
The Most Favorite Chinese Restaurant in Stockholm, Sweden

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Introduction

With the globalization, a large number of products from other countries become alternatives for customers compared with domestic products. Some of consumers prefer to choose the native products in order to support national industry. Others would like to try something abroad. At the same time, suppliers want to develop overseas marketing which means more opportunities and wealth. Many foreign restaurants can be seen on the street of Stockholm and different kind of imported food can be found in native or Asian supermarkets in Sweden.

According to the questionnaire survey carried out by Jie Chen under supervision of Ola Feurst from Gotland University, Swedes like Chinese food because it is healthy, and it has natural and safe ingredients. Moreover, the delicious Chinese food could bring a good mood to Swedes. Swedes also think the price of Chinese food is cheaper than Swedish meal. Compared to fast food, Chinese buffet offer more kinds of dishes for choosing.

Considering the complicated process of cooking Chinese's food, Swedes who do not want to spend time in cooking hardly choose to prepare Chinese food at home. The best way is going to Chinese restaurant.

The aim of this project is to use Foursquare location data and regional clustering of venue information to determine the best Chinese restaurant in Stockholm County.

This project is aimed towards Swedes who like Chinese food, citizens and residents of Sweden who were born in or have ancestry from nations in Asia, tourist from nations in Asia, as well as Chinese food suppliers.

Data

The data used in this project is a combination of CSV files from multiple sources. The list of cities in Stockholm County and the geographical location of the cities are taken from Sweden Cities Database. The venue data pertaining to Chinese restaurants is obtained via the Foursquare API utilised via the request library in Python.

Methodology

Pandas, Numpy, Json, Requests, and Folium libraries as well as One Hot Encoding are used to perform Data Acquisition, Data Cleaning, as well as Data Exploration and Analysis.

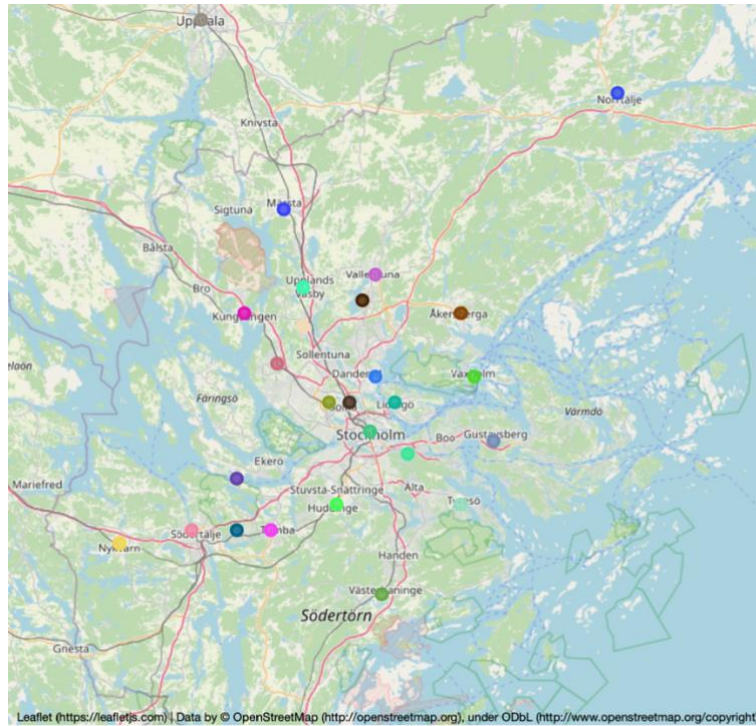
Result

The data taken from Sweden Cities Database contains the list of Cities and their detail information on Latitude, Longitude, and County.

	city	latitude	longitude	county
0	Stockholm	59.3294	18.0686	Stockholm
1	Gothenburg	57.6717	11.9810	Västra Götaland
2	Malmö	55.5932	13.0214	Skåne
3	Uppsala	59.8498	17.6389	Uppsala
4	Uppsala	59.8601	17.6400	Stockholm

There are two cities 'Uppsala' in Uppsala and Stockholm counties. In this project, the acquired data is used as it is without alteration.

Python folium library was used to visualise the region of Stockholm County and its cities from the latitude and longitude of the cities.



The Foursquare API was utilised to explore the cities from their given latitude and longitude informations. Below are the venues found in Stockholm County along with its latitude, longitude and category informations.

	City	City Latitude	City Longitude	Venue	Venue ID	Venue Latitude	Venue Longitude	Venue Category
0	Stockholm	59.3294	18.0686	At Six	58d36bd98ab03f3dceb3d9fe	59.331057	18.066930	Hotel
1	Stockholm	59.3294	18.0686	Bakfickan	4adcdaef0f964a520485b21e3	59.330194	18.070884	Scandinavian Restaurant
2	Stockholm	59.3294	18.0686	Kungliga Operan	4adcdaef2f964a520ff5b21e3	59.329498	18.069324	Opera House
3	Stockholm	59.3294	18.0686	Bastard Burgers	5cb1cd6375eee4002c92ed6d	59.331553	18.066903	Burger Joint
4	Stockholm	59.3294	18.0686	Bengans Skivbutik	4bc9a629cc8cd13af7e6bbcf	59.330098	18.065146	Record Shop

There are 109 unique venue categories returned by Foursquare and there are Chinese restaurants in Stockholm County.

A technique called one hot encoding was performed to transform categorical data into numerical data. Individual venues were turned into the number of venues located in each city.

[illegible]

Then, the venues were grouped by city and by taking the average of the occurrence frequency of each Venue Category.

	City	American Restaurant	Antique Shop	Argentinian Restaurant	Asian Restaurant	Athletics & Sports	Auto Workshop	Bakery	Bar	Bed & Breakfast	...
0	Djursholm	0.0	0.0	0.0	0.00	0.0	0.0	0.125000	0.0	0.0	...
1	Gustavsberg	0.0	0.0	0.0	0.25	0.0	0.0	0.000000	0.0	0.0	...
2	Huddinge	0.0	0.0	0.0	0.00	0.0	0.0	0.058824	0.0	0.0	...
3	Jakobsberg	0.0	0.0	0.0	0.00	0.0	0.0	0.000000	0.0	0.0	...
4	KungsÅngen	0.0	0.0	0.0	0.00	0.0	0.0	0.000000	0.0	0.0	...

Then, a data frame was created to store the city names and the frequency of Chinese restaurants in the respective city.

	City	Chinese Restaurant
0	Djursholm	0.000000
1	Gustavsberg	0.000000
2	Huddinge	0.000000
3	Jakobsberg	0.000000
4	KungsÅngen	0.000000
5	LidingÅl	0.000000
6	MÅrsta	0.000000
7	Nacka	0.000000
8	NorrteÅlje	0.000000
9	Nykvarn	0.000000
10	NynÅshamn	0.000000
11	RÅlninge	0.000000
12	Sollentuna	0.000000
13	Solna	0.000000
14	Stockholm	0.000000
15	Sundbyberg	0.000000
16	SÅdertÅlje	0.142857
17	Tumba	0.000000
18	TyresÅl	0.000000
19	TÅby	0.000000
20	Upplands VÅsby	0.000000
21	Uppsala	0.030000

The data frame above shows that Chinese restaurants can be found in Södertälje and Uppsala. Below is a data frame presenting the Chinese restaurants located in both cities.

	City	City Latitude	City Longitude	Venue	Venue ID	Venue Latitude	Venue Longitude	Venue Category
112	Uppsala	59.8601	17.6400	China River	4c7123a0b5a5236a8e2c5252	59.858641	17.643428	Chinese Restaurant
133	Uppsala	59.8601	17.6400	Golden China	4d00d0deffcea1435a7a2f91	59.856489	17.642677	Chinese Restaurant
139	Uppsala	59.8601	17.6400	China Garden	4bec0370a9900f478d6e1840	59.858740	17.643270	Chinese Restaurant
232	Södertälje	59.2000	17.6167	Asian Roxy Södertälje	4c34be3a3ffc9521e6f890f5	59.197415	17.623835	Chinese Restaurant

Later, The Foursquare API was used to investigate which restaurant gets more likes.

	City	City Latitude	City Longitude	Venue	Venue ID	Venue Latitude	Venue Longitude	Venue Category	Venue Likes
112	Uppsala	59.8601	17.6400	China River	4c7123a0b5a5236a8e2c5252	59.858641	17.643428	Chinese Restaurant	6
133	Uppsala	59.8601	17.6400	Golden China	4d00d0deffcea1435a7a2f91	59.856489	17.642677	Chinese Restaurant	8
139	Uppsala	59.8601	17.6400	China Garden	4bec0370a9900f478d6e1840	59.858740	17.643270	Chinese Restaurant	5
232	Södertälje	59.2000	17.6167	Asian Roxy Södertälje	4c34be3a3ffc9521e6f890f5	59.197415	17.623835	Chinese Restaurant	4

Golden China restaurant in Uppsala is the most-likes Chinese restaurant.

Discussion

From the data taken from Sweden Cities Database, this has been mentioned in the Result section as well, there are two cities 'Uppsala' in Uppsala and Stockholm counties. In this project, the acquired data is used as it is without alteration. The result shows that the most favourite Chinese restaurant in Stockholm County, Sweden, is Golden China restaurant in Uppsala. However, there are some limitations in the Data Exploration and Analysis. The result is completely based on the accuracy of Foursquare data that goes with limitations as to the number of API calls and results returned.

In my experience, I have gone to many restaurant which serves Chinese foods in Stockholm City. However, there was no Chinese restaurant listed in Stockholm City from the data returned by Foursquare. If we look closely to the venue categories from Foursquare, there were Sushi restaurant, Indian restaurant, Japanese restaurant, Thai restaurant, Korean restaurant, and Asian restaurant. Geographically, India, Japan, Thailand, Korea, and China are Asian countries. This is another limitation in this project. Some restaurant may be registered as non-Chinese restaurant and serve Chinese foods.

There was also a challenge on extracting the rating of Chinese restaurant. Key error from the code was observed during the run. Investigating how many likes for each restaurant was performed instead.

Conclusion

The most favourite Chinese restaurant in Stockholm County, Sweden, is Golden China restaurant in Uppsala. This project can be improved with the assistance of more information and distinctive Machine Learning strategies. Paid account on Foursquare can be considered for future research work and more comprehensive analysis to overcome the limitation of the number of API calls and results returned. Incorporating data from other external databases can also be evaluated.