1. Introduction

In this situation, the implementation of machine learning software is desperately required to help home buyers' customers in Manchester make sensible, successful decisions. As an outcome, the business concern we are currently presenting is: in this unpredictable economic and political equation, how could we aid home buyers' customers in purchasing appropriate property in Manchester?

To overcome this investment issue, we will be clustering Manchester neighbourhoods to suggest areas and the latest average real estate price where homebuyers may make an investment in real estate. They would propose attractive locations dependent on services and essential facilities surrounding these locations, i.e. elementary schools, secondary schools, pharmacies & department stores.

The Manchester Housing industry was in negative spiral as per ManchesterEveningNews reporting. This now poses a variety of diverse downturns, including the possibility of higher taxation and a Reserve bank report the U.K. In the case of a disruptive withdrawal from the United Kingdom, house prices could fall by much more than as 30 per cent. In fact, four ignored cracks suggest that the Manchester market will only get worse.

2. Data

Information is collected from the HM Land Registry on Manchester property and the relative valuation-paid Information (http:/landregistry.data.gov.uk/). The following fields provide the address details used in Price Paid Details: Postcode; Primary Addressable Object Number PAON. The house number or designation typically; SAON Secondary Addressable Object Number.

For e.g., if there is a sub-floor, the floor would be divided into flats, a SAON; Street; Locality; Town / City; District; County. To identify and select preferred locations through different sites based on the availability of services and essential facilities, we can view data via the Foursquare API platform and configure it as a visualization data frame.

Through combining data on Manchester property and relative price charged data from the HM Land Registry and data on services and critical infrastructure covering such assets from the Foursquare API app, we would be able to suggest successful real estate investments.

3. Methodology

The Methodology section will describe the main components of our analysis and predication system. The Methodology section comprises four stages:

1. Collect Inspection Data

2. Explore and Understand Data

3. Data preparation and pre-processing

4. Modelling

1. Collect Inspection Data

The data is collected from the HM Land Registry on Manchester property and the relative valuation-paid Information (http:/landregistry.data.gov.uk/).

2. Explore and understand the data

We read the dataset that we collected from the HM Land Registry website into a pandas' data frame and display the data.

3. Data preparation and processing

At this stage, we prepare our dataset for the modelling process, opting for the most suitable machine learning algorithm for our scope. Accordingly, we perform the following steps:

- Rename the column names
- Format the date column
- Sort data by date of sale
- Select data only for the city of Manchester

- Make a list of street names in Manchester
- Calculate the streetwise average price of the property
- Read the streetwise coordinates into a data frame, eliminating recurring word Manchester from individual names
- Join the data to find the coordinates of locations which fit into client's budget
- Plot recommended locations on Manchester map along with current market prices

4. Modelling

After exploring the dataset and gaining insights into it, we are ready to use the clustering methodology to analyse real estates. We will use the k-means clustering technique as it is fast and efficient in terms of computational cost, is highly flexible to account for mutations in real estate market in Manchester and is accurate.

4. Results and Discussion section

Therefore, while the Manchester Housing Market are still in a state of slump, this is still an "ever-green" for sector. We will be presenting our observations from two different perspectives.

Next, we will investigate them by neighbourhood / Manchester city. It is interesting to note that while West Manchester (Eccles, Irlam, Swinton, Stretford, Warrington, Newton-le-Willows) South Manchester (Fallowfield, Didsbury, Newall Green) could possibly have be considered highly profitable venues to purchase a real estate according to amenities and essential facilities surrounding such venues i.e. elementary schools, high schools, hospitals & grocery stores, North East Manchester (Strangeways, Stanycliffe, Huddersfield) are arising as next future elite venues with a wide range of amenities and facilities. Accordingly, one might target under-priced real estates in these areas of Manchester in order to make a business affair.

Lastly, we can be able to evaluate our findings based on the five clusters that we created. While an ideal selection of services and utilities should be celebrated by both classes, we have noticed two major trends. The first series, to which we relate, i.e. Clusters 0 growing target home buyers who are likely to live near to clothing store, liquor market, supermarket areas. Instead we are referring to the second sequence, i.e. i.e. Clusters 1 may target individuals who love gym, coffee shop, baseball. Cluster 2 may be for individuals who love Steakhouse, Pub, Lounge, Bar. Cluster 3 is for individuals who love Indian, Afghan, French Restaurants, Cricket ground, Fitness Center. Finally, Cluster 4 for individuals who love Vietnamese, Chinese Restaurants, Cricket ground, Bar, Coffee Shop.

5. Conclusion

To summarise, the Manchester Housing Market is in a recession, according to ManchesterEveningNews. It faces some separate headwinds now, including the threatof rising taxation and a Reserve Bank notice that U.K. In the case of a chaotic departure from the European Union, home prices could plunge by as much as 30 per cent. Under this case, the use of machine learning software is imperative under order to assist homebuyer’s clientele in Manchester to make wise and effective decisions. As a result, the business problem we were posing was: how could we provide support to homebuyer’s clientele in to purchase a suitable real estate in Manchester in this uncertain economic and financial scenario?

To overcome this business issue, we've grouped Manchester communities to suggest areas and the existing average real estate price where homebuyers may make an investment in real estate. We proposed attractive locations focused on services and critical infrastructure surrounding these areas, i.e. primary schools, middle schools, hospitals & grocery stores.

First, we gathered data on Manchester properties and the relative price paid data were extracted from the HM Land Registry (http://landregistry.data.gov.uk/). Moreover, to explore and target recommended locations across different venues according to the presence of amenities and essential facilities, we accessed data through Foursquare API interface and arranged them as a data frame for visualization. By merging data on Manchester properties and the relative price paid data from the HM Land Registry and data on amenities and essential facilities surrounding such properties from Foursquare API interface, we were able to recommend profitable real estate investments.

Second, The Methodology section comprised four stages: 1. Collect Inspection Data; 2. Explore and Understand Data; 3. Data preparation and pre-processing; 4. Modelling. In the modelling section, we used the k-means

clustering technique as it is fast and efficient in terms of computational cost, is highly flexible to account for mutations in real estate market in Manchester and is accurate.

Eventually, we reached the conclusion that while Manchester Housing Market might be in a recession, corporate relations are still an "ever-green." We discussed our findings from two different viewpoints. First, we looked at them by community / Manchester city. Though south of Manchester (Eccles, Irlam, Swinton, Stretford, Warrington, Newton-le-Willows) (Fallowfield, Didsbury, Newall Green) Highly lucrative areas for the acquisition of real estate may likely have been regarded due to the services and critical infrastructure accompanying these locations, i.e. primary schools, high schools, hospitals & retail stores, North East Manchester (Strangeways, Stanycliffe, Huddersfield) appear as potential affluent areas with a broad variety of services and infrastructure. Accordingly, to make a business affair, one might target under-priced real estate in those areas of Manchester. Second, we were evaluating our findings on the basis of the five clusters we created. Every Cluster was intended to display a cluster's function as stated in the segment on the outcome.