Capstone Project - The Battle of Neighborhoods (Week 4)

Restaurant strategy

“Now that you have been equipped with the skills and the tools to use location data to explore a geographical location, over the course of two weeks, you will have the opportunity to be as creative as you want and come up with an idea to leverage the Foursquare location data to explore or compare neighborhoods or cities of your choice or to come up with a problem that you can use the Foursquare location data to solve.”

Description of the Problem and Discussion of the Background (Introduction Section)

Tokyo is the most populous metroplitan area in the world.

We will use this Project to select top places (wards) in Tokyo to this investimento.

#Preparation for Data (Data Section)

##STEPS

##Get The Names of Wards, Major Districts and Population from Wikipedia

##Processing the Information From Wiki To Make Necessary Lists

##Get the Coordinates of the Major Districts

##Check and Compare with Google Search and Refine if Necessary

#Importing Libraries

In [6]:
```
import requests
import json

import matplotlib.pyplot as plt
import matplotlib.cm as cm
import matplotlib.colors as colors

from bs4 import BeautifulSoup
import pandas as pd
import numpy as np
```

#Names of Wards, Major Districts and Population from Wikipedia
#Ward (electoral subdivision), electoral district or unit of local government

Out[12]:

	Ward	Area_SqKm	Population	Major_District
1	Chiyoda	5100	59441	Nagatacho
2	Chuo	14460	147620	Nihonbashi
3	Minato	12180	248071	Odaiba
4	Shinjuku	18620	339211	Shinjuku
5	Bunkyō	19790	223389	Hongo
6	Taitō	19830	200486	Ueno
7	Sumida	18910	260358	Kinshicho
8	Koto	12510	502579	Kiba
9	Shinagawa	17180	392492	Shinagawa
10	Meguro	19110	280283	Meguro
11	Ota	11910	722608	Omori
12	Setagaya	15690	910868	Shimokitazawa
13	Shibuya	15080	227850	Shibuya
14	Nakano	21350	332902	Nakano
15	Suginami	16750	570483	Koenji
16	Toshima	22650	294673	Ikebukuro
17	Kita	16740	345063	Akabane
18	Arakawa	21030	213648	Arakawa
19	Itabashi	17670	569225	Itabashi
20	Nerima	15120	726748	Nerima
21	Adachi	12660	674067	Ayase
22	Katsushika	12850	447140	Tateishi
23	Edogawa	13750	685899	Kasai

#Get the Coordinates of the Major Districts

Out[19]:

	Ward	Area_SqKm	Population	Major_District	Dist_Latitude	Dist_Longitude
1	Chiyoda	5100	59441	Nagatacho	35.675618	139.743469
2	Chuo	14460	147620	Nihonbashi	35.684068	139.774503
3	Minato	12180	248071	Odaiba	35.619050	139.779364
4	Shinjuku	18620	339211	Shinjuku	35.693763	139.703632
5	Bunkyō	19790	223389	Hongo	35.175376	137.013476
6	Taitō	19830	200486	Ueno	35.711795	139.776075
7	Sumida	18910	260358	Kinshicho	35.696312	139.815043
8	Koto	12510	502579	Kiba	35.672200	139.806100
9	Shinagawa	17180	392492	Shinagawa	35.599252	139.738910
10	Meguro	19110	280283	Meguro	35.621250	139.688014
11	Ota	11910	722608	Omori	35.588473	139.727933
12	Setagaya	15690	910868	Shimokitazawa	35.661678	139.666335
13	Shibuya	15080	227850	Shibuya	35.664596	139.698711
14	Nakano	21350	332902	Nakano	35.718123	139.664468
15	Suginami	16750	570483	Koenji	35.704942	139.649909
16	Toshima	22650	294673	Ikebukuro	35.731084	139.708916
17	Kita	16740	345063	Akabane	35.778139	139.720800
18	Arakawa	21030	213648	Arakawa	35.737529	139.781310
19	Itabashi	17670	569225	Itabashi	35.774143	139.681209
20	Nerima	15120	726748	Nerima	35.748360	139.638735
21	Adachi	12660	674067	Ayase	35.446047	139.430823
22	Katsushika	12850	447140	Tateishi	33.481791	131.478154
23	Edogawa	13750	685899	Kasai	34.929109	134.860050

########################## end of 1st part

########################## begin of 2nd part

#Exploratory Data Analysis

Concentrate on the best five wards

Chiyoda. Major District: Nagatacho Shinjuku. Major District: Shinjuku Shibuya. Major District: Shibuya Chuo. Major District: Nihombashi Shinagawa. Major District: Shinagawa So as the next step we will use Foursquare data and obtain information on restaurants. With these, we can start with our battle of neighborhoods for opening a restaurant in Tokyo.

Out[78]:

	Ward	Area_SqKm	Population	Major_District	Dist_Latitude	Dist_Longitude
1	Chiyoda	5100	59441	Nagatacho	35.675618	139.743469
2	Chuo	14460	147620	Nihonbashi	35.684068	139.774503
3	Minato	12180	248071	Odaiba	35.619050	139.779364
4	Shinjuku	18620	339211	Shinjuku	35.693763	139.703632
5	Bunkyō	19790	223389	Hongo	35.175376	137.013476

Avg price / square

Out[36]:

	Ward	Average_Price(SqKm)
1	Chiyoda	2370567
2	Chuo	1844643
3	Shinjuku	869731
4	Shinagawa	776510
5	Shibuya	1190323

```
# Merge the dataframes according to the ward names
```

Out[38]:

	Ward	Area_SqKm	Population	Major_District	Dist_Latitude	Dist_Longitude	Average_Price(SqKm)
1	Chiyoda	5100	59441	Nagatacho	35.675618	139.743469	2370567
2	Chuo	14460	147620	Nihonbashi	35.684068	139.774503	1844643
3	Shinjuku	18620	339211	Shinjuku	35.693763	139.703632	869731
4	Shinagawa	17180	392492	Shinagawa	35.599252	139.738910	776510
5	Shibuya	15080	227850	Shibuya	35.664596	139.698711	1190323

```
## Show in Map the Top Rated Restaruants in the Top 5 Districts
```

#The 5 Neighbourhoods (Chiyoda, Chuo, Shinjuku, Shibuya, Shinagawa)
#that are ready to battle for the best place to open a lunch restaurant
#looks as above in Map, obtained using Folium

Exploring the Major Districts

Out[44]:

	District	Dist_Latitude	Dist_Longitude	Venue	Venue_Lat	Venue_Long	Venue_Category
497	Shibuya	35.664596	139.698711	NUMBER SUGAR	35.666434	139.706014	Candy Store
498	Shibuya	35.664596	139.698711	pivoine	35.666129	139.692082	Women's Store
499	Shibuya	35.664596	139.698711	Gyukatsu Motomura (牛かつ もと村)	35.659031	139.699252	Japanese Restaurant

Out[45]:

	District	Dist_Latitude	Dist_Longitude	Venue	Venue_Lat	Venue_Long	Venue_Category
1	Nagatacho	35.675618	139.743469	Shinamen Hashigo (支那麺 はしご)	35.672184	139.741576	Ramen Restaurant
2	Nagatacho	35.675618	139.743469	Sushi Isshin (鮨 一新)	35.672589	139.739399	Sushi Restaurant
3	Nagatacho	35.675618	139.743469	All Day Dining Origami (オールデイダイニング ORIGAMI)	35.673815	139.741104	Restaurant

In [ ]:
```
#See, above, the Most Frequently Visited Restaurants in the Best Five Districts of Tokyo.
```

In [ ]:
```
#See, above, the Most Frequently Visited Restaurants in the Best Five Districts of Tokyo.
```

In [47]:
```
### Number of Unique Categories in the Dataframe
print('There are {} unique categories.'.format(len(Tokyo_5_Dist_Venues['Venue_Category'].unique())))
## We can check some of the categories randomly
print (Tokyo_5_Dist_Venues[['Venue_Category']][70:75])
```

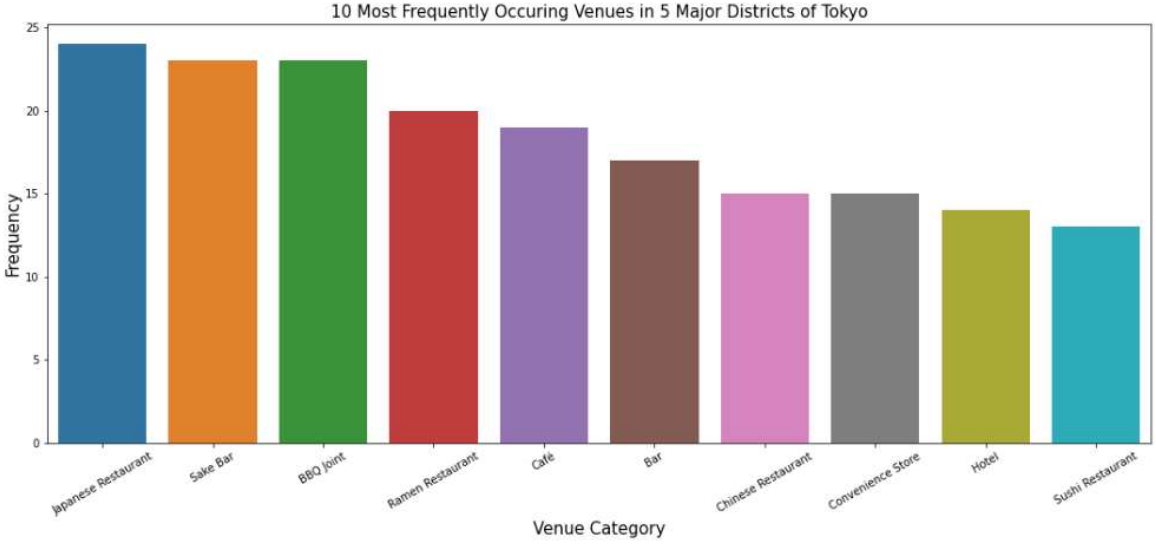
```
There are 134 unique categories.
       Venue_Category
70  Italian Restaurant
71               Hotel
72           Jazz Club
73     Soba Restaurant
74        Comedy Club
```

In [ ]:
```
#We have seen that there are 134 unique categories in the Venues Data-Frame.
#Let's see the Frequency of Each Category
```

#Create a Data-frame with the 10 Most Frequently Occuring Venue_Category

Out[49]:

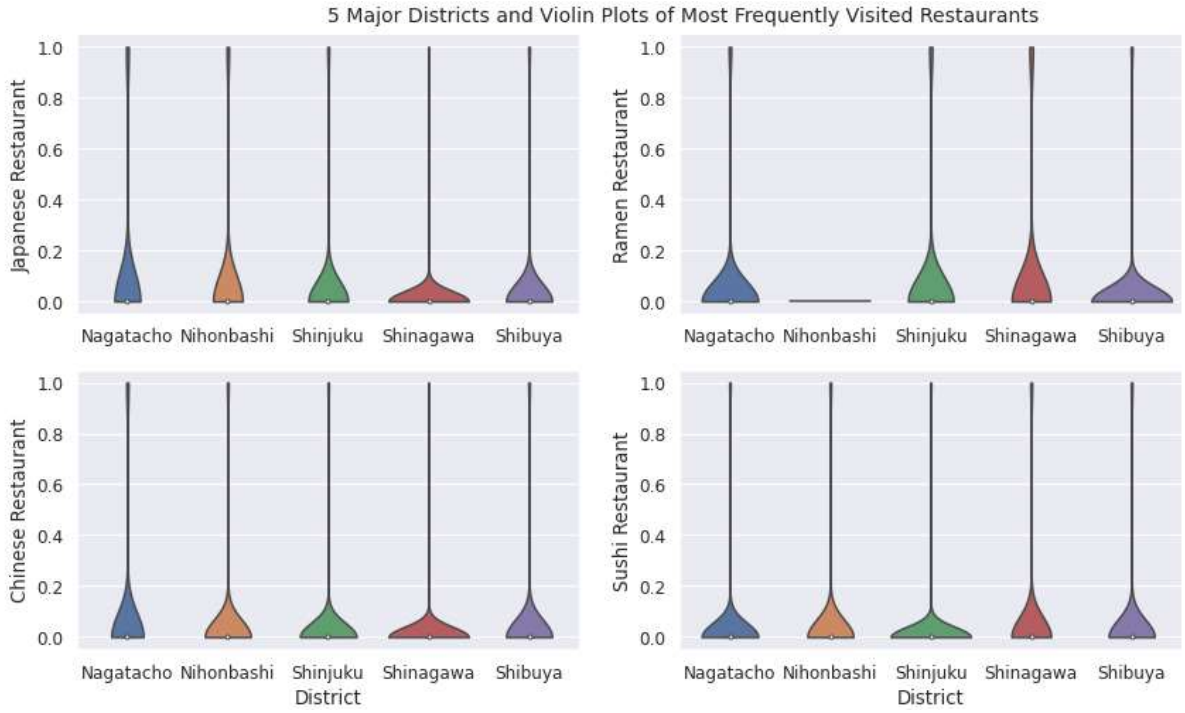
	Venue_Category	Frequency
0	Japanese Restaurant	24
1	Sake Bar	23
2	BBQ Joint	23
3	Ramen Restaurant	20
4	Café	19
5	Bar	17
6	Chinese Restaurant	15
7	Convenience Store	15
8	Hotel	14
9	Sushi Restaurant	13

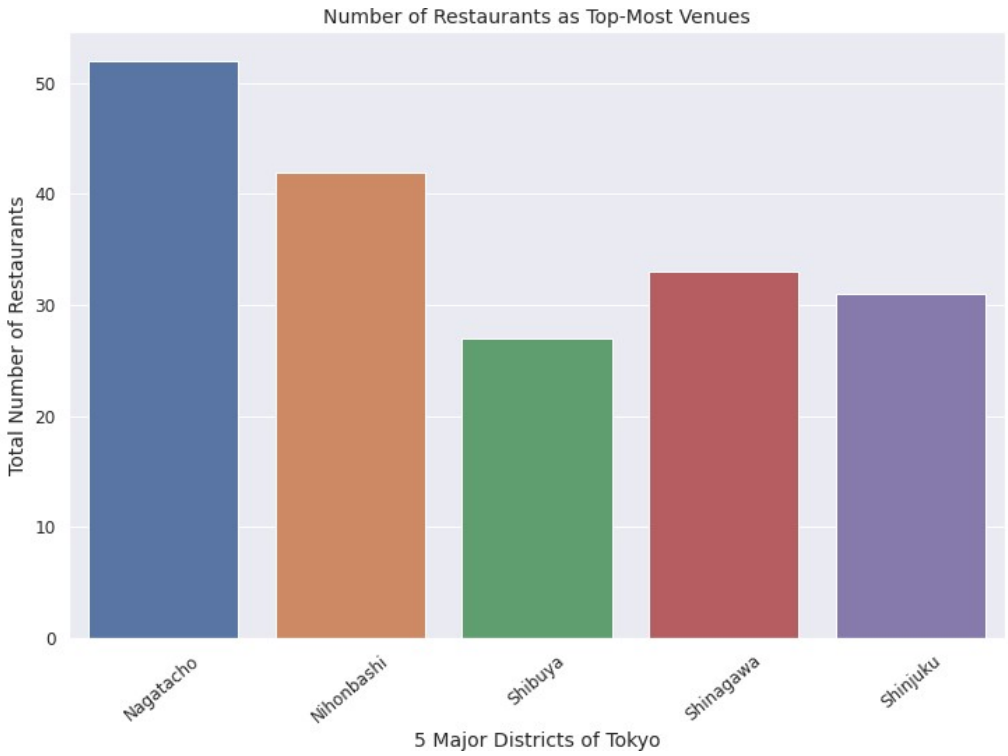

10 Most Frequently Occuring Venues in 5 Major Districts of Tokyo
Frequency
0
5
10
15
20
25
Japanese Restaurant
Sake Bar
BBQ Joint
Ramen Restaurant
Cafe
Bar
Chinese Restaurant
Convenience Store
Hotel
Sushi Restaurant
Venue Category


theRantingPanda.com

Out[54]:

	District	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
1	Nagatacho	Japanese Restaurant	BBQ Joint	Coffee Shop	Chinese Restaurant	Hotel	Szechuan Restaurant	Ramen Restaurant	Kaiseki Restaurant	Theater	Dessert Shop
2	Nihonbashi	Japanese Restaurant	Café	BBQ Joint	Yoshoku Restaurant	Dessert Shop	Soba Restaurant	Hotel	Department Store	French Restaurant	Chinese Restaurant
3	Shibuya	Café	Record Shop	Coffee Shop	Bar	Chinese Restaurant	Sushi Restaurant	Sake Bar	French Restaurant	Japanese Restaurant	Ramen Restaurant
4	Shinagawa	Convenience Store	Ramen Restaurant	Sake Bar	Grocery Store	BBQ Joint	Sushi Restaurant	Donburi Restaurant	Park	Soba Restaurant	Yakitori Restaurant
5	Shinjuku	Sake Bar	Bar	Ramen Restaurant	BBQ Joint	Pub	Japanese Restaurant	Department Store	Dessert Shop	Thai Restaurant	Movie Theater





#Clustering the Tokyo Districts (Neighborhoods) using K-Means