

Introduction:

Bangkok is by far one of the world's tourist destination cities, not just domestic tourists but also international tourists may be because it's the principal gateway for arriving visitors to Southeast Asia. Bangkok is a modern Asian never slept city. Originally Bangkok was a tiny village on the west bank of the Chao Phraya River. Times pass by many things happened, the capital was moved to the eastern bank and named

"Krung Thep mahanakhon amorn ratanakosin mahintharayutthaya mahadilok
popnoparat ratchathani burirom udomratchanivetmahasathan amornpiman
avatarnsathit sakkathattiya visnukarmprasit", which means the 'City of Angels'.

As I mentioned the west bank is call 'Thonburi' and the eastern bank where the Grand Palace is located call 'Phra nakhon' which translated to Grand Palace in English. Besides from the recently Coup, all day heavy traffic congestion, high heat temperature and naughty there're a lot more you can find here.

Business Problem:

From the introduction you can easily tell that Bangkok is a crowded city and a lot of people come with a lot of business, highly competitive new business venture who would like to have a slice of cake called profit need to be carefully about their decision making. Any insights from analysis will give some good business understanding. This will also help business development and targeting the rights market.

Basically, what I am doing is try to apply data science technique to location data with a little help from 4SquareAPI we managed to get venues nearby the neighborhoods For this location dataset I chooses Bangkok because I studied in Bangkok for 4 years and I still know tiny bit of it because Bangkok is so huge. It's divided into 50 districts and lots of sub-district.

Main Objectives:

- Explore Bangkok how place are located in Bangkok
 - Is the inner core side of Bangkok have more tourist attraction?

- If we are looking for an opportunity to open a Bar in Bangkok, where should we landed?
 - Where we wanted to land is a place that we have enough customer but don't have a lot of bar around

Target Audience:

The result can be used for either tourists domestic or international who would like to explore Bangkok or Business owner who looking for a new opportunity in this gigantic city and also ordinary people who love to learn more about this city

- Tourists
- Business owner
- Anyone

Data:

The data that use in this project is location data from

1. Wiki pages contain latitude, longitude, district, sub-district and other necessities location Data
 - wiki page: list of districts of Bangkok, ([link1](#))
 - wiki page: Postal code of Bangkok districts, ([link2](#))
 - wiki page: Districts and Sub-districts, ([link3](#))

Note there are missing value of latitude and longitude in [[link1](#)]

so the missing value has been replaced by the data in [Geocoder](#)

2. foursquare API for in each neighborhoods
 - foursquare API ([link4](#))

Process of data collection:

- Scrapped location data from Wiki page
- Replaced missing-value with data from Geocoder
- Called foursquare API for venues around neighborhoods

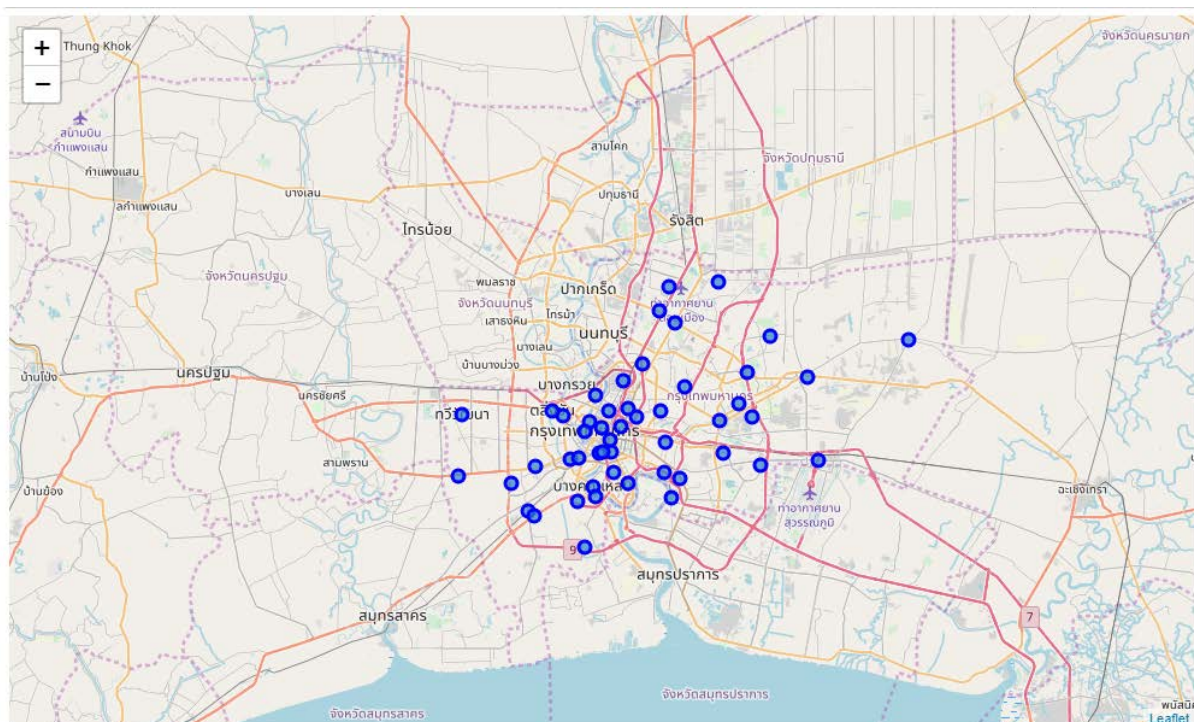
	District	Side	Latitude	Longitude	PostalCode	Sub-district
0	Bang Bon	Thorn Buri	13.666503	100.428859	10150	บางบอน,บางบอนเหนือ,บางบอนใต้,คลองบางพราน,คลอง...
1	Bang Kapi	Phra Nakhon	13.765833	100.647778	10240	คลองจั่น,วังทองหลาง,ลาดพร้าว,คลองกุ่ม,สะพานสูง...
2	Bang Khae	Thorn Buri	13.696111	100.409444	10160	บางแค,บางแคเหนือ,บางไผ่,หลักสอง
3	Bang Khen	Phra Nakhon	13.873889	100.596389	10220	ลาดยาว,อนุสาวรีย์,คลองถนน,ตลาดบางเขน,สีกัน,สาย...
4	Bang Kho Laem	Phra Nakhon	13.693333	100.502500	10120	บางคอแหลม,วัดพระยาไกร,บางโคล่

(50, 6)

Figure1: 1 Bangkok final dataset

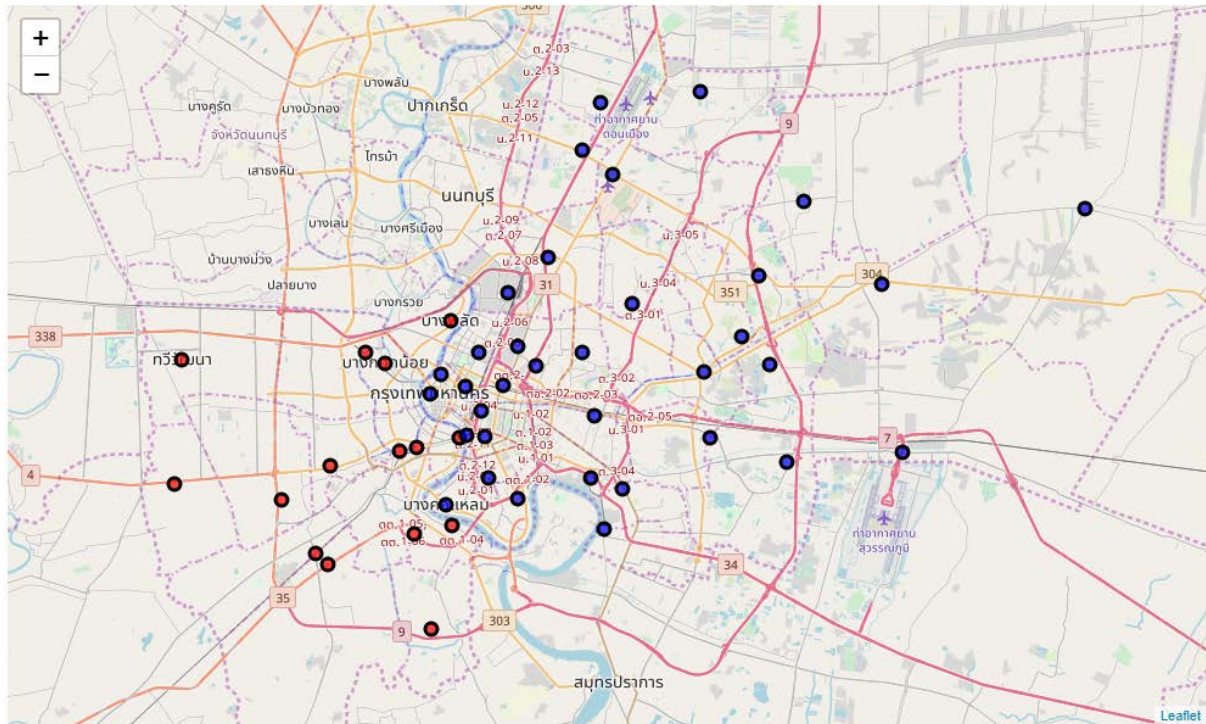
Methodology:

For this part, I will use the same methodology as in Week3 lab. Now we have Bangkok final dataset which contain location data that we need about Bangkok districts. Let's plot some visualization before we are going to use Foursquare API to explore nearby neighborhoods in Bangkok as I mentioned Bangkok is separated by Chao Phraya River so I will also show the cluster of both side too.



This Visualization shows before the cluster of Bangkok based on their Side of the river.

Figure1: 2 Districts of Bangkok



This Visualization shows cluster of Bangkok based on their Side of the river red is 'Thon Buri Side', blue is 'Phra Nakhon Side' .

Figure1: 3 Districts of Bangkok cluster by side of the river

As you can see the side where Bangkok inner core is represented by blue dot are called 'Phra Nakhon Side'

And clearly this side have more districts than 'Thonburi Side'. Then explore Bangkok venues by using

Foursquare API.

```
print(bkk_venues.shape)
bkk_venues.head()
```

(2867, 7)

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	บางบอน,บางบอนเหนือ,บางบอนใต้,คลองบางพราน,คลองข...	13.666503	100.428859	Shabu Na-Mor (ชาบูหน้ามอ)	13.663855	100.428756	Shabu-Shabu Restaurant
1	บางบอน,บางบอนเหนือ,บางบอนใต้,คลองบางพราน,คลองข...	13.666503	100.428859	ก๊วยเตี๋ยวต๋าลิ่ง นายเอก	13.667102	100.428354	Noodle House
2	บางบอน,บางบอนเหนือ,บางบอนใต้,คลองบางพราน,คลองข...	13.666503	100.428859	ส้มตำครกเงิน	13.666023	100.432755	Som Tum Restaurant
3	บางบอน,บางบอนเหนือ,บางบอนใต้,คลองบางพราน,คลองข...	13.666503	100.428859	ไฟทองโภชนา	13.662101	100.435264	Thai Restaurant
4	บางบอน,บางบอนเหนือ,บางบอนใต้,คลองบางพราน,คลองข...	13.666503	100.428859	ขนมจีนเหวตา บ๊อบเส้นสดๆ	13.659428	100.433692	Noodle House

```
#There are 164 uniques venues categories from cols = ['Venue Category']
print('There are {} uniques venues categories.'.format(len(bkk_venues['Venue Category'].unique())))
#Group Bangkok venues by cols =['Neighborhood'] and count all of the cols
bkk_venues.groupby('Neighborhood').count().head()
```

There are 237 uniques venues categories.

Figure1: 4 Bangkok Venues

Attempt 1: Explore Bangkok neighborhood venues

After obtained Bangkok venues I listed 5th most common venues just the same in Week 3 lab to see what are the most common venues around the neighborhoods is

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
0	กระทุ่มราย,หนองจอก,คลองสิบ,คลองสิบสอง,โคกแฝด,ค...	Coffee Shop	Thai Restaurant	Convenience Store	Shopping Mall	Food Court
1	คลองกุ่ม,สะพานสูง,คันนายาว,นวมินทร์,นวลจันทร์	Coffee Shop	Convenience Store	Café	Supermarket	Thai Restaurant
2	คลองจั่น,วังทองหลาง,ลาดพร้าว,คลองกุ่ม,สะพานสูง...	Coffee Shop	Thai Restaurant	Japanese Restaurant	Fast Food Restaurant	Steakhouse
3	คลองชักพระ,ตลิ่งชัน,ฉิมพลี,บางพระม,บางระมาด,ทวี...	Convenience Store	Noodle House	Café	Coffee Shop	Badminton Court
4	คลองเตย,คลองตัน,พระโขนง,คลองเตยเหนือ,คลองตันเห...	Convenience Store	Coffee Shop	Noodle House	Karaoke Bar	Bakery

Figure1: 5 Top 5 Most Common Venue around neighborhood

Finally, using KMeans algorithms for clustering (k = 5), and Folium library to visualize the cluster.

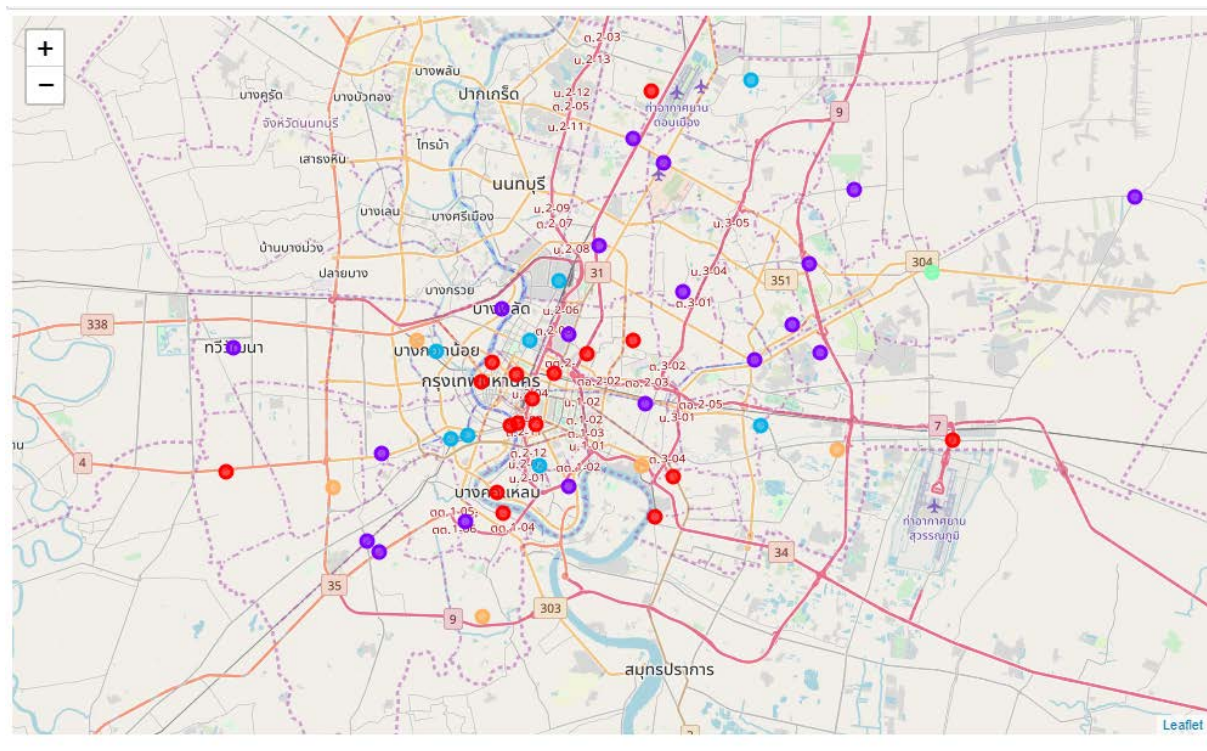


Figure1: 6 Map visualized cluster of Bangkok common venues

As shown above, by using KMeans clustering there are Cluster 0, Cluster 1, Cluster 2, Cluster 3, Cluster 4

Represented in Red, Purple, Blue, Light green and Light orange respectively. In the table below there are 2 cluster columns. The one that represented the for this cluster is 'Cluster Labels' and the other Cluster

represented side of the river, for instant Cluster = 1 is Bangkok 'Phra nakhon' side which is the Bangkok inner core side, and Cluster = 0 is Bangkok 'Thonburi' side

Result 1:

KMeans cluster for attempted 1 to explore Bangkok venues

```
5]: cluster0 = merged_group.loc[merged_group['Cluster Labels'] == 0, merged_group.columns[[1] + list(range(0, merged_group.shape[1]
)]]]
print(cluster0.shape)
cluster0
```

(17, 14)

```
5]:
```

PostalCode	Sub-district	Cluster	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
10120	บางคอแหลม, วัดพระยาไกร, บางโคล่	1	0	Thai Restaurant	Convenience Store	Coffee Shop	Noodle House	Seafood Restaurant
10260	บางนา, บางนาเหนือ, บางนาใต้	1	0	Noodle House	Café	Thai Restaurant	Convenience Store	Asian Restaurant
10500	มหาพฤฒาราม, สีลม, สรียวงศ์, บางรัก, สีพระยา	1	0	Noodle House	Thai Restaurant	Hotel	Chinese Restaurant	Café
10400	ดินแดง, รัชดาภิเษก	1	0	Noodle House	Convenience Store	Thai Restaurant	Sports Club	Stadium
10210	ตลาดบางเขน, สีกัน, หงส์ทอง, คอนเมือง, สนามบิน	1	0	Convenience Store	Restaurant	Noodle House	Café	Buffet
10310	ห้วยขวาง, บางกะปิ, ดินแดง, สามเสนนอก	1	0	Thai Restaurant	Noodle House	Japanese Restaurant	Hotel	Convenience Store
10600	สมเด็จพระยา, คลองสาน, บางสาธุล่าง, คลองตันโพธิ์	0	0	Chinese Restaurant	Noodle House	Dessert Shop	Thai Restaurant	Coffee Shop
10520	ลาดกระบัง, คลองสองต้นนุ่น, คลองสามประเวศ, ลำปลายท...	1	0	Thai Restaurant	Café	Hotel	Som Tum Restaurant	Noodle House
10160	หลักสอง, หนองแขม, หนองค้างพลู	0	0	Thai Restaurant	Market	Bar	Bus Stop	Convenience Store
10330	รองเมือง, วังใหม่, ปทุมวัน, ลุมพินี	1	0	Noodle House	Asian Restaurant	Chinese Restaurant	Thai Restaurant	Hostel
10260	คลองเตย, คลองตัน, พระโขนง, บางนา, บางจาก, สวนหลวง, ห...	1	0	Convenience Store	Coffee Shop	Hotel	Noodle House	Fast Food Restaurant

Figure1: 7 Bangkok common venues cluster 0

```

]: cluster1 = merged_group.loc[merged_group['Cluster Labels'] == 1, merged_group.columns[[1] + list(range(0, merged_group.shape[1]
))]]
print(cluster1.shape)
cluster1
(19, 14)

```

ude	Longitude	PostalCode	Sub-district	Cluster	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
503	100.428859	10150	บางบอน,บางบอนเหนือ,บางบอนใต้,คลองบางพราน,คลองข...	0	1	Noodle House	Pizza Place	Thai Restaurant	Coffee Shop	Bakery
833	100.647778	10240	คลองจั่น,วังทองหลาง,ลาดพร้าว,คลองกุ่ม,สะพานสูง...	1	1	Coffee Shop	Thai Restaurant	Japanese Restaurant	Fast Food Restaurant	Steakhouse
889	100.596389	10220	ลาดยาว,อนุสาวรีย์,คลองถนน,ตลาดบางเขน,สีกัน,สาย...	1	1	Fast Food Restaurant	Coffee Shop	Asian Restaurant	Hotpot Restaurant	Bookstore
833	100.435833	10150	บางค้อ,จอมทอง,บางขุนเทียน,บางบอน,ท่าข้าม,บางมด...	0	1	Thai Restaurant	Japanese Restaurant	Coffee Shop	Restaurant	Hotpot Restaurant
889	100.505000	10700	บางพลัด,บางอ้อ,บางป้าหร,บางยี่ขัน	0	1	Convenience Store	Thai Restaurant	Café	Fast Food Restaurant	Toll Plaza
278	100.669167	10240	คลองกุ่ม,สะพานสูง,คันนายาว,นวมินทร์,นวลจันทร์	1	1	Coffee Shop	Convenience Store	Café	Supermarket	Thai Restaurant
611	100.559722	10900	ลาดยาว,เสนานิคม,จันทรม,จอมพล,จตุจักร	1	1	Coffee Shop	Thai Restaurant	Japanese Restaurant	Fast Food Restaurant	Noodle House
222	100.484722	10150	บางขุนเทียน,บางค้อ,บางมด,จอมทอง	0	1	Thai Restaurant	Convenience Store	Pet Store	Asian Restaurant	Restaurant
881	100.678848	10230	คันนายาว,รามอินทรา	1	1	Thai Restaurant	Coffee Shop	Japanese Restaurant	Som Tum Restaurant	Bakery
722	100.704167	10510	สามวาตะวันตก,สามวาตะวันออก,บางชัน,ทรายกองดิน,ท...	1	1	Exhibit	Thai Restaurant	Coffee Shop	Noodle House	Restaurant
500	100.578889	10210	ทุ่งสองห้อง,ตลาดบางเขน	1	1	Thai	Coffee Shop	Convenience	Gym / Fitness	Fast Food

Figure1: 8 Bangkok common venues cluster 1

```

cluster2 = merged_group.loc[merged_group['Cluster Labels'] == 2, merged_group.columns[[1] + list(range(0, merged_group.shape[1]
))]]
print(cluster2.shape)
cluster2
(8, 14)

```

itude	Longitude	PostalCode	Sub-district	Cluster	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
109722	100.537222	10800	บางซื่อ,วงศ์สว่าง	1	2	Noodle House	Thai Restaurant	Train Station	Convenience Store	Coffee Shop
'70867	100.467933	10700	บางพลัด,บางป้าหร,บางอ้อ,สีรีราช,บ้านช่างหล่อ,บ...	0	2	Noodle House	Convenience Store	Thai Restaurant	Café	Asian Restaurant
'22778	100.476389	10600	วัดอรุณ,วัดท่าพระ	0	2	Noodle House	Asian Restaurant	Convenience Store	Dessert Shop	Train Station
'76944	100.520556	10300	คูสิต,วชิรพยาบาล,สวนจิตรลดา,สี่แยกมหานาค,บางชี...	1	2	Noodle House	Thai Restaurant	Convenience Store	Asian Restaurant	Coffee Shop
119167	100.645833	10220	สายไหม,ออเงิน,คลองถนน	1	2	Noodle House	Thai Restaurant	Convenience Store	Market	Soup Place
'08056	100.526389	10120	ทุ่งวัดดอน,ยานนาวา,ทุ่งมหาเมฆ	1	2	Noodle House	Asian Restaurant	Chinese Restaurant	Convenience Store	Thai Restaurant
'30278	100.651389	10250	สวนหลวง,อ่อนนุช,พัฒนาการ	1	2	Noodle House	Coffee Shop	Thai Restaurant	Asian Restaurant	Convenience Store
'25000	100.485833	10600	วัดกัลยาณ,หิรัญรูจี,บางยี่เรือ,มุดคโล,ตลาดพลู...	0	2	Noodle House	Convenience Store	Asian Restaurant	Thai Restaurant	Train Station

Figure1: 9 Bangkok common venues cluster2

```
cluster3 = merged_group.loc[merged_group['Cluster Labels'] == 3, merged_group.columns[[1] + list(range(0, merged_group.shape[1]))]]
print(cluster3.shape)
cluster3
```

(1, 14)

Side	District	Side	Latitude	Longitude	PostalCode	Sub-district	Cluster	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
ra akhon	Min Buri	Phra Nakhon	13.813889	100.748056	10510	มีนบุรี, แส่นแสน, บางชัน, ทรายกองดิน, ทรายกองดินใต้...	1	3	Intersection	Coffee Shop	Bakery	Massage Studio	Noodle House

Figure1: 10 Bangkok common venues cluster 3

```
cluster4 = merged_group.loc[merged_group['Cluster Labels'] == 4, merged_group.columns[[1] + list(range(0, merged_group.shape[1]))]]
print(cluster4.shape)
cluster4
```

(5, 14)

Latitude	Longitude	PostalCode	Sub-district	Cluster	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
13.696111	100.409444	10160	บางแค, บางแคเหนือ, บางไผ่, หักสอง	0	4	Convenience Store	Noodle House	Coffee Shop	Japanese Restaurant	Shopping Mall
13.708056	100.583889	10110	คลองเตย, คลองตัน, พระโขนง, คลองเตยเหนือ, คลองตันเหนือ...	1	4	Convenience Store	Coffee Shop	Noodle House	Karaoke Bar	Bakery
13.716944	100.694444	10250	ประเวศ, หนองบอน, ดอกไม้, สวนหลวง	1	4	Intersection	Convenience Store	Soccer Field	Coffee Shop	Outdoor Gym
13.776944	100.456667	10170	คลองชักพระ, ดลิ่งชัน, เขมพิสัย, บางพรหม, บางระมาด, ทวี...	0	4	Convenience Store	Noodle House	Café	Coffee Shop	Badminton Court
13.625420	100.493783	10140	บางนา, หุ้ญครุ	0	4	Bakery	Convenience Store	Spa	Soccer Field	Noodle House

Figure1: 11 Bangkok common venues cluster4

For this attempt as you can clearly see that Bangkok most common venues are Commercial venues for instants, Café, Restaurant. Of course the inner core of the city will have more commercial venues such as cluster 0 that have Commercial venues grouped together from both side of the city as shown in the map.

Attempt 2: Where should we landed our Nightclub

The same method as above have been applied to this data frame but now with Foursquare API we're focusing on CategoryIds = 'Nightclub' the code for category can be obtain by going to this link

<https://developer.foursquare.com/docs/resources/categories>

```
bkk_bar_venues = getNearbyVenues2(names = bkk_location['Sub-district'],
                                  latitudes= bkk_location['Latitude'],
                                  longitudes = bkk_location['Longitude'],
                                  categoryIds = '4bf58dd8d48988d1f941735')
print(bkk_bar_venues.shape)
bkk_bar_venues.head()
```

(296, 7)

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	บางบอน,บางบอนเหนือ,บางบอนใต้,คลองบางพราน,คลองบ...	13.666503	100.428859	RM2 Club	13.665800	100.428997	Nightclub
1	บางบอน,บางบอนเหนือ,บางบอนใต้,คลองบางพราน,คลองบ...	13.666503	100.428859	vintage	13.660642	100.429293	Nightclub
2	บางบอน,บางบอนเหนือ,บางบอนใต้,คลองบางพราน,คลองบ...	13.666503	100.428859	ศรีรัตนพัฒนา	13.675447	100.428840	Nightclub
3	คลองจั่น,วังทองหลาง,ลาดพร้าว,คลองกุ่ม,สะพานสูง...	13.765833	100.647778	ICK Pub	13.762867	100.644091	Nightclub
4	คลองจั่น,วังทองหลาง,ลาดพร้าว,คลองกุ่ม,สะพานสูง...	13.765833	100.647778	G-STAR Paradise Pub	13.769842	100.645406	Nightclub

Figure1: 12 Bangkok Night club category data frame

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
0	กระทุ่มราย,หนองจอก,คลองสิบ,คลองสิบสอง,โคกแฝด,ค...	Nightclub	Whisky Bar	Strip Club	Speakeasy	Pub
1	คลองจั่น,วังทองหลาง,ลาดพร้าว,คลองกุ่ม,สะพานสูง...	Nightclub	Whisky Bar	Strip Club	Speakeasy	Pub
2	คลองเตย,คลองตัน,พระโขนง,คลองเตยเหนือ,คลองตันเห...	Nightclub	Lounge	Whisky Bar	Strip Club	Speakeasy
3	คลองเตย,คลองตัน,พระโขนง,บางนา,บางจาก,สวนหลวง,น...	Nightclub	Whisky Bar	Strip Club	Speakeasy	Pub
4	คลองเตยเหนือ,คลองตันเหนือ,พระโขนงเหนือ	Nightclub	Pub	Whisky Bar	Bar	Strip Club

Figure1: 13 Top five most common Nightclub category around neighborhood

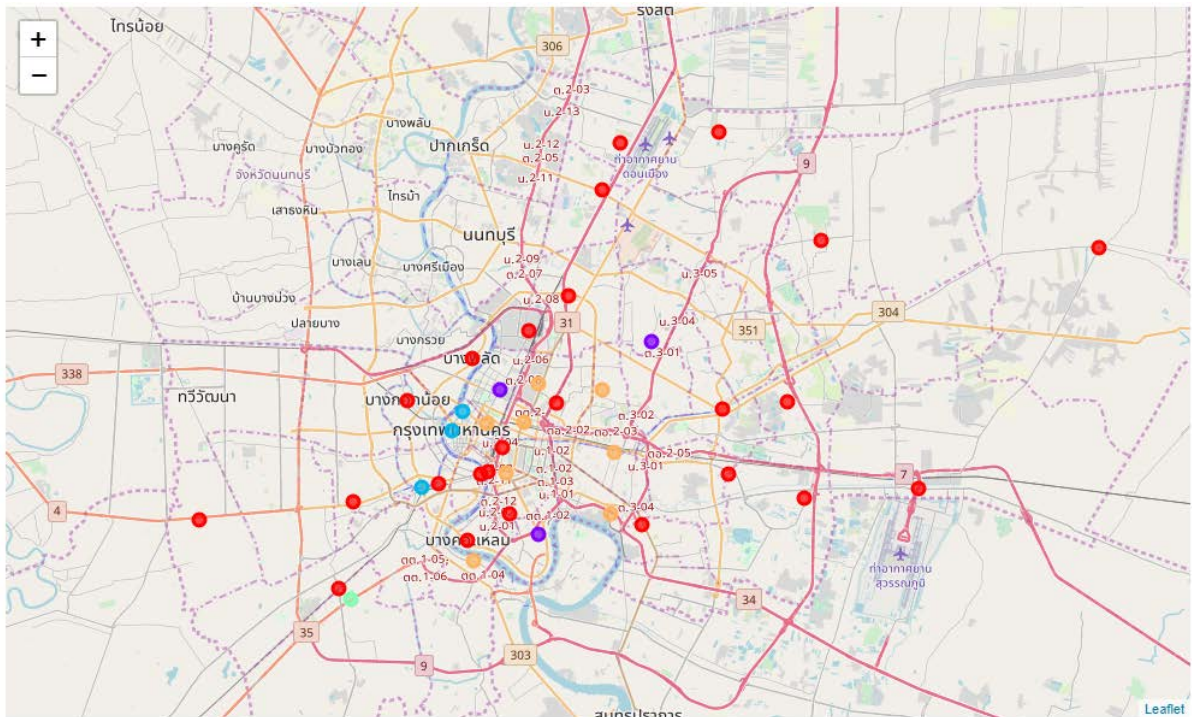


Figure1: 14 Map visualized cluster of Bangkok common Night club

As shown above, by using KMeans clustering there are Cluster 0, Cluster 1, Cluster 2, Cluster 3, Cluster 4

Represented in Red, Purple, Blue, Light green and Light orange respectively. In the table below there are 2 cluster columns. The one that represented the for this cluster is 'Cluster Labels' and the other Cluster represented side of the river, for instant Cluster = 1 is Bangkok 'Phra nakhon' side which is the Bangkok inner core side, and Cluster = 0 is Bangkok 'Thonburi' side

Result 2:

KMeans cluster for attempted 2 to answer the question on where to land our Night Club

```
cluster0 = merged.loc[merged['Cluster Labels'] == 0, merged.columns[[1] + list(range(2, merged.shape[1]))]]
print(cluster0.shape)
cluster0
```

(25, 12)

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	District	Side	Latitude	Longitude	PostalCode	Cluster
	งเลียบสอง,โคกแฝด,ค...	Nightclub	Whisky Bar	Strip Club	Speakeasy	Pub	Nong Chok	Phra Nakhon	13.855556	100.862500	10530	1
	องกุ่ม,สะพานสูง...	Nightclub	Whisky Bar	Strip Club	Speakeasy	Pub	Bang Kapi	Phra Nakhon	13.765833	100.647778	10240	1
	า,บางจาก,สวนหลวง,ห...	Nightclub	Whisky Bar	Strip Club	Speakeasy	Pub	Phra Khanong	Phra Nakhon	13.702222	100.601667	10260	1
		Nightclub	Whisky Bar	Strip Club	Speakeasy	Pub	Samphanthawong	Phra Nakhon	13.731389	100.514167	10100	1
		Nightclub	Whisky Bar	Strip Club	Speakeasy	Pub	Din Daeng	Phra Nakhon	13.769722	100.552778	10400	1
	เมือง,สนามบิน	Nightclub	Whisky Bar	Strip Club	Speakeasy	Pub	Don Mueang	Phra Nakhon	13.913611	100.589722	10210	1
		Nightclub	Whisky Bar	Strip Club	Speakeasy	Pub	Sathon	Phra Nakhon	13.708056	100.526389	10120	1
		Nightclub	Whisky Bar	Strip Club	Speakeasy	Pub	Lak Si	Phra Nakhon	13.887500	100.578889	10210	1
		Nightclub	Whisky Bar	Strip Club	Speakeasy	Pub	Bang Kho Laem	Phra Nakhon	13.693333	100.502500	10120	1
		Nightclub	Whisky Bar	Strip Club	Speakeasy	Pub	Bang Sue	Phra Nakhon	13.809722	100.537222	10800	1
	คลองบางพราน,คลอง	Nightclub	Whisky Bar	Strip Club	Speakeasy	Pub	Bang Bon	Thorn Buri	13.666503	100.428859	10150	0
			Whiskv	Strip				Thorn				

Figure1: 15 Bangkok Night club cluster 0

```
cluster1 = merged.loc[merged['Cluster Labels'] == 1, merged.columns[[1] + list(range(2, merged.shape[1]))]]
print(cluster1.shape)
cluster1
```

(3, 12)

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	District	Side	Latitude	Longitude	PostalCode	Cluster
7	คูสิต,วชิรพยาบาล,สวนจิตรลดา,สี่แยกมหานาค,บางชี...	Nightclub	Bar	Whisky Bar	Strip Club	Speakeasy	Dusit	Phra Nakhon	13.776944	100.520556	10300	1
10	ทุ่งวัดดอน,ยานนาวา,ช่องนนทรี,บางโพธิ์,วัดพระย...	Nightclub	Bar	Whisky Bar	Strip Club	Speakeasy	Yan Nawa	Phra Nakhon	13.696944	100.543056	10120	1
27	ลาดพร้าว,จรัญฯ	Nightclub	Bar	Whisky Bar	Strip Club	Speakeasy	Lat Phrao	Phra Nakhon	13.803611	100.607500	10230	1

Figure1: 16 Bangkok Night club cluster 1

```
cluster2 = merged.loc[merged['Cluster Labels'] == 2, merged.columns[[1] + list(range(2, merged.shape[1]))]]
print(cluster2.shape)
cluster2
```

(3, 12)

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	District	Side	Latitude	Longitude	PostalCode	Cluster
22	พระบรมมหาราชวัง, วังบูรพาภิรมย์, วัดราชบพิธ, สาร...	Nightclub	Pub	Bar	Music Venue	Whisky Bar	Phra Nakhon	Phra Nakhon	13.764444	100.499167	10200	1
29	วังทองหลาง, สะพานสอง, คลองเจ้าคุณสิงห์, พลับพลา	Nightclub	Pub	Bar	Music Venue	Whisky Bar	Wang Thonglang	Phra Nakhon	13.754253	100.493087	10310	1
31	วัดอรุณ, วัดท่าพระ	Nightclub	Pub	Other Nightlife	Bar	Whisky Bar	Bangkok Yai	Thorn Buri	13.722778	100.476389	10600	0

Figure1: 17 Bangkok Night club cluster 2

```
cluster3 = merged.loc[merged['Cluster Labels'] == 3, merged.columns[[1] + list(range(2, merged.shape[1]))]]
print(cluster3.shape)
cluster3
```

(1, 12)

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	District	Side	Latitude	Longitude	PostalCode	Cluster
14	บางค้อ, จอมทอง, บางขุนเทียน, บางบอน, ท่าข้าม, บางมด...	Nightclub	Brewery	Whisky Bar	Strip Club	Speakeasy	Bang Khun Thian	Thorn Buri	13.660833	100.435833	10150	0

Figure1: 18 Bangkok Night club cluster 3

```
: cluster4 = merged.loc[merged['Cluster Labels'] == 4, merged.columns[[1] + list(range(2, merged.shape[1]))]]
print(cluster4.shape)
cluster4
```

(8, 12)

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	District	Side	Latitude	Longitude	PostalCode
2	คลองเตย, คลองตัน, พระโขนง, คลองเตยเหนือ, คลองตันเหนือ...	Nightclub	Lounge	Whisky Bar	Strip Club	Speakeasy	Khlong Toei	Phra Nakhon	13.708056	100.583889	10110
4	คลองเตยเหนือ, คลองตันเหนือ, พระโขนงเหนือ	Nightclub	Pub	Whisky Bar	Bar	Strip Club	Wattana	Phra Nakhon	13.742222	100.585833	10110
9	ทุ่งพญาไท, ถนนพญาไท, ถนนเพชรบุรี, มักกะสัน	Nightclub	Pub	Whisky Bar	Strip Club	Speakeasy	Ratchathewi	Phra Nakhon	13.758889	100.534444	10400
21	ป้อมปราบ, วัดเทพศิรินทร์, คลองมหานาค, บ้านบาตร, ไร่...	Nightclub	Music Venue	Whisky Bar	Strip Club	Speakeasy	Pom Prap Sattru Phai	Phra Nakhon	13.758056	100.513056	10100
23	มหาพฤฒาราม, สีลม, สุริยวงศ์, บางรัก, สีพระยา	Nightclub	Music Venue	Health & Beauty Service	Gay Bar	Cocktail Bar	Bang Rak	Phra Nakhon	13.730833	100.524167	10500
25	ราชบุรีรัตน, บางปะกอก, บางมด, ทุ่งครุ	Nightclub	Gay Bar	Whisky Bar	Strip Club	Speakeasy	Rat Burana	Thorn Buri	13.682222	100.505556	10140
36	สามเสนใน, ถนนเพชรบุรี, ทุ่งพญาไท, มักกะสัน, ถนนพญา...	Nightclub	Pub	Whisky Bar	Strip Club	Speakeasy	Phaya Thai	Phra Nakhon	13.780000	100.542778	10400
39	ห้วยขวาง, บางกะปิ, ดินแดง, สามเสนนอก	Nightclub	Strip Club	Other Nightlife	Music Venue	Bar	Huai Khwang	Phra Nakhon	13.776667	100.579444	10310

Figure1: 19 Bangkok Night club cluster 4

Finally, for this attempted clearly Cluster 1 and Cluster 2 are our best places to land our business because there're not a lot rival and there are enough customer for our business.

Conclusion:

As I mention before after we clustering all over Bangkok venues. We found that there are commercial venues all over the place to support the demand of tourism industry and the more inner core of the city the more commercial venues you will find and then I go further for Night club venues on where should we start our business and the result are Cluster 1, Cluster 2 where not many rival and enough customer in the area.

Discussion:

This project is based on applied data science technique such as k-means algorithms to a set of data which is location data. This analysis may be not accuracy due to limited data and times.

- Inner core of Bangkok which is Cluster 0 are more likely to have high competition and also the cost of investment.
- Outer more a bit but not too far should be a perfect fit for new venture to entry the market

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