



# CAPSTONE PROJECT

BATTLE OF THE NEIGHBOURHOODS: OXFORD

# BACKGROUND AND BUSINESS PROBLEM:

## Background

According to recent news, the UK Housing Market is facing something of a rut....

1. BofE warning that house prices could fall by up to 15%
2. Risks of purchasing a property include: hidden price falls, record-low sales, and tax hikes for overseas buyers

## Business Problem

- How can prospective homeowners have confidence in their purchasing decisions?
- We will attempt to use a machine learning approach to provide useful information to prospective homebuyers in Oxford. This should help them make more informed decisions in this uncertain economic times.
- We will attempt to cluster Oxford neighbourhoods and discover their average prices to help prospective homeowners isolate areas of interest within a specified budget.
- We will also recommend neighbourhoods according to their proximity to amenities such as schools, restaurants and supermarket.

# DATA

- Data on the price paid per property in Oxford will be extracted from the HM Land Registry (<http://landregistry.data.gov.uk/>).
- FourSquare API will be used to create dataframes that explore the addresses that correlate to our budget across different amenities.
- We can then attempt to merge the dataframe of average house prices per neighbourhood with the dataframe containing amenities surrounding the neighbourhood to create a clearer picture of the neighbourhood.

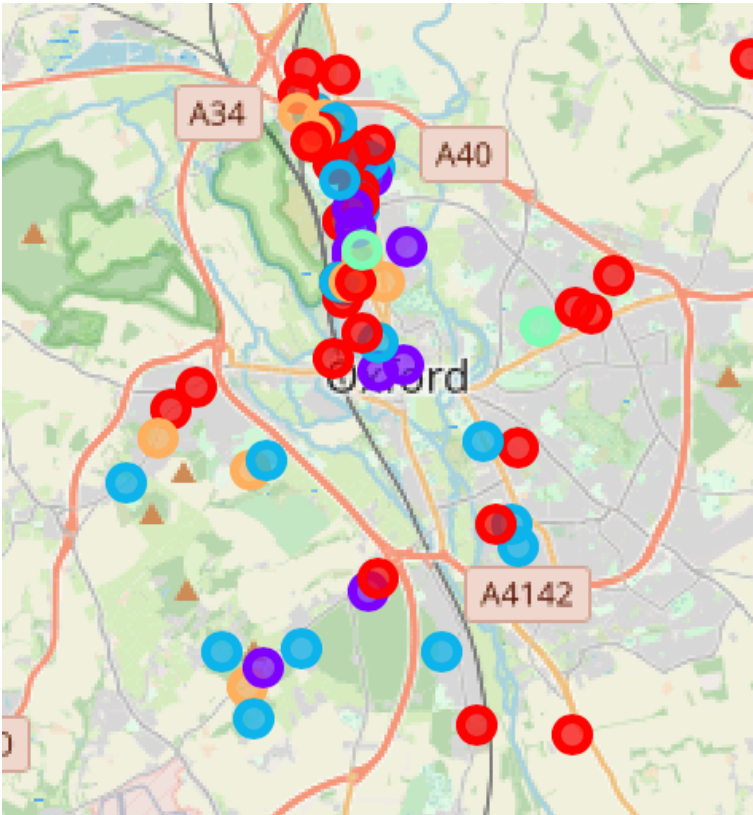
# METHODOLOGY SECTION

- Collection and Inspection of the HM Registry Data
- Explore and Understand the Data
- Data preparation and pre-processing
- Modeling – k-means clustering covered in other coursera courses

# OUTCOME- EXAMPLES

Address	Avg_Price	latitude	longitude	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7
Abberbury Road, Rose Hill, Oxford, Oxfordshire...	1.300000e+06	51.729141	-1.231905	2	Pub	Pizza Place	Grocery Store	Hotel	Market	Pie Shop	P
Abbey Road, St Thomas', Jericho, Binsey, Oxford...	1.093571e+06	51.754069	-1.271886	0	Pub	Nightclub	Hotel	Hostel	Bar	Indian Restaurant	S
Apsley Road, Upper Wolvercote, Sunnymead, Oxford...	1.600000e+06	51.784431	-1.270881	2	Hotel	Pharmacy	American Restaurant	Market	Pizza Place	Pie Shop	F
Badger Lane, Hinksey Hill, South Hinksey, Vale...	2.275000e+06	51.723388	-1.264087	1	Hotel	American Restaurant	Market	Pizza Place	Pie Shop	Pharmacy	F

	Avg_Price	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
2	1.093571e+06	Pub	Nightclub	Hotel	Hostel	Bar	Indian Restaurant	Sandwich Place	Burger Joint	Park	Cocktail Bar
52	1.187000e+06	Gym / Fitness Center	Snack Place	Hotel	Park	Indian Restaurant	Pizza Place	Pie Shop	Pharmacy	Pet Store	Noodle House
62	1.250000e+06	Hotel	Grocery Store	Wine Shop	Coffee Shop	Pizza Place	Bakery	Farmers Market	Middle Eastern Restaurant	Nightclub	Movie Theater
96	1.001000e+06	Grocery Store	Sandwich Place	Bus Stop	Supermarket	Pub	Coffee Shop	Chinese Restaurant	Café	Pizza Place	Pharmacy
120	1.050000e+06	Hotel	Grocery Store	Gym / Fitness Center	Coffee Shop	Pizza Place	Concert Hall	Hotel Bar	IT Services	Home Service	Plaza





# RESULTS AND DISCUSSION

- Plenty of opportunity for prospective home-owners to move to Oxford.
- Areas can be tailored to interest within the budget, so lots of choice! All clusters have a good range of amenities within the range set.
- Clusters 1, 3 and 4 may be of more interest to prospective home-owners who value green spaces with the common venues of Parks appearing more often. Clusters 0 and 2 may be of more interest to those who prefer dining out and proximity to pubs.
- When the addresses have a larger range of restaurants, transport links and proximity to a hospital, the average price of the property increases too.

# CONCLUSION

- Finally, we can conclude that despite possible economic uncertainty, that Oxford is still an appropriate place to purchase a home.
- Examining neighbourhoods showed us that there are suitable properties with the budget set.
- Through examining the clusters we formed, there is also a lot of choice for prospective home-owners with the clusters showing a good range of amenities for each within the range.