The Battle of Neighborhoods [Singapore]

Introduction

Singapore, as a sovereign island city-state in South-East Asia, is an important trading and business hub in the region that attacts thousands of foreign visitors every year for business, work, study and play. For this, it becomes a melting pot of different cultures from the people that visit and work here. In this project, we will try to explore and list the different types of restaurants that serve international cuisines in Singapore.

Business questions to be answered in this project.

1. To find out the Thai and Korean restaurants in Singapore

2. The best rated Thai and Korean restaurant in Singapore to recommend for a Korean or a Thai visiting Singapore.

3. If a businessman is interested to open a Thai or a Korean restaurant in Singapore, which part of Singapore will be the best place to attract diners?

4. What type of venues are the most popular in the neighbourhoods of Singapore?

Data

For this project, we will be using the following data.

1. List of neighborhoods in Singapore with location coordinates (latitudes and longitudes).
2. List of nearby venues in these neighborhoods from FourSquare API.

Methodology

1. First, we will download the planning areas and subzones data from Open Data Singapore link.

2. We will process the csv data into a Pandas dataframe and remove the unnecessary columns not required in our analysis.
3. We will call Nominatim inside Geopy library to retrieve the location coordinates of the neighborhoods.
4. We will find all available venues for each neighborhood using FourSquare API.
5. We will then filter out the Korean and Thai restaurant venues.
6. With FourSquare API, we will retrieve the ratings, tips and likes count for the Korean and Thai restaurants.
7. We will go back to the neighborhoods and sort the dataframe by population count and find out which location is best to open a Korean or Thai restaurant to capture the customers.
8. We will go back to the retrieved venues for each neighborhood and do a pivot table to see what are the most popular venue in each neighborhood.

Importing the required libraries.

```
In [1]: import numpy as np

        import pandas as pd
        pd.set_option('display.max_columns', None)
        pd.set_option('display.max_rows', None)

        import json

        from geopy.geocoders import Nominatim

        import requests
        from pandas.io.json import json_normalize

        import matplotlib.cm as cm
        import matplotlib.colors as colors

        from sklearn.cluster import KMeans

        import folium

        import bs4 as bs
        import lxml.html as lh

        print('Libraries imported.')
```

```
Libraries imported.
```

After some exploration of the correct data to use for getting the accurate snapshot of the neighborhoods of Singapore, we found the subzones to be more relevant for our analysis. The information of the subzones can be found from the following link [https://data.gov.sg/dataset/resident-population-by-planning-area-subzone-and-type-of-dwelling-2015 (https://data.gov.sg/dataset/resident-population-by-planning-area-subzone-and-type-of-dwelling-2015)]. The data is in csv format which is downloaded for analysis.

```
In [2]: df = pd.read_csv('resident-population-by-subzone-and-type-of-dwelling.csv')
```

```
In [3]: df.head()
```

Out[3]:

	year	level_1	level_2	level_3	value
0	2015	Total	Ang Mo Kio	Ang Mo Kio Town Centre	5020
1	2015	Total	Ang Mo Kio	Cheng San	29770
2	2015	Total	Ang Mo Kio	Chong Boon	27900
3	2015	Total	Ang Mo Kio	Kebun Bahru	23910
4	2015	Total	Ang Mo Kio	Sembawang Hills	6890

Data Cleaning and manipulation

The raw data from the csv will require some cleaning and renaming of columns into meaningful names. We also drop some columns that are not required in our analysis.

```
In [4]: df.rename(columns={'level_2':'Area','level_3':'Neighborhood' ,'value': 'Population'}, inplace = True)
```

```
In [5]: df.head()
```

Out[5]:

	year	level_1	Area	Neighborhood	Population
0	2015	Total	Ang Mo Kio	Ang Mo Kio Town Centre	5020
1	2015	Total	Ang Mo Kio	Cheng San	29770
2	2015	Total	Ang Mo Kio	Chong Boon	27900
3	2015	Total	Ang Mo Kio	Kebun Bahru	23910
4	2015	Total	Ang Mo Kio	Sembawang Hills	6890

```
In [6]: df = df.drop(['year','level_1'], axis = 1)
```

```
In [7]: df = df.drop_duplicates(subset = ['Neighborhood'])
        df.head(10)
```

Out[7]:

	Area	Neighborhood	Population
0	Ang Mo Kio	Ang Mo Kio Town Centre	5020
1	Ang Mo Kio	Cheng San	29770
2	Ang Mo Kio	Chong Boon	27900
3	Ang Mo Kio	Kebun Bahru	23910
4	Ang Mo Kio	Sembawang Hills	6890
5	Ang Mo Kio	Shangri-La	18510
6	Ang Mo Kio	Tagore	8350
7	Ang Mo Kio	Townsville	23770
8	Ang Mo Kio	Yio Chu Kang	30
9	Ang Mo Kio	Yio Chu Kang East	4080
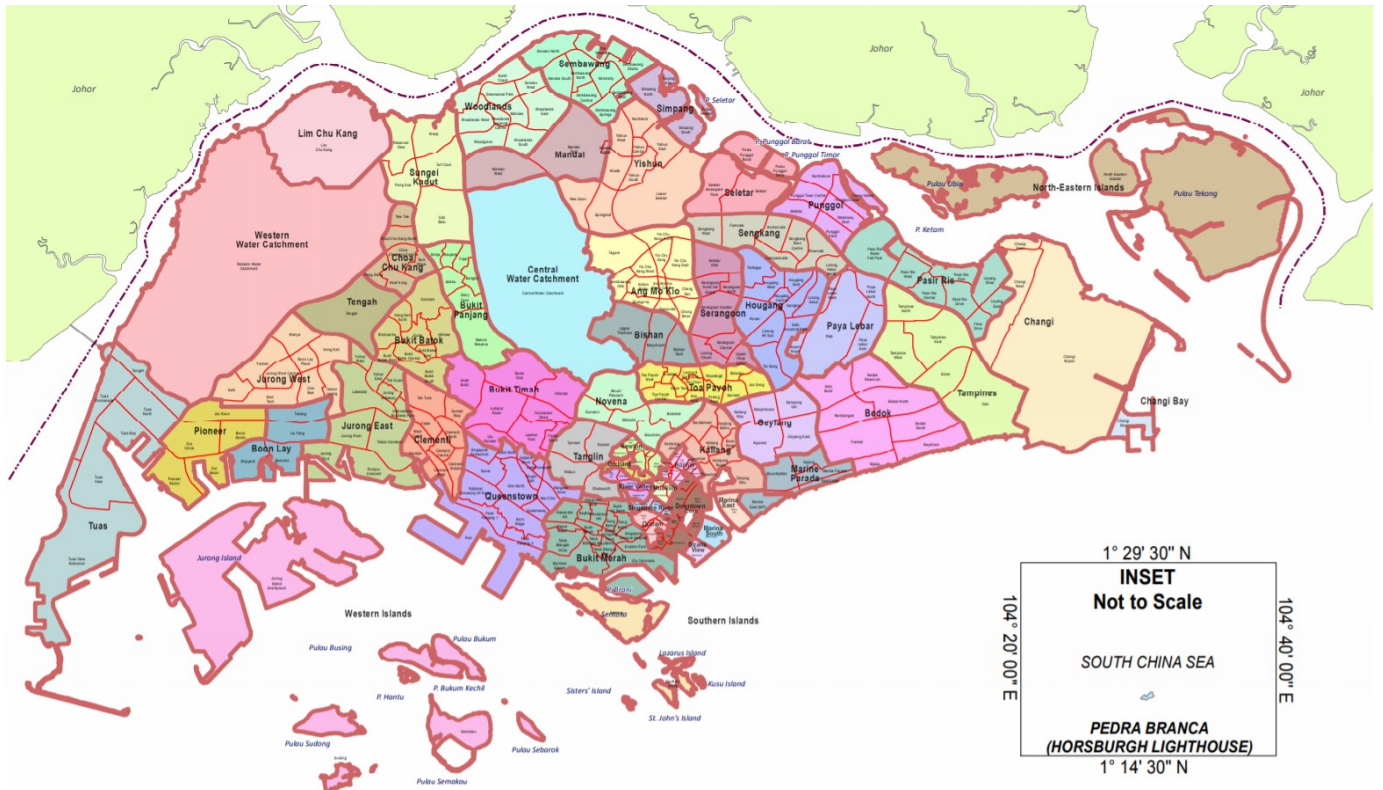
From the above pictures captured from the Internet, we can see that the Area comprises of a number of smaller subzones which for this case, we will use as the neighborhoods.

There is no location coordinates (Latitude and Longitude) for the neighborhoods. We will need to do some more manipulation and call Geopy library to get the required information.

```
In [8]:  neigh = df['Neighborhood'].tolist()
```

```
In [9]: lat = []
        lon = []
        for x in range(len(neigh)):
            try:
                address = neigh[x] + ', Singapore'
                geolocator = Nominatim(user_agent = "sg_explorer")
                location = geolocator.geocode(address)
                lat.append(location.latitude)
                lon.append(location.longitude)
            except:
                lat.append('0')
                lon.append('0')
        print(lat)
        print(lon)
```

[1.3712845, 1.3408630000000001, 1.36820695, 1.4602144, 1.3723986, 1.3112474, 1.3841414, 1.3593241, 1.3817905, 1.3817905, 1.3817905, 1.3128118, 1.3324018, 1.3425058, 1.3171206, 1.3146796, 1.3360277, 1.3210321, 1.3169991, 1.3509859, 1.34860435, 1.354498, '0', 1.302728, 1.3253215, 1.3512849, 1.3490572, 1.3490572, 1.3455305, 1.3588929, 1.3539591999999998, 1.3624042, 1.3553973, 1.277477, 1.277477, 1.2879953, 1.2704395, 1.2476261499999999, 1.2815679, 1.2771286000000002, 1.28115755, '0', 1.264222, 1.2896482, 1.27944885, 1.2725019, 1.2752381, 1.2785818, 1.28617925, 1.28617925, 1.3800554, 1.3651581, 1.3845503, 1.3782544, 1.3463969, 1.3826651, 1.3826778, 1.3358173, 1.3234152, 1.31259105, 1.2904753, 1.3126042, 1.3158886, 1.3429964, 1.3080256, 1.3757082999999999, 1.35107955, 1.35107955, 1.3823894, 1.3892601, 1.3786034, '0', 1.3766705, 1.3974608, 1.3151003, 1.3151003, 1.3151003, 1.29980405, 1.2719239999999998, 1.3080256, 1.3219194, 1.3309244, 1.3033734, 1.276629, 1.2999532999999999, 1.276564, '0', 1.2930272, 1.2904753, 1.2835416999999998, 1.27660565, 1.3164515, 1.3181862, 1.3249544, 1.3296421, 1.32620695, 1.35161105, 1.3710492, 1.3708011, 1.3708011, 1.3839286, 1.3601757, 1.3520481, 1.3353828, 1.2904753, 1.3273734, 1.33298835, 1.3056298499999999, 1.344581, 1.34425, 1.3165214, 1.32089305, 1.3400465, 1.3438518, 1.3438518, 1.3475171000000001, 1.3553973, 1.3396365, 1.3333433499999998, 1.33488355, '0', 1.33828435, 1.3136389, 1.3195690500000001, 1.30558585, 1.3237356, 1.3121599, 1.3082141, 1.3139715, 1.30734955, 1.2973427499999999, 1.4342172, 1.4080963999999998, 1.3052327, 1.3026889, 1.3063254, 1.2968214, 1.2995657999999999, 1.2923829, 1.3065605, 1.3082222, '0', 1.3087228999999998, 1.3128904, 1.31353095, 1.3828816000000002, 1.326226, 1.3190787, 1.3225026, 1.3180495, 1.3267807, 1.2776691, 1.30038375, 1.3060443, 1.2834925, 1.2837372, 1.28489795, 1.2858105, 1.3585664, 1.3753678, 1.3753678, 1.3726634, 1.3730307, 1.37898635, '0', 1.3730307, 1.3174795000000001, 1.3174795000000001, '0', 1.3196353, 1.327735, 1.40297695, 1.4160132, 1.3947438, 1.40519735, 1.4066031, 1.3024428, 1.3113893, 1.311558, 1.3074817, 1.2933374, 1.2953638, 1.2913979, '0', 1.29954015, 1.27620135, 1.27620135, 1.3548836, 1.2977574, 1.30913695, 1.2999069, 1.2958533, 1.2963382, 1.30187, 1.29883365000000002, 1.30030955, 1.29860845000000001, 1.31259105, 1.30128, 1.30684265, 1.30494005, 1.304695, 1.3057009, 1.3027586, 1.3046642, 1.30854205, 1.4098488, 1.4170202, 1.4406369, 1.4490928, 1.4490928, 1.4490928, 1.4405369, 1.458458, 1.4602965, 1.4602965, 1.3935589, 1.394518, 1.3904635, 1.3806234499999999, 1.3919236499999998, 1.3919236499999998, 1.35156575, 1.3854637, 1.3535142, 1.3624579, 1.3713383, '0', 1.3174795000000001, 1.2887213, 1.2881865499999998, 1.29040905, 1.24894585, 1.3892735, 1.4252189, 1.3937774, 1.3375104, 1.4220553, 1.3431881, 1.3560492499999999, 1.3458660999999998, 1.3290801, 1.29902585, 1.30659285, 1.3056239, 1.3065848, 1.3624531, 1.3352618, 1.32778935, 1.3400707, 1.3355302, 1.329711, 1.3398471, 1.3370877, 1.3314141, 1.33198165, 1.33267465, 1.3353028, 1.3391943, 1.3293722, 1.3293722, '0', 1.3293722, 1.3664522, 1.3555198499999999, 1.359286, 1.45415355, 1.4602965, 1.42913595, 1.436897, 1.4271409, 1.436897, 1.4173597, 1.411265, 1.4263793, 1.43571045, 1.398315, 1.42645065, 1.4293839, 1.4293839, 1.4293839]
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```
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429763815054, 103.786216, 103.8330179, 103.85213585565683, 103.83358336447131, 103.84071947
342821, 103.81805726106943, 103.83720383435042, 103.8350282, 103.8350282, 103.8350282]
```

In [10]:
```python
df.insert(1,"Latitude", None)
df.insert(2,"Longitude", None)
df.head()
```

Out[10]:

	Area	Latitude	Longitude	Neighborhood	Population
0	Ang Mo Kio	None	None	Ang Mo Kio Town Centre	5020
1	Ang Mo Kio	None	None	Cheng San	29770
2	Ang Mo Kio	None	None	Chong Boon	27900
3	Ang Mo Kio	None	None	Kebun Bahru	23910
4	Ang Mo Kio	None	None	Sembawang Hills	6890

In [11]:
```python
df['Latitude']= lat
df['Longitude'] = lon
df.head()
```

Out[11]:

	Area	Latitude	Longitude	Neighborhood	Population
0	Ang Mo Kio	1.37128	103.847	Ang Mo Kio Town Centre	5020
1	Ang Mo Kio	1.34086	103.83	Cheng San	29770
2	Ang Mo Kio	1.36821	103.856	Chong Boon	27900
3	Ang Mo Kio	1.46021	103.777	Kebun Bahru	23910
4	Ang Mo Kio	1.3724	103.829	Sembawang Hills	6890

In [12]:
```python
df['Latitude'] = df['Latitude'].astype('float64')
df['Longitude'] = df['Longitude'].astype('float64')
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 281 entries, 0 to 280
Data columns (total 5 columns):
 #   Column        Non-Null Count  Dtype
---  ------        --------------  -----
 0   Area          281 non-null    object
 1   Latitude      281 non-null    float64
 2   Longitude     281 non-null    float64
 3   Neighborhood  281 non-null    object
 4   Population    281 non-null    int64
dtypes: float64(2), int64(1), object(2)
memory usage: 13.2+ KB
```

```
In [13]: df2 = df[(df['Latitude'] != 0) | (df['Longitude'] != 0)]
         df2.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 270 entries, 0 to 280
Data columns (total 5 columns):
 #   Column        Non-Null Count  Dtype
---  ------        --------------  -----
 0   Area          270 non-null    object
 1   Latitude      270 non-null    float64
 2   Longitude     270 non-null    float64
 3   Neighborhood  270 non-null    object
 4   Population    270 non-null    int64
dtypes: float64(2), int64(1), object(2)
memory usage: 12.7+ KB
```

```
In [14]:  import matplotlib.pyplot as plt
          plt.figure(figsize = (11,10), dpi = 100)
          # title
          plt.title('Number of Neighborhoods for each Area in Singapore')
          #On x-axis
          plt.xlabel('Area', fontsize = 15)
          #On y-axis
          plt.ylabel('No.of Neighborhood', fontsize = 15)
          #giving a bar plot
          df2.groupby('Area')['Neighborhood'].count().plot(kind = 'bar')
          #legend
          plt.legend()
          #displays the plot
          plt.show()
```
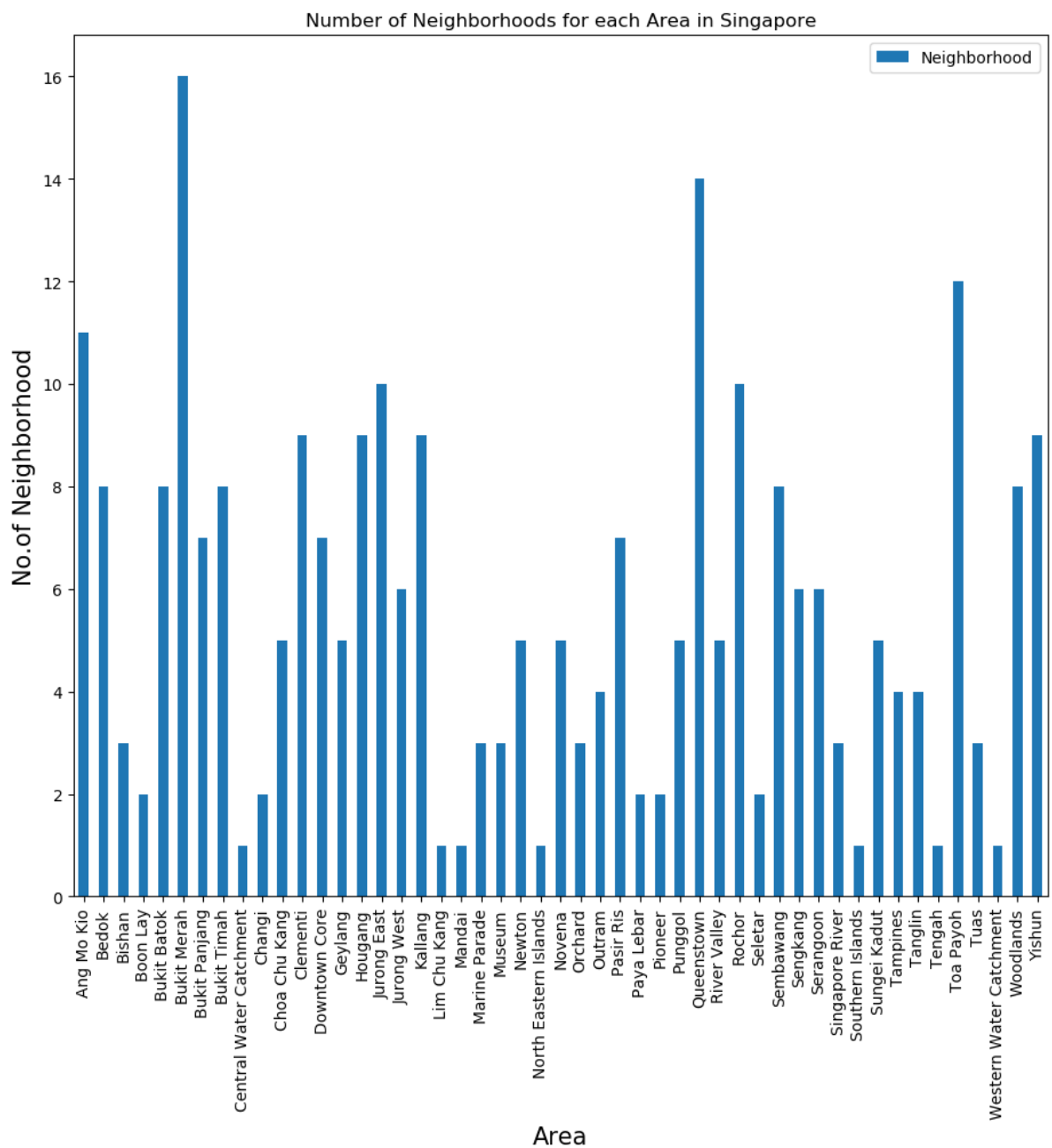

With the location coordinates obtained from Geopy library, we can create a map visualization to view the neighborhoods of Singapore.

```
In [15]: address = 'Singapore'

         geolocator = Nominatim(user_agent = "sg_explorer")
         location = geolocator.geocode(address, timeout = 10)
         latitude = location.latitude
         longitude = location.longitude
         print('The geograpical coordinate of Singapore are {}, {}.'.format(latitude, longitude))
```

The geograpical coordinate of Singapore are 1.3408630000000001, 103.83039182212079.

```
In [16]: map_Sg = folium.Map(location = [latitude, longitude], zoom_start = 11)

         for lat, lng, neighborhood, area in zip(df2['Latitude'], df2['Longitude'],
                                                 df2['Neighborhood'], df2['Area']):
             label = '{},{}'.format(area, neighborhood)
             label = folium.Popup(label, parse_html = True)
             folium.CircleMarker(
                 [lat, lng],
                 radius = 3,
                 popup = label,
                 color = 'red',
                 fill = True,
                 fill_color = '#3186cc',
                 fill_opacity = 0.6,
                 parse_html = False).add_to(map_Sg)

         map_Sg
```

Out[16]:
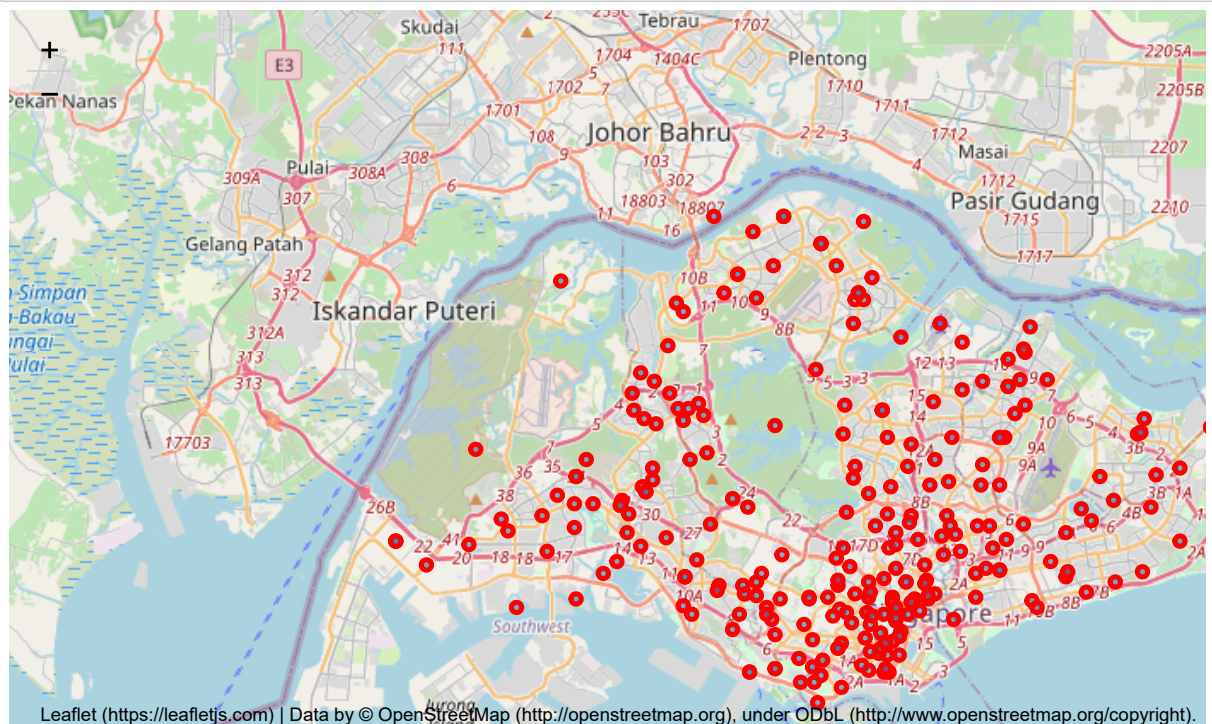
Getting the venues from Foursquare API

Next we shall use Foursquare API to query the venues in these neighborhoods.

```
In [18]:  def getNearbyVenues(names, latitudes, longitudes, radius = 1000):

              venues_list = []
              for name, lat, lng in zip(names, latitudes, longitudes):


                  url = 'https://api.foursquare.com/v2/venues/explore?&client_id={}&client_secret={}&
          v={}&ll={},{}&radius={}&limit={}'.format(
                      CLIENT_ID,
                      CLIENT_SECRET,
                      VERSION,
                      lat,
                      lng,
                      radius,
                      1000)

                  # make the GET request
                  results = requests.get(url).json()["response"]['groups'][0]['items']

                  # return only relevant information for each nearby venue
                  venues_list.append([(
                      name,
                      lat,
                      lng,
                      v['venue']['name'],
                      v['venue']['id'],
                      v['venue']['location']['lat'],
                      v['venue']['location']['lng'],
                      v['venue']['categories'][0]['name']) for v in results])

              nearby_venues = pd.DataFrame([item for venue_list in venues_list for item in venue_list
          ])
              nearby_venues.columns = ['Neighborhood',
                              'Neighborhood Latitude',
                              'Neighborhood Longitude',
                              'Venue', 'Venue ID',
                              'Venue Latitude',
                              'Venue Longitude',
                              'Venue Category']

              return(nearby_venues)
```

```
In [19]:  sg_venues = getNearbyVenues(names = df2['Neighborhood'], latitudes = df2['Latitude'],
                                       longitudes = df2['Longitude'])
          sg_venues.shape
```

```
Out[19]:  (16427, 8)
```

```
In [20]: sg_venues.head(15)
```

Out[20]:

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue ID	Venue Latitude	Venue Longitude	
0	Ang Mo Kio Town Centre	1.371285	103.846994	Face Ban Mian 非板面 (Ang Mo Kio)	50712b67e4b0548504446dea	1.372031	103.847504	
1	Ang Mo Kio Town Centre	1.371285	103.846994	Old Chang Kee	4bc30123abf495215220c393	1.369094	103.848389	S
2	Ang Mo Kio Town Centre	1.371285	103.846994	FairPrice Xtra	4b15f661f964a52012b623e3	1.369279	103.848886	Su
3	Ang Mo Kio Town Centre	1.371285	103.846994	NTUC FairPrice	4ece4dd693ad987b4a9fb4ef	1.371507	103.847082	Su
4	Ang Mo Kio Town Centre	1.371285	103.846994	MOS Burger	4b1ea04ff964a520e21c24e3	1.369170	103.847831	B
5	Ang Mo Kio Town Centre	1.371285	103.846994	Kam Jia Zhuang Restaurant	4b9f647df964a520032037e3	1.368167	103.844118	
6	Ang Mo Kio Town Centre	1.371285	103.846994	PLAYe	4b5eef6df964a5208b9e29e3	1.369109	103.848225	H
7	Ang Mo Kio Town Centre	1.371285	103.846994	Collin's Grille . Bento	57662f0f498e7856b64833be	1.371713	103.847526	
8	Ang Mo Kio Town Centre	1.371285	103.846994	A&W	5d48d8dfdae4eb0008d85e5a	1.369541	103.849043	
9	Ang Mo Kio Town Centre	1.371285	103.846994	Xi Xiang Feng Yong Tau Foo 喜相逢酿豆腐	4b0a18e6f964a520c02123e3	1.371975	103.846408	
10	Ang Mo Kio Town Centre	1.371285	103.846994	True Fitness	51f77455498e868c8f2bbbbb	1.372891	103.847661	
11	Ang Mo Kio Town Centre	1.371285	103.846994	e品红麻辣香锅 Mala Hot Pot	53c68f51498efd710da56841	1.371498	103.847803	
12	Ang Mo Kio Town Centre	1.371285	103.846994	Dog Run @ Bishan Park	4d5cc196775f8cfae9f2b9e0	1.365967	103.844024	
13	Ang Mo Kio Town Centre	1.371285	103.846994	Swensen's	5213643e11d236c03cd2810f	1.369112	103.847718	
14	Ang Mo Kio Town Centre	1.371285	103.846994	Pepper Lunch	4b06a9c8f964a52059ee22e3	1.369107	103.847791	

```
In [22]: print('There are {} uniques categories.'.format(len(sg_venues['Venue Category'].unique())))

         There are 382 uniques categories.
```

```
In [23]: sg_venues_clean = sg_venues.drop_duplicates(subset='Venue ID', keep="first")
```

```
In [24]: sg_venues_clean.shape
```

Out[24]: (6276, 8)

```
In [25]: sg_venues_clean.groupby('Neighborhood').count()
```

Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue ID	Venue Latitude	Venue Longitude	Venue Category
Admiralty	28	28	28	28	28	28	28
Alexandra Hill	84	84	84	84	84	84	84
Aljunied	100	100	100	100	100	100	100
Anak Bukit	75	75	75	75	75	75	75
Anchorvale	22	22	22	22	22	22	22
Ang Mo Kio Town Centre	81	81	81	81	81	81	81
Anson	49	49	49	49	49	49	49
Balestier	54	54	54	54	54	54	54
Bangkit	40	40	40	40	40	40	40
Bayshore	45	45	45	45	45	45	45
Bedok North	41	41	41	41	41	41	41
Bedok Reservoir	13	13	13	13	13	13	13
Bedok South	8	8	8	8	8	8	8
Bencoolen	2	2	2	2	2	2	2
Bendemeer	47	47	47	47	47	47	47
Bidadari	22	22	22	22	22	22	22
Bishan East	67	67	67	67	67	67	67
Boat Quay	2	2	2	2	2	2	2
Boon Keng	39	39	39	39	39	39	39
Boon Lay Place	16	16	16	16	16	16	16
Boon Teck	22	22	22	22	22	22	22
Boulevard	1	1	1	1	1	1	1
Braddell	65	65	65	65	65	65	65
Bras Basah	19	19	19	19	19	19	19
Bugis	85	85	85	85	85	85	85
Bukit Batok Central	52	52	52	52	52	52	52
Bukit Batok East	11	11	11	11	11	11	11
Bukit Batok West	26	26	26	26	26	26	26
Bukit Ho Swee	100	100	100	100	100	100	100
Bukit Merah	54	54	54	54	54	54	54
Cairnhill	45	45	45	45	45	45	45
Central Water Catchment	3	3	3	3	3	3	3
Changi Point	32	32	32	32	32	32	32
Chatsworth	13	13	13	13	13	13	13
Cheng San	19	19	19	19	19	19	19
China Square	15	15	15	15	15	15	15
Chinatown	2	2	2	2	2	2	2
Choa Chu Kang Central	48	48	48	48	48	48	48
Choa Chu Kang North	21	21	21	21	21	21	21
Chong Boon	31	31	31	31	31	31	31
City Hall	17	17	17	17	17	17	17

Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue ID	Venue Latitude	Venue Longitude	Venue Category
City Terminals	4	4	4	4	4	4	4
Clarke Quay	1	1	1	1	1	1	1
Clementi Central	92	92	92	92	92	92	92
Clementi Woods	64	64	64	64	64	64	64
Commonwealth	32	32	32	32	32	32	32
Compassvale	25	25	25	25	25	25	25
Coronation Road	51	51	51	51	51	51	51
Crawford	31	31	31	31	31	31	31
Dairy Farm	10	10	10	10	10	10	10
Defu Industrial Park	35	35	35	35	35	35	35
Depot Road	78	78	78	78	78	78	78
Dhoby Ghaut	62	62	62	62	62	62	62
Dover	20	20	20	20	20	20	20
Dunearn	6	6	6	6	6	6	6
Everton Park	99	99	99	99	99	99	99
Faber	13	13	13	13	13	13	13
Fajar	2	2	2	2	2	2	2
Farrer Court	100	100	100	100	100	100	100
Fernvale	60	60	60	60	60	60	60
Flora Drive	23	23	23	23	23	23	23
Fort Canning	47	47	47	47	47	47	47
Frankel	87	87	87	87	87	87	87
Gali Batu	4	4	4	4	4	4	4
Geylang Bahru	12	12	12	12	12	12	12
Geylang East	48	48	48	48	48	48	48
Ghim Moh	7	7	7	7	7	7	7
Gombak	24	24	24	24	24	24	24
Goodwood Park	6	6	6	6	6	6	6
Greenwood Park	19	19	19	19	19	19	19
Guilin	1	1	1	1	1	1	1
Gul Circle	9	9	9	9	9	9	9
Henderson Hill	19	19	19	19	19	19	19
Hillcrest	100	100	100	100	100	100	100
Hillview	35	35	35	35	35	35	35
Holland Road	100	100	100	100	100	100	100
Hong Kah North	21	21	21	21	21	21	21
Hougang Central	60	60	60	60	60	60	60
Hougang East	8	8	8	8	8	8	8
Institution Hill	2	2	2	2	2	2	2
International Business Park	56	56	56	56	56	56	56
Jelebu	36	36	36	36	36	36	36
Joo Koon	22	22	22	22	22	22	22
Joo Seng	8	8	8	8	8	8	8
Jurong Gateway	39	39	39	39	39	39	39

Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue ID	Venue Latitude	Venue Longitude	Venue Category
Jurong Port	8	8	8	8	8	8	8
Jurong River	18	18	18	18	18	18	18
Jurong West Central	63	63	63	63	63	63	63
Kaki Bukit	16	16	16	16	16	16	16
Kallang Bahru	5	5	5	5	5	5	5
Kallang Way	36	36	36	36	36	36	36
Kampong Bugis	26	26	26	26	26	26	26
Kampong Glam	5	5	5	5	5	5	5
Kampong Java	75	75	75	75	75	75	75
Kampong Ubi	43	43	43	43	43	43	43
Kangkar	33	33	33	33	33	33	33
Katong	99	99	99	99	99	99	99
Keat Hong	15	15	15	15	15	15	15
Kebun Bahru	20	20	20	20	20	20	20
Kembangan	28	28	28	28	28	28	28
Kent Ridge	74	74	74	74	74	74	74
Khatib	46	46	46	46	46	46	46
Kian Teck	22	22	22	22	22	22	22
Kim Keat	15	15	15	15	15	15	15
Kovan	52	52	52	52	52	52	52
Kranji	14	14	14	14	14	14	14
Lakeside	19	19	19	19	19	19	19
Leedon Park	2	2	2	2	2	2	2
Leonie Hill	4	4	4	4	4	4	4
Lim Chu Kang	6	6	6	6	6	6	6
Little India	1	1	1	1	1	1	1
Lorong 8 Toa Payoh	28	28	28	28	28	28	28
Lorong Ah Soo	33	33	33	33	33	33	33
Lorong Chuan	52	52	52	52	52	52	52
Lower Seletar	22	22	22	22	22	22	22
Loyang East	6	6	6	6	6	6	6
Mackenzie	1	1	1	1	1	1	1
Macpherson	18	18	18	18	18	18	18
Malcolm	19	19	19	19	19	19	19
Mandai Estate	7	7	7	7	7	7	7
Margaret Drive	16	16	16	16	16	16	16
Marine Parade	13	13	13	13	13	13	13
Maritime Square	67	67	67	67	67	67	67
Marymount	51	51	51	51	51	51	51
Matilda	35	35	35	35	35	35	35
Mei Chin	36	36	36	36	36	36	36
Midview	25	25	25	25	25	25	25
Monk's Hill	2	2	2	2	2	2	2
Moulmein	2	2	2	2	2	2	2

Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue ID	Venue Latitude	Venue Longitude	Venue Category
Mount Pleasant	3	3	3	3	3	3	3
Mountbatten	35	35	35	35	35	35	35
Nassim	5	5	5	5	5	5	5
Nature Reserve	26	26	26	26	26	26	26
Nee Soon	84	84	84	84	84	84	84
Newton Circus	27	27	27	27	27	27	27
North Coast	9	9	9	9	9	9	9
Northland	27	27	27	27	27	27	27
Northshore	31	31	31	31	31	31	31
One Tree Hill	2	2	2	2	2	2	2
Orange Grove	43	43	43	43	43	43	43
Oxley	3	3	3	3	3	3	3
Pang Sua	1	1	1	1	1	1	1
Pasir Panjang 1	27	27	27	27	27	27	27
Pasir Ris Central	34	34	34	34	34	34	34
Pasir Ris Drive	5	5	5	5	5	5	5
Pasir Ris Park	46	46	46	46	46	46	46
Paterson	2	2	2	2	2	2	2
Paya Lebar East	11	11	11	11	11	11	11
Pearl's Hill	10	10	10	10	10	10	10
Penjuru Crescent	8	8	8	8	8	8	8
People's Park	1	1	1	1	1	1	1
Port	29	29	29	29	29	29	29
Potong Pasir	11	11	11	11	11	11	11
Punggol Field	40	40	40	40	40	40	40
Punggol Town Centre	5	5	5	5	5	5	5
Queensway	13	13	13	13	13	13	13
Raffles Place	45	45	45	45	45	45	45
Redhill	18	18	18	18	18	18	18
Reservoir View	26	26	26	26	26	26	26
Ridout	9	9	9	9	9	9	9
Rivervale	8	8	8	8	8	8	8
Robertson Quay	1	1	1	1	1	1	1
Samulun	7	7	7	7	7	7	7
Saujana	13	13	13	13	13	13	13
Seletar	10	10	10	10	10	10	10
Seletar Aerospace Park	12	12	12	12	12	12	12
Seletar Hills	5	5	5	5	5	5	5
Sembawang Central	48	48	48	48	48	48	48
Sembawang Hills	36	36	36	36	36	36	36
Sembawang Springs	13	13	13	13	13	13	13
Sembawang Straits	28	28	28	28	28	28	28
Sengkang Town Centre	7	7	7	7	7	7	7

Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue ID	Venue Latitude	Venue Longitude	Venue Category
Senja	2	2	2	2	2	2	2
Senoko North	8	8	8	8	8	8	8
Sentosa	35	35	35	35	35	35	35
Serangoon Central	26	26	26	26	26	26	26
Serangoon Garden	45	45	45	45	45	45	45
Serangoon North	31	31	31	31	31	31	31
Shangri-La	100	100	100	100	100	100	100
Siglap	12	12	12	12	12	12	12
Simei	53	53	53	53	53	53	53
Singapore General Hospital	4	4	4	4	4	4	4
Somerset	14	14	14	14	14	14	14
Springleaf	24	24	24	24	24	24	24
Sunset Way	30	30	30	30	30	30	30
Swiss Club	37	37	37	37	37	37	37
Tagore	13	13	13	13	13	13	13
Tai Seng	23	23	23	23	23	23	23
Taman Jurong	16	16	16	16	16	16	16
Tampines East	31	31	31	31	31	31	31
Tampines West	47	47	47	47	47	47	47
Tanglin	91	91	91	91	91	91	91
Tanjong Pagar	1	1	1	1	1	1	1
Tanjong Rhu	47	47	47	47	47	47	47
Teban Gardens	4	4	4	4	4	4	4
Teck Whye	1	1	1	1	1	1	1
Telok Blangah Drive	24	24	24	24	24	24	24
Telok Blangah Rise	23	23	23	23	23	23	23
Telok Blangah Way	4	4	4	4	4	4	4
Tengah	2	2	2	2	2	2	2
Tiong Bahru	9	9	9	9	9	9	9
Toa Payoh West	12	12	12	12	12	12	12
Toh Guan	10	10	10	10	10	10	10
Toh Tuck	18	18	18	18	18	18	18
Townsville	30	30	30	30	30	30	30
Tuas Bay	6	6	6	6	6	6	6
Tukang	21	21	21	21	21	21	21
Turf Club	3	3	3	3	3	3	3
Tyersall	2	2	2	2	2	2	2
Ulu Pandan	22	22	22	22	22	22	22
Upper Thomson	12	12	12	12	12	12	12
Victoria	21	21	21	21	21	21	21
Waterway East	1	1	1	1	1	1	1
West Coast	14	14	14	14	14	14	14
Western Water Catchment	2	2	2	2	2	2	2

	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue ID	Venue Latitude	Venue Longitude	Venue Category
Neighborhood							
Woodgrove	58	58	58	58	58	58	58
Woodlands East	29	29	29	29	29	29	29
Woodlands South	7	7	7	7	7	7	7
Woodleigh	4	4	4	4	4	4	4
Xilin	78	78	78	78	78	78	78
Yew Tee	23	23	23	23	23	23	23
Yio Chu Kang	22	22	22	22	22	22	22
Yishun Central	6	6	6	6	6	6	6
Yuhua East	6	6	6	6	6	6	6
Yunnan	16	16	16	16	16	16	16

Analyze the venue categories in each neighborhood

After calling FourSquare API to get the nearby venues in each neighborhood, we can further analyze the data to find out in more details, what are the most popular venues in each neighborhood and also to explore whether there is any similarities or difference in the venue categories in each neighborhood.

First, we get a new dataframe to store the venue category from the sg_venues_clean dataframe. We then encode a value to each occurrence of the venue found.

In [26]:
```python
# one hot encoding
sg_onehot = pd.get_dummies(sg_venues_clean[['Venue Category']], prefix="", prefix_sep = "")

# add neighborhood column back to dataframe
sg_onehot['Neighborhood'] = sg_venues_clean['Neighborhood']

# move neighborhood column to the first column
fixed_columns = [sg_onehot.columns[-1]] + list(sg_onehot.columns[:-1])
sg_onehot = sg_onehot[fixed_columns]

sg_onehot.head()
```

Out[26]:

	Zoo Exhibit	ATM	Accessories Store	Airport	Airport Lounge	Airport Service	Airport Terminal	American Restaurant	Aquarium	Arcade	Art Gallery	Museu
0	0	0	0	0	0	0	0	0	0	0	0	
1	0	0	0	0	0	0	0	0	0	0	0	
2	0	0	0	0	0	0	0	0	0	0	0	
3	0	0	0	0	0	0	0	0	0	0	0	
4	0	0	0	0	0	0	0	0	0	0	0	

In [27]:
```python
sg_onehot.shape
```

Out[27]: (6276, 382)

```
sg_group = sg_onehot.groupby('Neighborhood').mean().reset_index()
sg_group
```

	Neighborhood	Zoo Exhibit	ATM	Accessories Store	Airport	Airport Lounge	Airport Service	Airport Terminal	American Restaurant	Aquari
0	Admiralty	0.000000	0.000000	0.000000	0.035714	0.000000	0.000000	0.0	0.000000	0.000
1	Alexandra Hill	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.011905	0.000
2	Aljunied	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
3	Anak Bukit	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
4	Anchorvale	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
5	Ang Mo Kio Town Centre	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
6	Anson	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
7	Balestier	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
8	Bangkit	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.025000	0.000
9	Bayshore	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
10	Bedok North	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
11	Bedok Reservoir	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
12	Bedok South	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
13	Bencoolen	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
14	Bendemeer	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
15	Bidadari	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
16	Bishan East	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
17	Boat Quay	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
18	Boon Keng	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
19	Boon Lay Place	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
20	Boon Teck	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
21	Boulevard	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
22	Braddell	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
23	Bras Basah	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
24	Bugis	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
25	Bukit Batok Central	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
26	Bukit Batok East	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
27	Bukit Batok West	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.038462	0.000
28	Bukit Ho Swee	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
29	Bukit Merah	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.018519	0.000
30	Cairnhill	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.022222	0.000
31	Central Water Catchment	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
32	Changi Point	0.000000	0.000000	0.000000	0.156250	0.093750	0.031250	0.0	0.000000	0.000
33	Chatsworth	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
34	Cheng San	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
35	China Square	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
36	Chinatown	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
37	Choa Chu Kang Central	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
38	Choa Chu Kang North	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000

	Neighborhood	Zoo Exhibit	ATM	Accessories Store	Airport	Airport Lounge	Airport Service	Airport Terminal	American Restaurant	Aquari
39	Chong Boon	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
40	City Hall	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
41	City Terminals	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
42	Clarke Quay	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
43	Clementi Central	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.010870	0.000
44	Clementi Woods	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
45	Commonwealth	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
46	Compassvale	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
47	Coronation Road	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
48	Crawford	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
49	Dairy Farm	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
50	Defu Industrial Park	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
51	Depot Road	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.012821	0.000
52	Dhoby Ghaut	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
53	Dover	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
54	Dunearn	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
55	Everton Park	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.020202	0.000
56	Faber	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
57	Fajar	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
58	Farrer Court	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
59	Fernvale	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.033333	0.000
60	Flora Drive	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.043478	0.000
61	Fort Canning	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
62	Frankel	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.022989	0.000
63	Gali Batu	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
64	Geylang Bahru	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
65	Geylang East	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
66	Ghim Moh	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
67	Gombak	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
68	Goodwood Park	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
69	Greenwood Park	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
70	Guilin	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
71	Gul Circle	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
72	Henderson Hill	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
73	Hillcrest	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
74	Hillview	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.028571	0.000
75	Holland Road	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.010000	0.000
76	Hong Kah North	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
77	Hougang Central	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
78	Hougang East	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000

	Neighborhood	Zoo Exhibit	ATM	Accessories Store	Airport	Airport Lounge	Airport Service	Airport Terminal	American Restaurant	Aquari
79	Institution Hill	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
80	International Business Park	0.000000	0.000000	0.017857	0.000000	0.000000	0.000000	0.0	0.000000	0.000
81	Jelebu	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
82	Joo Koon	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
83	Joo Seng	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
84	Jurong Gateway	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
85	Jurong Port	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
86	Jurong River	0.055556	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
87	Jurong West Central	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.015873	0.000
88	Kaki Bukit	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
89	Kallang Bahru	0.000000	0.000000	0.200000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
90	Kallang Way	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
91	Kampong Bugis	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
92	Kampong Glam	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
93	Kampong Java	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
94	Kampong Ubi	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
95	Kangkar	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
96	Katong	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
97	Keat Hong	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
98	Kebun Bahru	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
99	Kembangan	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
100	Kent Ridge	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
101	Khatib	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.021739	0.000
102	Kian Teck	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
103	Kim Keat	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
104	Kovan	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
105	Kranji	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
106	Lakeside	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
107	Leedon Park	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
108	Leonie Hill	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
109	Lim Chu Kang	0.166667	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
110	Little India	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
111	Lorong 8 Toa Payoh	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
112	Lorong Ah Soo	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
113	Lorong Chuan	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.019231	0.000
114	Lower Seletar	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
115	Loyang East	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
116	Mackenzie	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
117	Macpherson	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.055556	0.000
118	Malcolm	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
119	Mandai Estate	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000

	Neighborhood	Zoo Exhibit	ATM	Accessories Store	Airport	Airport Lounge	Airport Service	Airport Terminal	American Restaurant	Aquari
120	Margaret Drive	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000(
121	Marine Parade	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000(
122	Maritime Square	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.014925	0.014!
123	Marymount	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000(
124	Matilda	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000(
125	Mei Chin	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000(
126	Midview	0.000000	0.000000	0.040000	0.000000	0.000000	0.000000	0.0	0.000000	0.000(
127	Monk's Hill	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000(
128	Moulmein	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000(
129	Mount Pleasant	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000(
130	Mountbatten	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000(
131	Nassim	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000(
132	Nature Reserve	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000(
133	Nee Soon	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000(
134	Newton Circus	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.111111	0.000(
135	North Coast	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000(
136	Northland	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000(
137	Northshore	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000(
138	One Tree Hill	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000(
139	Orange Grove	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.023256	0.000(
140	Oxley	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000(
141	Pang Sua	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000(
142	Pasir Panjang 1	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000(
143	Pasir Ris Central	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.029412	0.000(
144	Pasir Ris Drive	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000(
145	Pasir Ris Park	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000(
146	Paterson	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000(
147	Paya Lebar East	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000(
148	Pearl's Hill	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000(
149	Penjuru Crescent	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000(
150	People's Park	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000(
151	Port	0.000000	0.000000	0.000000	0.000000	0.068966	0.000000	0.0	0.000000	0.000(
152	Potong Pasir	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000(
153	Punggol Field	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000(
154	Punggol Town Centre	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000(
155	Queensway	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000(
156	Raffles Place	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000(
157	Redhill	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000(
158	Reservoir View	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000(
159	Ridout	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000(

	Neighborhood	Zoo Exhibit	ATM	Accessories Store	Airport	Airport Lounge	Airport Service	Airport Terminal	American Restaurant	Aquari
160	Rivervale	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
161	Robertson Quay	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
162	Samulun	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
163	Saujana	0.000000	0.000000	0.076923	0.000000	0.000000	0.000000	0.0	0.076923	0.000
164	Seletar	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.2	0.000000	0.000
165	Seletar Aerospace Park	0.000000	0.000000	0.000000	0.250000	0.000000	0.083333	0.0	0.000000	0.000
166	Seletar Hills	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
167	Sembawang Central	0.000000	0.020833	0.000000	0.000000	0.000000	0.000000	0.0	0.020833	0.000
168	Sembawang Hills	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
169	Sembawang Springs	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
170	Sembawang Straits	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
171	Sengkang Town Centre	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
172	Senja	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
173	Senoko North	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
174	Sentosa	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
175	Serangoon Central	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
176	Serangoon Garden	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
177	Serangoon North	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
178	Shangri-La	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.010000	0.000
179	Siglap	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
180	Simei	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
181	Singapore General Hospital	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
182	Somerset	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
183	Springleaf	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
184	Sunset Way	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
185	Swiss Club	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
186	Tagore	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
187	Tai Seng	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
188	Taman Jurong	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
189	Tampines East	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
190	Tampines West	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
191	Tanglin	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.010989	0.000
192	Tanjong Pagar	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
193	Tanjong Rhu	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.021277	0.000
194	Teban Gardens	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
195	Teck Whye	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
196	Telok Blangah Drive	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000

	Neighborhood	Zoo Exhibit	ATM	Accessories Store	Airport	Airport Lounge	Airport Service	Airport Terminal	American Restaurant	Aquari
197	Telok Blangah Rise	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
198	Telok Blangah Way	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
199	Tengah	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
200	Tiong Bahru	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
201	Toa Payoh West	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
202	Toh Guan	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
203	Toh Tuck	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.055556	0.000
204	Townsville	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
205	Tuas Bay	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
206	Tukang	0.142857	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
207	Turf Club	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
208	Tyersall	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
209	Ulu Pandan	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
210	Upper Thomson	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
211	Victoria	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
212	Waterway East	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
213	West Coast	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
214	Western Water Catchment	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
215	Woodgrove	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
216	Woodlands East	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
217	Woodlands South	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
218	Woodleigh	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
219	Xilin	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
220	Yew Tee	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
221	Yio Chu Kang	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
222	Yishun Central	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.166667	0.000
223	Yuhua East	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000
224	Yunnan	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.000

In [29]: `sg_group.shape`

Out[29]: (225, 382)

In [30]:
```python
def return_most_common_venues(row, num_top_venues):
    row_categories = row.iloc[1:]
    row_categories_sorted = row_categories.sort_values(ascending = False)

    return row_categories_sorted.index.values[0:num_top_venues]
```

```
In [31]: num_top_venues = 10

         indicators = ['st', 'nd', 'rd']

         # create columns according to number of top venues
         columns = ['Neighborhood']
         for ind in np.arange(num_top_venues):
             try:
                 columns.append('{}{} Most Common Venue'.format(ind+1, indicators[ind]))
             except:
                 columns.append('{}th Most Common Venue'.format(ind+1))

         # create a new dataframe
         sg_venues_sorted = pd.DataFrame(columns = columns)
         sg_venues_sorted['Neighborhood'] = sg_group['Neighborhood']

         for ind in np.arange(sg_group.shape[0]):
             sg_venues_sorted.iloc[ind, 1:] = return_most_common_venues(sg_group.iloc[ind, :], num_t
         op_venues)

         sg_venues_sorted
```

	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 Mo Commo Venu
0	Admiralty	Bus Station	Food Court	Park	Fast Food Restaurant	Coffee Shop	Shopping Mall	Supermark
1	Alexandra Hill	Chinese Restaurant	Food Court	Café	Coffee Shop	Supermarket	Asian Restaurant	Cocktail B
2	Aljunied	Chinese Restaurant	Food Court	Noodle House	Vegetarian / Vegan Restaurant	Hotel	Seafood Restaurant	BBQ Joi
3	Anak Bukit	Korean Restaurant	Chinese Restaurant	Café	Food Court	Thai Restaurant	Coffee Shop	India Restaura
4	Anchorvale	Food Court	Convenience Store	Park	Asian Restaurant	Bus Line	Fast Food Restaurant	Metro Stati
5	Ang Mo Kio Town Centre	Food Court	Chinese Restaurant	Coffee Shop	Dessert Shop	Noodle House	Convenience Store	Supermark
6	Anson	Coffee Shop	Café	Spanish Restaurant	Bar	Japanese Restaurant	Restaurant	Korea Restaura
7	Balestier	Chinese Restaurant	Hotel	Bakery	Dessert Shop	Fast Food Restaurant	Coffee Shop	Sandwic Plac
8	Bangkit	Fast Food Restaurant	Bus Station	Food Court	Coffee Shop	Park	Noodle House	Asia Restaura
9	Bayshore	Chinese Restaurant	Asian Restaurant	Food Court	Indian Restaurant	Beach	Coffee Shop	Bus Stati
10	Bedok North	Food Court	Coffee Shop	Indian Restaurant	Supermarket	Fast Food Restaurant	Asian Restaurant	Ca
11	Bedok Reservoir	Bus Line	College Cafeteria	Fast Food Restaurant	Other Great Outdoors	Asian Restaurant	Bus Station	Basketb Cou
12	Bedok South	Food Court	Coffee Shop	Ice Cream Shop	Asian Restaurant	Malay Restaurant	Dessert Shop	Supermark
13	Bencoolen	French Restaurant	General College & University	Zoo	Fishing Spot	Exhibit	Factory	Far
14	Bendemeer	Chinese Restaurant	Food Court	Coffee Shop	Supermarket	Noodle House	Seafood Restaurant	Vegetarian Vega Restaura
15	Bidadari	Convenience Store	Asian Restaurant	Café	Food Court	Noodle House	Bus Station	Gener Entertainme
16	Bishan East	Food Court	Coffee Shop	Chinese Restaurant	Thai Restaurant	Café	Bubble Tea Shop	Seafoo Restaura
17	Boat Quay	Speakeasy	Nightclub	Zoo	Fishing Spot	Exhibit	Factory	Far
18	Boon Keng	Chinese Restaurant	Noodle House	Asian Restaurant	Food Court	Coffee Shop	Indian Restaurant	Foo
19	Boon Lay Place	Food Court	Pizza Place	Seafood Restaurant	Gym	Café	Bakery	Chines Restaura
20	Boon Teck	Chinese Restaurant	Food Court	Coffee Shop	Asian Restaurant	Noodle House	Park	Bake
21	Boulevard	Noodle House	Zoo	Flea Market	Factory	Farm	Farmers Market	Fast Foo Restaura
22	Braddell	Noodle House	Chinese Restaurant	Food Court	Coffee Shop	Café	Bakery	Metro Stati
23	Bras Basah	Hotel	Bubble Tea Shop	Café	Ramen Restaurant	Arts & Crafts Store	Gym / Fitness Center	Other Repa Sho
24	Bugis	Hotel	Bakery	Italian Restaurant	Café	Dessert Shop	Thai Restaurant	Coffee Sho
25	Bukit Batok Central	Coffee Shop	Food Court	Chinese Restaurant	Fast Food Restaurant	Malay Restaurant	Sandwich Place	Bus Lir
26	Bukit Batok East	Food Court	Bus Stop	Convenience Store	Halal Restaurant	Grocery Store	Fast Food Restaurant	Light Ra Stati

	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 Mo Comm Venu
27	Bukit Batok West	Food Court	Chinese Restaurant	Coffee Shop	Indian Restaurant	Asian Restaurant	Market	Din
28	Bukit Ho Swee	Chinese Restaurant	Café	Bakery	Japanese Restaurant	Noodle House	Food Court	Booksto
29	Bukit Merah	Clothing Store	Multiplex	Bus Stop	Japanese Restaurant	Asian Restaurant	Food Court	Ca
30	Cairnhill	Boutique	Clothing Store	Shopping Mall	Sushi Restaurant	Indonesian Restaurant	Asian Restaurant	Japanes Restaura
31	Central Water Catchment	Reservoir	Café	Food Court	Fish Market	Exhibit	Factory	Far
32	Changi Point	Airport	Airport Lounge	Border Crossing	Hotel	Latin American Restaurant	Chinese Restaurant	Gener Entertainme
33	Chatsworth	Bus Station	Deli / Bodega	Shopping Mall	Gourmet Shop	Electronics Store	Asian Restaurant	Bus Lir
34	Cheng San	Flower Shop	Trail	Metro Station	Park	Reservoir	Sandwich Place	Mov Theat
35	China Square	French Restaurant	Hostel	Chinese Restaurant	Flea Market	Coffee Shop	Noodle House	Japanes Restaura
36	Chinatown	Food Court	Tea Room	Zoo	Fishing Spot	Exhibit	Factory	Far
37	Choa Chu Kang Central	Coffee Shop	Fast Food Restaurant	Food Court	Café	Bus Station	Noodle House	Chines Restaura
38	Choa Chu Kang North	Gym	Food Court	Café	Fast Food Restaurant	Gym / Fitness Center	Diner	Shoppir M
39	Chong Boon	Food Court	Chinese Restaurant	Café	Bakery	Steakhouse	Coffee Shop	Farme Mark
40	City Hall	Hotel	Buffet	Park	Clothing Store	Market	Café	Bubble Te Shc
41	City Terminals	Boat or Ferry	Resort	Harbor / Marina	Zoo	Fishing Spot	Factory	Far
42	Clarke Quay	Hostel	Zoo	Fishing Spot	Exhibit	Factory	Farm	Farme Mark
43	Clementi Central	Food Court	Chinese Restaurant	Coffee Shop	Asian Restaurant	Café	Gym	Bake
44	Clementi Woods	Beach	Chinese Restaurant	Sandwich Place	Italian Restaurant	Fast Food Restaurant	Bakery	Gym / Fitnes Cent
45	Commonwealth	Café	Chinese Restaurant	Convenience Store	Indian Restaurant	Vegetarian / Vegan Restaurant	Asian Restaurant	Coffee Shc
46	Compassvale	Coffee Shop	Fast Food Restaurant	Basketball Court	Asian Restaurant	Restaurant	Sandwich Place	Bake
47	Coronation Road	Bakery	Café	Park	Chinese Restaurant	Bus Station	Pizza Place	Japanes Restaura
48	Crawford	Thai Restaurant	Vietnamese Restaurant	Hotel	Café	Food Court	Dessert Shop	Frenc Restaura
49	Dairy Farm	Trail	Nature Preserve	Parking	Rest Area	Athletics & Sports	Tourist Information Center	Food Servi
50	Defu Industrial Park	Coffee Shop	Food Court	Noodle House	Café	Convenience Store	Bakery	Bus Statio
51	Depot Road	Food Court	Chinese Restaurant	Coffee Shop	Café	Bakery	Noodle House	Art Galle
52	Dhoby Ghaut	Japanese Restaurant	Shopping Mall	Wine Bar	Hotel	Clothing Store	Spa	Cosmetic Shc
53	Dover	Café	Bus Station	Convenience Store	French Restaurant	Basketball Court	Soccer Field	Th Restaura

	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
54	Dunearn	Café	Spa	Japanese Restaurant	Hostel	Bus Stop	Bus Station	Zo
55	Everton Park	Japanese Restaurant	Coffee Shop	Italian Restaurant	Hotel	Bakery	Café	Wine B
56	Faber	Office	Seafood Restaurant	Gym	Music Venue	Fast Food Restaurant	Chinese Restaurant	Asia Restaura
57	Fajar	Martial Arts School	Basketball Court	Zoo	Exhibit	Farm	Farmers Market	Fast Foo Restaura
58	Farrer Court	Indian Restaurant	Café	Chinese Restaurant	Hostel	Vegetarian / Vegan Restaurant	BBQ Joint	Hot
59	Fernvale	Asian Restaurant	Coffee Shop	Café	Thai Restaurant	Bus Station	Fast Food Restaurant	Supermark
60	Flora Drive	Bus Station	Fast Food Restaurant	Gym / Fitness Center	Gym	Asian Restaurant	Fried Chicken Joint	Food & Dri Sh
61	Fort Canning	Hotel	Café	Japanese Restaurant	BBQ Joint	Yoga Studio	Pizza Place	Coffee Sh
62	Frankel	Indian Restaurant	Chinese Restaurant	Asian Restaurant	Coffee Shop	Café	Spa	Dessert Sho
63	Gali Batu	Bus Station	Sports Club	Zoo	Fishing Spot	Factory	Farm	Farme Mark
64	Geylang Bahru	Coffee Shop	Gym	Gym / Fitness Center	Thai Restaurant	Fast Food Restaurant	Photography Studio	Chines Restaura
65	Geylang East	Asian Restaurant	Fast Food Restaurant	Supermarket	Steakhouse	Food Court	Noodle House	Hotp Restaura
66	Ghim Moh	Café	Bar	Bookstore	Hotel	Supermarket	Coffee Shop	Flea Mark
67	Gombak	Coffee Shop	Golf Course	Bus Station	Ice Cream Shop	Bus Line	Gym	B
68	Goodwood Park	Boutique	Bubble Tea Shop	Chocolate Shop	Department Store	Gym / Fitness Center	Food Stand	Food Tru
69	Greenwood Park	Bus Station	Asian Restaurant	Sandwich Place	Supermarket	Salad Place	Badminton Court	Fast Foo Restaura
70	Guilin	Food Court	Zoo	Fishing Spot	Exhibit	Factory	Farm	Farme Mark
71	Gul Circle	Coffee Shop	Park	Electronics Store	Seafood Restaurant	Food Court	Restaurant	Harbo Marir
72	Henderson Hill	Chinese Restaurant	Coffee Shop	Seafood Restaurant	Pool	Malay Restaurant	Hainan Restaurant	Departme Sto
73	Hillcrest	Hotel	Cocktail Bar	Shopping Mall	Japanese Restaurant	Event Space	Café	Waterfro
74	Hillview	Italian Restaurant	Coffee Shop	Shopping Mall	Café	Indian Restaurant	Metro Station	Supermark
75	Holland Road	Chinese Restaurant	Bakery	Japanese Restaurant	Dessert Shop	Food Court	Café	Salad Plac
76	Hong Kah North	Food Court	Asian Restaurant	Coffee Shop	Bus Station	Café	Basketball Court	Fast Foo Restaura
77	Hougang Central	Coffee Shop	Food Court	Chinese Restaurant	Café	Fast Food Restaurant	Asian Restaurant	Shoppir Mi
78	Hougang East	Breakfast Spot	Bakery	Spa	Food Court	Noodle House	Jewelry Store	Pi
79	Institution Hill	Restaurant	Hotel	Zoo	Fish Market	Event Space	Exhibit	Facto
80	International Business Park	Japanese Restaurant	Chinese Restaurant	Coffee Shop	Café	Shopping Mall	Clothing Store	India Restaura

	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
81	Jelebu	Supermarket	Bakery	Bus Station	Coffee Shop	Sushi Restaurant	Indonesian Restaurant	Snack Place
82	Joo Koon	Fast Food Restaurant	Museum	Pub	Italian Restaurant	Bus Station	Bakery	Shopping Ma...
83	Joo Seng	Bus Station	Coffee Shop	Metro Station	Chinese Restaurant	Asian Restaurant	Martial Arts School	Hotel Po...
84	Jurong Gateway	Food Court	Gym	Seafood Restaurant	Café	Bus Station	Italian Restaurant	Skating Rin...
85	Jurong Port	Boat or Ferry	Fish Market	Pier	Seafood Restaurant	Cafeteria	Arcade	Zo...
86	Jurong River	Athletics & Sports	Garden	Zoo Exhibit	Food Court	Stadium	Snack Place	Fast Food Restaura...
87	Jurong West Central	Japanese Restaurant	Asian Restaurant	Fast Food Restaurant	Chinese Restaurant	Dessert Shop	Coffee Shop	Ca...
88	Kaki Bukit	Food Court	Coffee Shop	Asian Restaurant	Boutique	Supermarket	Restaurant	Motorcyc... Sho...
89	Kallang Bahru	Indian Restaurant	Accessories Store	Steakhouse	New American Restaurant	Restaurant	Fishing Spot	Facto...
90	Kallang Way	Food Court	Chinese Restaurant	Asian Restaurant	Convenience Store	Noodle House	Café	India... Restaura...
91	Kampong Bugis	Hostel	Harbor / Marina	Indonesian Restaurant	Snack Place	Korean Restaurant	Bakery	Supermark...
92	Kampong Glam	Bakery	Arts & Crafts Store	Shopping Mall	Toy / Game Store	Food Truck	Food Stand	Exhi...
93	Kampong Java	Chinese Restaurant	Coffee Shop	Hotel	Café	Japanese Restaurant	Asian Restaurant	Rame... Restaura...
94	Kampong Ubi	Coffee Shop	Food Court	Japanese Restaurant	Chinese Restaurant	Metro Station	Office	Din...
95	Kangkar	Fast Food Restaurant	Indonesian Restaurant	Food Court	Trail	Bus Station	Golf Course	Metro Stati...
96	Katong	Chinese Restaurant	Asian Restaurant	Hotel	Bakery	Noodle House	Indian Restaurant	B...
97	Keat Hong	Gym	College Cafeteria	Park	Dessert Shop	Supermarket	Soccer Stadium	Shoe Sto...
98	Kebun Bahru	Beach	Restaurant	Hotel	Fast Food Restaurant	Seafood Restaurant	Bar	Chines... Restaura...
99	Kembangan	Coffee Shop	Chinese Restaurant	Food Court	Malay Restaurant	Seafood Restaurant	Noodle House	Din...
100	Kent Ridge	Coffee Shop	Sandwich Place	Food Court	Asian Restaurant	Café	Indian Restaurant	Pharma...
101	Khatib	Coffee Shop	Food Court	Asian Restaurant	Playground	Café	Supermarket	Pa...
102	Kian Teck	Stadium	Coffee Shop	Food Court	Bus Line	Grocery Store	Basketball Court	Fast Foo... Restaura...
103	Kim Keat	Chinese Restaurant	Seafood Restaurant	Coffee Shop	Gym / Fitness Center	Print Shop	Noodle House	Foo...
104	Kovan	Chinese Restaurant	Coffee Shop	Asian Restaurant	Bus Station	Café	Noodle House	Food Cou...
105	Kranji	Racetrack	Asian Restaurant	Farm	Café	Food	Night Market	Stadiu...
106	Lakeside	Noodle House	Asian Restaurant	Bus Station	Grocery Store	Track	Bakery	Shoppin... Ma...
107	Leedon Park	Market	Gym	Zoo	Fruit & Vegetable Store	Factory	Farm	Farme... Mark...

	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 Mo Commo Venu
108	Leonie Hill	Clothing Store	Japanese Restaurant	Chinese Restaurant	Shoe Store	Fish Market	Event Space	Exhil
109	Lim Chu Kang	Farm	Zoo Exhibit	Theme Park Ride / Attraction	Vegetarian / Vegan Restaurant	Fish Market	Exhibit	Facto
110	Little India	Sports Bar	Zoo	Fishing Spot	Exhibit	Factory	Farm	Farme Mark
111	Lorong 8 Toa Payoh	Coffee Shop	Convenience Store	Trail	Park	Food Court	Café	Bus Static
112	Lorong Ah Soo	Chinese Restaurant	Bus Station	Noodle House	Coffee Shop	Food Court	Seafood Restaurant	Asia Restaura
113	Lorong Chuan	Clothing Store	Café	Japanese Restaurant	Asian Restaurant	Indonesian Restaurant	Multiplex	Bus Static
114	Lower Seletar	Golf Course	Japanese Restaurant	Bowling Alley	Chinese Restaurant	Sandwich Place	Gym	Grocery Sto
115	Loyang East	Bus Station	Seafood Restaurant	Food Court	Chinese Restaurant	Zoo	Exhibit	Facto
116	Mackenzie	Art Museum	Event Space	Factory	Farm	Farmers Market	Fast Food Restaurant	Fie
117	Macpherson	Chinese Restaurant	Coffee Shop	Indian Restaurant	Seafood Restaurant	Japanese Restaurant	Café	Sus Restaura
118	Malcolm	Garden	Botanical Garden	Flower Shop	Basketball Court	Golf Course	Gym Pool	Tra Stadiu
119	Mandai Estate	Café	Asian Restaurant	Furniture / Home Store	Coffee Shop	Playground	Bus Station	Zc
120	Margaret Drive	Pub	Asian Restaurant	Noodle House	Bus Line	Skate Park	Gourmet Shop	Electroni Sto
121	Marine Parade	Food Court	Chinese Restaurant	Ice Cream Shop	Beach	Lighthouse	Playground	Nood Hous
122	Maritime Square	Chinese Restaurant	Fast Food Restaurant	Spa	Chocolate Shop	Harbor / Marina	Coffee Shop	Ca
123	Marymount	Chinese Restaurant	Café	Indian Restaurant	Thai Restaurant	Coffee Shop	Spa	Bake
124	Matilda	Chinese Restaurant	Bakery	Food Court	Café	Fast Food Restaurant	Japanese Restaurant	Coffee Sho
125	Mei Chin	Chinese Restaurant	Coffee Shop	Food Court	Noodle House	Asian Restaurant	Tennis Court	Beer Garde
126	Midview	Chinese Restaurant	Bus Station	Café	Hotpot Restaurant	Video Store	Music Store	Sportir Goods Sho
127	Monk's Hill	Hotel	Chinese Restaurant	Zoo	Fishing Spot	Exhibit	Factory	Far
128	Moulmein	Noodle House	Hostel	Zoo	Flea Market	Factory	Farm	Farme Mark
129	Mount Pleasant	Plaza	Cosmetics Shop	College Administrative Building	Flea Market	Factory	Farm	Farme Mark
130	Mountbatten	Fast Food Restaurant	Noodle House	Café	Food Court	Asian Restaurant	Tennis Court	Chines Restaura
131	Nassim	Park	Tourist Information Center	Garden	Lake	Fish Market	Exhibit	Facto
132	Nature Reserve	Trail	Gym	Café	Rest Area	Athletics & Sports	Bike Trail	Loung
133	Nee Soon	Chinese Restaurant	Fast Food Restaurant	Indian Restaurant	Coffee Shop	Food Court	Asian Restaurant	Pa
134	Newton Circus	American Restaurant	Hotel	Chinese Restaurant	Hotel Bar	Café	Italian Restaurant	Seafoc Restaura

	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
135	North Coast	Food Court	Supermarket	Coffee Shop	BBQ Joint	Fish Market	Chinese Restaurant	Bus Station
136	Northland	Coffee Shop	Fast Food Restaurant	Vegetarian / Vegan Restaurant	Pharmacy	Café	Shoe Store	Cafeteria
137	Northshore	Park	Light Rail Station	Fast Food Restaurant	Soccer Field	Steakhouse	Seafood Restaurant	General Entertainme
138	One Tree Hill	Furniture / Home Store	Asian Restaurant	Event Space	Factory	Farm	Farmers Market	Fast Foo Restaura
139	Orange Grove	Café	Spa	Hotel	Food Court	Chinese Restaurant	Malay Restaurant	Japanese Restaura
140	Oxley	Dessert Shop	Soup Place	Hobby Shop	Fishing Spot	Exhibit	Factory	Far
141	Pang Sua	Bus Station	Zoo	Fishing Spot	Factory	Farm	Farmers Market	Fast Foo Restaura
142	Pasir Panjang 1	Bar	Convenience Store	Chinese Restaurant	Indian Restaurant	Boat or Ferry	Café	Pi
143	Pasir Ris Central	Food Court	Fast Food Restaurant	Coffee Shop	Park	Sandwich Place	Supermarket	Asia Restaura
144	Pasir Ris Drive	Coffee Shop	Hotpot Restaurant	Park	Noodle House	Zoo	Fish Market	Exhi
145	Pasir Ris Park	Park	Playground	Bus Station	Beach	Beach Bar	Fast Food Restaurant	Reso
146	Paterson	Shopping Mall	Café	Zoo	Comfort Food Restaurant	Factory	Farm	Farme Mark
147	Paya Lebar East	Restaurant	Malay Restaurant	Building	Asian Restaurant	Chinese Restaurant	Thai Restaurant	Midd Easte Restaura
148	Pearl's Hill	Chinese Restaurant	Szechuan Restaurant	Beer Bar	Beer Garden	Steakhouse	Hostel	Dessert Sh
149	Penjuru Crescent	Coffee Shop	Chinese Restaurant	Supermarket	Food Court	Zoo	Fishing Spot	Facto
150	People's Park	Bistro	Zoo	Flea Market	Factory	Farm	Farmers Market	Fast Foo Restaura
151	Port	Boutique	Airport Lounge	Public Art	Candy Store	Food Court	Chinese Restaurant	Bake
152	Potong Pasir	Bus Station	Gym	Thrift / Vintage Store	Resort	Nightclub	Theater	Bus Lir
153	Punggol Field	Fast Food Restaurant	Gastropub	Gym	Coffee Shop	Dessert Shop	Fishing Spot	Ca
154	Punggol Town Centre	Market	Breakfast Spot	Supermarket	BBQ Joint	Bus Line	Flea Market	Far
155	Queensway	Diner	Noodle House	Train Station	Bakery	Asian Restaurant	Supermarket	Chines Restaura
156	Raffles Place	Café	Gym / Fitness Center	Food Court	Italian Restaurant	Hotel	Coffee Shop	Wine B
157	Redhill	Food Court	Café	Park	Canal	Coffee Shop	Bus Station	Sandwi Plac
158	Reservoir View	Coffee Shop	Asian Restaurant	Bus Station	Chinese Restaurant	Noodle House	Convenience Store	Food Cou
159	Ridout	Chinese Restaurant	Spanish Restaurant	Café	Italian Restaurant	Food & Drink Shop	Soccer Field	Tennis Cou
160	Rivervale	Bus Station	Basketball Court	Snack Place	Park	Convenience Store	Supermarket	BBQ Joi
161	Robertson Quay	Café	Zoo	Fishing Spot	Factory	Farm	Farmers Market	Fast Foo Restaura
162	Samulun	Harbor / Marina	Comedy Club	Bus Station	Multiplex	Boat or Ferry	Café	Farme Mark

	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 Mo Comm Venu
163	Saujana	Bus Station	Italian Restaurant	Pharmacy	Korean Restaurant	Sandwich Place	Flower Shop	Ca
164	Seletar	Airport Terminal	Sporting Goods Shop	Resort	Food Court	Café	Boat or Ferry	Hai Restaura
165	Seletar Aerospace Park	Airport	Café	Airport Service	Restaurant	Waterfront	Coffee Shop	Englis Restaura
166	Seletar Hills	Playground	Gym	Grocery Store	Food Court	Bus Stop	Fish Market	Facto
167	Sembawang Central	Coffee Shop	Chinese Restaurant	Fast Food Restaurant	Park	Asian Restaurant	Cantonese Restaurant	Supermark
168	Sembawang Hills	Chinese Restaurant	Food Court	Fast Food Restaurant	Seafood Restaurant	Indian Restaurant	Café	Pa
169	Sembawang Springs	Coffee Shop	Asian Restaurant	Food Court	Indian Restaurant	Hot Spring	Basketball Court	Pa
170	Sembawang Straits	Pub	Seafood Restaurant	Campground	Bar	Chinese Restaurant	Food Court	Din
171	Sengkang Town Centre	Bus Station	Other Great Outdoors	Basketball Court	Grocery Store	Supermarket	Zoo	Far
172	Senja	Asian Restaurant	Bus Station	Zoo	Event Space	Factory	Farm	Farme Mark
173	Senoko North	Bakery	Food Court	Food & Drink Shop	Office	Coffee Shop	Karaoke Bar	Bus Statio
174	Sentosa	Bar	Plaza	Chinese Restaurant	Golf Course	Italian Restaurant	Spanish Restaurant	Mexica Restaura
175	Serangoon Central	Park	Café	Bus Station	Seafood Restaurant	Music Venue	Coffee Shop	Fast Foc Restaura
176	Serangoon Garden	Chinese Restaurant	Food Court	Italian Restaurant	Bakery	Noodle House	Coffee Shop	Asia Restaura
177	Serangoon North	Coffee Shop	Food Court	Asian Restaurant	Supermarket	Chinese Restaurant	Pet Store	Basketb Cou
178	Shangri-La	Hotel	Japanese Restaurant	Italian Restaurant	Chinese Restaurant	Coffee Shop	Café	Boutiqu
179	Siglap	Supermarket	Food Court	French Restaurant	Shopping Mall	Cafeteria	Asian Restaurant	Salad Plac
180	Simei	Coffee Shop	Chinese Restaurant	Café	Snack Place	Japanese Restaurant	Bus Station	Asia Restaura
181	Singapore General Hospital	Chinese Restaurant	Seafood Restaurant	Food Court	Spa	Zoo	Event Space	Exhil
182	Somerset	Seafood Restaurant	Bakery	Shopping Mall	Travel Lounge	Clothing Store	Hainan Restaurant	Restaura
183	Springleaf	Chinese Restaurant	Thai Restaurant	Bus Station	Café	Asian Restaurant	Indian Restaurant	Gy
184	Sunset Way	Coffee Shop	Bakery	Gym	Shopping Mall	Convenience Store	Electronics Store	Gym / Fitne Cent
185	Swiss Club	Soccer Field	Seafood Restaurant	Thai Restaurant	Japanese Restaurant	Italian Restaurant	Dessert Shop	Caribbea Restaura
186	Tagore	Bus Stop	Coffee Shop	Gym	Park	Trail	Shop & Service	Used Au Dealersh
187	Tai Seng	Food Court	Bus Stop	Chinese Restaurant	Coffee Shop	Furniture / Home Store	Bistro	Tech Startu
188	Taman Jurong	Food Court	Chinese Restaurant	Bus Station	Supermarket	Sandwich Place	Coffee Shop	Ca
189	Tampines East	Coffee Shop	Supermarket	Dessert Shop	Sandwich Place	Food Court	Fried Chicken Joint	Fast Foc Restaura

	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
190	Tampines West	Coffee Shop	Fast Food Restaurant	Food Court	Gym	Thai Restaurant	Supermarket	Booksto
191	Tanglin	Café	Bar	Lounge	Thai Restaurant	Modern European Restaurant	French Restaurant	Garde
192	Tanjong Pagar	Hotel	Zoo	Fishing Spot	Exhibit	Factory	Farm	Farme Mark
193	Tanjong Rhu	Bus Station	Stadium	Park	Soccer Field	Japanese Restaurant	Ice Cream Shop	Ca
194	Teban Gardens	Gym	Electronics Store	Park	Chinese Restaurant	Zoo	Fish & Chips Shop	Facto
195	Teck Whye	Theater	Zoo	Fruit & Vegetable Store	Exhibit	Factory	Farm	Farme Mark
196	Telok Blangah Drive	Café	Pool	Chinese Restaurant	Scenic Lookout	Asian Restaurant	Bridge	Bowling Alle
197	Telok Blangah Rise	Chinese Restaurant	Coffee Shop	Asian Restaurant	Bus Station	Restaurant	Cafeteria	Vegetarian Vega Restaura
198	Telok Blangah Way	Bus Line	Convenience Store	Pharmacy	Miscellaneous Shop	Zoo	Factory	Far
199	Tengah	Campground	Food	Zoo	Fishing Spot	Factory	Farm	Farme Mark
200	Tiong Bahru	Gourmet Shop	Asian Restaurant	Seafood Restaurant	Cosmetics Shop	Hotel	Italian Restaurant	Chines Restaura
201	Toa Payoh West	Food Court	Coffee Shop	Stables	Noodle House	Fast Food Restaurant	BBQ Joint	Chines Restaura
202	Toh Guan	Café	Food Court	Bakery	Cafeteria	Cupcake Shop	Japanese Restaurant	Supermark
203	Toh Tuck	Food Court	Seafood Restaurant	Café	Vegetarian / Vegan Restaurant	Chinese Restaurant	Athletics & Sports	Medic Cent
204	Townsville	Coffee Shop	Park	Cosmetics Shop	Stadium	Fast Food Restaurant	Pizza Place	Athletics Spor
205	Tuas Bay	Bar	Brewery	Café	Food Court	Coffee Shop	Chinese Restaurant	Fish Mark
206	Tukang	Exhibit	Zoo Exhibit	Scenic Lookout	Water Park	Business Service	Café	Fishing Sp
207	Turf Club	Racetrack	Gaming Cafe	Coffee Shop	Zoo	Fishing Spot	Exhibit	Facto
208	Tyersall	Café	Tourist Information Center	Zoo	Fruit & Vegetable Store	Factory	Farm	Farme Mark
209	Ulu Pandan	Coffee Shop	Grocery Store	Food Court	Japanese Restaurant	Basketball Court	Café	Bake
210	Upper Thomson	Chinese Restaurant	Sushi Restaurant	Soup Place	Thai Restaurant	Vegetarian / Vegan Restaurant	Dessert Shop	Supermark
211	Victoria	Seafood Restaurant	Beach	BBQ Joint	Italian Restaurant	Asian Restaurant	Café	Beer Garde
212	Waterway East	Sporting Goods Shop	Zoo	Fishing Spot	Exhibit	Factory	Farm	Farme Mark
213	West Coast	Bus Stop	Food Court	Food & Drink Shop	Halal Restaurant	Grocery Store	Café	Coffee Sho
214	Western Water Catchment	Gym	Gun Range	Zoo	Frozen Yogurt Shop	Exhibit	Factory	Far
215	Woodgrove	Shopping Mall	Fast Food Restaurant	Japanese Restaurant	Food Court	Coffee Shop	Supermarket	Electroni Sto
216	Woodlands East	Food Court	Park	Convenience Store	Asian Restaurant	Coffee Shop	Night Market	Sandwi Plac

	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
217	Woodlands South	Food Court	Trail	Gym	Basketball Court	Fast Food Restaurant	Park	Food Servic
218	Woodleigh	Indian Restaurant	Café	Noodle House	Asian Restaurant	Zoo	Fishing Spot	Far
219	Xilin	Café	Japanese Restaurant	Coffee Shop	Chinese Restaurant	Fast Food Restaurant	Golf Course	Hot
220	Yew Tee	Park	Bus Station	Fast Food Restaurant	Coffee Shop	Chinese Restaurant	Dog Run	Cafeter
221	Yio Chu Kang	Food Court	Convenience Store	Café	Gym	Coffee Shop	Gym / Fitness Center	Chines Restaura
222	Yishun Central	Indian Restaurant	Food Court	Coffee Shop	American Restaurant	Gym / Fitness Center	Fried Chicken Joint	Food Star
223	Yuhua East	Grocery Store	Restaurant	Coffee Shop	Vegetarian / Vegan Restaurant	Park	Pizza Place	Filipi Restaura
224	Yunnan	Bus Station	Park	Coffee Shop	Restaurant	Food Court	Supermarket	Fast Foc Restaura

In [34]:
```python
# set number of clusters
kclusters = 5

sg_group_clustering = sg_group.drop('Neighborhood', 1)

# run k-means clustering
kmeans = KMeans(n_clusters = kclusters, random_state = 0).fit(sg_group_clustering)

# check cluster labels generated for each row in the dataframe
kmeans.labels_[0:224]
```

Out[34]:
```
array([2, 4, 4, 4, 2, 2, 4, 4, 4, 2, 2, 4, 2, 4, 2, 4, 2, 4, 4, 4, 2, 1,
       2, 4, 4, 2, 2, 2, 4, 4, 4, 2, 4, 4, 4, 2, 2, 4, 2, 4, 4, 1, 4,
       4, 4, 4, 4, 4, 4, 2, 2, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 0, 2, 4,
       4, 4, 4, 0, 2, 2, 2, 4, 4, 4, 2, 2, 2, 4, 4, 4, 4, 0, 4, 4, 4, 4,
       2, 4, 2, 4, 4, 4, 2, 4, 4, 4, 2, 4, 2, 4, 2, 4, 4, 4, 4, 4, 4,
       4, 2, 2, 4, 4, 0, 4, 2, 4, 3, 4, 2, 4, 4, 4, 2, 4, 4, 1, 4, 4, 4,
       4, 4, 4, 2, 2, 4, 3, 4, 4, 0, 4, 2, 2, 4, 3, 4, 4, 2, 4, 4, 0, 4,
       4, 4, 4, 2, 2, 4, 0, 3, 4, 4, 4, 4, 2, 4, 4, 2, 4, 0, 0, 2, 4, 4,
       4, 2, 4, 2, 4, 2, 4, 4, 2, 4, 4, 2, 2, 2, 2, 4, 4, 4, 4, 4, 4, 2,
       4, 4, 4, 2, 2, 4, 4, 2, 4, 2, 3, 2, 4, 4, 4, 2, 4, 4, 2, 2, 3, 4,
       4, 2, 2, 4])
```

In [35]:
```python
sg_venues_sorted.insert(0, 'Cluster Labels', kmeans.labels_)
sg_merged = df2
sg_merged = sg_merged.join(sg_venues_sorted.set_index('Neighborhood'), on ='Neighborhood')
```

```
In [36]: sg_merged.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 270 entries, 0 to 280
Data columns (total 16 columns):
 #   Column                Non-Null Count   Dtype
---  ------                --------------   -----
 0   Area                  270 non-null     object
 1   Latitude              270 non-null     float64
 2   Longitude             270 non-null     float64
 3   Neighborhood          270 non-null     object
 4   Population            270 non-null     int64
 5   Cluster Labels        225 non-null     float64
 6   1st Most Common Venue  225 non-null     object
 7   2nd Most Common Venue  225 non-null     object
 8   3rd Most Common Venue  225 non-null     object
 9   4th Most Common Venue  225 non-null     object
 10  5th Most Common Venue  225 non-null     object
 11  6th Most Common Venue  225 non-null     object
 12  7th Most Common Venue  225 non-null     object
 13  8th Most Common Venue  225 non-null     object
 14  9th Most Common Venue  225 non-null     object
 15  10th Most Common Venue 225 non-null     object
dtypes: float64(3), int64(1), object(12)
memory usage: 35.9+ KB
```

```
In [37]: sg_merged1 = sg_merged.dropna()
```

```
In [38]: sg_merged1['Cluster Labels'] = sg_merged1['Cluster Labels'].astype('int64')
```

```
C:\Users\etentan\Anaconda3\lib\site-packages\ipykernel_launcher.py:1: SettingWithCopyWarnin
g:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_gui
de/indexing.html#returning-a-view-versus-a-copy
  """Entry point for launching an IPython kernel.
```

```
In [39]: sg_merged1.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 225 entries, 0 to 277
Data columns (total 16 columns):
 #   Column                Non-Null Count   Dtype
---  ------                --------------   -----
 0   Area                  225 non-null     object
 1   Latitude              225 non-null     float64
 2   Longitude             225 non-null     float64
 3   Neighborhood          225 non-null     object
 4   Population            225 non-null     int64
 5   Cluster Labels        225 non-null     int64
 6   1st Most Common Venue  225 non-null     object
 7   2nd Most Common Venue  225 non-null     object
 8   3rd Most Common Venue  225 non-null     object
 9   4th Most Common Venue  225 non-null     object
 10  5th Most Common Venue  225 non-null     object
 11  6th Most Common Venue  225 non-null     object
 12  7th Most Common Venue  225 non-null     object
 13  8th Most Common Venue  225 non-null     object
 14  9th Most Common Venue  225 non-null     object
 15  10th Most Common Venue 225 non-null     object
dtypes: float64(2), int64(2), object(12)
memory usage: 29.9+ KB
```

```
In [40]:  map_clusters = folium.Map(location = [latitude, longitude], zoom_start = 11)

          x = np.arange(kclusters)
          ys = [i + x + (i*x)**2 for i in range(kclusters)]
          colors_array = cm.rainbow(np.linspace(0, 1, len(ys)))
          rainbow = [colors.rgb2hex(i) for i in colors_array]

          markers_colors = []
          for lat, lon, poi, cluster in zip(sg_merged1['Latitude'], sg_merged1['Longitude'],
                                            sg_merged1['Neighborhood'], sg_merged1['Cluster Labels'
          ]):
              label = folium.Popup(str(poi) + ' Cluster ' + str(cluster), parse_html = True)
              folium.CircleMarker(
                  [lat, lon],
                  radius = 5,
                  popup = label,
                  color = rainbow[cluster-1],
                  fill = True,
                  fill_color = rainbow[cluster-1],
                  fill_opacity = 0.7).add_to(map_clusters)

          map_clusters
```

Out[40]:
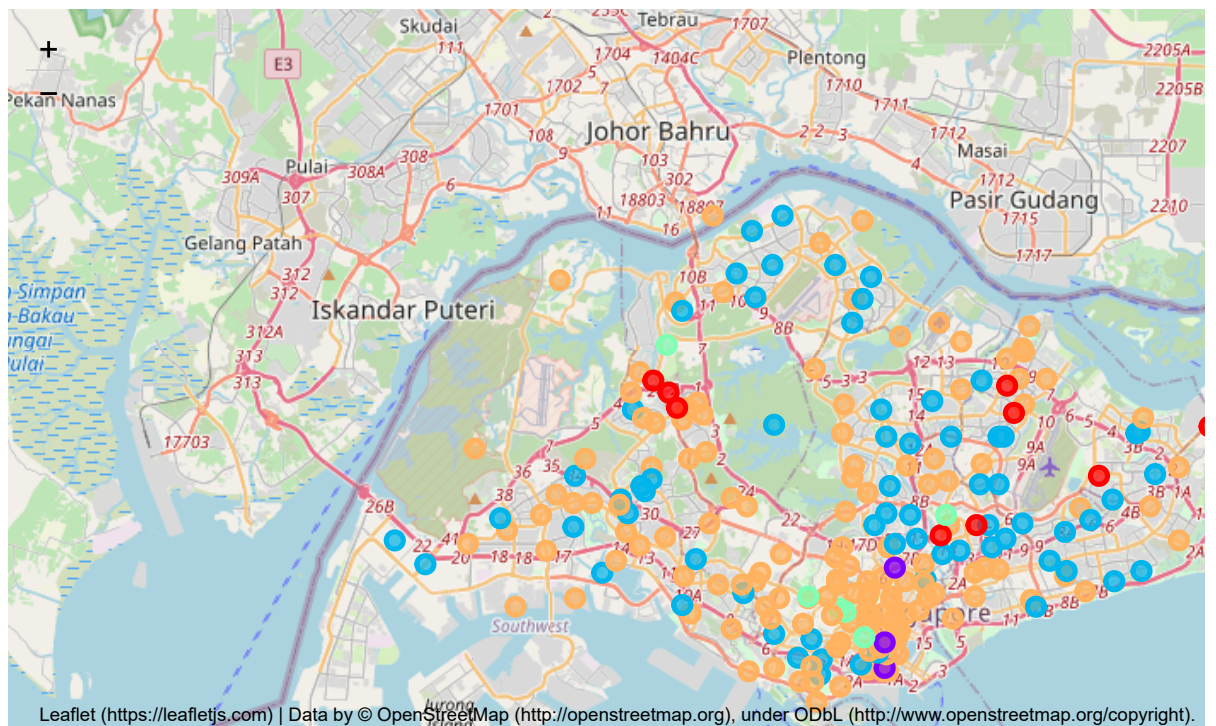
Cluster 1

In [41]:
```python
sg_merged1.loc[sg_merged1['Cluster Labels'] == 0,
               sg_merged1.columns[[1] + list(range(5, sg_merged1.shape[1]))]]
```

Out[41]:

	Latitude	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 Com V
56	1.382678	0	Asian Restaurant	Bus Station	Zoo	Event Space	Factory	Farm	Farmers Market	Fast Rest:
159	1.375368	0	Bus Station	Seafood Restaurant	Food Court	Chinese Restaurant	Zoo	Exhibit	Factory	
219	1.380623	0	Bus Station	Basketball Court	Snack Place	Park	Convenience Store	Supermarket	BBQ Joint	
220	1.391924	0	Bus Station	Other Great Outdoors	Basketball Court	Grocery Store	Supermarket	Zoo	Farm	Fa M
233	1.389274	0	Bus Station	Sports Club	Zoo	Fishing Spot	Factory	Farm	Farmers Market	Fast Rest:
235	1.393777	0	Bus Station	Zoo	Fishing Spot	Factory	Farm	Farmers Market	Fast Food Restaurant	
250	1.335530	0	Bus Station	Coffee Shop	Metro Station	Chinese Restaurant	Asian Restaurant	Martial Arts School	Hotel Pool	S
254	1.331414	0	Bus Station	Gym	Thrift / Vintage Store	Resort	Nightclub	Theater	Bus Line	F
264	1.355520	0	Bus Station	Asian Restaurant	Sandwich Place	Supermarket	Salad Place	Badminton Court	Fast Food Restaurant	

Cluster 2

In [42]:
```python
sg_merged1.loc[sg_merged1['Cluster Labels'] == 1,
               sg_merged1.columns[[1] + list(range(5, sg_merged1.shape[1]))]]
```

Out[42]:

	Latitude	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 Con V
149	1.318050	1	Noodle House	Hostel	Zoo	Flea Market	Factory	Farm	Farmers Market	Fast Food Restaurant	
151	1.277669	1	Noodle House	Zoo	Flea Market	Factory	Farm	Farmers Market	Fast Food Restaurant	Field	F Rest:
230	1.288187	1	Hostel	Zoo	Fishing Spot	Exhibit	Factory	Farm	Farmers Market	Fast Food Restaurant	

Cluster 3

```python
sg_merged1.loc[sg_merged1['Cluster Labels'] == 2,
               sg_merged1.columns[[1] + list(range(5, sg_merged1.shape[1]))]]
```

Out[43]:

	Latitude	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
0	1.371285	2	Food Court	Chinese Restaurant	Coffee Shop	Dessert Shop	Noodle House	Convenience Store	Supermark
2	1.368207	2	Food Court	Chinese Restaurant	Café	Bakery	Steakhouse	Coffee Shop	Farme Mark
8	1.381790	2	Food Court	Convenience Store	Café	Gym	Coffee Shop	Gym / Fitness Center	Chine Restaura
11	1.312812	2	Chinese Restaurant	Asian Restaurant	Food Court	Indian Restaurant	Beach	Coffee Shop	Bus Stati
12	1.332402	2	Food Court	Coffee Shop	Indian Restaurant	Supermarket	Fast Food Restaurant	Asian Restaurant	Ca
14	1.317121	2	Food Court	Coffee Shop	Ice Cream Shop	Asian Restaurant	Malay Restaurant	Dessert Shop	Supermark
16	1.336028	2	Food Court	Coffee Shop	Asian Restaurant	Boutique	Supermarket	Restaurant	Motorcyc Sh
17	1.321032	2	Coffee Shop	Chinese Restaurant	Food Court	Malay Restaurant	Seafood Restaurant	Noodle House	Dir
18	1.316999	2	Supermarket	Food Court	French Restaurant	Shopping Mall	Cafeteria	Asian Restaurant	Salad Pla
19	1.350986	2	Food Court	Coffee Shop	Chinese Restaurant	Thai Restaurant	Café	Bubble Tea Shop	Seafo Restaura
25	1.351285	2	Coffee Shop	Food Court	Chinese Restaurant	Fast Food Restaurant	Malay Restaurant	Sandwich Place	Bus Li
26	1.349057	2	Food Court	Bus Stop	Convenience Store	Halal Restaurant	Grocery Store	Fast Food Restaurant	Light R Stati
28	1.345530	2	Food Court	Chinese Restaurant	Coffee Shop	Indian Restaurant	Asian Restaurant	Market	Dir
30	1.353959	2	Food Court	Zoo	Fishing Spot	Exhibit	Factory	Farm	Farme Mark
32	1.355397	2	Food Court	Asian Restaurant	Coffee Shop	Bus Station	Café	Basketball Court	Fast Fo Restaura
38	1.281568	2	Food Court	Chinese Restaurant	Coffee Shop	Café	Bakery	Noodle House	Art Galle
40	1.281158	2	Chinese Restaurant	Coffee Shop	Seafood Restaurant	Pool	Malay Restaurant	Hainan Restaurant	Departme Sto
43	1.289648	2	Food Court	Café	Park	Canal	Coffee Shop	Bus Station	Sandwi Pla
44	1.279449	2	Chinese Restaurant	Seafood Restaurant	Food Court	Spa	Zoo	Event Space	Exhi
46	1.275238	2	Chinese Restaurant	Coffee Shop	Asian Restaurant	Bus Station	Restaurant	Cafeteria	Vegetaria Veg Restaura
64	1.308026	2	Coffee Shop	Grocery Store	Food Court	Japanese Restaurant	Basketball Court	Café	Bake
65	1.375708	2	Reservoir	Café	Food Court	Fish Market	Exhibit	Factory	Fa
68	1.382389	2	Coffee Shop	Fast Food Restaurant	Food Court	Café	Bus Station	Noodle House	Chine Restaura
80	1.321919	2	Coffee Shop	Bakery	Gym	Shopping Mall	Convenience Store	Electronics Store	Gyr Fitne Cent
82	1.303373	2	Bus Stop	Food Court	Food & Drink Shop	Halal Restaurant	Grocery Store	Café	Coffee Sh
93	1.324954	2	Food Court	Chinese Restaurant	Asian Restaurant	Convenience Store	Noodle House	Café	Indi Restaura

	Latitude	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 Mo Commo Ven
94	1.329642	2	Coffee Shop	Food Court	Japanese Restaurant	Chinese Restaurant	Metro Station	Office	Din
95	1.326207	2	Chinese Restaurant	Coffee Shop	Indian Restaurant	Seafood Restaurant	Japanese Restaurant	Café	Sus Restaura
96	1.351611	2	Coffee Shop	Food Court	Noodle House	Café	Convenience Store	Bakery	Bus Stati
97	1.371049	2	Coffee Shop	Food Court	Chinese Restaurant	Café	Fast Food Restaurant	Asian Restaurant	Shoppi M
98	1.370801	2	Breakfast Spot	Bakery	Spa	Food Court	Noodle House	Jewelry Store	Pa
102	1.352048	2	Chinese Restaurant	Bus Station	Noodle House	Coffee Shop	Food Court	Seafood Restaurant	Asi Restaura
103	1.335383	2	Food Court	Bus Stop	Chinese Restaurant	Coffee Shop	Furniture / Home Store	Bistro	Tech Start
110	1.316521	2	Coffee Shop	Chinese Restaurant	Supermarket	Food Court	Zoo	Fishing Spot	Facto
112	1.340046	2	Café	Food Court	Bakery	Cafeteria	Cupcake Shop	Japanese Restaurant	Supermark
119	1.334884	2	Food Court	Chinese Restaurant	Bus Station	Supermarket	Sandwich Place	Coffee Shop	Ca
121	1.338284	2	Bus Station	Park	Coffee Shop	Restaurant	Food Court	Supermarket	Fast Fo Restaura
122	1.313639	2	Chinese Restaurant	Food Court	Coffee Shop	Supermarket	Noodle House	Seafood Restaurant	Vegetaria Veg Restaura
125	1.323736	2	Coffee Shop	Gym	Gym / Fitness Center	Thai Restaurant	Fast Food Restaurant	Photography Studio	Chine Restaura
134	1.302689	2	Food Court	Chinese Restaurant	Ice Cream Shop	Beach	Lighthouse	Playground	Nooc Hou
155	1.283737	2	Food Court	Tea Room	Zoo	Fishing Spot	Exhibit	Factory	Fa
161	1.372663	2	Food Court	Fast Food Restaurant	Coffee Shop	Park	Sandwich Place	Supermarket	Asi Restaura
162	1.373031	2	Coffee Shop	Hotpot Restaurant	Park	Noodle House	Zoo	Fish Market	Exhi
169	1.319635	2	Coffee Shop	Park	Electronics Store	Seafood Restaurant	Food Court	Restaurant	Harbc Mari
182	1.291398	2	Chinese Restaurant	Coffee Shop	Food Court	Noodle House	Asian Restaurant	Tennis Court	Beer Gard
208	1.440637	2	Bus Station	Food Court	Park	Fast Food Restaurant	Coffee Shop	Shopping Mall	Supermark
212	1.440537	2	Coffee Shop	Asian Restaurant	Food Court	Indian Restaurant	Hot Spring	Basketball Court	Pa
214	1.460297	2	Bakery	Food Court	Food & Drink Shop	Office	Coffee Shop	Karaoke Bar	Bus Stati
216	1.393559	2	Food Court	Convenience Store	Park	Asian Restaurant	Bus Line	Fast Food Restaurant	Met Stati
223	1.385464	2	Playground	Gym	Grocery Store	Food Court	Bus Stop	Fish Market	Facto
226	1.371338	2	Coffee Shop	Food Court	Asian Restaurant	Supermarket	Chinese Restaurant	Pet Store	Basketb Co
236	1.337510	2	Coffee Shop	Asian Restaurant	Bus Station	Chinese Restaurant	Noodle House	Convenience Store	Food Co
237	1.422055	2	Racetrack	Gaming Cafe	Coffee Shop	Zoo	Fishing Spot	Exhibit	Facto

	Latitude	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
239	1.356049	2	Coffee Shop	Supermarket	Dessert Shop	Sandwich Place	Food Court	Fried Chicken Joint	Fast Food Restaurant
240	1.345866	2	Coffee Shop	Fast Food Restaurant	Food Court	Gym	Thai Restaurant	Supermarket	Bookstore
248	1.327789	2	Chinese Restaurant	Food Court	Coffee Shop	Asian Restaurant	Noodle House	Park	Bakery
249	1.340071	2	Noodle House	Chinese Restaurant	Food Court	Coffee Shop	Café	Bakery	Metro Station
251	1.329711	2	Chinese Restaurant	Seafood Restaurant	Coffee Shop	Gym / Fitness Center	Print Shop	Noodle House	Fo
252	1.339847	2	Coffee Shop	Convenience Store	Trail	Park	Food Court	Café	Bus Station
257	1.335303	2	Food Court	Coffee Shop	Stables	Noodle House	Fast Food Restaurant	BBQ Joint	Chinese Restaurant
259	1.329372	2	Bar	Brewery	Café	Food Court	Coffee Shop	Chinese Restaurant	Fish Market
266	1.454154	2	Food Court	Supermarket	Coffee Shop	BBQ Joint	Fish Market	Chinese Restaurant	Bus Station
269	1.436897	2	Food Court	Park	Convenience Store	Asian Restaurant	Coffee Shop	Night Market	Sandwich Place
270	1.427141	2	Food Court	Trail	Gym	Basketball Court	Fast Food Restaurant	Park	Food Service
272	1.417360	2	Coffee Shop	Food Court	Asian Restaurant	Playground	Café	Supermarket	Pa
275	1.435710	2	Coffee Shop	Fast Food Restaurant	Vegetarian / Vegan Restaurant	Pharmacy	Café	Shoe Store	Cafete
277	1.426451	2	Indian Restaurant	Food Court	Coffee Shop	American Restaurant	Gym / Fitness Center	Fried Chicken Joint	Food Sta

Recommendations for Korean and Thai restaurants in Singapore

Next we shall investigate the venues pulled from Foursquare API to answer the following questions.

1. To find out the Thai and Korean restaurants in Singapore
2. The best rated Thai and Korean restaurant in Singapore to recommend for a Korean or a Thai visiting Singapore.
3. If a businessman is interested to open a Thai or a Korean restaurant in Singapore, which part of Singapore will be the best place to attract diners?

```
In [45]: def get_venue_details(venue_id):

             url = 'https://api.foursquare.com/v2/venues/{}?&client_id={}&client_secret={}&v={}'.for
         mat(
                 venue_id,
                 CLIENT_ID,
                 CLIENT_SECRET,
                 VERSION)

             results = requests.get(url).json()
             venue_data = results['response']['venue']
             venue_details = []
             try:
                 venue_id = venue_data['id']
                 venue_name = venue_data['name']
                 venue_likes = venue_data['likes']['count']
                 venue_rating = venue_data['rating']
                 venue_tips = venue_data['tips']['count']
                 venue_details.append([venue_id,venue_name,venue_likes,venue_rating,venue_tips])
             except KeyError:
                 pass

             column_names = ['ID','Name','Likes','Rating','Tips']
             df = pd.DataFrame(venue_details,columns=column_names)
             return df


In [47]: def get_venues(lat,lng):

             radius = 1000
             LIMIT=1000

             url = 'https://api.foursquare.com/v2/venues/explore?&client_id={}&client_secret={}&v={}
         &ll={},{}&radius={}&limit={}'.format(
                 CLIENT_ID,
                 CLIENT_SECRET,
                 VERSION,
                 lat,
                 lng,
                 radius,
                 LIMIT)

             results = requests.get(url).json()
             venue_data = results["response"]['groups'][0]['items']
             venue_details = []
             for row in venue_data:
                 try:
                     venue_id = row['venue']['id']
                     venue_name = row['venue']['name']
                     venue_category = row['venue']['categories'][0]['name']
                     venue_details.append([venue_id,venue_name,venue_category])
                 except KeyError:
                     pass

             column_names = ['ID','Name','Category']
             df = pd.DataFrame(venue_details,columns = column_names)
             return df
```

In [48]: df2.head()

Out[48]:

	Area	Latitude	Longitude	Neighborhood	Population
0	Ang Mo Kio	1.371285	103.846994	Ang Mo Kio Town Centre	5020
1	Ang Mo Kio	1.340863	103.830392	Cheng San	29770
2	Ang Mo Kio	1.368207	103.856360	Chong Boon	27900
3	Ang Mo Kio	1.460214	103.776635	Kebun Bahru	23910
4	Ang Mo Kio	1.372399	103.829029	Sembawang Hills	6890

In [49]: sg_venues.head()

Out[49]:

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue ID	Venue Latitude	Venue Longitude	Ca
0	Ang Mo Kio Town Centre	1.371285	103.846994	Face Ban Mian 非板面 (Ang Mo Kio)	50712b67e4b0548504446dea	1.372031	103.847504	
1	Ang Mo Kio Town Centre	1.371285	103.846994	Old Chang Kee	4bc30123abf495215220c393	1.369094	103.848389	Snac
2	Ang Mo Kio Town Centre	1.371285	103.846994	FairPrice Xtra	4b15f661f964a52012b623e3	1.369279	103.848886	Supe
3	Ang Mo Kio Town Centre	1.371285	103.846994	NTUC FairPrice	4ece4dd693ad987b4a9fb4ef	1.371507	103.847082	Supe
4	Ang Mo Kio Town Centre	1.371285	103.846994	MOS Burger	4b1ea04ff964a520e21c24e3	1.369170	103.847831	Burg

```
In [53]:   column_names = ['Neighborhood', 'ID','Name']
           korean_rest = pd.DataFrame(columns = column_names)
           count = 1
           for row in df2.values.tolist():
               Area, Latitude, Longitude,Neighborhood, Population = row
               venues = get_venues(Latitude,Longitude)
               korean_resturants = venues[venues['Category'] == 'Korean Restaurant']
               print('(',count,'/',len(df2),')','Korean Resturants in '+Neighborhood+', :'+str(len(kor
           ean_resturants)))
               for detail in korean_resturants.values.tolist():
                   id, name , category = detail
                   korean_rest = korean_rest.append({'Neighborhood': Neighborhood,
                                                     'ID': id,
                                                     'Name' : name
                                                     }, ignore_index = True)

               count+=1
```

```
( 1 / 270 ) Korean Resturants in Ang Mo Kio Town Centre, :0
( 2 / 270 ) Korean Resturants in Cheng San, :0
( 3 / 270 ) Korean Resturants in Chong Boon, :0
( 4 / 270 ) Korean Resturants in Kebun Bahru, :0
( 5 / 270 ) Korean Resturants in Sembawang Hills, :0
( 6 / 270 ) Korean Resturants in Shangri-La, :1
( 7 / 270 ) Korean Resturants in Tagore, :0
( 8 / 270 ) Korean Resturants in Townsville, :0
( 9 / 270 ) Korean Resturants in Yio Chu Kang, :0
( 10 / 270 ) Korean Resturants in Yio Chu Kang East, :0
( 11 / 270 ) Korean Resturants in Yio Chu Kang West, :0
( 12 / 270 ) Korean Resturants in Bayshore, :0
( 13 / 270 ) Korean Resturants in Bedok North, :0
( 14 / 270 ) Korean Resturants in Bedok Reservoir, :0
( 15 / 270 ) Korean Resturants in Bedok South, :0
( 16 / 270 ) Korean Resturants in Frankel, :0
( 17 / 270 ) Korean Resturants in Kaki Bukit, :0
( 18 / 270 ) Korean Resturants in Kembangan, :0
( 19 / 270 ) Korean Resturants in Siglap, :0
( 20 / 270 ) Korean Resturants in Bishan East, :0
( 21 / 270 ) Korean Resturants in Marymount, :1
( 22 / 270 ) Korean Resturants in Upper Thomson, :0
( 23 / 270 ) Korean Resturants in Samulun, :0
( 24 / 270 ) Korean Resturants in Tukang, :0
( 25 / 270 ) Korean Resturants in Bukit Batok Central, :0
( 26 / 270 ) Korean Resturants in Bukit Batok East, :0
( 27 / 270 ) Korean Resturants in Bukit Batok South, :0
( 28 / 270 ) Korean Resturants in Bukit Batok West, :0
( 29 / 270 ) Korean Resturants in Gombak, :0
( 30 / 270 ) Korean Resturants in Guilin, :0
( 31 / 270 ) Korean Resturants in Hillview, :0
( 32 / 270 ) Korean Resturants in Hong Kah North, :0
( 33 / 270 ) Korean Resturants in Alexandra Hill, :0
( 34 / 270 ) Korean Resturants in Alexandra North, :0
( 35 / 270 ) Korean Resturants in Bukit Ho Swee, :1
( 36 / 270 ) Korean Resturants in Bukit Merah, :0
( 37 / 270 ) Korean Resturants in City Terminals, :0
( 38 / 270 ) Korean Resturants in Depot Road, :1
( 39 / 270 ) Korean Resturants in Everton Park, :2
( 40 / 270 ) Korean Resturants in Henderson Hill, :0
( 41 / 270 ) Korean Resturants in Maritime Square, :1
( 42 / 270 ) Korean Resturants in Redhill, :0
( 43 / 270 ) Korean Resturants in Singapore General Hospital, :2
( 44 / 270 ) Korean Resturants in Telok Blangah Drive, :0
( 45 / 270 ) Korean Resturants in Telok Blangah Rise, :0
( 46 / 270 ) Korean Resturants in Telok Blangah Way, :0
( 47 / 270 ) Korean Resturants in Tiong Bahru, :1
( 48 / 270 ) Korean Resturants in Tiong Bahru Station, :1
( 49 / 270 ) Korean Resturants in Bangkit, :0
( 50 / 270 ) Korean Resturants in Dairy Farm, :0
( 51 / 270 ) Korean Resturants in Fajar, :0
( 52 / 270 ) Korean Resturants in Jelebu, :0
( 53 / 270 ) Korean Resturants in Nature Reserve, :0
( 54 / 270 ) Korean Resturants in Saujana, :1
( 55 / 270 ) Korean Resturants in Senja, :0
( 56 / 270 ) Korean Resturants in Anak Bukit, :8
( 57 / 270 ) Korean Resturants in Coronation Road, :0
( 58 / 270 ) Korean Resturants in Farrer Court, :0
( 59 / 270 ) Korean Resturants in Hillcrest, :1
( 60 / 270 ) Korean Resturants in Holland Road, :1
( 61 / 270 ) Korean Resturants in Leedon Park, :0
( 62 / 270 ) Korean Resturants in Swiss Club, :0
( 63 / 270 ) Korean Resturants in Ulu Pandan, :1
( 64 / 270 ) Korean Resturants in Central Water Catchment, :0
( 65 / 270 ) Korean Resturants in Changi Point, :0
( 66 / 270 ) Korean Resturants in Changi West, :0
( 67 / 270 ) Korean Resturants in Choa Chu Kang Central, :0
( 68 / 270 ) Korean Resturants in Choa Chu Kang North, :0
( 69 / 270 ) Korean Resturants in Keat Hong, :0
( 70 / 270 ) Korean Resturants in Teck Whye, :0
( 71 / 270 ) Korean Resturants in Yew Tee, :0
```

```
( 72 / 270 ) Korean Resturants in Clementi Central, :1
( 73 / 270 ) Korean Resturants in Clementi North, :1
( 74 / 270 ) Korean Resturants in Clementi West, :1
( 75 / 270 ) Korean Resturants in Clementi Woods, :1
( 76 / 270 ) Korean Resturants in Faber, :0
( 77 / 270 ) Korean Resturants in Pandan, :1
( 78 / 270 ) Korean Resturants in Sunset Way, :1
( 79 / 270 ) Korean Resturants in Toh Tuck, :0
( 80 / 270 ) Korean Resturants in West Coast, :0
( 81 / 270 ) Korean Resturants in Anson, :3
( 82 / 270 ) Korean Resturants in Bugis, :0
( 83 / 270 ) Korean Resturants in Cecil, :2
( 84 / 270 ) Korean Resturants in City Hall, :1
( 85 / 270 ) Korean Resturants in Marina Centre, :1
( 86 / 270 ) Korean Resturants in Raffles Place, :2
( 87 / 270 ) Korean Resturants in Tanjong Pagar, :2
( 88 / 270 ) Korean Resturants in Aljunied, :1
( 89 / 270 ) Korean Resturants in Geylang East, :0
( 90 / 270 ) Korean Resturants in Kallang Way, :0
( 91 / 270 ) Korean Resturants in Kampong Ubi, :0
( 92 / 270 ) Korean Resturants in Macpherson, :0
( 93 / 270 ) Korean Resturants in Defu Industrial Park, :0
( 94 / 270 ) Korean Resturants in Hougang Central, :0
( 95 / 270 ) Korean Resturants in Hougang East, :0
( 96 / 270 ) Korean Resturants in Hougang West, :0
( 97 / 270 ) Korean Resturants in Kangkar, :0
( 98 / 270 ) Korean Resturants in Kovan, :1
( 99 / 270 ) Korean Resturants in Lorong Ah Soo, :2
( 100 / 270 ) Korean Resturants in Tai Seng, :0
( 101 / 270 ) Korean Resturants in Trafalgar, :1
( 102 / 270 ) Korean Resturants in International Business Park, :1
( 103 / 270 ) Korean Resturants in Jurong Gateway, :2
( 104 / 270 ) Korean Resturants in Jurong Port, :0
( 105 / 270 ) Korean Resturants in Jurong River, :0
( 106 / 270 ) Korean Resturants in Lakeside, :0
( 107 / 270 ) Korean Resturants in Penjuru Crescent, :0
( 108 / 270 ) Korean Resturants in Teban Gardens, :0
( 109 / 270 ) Korean Resturants in Toh Guan, :2
( 110 / 270 ) Korean Resturants in Yuhua East, :0
( 111 / 270 ) Korean Resturants in Yuhua West, :0
( 112 / 270 ) Korean Resturants in Boon Lay Place, :0
( 113 / 270 ) Korean Resturants in Hong Kah, :0
( 114 / 270 ) Korean Resturants in Jurong West Central, :0
( 115 / 270 ) Korean Resturants in Kian Teck, :0
( 116 / 270 ) Korean Resturants in Taman Jurong, :0
( 117 / 270 ) Korean Resturants in Yunnan, :0
( 118 / 270 ) Korean Resturants in Bendemeer, :0
( 119 / 270 ) Korean Resturants in Boon Keng, :0
( 120 / 270 ) Korean Resturants in Crawford, :0
( 121 / 270 ) Korean Resturants in Geylang Bahru, :0
( 122 / 270 ) Korean Resturants in Kallang Bahru, :0
( 123 / 270 ) Korean Resturants in Kampong Bugis, :1
( 124 / 270 ) Korean Resturants in Kampong Java, :0
( 125 / 270 ) Korean Resturants in Lavender, :0
( 126 / 270 ) Korean Resturants in Tanjong Rhu, :1
( 127 / 270 ) Korean Resturants in Lim Chu Kang, :0
( 128 / 270 ) Korean Resturants in Mandai Estate, :0
( 129 / 270 ) Korean Resturants in Katong, :1
( 130 / 270 ) Korean Resturants in Marine Parade, :1
( 131 / 270 ) Korean Resturants in Mountbatten, :1
( 132 / 270 ) Korean Resturants in Bras Basah, :0
( 133 / 270 ) Korean Resturants in Dhoby Ghaut, :1
( 134 / 270 ) Korean Resturants in Fort Canning, :2
( 135 / 270 ) Korean Resturants in Cairnhill, :1
( 136 / 270 ) Korean Resturants in Goodwood Park, :0
( 137 / 270 ) Korean Resturants in Monk's Hill, :1
( 138 / 270 ) Korean Resturants in Newton Circus, :0
( 139 / 270 ) Korean Resturants in Orange Grove, :1
( 140 / 270 ) Korean Resturants in North-Eastern Islands, :0
( 141 / 270 ) Korean Resturants in Balestier, :0
( 142 / 270 ) Korean Resturants in Dunearn, :0
( 143 / 270 ) Korean Resturants in Malcolm, :0
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( 144 / 270 ) Korean Resturants in Moulmein, :0
( 145 / 270 ) Korean Resturants in Mount Pleasant, :0
( 146 / 270 ) Korean Resturants in Boulevard, :3
( 147 / 270 ) Korean Resturants in Somerset, :1
( 148 / 270 ) Korean Resturants in Tanglin, :2
( 149 / 270 ) Korean Resturants in China Square, :3
( 150 / 270 ) Korean Resturants in Chinatown, :4
( 151 / 270 ) Korean Resturants in Pearl's Hill, :1
( 152 / 270 ) Korean Resturants in People's Park, :2
( 153 / 270 ) Korean Resturants in Flora Drive, :0
( 154 / 270 ) Korean Resturants in Loyang East, :0
( 155 / 270 ) Korean Resturants in Loyang West, :0
( 156 / 270 ) Korean Resturants in Pasir Ris Central, :0
( 157 / 270 ) Korean Resturants in Pasir Ris Drive, :0
( 158 / 270 ) Korean Resturants in Pasir Ris Park, :0
( 159 / 270 ) Korean Resturants in Pasir Ris West, :0
( 160 / 270 ) Korean Resturants in Paya Lebar East, :0
( 161 / 270 ) Korean Resturants in Paya Lebar North, :0
( 162 / 270 ) Korean Resturants in Gul Circle, :0
( 163 / 270 ) Korean Resturants in Joo Koon, :0
( 164 / 270 ) Korean Resturants in Matilda, :0
( 165 / 270 ) Korean Resturants in Northshore, :0
( 166 / 270 ) Korean Resturants in Punggol Field, :0
( 167 / 270 ) Korean Resturants in Punggol Town Centre, :0
( 168 / 270 ) Korean Resturants in Waterway East, :0
( 169 / 270 ) Korean Resturants in Commonwealth, :0
( 170 / 270 ) Korean Resturants in Dover, :1
( 171 / 270 ) Korean Resturants in Ghim Moh, :1
( 172 / 270 ) Korean Resturants in Holland Drive, :1
( 173 / 270 ) Korean Resturants in Kent Ridge, :2
( 174 / 270 ) Korean Resturants in Margaret Drive, :2
( 175 / 270 ) Korean Resturants in Mei Chin, :1
( 176 / 270 ) Korean Resturants in One North, :0
( 177 / 270 ) Korean Resturants in Pasir Panjang 1, :0
( 178 / 270 ) Korean Resturants in Pasir Panjang 2, :0
( 179 / 270 ) Korean Resturants in Port, :0
( 180 / 270 ) Korean Resturants in Queensway, :0
( 181 / 270 ) Korean Resturants in Singapore Polytechnic, :1
( 182 / 270 ) Korean Resturants in Tanglin Halt, :0
( 183 / 270 ) Korean Resturants in Institution Hill, :1
( 184 / 270 ) Korean Resturants in Leonie Hill, :0
( 185 / 270 ) Korean Resturants in One Tree Hill, :1
( 186 / 270 ) Korean Resturants in Oxley, :1
( 187 / 270 ) Korean Resturants in Paterson, :0
( 188 / 270 ) Korean Resturants in Bencoolen, :0
( 189 / 270 ) Korean Resturants in Farrer Park, :0
( 190 / 270 ) Korean Resturants in Kampong Glam, :0
( 191 / 270 ) Korean Resturants in Little India, :0
( 192 / 270 ) Korean Resturants in Mackenzie, :1
( 193 / 270 ) Korean Resturants in Mount Emily, :1
( 194 / 270 ) Korean Resturants in Rochor Canal, :0
( 195 / 270 ) Korean Resturants in Selegie, :0
( 196 / 270 ) Korean Resturants in Sungei Road, :0
( 197 / 270 ) Korean Resturants in Victoria, :0
( 198 / 270 ) Korean Resturants in Seletar, :0
( 199 / 270 ) Korean Resturants in Seletar Aerospace Park, :0
( 200 / 270 ) Korean Resturants in Admiralty, :0
( 201 / 270 ) Korean Resturants in Sembawang Central, :0
( 202 / 270 ) Korean Resturants in Sembawang East, :0
( 203 / 270 ) Korean Resturants in Sembawang North, :0
( 204 / 270 ) Korean Resturants in Sembawang Springs, :0
( 205 / 270 ) Korean Resturants in Sembawang Straits, :0
( 206 / 270 ) Korean Resturants in Senoko North, :0
( 207 / 270 ) Korean Resturants in Senoko South, :0
( 208 / 270 ) Korean Resturants in Anchorvale, :0
( 209 / 270 ) Korean Resturants in Compassvale, :0
( 210 / 270 ) Korean Resturants in Fernvale, :0
( 211 / 270 ) Korean Resturants in Rivervale, :0
( 212 / 270 ) Korean Resturants in Sengkang Town Centre, :0
( 213 / 270 ) Korean Resturants in Sengkang West, :0
( 214 / 270 ) Korean Resturants in Lorong Chuan, :0
( 215 / 270 ) Korean Resturants in Seletar Hills, :0
```

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( 216 / 270 ) Korean Resturants in Serangoon Central, :2
( 217 / 270 ) Korean Resturants in Serangoon Garden, :1
( 218 / 270 ) Korean Resturants in Serangoon North, :0
( 219 / 270 ) Korean Resturants in Upper Paya Lebar, :0
( 220 / 270 ) Korean Resturants in Boat Quay, :2
( 221 / 270 ) Korean Resturants in Clarke Quay, :2
( 222 / 270 ) Korean Resturants in Robertson Quay, :0
( 223 / 270 ) Korean Resturants in Sentosa, :0
( 224 / 270 ) Korean Resturants in Gali Batu, :0
( 225 / 270 ) Korean Resturants in Kranji, :0
( 226 / 270 ) Korean Resturants in Pang Sua, :0
( 227 / 270 ) Korean Resturants in Reservoir View, :0
( 228 / 270 ) Korean Resturants in Turf Club, :0
( 229 / 270 ) Korean Resturants in Simei, :0
( 230 / 270 ) Korean Resturants in Tampines East, :0
( 231 / 270 ) Korean Resturants in Tampines West, :0
( 232 / 270 ) Korean Resturants in Xilin, :0
( 233 / 270 ) Korean Resturants in Chatsworth, :1
( 234 / 270 ) Korean Resturants in Nassim, :1
( 235 / 270 ) Korean Resturants in Ridout, :0
( 236 / 270 ) Korean Resturants in Tyersall, :2
( 237 / 270 ) Korean Resturants in Tengah, :0
( 238 / 270 ) Korean Resturants in Bidadari, :0
( 239 / 270 ) Korean Resturants in Boon Teck, :0
( 240 / 270 ) Korean Resturants in Braddell, :1
( 241 / 270 ) Korean Resturants in Joo Seng, :0
( 242 / 270 ) Korean Resturants in Kim Keat, :0
( 243 / 270 ) Korean Resturants in Lorong 8 Toa Payoh, :0
( 244 / 270 ) Korean Resturants in Pei Chun, :0
( 245 / 270 ) Korean Resturants in Potong Pasir, :0
( 246 / 270 ) Korean Resturants in Sennett, :0
( 247 / 270 ) Korean Resturants in Toa Payoh Central, :0
( 248 / 270 ) Korean Resturants in Toa Payoh West, :1
( 249 / 270 ) Korean Resturants in Woodleigh, :0
( 250 / 270 ) Korean Resturants in Tuas Bay, :0
( 251 / 270 ) Korean Resturants in Tuas North, :0
( 252 / 270 ) Korean Resturants in Tuas View, :0
( 253 / 270 ) Korean Resturants in Western Water Catchment, :0
( 254 / 270 ) Korean Resturants in Greenwood Park, :0
( 255 / 270 ) Korean Resturants in Midview, :1
( 256 / 270 ) Korean Resturants in North Coast, :0
( 257 / 270 ) Korean Resturants in Senoko West, :0
( 258 / 270 ) Korean Resturants in Woodgrove, :0
( 259 / 270 ) Korean Resturants in Woodlands East, :0
( 260 / 270 ) Korean Resturants in Woodlands South, :0
( 261 / 270 ) Korean Resturants in Woodlands West, :0
( 262 / 270 ) Korean Resturants in Khatib, :0
( 263 / 270 ) Korean Resturants in Lower Seletar, :0
( 264 / 270 ) Korean Resturants in Nee Soon, :0
( 265 / 270 ) Korean Resturants in Northland, :0
( 266 / 270 ) Korean Resturants in Springleaf, :0
( 267 / 270 ) Korean Resturants in Yishun Central, :0
( 268 / 270 ) Korean Resturants in Yishun East, :0
( 269 / 270 ) Korean Resturants in Yishun South, :0
( 270 / 270 ) Korean Resturants in Yishun West, :0
```

In [54]: `korean_rest.head()`

Out[54]:

	Neighborhood	ID	Name
0	Shangri-La	539bda5c498ea6a82328fa17	Seoul Restaurant (Charcoal barbecue)
1	Marymount	4bd4219b77b29c7488289282	Parker Korean Restaurant
2	Bukit Ho Swee	4f241718e4b0008741f2ca13	BigMama Korean Restaurant
3	Depot Road	55c045ce498ef4ba12e8fd64	The Gogi
4	Everton Park	4f57625de4b0a4bae7120806	Super Star K Korean BBQ

```
In [55]: korean_rest.shape
```

Out[55]: (105, 3)

```python
column_names = ['Neighborhood', 'ID','Name','Likes','Rating','Tips']
korean_rest_stats_sg = pd.DataFrame(columns = column_names)
count=1

for row in korean_rest.values.tolist():
    Neighborhood,ID,Name = row
    try:
        venue_details = get_venue_details(ID)
        print(venue_details)
        id,name,likes,rating,tips = venue_details.values.tolist()[0]
    except IndexError:
        print('No data available for id=',ID)
        id,name,likes,rating,tips = [0]*5
    print('(',count,'/',len(korean_rest),')','processed')
    korean_rest_stats_sg = korean_rest_stats_sg.append({
                                        'Neighborhood': Neighborhood,
                                        'ID': id,
                                        'Name' : name,
                                        'Likes' : likes,
                                        'Rating' : rating,
                                        'Tips' : tips
                                        }, ignore_index = True)
    count+=1
```

```
                         ID                                    Name   Likes  \
0  539bda5c498ea6a82328fa17   Seoul Restaurant (Charcoal barbecue)      15

   Rating  Tips
0     8.0     7
( 1 / 105 ) processed
                         ID                   Name   Likes   Rating   Tips
0  4bd4219b77b29c7488289282   Parker Korean Restaurant      10      6.2     16
( 2 / 105 ) processed
                         ID                    Name   Likes   Rating   Tips
0  4f241718e4b0008741f2ca13   BigMama Korean Restaurant      46      7.0     21
( 3 / 105 ) processed
                         ID       Name   Likes   Rating   Tips
0  55c045ce498ef4ba12e8fd64   The Gogi       9      7.0     11
( 4 / 105 ) processed
                         ID                    Name   Likes   Rating   Tips
0  4f57625de4b0a4bae7120806   Super Star K Korean BBQ      54      8.3     20
( 5 / 105 ) processed
                         ID         Name   Likes   Rating   Tips
0  528b5cee11d2eff2bb5cd4d5   Don Dae Bak      25      7.6      4
( 6 / 105 ) processed
                         ID          Name   Likes   Rating   Tips
0  5322a364498ea3d0580f5be9   Paik's Bibim      25      7.3     14
( 7 / 105 ) processed
                         ID                    Name   Likes   Rating   Tips
0  4f57625de4b0a4bae7120806   Super Star K Korean BBQ      54      8.3     20
( 8 / 105 ) processed
                         ID         Name   Likes   Rating   Tips
0  528b5cee11d2eff2bb5cd4d5   Don Dae Bak      25      7.6      4
( 9 / 105 ) processed
                         ID                    Name   Likes   Rating   Tips
0  4f241718e4b0008741f2ca13   BigMama Korean Restaurant      46      7.0     21
( 10 / 105 ) processed
                         ID                    Name   Likes   Rating   Tips
0  4f241718e4b0008741f2ca13   BigMama Korean Restaurant      46      7.0     21
( 11 / 105 ) processed
Empty DataFrame
Columns: [ID, Name, Likes, Rating, Tips]
Index: []
No data available for id= 58b7c3384f106962731b516b
( 12 / 105 ) processed
                         ID                        Name   Likes   Rating   Tips
0  553e0db9498e9ba5847ff140   Three Meals a Day (삼시세끼)      19      8.0     15
( 13 / 105 ) processed
                         ID                  Name   Likes   Rating   Tips
0  5618f61f498e1a671fa78f2e   Oven & Fried Chicken       8      7.3      6
( 14 / 105 ) processed
                         ID                      Name   Likes   Rating   Tips
0  4c010d85cf3aa5930e5dccb0   Woorinara Korean Restaurant      17      6.9     11
( 15 / 105 ) processed
                         ID         Name   Likes   Rating   Tips
0  4f9cf067e4b04dd735eaa371   Sin Manbok       9      7.1      8
( 16 / 105 ) processed
                         ID                               Name   Likes  \
0  4f12b9cce4b07e9ecbbc4a2f   Ga Ya Guem Korean Family Restaurant       8

   Rating  Tips
0     6.6     9
( 17 / 105 ) processed
                         ID                      Name   Likes   Rating   Tips
0  4c652be9c74c1b8df751b383   Joo Mak Korean Restaurant      10      6.2     14
( 18 / 105 ) processed
                         ID                           Name   Likes   Rating  \
0  53d249cc498e53e973aa85a0   名家 (Ming Jia) 명가 II Korean BBQ       3      5.9

   Tips
0     5
( 19 / 105 ) processed
                         ID                     Name   Likes   Rating   Tips
0  4cba37b6c7228cfa58c515ce   Kim's Family Restaurant      20      5.7     40
( 20 / 105 ) processed
```

```
                              ID    Name  Likes  Rating  Tips
0  5d1ec4335cbbb2002366cf03  Ajumma's      7     7.7     7
( 21 / 105 ) processed
                              ID    Name  Likes  Rating  Tips
0  5666c8a0498e92a6426490a5  chibing      5     6.7     2
( 22 / 105 ) processed
                              ID    Name  Likes  Rating  Tips
0  5666c8a0498e92a6426490a5  chibing      5     6.7     2
( 23 / 105 ) processed
Empty DataFrame
Columns: [ID, Name, Likes, Rating, Tips]
Index: []
No data available for id= 574e82f1498e44b7c8374534
( 24 / 105 ) processed
Empty DataFrame
Columns: [ID, Name, Likes, Rating, Tips]
Index: []
No data available for id= 574e82f1498e44b7c8374534
( 25 / 105 ) processed
Empty DataFrame
Columns: [ID, Name, Likes, Rating, Tips]
Index: []
No data available for id= 574e82f1498e44b7c8374534
( 26 / 105 ) processed
                              ID       Name  Likes  Rating  Tips
0  4ec0a5c629c25ce5a25d2379  황 Hwang's     13     6.7    14
( 27 / 105 ) processed
                              ID    Name  Likes  Rating  Tips
0  5666c8a0498e92a6426490a5  chibing      5     6.7     2
( 28 / 105 ) processed
Empty DataFrame
Columns: [ID, Name, Likes, Rating, Tips]
Index: []
No data available for id= 574e82f1498e44b7c8374534
( 29 / 105 ) processed
                              ID                   Name  Likes  Rating  Tips
0  4f57625de4b0a4bae7120806  Super Star K Korean BBQ     54     8.3    20
( 30 / 105 ) processed
                              ID                                    Name  Likes  \
0  4e5e1aefe4cdfc603ed5c7c3  왕대박 Wang Dae Bak Korean BBQ Restaurant     98

   Rating  Tips
0     8.2    33
( 31 / 105 ) processed
                              ID                 Name  Likes  Rating  Tips
0  543e53f6498e8eacbba09d5e  Oven & Fried Chicken     65     7.8    28
( 32 / 105 ) processed
                              ID                   Name  Likes  Rating  Tips
0  4f57625de4b0a4bae7120806  Super Star K Korean BBQ     54     8.3    20
( 33 / 105 ) processed
                              ID                                    Name  Likes  \
0  4e5e1aefe4cdfc603ed5c7c3  왕대박 Wang Dae Bak Korean BBQ Restaurant     98

   Rating  Tips
0     8.2    33
( 34 / 105 ) processed
                              ID    Name  Likes  Rating  Tips
0  5d1ec4335cbbb2002366cf03  Ajumma's      7     7.7     7
( 35 / 105 ) processed
                              ID    Name  Likes  Rating  Tips
0  5d1ec4335cbbb2002366cf03  Ajumma's      7     7.7     7
( 36 / 105 ) processed
                              ID                     Name  Likes  Rating  Tips
0  51279816e4b0e4084477c34d  Wang Dae Bak Korean BBQ     71     8.1    23
( 37 / 105 ) processed
                              ID                                    Name  Likes  \
0  4e5e1aefe4cdfc603ed5c7c3  왕대박 Wang Dae Bak Korean BBQ Restaurant     98

   Rating  Tips
0     8.2    33
( 38 / 105 ) processed
                              ID                   Name  Likes  Rating  Tips
```

```
0  4f57625de4b0a4bae7120806  Super Star K Korean BBQ      54      8.3      20
( 39 / 105 ) processed
                        ID                                            Name  Likes  \
0  4e5e1aefe4cdfc603ed5c7c3  왕대박 Wang Dae Bak Korean BBQ Restaurant     98

   Rating  Tips
0     8.2    33
( 40 / 105 ) processed
                        ID        Name  Likes  Rating  Tips
0  52a945c411d2c6d9b10b2c3a  Ju Shin Jung     28     6.8     7
( 41 / 105 ) processed
                        ID                       Name  Likes  Rating  Tips
0  4e07231a483b98d4170e8157  Hansik Korean Restaurant     27     7.4    18
( 42 / 105 ) processed
                        ID                       Name  Likes  Rating  Tips
0  4e07231a483b98d4170e8157  Hansik Korean Restaurant     27     7.4    18
( 43 / 105 ) processed
                        ID                                    Name  Likes  \
0  4f004859d3e364d5fcca30a7  Goki Day Korean BBQ Buffet Restaurant     13

   Rating  Tips
0     7.1     4
( 44 / 105 ) processed
                        ID      Name  Likes  Rating  Tips
0  5d1ec4335cbbb2002366cf03  Ajumma's      7     7.7     7
( 45 / 105 ) processed
                        ID       Name  Likes  Rating  Tips
0  57933e6d498e1f75f9f4955d  Chir Chir      5     7.2     6
( 46 / 105 ) processed
                        ID       Name  Likes  Rating  Tips
0  57933e6d498e1f75f9f4955d  Chir Chir      5     7.2     6
( 47 / 105 ) processed
                        ID                Name  Likes  Rating  Tips
0  53881b77498e33f16c34889e  Oppa Korean Grill BBQ      9     6.6     4
( 48 / 105 ) processed
                        ID       Name  Likes  Rating  Tips
0  57933e6d498e1f75f9f4955d  Chir Chir      5     7.2     6
( 49 / 105 ) processed
                        ID                Name  Likes  Rating  Tips
0  53881b77498e33f16c34889e  Oppa Korean Grill BBQ      9     6.6     4
( 50 / 105 ) processed
                        ID                 Name  Likes  Rating  Tips
0  59323a7a916bc1447767f975  Omoomo Food Concepts      6     7.1     3
( 51 / 105 ) processed
                        ID                 Name  Likes  Rating  Tips
0  59323a7a916bc1447767f975  Omoomo Food Concepts      6     7.1     3
( 52 / 105 ) processed
                        ID                    Name  Likes  Rating  Tips
0  4bcbe7450687ef3b3f92decc  Doong Ji Korean Restaurant     29     7.2    27
( 53 / 105 ) processed
                        ID                    Name  Likes  Rating  Tips
0  4bcbe7450687ef3b3f92decc  Doong Ji Korean Restaurant     29     7.2    27
( 54 / 105 ) processed
                        ID        Name  Likes  Rating  Tips
0  52a945c411d2c6d9b10b2c3a  Ju Shin Jung     28     6.8     7
( 55 / 105 ) processed
                        ID                  Name  Likes  Rating  Tips
0  4b70d58cf964a520ca302de3  Kim Dae Mun Korean Food     64     8.3    61
( 56 / 105 ) processed
                        ID      Name  Likes  Rating  Tips
0  5d1ec4335cbbb2002366cf03  Ajumma's      7     7.7     7
( 57 / 105 ) processed
                        ID                  Name  Likes  Rating  Tips
0  4b70d58cf964a520ca302de3  Kim Dae Mun Korean Food     64     8.3    61
( 58 / 105 ) processed
                        ID                  Name  Likes  Rating  Tips
0  4b70d58cf964a520ca302de3  Kim Dae Mun Korean Food     64     8.3    61
( 59 / 105 ) processed
                        ID                  Name  Likes  Rating  Tips
0  4b70d58cf964a520ca302de3  Kim Dae Mun Korean Food     64     8.3    61
( 60 / 105 ) processed
                        ID                                     Name  Likes  \
```

```
0  539bda5c498ea6a82328fa17  Seoul Restaurant (Charcoal barbecue)    15

   Rating  Tips
0     8.0     7
( 61 / 105 ) processed
                        ID                    Name  Likes  Rating  Tips
0  4f57625de4b0a4bae7120806  Super Star K Korean BBQ     54     8.3    20
( 62 / 105 ) processed
                        ID                                  Name  Likes  \
0  4e5e1aefe4cdfc603ed5c7c3  왕대박 Wang Dae Bak Korean BBQ Restaurant     98

   Rating  Tips
0     8.2    33
( 63 / 105 ) processed
                        ID                 Name  Likes  Rating  Tips
0  543e53f6498e8eacbba09d5e  Oven & Fried Chicken     65     7.8    28
( 64 / 105 ) processed
                        ID                  Name  Likes  Rating  Tips
0  4b70d58cf964a520ca302de3  Kim Dae Mun Korean Food     64     8.3    61
( 65 / 105 ) processed
                        ID             Name  Likes  Rating  Tips
0  57b838c3498e955a15a93e71  Chang Korean BBQ     14     7.8     3
( 66 / 105 ) processed
                        ID             Name  Likes  Rating  Tips
0  4b592290f964a520577e28e3  Chang Korean BBQ     26     5.8    20
( 67 / 105 ) processed
                        ID                  Name  Likes  Rating  Tips
0  51279816e4b0e4084477c34d  Wang Dae Bak Korean BBQ     71     8.1    23
( 68 / 105 ) processed
                        ID                                  Name  Likes  \
0  4e5e1aefe4cdfc603ed5c7c3  왕대박 Wang Dae Bak Korean BBQ Restaurant     98

   Rating  Tips
0     8.2    33
( 69 / 105 ) processed
                        ID                 Name  Likes  Rating  Tips
0  543e53f6498e8eacbba09d5e  Oven & Fried Chicken     65     7.8    28
( 70 / 105 ) processed
                        ID                                  Name  Likes  \
0  4e5e1aefe4cdfc603ed5c7c3  왕대박 Wang Dae Bak Korean BBQ Restaurant     98

   Rating  Tips
0     8.2    33
( 71 / 105 ) processed
                        ID                  Name  Likes  Rating  Tips
0  51279816e4b0e4084477c34d  Wang Dae Bak Korean BBQ     71     8.1    23
( 72 / 105 ) processed
                        ID        Name  Likes  Rating  Tips
0  528b5cee11d2eff2bb5cd4d5  Don Dae Bak     25     7.6     4
( 73 / 105 ) processed
                        ID                    Name  Likes  Rating  Tips
0  4f57625de4b0a4bae7120806  Super Star K Korean BBQ     54     8.3    20
( 74 / 105 ) processed
                        ID        Name  Likes  Rating  Tips
0  528b5cee11d2eff2bb5cd4d5  Don Dae Bak     25     7.6     4
( 75 / 105 ) processed
                        ID                  Name  Likes  Rating  Tips
0  51279816e4b0e4084477c34d  Wang Dae Bak Korean BBQ     71     8.1    23
( 76 / 105 ) processed
                        ID                                  Name  Likes  \
0  4e5e1aefe4cdfc603ed5c7c3  왕대박 Wang Dae Bak Korean BBQ Restaurant     98

   Rating  Tips
0     8.2    33
( 77 / 105 ) processed
                        ID      Name  Likes  Rating  Tips
0  4ec0a5c629c25ce5a25d2379  황 Hwang's     13     6.7    14
( 78 / 105 ) processed
                        ID    Name  Likes  Rating  Tips
0  5666c8a0498e92a6426490a5  chibing      5     6.7     2
( 79 / 105 ) processed
                        ID    Name  Likes  Rating  Tips
```

```
0  5666c8a0498e92a6426490a5    chibing      5    6.7     2
( 80 / 105 ) processed
                         ID          Name  Likes  Rating  Tips
0  53281e84498e4e312c042fb9  Sunny Korean      6     6.2     3
( 81 / 105 ) processed
                         ID      Name  Likes  Rating  Tips
0  56e78dbf498e37fb5bd50da4  Hoodadak      4     5.9     2
( 82 / 105 ) processed
                         ID             Name  Likes  Rating  Tips
0  57b838c3498e955a15a93e71  Chang Korean BBQ     14     7.8     3
( 83 / 105 ) processed
                         ID             Name  Likes  Rating  Tips
0  4b592290f964a520577e28e3  Chang Korean BBQ     26     5.8    20
( 84 / 105 ) processed
                         ID      Name  Likes  Rating  Tips
0  55c045ce498ef4ba12e8fd64  The Gogi      9     7.0    11
( 85 / 105 ) processed
                         ID        Name  Likes  Rating  Tips
0  4ec0a5c629c25ce5a25d2379  황 Hwang's     13     6.7    14
( 86 / 105 ) processed
                         ID                   Name  Likes  Rating  Tips
0  4b70d58cf964a520ca302de3  Kim Dae Mun Korean Food     64     8.3    61
( 87 / 105 ) processed
                         ID                                   Name  Likes  \
0  539bda5c498ea6a82328fa17  Seoul Restaurant (Charcoal barbecue)     15

   Rating  Tips
0     8.0     7
( 88 / 105 ) processed
                         ID                   Name  Likes  Rating  Tips
0  4b70d58cf964a520ca302de3  Kim Dae Mun Korean Food     64     8.3    61
( 89 / 105 ) processed
                         ID                   Name  Likes  Rating  Tips
0  4b70d58cf964a520ca302de3  Kim Dae Mun Korean Food     64     8.3    61
( 90 / 105 ) processed
                         ID                   Name  Likes  Rating  Tips
0  4b70d58cf964a520ca302de3  Kim Dae Mun Korean Food     64     8.3    61
( 91 / 105 ) processed
                         ID                               Name  Likes  \
0  4f004859d3e364d5fcca30a7  Goki Day Korean BBQ Buffet Restaurant     13

   Rating  Tips
0     7.1     4
( 92 / 105 ) processed
                         ID          Name  Likes  Rating  Tips
0  50d2eee7e4b07de97871ad0a  Seoul Garden     16     7.0     7
( 93 / 105 ) processed
                         ID                        Name  Likes  Rating  Tips
0  4e9024dc775bfdaabc346dd3  Hanwoori Korean Restaurant     21     6.4    18
( 94 / 105 ) processed
                         ID      Name  Likes  Rating  Tips
0  5d1ec4335cbbb2002366cf03  Ajumma's      7     7.7     7
( 95 / 105 ) processed
                         ID                   Name  Likes  Rating  Tips
0  51279816e4b0e4084477c34d  Wang Dae Bak Korean BBQ     71     8.1    23
( 96 / 105 ) processed
                         ID                   Name  Likes  Rating  Tips
0  51279816e4b0e4084477c34d  Wang Dae Bak Korean BBQ     71     8.1    23
( 97 / 105 ) processed
                         ID      Name  Likes  Rating  Tips
0  5d1ec4335cbbb2002366cf03  Ajumma's      7     7.7     7
( 98 / 105 ) processed
                         ID                                   Name  Likes  \
0  539bda5c498ea6a82328fa17  Seoul Restaurant (Charcoal barbecue)     15

   Rating  Tips
0     8.0     7
( 99 / 105 ) processed
                         ID                                   Name  Likes  \
0  539bda5c498ea6a82328fa17  Seoul Restaurant (Charcoal barbecue)     15

   Rating  Tips
```

```
0     8.0      7
( 100 / 105 ) processed
                          ID               Name  Likes  Rating  Tips
0  57b838c3498e955a15a93e71  Chang Korean BBQ     14     7.8     3
( 101 / 105 ) processed
                          ID               Name  Likes  Rating  Tips
0  4b592290f964a520577e28e3  Chang Korean BBQ     26     5.8    20
( 102 / 105 ) processed
                          ID                     Name  Likes  Rating  Tips
0  51974bc5498e968daf58212f  Korean BBQ Buffet (KBB)      5     6.1     6
( 103 / 105 ) processed
                          ID                     Name  Likes  Rating  Tips
0  51974bc5498e968daf58212f  Korean BBQ Buffet (KBB)      5     6.1     6
( 104 / 105 ) processed
                          ID                      Name  Likes  Rating  Tips
0  4bd4219b77b29c7488289282  Parker Korean Restaurant     10     6.2    16
( 105 / 105 ) processed
```

```
korean_rest_stats_sg = korean_rest_stats_sg[(korean_rest_stats_sg['ID'] != 0)]
korean_rest_stats_sg
```

	Neighborhood	ID	Name	Likes	Rating	Tips
0	Shangri-La	539bda5c498ea6a82328fa17	Seoul Restaurant (Charcoal barbecue)	15	8.0	7
1	Marymount	4bd4219b77b29c7488289282	Parker Korean Restaurant	10	6.2	16
2	Bukit Ho Swee	4f241718e4b0008741f2ca13	BigMama Korean Restaurant	46	7.0	21
3	Depot Road	55c045ce498ef4ba12e8fd64	The Gogi	9	7.0	11
4	Everton Park	4f57625de4b0a4bae7120806	Super Star K Korean BBQ	54	8.3	20
5	Everton Park	528b5cee11d2eff2bb5cd4d5	Don Dae Bak	25	7.6	4
6	Maritime Square	5322a364498ea3d0580f5be9	Paik's Bibim	25	7.3	14
7	Singapore General Hospital	4f57625de4b0a4bae7120806	Super Star K Korean BBQ	54	8.3	20
8	Singapore General Hospital	528b5cee11d2eff2bb5cd4d5	Don Dae Bak	25	7.6	4
9	Tiong Bahru	4f241718e4b0008741f2ca13	BigMama Korean Restaurant	46	7.0	21
10	Tiong Bahru Station	4f241718e4b0008741f2ca13	BigMama Korean Restaurant	46	7.0	21
12	Anak Bukit	553e0db9498e9ba5847ff140	Three Meals a Day (삼시세끼)	19	8.0	15
13	Anak Bukit	5618f61f498e1a671fa78f2e	Oven & Fried Chicken	8	7.3	6
14	Anak Bukit	4c010d85cf3aa5930e5dccb0	Woorinara Korean Restaurant	17	6.9	11
15	Anak Bukit	4f9cf067e4b04dd735eaa371	Sin Manbok	9	7.1	8
16	Anak Bukit	4f12b9cce4b07e9ecbbc4a2f	Ga Ya Guem Korean Family Restaurant	8	6.6	9
17	Anak Bukit	4c652be9c74c1b8df751b383	Joo Mak Korean Restaurant	10	6.2	14
18	Anak Bukit	53d249cc498e53e973aa85a0	名家 (Ming Jia) 명가 II Korean BBQ	3	5.9	5
19	Anak Bukit	4cba37b6c7228cfa58c515ce	Kim's Family Restaurant	20	5.7	40
20	Hillcrest	5d1ec4335cbbb2002366cf03	Ajumma's	7	7.7	7
21	Holland Road	5666c8a0498e92a6426490a5	chibing	5	6.7	2
22	Ulu Pandan	5666c8a0498e92a6426490a5	chibing	5	6.7	2
26	Clementi Woods	4ec0a5c629c25ce5a25d2379	황 Hwang's	13	6.7	14
27	Pandan	5666c8a0498e92a6426490a5	chibing	5	6.7	2
29	Anson	4f57625de4b0a4bae7120806	Super Star K Korean BBQ	54	8.3	20
30	Anson	4e5e1aefe4cdfc603ed5c7c3	왕대박 Wang Dae Bak Korean BBQ Restaurant	98	8.2	33
31	Anson	543e53f6498e8eacbba09d5e	Oven & Fried Chicken	65	7.8	28
32	Cecil	4f57625de4b0a4bae7120806	Super Star K Korean BBQ	54	8.3	20
33	Cecil	4e5e1aefe4cdfc603ed5c7c3	왕대박 Wang Dae Bak Korean BBQ Restaurant	98	8.2	33
34	City Hall	5d1ec4335cbbb2002366cf03	Ajumma's	7	7.7	7
35	Marina Centre	5d1ec4335cbbb2002366cf03	Ajumma's	7	7.7	7
36	Raffles Place	51279816e4b0e4084477c34d	Wang Dae Bak Korean BBQ	71	8.1	23
37	Raffles Place	4e5e1aefe4cdfc603ed5c7c3	왕대박 Wang Dae Bak Korean BBQ Restaurant	98	8.2	33
38	Tanjong Pagar	4f57625de4b0a4bae7120806	Super Star K Korean BBQ	54	8.3	20
39	Tanjong Pagar	4e5e1aefe4cdfc603ed5c7c3	왕대박 Wang Dae Bak Korean BBQ Restaurant	98	8.2	33
40	Aljunied	52a945c411d2c6d9b10b2c3a	Ju Shin Jung	28	6.8	7
41	Kovan	4e07231a483b98d4170e8157	Hansik Korean Restaurant	27	7.4	18
42	Lorong Ah Soo	4e07231a483b98d4170e8157	Hansik Korean Restaurant	27	7.4	18
43	Lorong Ah Soo	4f004859d3e364d5fcca30a7	Goki Day Korean BBQ Buffet Restaurant	13	7.1	4
44	Trafalgar	5d1ec4335cbbb2002366cf03	Ajumma's	7	7.7	7

	Neighborhood	ID	Name	Likes	Rating	Tips
45	International Business Park	57933e6d498e1f75f9f4955d	Chir Chir	5	7.2	6
46	Jurong Gateway	57933e6d498e1f75f9f4955d	Chir Chir	5	7.2	6
47	Jurong Gateway	53881b77498e33f16c34889e	Oppa Korean Grill BBQ	9	6.6	4
48	Toh Guan	57933e6d498e1f75f9f4955d	Chir Chir	5	7.2	6
49	Toh Guan	53881b77498e33f16c34889e	Oppa Korean Grill BBQ	9	6.6	4
50	Kampong Bugis	59323a7a916bc1447767f975	Omoomo Food Concepts	6	7.1	3
51	Tanjong Rhu	59323a7a916bc1447767f975	Omoomo Food Concepts	6	7.1	3
52	Katong	4bcbe7450687ef3b3f92decc	Doong Ji Korean Restaurant	29	7.2	27
53	Marine Parade	4bcbe7450687ef3b3f92decc	Doong Ji Korean Restaurant	29	7.2	27
54	Mountbatten	52a945c411d2c6d9b10b2c3a	Ju Shin Jung	28	6.8	7
55	Dhoby Ghaut	4b70d58cf964a520ca302de3	Kim Dae Mun Korean Food	64	8.3	61
56	Fort Canning	5d1ec4335cbbb2002366cf03	Ajumma's	7	7.7	7
57	Fort Canning	4b70d58cf964a520ca302de3	Kim Dae Mun Korean Food	64	8.3	61
58	Cairnhill	4b70d58cf964a520ca302de3	Kim Dae Mun Korean Food	64	8.3	61
59	Monk's Hill	4b70d58cf964a520ca302de3	Kim Dae Mun Korean Food	64	8.3	61
60	Orange Grove	539bda5c498ea6a82328fa17	Seoul Restaurant (Charcoal barbecue)	15	8.0	7
61	Boulevard	4f57625de4b0a4bae7120806	Super Star K Korean BBQ	54	8.3	20
62	Boulevard	4e5e1aefe4cdfc603ed5c7c3	왕대박 Wang Dae Bak Korean BBQ Restaurant	98	8.2	33
63	Boulevard	543e53f6498e8eacbba09d5e	Oven & Fried Chicken	65	7.8	28
64	Somerset	4b70d58cf964a520ca302de3	Kim Dae Mun Korean Food	64	8.3	61
65	Tanglin	57b838c3498e955a15a93e71	Chang Korean BBQ	14	7.8	3
66	Tanglin	4b592290f964a520577e28e3	Chang Korean BBQ	26	5.8	20
67	China Square	51279816e4b0e4084477c34d	Wang Dae Bak Korean BBQ	71	8.1	23
68	China Square	4e5e1aefe4cdfc603ed5c7c3	왕대박 Wang Dae Bak Korean BBQ Restaurant	98	8.2	33
69	China Square	543e53f6498e8eacbba09d5e	Oven & Fried Chicken	65	7.8	28
70	Chinatown	4e5e1aefe4cdfc603ed5c7c3	왕대박 Wang Dae Bak Korean BBQ Restaurant	98	8.2	33
71	Chinatown	51279816e4b0e4084477c34d	Wang Dae Bak Korean BBQ	71	8.1	23
72	Chinatown	528b5cee11d2eff2bb5cd4d5	Don Dae Bak	25	7.6	4
73	Chinatown	4f57625de4b0a4bae7120806	Super Star K Korean BBQ	54	8.3	20
74	Pearl's Hill	528b5cee11d2eff2bb5cd4d5	Don Dae Bak	25	7.6	4
75	People's Park	51279816e4b0e4084477c34d	Wang Dae Bak Korean BBQ	71	8.1	23
76	People's Park	4e5e1aefe4cdfc603ed5c7c3	왕대박 Wang Dae Bak Korean BBQ Restaurant	98	8.2	33
77	Dover	4ec0a5c629c25ce5a25d2379	황 Hwang's	13	6.7	14
78	Ghim Moh	5666c8a0498e92a6426490a5	chibing	5	6.7	2
79	Holland Drive	5666c8a0498e92a6426490a5	chibing	5	6.7	2
80	Kent Ridge	53281e84498e4e312c042fb9	Sunny Korean	6	6.2	3
81	Kent Ridge	56e78dbf498e37fb5bd50da4	Hoodadak	4	5.9	2
82	Margaret Drive	57b838c3498e955a15a93e71	Chang Korean BBQ	14	7.8	3
83	Margaret Drive	4b592290f964a520577e28e3	Chang Korean BBQ	26	5.8	20
84	Mei Chin	55c045ce498ef4ba12e8fd64	The Gogi	9	7.0	11
85	Singapore Polytechnic	4ec0a5c629c25ce5a25d2379	황 Hwang's	13	6.7	14
86	Institution Hill	4b70d58cf964a520ca302de3	Kim Dae Mun Korean Food	64	8.3	61
87	One Tree Hill	539bda5c498ea6a82328fa17	Seoul Restaurant (Charcoal barbecue)	15	8.0	7

	Neighborhood	ID	Name	Likes	Rating	Tips
88	Oxley	4b70d58cf964a520ca302de3	Kim Dae Mun Korean Food	64	8.3	61
89	Mackenzie	4b70d58cf964a520ca302de3	Kim Dae Mun Korean Food	64	8.3	61
90	Mount Emily	4b70d58cf964a520ca302de3	Kim Dae Mun Korean Food	64	8.3	61
91	Serangoon Central	4f004859d3e364d5fcca30a7	Goki Day Korean BBQ Buffet Restaurant	13	7.1	4
92	Serangoon Central	50d2eee7e4b07de97871ad0a	Seoul Garden	16	7.0	7
93	Serangoon Garden	4e9024dc775bfdaabc346dd3	Hanwoori Korean Restaurant	21	6.4	18
94	Boat Quay	5d1ec4335cbbb2002366cf03	Ajumma's	7	7.7	7
95	Boat Quay	51279816e4b0e4084477c34d	Wang Dae Bak Korean BBQ	71	8.1	23
96	Clarke Quay	51279816e4b0e4084477c34d	Wang Dae Bak Korean BBQ	71	8.1	23
97	Clarke Quay	5d1ec4335cbbb2002366cf03	Ajumma's	7	7.7	7
98	Chatsworth	539bda5c498ea6a82328fa17	Seoul Restaurant (Charcoal barbecue)	15	8.0	7
99	Nassim	539bda5c498ea6a82328fa17	Seoul Restaurant (Charcoal barbecue)	15	8.0	7
100	Tyersall	57b838c3498e955a15a93e71	Chang Korean BBQ	14	7.8	3
101	Tyersall	4b592290f964a520577e28e3	Chang Korean BBQ	26	5.8	20
102	Braddell	51974bc5498e968daf58212f	Korean BBQ Buffet (KBB)	5	6.1	6
103	Toa Payoh West	51974bc5498e968daf58212f	Korean BBQ Buffet (KBB)	5	6.1	6
104	Midview	4bd4219b77b29c7488289282	Parker Korean Restaurant	10	6.2	16

In [58]:
```python
korean_rest_stats_sg['Likes'] = korean_rest_stats_sg['Likes'].astype('float64')
korean_rest_stats_sg['Tips'] = korean_rest_stats_sg['Tips'].astype('float64')
korean_rest_stats_sg.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 100 entries, 0 to 104
Data columns (total 6 columns):
 #   Column        Non-Null Count  Dtype
---  ------        --------------  -----
 0   Neighborhood  100 non-null    object
 1   ID            100 non-null    object
 2   Name          100 non-null    object
 3   Likes         100 non-null    float64
 4   Rating        100 non-null    float64
 5   Tips          100 non-null    float64
dtypes: float64(3), object(3)
memory usage: 5.5+ KB
```

In [59]:
```python
test = korean_rest_stats_sg.drop_duplicates(subset='ID', keep="first")
```

In [60]:
```python
test.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 36 entries, 0 to 102
Data columns (total 6 columns):
 #   Column        Non-Null Count  Dtype
---  ------        --------------  -----
 0   Neighborhood  36 non-null     object
 1   ID            36 non-null     object
 2   Name          36 non-null     object
 3   Likes         36 non-null     float64
 4   Rating        36 non-null     float64
 5   Tips          36 non-null     float64
dtypes: float64(3), object(3)
memory usage: 2.0+ KB
```

```
In [61]:  test.sort_values(by = ['Likes','Rating'],ascending = False)
```

Out[61]:

	Neighborhood	ID	Name	Likes	Rating	Tips
30	Anson	4e5e1aefe4cdfc603ed5c7c3	왕대박 Wang Dae Bak Korean BBQ Restaurant	98.0	8.2	33.0
36	Raffles Place	51279816e4b0e4084477c34d	Wang Dae Bak Korean BBQ	71.0	8.1	23.0
31	Anson	543e53f6498e8eacbba09d5e	Oven & Fried Chicken	65.0	7.8	28.0
55	Dhoby Ghaut	4b70d58cf964a520ca302de3	Kim Dae Mun Korean Food	64.0	8.3	61.0
4	Everton Park	4f57625de4b0a4bae7120806	Super Star K Korean BBQ	54.0	8.3	20.0
2	Bukit Ho Swee	4f241718e4b0008741f2ca13	BigMama Korean Restaurant	46.0	7.0	21.0
52	Katong	4bcbe7450687ef3b3f92decc	Doong Ji Korean Restaurant	29.0	7.2	27.0
40	Aljunied	52a945c411d2c6d9b10b2c3a	Ju Shin Jung	28.0	6.8	7.0
41	Kovan	4e07231a483b98d4170e8157	Hansik Korean Restaurant	27.0	7.4	18.0
66	Tanglin	4b592290f964a520577e28e3	Chang Korean BBQ	26.0	5.8	20.0
5	Everton Park	528b5cee11d2eff2bb5cd4d5	Don Dae Bak	25.0	7.6	4.0
6	Maritime Square	5322a364498ea3d0580f5be9	Paik's Bibim	25.0	7.3	14.0
93	Serangoon Garden	4e9024dc775bfdaabc346dd3	Hanwoori Korean Restaurant	21.0	6.4	18.0
19	Anak Bukit	4cba37b6c7228cfa58c515ce	Kim's Family Restaurant	20.0	5.7	40.0
12	Anak Bukit	553e0db9498e9ba5847ff140	Three Meals a Day (삼시세끼)	19.0	8.0	15.0
14	Anak Bukit	4c010d85cf3aa5930e5dccb0	Woorinara Korean Restaurant	17.0	6.9	11.0
92	Serangoon Central	50d2eee7e4b07de97871ad0a	Seoul Garden	16.0	7.0	7.0
0	Shangri-La	539bda5c498ea6a82328fa17	Seoul Restaurant (Charcoal barbecue)	15.0	8.0	7.0
65	Tanglin	57b838c3498e955a15a93e71	Chang Korean BBQ	14.0	7.8	3.0
43	Lorong Ah Soo	4f004859d3e364d5fcca30a7	Goki Day Korean BBQ Buffet Restaurant	13.0	7.1	4.0
26	Clementi Woods	4ec0a5c629c25ce5a25d2379	황 Hwang's	13.0	6.7	14.0
1	Marymount	4bd4219b77b29c7488289282	Parker Korean Restaurant	10.0	6.2	16.0
17	Anak Bukit	4c652be9c74c1b8df751b383	Joo Mak Korean Restaurant	10.0	6.2	14.0
15	Anak Bukit	4f9cf067e4b04dd735eaa371	Sin Manbok	9.0	7.1	8.0
3	Depot Road	55c045ce498ef4ba12e8fd64	The Gogi	9.0	7.0	11.0
47	Jurong Gateway	53881b77498e33f16c34889e	Oppa Korean Grill BBQ	9.0	6.6	4.0
13	Anak Bukit	5618f61f498e1a671fa78f2e	Oven & Fried Chicken	8.0	7.3	6.0
16	Anak Bukit	4f12b9cce4b07e9ecbbc4a2f	Ga Ya Guem Korean Family Restaurant	8.0	6.6	9.0
20	Hillcrest	5d1ec4335cbbb2002366cf03	Ajumma's	7.0	7.7	7.0
50	Kampong Bugis	59323a7a916bc1447767f975	Omoomo Food Concepts	6.0	7.1	3.0
80	Kent Ridge	53281e84498e4e312c042fb9	Sunny Korean	6.0	6.2	3.0
45	International Business Park	57933e6d498e1f75f9f4955d	Chir Chir	5.0	7.2	6.0
21	Holland Road	5666c8a0498e92a6426490a5	chibing	5.0	6.7	2.0
102	Braddell	51974bc5498e968daf58212f	Korean BBQ Buffet (KBB)	5.0	6.1	6.0
81	Kent Ridge	56e78dbf498e37fb5bd50da4	Hoodadak	4.0	5.9	2.0
18	Anak Bukit	53d249cc498e53e973aa85a0	名家 (Ming Jia) 명가 II Korean BBQ	3.0	5.9	5.0

From the above sorted dataframe, we can recommend someone who wants to have a good Korean meal to try out the first 5 in the list as they are very popular among the local communities in Singapore.

Next, we shall find out the Thai restaurants in Singapore using Foursquare API.

```
In [63]: column_names = ['Neighborhood', 'ID','Name']
         thai_rest = pd.DataFrame(columns=column_names)
         count = 1
         for row in df2.values.tolist():
             Area, Latitude, Longitude,Neighborhood, Population = row
             venues = get_venues(Latitude,Longitude)
             thai_resturants = venues[venues['Category'] == 'Thai Restaurant']
             print('(',count,'/',len(df2),')','Thai Resturants in '+Neighborhood+', :'+str(len(thai_
         resturants)))
             for detail in thai_resturants.values.tolist():
                 id, name , category = detail
                 thai_rest = thai_rest.append({'Neighborhood': Neighborhood,
                                                'ID': id,
                                                'Name' : name
                                               }, ignore_index = True)
             count+=1
```

```
( 1 / 270 ) Thai Resturants in Ang Mo Kio Town Centre, :1
( 2 / 270 ) Thai Resturants in Cheng San, :0
( 3 / 270 ) Thai Resturants in Chong Boon, :0
( 4 / 270 ) Thai Resturants in Kebun Bahru, :1
( 5 / 270 ) Thai Resturants in Sembawang Hills, :1
( 6 / 270 ) Thai Resturants in Shangri-La, :1
( 7 / 270 ) Thai Resturants in Tagore, :0
( 8 / 270 ) Thai Resturants in Townsville, :0
( 9 / 270 ) Thai Resturants in Yio Chu Kang, :1
( 10 / 270 ) Thai Resturants in Yio Chu Kang East, :1
( 11 / 270 ) Thai Resturants in Yio Chu Kang West, :1
( 12 / 270 ) Thai Resturants in Bayshore, :0
( 13 / 270 ) Thai Resturants in Bedok North, :1
( 14 / 270 ) Thai Resturants in Bedok Reservoir, :0
( 15 / 270 ) Thai Resturants in Bedok South, :0
( 16 / 270 ) Thai Resturants in Frankel, :0
( 17 / 270 ) Thai Resturants in Kaki Bukit, :0
( 18 / 270 ) Thai Resturants in Kembangan, :0
( 19 / 270 ) Thai Resturants in Siglap, :0
( 20 / 270 ) Thai Resturants in Bishan East, :4
( 21 / 270 ) Thai Resturants in Marymount, :5
( 22 / 270 ) Thai Resturants in Upper Thomson, :3
( 23 / 270 ) Thai Resturants in Samulun, :0
( 24 / 270 ) Thai Resturants in Tukang, :0
( 25 / 270 ) Thai Resturants in Bukit Batok Central, :0
( 26 / 270 ) Thai Resturants in Bukit Batok East, :0
( 27 / 270 ) Thai Resturants in Bukit Batok South, :0
( 28 / 270 ) Thai Resturants in Bukit Batok West, :0
( 29 / 270 ) Thai Resturants in Gombak, :0
( 30 / 270 ) Thai Resturants in Guilin, :0
( 31 / 270 ) Thai Resturants in Hillview, :0
( 32 / 270 ) Thai Resturants in Hong Kah North, :1
( 33 / 270 ) Thai Resturants in Alexandra Hill, :2
( 34 / 270 ) Thai Resturants in Alexandra North, :2
( 35 / 270 ) Thai Resturants in Bukit Ho Swee, :2
( 36 / 270 ) Thai Resturants in Bukit Merah, :0
( 37 / 270 ) Thai Resturants in City Terminals, :0
( 38 / 270 ) Thai Resturants in Depot Road, :0
( 39 / 270 ) Thai Resturants in Everton Park, :1
( 40 / 270 ) Thai Resturants in Henderson Hill, :0
( 41 / 270 ) Thai Resturants in Maritime Square, :1
( 42 / 270 ) Thai Resturants in Redhill, :0
( 43 / 270 ) Thai Resturants in Singapore General Hospital, :2
( 44 / 270 ) Thai Resturants in Telok Blangah Drive, :0
( 45 / 270 ) Thai Resturants in Telok Blangah Rise, :0
( 46 / 270 ) Thai Resturants in Telok Blangah Way, :0
( 47 / 270 ) Thai Resturants in Tiong Bahru, :2
( 48 / 270 ) Thai Resturants in Tiong Bahru Station, :2
( 49 / 270 ) Thai Resturants in Bangkit, :0
( 50 / 270 ) Thai Resturants in Dairy Farm, :0
( 51 / 270 ) Thai Resturants in Fajar, :0
( 52 / 270 ) Thai Resturants in Jelebu, :1
( 53 / 270 ) Thai Resturants in Nature Reserve, :0
( 54 / 270 ) Thai Resturants in Saujana, :0
( 55 / 270 ) Thai Resturants in Senja, :1
( 56 / 270 ) Thai Resturants in Anak Bukit, :4
( 57 / 270 ) Thai Resturants in Coronation Road, :2
( 58 / 270 ) Thai Resturants in Farrer Court, :0
( 59 / 270 ) Thai Resturants in Hillcrest, :0
( 60 / 270 ) Thai Resturants in Holland Road, :1
( 61 / 270 ) Thai Resturants in Leedon Park, :0
( 62 / 270 ) Thai Resturants in Swiss Club, :2
( 63 / 270 ) Thai Resturants in Ulu Pandan, :0
( 64 / 270 ) Thai Resturants in Central Water Catchment, :0
( 65 / 270 ) Thai Resturants in Changi Point, :0
( 66 / 270 ) Thai Resturants in Changi West, :0
( 67 / 270 ) Thai Resturants in Choa Chu Kang Central, :1
( 68 / 270 ) Thai Resturants in Choa Chu Kang North, :1
( 69 / 270 ) Thai Resturants in Keat Hong, :2
( 70 / 270 ) Thai Resturants in Teck Whye, :1
( 71 / 270 ) Thai Resturants in Yew Tee, :0
```

```
( 72 / 270 ) Thai Resturants in Clementi Central, :1
( 73 / 270 ) Thai Resturants in Clementi North, :1
( 74 / 270 ) Thai Resturants in Clementi West, :1
( 75 / 270 ) Thai Resturants in Clementi Woods, :1
( 76 / 270 ) Thai Resturants in Faber, :1
( 77 / 270 ) Thai Resturants in Pandan, :0
( 78 / 270 ) Thai Resturants in Sunset Way, :1
( 79 / 270 ) Thai Resturants in Toh Tuck, :0
( 80 / 270 ) Thai Resturants in West Coast, :1
( 81 / 270 ) Thai Resturants in Anson, :1
( 82 / 270 ) Thai Resturants in Bugis, :3
( 83 / 270 ) Thai Resturants in Cecil, :1
( 84 / 270 ) Thai Resturants in City Hall, :0
( 85 / 270 ) Thai Resturants in Marina Centre, :0
( 86 / 270 ) Thai Resturants in Raffles Place, :0
( 87 / 270 ) Thai Resturants in Tanjong Pagar, :1
( 88 / 270 ) Thai Resturants in Aljunied, :3
( 89 / 270 ) Thai Resturants in Geylang East, :1
( 90 / 270 ) Thai Resturants in Kallang Way, :0
( 91 / 270 ) Thai Resturants in Kampong Ubi, :1
( 92 / 270 ) Thai Resturants in Macpherson, :1
( 93 / 270 ) Thai Resturants in Defu Industrial Park, :1
( 94 / 270 ) Thai Resturants in Hougang Central, :1
( 95 / 270 ) Thai Resturants in Hougang East, :1
( 96 / 270 ) Thai Resturants in Hougang West, :1
( 97 / 270 ) Thai Resturants in Kangkar, :0
( 98 / 270 ) Thai Resturants in Kovan, :1
( 99 / 270 ) Thai Resturants in Lorong Ah Soo, :2
( 100 / 270 ) Thai Resturants in Tai Seng, :1
( 101 / 270 ) Thai Resturants in Trafalgar, :0
( 102 / 270 ) Thai Resturants in International Business Park, :0
( 103 / 270 ) Thai Resturants in Jurong Gateway, :0
( 104 / 270 ) Thai Resturants in Jurong Port, :0
( 105 / 270 ) Thai Resturants in Jurong River, :1
( 106 / 270 ) Thai Resturants in Lakeside, :1
( 107 / 270 ) Thai Resturants in Penjuru Crescent, :0
( 108 / 270 ) Thai Resturants in Teban Gardens, :0
( 109 / 270 ) Thai Resturants in Toh Guan, :0
( 110 / 270 ) Thai Resturants in Yuhua East, :0
( 111 / 270 ) Thai Resturants in Yuhua West, :0
( 112 / 270 ) Thai Resturants in Boon Lay Place, :0
( 113 / 270 ) Thai Resturants in Hong Kah, :1
( 114 / 270 ) Thai Resturants in Jurong West Central, :0
( 115 / 270 ) Thai Resturants in Kian Teck, :0
( 116 / 270 ) Thai Resturants in Taman Jurong, :0
( 117 / 270 ) Thai Resturants in Yunnan, :0
( 118 / 270 ) Thai Resturants in Bendemeer, :0
( 119 / 270 ) Thai Resturants in Boon Keng, :0
( 120 / 270 ) Thai Resturants in Crawford, :6
( 121 / 270 ) Thai Resturants in Geylang Bahru, :1
( 122 / 270 ) Thai Resturants in Kallang Bahru, :0
( 123 / 270 ) Thai Resturants in Kampong Bugis, :5
( 124 / 270 ) Thai Resturants in Kampong Java, :3
( 125 / 270 ) Thai Resturants in Lavender, :6
( 126 / 270 ) Thai Resturants in Tanjong Rhu, :1
( 127 / 270 ) Thai Resturants in Lim Chu Kang, :0
( 128 / 270 ) Thai Resturants in Mandai Estate, :0
( 129 / 270 ) Thai Resturants in Katong, :0
( 130 / 270 ) Thai Resturants in Marine Parade, :0
( 131 / 270 ) Thai Resturants in Mountbatten, :2
( 132 / 270 ) Thai Resturants in Bras Basah, :0
( 133 / 270 ) Thai Resturants in Dhoby Ghaut, :0
( 134 / 270 ) Thai Resturants in Fort Canning, :1
( 135 / 270 ) Thai Resturants in Cairnhill, :1
( 136 / 270 ) Thai Resturants in Goodwood Park, :1
( 137 / 270 ) Thai Resturants in Monk's Hill, :2
( 138 / 270 ) Thai Resturants in Newton Circus, :5
( 139 / 270 ) Thai Resturants in Orange Grove, :0
( 140 / 270 ) Thai Resturants in North-Eastern Islands, :0
( 141 / 270 ) Thai Resturants in Balestier, :2
( 142 / 270 ) Thai Resturants in Dunearn, :0
( 143 / 270 ) Thai Resturants in Malcolm, :0
```

```
( 144 / 270 ) Thai Resturants in Moulmein, :1
( 145 / 270 ) Thai Resturants in Mount Pleasant, :0
( 146 / 270 ) Thai Resturants in Boulevard, :1
( 147 / 270 ) Thai Resturants in Somerset, :0
( 148 / 270 ) Thai Resturants in Tanglin, :3
( 149 / 270 ) Thai Resturants in China Square, :0
( 150 / 270 ) Thai Resturants in Chinatown, :0
( 151 / 270 ) Thai Resturants in Pearl's Hill, :1
( 152 / 270 ) Thai Resturants in People's Park, :0
( 153 / 270 ) Thai Resturants in Flora Drive, :0
( 154 / 270 ) Thai Resturants in Loyang East, :0
( 155 / 270 ) Thai Resturants in Loyang West, :0
( 156 / 270 ) Thai Resturants in Pasir Ris Central, :1
( 157 / 270 ) Thai Resturants in Pasir Ris Drive, :1
( 158 / 270 ) Thai Resturants in Pasir Ris Park, :2
( 159 / 270 ) Thai Resturants in Pasir Ris West, :1
( 160 / 270 ) Thai Resturants in Paya Lebar East, :2
( 161 / 270 ) Thai Resturants in Paya Lebar North, :2
( 162 / 270 ) Thai Resturants in Gul Circle, :0
( 163 / 270 ) Thai Resturants in Joo Koon, :0
( 164 / 270 ) Thai Resturants in Matilda, :0
( 165 / 270 ) Thai Resturants in Northshore, :0
( 166 / 270 ) Thai Resturants in Punggol Field, :0
( 167 / 270 ) Thai Resturants in Punggol Town Centre, :0
( 168 / 270 ) Thai Resturants in Waterway East, :0
( 169 / 270 ) Thai Resturants in Commonwealth, :0
( 170 / 270 ) Thai Resturants in Dover, :1
( 171 / 270 ) Thai Resturants in Ghim Moh, :1
( 172 / 270 ) Thai Resturants in Holland Drive, :0
( 173 / 270 ) Thai Resturants in Kent Ridge, :1
( 174 / 270 ) Thai Resturants in Margaret Drive, :0
( 175 / 270 ) Thai Resturants in Mei Chin, :1
( 176 / 270 ) Thai Resturants in One North, :0
( 177 / 270 ) Thai Resturants in Pasir Panjang 1, :2
( 178 / 270 ) Thai Resturants in Pasir Panjang 2, :2
( 179 / 270 ) Thai Resturants in Port, :0
( 180 / 270 ) Thai Resturants in Queensway, :0
( 181 / 270 ) Thai Resturants in Singapore Polytechnic, :1
( 182 / 270 ) Thai Resturants in Tanglin Halt, :0
( 183 / 270 ) Thai Resturants in Institution Hill, :0
( 184 / 270 ) Thai Resturants in Leonie Hill, :0
( 185 / 270 ) Thai Resturants in One Tree Hill, :0
( 186 / 270 ) Thai Resturants in Oxley, :0
( 187 / 270 ) Thai Resturants in Paterson, :0
( 188 / 270 ) Thai Resturants in Bencoolen, :0
( 189 / 270 ) Thai Resturants in Farrer Park, :0
( 190 / 270 ) Thai Resturants in Kampong Glam, :7
( 191 / 270 ) Thai Resturants in Little India, :0
( 192 / 270 ) Thai Resturants in Mackenzie, :0
( 193 / 270 ) Thai Resturants in Mount Emily, :0
( 194 / 270 ) Thai Resturants in Rochor Canal, :5
( 195 / 270 ) Thai Resturants in Selegie, :0
( 196 / 270 ) Thai Resturants in Sungei Road, :3
( 197 / 270 ) Thai Resturants in Victoria, :1
( 198 / 270 ) Thai Resturants in Seletar, :0
( 199 / 270 ) Thai Resturants in Seletar Aerospace Park, :0
( 200 / 270 ) Thai Resturants in Admiralty, :0
( 201 / 270 ) Thai Resturants in Sembawang Central, :1
( 202 / 270 ) Thai Resturants in Sembawang East, :1
( 203 / 270 ) Thai Resturants in Sembawang North, :1
( 204 / 270 ) Thai Resturants in Sembawang Springs, :1
( 205 / 270 ) Thai Resturants in Sembawang Straits, :0
( 206 / 270 ) Thai Resturants in Senoko North, :0
( 207 / 270 ) Thai Resturants in Senoko South, :0
( 208 / 270 ) Thai Resturants in Anchorvale, :0
( 209 / 270 ) Thai Resturants in Compassvale, :0
( 210 / 270 ) Thai Resturants in Fernvale, :3
( 211 / 270 ) Thai Resturants in Rivervale, :0
( 212 / 270 ) Thai Resturants in Sengkang Town Centre, :0
( 213 / 270 ) Thai Resturants in Sengkang West, :0
( 214 / 270 ) Thai Resturants in Lorong Chuan, :0
( 215 / 270 ) Thai Resturants in Seletar Hills, :1
```

```
( 216 / 270 ) Thai Resturants in Serangoon Central, :1
( 217 / 270 ) Thai Resturants in Serangoon Garden, :1
( 218 / 270 ) Thai Resturants in Serangoon North, :0
( 219 / 270 ) Thai Resturants in Upper Paya Lebar, :2
( 220 / 270 ) Thai Resturants in Boat Quay, :0
( 221 / 270 ) Thai Resturants in Clarke Quay, :0
( 222 / 270 ) Thai Resturants in Robertson Quay, :1
( 223 / 270 ) Thai Resturants in Sentosa, :1
( 224 / 270 ) Thai Resturants in Gali Batu, :0
( 225 / 270 ) Thai Resturants in Kranji, :0
( 226 / 270 ) Thai Resturants in Pang Sua, :0
( 227 / 270 ) Thai Resturants in Reservoir View, :0
( 228 / 270 ) Thai Resturants in Turf Club, :0
( 229 / 270 ) Thai Resturants in Simei, :0
( 230 / 270 ) Thai Resturants in Tampines East, :0
( 231 / 270 ) Thai Resturants in Tampines West, :3
( 232 / 270 ) Thai Resturants in Xilin, :1
( 233 / 270 ) Thai Resturants in Chatsworth, :0
( 234 / 270 ) Thai Resturants in Nassim, :1
( 235 / 270 ) Thai Resturants in Ridout, :1
( 236 / 270 ) Thai Resturants in Tyersall, :3
( 237 / 270 ) Thai Resturants in Tengah, :0
( 238 / 270 ) Thai Resturants in Bidadari, :0
( 239 / 270 ) Thai Resturants in Boon Teck, :0
( 240 / 270 ) Thai Resturants in Braddell, :3
( 241 / 270 ) Thai Resturants in Joo Seng, :1
( 242 / 270 ) Thai Resturants in Kim Keat, :1
( 243 / 270 ) Thai Resturants in Lorong 8 Toa Payoh, :2
( 244 / 270 ) Thai Resturants in Pei Chun, :0
( 245 / 270 ) Thai Resturants in Potong Pasir, :0
( 246 / 270 ) Thai Resturants in Sennett, :1
( 247 / 270 ) Thai Resturants in Toa Payoh Central, :1
( 248 / 270 ) Thai Resturants in Toa Payoh West, :0
( 249 / 270 ) Thai Resturants in Woodleigh, :0
( 250 / 270 ) Thai Resturants in Tuas Bay, :0
( 251 / 270 ) Thai Resturants in Tuas North, :0
( 252 / 270 ) Thai Resturants in Tuas View, :0
( 253 / 270 ) Thai Resturants in Western Water Catchment, :0
( 254 / 270 ) Thai Resturants in Greenwood Park, :2
( 255 / 270 ) Thai Resturants in Midview, :4
( 256 / 270 ) Thai Resturants in North Coast, :0
( 257 / 270 ) Thai Resturants in Senoko West, :0
( 258 / 270 ) Thai Resturants in Woodgrove, :1
( 259 / 270 ) Thai Resturants in Woodlands East, :2
( 260 / 270 ) Thai Resturants in Woodlands South, :0
( 261 / 270 ) Thai Resturants in Woodlands West, :2
( 262 / 270 ) Thai Resturants in Khatib, :1
( 263 / 270 ) Thai Resturants in Lower Seletar, :0
( 264 / 270 ) Thai Resturants in Nee Soon, :3
( 265 / 270 ) Thai Resturants in Northland, :1
( 266 / 270 ) Thai Resturants in Springleaf, :3
( 267 / 270 ) Thai Resturants in Yishun Central, :1
( 268 / 270 ) Thai Resturants in Yishun East, :4
( 269 / 270 ) Thai Resturants in Yishun South, :4
( 270 / 270 ) Thai Resturants in Yishun West, :4
```

In [64]: `thai_rest.head()`

Out[64]:

	Neighborhood	ID	Name
0	Ang Mo Kio Town Centre	51243f60e4b02ffb6a43eeea	Soi 19 十九街 Thai Wanton Mee
1	Kebun Bahru	5a1e3ebf3149b9447be1aec5	Carabao Thai Restaurant Stulang
2	Sembawang Hills	4f712a2be4b09e60f82d8389	泰美妙海鲜 Thai Wonder Cuisine
3	Shangri-La	56cee098498e2f5c99b54a8d	Kra Pow Thai Street Food
4	Yio Chu Kang	51243f60e4b02ffb6a43eeea	Soi 19 十九街 Thai Wanton Mee

```
In [65]: thai_rest.shape
```

Out[65]: (221, 3)

```
In [66]:  column_names = ['Neighborhood', 'ID','Name','Likes','Rating','Tips']
          thai_rest_stats_sg = pd.DataFrame(columns = column_names)
          count = 1

          for row in thai_rest.values.tolist():
              Neighborhood,ID,Name = row
              try:
                  venue_details = get_venue_details(ID)
                  print(venue_details)
                  id,name,likes,rating,tips = venue_details.values.tolist()[0]
              except IndexError:
                  print('No data available for id =',ID)
                  id,name,likes,rating,tips = [0]*5
              print('(',count,'/',len(thai_rest),')','processed')
              thai_rest_stats_sg = thai_rest_stats_sg.append({
                                                  'Neighborhood': Neighborhood,
                                                  'ID': id,
                                                  'Name' : name,
                                                  'Likes' : likes,
                                                  'Rating' : rating,
                                                  'Tips' : tips
                                                  }, ignore_index = True)
              count+=1
```

```
                                ID                           Name  Likes  Rating  Tips
0  51243f60e4b02ffb6a43eeea  Soi 19 十九街 Thai Wanton Mee     40     6.5    25
( 1 / 221 ) processed
                                ID                              Name  Likes  Rating  \
0  5a1e3ebf3149b9447be1aec5  Carabao Thai Restaurant Stulang      6     7.4

   Tips
0    13
( 2 / 221 ) processed
Empty DataFrame
Columns: [ID, Name, Likes, Rating, Tips]
Index: []
No data available for id= 4f712a2be4b09e60f82d8389
( 3 / 221 ) processed
                                ID                      Name  Likes  Rating  Tips
0  56cee098498e2f5c99b54a8d  Kra Pow Thai Street Food     12     7.8    16
( 4 / 221 ) processed
                                ID                           Name  Likes  Rating  Tips
0  51243f60e4b02ffb6a43eeea  Soi 19 十九街 Thai Wanton Mee     40     6.5    25
( 5 / 221 ) processed
                                ID                           Name  Likes  Rating  Tips
0  51243f60e4b02ffb6a43eeea  Soi 19 十九街 Thai Wanton Mee     40     6.5    25
( 6 / 221 ) processed
                                ID                           Name  Likes  Rating  Tips
0  51243f60e4b02ffb6a43eeea  Soi 19 十九街 Thai Wanton Mee     40     6.5    25
( 7 / 221 ) processed
Empty DataFrame
Columns: [ID, Name, Likes, Rating, Tips]
Index: []
No data available for id= 4d3a4694beb7b1f723e7e771
( 8 / 221 ) processed
                                ID      Name  Likes  Rating  Tips
0  4b36df8bf964a520ab3d25e3  Jai Thai     52     7.1    61
( 9 / 221 ) processed
                                ID                    Name  Likes  Rating  Tips
0  4d9476735241a1cd39815f4b  Mata Thai Restaurant     15     6.0    34
( 10 / 221 ) processed
                                ID          Name  Likes  Rating  Tips
0  50fa92bfe4b04cffec4dbfd5  Aroy Mookata      5     5.8     2
( 11 / 221 ) processed
Empty DataFrame
Columns: [ID, Name, Likes, Rating, Tips]
Index: []
No data available for id= 56e8acde498edce4fd18437b
( 12 / 221 ) processed
                                ID          Name  Likes  Rating  Tips
0  587a1563561ded2967529265  Tomyum Mama     16     8.7     7
( 13 / 221 ) processed
                                ID      Name  Likes  Rating  Tips
0  4b36df8bf964a520ab3d25e3  Jai Thai     52     7.1    61
( 14 / 221 ) processed
                                ID              Name  Likes  Rating  Tips
0  4c1a0400838020a1cd83e661  E-Sarn Thai Corner     21     7.3    19
( 15 / 221 ) processed
                                ID          Name  Likes  Rating  Tips
0  549980c0498eb47afc9ae507  Thai in Town      7     6.0     9
( 16 / 221 ) processed
                                ID          Name  Likes  Rating  Tips
0  50fa92bfe4b04cffec4dbfd5  Aroy Mookata      5     5.8     2
( 17 / 221 ) processed
                                ID          Name  Likes  Rating  Tips
0  587a1563561ded2967529265  Tomyum Mama     16     8.7     7
( 18 / 221 ) processed
                                ID              Name  Likes  Rating  Tips
0  4c1a0400838020a1cd83e661  E-Sarn Thai Corner     21     7.3    19
( 19 / 221 ) processed
                                ID                          Name  Likes  Rating  Tips
0  5602a497498eeb82cd6918ab  Taste of Thailand (Original)      9     7.5     3
( 20 / 221 ) processed
                                ID                      Name  Likes  Rating  Tips
0  5479a984498e141c4cce0b3b  Bangkok Street Mookata     17     7.5     4
```

```
( 21 / 221 ) processed
                         ID           Name  Likes  Rating  Tips
0  5436696c498e33113d456016  #87 Just Thai     53     8.1    10
( 22 / 221 ) processed
                         ID                     Name  Likes  Rating  Tips
0  4d5fabbe196ba09365761056  Joe's Kitchen Thai Cuisine     26     7.1    17
( 23 / 221 ) processed
                         ID           Name  Likes  Rating  Tips
0  5436696c498e33113d456016  #87 Just Thai     53     8.1    10
( 24 / 221 ) processed
                         ID                     Name  Likes  Rating  Tips
0  4d5fabbe196ba09365761056  Joe's Kitchen Thai Cuisine     26     7.1    17
( 25 / 221 ) processed
                         ID             Name  Likes  Rating  Tips
0  5b25206195d986002c246edb  Little Elephant      6     8.3     3
( 26 / 221 ) processed
                         ID    Name  Likes  Rating  Tips
0  4ba8b7cef964a5205ee939e3  Go Thai      1     7.0    11
( 27 / 221 ) processed
                         ID             Name  Likes  Rating  Tips
0  4c345b95a0ced13aaffa176e  Issan Thai Food      9     8.1     7
( 28 / 221 ) processed
                         ID                 Name  Likes  Rating  Tips
0  4c87825d51ada1cd61424810  Thaksin Beef Noodle     16     6.6    13
( 29 / 221 ) processed
                         ID             Name  Likes  Rating  Tips
0  5b25206195d986002c246edb  Little Elephant      6     8.3     3
( 30 / 221 ) processed
                         ID             Name  Likes  Rating  Tips
0  4c345b95a0ced13aaffa176e  Issan Thai Food      9     8.1     7
( 31 / 221 ) processed
                         ID             Name  Likes  Rating  Tips
0  5b25206195d986002c246edb  Little Elephant      6     8.3     3
( 32 / 221 ) processed
                         ID    Name  Likes  Rating  Tips
0  4ba8b7cef964a5205ee939e3  Go Thai      1     7.0    11
( 33 / 221 ) processed
                         ID             Name  Likes  Rating  Tips
0  5b25206195d986002c246edb  Little Elephant      6     8.3     3
( 34 / 221 ) processed
                         ID    Name  Likes  Rating  Tips
0  4ba8b7cef964a5205ee939e3  Go Thai      1     7.0    11
( 35 / 221 ) processed
                         ID                         Name  Likes  Rating  Tips
0  53749f67498ebf1a4f44c65b  Rasa Rasa Seafood Restaurant      5     6.8     0
( 36 / 221 ) processed
                         ID                         Name  Likes  Rating  Tips
0  53749f67498ebf1a4f44c65b  Rasa Rasa Seafood Restaurant      5     6.8     0
( 37 / 221 ) processed
                         ID            Name  Likes  Rating  Tips
0  4daec6304b229076786d5ffa  Tasty Thai Hut      5     6.8     3
( 38 / 221 ) processed
                         ID                  Name  Likes  Rating  Tips
0  4ce7f13bf86537045009adc4  HotSpice Thai Cuisine      4     6.8     7
( 39 / 221 ) processed
                         ID                          Name  Likes  Rating  \
0  5a69b465a0215b2c2b56e65b  Royal Thai Boat Noodles & Bar      4     6.2

   Tips
0     4
( 40 / 221 ) processed
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0  59959121bfc6d06a2950f0fb  Time For Thai      2     5.8     3
( 41 / 221 ) processed
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0  4b583420f964a520e44d28e3  Thai Noodle House      7     6.1    27
( 42 / 221 ) processed
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0  4ba45952f964a520bc9738e3  Le Wu Café     10     6.0     9
( 43 / 221 ) processed
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0  5290292e498e7949ebfc62d4  Sala Thai Kitchen      6     6.3     3
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( 44 / 221 ) processed
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0  51df898a498e56e0e64c5409  Royal Thai     13     8.0     7
( 45 / 221 ) processed
                        ID               Name  Likes  Rating  Tips
0  51fcb12b498e46f224c79217  E-Sarn Thai Cuisine     16     6.7     7
( 46 / 221 ) processed
                        ID          Name  Likes  Rating  Tips
0  4bada046f964a520c75f3be3  Siam Kitchen      9     6.7     8
( 47 / 221 ) processed
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0  4bada046f964a520c75f3be3  Siam Kitchen      9     6.7     8
( 48 / 221 ) processed
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0  53749f67498ebf1a4f44c65b  Rasa Rasa Seafood Restaurant      5     6.8     0
( 49 / 221 ) processed
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0  4bada046f964a520c75f3be3  Siam Kitchen      9     6.7     8
( 50 / 221 ) processed
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0  53749f67498ebf1a4f44c65b  Rasa Rasa Seafood Restaurant      5     6.8     0
( 51 / 221 ) processed
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0  4b72520ff964a520ae772de3  Thaksin Beef Noodle      8     7.0     4
( 52 / 221 ) processed
                        ID                 Name  Likes  Rating  Tips
0  4b72520ff964a520ae772de3  Thaksin Beef Noodle      8     7.0     4
( 53 / 221 ) processed
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0  4b72520ff964a520ae772de3  Thaksin Beef Noodle      8     7.0     4
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( 55 / 221 ) processed
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0  4c87825d51ada1cd61424810  Thaksin Beef Noodle     16     6.6    13
( 56 / 221 ) processed
                        ID          Name  Likes  Rating  Tips
0  5017a98de4b02848f719002c  Thai Express     10     5.5     7
( 57 / 221 ) processed
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( 58 / 221 ) processed
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0  4c345b95a0ced13aaffa176e  Issan Thai Food      9     8.1     7
( 59 / 221 ) processed
                        ID          Name  Likes  Rating  Tips
0  5809abe738fab1dc497bd39f  Ah Loy Thai     29     8.1    12
( 60 / 221 ) processed
                        ID          Name  Likes  Rating  Tips
0  59c4fd028134883ec2ee1aef  Sticky Rice      4     8.0     2
( 61 / 221 ) processed
                        ID     Name  Likes  Rating  Tips
0  4cb0535d562d224b303b1588  Jai Thai     68     7.6    64
( 62 / 221 ) processed
                        ID             Name  Likes  Rating  Tips
0  4c345b95a0ced13aaffa176e  Issan Thai Food      9     8.1     7
( 63 / 221 ) processed
                        ID             Name  Likes  Rating  Tips
0  4c345b95a0ced13aaffa176e  Issan Thai Food      9     8.1     7
( 64 / 221 ) processed
                        ID                        Name  Likes  Rating  \
0  4b6432ecf964a520b4a32ae3  Thai Delights @ Lor 12 Geylang      8     7.2

   Tips
0     4
( 65 / 221 ) processed
                        ID               Name  Likes  Rating  Tips
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0  53021f91498e6d3419a15817  Mae Toi Thai Food      5    6.7      1
( 66 / 221 ) processed
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0  5cc592425d891b002ceee10b  Gu Thai House      2     5.8     5
( 67 / 221 ) processed
                          ID                    Name  Likes  Rating  Tips
0  585376d72eb979557cf6b5f1  Lotus Thai Restaurant      4     6.3     2
( 68 / 221 ) processed
                          ID          Name  Likes  Rating  Tips
0  5af6cc863abcaf002cd0a0a3  Took Lae Dee      4     6.3     5
( 69 / 221 ) processed
                          ID                    Name  Likes  Rating  Tips
0  585376d72eb979557cf6b5f1  Lotus Thai Restaurant      4     6.3     2
( 70 / 221 ) processed
                          ID             Name  Likes  Rating  Tips
0  4bc44c65abf4952126cfc493  Nakhon Kitchen     93     8.1   108
( 71 / 221 ) processed
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0  5960a89b9be5224b9b83c056  Tiew Mai Thai Boat Noodle     8     7.4     5
( 72 / 221 ) processed
                          ID                    Name  Likes  Rating  Tips
0  5960a89b9be5224b9b83c056  Tiew Mai Thai Boat Noodle     8     7.4     5
( 73 / 221 ) processed
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0  5960a89b9be5224b9b83c056  Tiew Mai Thai Boat Noodle     8     7.4     5
( 74 / 221 ) processed
                          ID             Name  Likes  Rating  Tips
0  4bc44c65abf4952126cfc493  Nakhon Kitchen     93     8.1   108
( 75 / 221 ) processed
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0  4bc44c65abf4952126cfc493  Nakhon Kitchen     93     8.1   108
( 76 / 221 ) processed
                          ID              Name  Likes  Rating  Tips
0  54b660d4498e91db7c94be34  Yaowarat Seafood      8     6.9     5
( 77 / 221 ) processed
                          ID          Name  Likes  Rating  Tips
0  5af6cc863abcaf002cd0a0a3  Took Lae Dee      4     6.3     5
( 78 / 221 ) processed
                          ID                    Name  Likes  Rating  Tips
0  5479a984498e141c4cce0b3b  Bangkok Street Mookata     17     7.5     4
( 79 / 221 ) processed
                          ID                    Name  Likes  Rating  Tips
0  5479a984498e141c4cce0b3b  Bangkok Street Mookata     17     7.5     4
( 80 / 221 ) processed
                          ID                    Name  Likes  Rating  Tips
0  5479a984498e141c4cce0b3b  Bangkok Street Mookata     17     7.5     4
( 81 / 221 ) processed
                          ID                                Name  Likes  \
0  4d075aaa26adb1f72e41e170  New Udon Thai Food (BBQ Steamboat)     45

   Rating  Tips
0     8.1    22
( 82 / 221 ) processed
                          ID                         Name  Likes  Rating  Tips
0  4c2d68bee760c9b63af24449  Beer Thai House Restaurant     82     8.2    37
( 83 / 221 ) processed
                          ID                     Name  Likes  Rating  Tips
0  4bc4c1a0461576b005678032  Nana Original Thai Food     56     8.0    28
( 84 / 221 ) processed
                          ID               Name  Likes  Rating  Tips
0  5837c4776e60752e1df5797c  Thai-Thai Kitchen     13     8.1     3
( 85 / 221 ) processed
                          ID                 Name  Likes  Rating  Tips
0  4bdad5072a3a0f47af27acb6  Nongkhai หนองคาย 隆开     22     7.7    25
( 86 / 221 ) processed
                          ID         Name  Likes  Rating  Tips
0  59c4fd028134883ec2ee1aef  Sticky Rice      4     8.0     2
( 87 / 221 ) processed
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( 88 / 221 ) processed
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0  4d075aaa26adb1f72e41e170  New Udon Thai Food (BBQ Steamboat)     45

   Rating  Tips
0    8.1    22
( 89 / 221 ) processed
                        ID                 Name  Likes  Rating  Tips
0  4bc4c1a0461576b005678032  Nana Original Thai Food     56    8.0    28
( 90 / 221 ) processed
                        ID                      Name  Likes  Rating  Tips
0  4c2d68bee760c9b63af24449  Beer Thai House Restaurant     82    8.2    37
( 91 / 221 ) processed
                        ID              Name  Likes  Rating  Tips
0  4bdad5072a3a0f47af27acb6  Nongkhai หนองคาย 隆开     22    7.7    25
( 92 / 221 ) processed
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0  5837c4776e60752e1df5797c  Thai-Thai Kitchen     13    8.1     3
( 93 / 221 ) processed
                        ID            Name  Likes  Rating  Tips
0  4be563532468c928c2efff42  Bangkok Express      8    7.4     9
( 94 / 221 ) processed
                        ID              Name  Likes  Rating  Tips
0  579dac11498ef4fbf0684d8b  A-Roy Thai Restaurant     13    6.8     7
( 95 / 221 ) processed
                        ID       Name  Likes  Rating  Tips
0  5aa4c1aa6fa81f2f6c9718b7  Baan Ying      6    6.5    19
( 96 / 221 ) processed
                        ID                                  Name   Likes  \
0  4d075aaa26adb1f72e41e170  New Udon Thai Food (BBQ Steamboat)     45

   Rating  Tips
0    8.1    22
( 97 / 221 ) processed
                        ID                 Name  Likes  Rating  Tips
0  4bc4c1a0461576b005678032  Nana Original Thai Food     56    8.0    28
( 98 / 221 ) processed
                        ID                      Name  Likes  Rating  Tips
0  4c2d68bee760c9b63af24449  Beer Thai House Restaurant     82    8.2    37
( 99 / 221 ) processed
                        ID              Name  Likes  Rating  Tips
0  5837c4776e60752e1df5797c  Thai-Thai Kitchen     13    8.1     3
( 100 / 221 ) processed
                        ID              Name  Likes  Rating  Tips
0  4bdad5072a3a0f47af27acb6  Nongkhai หนองคาย 隆开     22    7.7    25
( 101 / 221 ) processed
                        ID         Name  Likes  Rating  Tips
0  59c4fd028134883ec2ee1aef  Sticky Rice      4    8.0     2
( 102 / 221 ) processed
                        ID                    Name  Likes  Rating  Tips
0  4b655d2af964a52083ee2ae3  Thai Village Restaurant     17    7.1     4
( 103 / 221 ) processed
                        ID                         Name  Likes  Rating  \
0  4b6432ecf964a520b4a32ae3  Thai Delights @ Lor 12 Geylang      8    7.2

   Tips
0     4
( 104 / 221 ) processed
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0  53021f91498e6d3419a15817  Mae Toi Thai Food      5    6.7     1
( 105 / 221 ) processed
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0  5b2f272b8496ca002c9e2935  Un-Yang-Kor-Dai      6    8.1     3
( 106 / 221 ) processed
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0  56cee098498e2f5c99b54a8d  Kra Pow Thai Street Food     12    7.8    16
( 107 / 221 ) processed
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0  56cee098498e2f5c99b54a8d  Kra Pow Thai Street Food     12    7.8    16
( 108 / 221 ) processed
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0  4be563532468c928c2efff42  Bangkok Express      8    7.4     9
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( 109 / 221 ) processed
                         ID                       Name  Likes  Rating  Tips
0  56cee098498e2f5c99b54a8d  Kra Pow Thai Street Food     12     7.8    16
( 110 / 221 ) processed
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0  4be563532468c928c2efff42  Bangkok Express      8     7.4     9
( 111 / 221 ) processed
                         ID                       Name  Likes  Rating  Tips
0  56cee098498e2f5c99b54a8d  Kra Pow Thai Street Food     12     7.8    16
( 112 / 221 ) processed
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0  579dac11498ef4fbf0684d8b  A-Roy Thai Restaurant     13     6.8     7
( 113 / 221 ) processed
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0  5aa4c1aa6fa81f2f6c9718b7  Baan Ying      6     6.5    19
( 114 / 221 ) processed
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0  4d1862076d10370427723ebd  Thai Village Restaurant     15     6.0    11
( 115 / 221 ) processed
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0  579dac11498ef4fbf0684d8b  A-Roy Thai Restaurant     13     6.8     7
( 116 / 221 ) processed
                         ID       Name  Likes  Rating  Tips
0  5aa4c1aa6fa81f2f6c9718b7  Baan Ying      6     6.5    19
( 117 / 221 ) processed
                         ID                   Name  Likes  Rating  Tips
0  579dac11498ef4fbf0684d8b  A-Roy Thai Restaurant     13     6.8     7
( 118 / 221 ) processed
                         ID             Name  Likes  Rating  Tips
0  4c345b95a0ced13aaffa176e  Issan Thai Food      9     8.1     7
( 119 / 221 ) processed
                         ID           Name  Likes  Rating  Tips
0  4baeeb0ef964a520bfe13be3  Jim Thompson     93     7.6    38
( 120 / 221 ) processed
                         ID                    Name  Likes  Rating  Tips
0  4b0cde52f964a5204f4223e3  Tawandang Microbrewery     59     6.3    52
( 121 / 221 ) processed
                         ID                      Name  Likes  Rating  Tips
0  4b058813f964a5204db022e3  Patara Fine Thai Cuisine     25     6.3    20
( 122 / 221 ) processed
                         ID             Name  Likes  Rating  Tips
0  5b25206195d986002c246edb  Little Elephant      6     8.3     3
( 123 / 221 ) processed
                         ID           Name  Likes  Rating  Tips
0  4d05bc01a2685481707ebebd  The Basil Inn     30     7.1    22
( 124 / 221 ) processed
                         ID           Name  Likes  Rating  Tips
0  4d05bc01a2685481707ebebd  The Basil Inn     30     7.1    22
( 125 / 221 ) processed
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0  4d05bc01a2685481707ebebd  The Basil Inn     30     7.1    22
( 126 / 221 ) processed
                         ID                  Name  Likes  Rating  Tips
0  4d564ecae7f1a1cd2c0305a5  Magic Wok Restaurant      5     6.1    23
( 127 / 221 ) processed
                         ID           Name  Likes  Rating  Tips
0  4d05bc01a2685481707ebebd  The Basil Inn     30     7.1    22
( 128 / 221 ) processed
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0  585376d72eb979557cf6b5f1  Lotus Thai Restaurant      4     6.3     2
( 129 / 221 ) processed
                         ID                                               Name  \
0  504da249e4b04a78b07b80dc  Sri Bistari Changi Village Famous Ayam Penyet   

   Likes  Rating  Tips
0      5     6.8     2
( 130 / 221 ) processed
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0  585376d72eb979557cf6b5f1  Lotus Thai Restaurant      4     6.3     2
( 131 / 221 ) processed
                         ID                                               Name  \
0  504da249e4b04a78b07b80dc  Sri Bistari Changi Village Famous Ayam Penyet   
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( 132 / 221 ) processed
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0  4b83c01af964a520130f31e3   E-Sarn Thai Cuisine      8     7.8    15
( 133 / 221 ) processed
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0  5290292e498e7949ebfc62d4   Sala Thai Kitchen      6     6.3     3
( 134 / 221 ) processed
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0  56aae05b498efacbe702fb1d   The Red Noodle & Bottle Bar      5     5.7     2
( 135 / 221 ) processed
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0  4d5fabbe196ba09365761056   Joe's Kitchen Thai Cuisine     26     7.1    17
( 136 / 221 ) processed
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0  5436696c498e33113d456016   #87 Just Thai     53     8.1    10
( 137 / 221 ) processed
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0  4c3d6c2a15cb1b8deef37bdc   E-Sarn Thai Cuisine     43     7.4    39
( 138 / 221 ) processed
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0  5436696c498e33113d456016   #87 Just Thai     53     8.1    10
( 139 / 221 ) processed
                       ID                 Name  Likes  Rating  Tips
0  4c3d6c2a15cb1b8deef37bdc   E-Sarn Thai Cuisine     43     7.4    39
( 140 / 221 ) processed
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0  4b83c01af964a520130f31e3   E-Sarn Thai Cuisine      8     7.8    15
( 141 / 221 ) processed
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0  5837c4776e60752e1df5797c   Thai-Thai Kitchen     13     8.1     3
( 142 / 221 ) processed
                       ID          Name  Likes  Rating  Tips
0  59c4fd028134883ec2ee1aef   Sticky Rice      4     8.0     2
( 143 / 221 ) processed
                       ID          Name  Likes  Rating  Tips
0  5809abe738fab1dc497bd39f   Ah Loy Thai     29     8.1    12
( 144 / 221 ) processed
                       ID                        Name  Likes  Rating  Tips
0  4c2d68bee760c9b63af24449   Beer Thai House Restaurant     82     8.2    37
( 145 / 221 ) processed
                       ID                                Name  Likes  \
0  4d075aaa26adb1f72e41e170   New Udon Thai Food (BBQ Steamboat)     45

   Rating  Tips
0     8.1    22
( 146 / 221 ) processed
                       ID                       Name  Likes  Rating  Tips
0  4bc4c1a0461576b005678032   Nana Original Thai Food     56     8.0    28
( 147 / 221 ) processed
                       ID                     Name  Likes  Rating  Tips
0  4bdad5072a3a0f47af27acb6   Nongkhai หนองคาย 隆开     22     7.7    25
( 148 / 221 ) processed
                       ID          Name  Likes  Rating  Tips
0  59c4fd028134883ec2ee1aef   Sticky Rice      4     8.0     2
( 149 / 221 ) processed
                       ID                Name  Likes  Rating  Tips
0  5837c4776e60752e1df5797c   Thai-Thai Kitchen     13     8.1     3
( 150 / 221 ) processed
                       ID          Name  Likes  Rating  Tips
0  5809abe738fab1dc497bd39f   Ah Loy Thai     29     8.1    12
( 151 / 221 ) processed
                       ID                        Name  Likes  Rating  Tips
0  4c2d68bee760c9b63af24449   Beer Thai House Restaurant     82     8.2    37
( 152 / 221 ) processed
                       ID                                Name  Likes  \
0  4d075aaa26adb1f72e41e170   New Udon Thai Food (BBQ Steamboat)     45

   Rating  Tips
0     8.1    22
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( 153 / 221 ) processed
                          ID        Name  Likes  Rating  Tips
0  59c4fd028134883ec2ee1aef  Sticky Rice      4     8.0     2
( 154 / 221 ) processed
                          ID              Name  Likes  Rating  Tips
0  5837c4776e60752e1df5797c  Thai-Thai Kitchen     13     8.1     3
( 155 / 221 ) processed
                          ID       Name  Likes  Rating  Tips
0  5809abe738fab1dc497bd39f  Ah Loy Thai     29     8.1    12
( 156 / 221 ) processed
                          ID    Name  Likes  Rating  Tips
0  4ccc0d917c2ff04df64c967e  ThaiPan     18     6.8    27
( 157 / 221 ) processed
                          ID            Name  Likes  Rating  Tips
0  54705d4a498e8876c2694262  JJ Thai Cuisine     18     7.6    11
( 158 / 221 ) processed
                          ID            Name  Likes  Rating  Tips
0  54705d4a498e8876c2694262  JJ Thai Cuisine     18     7.6    11
( 159 / 221 ) processed
                          ID            Name  Likes  Rating  Tips
0  54705d4a498e8876c2694262  JJ Thai Cuisine     18     7.6    11
( 160 / 221 ) processed
                          ID            Name  Likes  Rating  Tips
0  54705d4a498e8876c2694262  JJ Thai Cuisine     18     7.6    11
( 161 / 221 ) processed
                          ID      Name  Likes  Rating  Tips
0  53fddb3e498e8b37594a775b  BALIThai      5     6.1     3
( 162 / 221 ) processed
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0  4f376297e4b0d26ba1011e6d  Mai Thai      8     6.6     7
( 163 / 221 ) processed
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( 164 / 221 ) processed
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0  4f376297e4b0d26ba1011e6d  Mai Thai      8     6.6     7
( 165 / 221 ) processed
                          ID             Name  Likes  Rating  Tips
0  54b660d4498e91db7c94be34  Yaowarat Seafood      8     6.9     5
( 166 / 221 ) processed
                          ID             Name  Likes  Rating  Tips
0  5762376f498ed59f67f9791a  Soi Thai Kitchen     14     6.6     6
( 167 / 221 ) processed
                          ID                   Name  Likes  Rating  Tips
0  585376d72eb979557cf6b5f1  Lotus Thai Restaurant      4     6.3     2
( 168 / 221 ) processed
                          ID                                               Name  \
0  504da249e4b04a78b07b80dc  Sri Bistari Changi Village Famous Ayam Penyet

   Likes  Rating  Tips
0      5     6.8     2
( 169 / 221 ) processed
                          ID             Name  Likes  Rating  Tips
0  5b25206195d986002c246edb  Little Elephant      6     8.3     3
( 170 / 221 ) processed
                          ID             Name  Likes  Rating  Tips
0  56dec434cd1095d757cbc5a0  Gin Khao Bistro      4     6.1     4
( 171 / 221 ) processed
                          ID            Name  Likes  Rating  Tips
0  5b2b292c3af988002ced398c  Nakhon Kitchen     10     8.1     3
( 172 / 221 ) processed
                          ID             Name  Likes  Rating  Tips
0  4fddad68e4b049c33bd0d6ff  Soi Thai Kitchen     38     7.5    21
( 173 / 221 ) processed
                          ID           Name  Likes  Rating  Tips
0  58351cb823188e7d9dc4d76d  Saap Saap Thai      9     6.6     5
( 174 / 221 ) processed
                          ID                     Name  Likes  Rating  Tips
0  5ac710e379f6c74413fedcf2  The Original Boat Noodle      6     6.5     2
( 175 / 221 ) processed
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                           ID           Name  Likes  Rating  Tips
0  4baeeb0ef964a520bfe13be3  Jim Thompson     93     7.6    38
( 176 / 221 ) processed
                           ID                   Name  Likes  Rating  Tips
0  4b0cde52f964a5204f4223e3  Tawandang Microbrewery     59     6.3    52
( 177 / 221 ) processed
                           ID           Name  Likes  Rating  Tips
0  4baeeb0ef964a520bfe13be3  Jim Thompson     93     7.6    38
( 178 / 221 ) processed
                           ID                   Name  Likes  Rating  Tips
0  4b0cde52f964a5204f4223e3  Tawandang Microbrewery     59     6.3    52
( 179 / 221 ) processed
                           ID                      Name  Likes  Rating  Tips
0  4b058813f964a5204db022e3  Patara Fine Thai Cuisine     25     6.3    20
( 180 / 221 ) processed
                           ID            Name  Likes  Rating  Tips
0  5917e9592bf9a936dec6c9a9  Soi 47 Thai Food      8     6.5     6
( 181 / 221 ) processed
                           ID          Name  Likes  Rating  Tips
0  50fa92bfe4b04cffec4dbfd5  Aroy Mookata      5     5.8     2
( 182 / 221 ) processed
                           ID                        Name  Likes  Rating  Tips
0  4c1df1978b3aa59339579b5f  Wang Thai Kitchen (旺泰小櫥)      3     5.5     7
( 183 / 221 ) processed
                           ID          Name  Likes  Rating  Tips
0  5af6cc863abcaf002cd0a0a3  Took Lae Dee      4     6.3     5
( 184 / 221 ) processed
                           ID            Name  Likes  Rating  Tips
0  5917e9592bf9a936dec6c9a9  Soi 47 Thai Food      8     6.5     6
( 185 / 221 ) processed
                           ID            Name  Likes  Rating  Tips
0  5917e9592bf9a936dec6c9a9  Soi 47 Thai Food      8     6.5     6
( 186 / 221 ) processed
                           ID                        Name  Likes  Rating  Tips
0  4c1df1978b3aa59339579b5f  Wang Thai Kitchen (旺泰小櫥)      3     5.5     7
( 187 / 221 ) processed
Empty DataFrame
Columns: [ID, Name, Likes, Rating, Tips]
Index: []
No data available for id= 5cb2b4e12aff31002c185cab
( 188 / 221 ) processed
                           ID            Name  Likes  Rating  Tips
0  5917e9592bf9a936dec6c9a9  Soi 47 Thai Food      8     6.5     6
( 189 / 221 ) processed
                           ID              Name  Likes  Rating  Tips
0  4fddad68e4b049c33bd0d6ff  Soi Thai Kitchen     38     7.5    21
( 190 / 221 ) processed
                           ID            Name  Likes  Rating  Tips
0  58351cb823188e7d9dc4d76d  Saap Saap Thai      9     6.6     5
( 191 / 221 ) processed
                           ID                       Name  Likes  Rating  Tips
0  5602a497498eeb82cd6918ab  Taste of Thailand (Original)      9     7.5     3
( 192 / 221 ) processed
                           ID          Name  Likes  Rating  Tips
0  587a1563561ded2967529265  Tomyum Mama     16     8.7     7
( 193 / 221 ) processed
                           ID                 Name  Likes  Rating  Tips
0  4c1a0400838020a1cd83e661  E-Sarn Thai Corner     21     7.3    19
( 194 / 221 ) processed
                           ID          Name  Likes  Rating  Tips
0  549980c0498eb47afc9ae507  Thai in Town      7     6.0     9
( 195 / 221 ) processed
                           ID      Name  Likes  Rating  Tips
0  514bf5c7e4b07ab0bb982912  BALIThai     15     6.1    14
( 196 / 221 ) processed
                           ID      Name  Likes  Rating  Tips
0  514bf5c7e4b07ab0bb982912  BALIThai     15     6.1    14
( 197 / 221 ) processed
Empty DataFrame
Columns: [ID, Name, Likes, Rating, Tips]
Index: []
No data available for id= 4cbe836419ceb1f77b1b1ecd
```

```
( 198 / 221 ) processed
                         ID       Name  Likes  Rating  Tips
0  514bf5c7e4b07ab0bb982912  BALIThai     15     6.1    14
( 199 / 221 ) processed
Empty DataFrame
Columns: [ID, Name, Likes, Rating, Tips]
Index: []
No data available for id= 4cbe836419ceb1f77b1b1ecd
( 200 / 221 ) processed
                         ID          Name  Likes  Rating  Tips
0  54f31b20498e31ed2e79266f  Orto Mookata     11     6.4     4
( 201 / 221 ) processed
                         ID              Name  Likes  Rating  Tips
0  4bdbb36863c5c9b679642968  Bei Sheng Seafood      8     6.8    18
( 202 / 221 ) processed
                         ID              Name  Likes  Rating  Tips
0  4b9b6fe2f964a520440736e3  Taste Of Thailand     43     6.3    68
( 203 / 221 ) processed
                         ID             Name  Likes  Rating  Tips
0  4ebbc8ee9911cfd604ce43bf  Thai The Dine In      4     5.8     5
( 204 / 221 ) processed
                         ID            Name  Likes  Rating  Tips
0  551d2f47498e6ba82559a6c1  Nakhon Kitchen     26     8.0    13
( 205 / 221 ) processed
                         ID  \
0  51616da9e4b0e63c799f73f5

                                               Name  Likes  Rating  Tips
0  Thai Hao Chi Traditional Thai Charcoal Steambo...      9     8.3     2
( 206 / 221 ) processed
                         ID     Name  Likes  Rating  Tips
0  54e08bc0498ec2e50ab10199  Mookata      6     7.7     1
( 207 / 221 ) processed
Empty DataFrame
Columns: [ID, Name, Likes, Rating, Tips]
Index: []
No data available for id= 4d0df5b23bbaa143541d40da
( 208 / 221 ) processed
                         ID            Name  Likes  Rating  Tips
0  551d2f47498e6ba82559a6c1  Nakhon Kitchen     26     8.0    13
( 209 / 221 ) processed
                         ID            Name  Likes  Rating  Tips
0  551d2f47498e6ba82559a6c1  Nakhon Kitchen     26     8.0    13
( 210 / 221 ) processed
                         ID              Name  Likes  Rating  Tips
0  4bdbb36863c5c9b679642968  Bei Sheng Seafood      8     6.8    18
( 211 / 221 ) processed
                         ID              Name  Likes  Rating  Tips
0  4b9b6fe2f964a520440736e3  Taste Of Thailand     43     6.3    68
( 212 / 221 ) processed
                         ID             Name  Likes  Rating  Tips
0  4ebbc8ee9911cfd604ce43bf  Thai The Dine In      4     5.8     5
( 213 / 221 ) processed
                         ID            Name  Likes  Rating  Tips
0  551d2f47498e6ba82559a6c1  Nakhon Kitchen     26     8.0    13
( 214 / 221 ) processed
                         ID              Name  Likes  Rating  Tips
0  4bdbb36863c5c9b679642968  Bei Sheng Seafood      8     6.8    18
( 215 / 221 ) processed
                         ID              Name  Likes  Rating  Tips
0  4b9b6fe2f964a520440736e3  Taste Of Thailand     43     6.3    68
( 216 / 221 ) processed
                         ID             Name  Likes  Rating  Tips
0  4ebbc8ee9911cfd604ce43bf  Thai The Dine In      4     5.8     5
( 217 / 221 ) processed
                         ID            Name  Likes  Rating  Tips
0  551d2f47498e6ba82559a6c1  Nakhon Kitchen     26     8.0    13
( 218 / 221 ) processed
                         ID              Name  Likes  Rating  Tips
0  4bdbb36863c5c9b679642968  Bei Sheng Seafood      8     6.8    18
( 219 / 221 ) processed
                         ID            Name  Likes  Rating  Tips
```

```
0  4b9b6fe2f964a520440736e3  Taste Of Thailand      43    6.3    68
( 220 / 221 ) processed
                         ID           Name  Likes  Rating  Tips
0  4ebbc8ee9911cfd604ce43bf  Thai The Dine In     4    5.8     5
( 221 / 221 ) processed
```

In [67]: `thai_rest_stats_sg.head()`

Out[67]:

	Neighborhood	ID	Name	Likes	Rating	Tips
0	Ang Mo Kio Town Centre	51243f60e4b02ffb6a43eeea	Soi 19 十九街 Thai Wanton Mee	40	6.5	25
1	Kebun Bahru	5a1e3ebf3149b9447be1aec5	Carabao Thai Restaurant Stulang	6	7.4	13
2	Sembawang Hills	0	0	0	0.0	0
3	Shangri-La	56cee098498e2f5c99b54a8d	Kra Pow Thai Street Food	12	7.8	16
4	Yio Chu Kang	51243f60e4b02ffb6a43eeea	Soi 19 十九街 Thai Wanton Mee	40	6.5	25

In [68]:
```
thai_rest_stats_sg = thai_rest_stats_sg[(thai_rest_stats_sg['ID'] != 0)]
thai_rest_stats_sg['Likes'] = thai_rest_stats_sg['Likes'].astype('float64')
thai_rest_stats_sg['Tips'] = thai_rest_stats_sg['Tips'].astype('float64')
thai_rest_stats_sg.info()
```
```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 210 entries, 0 to 220
Data columns (total 6 columns):
 #   Column        Non-Null Count  Dtype
---  ------        --------------  -----
 0   Neighborhood  210 non-null    object
 1   ID            210 non-null    object
 2   Name          210 non-null    object
 3   Likes         210 non-null    float64
 4   Rating        210 non-null    float64
 5   Tips          210 non-null    float64
dtypes: float64(3), object(3)
memory usage: 11.5+ KB
```

In [69]:
```
thai = thai_rest_stats_sg.drop_duplicates(subset ='ID', keep ="first")
thai.info()
```
```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 81 entries, 0 to 206
Data columns (total 6 columns):
 #   Column        Non-Null Count  Dtype
---  ------        --------------  -----
 0   Neighborhood  81 non-null     object
 1   ID            81 non-null     object
 2   Name          81 non-null     object
 3   Likes         81 non-null     float64
 4   Rating        81 non-null     float64
 5   Tips          81 non-null     float64
dtypes: float64(3), object(3)
memory usage: 4.4+ KB
```

```python
thai.sort_values(by = ['Likes','Rating'],ascending = False)
```

	Neighborhood	ID	Name	Likes	Rating	Tips
70	Defu Industrial Park	4bc44c65abf4952126cfc493	Nakhon Kitchen	93.0	8.1	108.0
119	Tanglin	4baeeb0ef964a520bfe13be3	Jim Thompson	93.0	7.6	38.0
82	Crawford	4c2d68bee760c9b63af24449	Beer Thai House Restaurant	82.0	8.2	37.0
61	Bugis	4cb0535d562d224b303b1588	Jai Thai	68.0	7.6	64.0
120	Tanglin	4b0cde52f964a5204f4223e3	Tawandang Microbrewery	59.0	6.3	52.0
83	Crawford	4bc4c1a0461576b005678032	Nana Original Thai Food	56.0	8.0	28.0
21	Alexandra Hill	5436696c498e33113d456016	#87 Just Thai	53.0	8.1	10.0
8	Bishan East	4b36df8bf964a520ab3d25e3	Jai Thai	52.0	7.1	61.0
81	Crawford	4d075aaa26adb1f72e41e170	New Udon Thai Food (BBQ Steamboat)	45.0	8.1	22.0
137	Pasir Panjang 1	4c3d6c2a15cb1b8deef37bdc	E-Sarn Thai Cuisine	43.0	7.4	39.0
202	Nee Soon	4b9b6fe2f964a520440736e3	Taste Of Thailand	43.0	6.3	68.0
0	Ang Mo Kio Town Centre	51243f60e4b02ffb6a43eeea	Soi 19 十九街 Thai Wanton Mee	40.0	6.5	25.0
172	Tampines West	4fddad68e4b049c33bd0d6ff	Soi Thai Kitchen	38.0	7.5	21.0
123	Pasir Ris Central	4d05bc01a2685481707ebebd	The Basil Inn	30.0	7.1	22.0
59	Bugis	5809abe738fab1dc497bd39f	Ah Loy Thai	29.0	8.1	12.0
204	Northland	551d2f47498e6ba82559a6c1	Nakhon Kitchen	26.0	8.0	13.0
22	Alexandra Hill	4d5fabbe196ba09365761056	Joe's Kitchen Thai Cuisine	26.0	7.1	17.0
121	Tanglin	4b058813f964a5204db022e3	Patara Fine Thai Cuisine	25.0	6.3	20.0
85	Crawford	4bdad5072a3a0f47af27acb6	Nongkhai หนองคาย 隆开	22.0	7.7	25.0
14	Marymount	4c1a0400838020a1cd83e661	E-Sarn Thai Corner	21.0	7.3	19.0
157	Sembawang Central	54705d4a498e8876c2694262	JJ Thai Cuisine	18.0	7.6	11.0
156	Victoria	4ccc0d917c2ff04df64c967e	ThaiPan	18.0	6.8	27.0
20	Hong Kah North	5479a984498e141c4cce0b3b	Bangkok Street Mookata	17.0	7.5	4.0
102	Tanjong Rhu	4b655d2af964a52083ee2ae3	Thai Village Restaurant	17.0	7.1	4.0
12	Marymount	587a1563561ded2967529265	Tomyum Mama	16.0	8.7	7.0
45	Swiss Club	51fcb12b498e46f224c79217	E-Sarn Thai Cuisine	16.0	6.7	7.0
28	Maritime Square	4c87825d51ada1cd61424810	Thaksin Beef Noodle	16.0	6.6	13.0
195	Woodgrove	514bf5c7e4b07ab0bb982912	BALIThai	15.0	6.1	14.0
9	Bishan East	4d9476735241a1cd39815f4b	Mata Thai Restaurant	15.0	6.0	34.0
114	Newton Circus	4d1862076d10370427723ebd	Thai Village Restaurant	15.0	6.0	11.0
166	Serangoon Garden	5762376f498ed59f67f9791a	Soi Thai Kitchen	14.0	6.6	6.0
84	Crawford	5837c4776e60752e1df5797c	Thai-Thai Kitchen	13.0	8.1	3.0
44	Swiss Club	51df898a498e56e0e64c5409	Royal Thai	13.0	8.0	7.0
94	Kampong Java	579dac11498ef4fbf0684d8b	A-Roy Thai Restaurant	13.0	6.8	7.0
3	Shangri-La	56cee098498e2f5c99b54a8d	Kra Pow Thai Street Food	12.0	7.8	16.0
200	Khatib	54f31b20498e31ed2e79266f	Orto Mookata	11.0	6.4	4.0
171	Tampines West	5b2b292c3af988002ced398c	Nakhon Kitchen	10.0	8.1	3.0
42	Coronation Road	4ba45952f964a520bc9738e3	Le Wu Café	10.0	6.0	9.0
56	Sunset Way	5017a98de4b02848f719002c	Thai Express	10.0	5.5	7.0
205	Springleaf	51616da9e4b0e63c799f73f5	Thai Hao Chi Traditional Thai Charcoal Steambo...	9.0	8.3	2.0
27	Everton Park	4c345b95a0ced13aaffa176e	Issan Thai Food	9.0	8.1	7.0
19	Upper Thomson	5602a497498eeb82cd6918ab	Taste of Thailand (Original)	9.0	7.5	3.0
46	Choa Chu Kang Central	4bada046f964a520c75f3be3	Siam Kitchen	9.0	6.7	8.0

	Neighborhood	ID	Name	Likes	Rating	Tips
173	Tampines West	58351cb823188e7d9dc4d76d	Saap Saap Thai	9.0	6.6	5.0
132	Dover	4b83c01af964a520130f31e3	E-Sarn Thai Cuisine	8.0	7.8	15.0
71	Hougang Central	5960a89b9be5224b9b83c056	Tiew Mai Thai Boat Noodle	8.0	7.4	5.0
93	Kampong Java	4be563532468c928c2efff42	Bangkok Express	8.0	7.4	9.0
64	Aljunied	4b6432ecf964a520b4a32ae3	Thai Delights @ Lor 12 Geylang	8.0	7.2	4.0
51	Clementi Central	4b72520ff964a520ae772de3	Thaksin Beef Noodle	8.0	7.0	4.0
76	Lorong Ah Soo	54b660d4498e91db7c94be34	Yaowarat Seafood	8.0	6.9	5.0
201	Nee Soon	4bdbb36863c5c9b679642968	Bei Sheng Seafood	8.0	6.8	18.0
162	Fernvale	4f376297e4b0d26ba1011e6d	Mai Thai	8.0	6.6	7.0
180	Braddell	5917e9592bf9a936dec6c9a9	Soi 47 Thai Food	8.0	6.5	6.0
41	Coronation Road	4b583420f964a520e44d28e3	Thai Noodle House	7.0	6.1	27.0
15	Marymount	549980c0498eb47afc9ae507	Thai in Town	7.0	6.0	9.0
25	Bukit Ho Swee	5b25206195d986002c246edb	Little Elephant	6.0	8.3	3.0
105	Fort Canning	5b2f272b8496ca002c9e2935	Un-Yang-Kor-Dai	6.0	8.1	3.0
206	Springleaf	54e08bc0498ec2e50ab10199	Mookata	6.0	7.7	1.0
1	Kebun Bahru	5a1e3ebf3149b9447be1aec5	Carabao Thai Restaurant Stulang	6.0	7.4	13.0
95	Kampong Java	5aa4c1aa6fa81f2f6c9718b7	Baan Ying	6.0	6.5	19.0
174	Xilin	5ac710e379f6c74413fedcf2	The Original Boat Noodle	6.0	6.5	2.0
43	Holland Road	5290292e498e7949ebfc62d4	Sala Thai Kitchen	6.0	6.3	3.0
35	Jelebu	53749f67498ebf1a4f44c65b	Rasa Rasa Seafood Restaurant	5.0	6.8	0.0
37	Anak Bukit	4daec6304b229076786d5ffa	Tasty Thai Hut	5.0	6.8	3.0
129	Paya Lebar East	504da249e4b04a78b07b80dc	Sri Bistari Changi Village Famous Ayam Penyet	5.0	6.8	2.0
65	Aljunied	53021f91498e6d3419a15817	Mae Toi Thai Food	5.0	6.7	1.0
126	Pasir Ris Park	4d564ecae7f1a1cd2c0305a5	Magic Wok Restaurant	5.0	6.1	23.0
161	Fernvale	53fddb3e498e8b37594a775b	BALIThai	5.0	6.1	3.0
10	Bishan East	50fa92bfe4b04cffec4dbfd5	Aroy Mookata	5.0	5.8	2.0
134	Kent Ridge	56aae05b498efacbe702fb1d	The Red Noodle & Bottle Bar	5.0	5.7	2.0
60	Bugis	59c4fd028134883ec2ee1aef	Sticky Rice	4.0	8.0	2.0
38	Anak Bukit	4ce7f13bf86537045009adc4	HotSpice Thai Cuisine	4.0	6.8	7.0
67	Geylang East	585376d72eb979557cf6b5f1	Lotus Thai Restaurant	4.0	6.3	2.0
68	Kampong Ubi	5af6cc863abcaf002cd0a0a3	Took Lae Dee	4.0	6.3	5.0
39	Anak Bukit	5a69b465a0215b2c2b56e65b	Royal Thai Boat Noodles & Bar	4.0	6.2	4.0
170	Sentosa	56dec434cd1095d757cbc5a0	Gin Khao Bistro	4.0	6.1	4.0
203	Nee Soon	4ebbc8ee9911cfd604ce43bf	Thai The Dine In	4.0	5.8	5.0
182	Braddell	4c1df1978b3aa59339579b5f	Wang Thai Kitchen (旺泰小橱)	3.0	5.5	7.0
40	Anak Bukit	59959121bfc6d06a2950f0fb	Time For Thai	2.0	5.8	3.0
66	Aljunied	5cc592425d891b002ceee10b	Gu Thai House	2.0	5.8	5.0
26	Bukit Ho Swee	4ba8b7cef964a5205ee939e3	Go Thai	1.0	7.0	11.0

From the above sorted dataframe, we can recommend someone who wants to have a good Thai cuisine to try out the first 5 in the list as they are very popular among the local communities in Singapore.

Conclusion for the business problems

From the Foursquare API, we can locate a total of 36 unique Korean restaurants and 81 unique Thai restaurants in Singapore. There could be more as some of the Korean restaurants could be categorized under BBQ joint. A further data manipulation will be required to find out those.

Out of these list, we found the Korean and Thai restaurants that are very popular among the locals in Singapore.

In addition from the 2 lists, we can also advise a businessman to try opening a Korean restaurant in Singapore since there is lesser as compared to Thai restaurant. More room for business in this sense.

We can do a map visualization to see where exactly in Singapore neighborhoods to open to prevent more competition.

In [71]: `sg_venues.head()`

Out[71]:

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue ID	Venue Latitude	Venue Longitude	Ca
0	Ang Mo Kio Town Centre	1.371285	103.846994	Face Ban Mian 非 板面 (Ang Mo Kio)	50712b67e4b0548504446dea	1.372031	103.847504	
1	Ang Mo Kio Town Centre	1.371285	103.846994	Old Chang Kee	4bc30123abf495215220c393	1.369094	103.848389	Snac
2	Ang Mo Kio Town Centre	1.371285	103.846994	FairPrice Xtra	4b15f661f964a52012b623e3	1.369279	103.848886	Supe
3	Ang Mo Kio Town Centre	1.371285	103.846994	NTUC FairPrice	4ece4dd693ad987b4a9fb4ef	1.371507	103.847082	Supe
4	Ang Mo Kio Town Centre	1.371285	103.846994	MOS Burger	4b1ea04ff964a520e21c24e3	1.369170	103.847831	Burg

In [76]: `rest_kor = sg_venues_clean[(sg_venues_clean['Venue Category'] == 'Korean Restaurant')]`

In [77]: `rest_kor.head()`

Out[77]:

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue ID	Venue Latitude	Venue Longitude
261	Shangri-La	1.311247	103.826757	Seoul Restaurant (Charcoal barbecue)	539bda5c498ea6a82328fa17	1.304777	103.825300
947	Marymount	1.348604	103.839393	Parker Korean Restaurant	4bd4219b77b29c7488289282	1.352265	103.835294
1587	Bukit Ho Swee	1.287995	103.828564	BigMama Korean Restaurant	4f241718e4b0008741f2ca13	1.285386	103.829427
1732	Depot Road	1.281568	103.811037	The Gogi	55c045ce498ef4ba12e8fd64	1.287485	103.804827
1817	Everton Park	1.277129	103.839368	Super Star K Korean BBQ	4f57625de4b0a4bae7120806	1.278003	103.843680

```
In [78]:  rest_kor.info()

<class 'pandas.core.frame.DataFrame'>
Int64Index: 38 entries, 261 to 14841
Data columns (total 8 columns):
 #   Column                 Non-Null Count  Dtype
---  ------                 --------------  -----
 0   Neighborhood           38 non-null     object
 1   Neighborhood Latitude  38 non-null     float64
 2   Neighborhood Longitude 38 non-null     float64
 3   Venue                  38 non-null     object
 4   Venue ID               38 non-null     object
 5   Venue Latitude         38 non-null     float64
 6   Venue Longitude        38 non-null     float64
 7   Venue Category         38 non-null     object
dtypes: float64(4), object(4)
memory usage: 2.7+ KB
```

```
In [79]:  address = 'Singapore'

          geolocator = Nominatim(user_agent = "sg_explorer")
          location = geolocator.geocode(address, timeout = 10)
          latitude = location.latitude
          longitude = location.longitude
          print('The geograpical coordinate of Singapore are {}, {}.'.format(latitude, longitude))
```

The geograpical coordinate of Singapore are 1.3408630000000001, 103.83039182212079.

```
In [80]: map_Sg_kor = folium.Map(location=[latitude, longitude], zoom_start = 11)


         for lat, lng, venue, neighborhood in zip(rest_kor['Venue Latitude'], rest_kor['Venue Longit
         ude'],
                                                  rest_kor['Venue'], rest_kor['Neighborhood']):
             label = '{},{}'.format(venue, neighborhood)
             label = folium.Popup(label, parse_html = True)
             folium.CircleMarker(
                 [lat, lng],
                 radius = 3,
                 popup = label,
                 color = 'red',
                 fill = True,
                 fill_color = '#3186cc',
                 fill_opacity = 0.5,
                 parse_html = False).add_to(map_Sg_kor)

         map_Sg_kor
```

Out[80]:
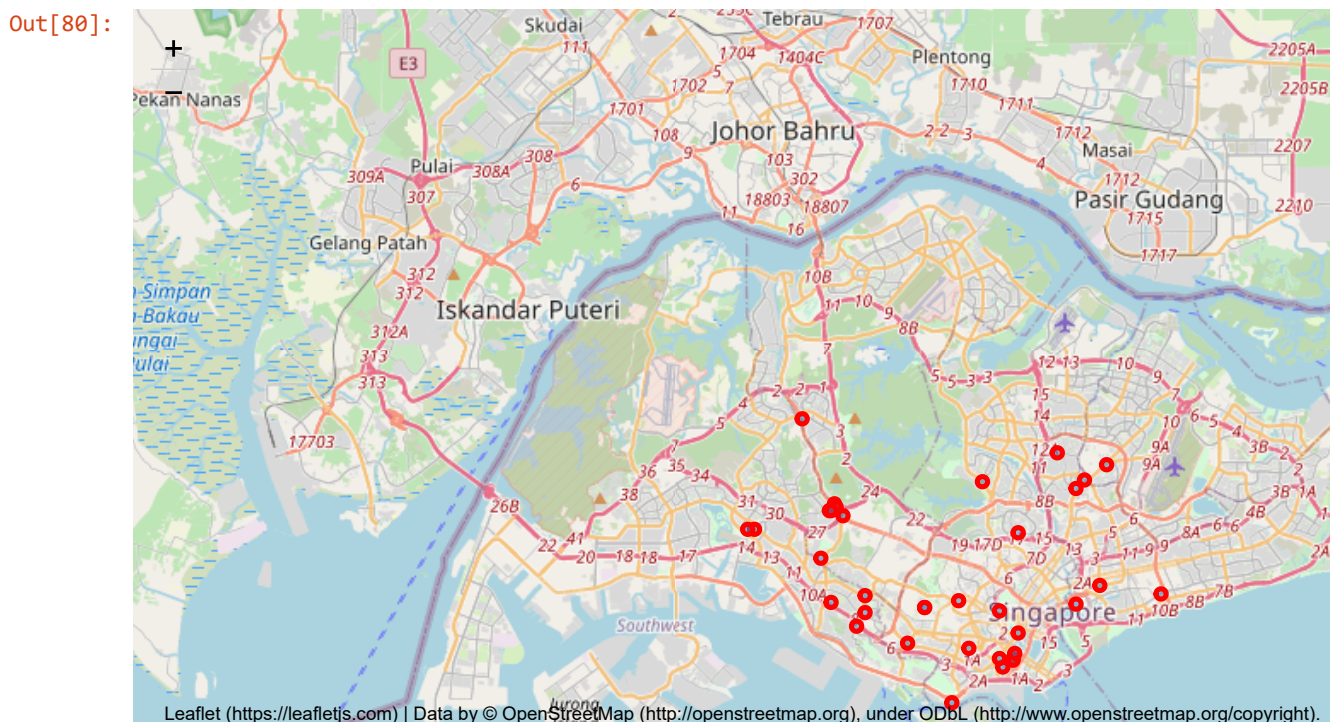
From the map visualization for the Korean restaurants currently opened in Singapore, we see that there is a potential for the businessman to open a Korean restaurant further to the north of Singapore, namely Woodlands and also Changi to the East region of Singapore.

For completeness, we can also do a similar map visualization to take a look at the Thai restaurants.

```
In [81]: rest_thai = sg_venues_clean[(sg_venues_clean['Venue Category'] == 'Thai Restaurant')]
         rest_thai.head()
```

Out[81]:

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue ID	Venue Latitude	Venue Longitude	
57	Ang Mo Kio Town Centre	1.371285	103.846994	Soi 19 十九街 Thai Wanton Mee	51243f60e4b02ffb6a43eeea	1.377004	103.840706	R
168	Kebun Bahru	1.460214	103.776635	Carabao Thai Restaurant Stulang	5a1e3ebf3149b9447be1aec5	1.463205	103.774340	R
219	Sembawang Hills	1.372399	103.829029	泰美妙海鲜 Thai Wonder Cuisine	4f712a2be4b09e60f82d8389	1.371260	103.837615	R
295	Shangri-La	1.311247	103.826757	Kra Pow Thai Street Food	56cee098498e2f5c99b54a8d	1.306974	103.833648	R
566	Bedok North	1.332402	103.919305	Sbey Sbey Thai Food	4d3a4694beb7b1f723e7e771	1.335963	103.911383	R

```
In [82]: map_Sg_thai = folium.Map(location = [latitude, longitude], zoom_start = 11)


         for lat, lng, venue, neighborhood in zip(rest_thai['Venue Latitude'], rest_thai['Venue Long
         itude'],
                                                   rest_thai['Venue'], rest_thai['Neighborhood']):
             label = '{},{}'.format(venue, neighborhood)
             label = folium.Popup(label, parse_html=True)
             folium.CircleMarker(
                 [lat, lng],
                 radius = 3,
                 popup = label,
                 color = 'blue',
                 fill = True,
                 fill_color = '#3186cc',
                 fill_opacity = 0.5,
                 parse_html = False).add_to(map_Sg_thai)

         map_Sg_thai
```

Out[82]:
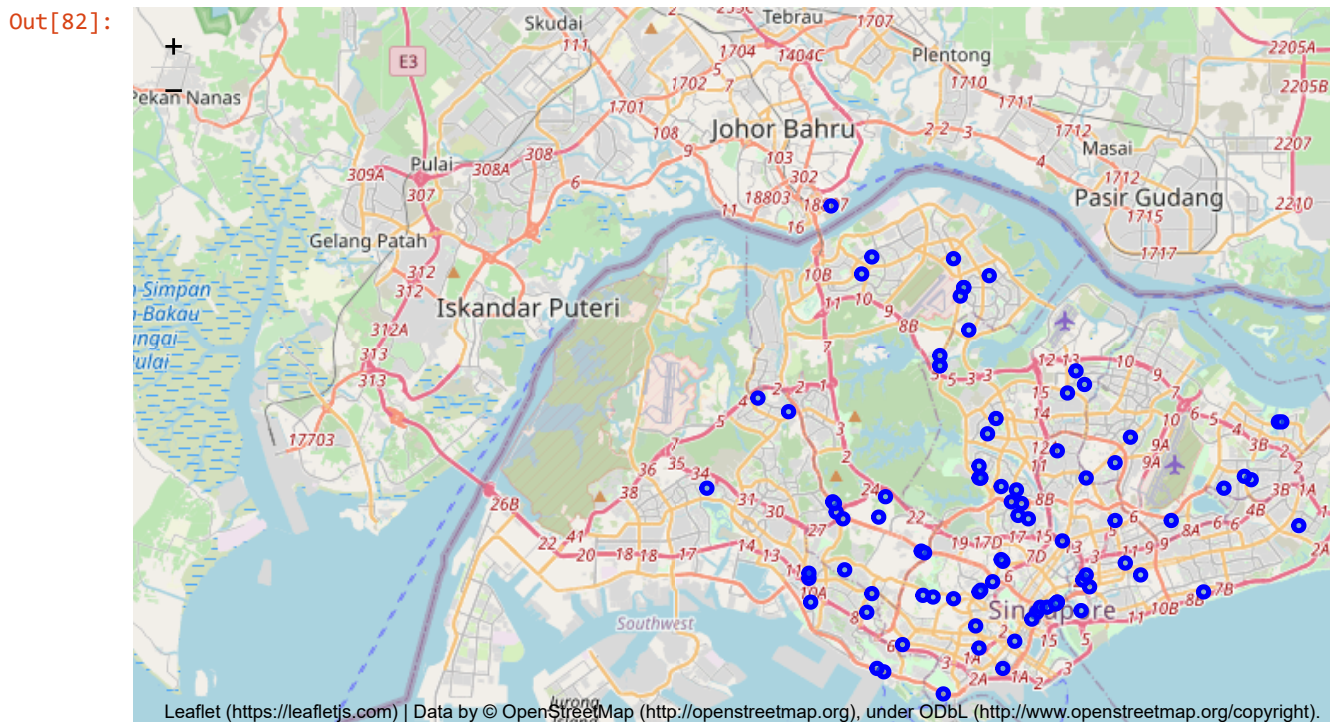
The last business problem to address is to find out what venue categories that are the most popular.

```
In [83]: sg_venues_clean['Venue Category'].value_counts()
```

```
Out[83]:  Coffee Shop                         379
          Chinese Restaurant                  365
          Food Court                          326
          Café                                269
          Asian Restaurant                    206
          Fast Food Restaurant                164
          Japanese Restaurant                 147
          Bus Station                         137
          Indian Restaurant                   134
          Supermarket                         128
          Bakery                              125
          Noodle House                        124
          Park                                112
          Hotel                               108
          Seafood Restaurant                  106
          Shopping Mall                        94
          Thai Restaurant                      89
          Italian Restaurant                   79
          Dessert Shop                         77
          Gym                                  72
          Convenience Store                    72
          Sandwich Place                       70
          Restaurant                           63
          Bar                                  60
          Vegetarian / Vegan Restaurant        57
          Ice Cream Shop                       52
          Grocery Store                        50
          BBQ Joint                            48
          Trail                                46
          Gym / Fitness Center                 46
          Pool                                 46
          Bus Stop                             44
          Sushi Restaurant                     43
          Spa                                  41
          Snack Place                          39
          Steakhouse                           39
          Korean Restaurant                    38
          Pizza Place                          34
          Soup Place                           34
          Bus Line                             34
          Clothing Store                       34
          American Restaurant                  33
          Malay Restaurant                     31
          Bubble Tea Shop                      30
          Fried Chicken Joint                  29
          Playground                           29
          Basketball Court                     27
          Pharmacy                             26
          French Restaurant                    25
          Dim Sum Restaurant                   25
          Multiplex                            24
          Bookstore                            24
          Cocktail Bar                         24
          Ramen Restaurant                     23
          Electronics Store                    23
          Wine Bar                             23
          Cosmetics Shop                       23
          Golf Course                          22
          Hotpot Restaurant                    22
          Halal Restaurant                     22
          Sporting Goods Shop                  21
          Diner                                21
          Furniture / Home Store               21
          Metro Station                        21
          Frozen Yogurt Shop                   20
          Yoga Studio                          20
          Bistro                               19
          Salad Place                          18
          Stadium                              18
          Hostel                               17
          Dumpling Restaurant                  17
```

```
Breakfast Spot                                    17
Boutique                                          17
Soccer Field                                      17
Department Store                                  17
Gastropub                                         17
Burger Joint                                      16
Plaza                                             16
Pet Store                                         16
Beach                                             16
Indonesian Restaurant                             16
Vietnamese Restaurant                             16
Market                                            15
Art Gallery                                       15
Harbor / Marina                                   15
Athletics & Sports                                15
Bowling Alley                                     15
Pub                                               15
Nightclub                                         15
Garden                                            14
Scenic Lookout                                    14
Karaoke Bar                                       14
Lounge                                            14
Movie Theater                                     13
Massage Studio                                    13
Food                                              13
College Cafeteria                                 13
Beer Bar                                          12
Lake                                              12
Cafeteria                                         12
Mexican Restaurant                                12
Hainan Restaurant                                 12
Food & Drink Shop                                 12
Flower Shop                                       11
Beer Garden                                       11
Boat or Ferry                                     11
Juice Bar                                         11
Tea Room                                          11
Tennis Court                                      11
Spanish Restaurant                                11
Miscellaneous Shop                                10
Gas Station                                       10
Club House                                        10
Shoe Store                                        10
Office                                            10
Deli / Bodega                                     10
Waterfront                                        10
Airport                                            9
Performing Arts Venue                              9
Modern European Restaurant                         9
Hotel Bar                                          9
General Entertainment                              8
Music Venue                                        8
Resort                                             8
Bridge                                             8
Pier                                               8
Cantonese Restaurant                               8
Train Station                                      8
Brewery                                            7
Discount Store                                     7
Gift Shop                                          7
Food Truck                                         7
German Restaurant                                  7
Martial Arts School                                7
Light Rail Station                                 7
Residential Building (Apartment / Condo)           7
Gourmet Shop                                       7
Comfort Food Restaurant                            7
Farm                                               7
Wings Joint                                        7
Kids Store                                         6
Exhibit                                            6
Farmers Market                                     6
```

Filipino Restaurant	6
Recreation Center	6
Toy / Game Store	6
Gym Pool	6
Event Space	6
Museum	6
Campground	6
Other Great Outdoors	6
Hong Kong Restaurant	6
Hobby Shop	6
Building	6
Buffet	5
Zoo Exhibit	5
Mediterranean Restaurant	5
Theater	5
Middle Eastern Restaurant	5
Water Park	5
South Indian Restaurant	5
Whisky Bar	5
Speakeasy	5
Smoke Shop	5
Dog Run	5
Arts & Crafts Store	5
Airport Lounge	5
Cupcake Shop	5
Sports Bar	5
Australian Restaurant	5
Soccer Stadium	5
Monument / Landmark	5
Dance Studio	5
Chinese Breakfast Place	4
North Indian Restaurant	4
Kitchen Supply Store	4
Mobile Phone Shop	4
Pool Hall	4
Fishing Spot	4
Greek Restaurant	4
Accessories Store	4
Botanical Garden	4
Motorcycle Shop	4
Portuguese Restaurant	4
Rest Area	4
Fruit & Vegetable Store	4
Skate Park	4
Wine Shop	4
Track Stadium	4
Jewelry Store	4
Racetrack	4
Art Museum	4
Candy Store	4
Nature Preserve	4
Paper / Office Supplies Store	4
Betting Shop	3
Go Kart Track	3
Canal	3
Garden Center	3
Concert Hall	3
New American Restaurant	3
Shabu-Shabu Restaurant	3
Historic Site	3
Thrift / Vintage Store	3
Casino	3
Fish & Chips Shop	3
Climbing Gym	3
Szechuan Restaurant	3
Salon / Barbershop	3
Bagel Shop	3
Peking Duck Restaurant	3
College Gym	3
Road	3
Reservoir	3
Chocolate Shop	3

Flea Market	3
Public Art	3
Sculpture Garden	3
History Museum	3
Track	3
Tapas Restaurant	3
Fish Market	3
Tourist Information Center	3
Butcher	2
Hookah Bar	2
Optical Shop	2
Burrito Place	2
Health Food Store	2
Sports Club	2
Photography Studio	2
Souvenir Shop	2
Beach Bar	2
Video Game Store	2
High School	2
Swiss Restaurant	2
Health & Beauty Service	2
Dive Bar	2
Bed & Breakfast	2
Outdoors & Recreation	2
Arcade	2
Hakka Restaurant	2
Night Market	2
Gun Range	2
Video Store	2
Bike Rental / Bike Share	2
Outdoor Sculpture	2
Medical Center	2
English Restaurant	2
Bike Trail	2
Airport Service	2
Lighthouse	2
Hotel Pool	2
Indoor Play Area	2
Lingerie Store	2
Skating Rink	2
Stables	2
College Theater	2
Theme Park	2
Tech Startup	2
River	2
Taiwanese Restaurant	2
Kebab Restaurant	2
Food Service	2
Satay Restaurant	2
Latin American Restaurant	2
Cha Chaan Teng	2
Shop & Service	2
Pie Shop	2
Border Crossing	2
Gaming Cafe	2
Airport Terminal	2
Shaanxi Restaurant	1
Cheese Shop	1
Nail Salon	1
Construction & Landscaping	1
College Bookstore	1
Badminton Court	1
Big Box Store	1
Military Base	1
Cable Car	1
Paella Restaurant	1
Aquarium	1
Baby Store	1
Doctor's Office	1
Theme Park Ride / Attraction	1
Mosque	1
Ski Area	1

Bridal Shop	1
Cemetery	1
TV Station	1
Baseball Stadium	1
Rock Climbing Spot	1
Southern / Soul Food Restaurant	1
Boarding House	1
Laundromat	1
Jazz Club	1
Baseball Field	1
Scandinavian Restaurant	1
Japanese Curry Restaurant	1
Music Store	1
Buddhist Temple	1
Yunnan Restaurant	1
Bowling Green	1
Organic Grocery	1
Persian Restaurant	1
College Auditorium	1
Planetarium	1
Soba Restaurant	1
Travel Lounge	1
Pedestrian Plaza	1
Veterinarian	1
College Administrative Building	1
Hospital	1
Motel	1
Volleyball Court	1
Stationery Store	1
Neighborhood	1
Udon Restaurant	1
Island	1
Zoo	1
Waterfall	1
Other Nightlife	1
Food Stand	1
Moving Target	1
Other Repair Shop	1
College Stadium	1
Hardware Store	1
Outlet Store	1
Fujian Restaurant	1
Print Shop	1
Mountain	1
School	1
Gay Bar	1
Science Museum	1
Community Center	1
Caribbean Restaurant	1
Zhejiang Restaurant	1
Post Office	1
Pop-Up Shop	1
Golf Driving Range	1
Ski Chalet	1
Warehouse Store	1
Rock Club	1
Bay	1
Hockey Arena	1
Escape Room	1
Chinese Aristocrat Restaurant	1
Non-Profit	1
Hot Dog Joint	1
Turkish Restaurant	1
Arts & Entertainment	1
Beer Store	1
Factory	1
Intersection	1
Macanese Restaurant	1
Parking	1
Sake Bar	1
Pet Service	1
Drugstore	1

```
          Women's Store                         1
          Shanghai Restaurant                   1
          Shopping Plaza                        1
          General College & University         1
          Bank                                  1
          Paintball Field                       1
          Auto Garage                           1
          Housing Development                   1
          Business Service                      1
          Lottery Retailer                      1
          Used Auto Dealership                  1
          Government Building                   1
          Coworking Space                       1
          Street Food Gathering                 1
          Field                                 1
          Carpet Store                          1
          Belgian Restaurant                    1
          Temple                                1
          Eastern European Restaurant          1
          ATM                                   1
          Comedy Club                           1
          Board Shop                            1
          Hot Spring                            1
          Name: Venue Category, dtype: int64
```

The top five most popular venues in Singapore are mostly Food & Beverage venue.

In [ ]: