

# Finding a house in London

## Background

Mr. and Mrs. Castro want to live in London, he is from Mexico and she is from the USA, they are in their 20s, they are recently married, they have no children and they do not plan to have them until after 10 years.

A month ago they were on their honeymoon and visited London, and fell in love with the city, so much so that they decided to move to this great and exciting city.

How not to fall in love with London, London is a great city, with a lot of life and fascinating corners to discover that are distributed in the 33 districts that make up this city. The most outstanding feature of London is that it is a city with a lot of personality, capable of making travelers from all over the world fall in love with just a glance. When you visit it, you will be able to see many emblematic buildings with history and an architectural level that will leave you ecstatic. In addition, you will find in it numerous alternatives for fun, activities of all kinds, nightlife.

As we can see, because of their backgrounds they know very little about the Borough in London. So I decided to help them.

## Problem

According to their lifestyles, what would be the best group of Borough to live for them?

Considering that they would have to sell their house in Los Angeles and that for this they would get a maximum of 500,000 British Pounds, and with this they would have to buy their new home, in addition, it will be necessary to consider that they like crowded neighborhoods, where the most popular are restaurants of all kinds of food and bars, since they do not want to lose all the fun that this multicultural city offers.

## Interest

This analysis may interest any person who is considering moving to London, in this case it is specific to a type of couple and considers their tastes, however it can be adapted according to the requirements.

## Description of the DATA

We will use the database consulted from Wikipedia as the data source, List of London Boroughs.

1. Wikipedia list of Boroughs with their coordinates.
2. Base data on average prices house in london.
3. Foursquare data to the most populars venues.

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/usr/local/lib/python3.6/dist-packages/statsmodels/tools/_testing.py:19: FutureWarning: pandas.util.testing is deprecated. Use the functions in the public API at pandas.testing instead
import pandas.util.testing as tm

```

	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	Barnet House, 2 Bristol Avenue, Colindale	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

## DATA Cleaning

The source base with which we will answer this question is extracted directly from Wikipedia and, as expected, it will come with some irregularities for what we need.

So we start by removing the columns that are too much in the source using the dorp code.

We also skew the information that we are going to require since we do not want the interior Boroughs because our young couple definitely wants to live where things happen.

Finally we proceed to fix the names of the neighborhoods that are found with some more brands.

With this process we will get something like this:

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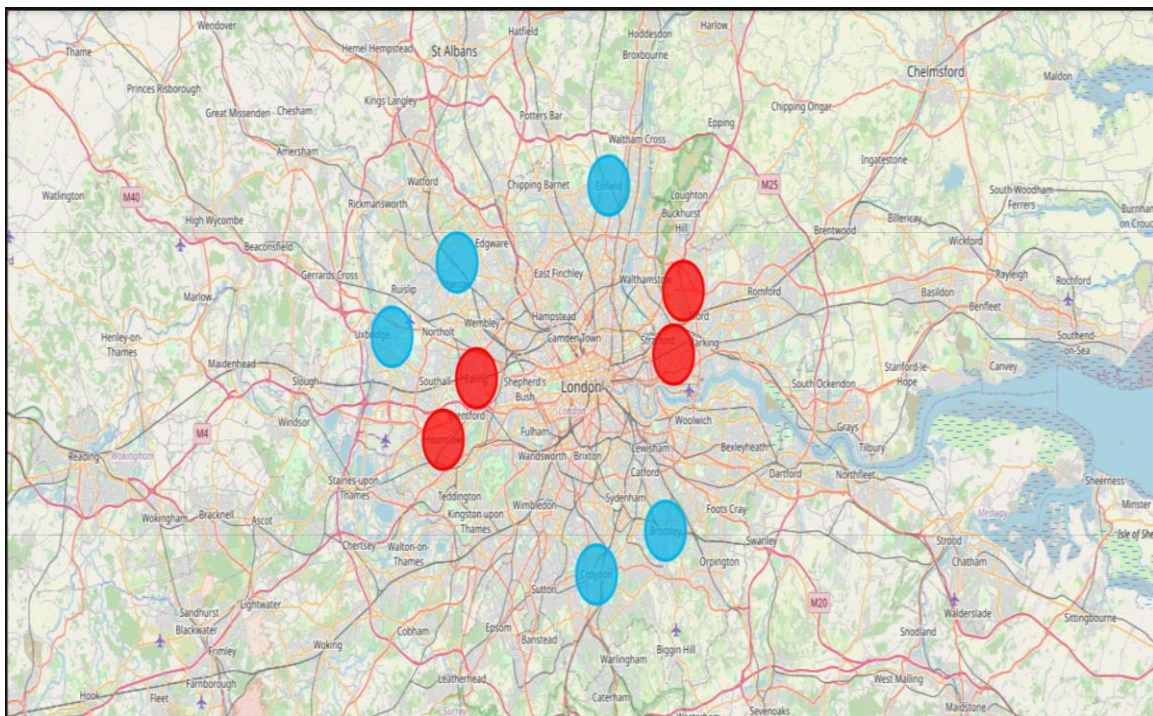
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# DATA Analysis

Once we have selected and cleaned the data that we require for the analysis, we use the K - Means Clustering method, an unsupervised algorithm based on the similarity of the interest groups.

What this algorithm does is to divide the neighborhoods into groups that have similar characteristics.

The idea is to minimize the distance of the Boroughs within the group and to maximize the distances between the groups.



## Results

- The first cluster of Boroughs seems to correspond to quite fun people, they enjoy outdoor places as well as trendy bars, they are also well-visited options of cafes and international restaurants. This cluster is made up of 4 Boroughs, where the first Borough is almost at the top of the proposed housing budget, however it has an interesting number of residents and everything required by our young couple.
- The second cluster is made up of a single Borough, and it is quite strange, being its most visited place a Hotel, followed by food or electronic shops, the average price of housing in this Borough is quite affordable.
- The third cluster also offers several quite interesting options, its most popular places boasting cafes, bars and restaurants. One of the neighborhoods is at the exact top of the maximum budget for housing that this couple would have.
- The fourth cluster proposed by this automatic algorithm corresponds to just one Borough again, this Borough is at the top of the housing budget and the most popular of the Borough is a fast food restaurant followed by the gas station, it does not fall within the requirements that they did to us at the beginning of the project.
- The fifth cluster looks like residential Boroughs, where pizzas and ice cream are the most popular, it is made up of 2 Boroughs.

## Discussion

Reviewing the data obtained, we observed certain quite interesting clusters according to the requirements of the young couple. These could be clusters 1 and 3 that are the most suitable for your lifestyle, however in the two clusters there are two Boroughs that reach the top of their budget.

They should check in the field with their real estate agent the possibility of seeing houses in these Boroughs, since it is more likely that they will come across houses much more expensive than the average observed here.

## Conclusion

Our enthusiastic and happy couple has decided to meet with their agent to see homes in the Boroughs of clusters 1 and 3 excluding the two Boroughs where their budget reaches the limit.

With this result you can see very good options according to your tastes in 7 great London Boroughs.

Thanks to the application of this methodology, we have reduced the search options from 33 neighborhoods currently existing in London to just 7 Boroughs, which are the ones that really fit your needs.

