



Opening a new Restaurant in London

IBM CAPSTONE PROJECT

Introduction



London is the capital and the largest city of England and the United Kingdom.

According to Office for National Statistics, London has 201,1 restaurants per 100,000 population, which is quite high score, that show demand for restaurants.*

* <http://www.worldcitiescultureforum.com/data/number-of-restaurants-per-100.000-population>

Problem Description



The objective of this project to analyze and select best location for a new Mediterranean food restaurant in one of the London central districts.

Using data science methodology and machine learning techniques, this project aims to provide solutions to business problem.

In the central districts London, an investor wants to open a Mediterranean food restaurant, and looking for a location that there is little competition for business. Which location would be best for that?

Data Collection 1



The postal districts of London city will be extracted from Wikipedia.*

The source page has a table with Location, London borough, Post town, Postcode district, Dial code, OS grid ref attributes.

Location, London borough and Postcode district columns will be used.

* https://en.wikipedia.org/wiki/List_of_areas_of_London

Data Collection

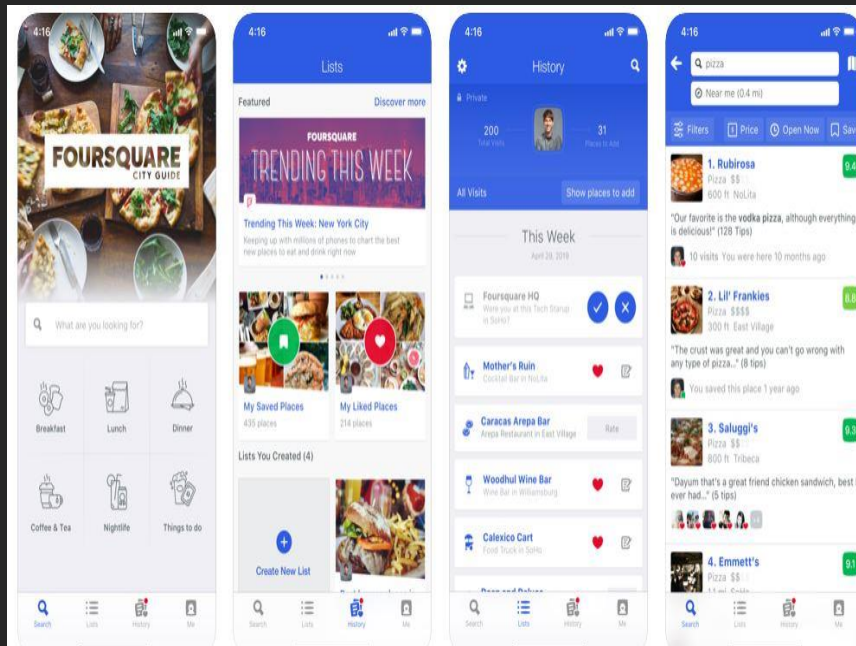
2



With the help of Nominatim geocoder geographical coordinates of each postal code district will be collected.

Data Collection

3



Using Foursquare API*, venues will be collected by each district.

The most common types of restaurants will be identified for each location. District latitude and longitude data will be used in order to get venue information.

For each venue distance center, category, popularity and venue category feature will be taken into consideration.

* <https://developer.foursquare.com/developer/>

Methodology



- Web scraping, Identifying the neighbourhoods in central London
- Nominatim, coordinates of districts
- Visualizing neighbourhoods in target area
- Foursquare API, retrieving venue information for each neighbourhood
- Processing the data, selecting required features
- Applying K-Means Clustering machine learning techniques.
- Analyzing each neighbourhood and the most common restaurant type
- Reporting the results and making recommendations.

Methodology



➤ Web scraping, Identifying the neighbourhoods in central London

	Location	London borough	Post town	Postcode district	Dial code	OS grid ref
0	Abbey Wood	Bexley, Greenwich [7]	LONDON	SE2	020	TQ465785
1	Acton	Ealing, Hammersmith and Fulham[8]	LONDON	W3, W4	020	TQ205805
2	Addington	Croydon[8]	CROYDON	CR0	020	TQ375645
3	Addiscombe	Croydon[8]	CROYDON	CR0	020	TQ345665
4	Albany Park	Bexley	BEXLEY, SIDCUP	DA5, DA14	020	TQ478728
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527	Woolwich	Greenwich	LONDON	SE18	020	TQ435795
528	Worcester Park	Sutton, Kingston upon Thames	WORCESTER PARK	KT4	020	TQ225655
529	Wormwood Scrubs	Hammersmith and Fulham	LONDON	W12	020	TQ225815

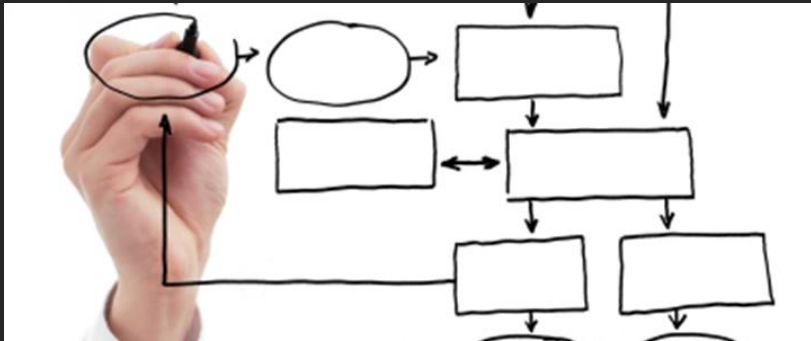
Methodology



➤ Nominatim, coordinates of districts

	Location	PostalCode	Latitude	Longitude
0	Aldwych	WC2	51.513281	-0.116030
1	Angel	EC1, N1	51.531842	-0.105714
2	Barbican	EC1, EC2	51.520150	-0.098683
3	Blackfriars	EC4	51.511585	-0.103767
4	Bloomsbury	WC1	51.523126	-0.126066

Methodology

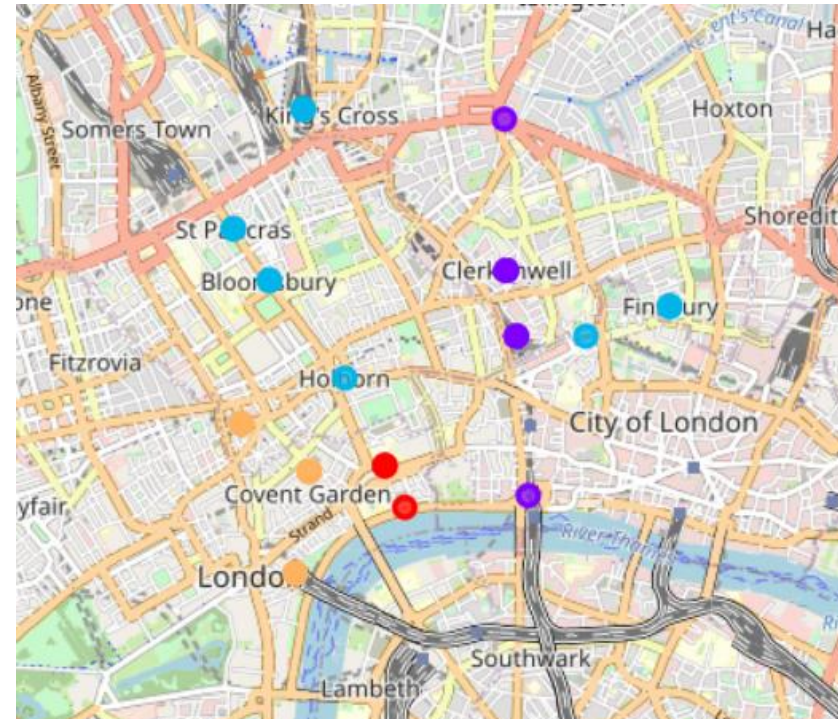


➤ Visualizing neighbourhoods in target area



Methodology

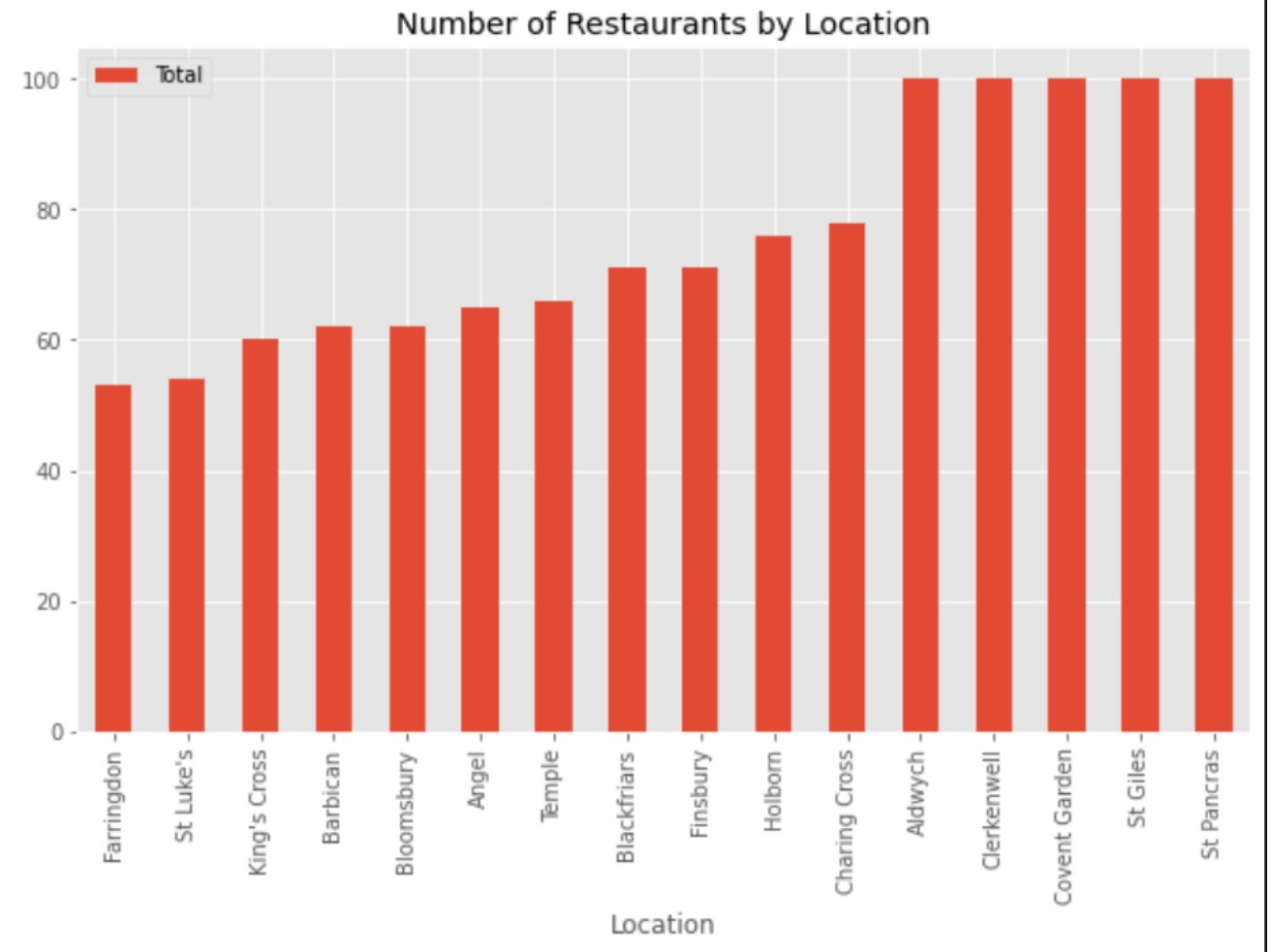
- Foursquare API, retrieving venue information for each neighbourhood
- Processing the data, selecting required features
- Applying K-Means Clustering machine learning techniques.



Methodology



➤ Number of restaurants for each location



Results



- According to number of restaurants for each location, Farringdon, St. Luke's are best places since they have least number of restaurants.
- However Italian, French and Spanish restaurants are among the most frequent in those places. Since the investor wants to open a Mediterranean restaurant, it wouldn't be profitable to start business in a competitive area. Looking at those locations closely, King's Cross is the only location that has no French, Italian, Spanish, Turkish restaurant which are parts of Mediterranean cuisine.

Results



- Looking at those locations closely, King's Cross is the only location that has no French, Italian, Spanish, Turkish restaurant which are parts of Mediterranean cuisine.
- As a conclusion, King's Cross would be the best location to start a Mediterranean Restaurant business since it is among the least that has total number of restaurant and doesn't have Mediterranean restaurants in most commons.

Thanks..