Finding the Best Postcode District in Central London in Which to Open a Restaurant

Introduction

London is the capital and largest city in England. Home to a wealth of potential customers, it is an ideal location in which to open restaurant. However, as the city is as large as it is, there are certain areas which are more suited to restaurants and other areas where a restaurant would not be so successful. The goal of this report is to find which areas different types of restaurants will be most successful in and to explore the reasons behind the difference. To do this, I will be separating London by its postcodes, focussing on those that are central. This will include only Western Central (WC) and Eastern Central (EC) postcodes, as due to being in the centre they will have the highest footfall and therefore the most potential customers. I will be using the Foursquare API to access the data on venues which will inform the analysis. We will be looking for a postcode that already contains restaurants, to make sure there is demand in that area, but ideally one that is not overly saturated with restaurants already. The results from this report can be used by anyone who is looking to open a restaurant to see where their type of restaurant will be most successful, allowing them to be more profitable.

Data

Data Sources

Postcode districts for London along with their latitude and longitude values was found at this website https://www.doogal.co.uk/london_postcodes.php in the form of a csv file. The data was downloaded from the website and then uploaded to Watson Studio, where it could be converted into a pandas dataframe.
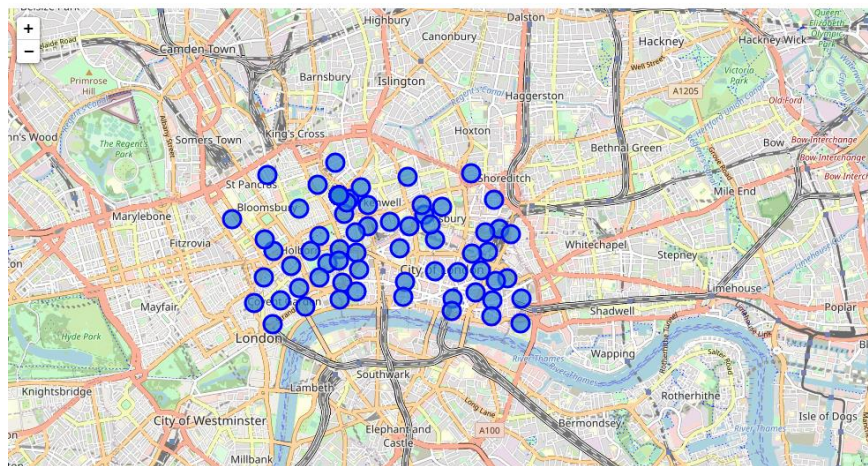
Data Cleaning

The original csv file contained a lot of information for each individual postcode, such as nearest station or London zone, which was unnecessary for analysis. Therefore, after converting the csv to a dataframe and dropping all postcodes that were not in use, the excess columns were dropped. This left a dataframe containing the individual postcodes, the postcode districts, the longitude and latitude and the average income. As the individual postcodes (e.g. EC1A 1AA) covered too small an

area, the dataframe was then grouped by postcode district (e.g. EC1A) with the other columns averaged. This was then reindexed to give the final prepared dataframe for analysis to begin.

Methodology

The first step was to visualise the data. This was done using geopy and folium to create a map of central London with the postcode districts marked on it.
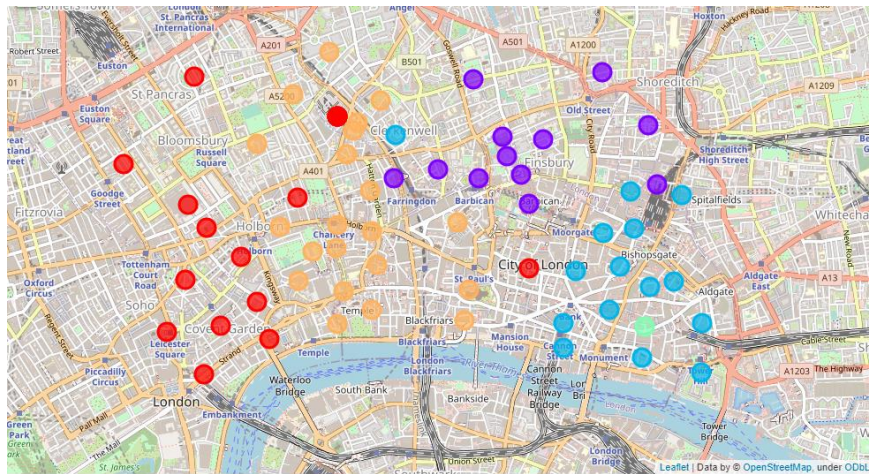

Next the Foursquare API was used to provide information about the venues surrounding each district. This was done by constructing functions that would explore the location around each set of latitudes and longitudes, by creating a unique url that would be used to request the data from FourSquare. The relevant information could then be extracted from the supplied json file and converted into a dataframe. This could then be combined with the previous dataframe using onehot encoding resulting in a dataframe that had the postcode district and the corresponding top ten venues in a set radius around it.

	Postcode District	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	EC1A	Pub	Coffee Shop	Italian Restaurant	French Restaurant	Sandwich Place	Bar	Pizza Place	Gym / Fitness Center	Hotel	Café
1	EC1M	Pub	Coffee Shop	Food Truck	Hotel	Gym / Fitness Center	Café	French Restaurant	Italian Restaurant	Wine Bar	Modern European Restaurant
2	EC1N	Pub	Coffee Shop	Sandwich Place	Hotel	Italian Restaurant	Food Truck	Cocktail Bar	Wine Bar	Sushi Restaurant	French Restaurant
3	EC1P	Pub	Coffee Shop	Garden	Pizza Place	Cocktail Bar	Sandwich Place	Vietnamese Restaurant	Indian Restaurant	Food Truck	History Museum
4	EC1R	Pub	Coffee Shop	Café	Bar	Food Truck	Pizza Place	Vietnamese Restaurant	Middle Eastern Restaurant	Gym / Fitness Center	Breakfast Spot
5	EC1V	Coffee Shop	Pub	Italian Restaurant	Café	Bar	Sandwich Place	Vietnamese Restaurant	Cocktail Bar	Gym / Fitness Center	Restaurant
6	EC1Y	Coffee Shop	Gym / Fitness Center	Food Truck	Italian Restaurant	Pub	Café	Bar	Concert Hall	Turkish Restaurant	Sushi Restaurant

As there are many districts and each district is fairly small it was useful to group them together into clusters. This was done by K means clustering from the scikit learn

package. Each district was randomly assigned to one of five clusters, and the iterative algorithm was run until the clusters were organised into similar groups. This could

then be visualised on a map using folium, with each cluster given a different cluster.

With the postcode districts broken down into clusters, we could now see where the best location to open a restaurant would be.

Results and Discussion

Our analysis left us with 5 clusters, each with a list of postcodes and the top ten venues in their radius. The goal of this report was to find the best place in central London to open a restaurant, so to do this we can use the clusters to split central London into 5 unique areas.

Our criteria for a good place to open a restaurant was one that contained restaurants already, but not too many. Looking at cluster 1 (made up of 32 postcodes), we can see that the most popular venues are pubs in all postcodes. Again, the second most popular venues are mostly the same with 30 coffee shops and 2 sandwich places. This means that there is not a particularly popular restaurant dominating the cluster. Looking at the third, fourth and fifth most popular venues, we start to see more restaurants including 19 Italian restaurants, 4 pizza places, 2 French restaurants and 4 general restaurants. This shows that there is definitely a desire for restaurants in this cluster and that they can be very popular. We can also see that, although Italian/pizza is the most popular, there is a wide range of cuisines that can be successful. This is further supported by 2 Middle Eastern, 5 Falafel, 7 Japanese, 7 Vietnamese and 4 Indian restaurants appearing in the fifth to tenth most popular venues, as well as 10 more pizza places, 7 more French restaurants, 6 more general restaurants and 7 more Italian restaurants. Out of the 320 top venues in the cluster, 84 are restaurants, which is over 26%. There is clearly a demand for restaurants in this area. Looking at the other top venues, we can speculate on why this is. Hotels are

very popular in this cluster, appearing 24 times in the top ten venues. People staying in these hotels will likely want to eat outside of the hotel, especially at dinner time. They would likely choose a local restaurant nearby their hotel so having a restaurant in the area would be a good choice. Another possible reason for the popularity of restaurants in the cluster could be to feed tourists, particularly at lunch time, while they are sight seeing at the popular gardens, park and museum that feature in this cluster. Therefore, we can say that this cluster would be a good place for a restaurant. Italian or pizza restaurants are the most successful, but also face the most competition. However, we can see that there are multiple different cuisines that are possible, so it is a good area for any restaurant. Within this cluster, it is likely that the best postcode would be one near either a hotel or a tourist attraction. Using this knowledge, we can identify the postcode district that will be most successful for a restaurant. EC4Y has a hotel as the third most popular venue and a History Museum as the seventh. An Italian restaurant and a general restaurant make up the fifth and sixth most popular venues showing that restaurants are popular in this postcode, but there is not a dominating restaurant.

Cluster 2 is slightly larger with 38 postcodes. The top two most popular venues are dominated by pubs, coffee shops and hotels, so no restaurants that would be too popular to compete with. The third to fifth most popular venues contain 12 pizza places, 9 Italian restaurants, 2 steakhouses and 2 general restaurants. The sixth to tenth most popular venues also contain a large and more varied number of restaurants including 17 French, 14 Indian, 10 Vietnamese, 2 Japanese and 2 Middle Eastern restaurants as well as 8 more steakhouses, 6 more Italian restaurants, 14 more pizza places and 4 more general restaurants. This means that again over 26% of the top ten venues in the cluster are restaurants. Judging by our same criteria, we can say that the best district to open a restaurant in this cluster would be EC3N. The top venue is a hotel and the ninth top venue is a History Museum, meaning the restaurant would get a lot of traffic form those venues. There are also restaurants as the sixth and eighth most popular venues, a French restaurant and a pizza place, so there is a demand for restaurants in this district but there is not so fierce a competition.

Cluster 3 is a smaller cluster with only 15 postcodes. The top two venues are more varied, being made up by pubs, coffee shops, bakeries, theatres and hotels. Restaurants do not feature until the fifth most popular venue with two general restaurants. We should note, however, that there are popular burger joints and sandwich places, meaning that the cluster caters more to people who want faster, simpler food as opposed to a proper restaurant meal. 6 pizza places, 3 more general restaurants, 8 steakhouses, 3 sushi restaurants, 3 Indian restaurants, 3 Japanese restaurants and 2 Italian restaurants feature in the fifth to tenth most popular venues,

so there is still a demand for restaurants in this cluster. However, restaurants make up only 18% of the top ten venues in this cluster so it is clear that there is a lesser demand to previous clusters. The best postcode in this cluster would be WC2H, as the third most popular venue is a theatre and the ninth most popular venue is a hotel. There are also restaurants as the seventh, eighth and tenth most popular venues so there is still some demand in this area.

Cluster 4 is the smallest cluster and is made up of only one postcode. EC3M could be a good district for a restaurant, as there is a hotel and a monument/landmark as the most and tenth most popular venue. We can also see that there is a good demand for restaurants as there is a general restaurant as the second most popular venue and a South American restaurant as the fifth most popular venue. However, as the general restaurant is very popular, it may be too much competition for a restaurant just starting out.

Cluster 5 is a small cluster with only 4 postcodes. The top three venues are all the same, being a coffee shop, a gym and a food truck. In the fourth most popular venue there are 2 Italian restaurants and in the sixth to tenth most popular venues there are 2 more Italian restaurants, 2 Turkish restaurants, 2 Vietnamese restaurants and 2 Sushi restaurants. This makes up 25% of the top ten venues so there is a good demand for restaurants in this cluster. The best district in this cluster would be EC2Y as it has an art gallery, a concert hall and a history museum as the fourth, eighth and ninth most popular venues so there will be a supply of tourists and event goers from these venues. There is also an Italian restaurant and a Turkish restaurant as the sixth and seventh most popular venue so there is demand, but no overwhelming competition.

Having found the best postcode within each cluster, we can now compare them to find the best postcode in which to open a restaurant in central London.

	Postcode District	Latitude	Longitude	Average Income	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	EC4Y	51.512879	-0.108688	65400.0	0	Pub	Coffee Shop	Hotel	Sandwich Place	Italian Restaurant	Restaurant	History Museum	Bar	Cocktail Bar	Garden
1	EC3N	51.512033	-0.076553	65400.0	1	Hotel	Pub	Coffee Shop	Garden	Gym / Fitness Center	Cocktail Bar	French Restaurant	History Museum	Pizza Place	Scenic Lookout
2	WC2H	51.514658	-0.126763	50200.0	2	Coffee Shop	Theater	Pub	Bakery	Cocktail Bar	Ice Cream Shop	Hotel	Steakhouse	Sushi Restaurant	Gym
3	EC3M	51.511831	-0.082165	65400.0	3	Hotel	Restaurant	Gym / Fitness Center	Cocktail Bar	South American Restaurant	Garden	Salad Place	Beer Bar	Hotel Bar	Portuguese Restaurant
4	EC2Y	51.519254	-0.093359	65400.0	4	Coffee Shop	Gym / Fitness Center	Food Truck	Art Gallery	Italian Restaurant	Café	Turkish Restaurant	Concert Hall	Bagel Shop	Beer Bar

Our criteria for a good postcode in which to open a restaurant is on that has either a hotel or tourist attraction in the top ten venues and one that has some popular restaurants but not any too popular ones that would be too difficult to compete with. With this in mind, we can discount WC2H from cluster 3 as there is limited demand for restaurants in the postcode, only three featuring at the end of the top ten venues. We can also discount EC3M as the second most popular venue is a restaurant, so it would be hard for a new restaurant to attract customers away from it. This leaves EC4Y, EC3N and EC2Y.

All three of these postcodes would be excellent locations to open a restaurant, they all have multiple tourist attraction/hotels as top ten venues as well as popular restaurants that show there is a demand, but not an over saturation.

Conclusion

This report set out to find the best postcode district in Central London in which to open a restaurant. Having used the FourSquare API to find the top venues in each postcode, the top three were found to be EC4Y, EC3N and EC2Y. All three would be excellent locations to open a restaurant, as they are proven to have demand for restaurants due to the number of hotels and tourist attractions supplying customers. Depending on the cuisine of the restaurant to be opened, one of the three may stand out more. EC4Y has an Italian and a general restaurant, so a different cuisine to these would fill a gap in the market. EC3N has a French restaurant and a pizza place, so a general restaurant or a Japanese or other Asian cuisine restaurant would differentiate itself well in that postcode. Finally, EC2Y has an Italian and a Turkish restaurant, so a different cuisine to these would do well. Alongside that, as EC2Y has three tourist attractions, a restaurant that had a focus on lunch meals rather than dinner meals may do better in the postcode as tourists are more likely to be out in the middle of the day.