster 5:

- Cluster 1
 - “Food Court” appeared as one of the top 3 most common venues in all neighbourhoods.
 - High competition for food court
 - Not ideal choice for Timbre+
- Cluster 2
 - Has a mix of various types of restaurants and food courts among top 5 most common venues, so there is some level of competition.
- Cluster 5
 - Tend to have other types of food and beverage outlets such as cafes and restaurants, which may be potential areas that Timbre+ can consider.

5. Discussion

Limitation

- This analysis is performed on limited data available for Singapore.
- The analysis may yield better results if there is greater adoption and usage of Foursquare in the Singapore market.

6. Conclusion

- Using Foursquare API, I can obtain data of common places in Singapore to:
 - Identify the similarity or dissimilarity of different neighbourhoods
 - Cluster the neighbourhoods based on commonality
- I can then use such analysis as one of my input to assess areas which may have good potential for new business in addition to other market and financial data.



Thank You