

Capstone Project - The Battle of Neighborhoods

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CLUSTERING ANALYSIS TO OPEN A SUPERMARKET BUSINESS IN LONDON



Description

- Opening a supermarket in London is required to have comprehensive analysis.
- London is a competitive market and one should take into account the distribution of supermarkets and other commercial venues in the area to decide best place to open a supermarket.
- One also needs to see additional information about population and earnings by borough for London to get information about their potential customers.

Background

- London is one of the largest cities of Europe and capital of United Kingdom.
- The population is more than 9 million.
- It is really attractive destinations for tourists with nearly 21 million visitors per year.
- One can also consider its diversity, it is obvious that supermarket business with offering great range of products is a good idea.
- This analysis is aiming to help deciding the location of supermarket to optimize the revenue.

Data acquisition and cleaning

- Data scrapped from Wikipedia: List of areas of London to get information about London boroughs, their locations and postal codes.
- Foursquare API to extract venue information about like café, restaurants, supermarkets etc in borough in London.
- The population of the boroughs of Greater London from citypopulation.de
- Earnings by Place of Residence, Borough in London from <https://data.london.gov.uk/dataset/earnings-place-residence-borough>

Map of the Great London with boroughs



London venues (not a complete list)

	PostalCode	Borough	BoroughLatitude	BoroughLongitude	VenueName	VenueLatitude	VenueLongitude	VenueCategory
0	SE2	Bexley, Greenwich	51.49245	0.12127	Lesnes Abbey	51.489526	0.125839	Historic Site
1	SE2	Bexley, Greenwich	51.49245	0.12127	Sainsbury's	51.492824	0.120724	Supermarket
2	SE2	Bexley, Greenwich	51.49245	0.12127	Lidl	51.496152	0.118417	Supermarket
3	SE2	Bexley, Greenwich	51.49245	0.12127	Abbey Wood Railway Station (ABW)	51.490825	0.123432	Train Station
4	SE2	Bexley, Greenwich	51.49245	0.12127	Platform 1	51.491023	0.119491	Platform
5	SE2	Bexley, Greenwich	51.49245	0.12127	Costcutter	51.491287	0.120938	Convenience Store
6	SE2	Bexley, Greenwich	51.49245	0.12127	Bean @ Work	51.491172	0.120649	Coffee Shop
7	W3	Ealing, Hammersmith and Fulham	51.51324	-0.26746	Sainsbury's Local	51.515025	-0.268968	Grocery Store
8	W3	Ealing, Hammersmith and Fulham	51.51324	-0.26746	BP	51.514910	-0.268510	Gas Station
9	W3	Ealing, Hammersmith and Fulham	51.51324	-0.26746	Acton Main Line Railway Station (AML)	51.517077	-0.267317	Train Station
10	W3	Ealing, Hammersmith and Fulham	51.51324	-0.26746	Co-op Food	51.515919	-0.268030	Grocery Store

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London venues group by category (not a complete list)

VenueCategory	PostalCode	Borough	BoroughLatitude	BoroughLongitude	VenueName	VenueLatitude	VenueLongitude
Adult Boutique	9	9	9	9	9	9	9
African Restaurant	6	6	6	6	6	6	6
American Restaurant	25	25	25	25	25	25	25
Antique Shop	9	9	9	9	9	9	9
Arcade	6	6	6	6	6	6	6
Arepá Restaurant	3	3	3	3	3	3	3
Argentinian Restaurant	41	41	41	41	41	41	41
Art Gallery	41	41	41	41	41	41	41
Art Museum	8	8	8	8	8	8	8
Arts & Crafts Store	18	18	18	18	18	18	18
Arts & Entertainment	1	1	1	1	1	1	1
Asian Restaurant t; double click to hide	84	84	84	84	84	84	84
Athletics & Sports	16	16	16	16	16	16	16

	venue	freq
0	Coffee Shop	0.0976431
1	Café	0.0690236
2	Grocery Store	0.0555556
3	Pub	0.047138
4	Supermarket	0.043771

----Barnet, Brent, Camden----

	venue	freq
0	Gym / Fitness Center	0.25
1	Music Venue	0.25
2	Clothing Store	0.25
3	Supermarket	0.25
4	Organic Grocery	0

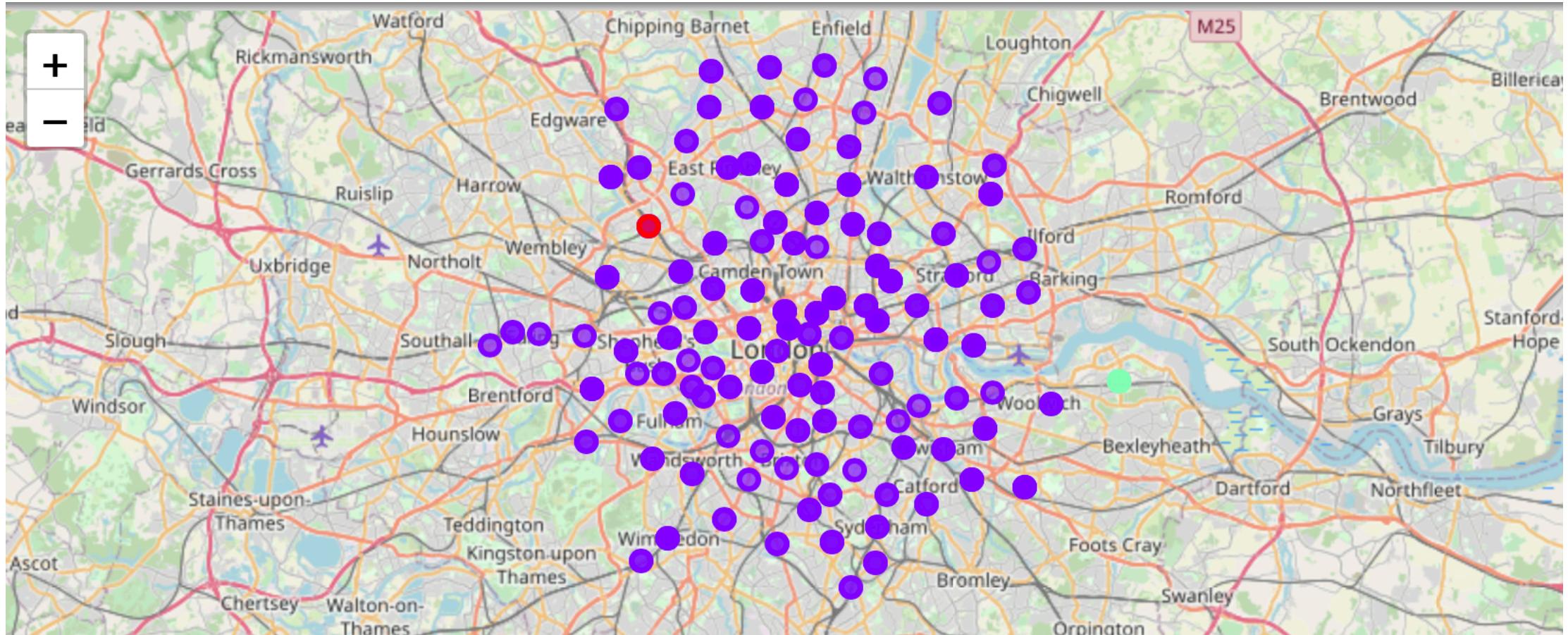
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Top 5 venues for
each borough
with frequency

Top ten most common venues by borough

	Borough	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	Barnet	Coffee Shop	Café	Grocery Store	Pub	Supermarket	Bus Stop	Italian Restaurant	Turkish Restaurant	Pizza Place	Pharmacy
1	Barnet, Brent, Camden	Music Venue	Gym / Fitness Center	Supermarket	Clothing Store	Zoo Exhibit	Film Studio	Exhibit	Fabric Shop	Falafel Restaurant	Farmers Market
2	Bexley	Supermarket	Coffee Shop	Convenience Store	Platform	Train Station	Historic Site	Exhibit	Fabric Shop	Falafel Restaurant	Farmers Market
3	Bexley, Greenwich	Supermarket	Coffee Shop	Convenience Store	Platform	Train Station	Historic Site	Exhibit	Fabric Shop	Falafel Restaurant	Farmers Market
4	Brent	Grocery Store	Café	Clothing Store	Indian Restaurant	Pub	Fast Food Restaurant	Sandwich Place	Pharmacy	Supermarket	Warehouse Store
5	Brent, Camden	Indian Restaurant	Pub	Brazilian Restaurant	Supermarket	Café	Entertainment Service	Gastropub	Middle Eastern Restaurant	Pizza Place	Fast Food Restaurant

Map for each cluster



Cluster 1- Ten most common venue

PostalCode	Latitude	Longitude	Cluster Label	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
SE20	51.41009	-0.05683	0	Supermarket	Grocery Store	Coffee Shop	Hotel	Fast Food Restaurant	Park	Convenience Store
SE19	51.41990	-0.08808	0	Supermarket	Grocery Store	Coffee Shop	Hotel	Fast Food Restaurant	Park	Convenience Store
SE20	51.41009	-0.05683	0	Supermarket	Grocery Store	Coffee Shop	Hotel	Fast Food Restaurant	Park	Convenience Store
SE26	51.42674	-0.05533	0	Supermarket	Grocery Store	Coffee Shop	Hotel	Fast Food Restaurant	Park	Convenience Store
SE9	51.44463	0.05212	0	Supermarket	Grocery Store	Coffee Shop	Hotel	Fast Food Restaurant	Park	Convenience Store
SE20	51.41009	-0.05683	0	Supermarket	Grocery Store	Coffee Shop	Hotel	Fast Food Restaurant	Park	Convenience Store

Cluster 2- Ten most common venue

de	Longitude	Cluster Label	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Cor
45	0.12127	1	Supermarket	Coffee Shop	Convenience Store	Platform	S
45	0.12127	1	Supermarket	Coffee Shop	Convenience Store	Platform	S
45	0.12127	1	Supermarket	Coffee Shop	Convenience Store	Platform	S

Cluster 3- Ten most common venue

	Location	Borough	Post town	PostalCode	Latitude	Longitude	Cluster Label	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	8t C
73	Cricklewood	Barnet, Brent, Camden	LONDON	NW2	51.56237	-0.22131	2	Music Venue	Gym / Fitness Center	Supermarket	Clothing Store	Zoo Exhibit	Film Studio	Exhibit	

Conclusion

- If one would like to open a supermarket in preferred address then should refer to that borough in the cluster and select the location by looking the most 10 common venue list.
- Although we have worked with limited data, this is an excellent beginning source to see distribution of commercials in the Great London area with supported by some visualizations.
- It also included the frequency of most common venues and its frequencies by borough.
- It is observed that supermarket is the most common venue for all location in cluster 2.