

Coursera Capstone

IBM Applied Data Science Capstone

**Want a cup of coffee? Open a coffee shop?
I tell you where to go in Taipei!**

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Introduction

Taipei is the capital city of Taiwan, and it's the most crowded city composed of 12 administrative districts. The city proper is home to an estimated population of 2,646,204. Taipei is home to various architectural or cultural landmarks, such as Taipei 101, Chiang Kai-shek Memorial Hall and several night markets dispersed throughout the city. To have a coffee in Taipei is not too difficult because it's the most economic city, but where to have one? Or, if I want to have a coffee shop travel, where can I go? If you want to open a coffee shop in Taipei, where should you first choose?

Business Problem

The objective of this capstone project is to provide useful information about coffee shops in Taipei for travelers who want to have a wonderful coffee travel so that they can visit coffee shops as many as possible. And also for business developers who want to start up their new coffee shop to know the best locations they can try to start earning their reputations without facing customer being divided by nearby coffee shops.

Data

To solve this problem, we will need the following data:

- Taipei city data containing list districts with their latitude and longitude.
 - Data source: <https://en.wikipedia.org/wiki/Taipei>
 - Description: Scrap Taipei districts table from Wikipedia and get the coordinates of these 12 major districts using geocoder
- Coffee shops in each district of Taipei:
 - Data source: Foursquare APIs
 - Description: Using the API to get all the venues in each neighborhood. Filter these venues to get only coffee shops.

Methodology

- Taipei city data is collected from Wikipedia (<https://en.wikipedia.org/wiki/Taipei>)
- ForuSquare is used to locate all venues and filtered by coffee shops.
- The data will be visually displayed using graphing from Python libraries.
- Finally the suggestion to travelers or business developer will be provided.

Results

1. Scratch district table from website

	Map			District			Population(Jan. 2016)	Area(km2)	Postalcode
	Map	Name[99]	Chinese[100]	Pinyin	Wade-Giles	Peh-ōe-jī	Population(Jan. 2016)	Area(km2)	Postalcode
0	Beitou Shilin Neihu Zhongshan Song-shan Datong...	Beitou	北投區	Běitóu	Pei-t'ou	Pak-táu	257922	56.8216	112
1	Beitou Shilin Neihu Zhongshan Song-shan Datong...	Daan (Da-an, Da'an)	大安區	Dà'an	Ta-an	Tai-an	312909	11.3614	106
2	Beitou Shilin Neihu Zhongshan Song-shan Datong...	Datong	大同區	Dàtóng	Ta-t'ung	Tai-tóng	131029	5.6815	103
3	Beitou Shilin Neihu Zhongshan Song-shan Datong...	Nangang (Nankang)	南港區	Nángǎng	Nan-kang	Lâm-káng	122296	21.8424	115
4	Beitou Shilin Neihu Zhongshan Song-shan Datong...	Neihu	內湖區	Nèihú	Nei-hu	Lái-ô	287726	31.5787	114
5	Beitou Shilin Neihu Zhongshan Song-shan Datong...	Shilin	士林區	Shílín	Shih-lin	Sô-lim	290682	62.3682	111
6	Beitou Shilin Neihu Zhongshan Song-shan Datong...	Songshan	松山區	Sōngshān	Sung-shan	Sîng-san	209689	9.2878	105
7	Beitou Shilin Neihu Zhongshan Song-shan Datong...	Wanhua	萬華區	Wànhuá	Wan-hua	Báng-kah	194314	8.8522	108
8	Beitou Shilin Neihu Zhongshan Song-shan Datong...	Wenshan	文山區	Wénshān	Wen-shan	Bûn-san	275433	31.5090	116
9	Beitou Shilin Neihu Zhongshan Song-shan Datong...	Xinyi	信義區	Xìnyì	Hsin-yi	Sin-gí	229139	11.2077	110
10	Beitou Shilin Neihu Zhongshan Song-shan Datong...	Zhongshan	中山區	Zhōngshān	Chung-shan	Tiong-san	231286	13.6821	104
11	Beitou Shilin Neihu Zhongshan Song-shan Datong...	Zhongzheng	中正區	Zhōngzhèng	Chung-cheng	Tiong-chèng	162549	7.6071	100

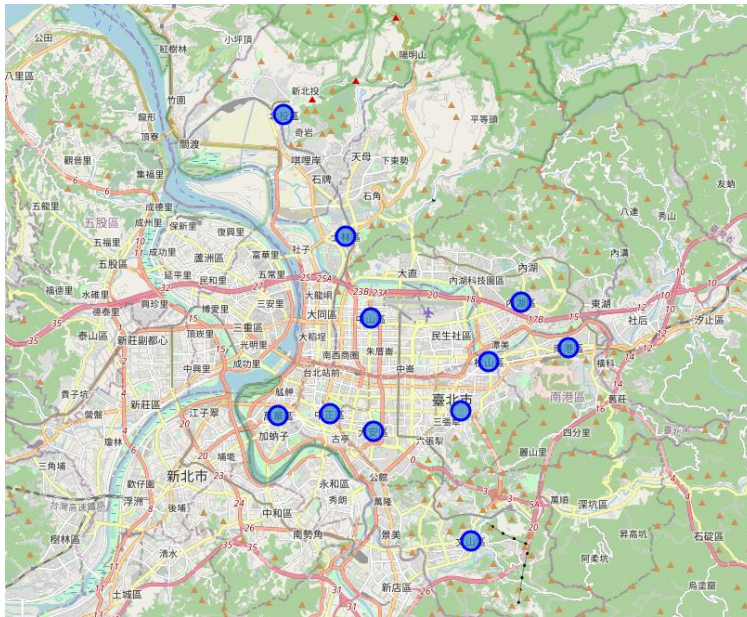
2. Data clean and calculate population density

	Postalcode	District	Chinesename	Population Density/(/km2))
0	112	Beitou	北投區	4539.154124
1	106	Daan (Da-an, Da'an)	大安區	27541.412150
2	103	Datong	大同區	23062.395494
3	115	Nangang (Nankang)	南港區	5599.018423
4	114	Neihu	內湖區	9111.394706
5	111	Shilin	士林區	4660.740570
6	105	Songshan	松山區	22576.821206
7	108	Wanhua	萬華區	21950.927453
8	116	Wenshan	文山區	8741.407217
9	110	Xinyi	信義區	20444.783497
10	104	Zhongshan	中山區	16904.276390
11	100	Zhongzheng	中正區	21368.064045

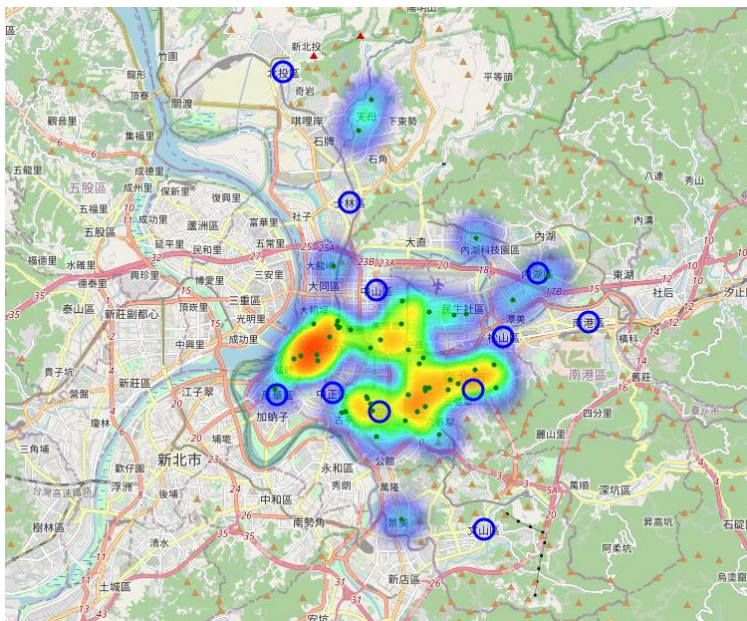
3. Get the latitude and longitude and incorporate them with district name

	Postalcode	District	Chinesename	Population Density/(/km2))	Latitude	Longitude
0	112	Beitou	北投區	4539.154124	25.132419	121.501379
1	106	Daan (Da-an, Da'an)	大安區	27541.412150	25.026515	121.534395
2	103	Datong	大同區	23062.395494	46.099463	124.697919
3	115	Nangang (Nankang)	南港區	5599.018423	25.054578	121.606600
4	114	Neihu	內湖區	9111.394706	25.069664	121.588998
5	111	Shilin	士林區	4660.740570	25.091840	121.524207
6	105	Songshan	松山區	22576.821206	25.049885	121.577272
7	108	Wanhua	萬華區	21950.927453	25.031933	121.499332
8	116	Wenshan	文山區	8741.407217	24.989786	121.570458
9	110	Xinyi	信義區	20444.783497	25.033345	121.566896
10	104	Zhongshan	中山區	16904.276390	25.064361	121.533468
11	100	Zhongzheng	中正區	21368.064045	25.032361	121.518267

4. Let's see how these 12 districts distributed in Taipei



5. Let's see the distribution of coffee shops in Taipei with labeled districts



Conclusion

- There are more aggregated coffee shops near the center of Taipei city.
- If you are a traveler wanting to visit as many coffee shops as possible in your timely schedule, I will suggest you to go to these districts: Zhongzheng, Zhongshan, Daan, and Xinyi.
- If you are a business developer wanting to open a new coffee shops, I will suggest to open in a less crowded districts: Beitou, Shilin, Nangang, and Wenshan.