Applied Data Science Capstone Capstone Project

Opening a Japanese restaurant in Bangkok

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Introduction

Bangkok

- very popular tourist spot
- people will go to Bangkok in their first Thai experience
- economic growth and cultural exchange due to ASEAN countries' growth
- Thai would start to experience and explore other countries' culture
- more Japanese nationals are moving to Thailand

Opening a restaurant providing Japanese cuisine is a great chance!

Business Problem & Targeted audience

to find the best place for whom looking forward to opening a Japanese restaurant in Bangkok, the following is considered

- popularity & competitiveness
- higher business opportunity & lower risk

Data

to solve the problem, the following data is required

- Bangkok's districts
- Districts' latitude and longitude
- Venue data around each district

Source of data:

- Wikipedia
- Foursquare APIs for venue data

Methodology

- scrape Bangkok districts' data from Wikipedia
- data cleansing
- call Foursquare APIs to explore the venue data near to each district
- venue categories dummies are built
- grouped by district, latitude and longitude simultaneously and take the mean of the frequency of occurrence of each category
- perform k-means clustering based on the top 10 most common venues (k=5)
- visualize the data
- result is capable to tell what are the characteristics among clusters
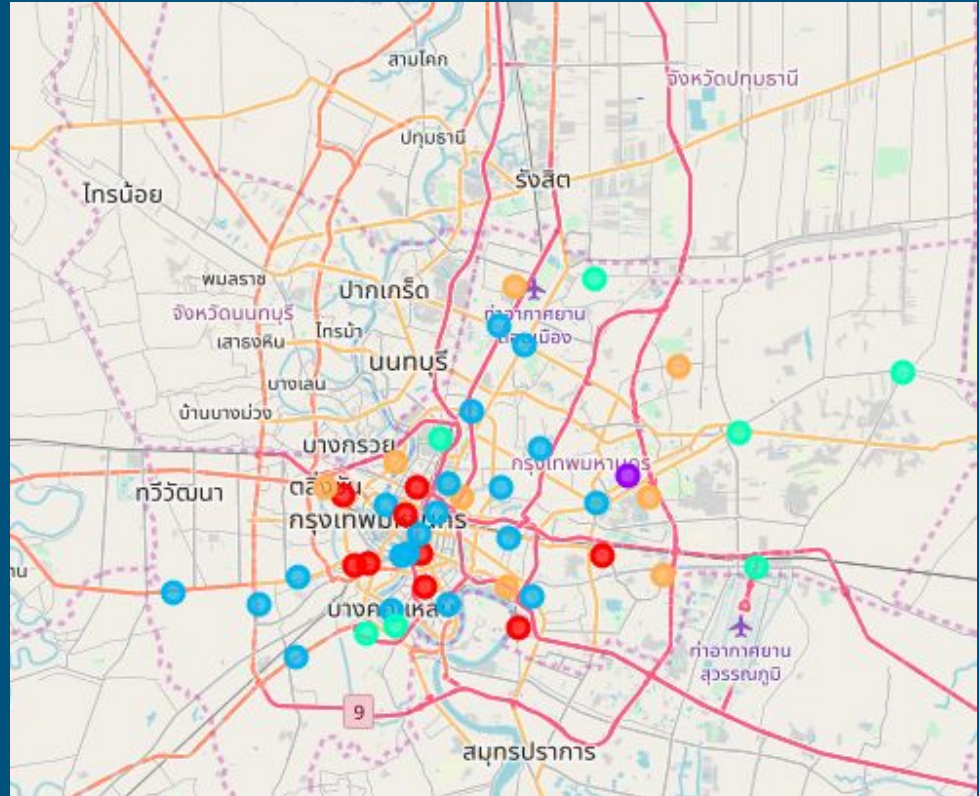
Results

45 districts

- clustered in 5 groups
- considering the top 10 most common venues

Results (cont)

relationship between cluster and color as well as districts count for each cluster.

Color	Cluster	No. of districts in the cluster
Red	1	9
Purple	2	1
Blue	3	20
Green	4	7
Orange	5	8

Cluster 1

	District	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 Most Common Venue	10th Most Common Venue
5	Bang Na	0	Asian Restaurant	Noodle House	Intersection	Coffee Shop	Café	Seafood Restaurant	Satay Restaurant	Thai Restaurant	Electronics Store	Farmers Market
7	Bang Rak	0	Noodle House	Hotel	Chinese Restaurant	Hotel Bar	Café	Clothing Store	Coffee Shop	Som Tum Restaurant	Massage Studio	Buffet
9	Bangkok Noi	0	Noodle House	Thai Restaurant	Park	Snack Place	Café	Chinese Restaurant	Coffee Shop	Dessert Shop	Asian Restaurant	Electronics Store
10	Bangkok Yai	0	Noodle House	Asian Restaurant	Dessert Shop	Farmers Market	Coffee Shop	Photography Studio	Train Station	BBQ Joint	Soup Place	Thai Restaurant
16	Dusit	0	Noodle House	Asian Restaurant	Dessert Shop	Convenience Store	Som Tum Restaurant	Coffee Shop	Market	Wings Joint	Floating Market	Food Truck
32	Pom Prap Sattru Phai	0	Noodle House	Café	Asian Restaurant	Thai Restaurant	Chinese Restaurant	Dim Sum Restaurant	Convenience Store	American Restaurant	Snack Place	Shopping Mall
39	Sathon	0	Noodle House	Asian Restaurant	Thai Restaurant	Chinese Restaurant	Convenience Store	Coffee Shop	Dessert Shop	Seafood Restaurant	Bakery	Bar
40	Suan Luang	0	Noodle House	Chinese Restaurant	Thai Restaurant	Coffee Shop	Asian Restaurant	Convenience Store	Som Tum Restaurant	German Restaurant	Café	Farmers Market
42	Thon Buri	0	Noodle House	Bus Stop	Fried Chicken Joint	Asian Restaurant	Pharmacy	Train Station	Deli / Bodega	Spa	Seafood Restaurant	Food Court

Cluster 2

	District	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 Most Common Venue	10th Most Common Venue
11	Bueng Kum	1	Food Truck	Miscellaneous Shop	Convenience Store	Gym / Fitness Center	Wings Joint	Fast Food Restaurant	Food Stand	Food Court	Food & Drink Shop	Floating Market

Cluster 3

	District	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 Most Common Venue	10th Most Common Venue
0	Bang Kapi	2	Convenience Store	Noodle House	Thai Restaurant	Flea Market	Coffee Shop	Market	Steakhouse	Massage Studio	Buffet	Museum
1	Bang Khae	2	Japanese Restaurant	Wings Joint	Gourmet Shop	Shopping Mall	Noodle House	Coffee Shop	Fast Food Restaurant	Convenience Store	Supermarket	Grocery Store
2	Bang Khen	2	Asian Restaurant	Coffee Shop	Convenience Store	Bakery	Garden Center	Noodle House	Som Tum Restaurant	Vietnamese Restaurant	Duty-free Shop	Electronics Store
3	Bang Kho Laem	2	Noodle House	Thai Restaurant	Chinese Restaurant	Coffee Shop	Sushi Restaurant	Hotpot Restaurant	Shopping Mall	Vietnamese Restaurant	Seafood Restaurant	Fast Food Restaurant
4	Bang Khun Thian	2	Thai Restaurant	Japanese Restaurant	Noodle House	Pizza Place	Café	Bakery	Restaurant	Juice Bar	Fast Food Restaurant	Building
12	Chatuchak	2	Coffee Shop	Flea Market	Thai Restaurant	Beer Bar	Food Truck	Cocktail Bar	Convenience Store	Noodle House	Massage Studio	Gym
17	Huai Khwang	2	Asian Restaurant	Som Tum Restaurant	Hotel	Noodle House	Thai Restaurant	Restaurant	Chinese Restaurant	Grocery Store	Supermarket	Hotpot Restaurant
19	Khlong San	2	Hotel Bar	Clothing Store	Café	Hotel	Department Store	Dessert Shop	Coffee Shop	Noodle House	Japanese Restaurant	Park
21	Lak Si	2	Thai Restaurant	Coffee Shop	Japanese Restaurant	Hotel	Supermarket	Shopping Mall	Food Court	Café	Canal	Soccer Stadium
23	Lat Phrao	2	Noodle House	Café	Som Tum Restaurant	Asian Restaurant	Coffee Shop	Gift Shop	Hotel	Organic Grocery	Convenience Store	Sake Bar
26	Nong Khaem	2	Thai Restaurant	Diner	Dessert Shop	Department Store	Noodle House	Pet Store	Convenience Store	Flea Market	Market	Coffee Shop
27	Pathum Wan	2	Convenience Store	Noodle House	Chinese Restaurant	Asian Restaurant	Dessert Shop	Thai Restaurant	Sporting Goods Shop	Japanese Restaurant	Seafood Restaurant	Som Tum Restaurant
28	Phasi Charoen	2	Coffee Shop	Japanese Restaurant	Fast Food Restaurant	BBQ Joint	Steakhouse	Department Store	Mobile Phone Shop	Clothing Store	Shabu-Shabu Restaurant	Pizza Place
29	Phaya Thai	2	Café	Thai Restaurant	Coffee Shop	Japanese Restaurant	Som Tum Restaurant	Noodle House	Bar	Sushi Restaurant	Bakery	BBQ Joint
30	Phra Khanong	2	Convenience Store	Fast Food Restaurant	Shopping Mall	Hotel	Italian Restaurant	Japanese Restaurant	Spa	Snack Place	Café	Supermarket
31	Phra Nakhon	2	Noodle House	Hostel	Café	Hotel	Thai Restaurant	Bakery	Asian Restaurant	Halal Restaurant	Massage Studio	Snack Place
35	Ratchathewi	2	Coffee Shop	Café	Steakhouse	Hostel	Hotel	Convenience Store	Food Court	Restaurant	Gym / Fitness Center	Jazz Club
37	Samphanthawong	2	Art Gallery	Hotel Bar	Hostel	Hotel	Chinese Restaurant	Coffee Shop	Restaurant	Dive Spot	Cocktail Bar	Seafood Restaurant
43	Watthana	2	Café	Coffee Shop	Thai Restaurant	Chinese Restaurant	Noodle House	Cocktail Bar	Hotel	BBQ Joint	Furniture / Home Store	Japanese Restaurant
44	Yan Nawa	2	Fast Food Restaurant	Thai Restaurant	Brewery	Hotpot Restaurant	Chinese Restaurant	Café	Intersection	Ice Cream Shop	Harbor / Marina	Japanese Restaurant

Cluster 4

	District	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 Most Common Venue	10th Most Common Venue
8	Bang Sue	3	Thai Restaurant	Coffee Shop	Noodle House	Hotpot Restaurant	Badminton Court	Bar	Seafood Restaurant	Wings Joint	Food Stand	Food Court
13	Chom Thong	3	Thai Restaurant	Toll Plaza	Fast Food Restaurant	Coffee Shop	Electronics Store	Food Stand	Food Court	Food & Drink Shop	Floating Market	Flea Market
22	Lat Krabang	3	Thai Restaurant	Steakhouse	Asian Restaurant	Café	Bar	Restaurant	Boat or Ferry	Noodle House	Flea Market	Wings Joint
24	Min Buri	3	Intersection	Department Store	Coffee Shop	Thai Restaurant	Dog Run	Donburi Restaurant	Dumpling Restaurant	Duty-free Shop	Electronics Store	Dive Spot
25	Nong Chok	3	Thai Restaurant	Gym / Fitness Center	Flea Market	Shopping Mall	Other Repair Shop	Park	Dessert Shop	Convenience Store	Duty-free Shop	Electronics Store
34	Rat Burana	3	Thai Restaurant	Coffee Shop	Hotpot Restaurant	Noodle House	Chinese Restaurant	Bistro	Food Stand	Food Court	Food & Drink Shop	Floating Market
36	Sai Mai	3	Thai Restaurant	Deli / Bodega	Noodle House	Bar	Farmers Market	Food Stand	Food Court	Food & Drink Shop	Floating Market	Flea Market

Cluster 5

	District	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 Most Common Venue	10th Most Common Venue
6	Bang Phlat	4	Convenience Store	Dog Run	Cocktail Bar	Café	Restaurant	Fast Food Restaurant	Bus Station	Massage Studio	Coffee Shop	Food Stand
14	Din Daeng	4	Convenience Store	Thai Restaurant	Hotel	Recreation Center	Sports Club	Park	Stadium	Farmers Market	Food Court	Food & Drink Shop
15	Don Mueang	4	Restaurant	Spa	Thai Restaurant	Convenience Store	Buffet	Gym	Food Truck	Hotel	Dumpling Restaurant	Donburi Restaurant
18	Khlong Sam Wa	4	Pub	Japanese Restaurant	Coffee Shop	Convenience Store	Restaurant	Thai Restaurant	Dim Sum Restaurant	Dog Run	Donburi Restaurant	Dive Spot
20	Khlong Toei	4	Recording Studio	Bar	Canal	Food Court	Bistro	Thai Restaurant	Karaoke Bar	Convenience Store	Farmers Market	Electronics Store
33	Prawet	4	Convenience Store	Comfort Food Restaurant	Food Stand	Halal Restaurant	Farmers Market	Food Court	Food & Drink Shop	Floating Market	Flea Market	Fast Food Restaurant
38	Saphan Sung	4	Thai Restaurant	Japanese Restaurant	Restaurant	Convenience Store	Stadium	Electronics Store	Food Court	Food & Drink Shop	Floating Market	Flea Market
41	Taling Chan	4	Coffee Shop	Soccer Field	Floating Market	Convenience Store	Farmers Market	Food Stand	Food Court	Food & Drink Shop	Flea Market	Fast Food Restaurant

Discussion

opportunity to run the business in this clustering sequence: 3, (1, 4, 5), 2 based on popularity

Cluster 3: it is full of restaurants with different style cuisine. It should be very competitive when we run a Japanese restaurant here (see Cluster 3 result).

Cluster 1: it is full of noodle house, Asian restaurant, Chinese restaurant, Thai restaurant and cafe (see Cluster 1 result). People right there should love eating and Asian food. However, just a few Japanese restaurants are opened there. Therefore, cluster 1 is a good choice to open a Japanese restaurant.

Discussion (cont)

Cluster 4 and cluster 5: they are too diverse with different categories. It poses more risk than cluster 1 as we are not sure if people right there love eating (see Cluster 4 & 5 results).

Cluster 2: it just has one district so it should not be a good start due to low popularity (see Cluster 2 result).

To sum up, it is a good choice to open a Japanese restaurant in districts in cluster 1.

Conclusion

Question: find the best place to open a Japanese restaurant in Bangkok in which popularity and competitiveness are considered concurrently for the targeted audience

Answer: districts in cluster 1 are the best places to open a Japanese restaurant.

THANK YOU

References

Understanding K-means Clustering in Machine Learning

https://towardsdatascience.com/understanding-k-means-clustering-in-machine-learning-6a6e67336aa1