Coursera – IBM Applied Data Science Capstone Project

Opening an Asian Restaurant in Amsterdam

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1. Introduction

According to travel forecast, 1.53 million visitors from Asia are expected to visit the Netherlands in 2020.[1] The bulk of the Asian travelers are expected to come from China, India and Japan. While travelers would love new culinary experience in a different country, there are also times when they would look for a familiar cuisine abroad. Comparatively, Amsterdam has quite an established Asian food scene.[2] This data science project aims to explore the concentration of Chinese, Indian and Japanese restaurants in Amsterdam to make an informed decision the type of cuisine and location to open a new Asian restaurant in Amsterdam.

1.1. Business Problem

As stated above, Amsterdam has a rather established Asian food scene. However, it is not clear about the concentration and location of the various Asian restaurants (Chinese, Indian and Japanese). This project aims to deploy data science to visualize the concentration and location of the Chinese, Indian and Japanese restaurants in Amsterdam that could cater to this growing tourist group.

1.2. Target Audience

The target audience of this report is prospective restaurateurs who are looking into the best option to open an Asian restaurant in Amsterdam.

2. Data

To solve the described problem, the following data are needed.

- Amsterdam neighbourhood data including the latitude and longitude coordinates of the various neighbourhoods.
- Venue data relating to Asian restaurants in Amsterdam to perform cluster analysis.

The Amsterdam neighbourhood data is available from Kaggle.[3] Since, it comes with the latitude and longitude coordinates of the neighbourhoods, it will be used as it is.

The Amsterdam neighbourhood dataset will then be used with Foursquare API to get the venue data for the various neighbourhoods. We will examine the concentration and locations of Chinese, Indian and Japanese restaurants in Amsterdam using the venue data. Following this, machine learning (k-means clustering) and map visualization using Folium will be used to help with the decision making.

3. Methodology

As the Amsterdam neighbourhood data is available, it will be used as it is. For venue data generation, the neighbourhood data is used together with Foursquare API to retrieve the top 100

venues within a 2000 m radius. Using a Foursquare developer account, API calls were made by passing the coordinates of the neighbourhood and in return, Foursquare returns the venue data in JSON format.

The venue name, category and coordinates were extracted where were subsequently grouped by the mean of frequency of the Chinese, Indian and Japanese restaurants. Using this data, clustering analysis was performed for each of the Asian restaurant category. The clustering results were plotted on the map using Folium for clear visualization of the data.

4. Results

Figures 1 to 3 show the cluster analysis of Chinese, Japanese and Indian restaurants in Amsterdam. There are 2 clusters for each analysis with red denoting cluster 1 and purple denoting cluster 2.

For Chinese restaurants, cluster 1 (Red) denotes neighbourhoods with higher concentration of Chinese restaurants while cluster 2 (Purple) denotes neighbourhoods without.

For Indian restaurants, cluster 1 (Red) denotes neighbourhoods without Indian restaurants while cluster 2 (Purple) denotes neighbourhoods with higher concentration of Indian restaurants.

Lastly, for Japanese restaurants, cluster 1 (Red) denotes neighbourhoods with higher concentration of Japanese restaurants while cluster 2 (Purple) denotes neighbourhoods without Japanese restaurants.

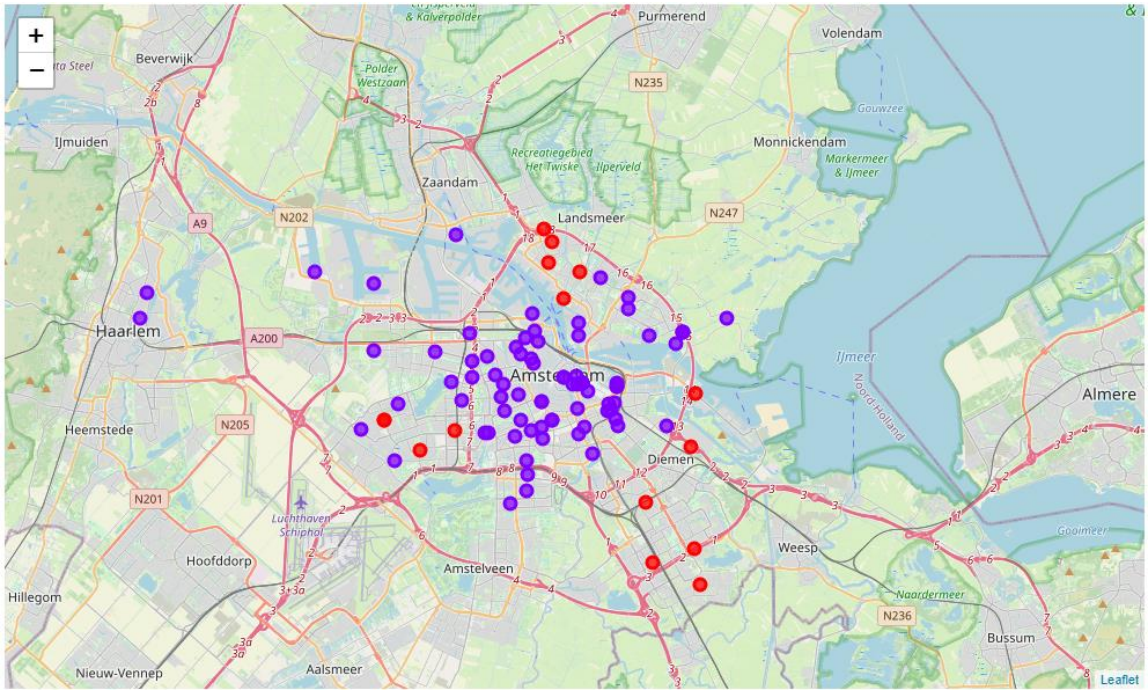

Figure 1. Cluster Analysis of Chinese Restaurants in Amsterdam. Cluster 1 – Red, Cluster 2 - Purple

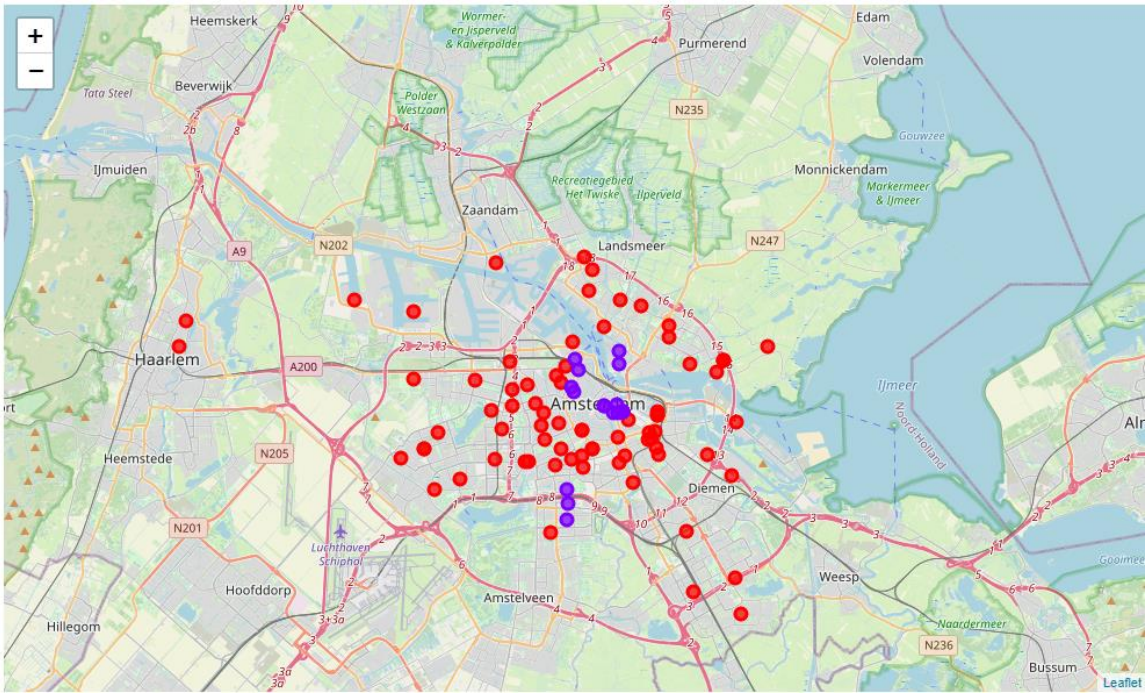

Figure 2. Cluster Analysis of Indian Restaurants in Amsterdam. Cluster 1 – Red, Cluster 2 - Purple

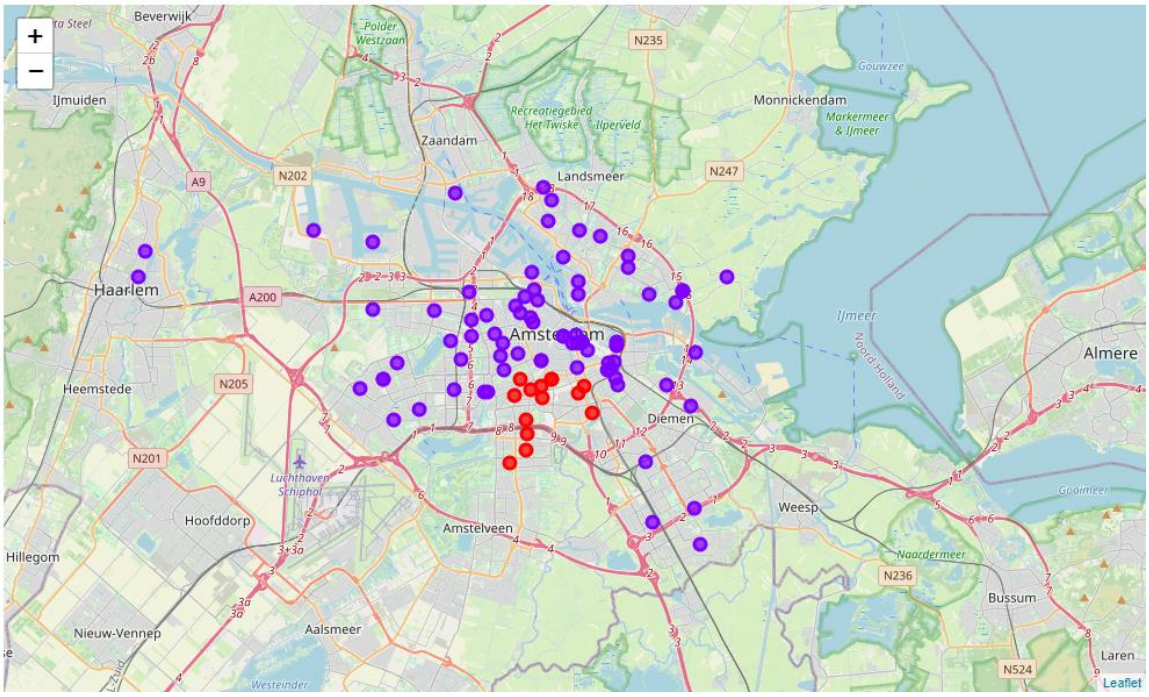

Figure 3. Cluster Analysis of Japanese Restaurants in Amsterdam. Cluster 1 – Red, Cluster 2 - Purple

5. Discussion

The above cluster analysis of Chinese, Indian and Japanese restaurants reveal patterns of their concentration and location in Amsterdam. From the analysis, Chinese restaurants are dispersed further away from the city centre. There are virtually no Chinese restaurants in the city centre. The reverse is true for Indian restaurants where there are representations in the city centre but not in neighbourhoods further away from the city centre. Finally, Japanese restaurants are concentrated in the southwest of Amsterdam.

Based on the above analysis, there could be an opportunity to explore the opening of Chinese restaurants in the city centre. On the other hand, since Indian restaurants are somewhat well-represented in the city centre, one may explore opening in neighbourhoods further away from the city centre. As for Japanese restaurants, there could be an opportunity to open in a location away from the southwest to avoid competition.

6. Limitation and Recommendation for Future Research

This current research is based solely on location data and did not take into account local sentiments about the popularity of these three Asian cuisines in Amsterdam. Additionally, the analysis was done without incorporating information about rental price in the various neighbourhoods. Subsequent research could attempt to integrate location data together with rental prices for the prospective restaurateurs to well an even more well-informed decision.

7. Conclusion

In project, the Amsterdam neighbourhood dataset was used together with venue data extracted using Foursquare API to reveal insights about the concentration and location of Chinese, Indian and Japanese restaurants in Amsterdam. Following the cluster analysis, it was determined that Chinese restaurants are more concentrated away from the city centre while Indian restaurants are concentrated within the centre. Japanese restaurants are found mainly in the Southwest of Amsterdam. This location analysis may help the prospective restaurateur to decide the location and type of Asian cuisine to open purely from a location standpoint.

References

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