The Battle of the Neighbourhoods – Moving to London

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Introduction

In every major city criminal activity in some of its forms takes place. London with a population of approximately 8.96 million people, is by far the largest city in the United Kingdom and its respective capital. Firstly in this report we will try to visualise the boroughs of London and their respective crimes numbers.

Secondly we would try to find a suitable place to live/move within the city by comparing the house/rent prices and taking into consideration the criminal data and venues. Finally, we will leverage the power of the Foursquare database to explore what types of venues within a desired area with the one of the lowest criminal activity.

Greater London city

Data

The data used in this report will be criminal records from the London Metropolitan Police Service, Housing and the geolocation data from the Foursquare and Google database and also Statistical GIS data for London.

London Housing Data

The Mayor's 'Housing in London' report sets out the evidence base for his housing policies, summarising key patterns and trends across a wide range of topics relevant to housing in the capital. The report is the evidence base for the Mayor's London Housing Strategy, the latest edition of which was published in May 2018. Housing in London 2020 is divided into nine sections, including six core thematic chapters: • London Housing Strategy monitoring • Key statistics for London boroughs • 1. Demographic, economic and social context • 2. Housing stock and supply • 3. Housing costs and affordability • 4. Housing needs • 5. Mobility and decent homes • 6. The impacts of Coronavirus • Appendices

Source: https://data.london.gov.uk/dataset/housing-london

Foursquare and Google API Data

We will need data about different venues in different neighbourhoods of that specific borough. In order to gain that information we will use "Foursquare" locational information.

Source: https://developer.foursquare.com/

Foursquare is a location data provider with information about all manner of venues and events within an area of interest. Such information includes venue names, locations, menus and even photos. As such, the foursquare location platform will be used as the sole data source since all the stated required information can be obtained through the API.

The data gathered from Google are geographical data. The Longitude and latitude of specific locations that will help us define the boundaries of Boroughs and Wards.

Criminal activity per Borough in London Area

This data counts the number of crimes at three different geographic levels of London (borough, ward, LSOA) per month, according to crime type. Data is available in two

files for each level of geography - the most up to date data covering the last available 24 months only and one covering all historic full calendar years. In March 2019, the Metropolitan Police Service started to provide offences grouped by the updated Home Office crime classifications . This currently only covers the most recent 24 months of data, but historic data using the previous categories is available separately back to January 2008. Below is a list of the crime types covered under the new HO categories (*not available at LSOA level):

Major Category: Minor Category

- Arson and Criminal Damage - Arson / Criminal Damage
- Burglary: Burglary - Business and Community / Burglary - Residential**
- Drug Offences: Drug Trafficking / Possession of Drugs
- Miscellaneous Crimes Against Society: Absconding from Lawful Custody / Bail Offences / Bigamy / Concealing an Infant Death Close to Birth / Dangerous Driving / Disclosure, Obstruction, False or Misleading State / Exploitation of Prostitution / Forgery or Use of Drug Prescription / Fraud or Forgery Associated with Driver Records / Going Equipped for Stealing / Handling Stolen Goods / Making, Supplying or Possessing Articles for use i / Obscene Publications / Offender Management Act / Other Forgery / Other Notifiable Offences / Perjury / Perverting Course of Justice / Possession of False Documents / Profitting From or Concealing Proceeds of Crime / Soliciting for Prostitution / Threat or Possession With Intent to Commit Crimina / Wildlife Crime
- Possession of Weapons: Other Firearm Offences / Possession of Firearm with Intent / Possession of Firearms Offences / Possession of Other Weapon / Possession of Article with Blade or Point
- Public Order Offences: Other Offences Against the State, or Public Order / Public Fear Alarm or Distress / Racially or Religiously Aggravated Public Fear / Violent Disorder
- Robbery: Robbery of Business Property / Robbery of Personal Property
- Sexual Offences*: Other Sexual Offences / Rape
- Theft: Bicycle Theft / Other Theft / Shoplifting / Theft from Person
- Vehicle Offences: Aggravated Vehicle Taking / Interfering with a Motor Vehicle / Theft from a Motor Vehicle / - Theft or Taking of a Motor Vehicle
- Violence Against the Person: Homicide / Violence with Injury / Violence without Injury

Note: Fraud data was transferred from individual police forces to National Action Fraud in March 2013 **Prior to April 2017, police recorded burglary offence categories were split such that dwellings (domestic burglary) and buildings other than dwellings (non-domestic burglary) were separately identifiable, where: • domestic burglary covers residential premises, including attached buildings such as garages • non-domestic burglary covers non-residential premises, including businesses and public

buildings, as well as non-attached buildings within the grounds of a dwelling, such as sheds and detached garages From April 2017 onwards a new classification of police recorded burglary was introduced, dividing offences into two categories of "residential" and "business and community". "Residential" burglary includes all buildings or parts of buildings that are within the boundary of, or form a part of, a dwelling and includes the dwelling itself, vacant dwellings, sheds, garages, outhouses, summer houses and any other structure that meets the definition of a building. It also includes other premises used for residential purposes such as houseboats, residential care homes and hostels. "Business and community" burglary includes all buildings or parts of buildings that are used solely and exclusively for business purposes or are otherwise entirely outside the classification of residential burglary.

Source: https://data.london.gov.uk/dataset/recorded_crime_summary

Statistical GIS Boundary Files for London

Greater London Authority (GLA)

The Zip folder contains a range of key GIS boundary files for ESRI and Map Info covering Greater London.

The folder includes:

- Output Area (OA) 2011,

- Lower Super Output Area (LSOA) 2004 and 2011,

- Middle Super Output Area (MSOA) 2004 and 2011,

- London Wards (two files: City of London merged into single area and split into seperate wards). There are separate download file for 2014 & 2018 boundaries.

- London Boroughs

Note: The OA to MSOA boundaries have been generalised to reduce file size/loading time.

On maps created using these boundaries the copyright must be stated. This is: "Contains National Statistics data © Crown copyright and database right [2015]" and "Contains Ordnance Survey data © Crown copyright and database right [2015]"
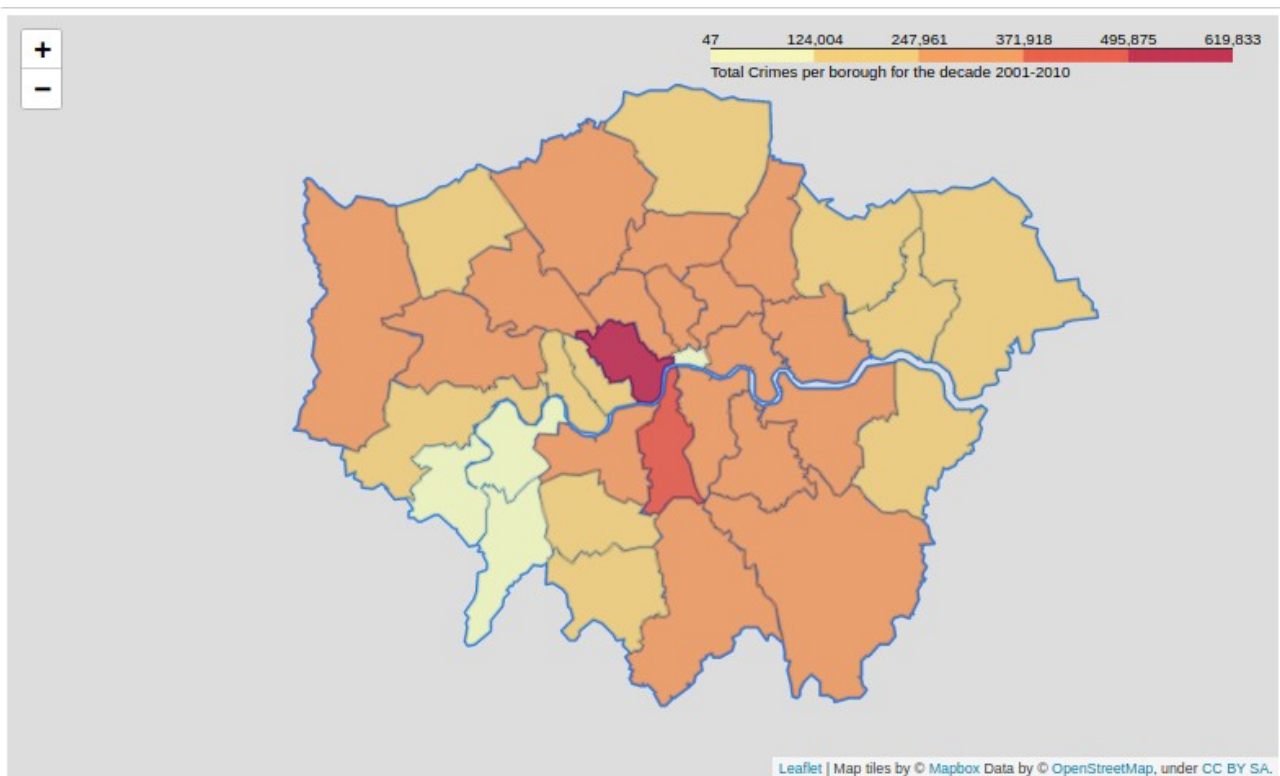
source: https://data.london.gov.uk/dataset/statistical-gis-boundary-files-london

Methodology

The approach taken in this report was to firstly analyse the criminal data in London,in order to distinguish the areas that are safer or more dangerous to live in. We used the Criminal activity dataset to distinguish the areas that are safer in high level to consider for moving purposes. The data is recorder for a duration of a decade between 2010 and 2010. This data was used as it is the most up to date. Let us havee a look at the crimes per Borough in London in the image below, which highlights the overall crime occurrences. These include all the major categories and their subs.

	Borough	Total Crimes			Borough	Total Crimes
0	Barking and Dagenham	189069		18	Kensington and Chelsea	214013
1	Barnet	264563		19	Kingston upon Thames	119253
2	Bexley	162583		20	Lambeth	374449
3	Brent	274466		21	Lewisham	274306
4	Bromley	248549		22	Merton	144455
5	Camden	370168		23	Newham	333159
6	Croydon	303534		24	Redbridge	224837
7	Ealing	307770		25	Richmond upon Thames	122038
8	Enfield	234849		26	Southwark	359458
9	Greenwich	262733		27	Sutton	131599
10	Hackney	304259		28	Tower Hamlets	284135
11	Hammersmith and Fulham	223792		29	Waltham Forest	253477
12	Haringey	287274		30	Wandsworth	264430
13	Harrow	149344		31	Westminster	619832
14	Havering	180024		32	City of London	47
15	Hillingdon	258081				
16	Hounslow	236538				
17	Islington	299161				

Overall crime occurences per Borough in London, United Kingdom

As it is difficult to visualize the data only by their arithmetic values I have constructed a useful map,to visualize the information and depict the severity of the criminal rates in each Borough:

Total Crimes per borough for the decade 2001-2010

| 47 | 124,004 | 247,961 | 371,918 | 495,875 | 619,833 |

Criminal activity map

From the analysis performed the safest boroughs in London were found to be:

- City of London

- Kingston upon Thames

- Richmond upon Thames

On the other hand The most dangerous boroughs of London are :

- Westminster

- Lambeth

- Around the city centre.

So it is advisable to avoid being in the dangerous zones depending on ones personal situation and preferences. The center offers plenty of conveniences compared to other regions but it has to be a validated decision especially in regards of criminal activity.
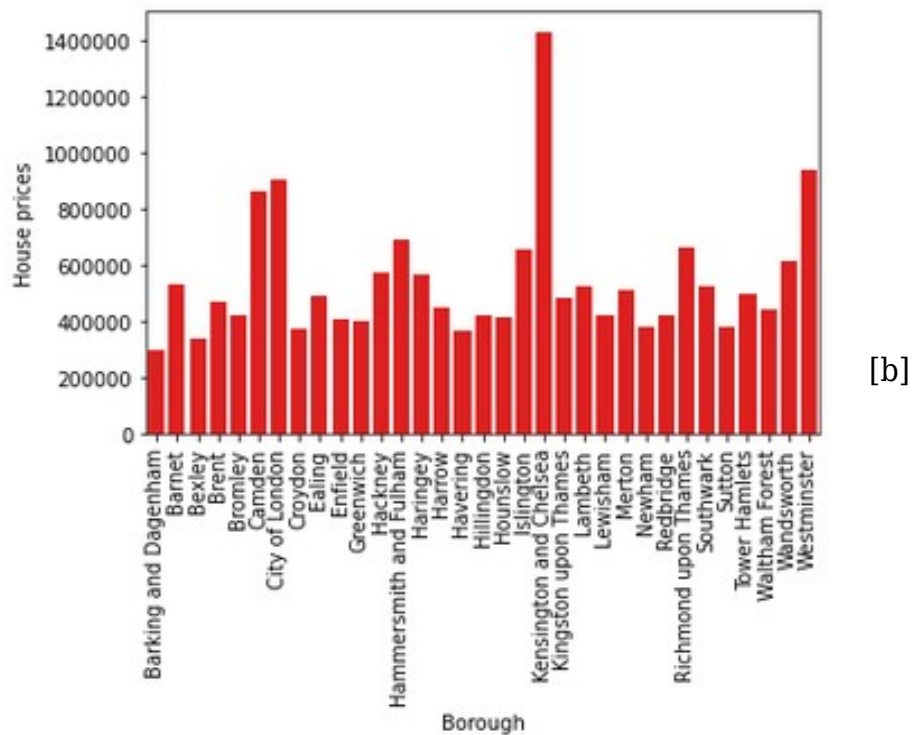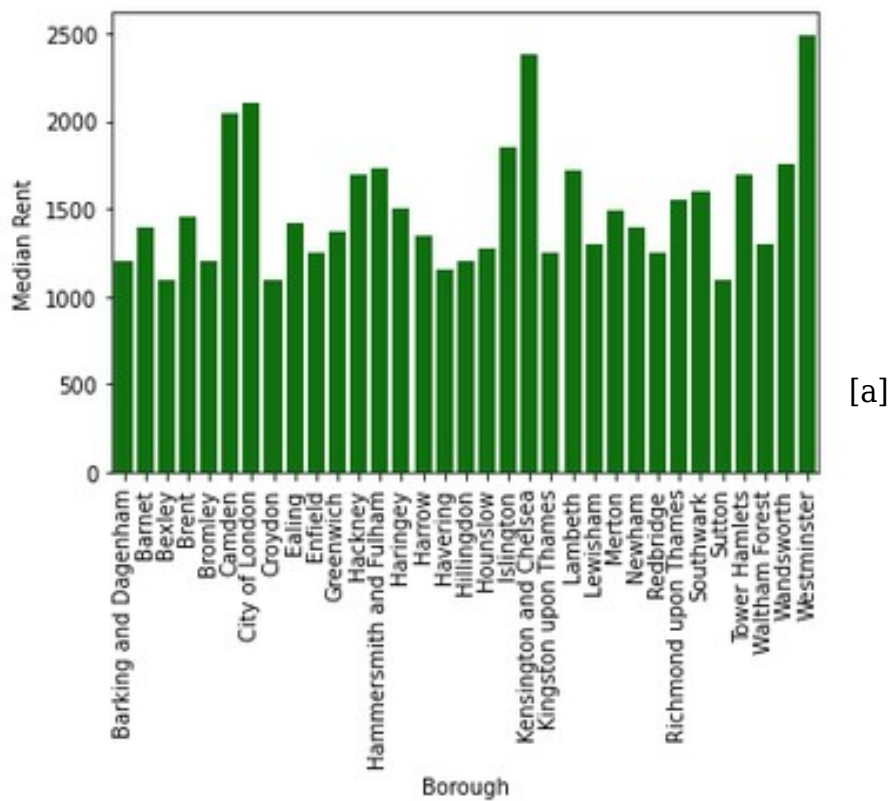
Housing prices in London

Housing in London can be a nightmare so we have given an overview in the table below. Rental Prices vary from £1100-£2,493 per month. Housing prices vary from £295,744-£1,428,517. An extra indicator that can be seen in the table is the median annual salary in the designated areas. This provides a clear estimation of the salary amount you will need to be earning in order to support yourself in each borough.
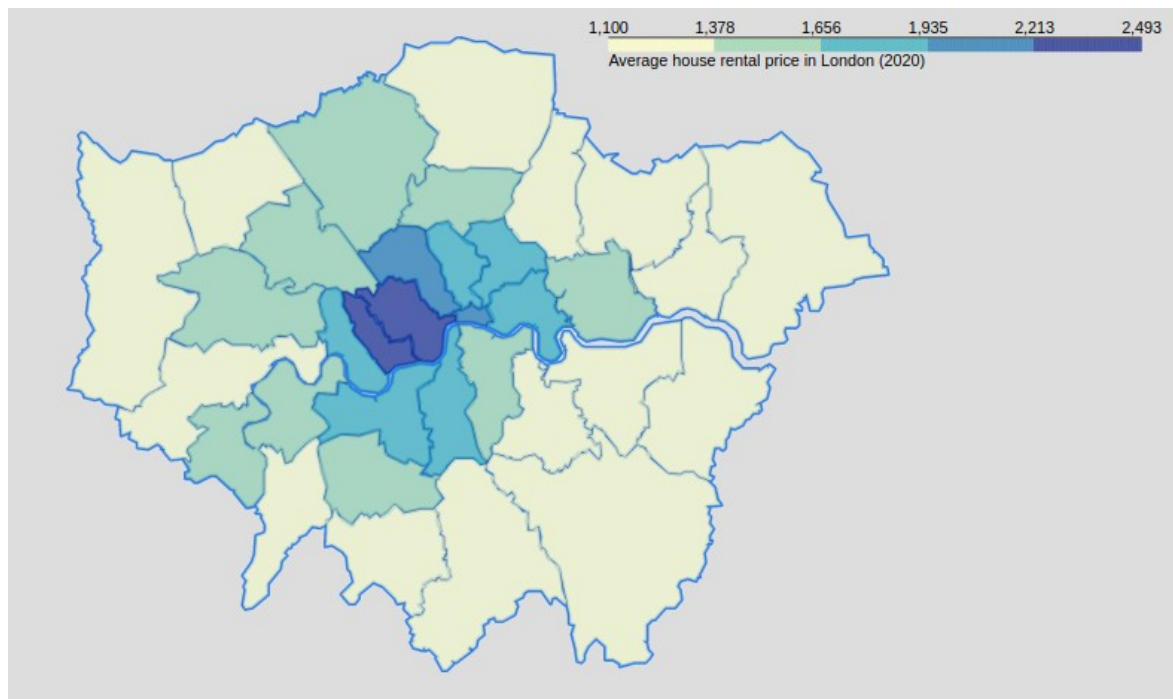
Borough	Sector	Median Private Rent (ONS) (2019/20)	House Prices (May 2020 - UKHPI)	Median annual full-time gross pay 2019, residence-based	Median house price to median earnings ratio, 2019
Barking and Dagenham	Outer	£1,200	£295,744	£29,454	11.0
Barnet	Outer	£1,400	£532,503	£36,287	16.3
Bexley	Outer	£1,100	£339,408	£36,657	11.2
Brent	Outer	£1,450	£466,574	£31,664	15.7
Bromley	Outer	£1,200	£420,036	£41,009	13.8
Camden	Inner	£2,050	£862,209	£42,125	19.2
City of London	Inner	£2,102	£899,831	NaN	14.9
Croydon	Outer	£1,100	£369,791	£34,890	11.1
Ealing	Outer	£1,425	£490,596	£31,676	15.3
Enfield	Outer	£1,250	£408,018	£32,903	14.5
Greenwich	Outer	£1,375	£402,463	£36,015	13.8
Hackney	Inner	£1,700	£572,410	£35,926	16.6
Hammersmith and Fulham	Inner	£1,733	£688,761	£41,706	19.5
Haringey	Inner	£1,500	£563,752	£35,769	17.0
Harrow	Outer	£1,350	£449,553	£35,525	14.2
Havering	Outer	£1,150	£367,809	£33,843	11.3
Hillingdon	Outer	£1,200	£422,073	£31,457	11.8
Hounslow	Outer	£1,275	£416,681	£34,559	11.3
Islington	Inner	£1,850	£652,895	£43,533	14.6
Kensington and Chelsea	Inner	£2,383	£1,428,516	£46,562	39.6
Kingston upon Thames	Outer	£1,250	£480,619	£38,575	15.3
Lambeth	Inner	£1,720	£523,127	£36,896	14.5
Lewisham	Inner	£1,300	£423,031	£33,830	13.4
Merton	Outer	£1,495	£513,216	£37,925	14.8
Newham	Inner	£1,400	£376,579	£31,694	12.2
Redbridge	Outer	£1,250	£423,193	£35,294	14.8
Richmond upon Thames	Outer	£1,550	£664,536	£43,118	18.3
Southwark	Inner	£1,600	£525,473	£39,183	13.9
Sutton	Outer	£1,100	£376,155	£36,093	11.6
Tower Hamlets	Inner	£1,700	£498,228	£42,602	10.6
Waltham Forest	Outer	£1,300	£443,510	£34,911	14.5
Wandsworth	Inner	£1,750	£615,207	£43,470	18.4
Westminster	Inner	£2,492	£937,356	£44,711	21.8

Median renting, housing and salary earnings per borough in London

If the option is to rent a house or room in London someone might expect to pay about 1k to claim one in the outskirts of the city. The same applies for those looking for purchasing a home.
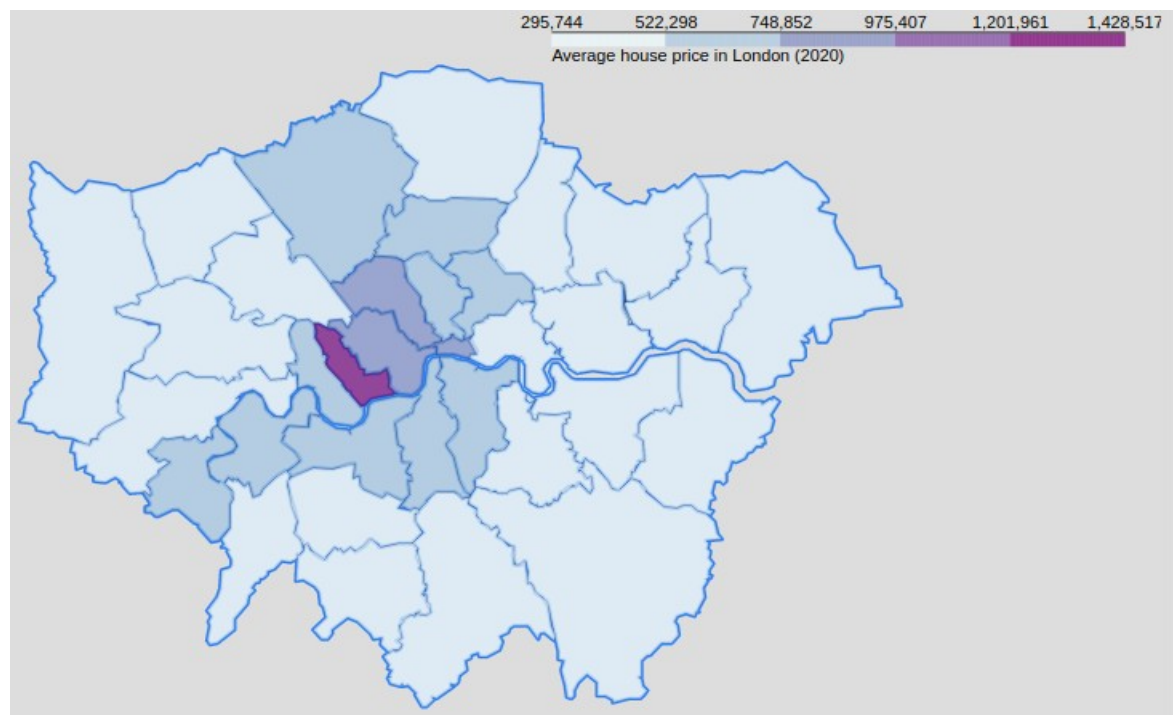
[a]

[b]

Comparison of boroughs and their respective (a)rental and (b)housing prices

Average house rental price in London (2020)

1,100   1,378   1,656   1,935   2,213   2,493

[a]

Again from the map visualization we are able to see that the cheaper regions are near the outskirts.

Average house price in London (2020)

295,744   522,298   748,852   975,407   1,201,961   1,428,517

[b]

Borough maps in regards to average (a)rental
and (b)purchase prices

For demonstration purposes we will try to pick a Borough that has low criminal activity and has also relatively cheap housing. Let us pick the Borough of Kingston upon Thames. We will use the Foursquare data to find venues in a specific Ward of that region. Let us see the criminal activity data in each of the 14 Wards below:

Ward Name	Crimes
Alexandra	3905
Berrylands	4137
Beverley	7656
Canbury	6778
Chessington North and Hook	4721
Chessington South	5828
Coombe Hill	5615
Coombe Vale	3330
Grove	38718
Norbiton	9382
Old Malden	3104
St James	3679
St Mark's	7621
Surbiton Hill	3963
Tolworth and Hook Rise	6600
Tudor	4216

Wards and crime distribution in Kingston upon Thames[4]

By observing the values we can select the Ward of Old Malden as the safest option of all and explore the nearby venues. By using Foursquare we managed to find just 4 venues as can be seen below:

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Old Malden	51.382484	-0.25909	Malden Manor Railway Station (MAL)	51.385210	-0.261264	Train Station
1	Old Malden	51.382484	-0.25909	The Manor	51.384902	-0.262429	Pub
2	Old Malden	51.382484	-0.25909	The Southern PAT Co.Ltd	51.379412	-0.256275	Construction & Landscaping
3	Old Malden	51.382484	-0.25909	The Manor Chippy	51.384961	-0.263321	Food

Because the venues are few we can not apply any clustering algorithms, but instead we can obtain insights about the available places around that area, which still serves the purpose of knowing what types of venues will be near your potential residential area.

Finally we can analyse and compare Boroughs and Wards as an extension of this research.

Results

If a decision needs to be made regarding house selection the data suggests that the outskirts are your best option as in most cases it is safer and cost effective. Transport is easy by train as there is a well developed network throughout the country, which can be an additional feature to the decision making process.

Overall the data analysis for London has provided solutions to the following list of questions. This research can be extremely useful for

- People trying to move to London to buy a house or rent

- For people looking for employment in order to pick safe locations

- As a reference of which areas have less criminal activity or are more dangerous

- As a reference to view the types of crimes in each Borough and Ward.

- To explore the venues nearby a specific geographical region.

Discussion

The major purpose of this project, is to find a better Ward in London for the people who are moving there. The analysis presented takes into consideration the criminal activity, housing prices and the venues in each Ward. Other things have been excluded but not on purpose. The factors someone might also include are age groups Connectivity to the airport, bus stands, markets and other daily things nearby.

Conclusion & Future Work

In this project, using k-means cluster algorithm I separated the Ward into a cluster from dataset latitude and longitude, which have very-similar wards around them. Using the charts above for each ward based on average house prices and criminal data. This project can be continued for making it more search specific and automated. Best means on the basis of all required things (daily needs or things we need to live a better life) around and also in terms of cost effectiveness.

References

[1] Foursquare API,

https://developer.foursquare.com/

[2] Housing Datasets,2020,

 https://data.london.gov.uk/dataset/housing-london

[3]Criminal activity in London,2001-2010,
https://data.london.gov.uk/dataset/recorded_crime_summary

[4] Map of Kingston upon thames,
https://www.kingston.gov.uk/downloads/download/560/ward_map

[5]London GIS data,
 https://data.london.gov.uk/dataset/statistical-gis-boundary-files-london