Capstone Project - The Battle of Neighborhoods
Exploring the Northwest of London

Introduction

For this project, I decided to investigate the various areas in Northwest London. This topic is of importance to me since I intend to relocate to London in the near future. The Northwestern part of the city is of particular interest to me as it is located close to my future place of study and hence has a favorable and comfortable commute. In this project, I intend to discover the differences between the various neighborhoods in terms of the facilities they provide and how the average rental prices vary. The goal of this project is to identify a neighborhood that best suits my needs.

This project can be beneficial to people that are in a similar situation and are planning on moving to London. Additionally, this project can be of interest to people that would like to broaden their knowledge of London and its neighborhoods.

Data

Foursquare location data, https://foursquare.com/
> To discover the different neighborhoods. Foursquare is used for example to see what kind of leisure facilities the areas have.

List of Areas in London, https://en.wikipedia.org/wiki/List_of_areas_of_London
> To fetch the London area data for my data frame.

Private rental market in London: January 2019 to December 2019, https://www.ons.gov.uk/peoplepopulationandcommunity/housing/adhocs/11100privaterentalmarketinlondonjanuary2019todecember2019
> For the data about the average rental price per area.

Questions

This project is focused on solving the following problem statements:
1. Discover whether the areas differ from each other based on facilities
2. Identify which neighborhoods are the most and the least expensive
3. Find a neighborhood with affordable average rent, many parks and green areas, and located close to many cafés as well as at least one gym.

Methodology

I started the project by importing the data and scraping it using BeautifulSoup. In a second step, I created an easily readable pandas data frame containing all the raw data of the areas. The data was then cleaned and formatted in order to exclude irrelevant data and a dataset was created that solely contains the neighborhoods in Northwest London.

	Neighborhood	Borough	Post town	Postcode	OS grid ref
0	Arkley	Barnet	BARNET, LONDON	EN5, NW7	TQ225955
1	Barnet Gate	Barnet	LONDON, BARNET	NW7, EN5	TQ218952
2	Belsize Park	Camden	LONDON	NW3	TQ273845
3	Brent Cross	Barnet	LONDON	NW2, NW4	TQ230874
4	Brent Park	Brent	LONDON	NW10	TQ209852

The coordinate data was converted from OS grid ref to latitude and longitude coordinates. The data was then saved into a CSV-file which was then imported into the project. I fetched the latitudinal and longitudinal data from the file and merged it into one data frame with all the information.

	Neighborhood	Borough	Post town	Postcode	OS grid ref	Latitude	Longitude
0	Arkley	Barnet	BARNET, LONDON	EN5, NW7	TQ225955	51.644964	-0.230957
1	Barnet Gate	Barnet	LONDON, BARNET	NW7, EN5	TQ218952	51.642420	-0.241173
2	Belsize Park	Camden	LONDON	NW3	TQ273845	51.545046	-0.165609
3	Brent Cross	Barnet	LONDON	NW2, NW4	TQ230874	51.572061	-0.226573
4	Brent Park	Brent	LONDON	NW10	TQ209852	51.552743	-0.257616

In the next step, I started exploring the data by creating a Folium map centred to London. I then attached markers into the map in order to identify the relevant neighborhoods in NW London. The resulting map is presented below and offers a clear view of the data points used for this project, and an idea of the different areas.

After creating the overall map of the area, I decided to investigate the first neighborhood on the list, named Arkley. The reasoning behind this step was to ensure that Foursquare is functioning as intended for this project and produces the desired outcome. After testing the Foursquare I got the wanted results and continued investigating the rest of the neighborhoods.

	name	categories	lat	lng
0	Cottage Garden Nursery	Flower Shop	51.645982	-0.234079
1	Arkley Golf Club	Golf Course	51.647774	-0.233413

In the next phase, I decided to look into the various venues in all of the neighborhoods located in the Northwest area of London. After investigating the venue data in each neighborhood and making a data frame of them, I noticed that some of them seemed to have more venues than others. I decided to group the neighborhoods and produce clusters based on the most common venues located within an area. I made a map with the different clusters as shown below:

I noticed that most of the data points fall within 2 different clusters: Cluster 0 (red) and 4 (orange). I conducted a deeper analysis of these two clusters in order to identify the difference between these clusters. The deep-dive showed that cluster 0 has the most data points and is closer to the city center. This cluster mostly contains cafés, pubs, and coffee shops. Cluster 4, which is situated more towards the northeast and further away from the city, contains more restaurants but does not have as many cafés and pubs.

In the next step of this project, I decided to look into the average rental prices in the targeted neighborhoods. After fetching the rental price data I created a new data frame that included all the neighborhood information and the specific average rental prices per neighborhood. As can be seen in the data set, the average rental prices in some of the bordering postal codes are similar. This is due to some postal codes having the same values for multiple neighborhoods.

	Neighborhood	Borough	Post town	Postcode	OS grid ref	Latitude	Longitude	Avgrent
0	Barnet Gate	Barnet	LONDON, BARNET	NW7, EN5	TQ218952	51.642420	-0.241173	1389
1	Belsize Park	Camden	LONDON	NW3	TQ273845	51.545046	-0.165609	2198
2	Brent Cross	Barnet	LONDON	NW2, NW4	TQ230874	51.572061	-0.226573	1561
3	Brent Park	Brent	LONDON	NW10	TQ209852	51.552743	-0.257616	1435
4	Brondesbury	Brent	LONDON	NW6	TQ245845	51.545670	-0.205966	1785
5	Burroughs, The	Barnet	LONDON	NW4	TQ227891	51.587404	-0.230307	1345
6	Camden Town	Camden	LONDON	NW1	TQ295845	51.544545	-0.133901	2497
7	Chalk Farm	Camden	LONDON	NW1	TQ281844	51.543966	-0.154115	2497
8	Childs Hill	Barnet	LONDON	NW2	TQ245865	51.563644	-0.205259	1561
9	Church End	Brent	LONDON	NW10	TQ205785	51.492613	-0.265672	1435

Next, I created a map with flagged price data on each neighborhood. When you click a neighborhood point, it shows the average rental price for that specific area. This map shows clearly that the closer to the city center you go, the higher the average rental prices per month are. This also supports the finding from the clusters, that closer to the city there are more facilities, which is also a price-increase indicator.
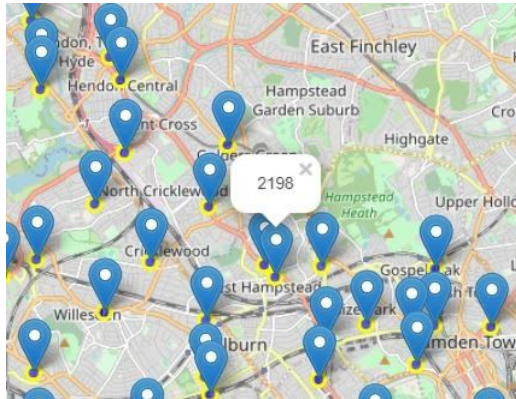
In order to further visualize and simplify the problem, I also wanted to see the various average rental prices in a different form. Hence, I decided to make a bar plot to visualize the average monthly rent per neighborhood more clearly.
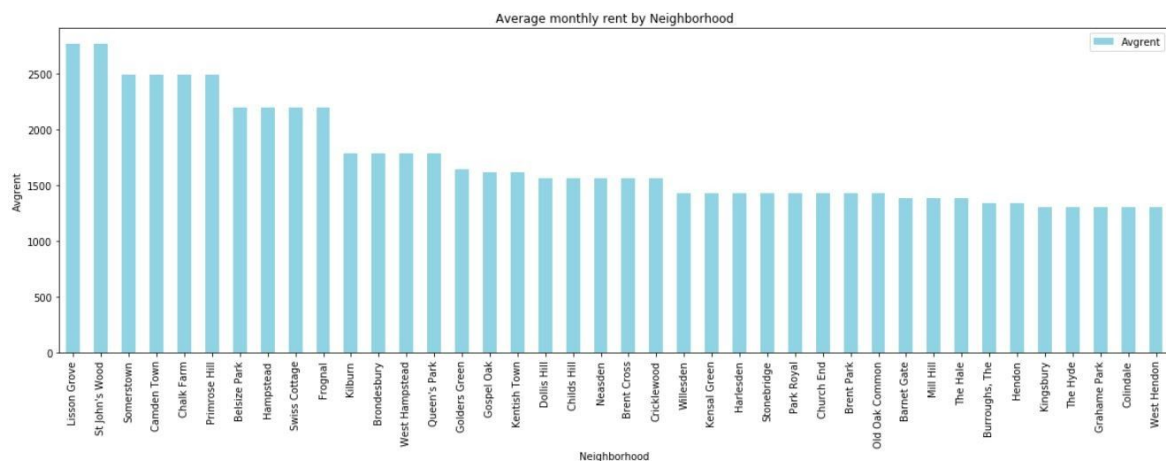

Generally, the average rent in London is high. Hence, this data is a great way to identify which areas are more affordable. This further allowed me to reduce the number of neighborhoods that are of interest to me. I concluded that I would exclude all areas that have an average monthly rent of more than 2000 GBP. Hence, I'm drawn more towards the right side of the bar plot.

To me, one important factor when it comes to my ideal neighborhood is the number of green areas and parks close by. That's why I searched the venue dataset to discover the number of parks located in the various neighborhoods. During this analysis, I found that Church End has 3 different parks. This neighborhood is also on the less expensive side of the average rent plot discussed above.

199	Church End	51.492613	-0.265672	Turnham Green	51.492099	-0.265968	Park
219	Church End	51.492613	-0.265672	Chiswick Park	51.494684	-0.270419	Park
246	Church End	51.492613	-0.265672	Gunnersbury Triangle	51.494288	-0.268504	Park

Therefore, I decided to focus my attention on that area to see if it can fulfill my other needs. I prefer living in an area with many shops, so I wanted to see if Church End fulfills this requirement. I made a map with shops around Church End (radius 1 km).
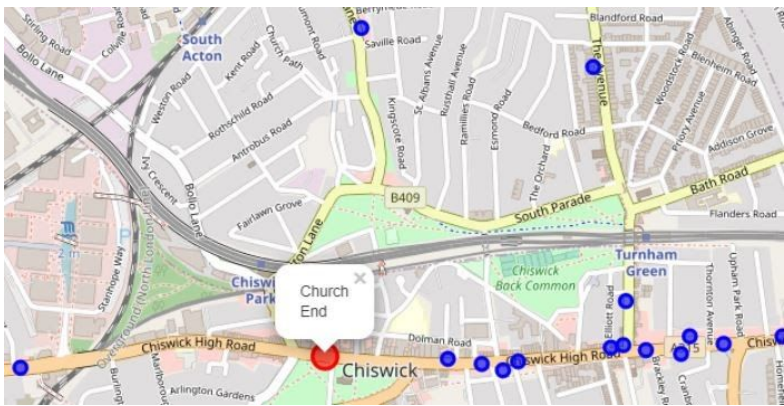
From the data analysis, I am satisfied with the number of shops within the area. So far Church End passed on average rental price, parks, and shops. The last requirement was to have a gym in the area, which I wanted to find out next. I made another map of Church End and its gyms and found that there were a few close by.
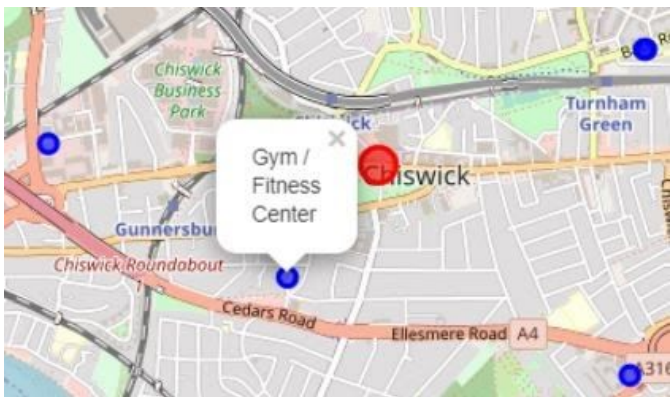
Results and discussion

In order to explore the results, I will restate the initial aim and objective of this project. First, I wanted to discover whether the various areas in Northwest London differ from each other based on facilities. I came to the conclusion that they differ from each other in various ways. The closer to the city you are, the more facilities there are. Those facilities are mostly cafés, pubs and coffee shops. The further away the neighborhood is from the center, the number of facilities drops. Moreover, most of these venues were restaurants, not cafés, pubs, and coffee shops.

The next question I wanted to answer with this data was to see which neighborhoods were the most and least expensive. I made a data frame with the average prices, a map with flagged prices, and a bar plot with the neighborhoods from most expensive to least expensive. I found that the areas closest to the city center were the most expensive and that the average monthly rent can go up to 2500 GBP in certain areas. I used this data to exclude certain neighborhoods from my consideration.

Lastly, I intended to use the data to find a neighborhood with affordable average rent, lots of parks and green areas, and located close to many shops and at least one gym. I discovered that Church End met my expectations best. It has an affordable average rent, parks, shops, and a few gyms as well.

Conclusions

The goal of this capstone project was to discover the differences between the neighborhoods, compare the prices, and find a suitable area that would satisfy my needs. In my opinion the goals were met and the report answered all of the questions and discovered interesting results.