Title: The Analysis of Food and Beverage (F&B) Industry in Kuala Lumpur, Malaysia.

A. Introduction / Business Problem

The objective of this analysis is to examine the trend of F&B industry in capital of Malaysia which is Kuala Lumpur (KL). Malaysia is a categorized as a middle income nation where the yearly salary is approximately USD 15,705.00 [1]. The most common venues within each district in KL were extracted and tabulated for analysis.

B. Interest

The parties who are interested are businessmen intending to open a new F&B outlet in KL. This analysis can serve as guidelines to determine the trend of industry.

C. Data

KL is composed of 11 districts [2]. The coordinates were collected from Wikipedia and Google Search function. Foursquare location data was utilized to explore the names and types of the F&B outlets within vicinity of KL. The explore feature of API was deployed to search for F&B outlets within the vicinity of Kuala Lumpur.

D. Methodology

Python software was applied to perform data analysis. The libraries that were deployed:-

1. Numpy
2. Pandas
3. Folium
4. Json
5. Geopy
6. Matplotlib

7. Sklearn KMeans Clustering

Descriptive analysis was applied on the data to list the most common venues among all the districts in KL. K means clustering was applied to the districts to categorize into two clusters based on certain conditions.

E. Results and Discussions

API explore feature which extracted the first 10 venues was illustrated in Figure below:-

	name	categories	lat	lng
0	BackHome Kuala Lumpur	Hostel	3.148732	101.697887
1	Pampas Reserve Grill & Bar	Latin American Restaurant	3.150222	101.704355
2	Family Mart	Convenience Store	3.145195	101.698606
3	Restoran Santa	South Indian Restaurant	3.149083	101.698156
4	Betel Leaf	Chettinad Restaurant	3.149543	101.697763
5	Kedai Mamak Husin	Halal Restaurant	3.144556	101.704214
6	茨厂街驰名罗汉果龙眼冰糖炖冬瓜 (Air Mata Kucing)	Food Truck	3.144283	101.697753
7	Urbanscapes House	Exhibit	3.146803	101.696028
8	Saravanaa Bhavan	Indian Restaurant	3.149231	101.697475
9	Starbucks	Coffee Shop	3.147224	101.699555

Figure 1

If an investor is interested in opening a restaurant, the data extracted was narrowed down to visualize restaurants only. This was illustrated in vertical bar chart in Figure 2 below:-
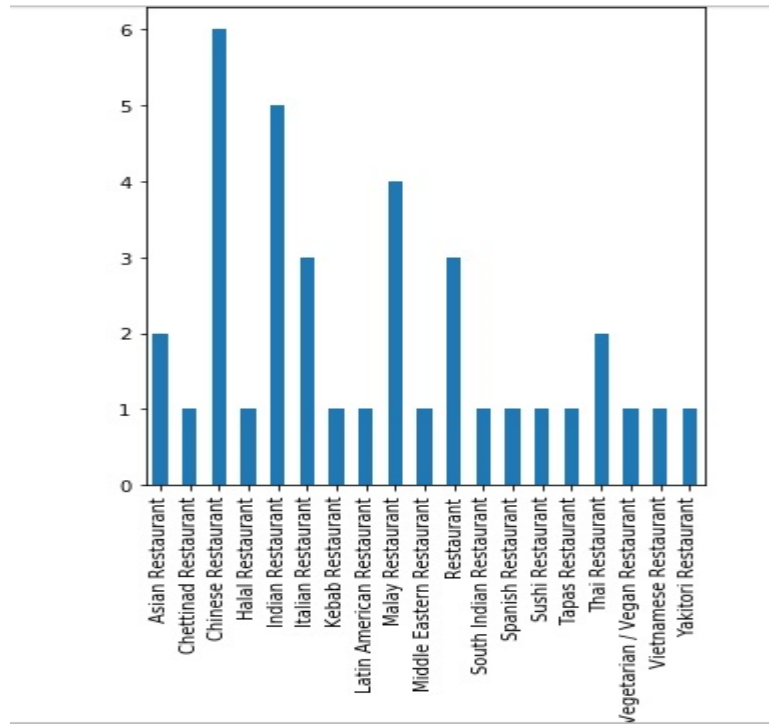
Figure 2

From the graph, the most common type of restaurant in Chinese followed Indian and Malay cuisines. The locations of restaurants were added into map using Folium feature as shown in Figure 3:-
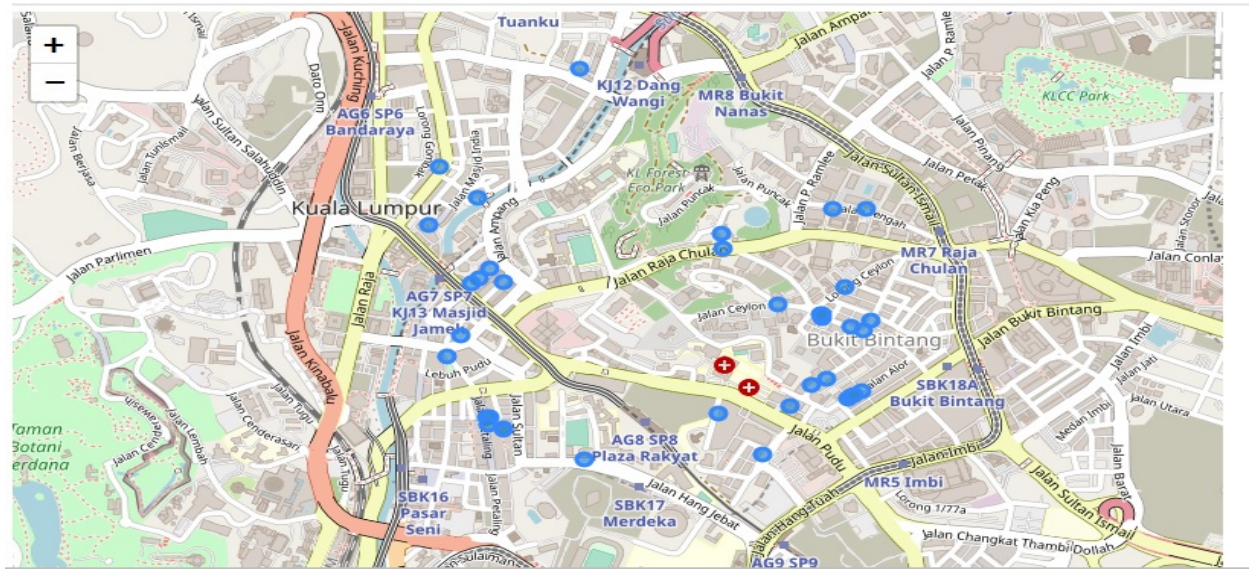

Figure 3

The data of 11 districts of KL were downloaded and tabulated using Pandas function as shown below in Figure 4:

	City	District	Latitude	Longitude
0	Kuala Lumpur	Bukit Bintang	3.146680	101.71119
1	Kuala Lumpur	Titiwangsa	3.177880	101.70677
2	Kuala Lumpur	Setiawangsa	3.185250	101.74646
3	Kuala Lumpur	Wangsa Maju	3.199490	101.74001
4	Kuala Lumpur	Batu	3.206600	101.68200
5	Kuala Lumpur	Kepong	3.214000	101.63560
6	Kuala Lumpur	Segambut	3.191700	101.67340
7	Kuala Lumpur	Lembah Pantai	3.125100	101.66830
8	Kuala Lumpur	Seputeh	3.108100	101.67540
9	Kuala Lumpur	Bandar Tun Razak	3.092000	101.72110
10	Kuala Lumpur	Cheras	3.107178	101.71649

Figure 4

The nearby venues of each district were extracted within radius of 500 m using Foursquare API explore feature and shown in Figure 5. The frequency of occurrence for each venue within each district was calculated and visualized in Figure 6.

	District	District Latitude	District Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Bukit Bintang	3.14668	101.71119	Sobaya Shige	3.146042	101.711673	Udon Restaurant
1	Bukit Bintang	3.14668	101.71119	Isetan The Japan Store	3.145937	101.712037	Department Store
2	Bukit Bintang	3.14668	101.71119	The Tokyo Restaurant	3.146118	101.712023	Café
3	Bukit Bintang	3.14668	101.71119	The KL Journal	3.148033	101.710645	Hotel
4	Bukit Bintang	3.14668	101.71119	J's Gate Dining	3.146570	101.711746	Japanese Restaurant
5	Bukit Bintang	3.14668	101.71119	Pulse Ultra Club	3.147828	101.712538	Music Venue
6	Bukit Bintang	3.14668	101.71119	BookXcess	3.147305	101.712777	Bookstore
7	Bukit Bintang	3.14668	101.71119	Sunshine Bedz KL	3.147050	101.711115	Hostel
8	Bukit Bintang	3.14668	101.71119	Family Mart	3.148141	101.711083	Convenience Store
9	Bukit Bintang	3.14668	101.71119	Starbucks	3.147107	101.711984	Coffee Shop
10	Bukit Bintang	3.14668	101.71119	Connoisseur Cafe	3.147726	101.712708	Café
11	Bukit Bintang	3.14668	101.71119	Restoran Beriani Asif	3.145442	101.713329	Asian Restaurant
12	Bukit Bintang	3.14668	101.71119	H&M	3.146569	101.711767	Clothing Store
13	Bukit Bintang	3.14668	101.71119	Pavilion Kuala Lumpur	3.148653	101.713143	Shopping Mall
14	Bukit Bintang	3.14668	101.71119	Pavilion Elite	3.148554	101.713033	Shopping Mall

Figure 5

	District	Arts & Crafts Store	Arts & Entertainment	Asian Restaurant	Auto Garage	BBQ Joint	Bakery	Bar	Basketball Court	Beer Bar	Bistro	Bookstore	Boutique	Bowling Alley
0	Bandar Tun Razak	0.000000	0.000000	0.058824	0.0	0.000000	0.058824	0.000000	0.000000	0.00	0.00000	0.000000	0.000000	0.00000
1	Batu	0.000000	0.000000	0.200000	0.2	0.000000	0.000000	0.000000	0.000000	0.00	0.00000	0.000000	0.000000	0.00000
2	Bukit Bintang	0.000000	0.000000	0.030000	0.0	0.010000	0.010000	0.020000	0.000000	0.01	0.00000	0.010000	0.030000	0.00000
3	Cheras	0.333333	0.000000	0.000000	0.0	0.000000	0.000000	0.000000	0.000000	0.00	0.00000	0.000000	0.000000	0.00000
4	Kepong	0.000000	0.000000	0.096154	0.0	0.000000	0.019231	0.000000	0.000000	0.00	0.00000	0.019231	0.000000	0.00000
5	Lembah Pantai	0.000000	0.000000	0.000000	0.0	0.000000	0.000000	0.000000	0.000000	0.00	0.00000	0.000000	0.000000	0.00000
6	Segambut	0.000000	0.000000	0.083333	0.0	0.083333	0.000000	0.000000	0.000000	0.00	0.00000	0.000000	0.083333	0.00000
7	Seputeh	0.000000	0.000000	0.100000	0.0	0.000000	0.000000	0.000000	0.000000	0.00	0.00000	0.000000	0.000000	0.00000
8	Setiawangsa	0.000000	0.000000	0.000000	0.0	0.000000	0.000000	0.142857	0.142857	0.00	0.00000	0.000000	0.000000	0.00000
9	Titiwangsa	0.000000	0.038462	0.038462	0.0	0.000000	0.000000	0.000000	0.038462	0.00	0.00000	0.000000	0.000000	0.00000
10	Wangsa Maju	0.000000	0.000000	0.024390	0.0	0.000000	0.000000	0.000000	0.000000	0.00	0.02439	0.024390	0.000000	0.02439

Figure 6

Top 10 most common venues were listed down for each district and shown in table format shown in Figure 7.

	City	District	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
0	Kuala Lumpur	Bukit Bintang	3.146680	101.71119	0	Coffee Shop	Hotel	Ice Cream Shop	Clothing Store	Japanese Restaurant	Boutique	Chinese Restaurant	Café
1	Kuala Lumpur	Titiwangsa	3.177880	101.70677	0	Malay Restaurant	Park	Gym	Harbor / Marina	Mexican Restaurant	Skate Park	Restaurant	Multiplex
2	Kuala Lumpur	Setiawangsa	3.185250	101.74646	0	Fast Food Restaurant	Dessert Shop	Mountain	Thai Restaurant	Bar	Basketball Court	Buffet	Food Truck
3	Kuala Lumpur	Wangsa Maju	3.199490	101.74001	0	Spa	Ice Cream Shop	Thai Restaurant	Dessert Shop	Electronics Store	Coffee Shop	Light Rail Station	Hookah Bar
4	Kuala Lumpur	Batu	3.206600	101.68200	0	Fast Food Restaurant	Auto Garage	Night Market	Malay Restaurant	Asian Restaurant	Flower Shop	Food	Food Court
5	Kuala Lumpur	Kepong	3.214000	101.63560	0	Chinese Restaurant	Asian Restaurant	Dessert Shop	Noodle House	Café	Fast Food Restaurant	Coffee Shop	Comfort Food Restaurant
6	Kuala Lumpur	Segambut	3.191700	101.67340	0	Chinese Restaurant	Diner	Motorcycle Shop	Pizza Place	Boutique	Malay Restaurant	Pool Hall	Electronics Store

Figure 7

Lastly, K means clustering method was applied to cluster the districts into two categories. The data frame shown in Figure 8

	City	District	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
0	Kuala Lumpur	Bukit Bintang	3.146680	101.71119	0	Coffee Shop	Hotel	Ice Cream Shop	Clothing Store	Japanese Restaurant	Boutique	Chinese Restaurant	Café
1	Kuala Lumpur	Titiwangsa	3.177880	101.70677	0	Malay Restaurant	Park	Gym	Harbor / Marina	Mexican Restaurant	Skate Park	Restaurant	Multiplex
2	Kuala Lumpur	Setiawangsa	3.185250	101.74646	0	Fast Food Restaurant	Dessert Shop	Mountain	Thai Restaurant	Bar	Basketball Court	Buffet	Food Truck
3	Kuala Lumpur	Wangsa Maju	3.199490	101.74001	0	Spa	Ice Cream Shop	Thai Restaurant	Dessert Shop	Electronics Store	Coffee Shop	Light Rail Station	Hookah Bar
4	Kuala Lumpur	Batu	3.206600	101.68200	0	Fast Food Restaurant	Auto Garage	Night Market	Malay Restaurant	Asian Restaurant	Flower Shop	Food	Food Court
5	Kuala Lumpur	Kepong	3.214000	101.63560	0	Chinese Restaurant	Asian Restaurant	Dessert Shop	Noodle House	Café	Fast Food Restaurant	Coffee Shop	Comfort Food Restaurant

Figure 8

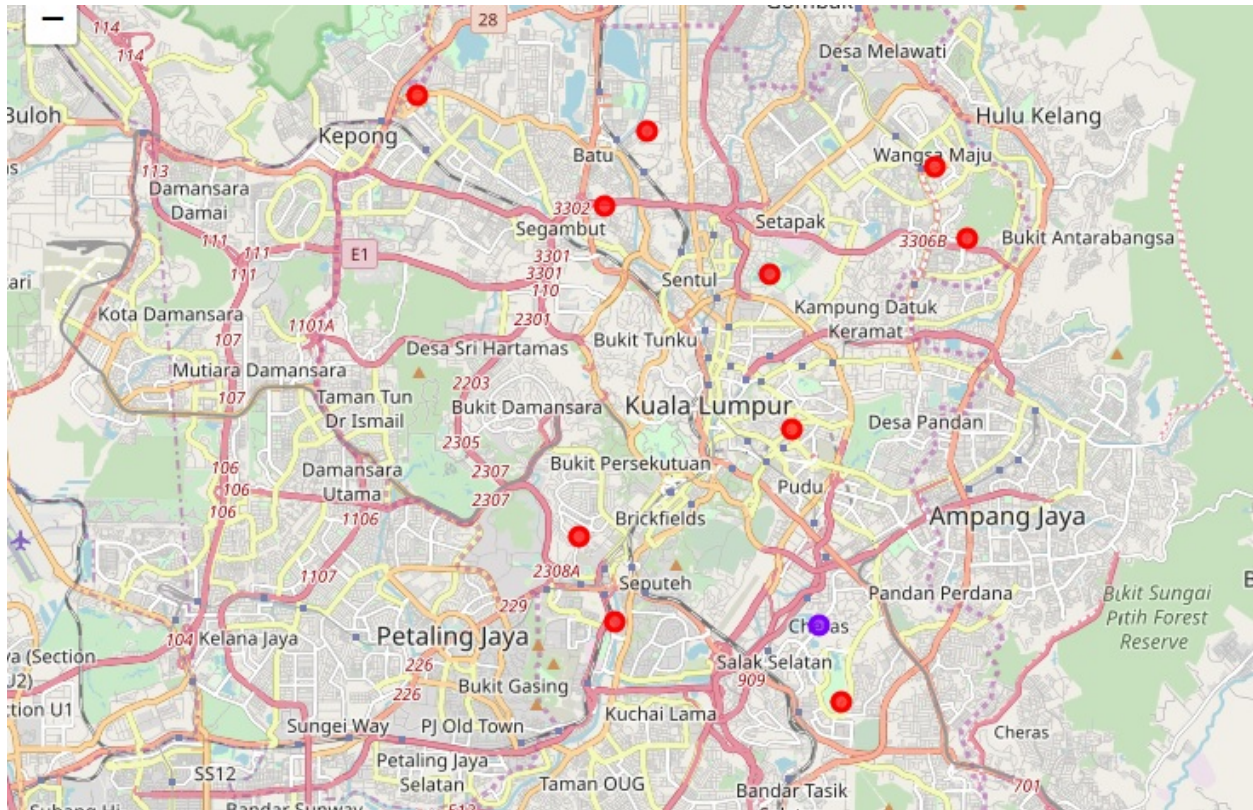The district were added into map and visualized using Folium as shown in Figure 9

Figure 9

F. Conclusions

KL is a dynamic city which offers a wide range of foods and cuisines. The analysis of the most common venues serves as a guide to any potential restaurateurs who are interested in venturing in F&B industry.

Reference

[1] https://www.payscale.com/research/MY/Location=Kuala-Lumpur/Salary

[2] https://en.wikipedia.org/wiki/Kuala_Lumpur