Deciding where to open a new venue in London, Outer Boroughs

Introduction

London is an amazing city. It is varied, multicultural, and brimming with possibilities. However, there is another aspect to its attractiveness and popularity. London is an expensive city to live in and prosper in. Many companies desire to build a shop on Piccadilly or Oxford Street, and many pay a premium for a window on these streets. But what about people who want to establish their own company but can't afford to do it in the city right now?

If we examine all of these factors, it would be a good idea to look at statistics from the outside London boroughs and dig further into the numbers. In my research, I've looked at:

1. A list of London boroughs with coordinates from Wikipedia.
2. Data from Foresquare on the most popular venues in each borough
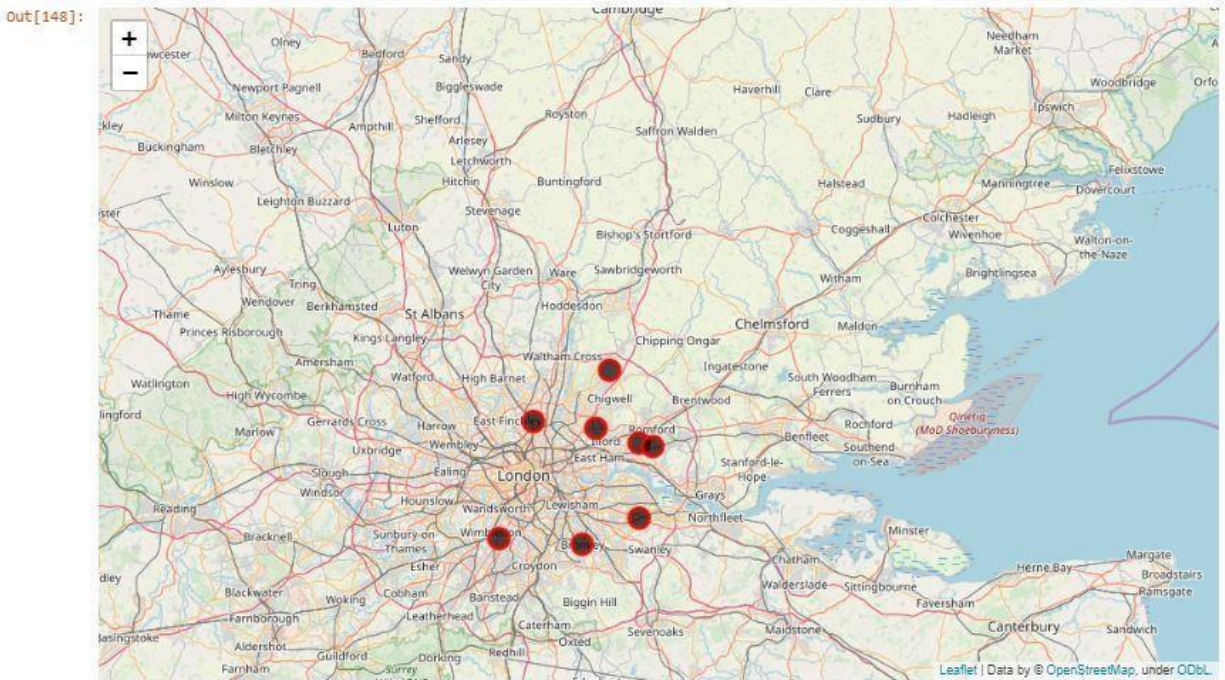3. Rent statistics in London boroughs based on the internet

Methodology

But first things first – let`s take a look at the boroughs we are to investigate!

	Borough	Inner	Status	Local authority	Political control	Headquarters	Area (sq mi)	Population (2013 est)[1]	Co-ordinates	Nr. in map
0	Barking and Dagenham [note 1]	NaN	NaN	Barking and Dagenham London Borough Council	Labour	Town Hall, 1 Town Square	13.93	194352	51°33'39"N 0°09'21"E / 51.5607°N 0.1557°E	25
1	Barnet	NaN	NaN	Barnet London Borough Council	Conservative	North London Business Park, Oakleigh Road South	33.49	369088	51°37'31"N 0°09'06"W / 51.6252°N 0.1517°W	31
2	Bexley	NaN	NaN	Bexley London Borough Council	Conservative	Civic Offices, 2 Watling Street	23.38	236687	51°27'18"N 0°09'02"E / 51.4549°N 0.1505°E	23
3	Brent	NaN	NaN	Brent London Borough Council	Labour	Brent Civic Centre, Engineers Way	16.70	317264	51°33'32"N 0°16'54"W / 51.5588°N 0.2817°W	12
4	Bromley	NaN	NaN	Bromley London Borough Council	Conservative	Civic Centre, Stockwell Close	57.97	317899	51°24'14"N 0°01'11"E / 51.4039°N 0.0198°E	20
5	Camden	NaN	NaN	Camden London Borough Council	Labour	Camden Town Hall, Judd Street	8.40	229719	51°31'44"N 0°07'32"W / 51.5290°N 0.1255°W	11
6	Croydon	NaN	NaN	Croydon London Borough Council	Labour	Bernard Weatherill House, Mint Walk	33.41	372752	51°22'17"N 0°05'52"W / 51.3714°N 0.0977°W	19
7	Ealing	NaN	NaN	Ealing London Borough Council	Labour	Perceval House, 14-16 Uxbridge Road	21.44	342494	51°30'47"N 0°18'32"W / 51.5130°N 0.3089°W	13
8	Enfield	NaN	NaN	Enfield London Borough Council	Labour	Civic Centre, Silver Street	31.74	320524	51°39'14"N 0°04'48"W / 51.6538°N 0.0799°W	30

After downloading the entire page from Wiki, it is rather obvious, that we will not need all of these columns – and they will distract us going forward. So we will trim the dataframe a little.

	Borough	Area	Population	Latitude	Max_Rent	Longitude
0	Barking and Dagenham	13.93	194352	51.554117	102.25	0.150504
2	Bexley	23.38	236687	51.441679	97.00	0.150488
4	Bromley	57.97	317899	51.402805	118.50	0.014814
8	Enfield	31.74	320524	51.663600	102.25	0.079900
12	Haringey	11.42	263386	51.587930	107.75	-0.105410
14	Havering	43.35	242080	51.549900	86.00	0.183700
22	Merton	14.52	203223	51.410803	123.75	-0.188099
24	Redbridge	21.78	288272	51.576320	118.50	0.045410

Much better! Now we will use the Folium map to see where the outer boroughs are spread around London
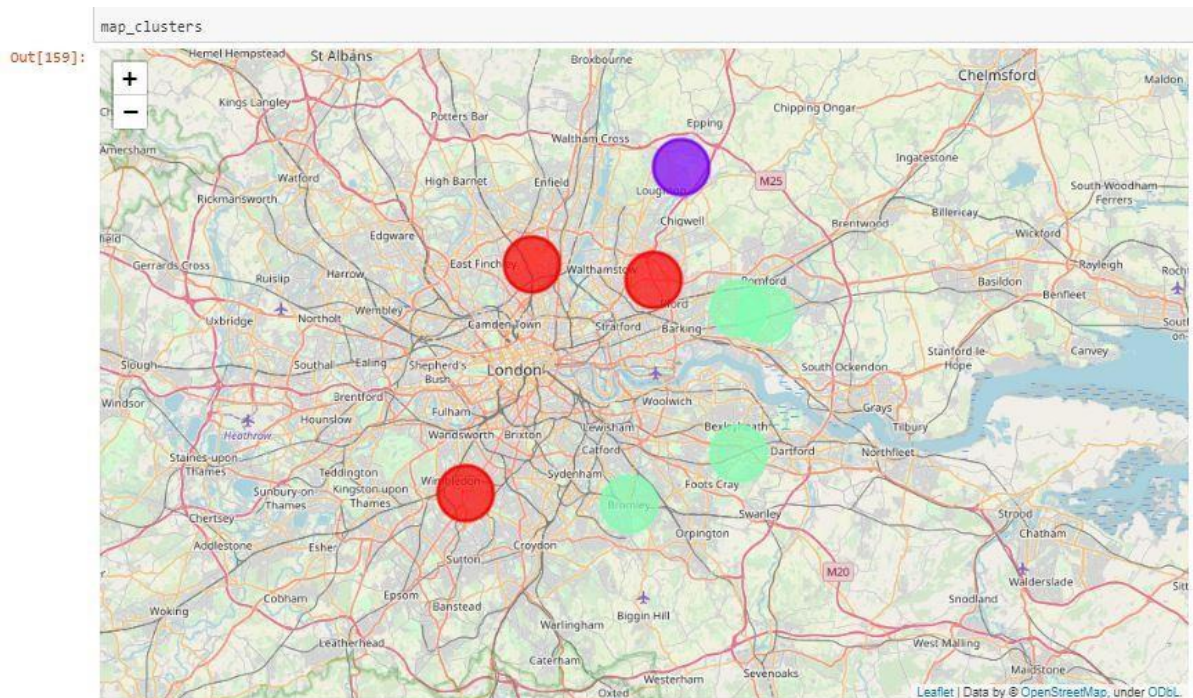
The first thing that comes to mind is how widely apart they are, with the exception of the ones in the upper right corner. Due to the varied sizes of the boroughs and the vast differences in cultural and ethnic variety inside each, it will be fascinating to pit them against one other!

brgh_venues_sorted.head(8)

	Borough	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
0	Barking and Dagenham	Supermarket	Grocery Store	Coffee Shop	Pub	Park
1	Bexley	Grocery Store	Pub	Coffee Shop	Supermarket	Park
2	Bromley	Coffee Shop	Pub	Grocery Store	Park	Gym / Fitness Center
3	Enfield	Pub	Coffee Shop	Café	Italian Restaurant	Grocery Store
4	Haringey	Pub	Coffee Shop	Park	Café	Turkish Restaurant
5	Havering	Pub	Coffee Shop	Supermarket	Grocery Store	Italian Restaurant
6	Merton	Pub	Park	Italian Restaurant	Coffee Shop	Sushi Restaurant
7	Redbridge	Pub	Park	Coffee Shop	Pizza Place	Restaurant

We'll use Foursquare data for venue discovery around the borough coordinates to obtain a sense of what the most and least popular venues are for the individuals who reside in the boroughs in question. Because everything is pretty much everywhere in London, we'll have to limit the number of places we examine. To do so, we'll need to use the format to filter each borough's top five sites of interest.

Now that we have figured out the top places for every borough – it`s time to cluster. Because the amount of boroughs is so little (on earlier stages it was decided to slash some of them due to high rent price compared to the finalists) the amount of clusters will be small.

Although the picture, that seemingly is worth a thousand words, is rather divisive. Until we look at the clusters individually, and try to determine patterns.

```
Borough_merged.loc[Borough_merged['Cluster Label'] == 0, Borough_merged.columns[[0,1,2,4] + list(range(6, Borough_merged.shape[1]))]]
```

	Borough	Area	Population	Max_Rent	Cluster Label	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
4	Haringey	11.42	263386	107.75	0	Pub	Coffee Shop	Park	Café	Turkish Restaurant
6	Merton	14.52	203223	123.75	0	Pub	Park	Italian Restaurant	Coffee Shop	Sushi Restaurant
7	Redbridge	21.78	288272	118.50	0	Pub	Park	Coffee Shop	Pizza Place	Restaurant

The first pattern and a very British picture: Pub as a most popular venue, and for those, who don`t feel like a visit to a pub can enjoy the nature. This cluster is hardly of interest, because it will be problematic to open a new Pub. Not to mention a Park... Amongst the most popular venues are also restaurants, which can be of interest to foodies and the chefs living close by.

```
Borough_merged.loc[Borough_merged['Cluster Label'] == 1, Borough_merged.columns[[0,1,2,4] + list(range(6, Borough_merged.shape[1]))]]
```

	Borough	Area	Population	Max_Rent	Cluster Label	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
3	Enfield	31.74	320524	102.25	1	Pub	Coffee Shop	Café	Italian Restaurant	Grocery Store

The second cluster is the most contentious. Enfield is one of the larger outer London boroughs, and the data we collect can vary dramatically within the same borough: people who live in suburban houses along the M25 prefer to remain indoors, spend more time with their family, and cook at home. Those that live closer to the inner borough borders, on the other hand, may be more outgoing and, as a result, contribute the most to our dataset. Regardless, Enfield is a great place to live with low rent, a large population, and a varied population.

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Borough_merged.loc[Borough_merged['Cluster Label'] == 2, Borough_merged.columns[[0,1,2,4] + list(range(6, Borough_merged.shape[1]))]]
```

	Borough	Area	Population	Max_Rent	Cluster Label	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
0	Barking and Dagenham	13.93	194352	102.25	2	Supermarket	Grocery Store	Coffee Shop	Pub	Park
1	Bexley	23.38	236687	97.00	2	Grocery Store	Pub	Coffee Shop	Supermarket	Park
2	Bromley	57.97	317899	118.50	2	Coffee Shop	Pub	Grocery Store	Park	Gym / Fitness Center
5	Havering	43.35	242080	86.00	2	Pub	Coffee Shop	Supermarket	Grocery Store	Italian Restaurant

Biggest and the most diverse cluster. Most of the boroughs are not heavy drinkers, but neither are they very outgoing. Because I would not call visit to the grocery store as a social route! However, Havering and Bromley are good fits to our target boroughs: both have entertainment venues as most common, both rather big and quite populated. In this situation perhaps Havering has a slight financial edge - cheaper rent a more incline to pubs and coffee shops in the area.

Results

The following is a summary of the above analysis and clustering results:

Pubs and coffee shops are the most popular social places outside of Inner London boroughs.
2. Northern boroughs are more inclined to frequent bars, whilst southern boroughs prefer to shop and socialise at home.
3. An ethnic restaurant is among the top five points of attraction in each borough.
4. Rent price isn't a big role in moving out since demand isn't affected by cost differences.

Discussion

According to the statistics, the best areas outside of Central London to launch a new venue are Havering, Bromley, and Enfield. However, a lot of data isn't taken into consideration, and it's impossible to get from Foursquare Developer:

1. The popularity of a certain cuisine may and will be influenced by the ethnic makeup of a specific borough.
2. People can visit to the next borough and influence the measures since they are closer to the inner boroughs and have superior transportation links.
3. Many tiny venues are not listed on Foursquare and are promoted by word-of-mouth, thus they aren't counted.

Conclusion

Finally, I got a solid practise run at addressing a real-life problem utilising accessible data to develop a business answer - deciding to build a venue in London - to wrap off this study. I used some commonly used Python libraries to manipulate data, the Foursquare API to explore the information on the Boroughs I investigated, and created a map of the results that allowed me to illustrate my point graphically and clearly to someone who isn't familiar with data manipulation and only wants to know one thing: where will my venue thrive??