Analysing the Concentration of Chinese Restaurants around London, UK

By Justin Wutoh

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Introduction: Business Problem

London is a very popular city known for its diversity, tourism, businesses, education etc. It is the capital city of the United Kingdom and home of the Queen of England. The population of London currently stands at 8.9m. London is a leading global city. It is the world's largest financial centre alongside New York, and is home to the headquarters of more than 100 of Europe's 500 largest companies. It has the most international visitors of any city in the world. An astonishing 33% of Chinese people in the United Kingdom live in London. London is a world capital of food from different countries of which Chinese food is a very popular choice.

In this project we will try to analyse the concentration of Chinese restaurants in London as well as outside London locations like Cambridge and Oxford. Two popular cities known for having the best universities in the world.

This project will enable us to use powerful data science tools to analyse and visualise areas where there is lower concentration of Chinese restaurants and will help an investor who wants to set up a Chinese restaurant in a good location.

Data Description.

The data to be used in solving this problem, we will be using geopy to find the coordinates for each neighborhood. Foursquare API will be used then to collect information on the neighborhood venues.

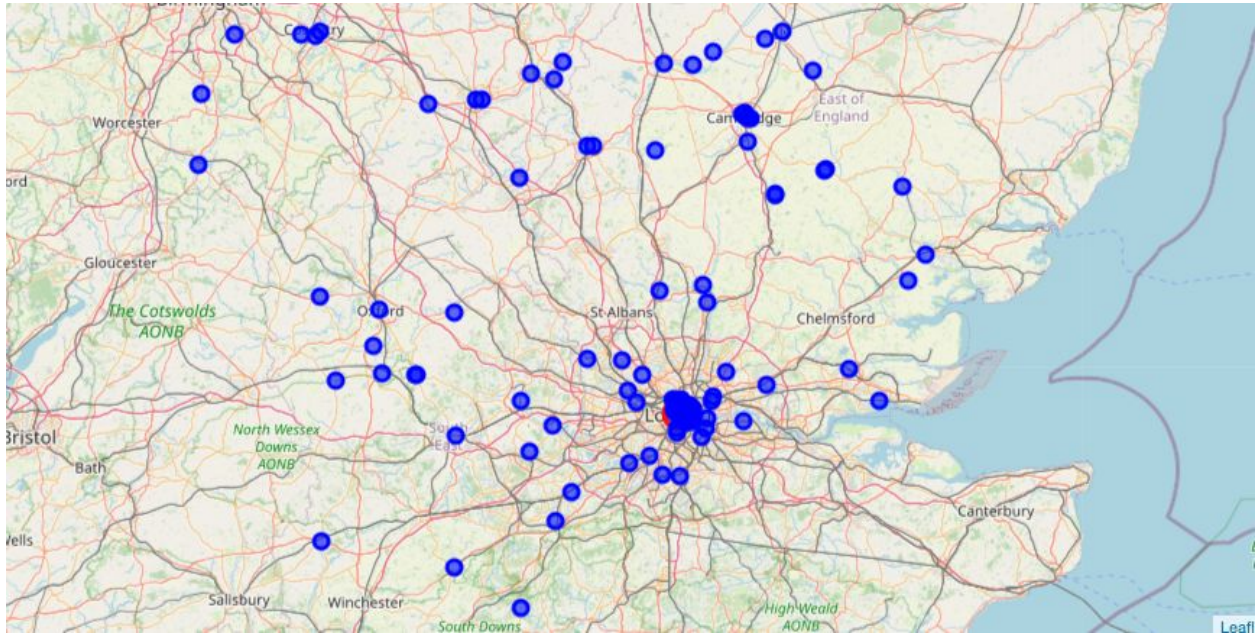Geopy Nominatin will be used to obtain the geo coordinates of the cities London, Cambridge and Oxford.

Methodology

The machine learning algorithm to be used to solve the problem is **K-means** clustering. This method will show the concentration of Chinese restaurants in London, Cambridge and Oxford, which will help the investor or entrepreneur make informed decisions. The Longitude and Latitude of the separate locations will be used as input parameters for the K-means clustering algorithm and this will also provide a visualisation of the findings.

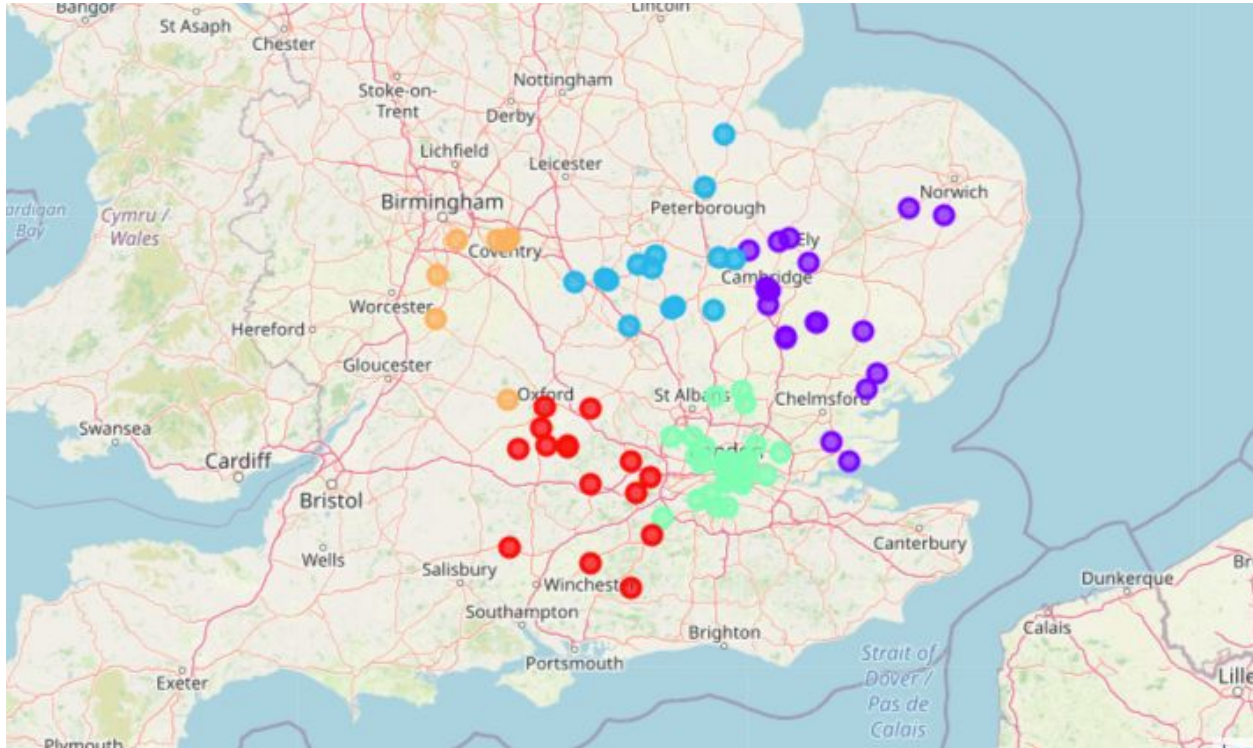**Results**

a. Exploratory Data Analysis

The project carried out an exploratory data analysis to get a visual representation of Chinese restaurants in and around London. This utilised the folium library and the results are shown below

The blue dots indicate that there is a high concentration in London compared to Cambridge and Oxford. This reflects the earlier point of a larger concentration of Chinese people in the United Kingdom located in London.

b. K-Means Clustering

The unsupervised machine learning algorithm k-means clustering was further utilised to fully tackle the problem to analyse the concentration of Chinese restaurants in and around London. The map below shows the results of the k-means clustering function.

The results indicate that Chinese restaurants are highly concentrated in London (green dots). The purple dots representing Chinese restaurants in Cambridge and red dots highlighting Chinese restaurants in London shows a lower concentration than in London.

Discussion

The project analysis has drawn some few observations discussed below;

- Oxford has a large population of Chinese but the concentration of Chinese restaurants are rather sparse. Majority of the Chinese population are university students.

- Cambridge has a good population of Chinese people as well but has a small number of Chinese restaurants.

- The large concentration of Chinese restaurants in London is a reflection of the high demand of Chinese food in the area and could be a good spot to start a Chinese restaurant. However, the investor faces the risk of being crowded out of the market due to the intense competition this comes with. Hence, setting up in a different city could be a better idea.

Conclusion

In summary, Chinese restaurants are largely concentrated in London and as such there is a risk of high competition and crowding out. Oxford and Cambridge are very good locations to set up due to

the student population and diversity in those areas. The two areas have a lower concentration of Chinese restaurants and could translate as having a good market to setting up a Chinese Restaurant.