Battle of Neighborhoods (Week 4)

Sectioning Airbnb Listings in Tokyo: Survey the Surroundings

1. Description of the Problem and Discussion of the Background

Despite rising tension with the government authority, Tokyo has been a growing market for property owners renting out their space for public; 民泊 or *minpaku* as they would call in Japanese. Airbnb, just as in other major cities, is among the popular platforms to find one, especially for foreigners who possess little or no local language understanding.

When arriving at Airbnb, people tend to wonder what are some good spots nearby. Quick Google search will do, but what if we could explore what kind of places are there around before even booking the place? We probably could save more time on deciding where to go and even plan our trip better. This light project aims to answer that question. It's not only targeting the travelers, but it also might be useful for those interested in running the lodging business, or even for people who consider living in the world's most populous metropolitan city and wonder what the neighborhoods look like.

2. Data Preparation

Let's see how Airbnb apartments are spread across Tokyo. Inside Airbnb has one of most updated databases for any Airbnb cities in the world, and it's free; thanks to their scraping tool who managed to extract texts from relatively complex HTML structure of Airbnb webpage. After grabbing only the necessary data for the analysis, the data consisting 13367 listings (as of November 2019) would look like this:

	name	neighbourhood	latitude	longitude	price
0	La Casa Gaienmae C Harajuku, Omotesando is nearby	Shibuya	35.67152	139.71203	4160
1	Oshiage Holiday Apartment	Sumida	35.71721	139.82596	10948
2	Private apt in central Tokyo #203	Nerima	35.74267	139.65810	4270
3	Cozy flat #203, local area YET 10 mins to shib...	Setagaya	35.66344	139.65593	7007
4	Private apt in central Tokyo #201	Nerima	35.74264	139.65832	4051
5	Kero-kero house room 1	Arakawa	35.73818	139.77009	7663
6	RELAX AT HOME:Shimo 5'/Shibuya 10'	Setagaya	35.66832	139.65159	8977
7	Classy room @Shinjuku, Takadanoba	Shinjuku	35.70865	139.69681	5145
8	4F - Near Shinjuku & Shibuya w/Free WiFi	Shibuya	35.67968	139.67949	9853
9	WOMAN ONLY LICENSED ! Cosy & Cat behnd Shibuya	Setagaya	35.65833	139.67153	7007

Then I aggregated the data to find out the number of listings, average price, and latitude/longitude coordinate of each neighborhood. To add some more information, I scraped a Wikipedia page (https://en.wikipedia.org/wiki/Special_wards_of_Tokyo) containing population and area data of Tokyo 23 wards.

	Neighborhood	No. of Listings	Average Price	Latitude	Longitude	Population	Area_km2
0	Adachi	214	6728	35.776307	139.790275	674067	53.25
1	Arakawa	344	12019	35.733565	139.780470	213648	10.16
2	Bunkyo	142	21831	35.719431	139.756299	223389	11.29
3	Chiyoda	207	17991	35.696185	139.773024	59441	11.66
4	Chuo	505	21333	35.678838	139.777576	147620	10.21
5	Edogawa	263	17960	35.707953	139.871731	685899	49.90
6	Itabashi	324	15075	35.758386	139.691179	569225	32.22
7	Katsushika	353	13276	35.741874	139.853582	447140	34.80
8	Kita	324	12778	35.753275	139.738731	345063	20.61
9	Koto	224	12372	35.686533	139.818622	502579	40.16
10	Meguro	86	11924	35.637254	139.696739	280283	14.67
11	Minato	577	17468	35.659335	139.739242	248071	20.37
12	Nakano	421	14866	35.701728	139.671702	332902	15.59
13	Nerima	90	7683	35.750107	139.646873	726748	48.08
14	Ota	607	11958	35.565070	139.719751	722608	60.66
15	Setagaya	331	12937	35.647916	139.655358	910868	58.05
16	Shibuya	946	18541	35.668130	139.693488	227850	15.11
17	Shinagawa	194	14670	35.614495	139.724895	392492	22.84
18	Shinjuku	2252	17364	35.698916	139.705109	339211	18.22
19	Suginami	350	11729	35.697518	139.635722	570483	34.06
20	Sumida	1199	17695	35.707154	139.808853	260358	13.77
21	Taito	1922	16923	35.713836	139.788075	200486	10.11
22	Toshima	1492	15770	35.732756	139.715963	294673	13.01

Based on the coordinates, I retrieved a maximum 100 recommended places for each area in walking distance radius (less than 1km) using Foursquare API. There might be some areas that are less concentrated than the others therefore having less spots surrounding. I found it's interesting to see the obtained results as so many places I didn't even know before in spite of living within the area for years. Displayed below are the first few rows of 2216 records collected. We would dig more on venue category to have a glimpse of the surroundings and answer the project question. So let's get going to further analysis.

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
2011	Sumida	35.707154	139.808853	蕎麦前 小まつ	35.699438	139.812544	Soba Restaurant
781	Kita	35.753275	139.738731	Key's Cafe	35.753933	139.737430	Café
1430	Setagaya	35.647916	139.655358	MERCI BAKE (メルシーベイク)	35.643533	139.655419	Cupcake Shop
2159	Toshima	35.732756	139.715963	BAKE CHEESE TART	35.730315	139.711410	Pastry Shop
1563	Shibuya	35.668130	139.693488	LINE CUBE SHIBUYA	35.664100	139.698520	Concert Hall
1904	Suginami	35.697518	139.635722	川名肉店	35.693494	139.639707	Deli / Bodega
487	Chuo	35.678838	139.777576	Snoopy Town mini (スヌーピータウンミニ)	35.681313	139.769319	Gift Shop
406	Chuo	35.678838	139.777576	Pokémon Cafe (ポケモンカフェ)	35.680620	139.774372	Café
1757	Shinjuku	35.698916	139.705109	TOHO Cinemas (TOHOシネマズ 新宿)	35.694856	139.702018	Multiplex
1704	Shinagawa	35.614495	139.724895	SPORU (スポル大井町)	35.608368	139.731697	Athletics & Sports