**Capstone Project – The Battle of Neighborhoods**

# North-East UK region
# home buyer guide.

# Introduction/Business Problem

❑ North-East of UK region  covers Northumberland, County Durham, Tyne and Wear, and the area of the former county of Cleveland in North Yorkshire.

❑ Its fast growing region with has several big international company's offices/plants locations.
❑ Quite often employees from another countries/regions are coming to work in local locations of international companies
❑ Its hard to determinate which area is best to rent/buy house in without deep analysis.
❑ To combine analysis potential buyer should use multiple sources of information which is time consuming

❑ There are more than 130 postcode districts to choose from and this guide is aimed to provide data driven approach for finding optimum house location in area.

**Following Data sources are planned to be used in analysis:**

❑ **NE UK postcode list** – CSV file with areas name, demographic and coordinates available for free use from multiple resources.

❑ **Latest property sale prices** in England and Wales - UK Price Paid Data from data.service.gov.uk

❑ **Crime rate** data from Police from data.police.uk

❑ **Foursquare API** to explore selected areas.

https://propertydata.co.uk/postcode-table

- Totally 132 unique postcodes areas

- Applying some additional factors like price, travel distance, crime rate allowed to narrow the list to 32.
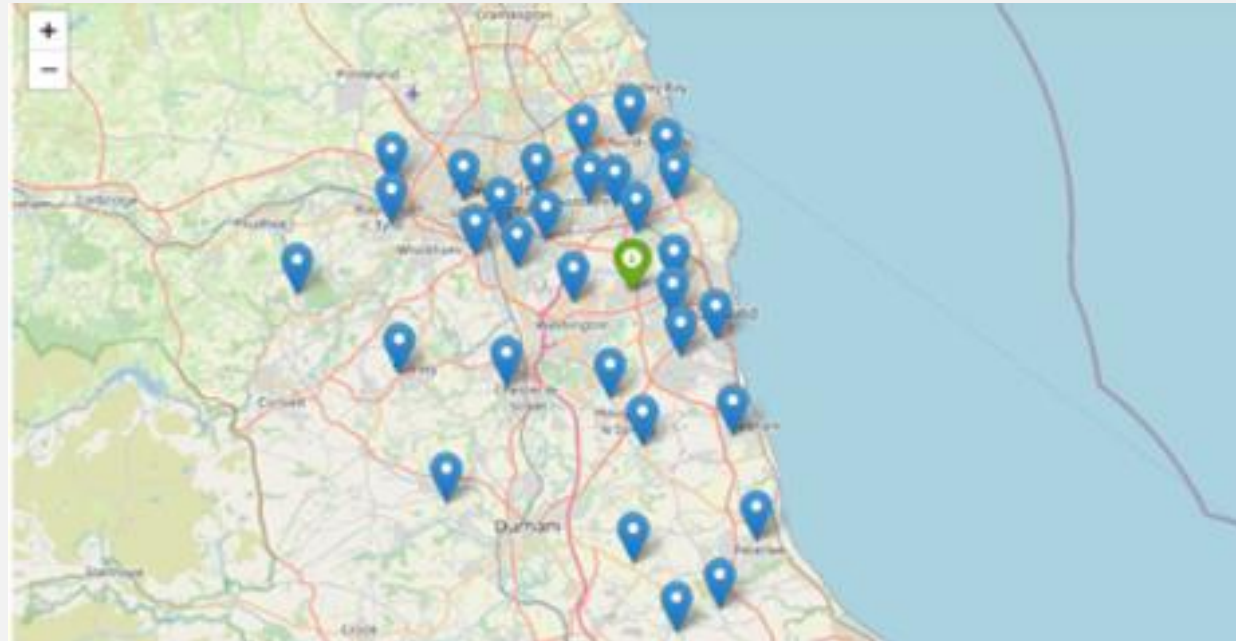
Explore selected postcodes using Foursquare API.

1) Explore top venues within specific radius of postcode coordinates
2) Finding q-ty of venues per postcode area
3) Explore most common venues for each postcode district.

| | Name | 1st Most Common Venue | 2nd Most Common Venue | 3rd Most Common Venue | 4th Most Common Venue | 5th Most Common Venue |
|---|---|---|---|---|---|---|
| 0 | BLYTH_NE24 | Supermarket | Warehouse Store | Soccer Stadium | Grocery Store | Italian Restaurant |
| 1 | Blaydon-on-Tyne_NE21 | Grocery Store | Coffee Shop | Supermarket | Business Service | Shopping Mall |
| 2 | Boldon Colliery_NE35 | American Restaurant | Soccer Field | Gastropub | Light Rail Station | Movie Theater |
| 3 | CHESTER LE STREET _DH2 | Construction & Landscaping | Mobile Phone Shop | Indian Restaurant | Doctor's Office | Home Service |
| 4 | DURHAM_DH6 | Campground | Warehouse Store | Dance Studio | Doctor's Office | Dog Run |
| 5 | DURHAM_DH7 | Restaurant | Warehouse Store | Convenience Store | Discount Store | Doctor's Office |
| 6 | Gateshead_NE10 | Supermarket | Gym Pool | Train Station | Gym | Grocery Store |
| 7 | Gateshead_NE11 | Hotel | Warehouse Store | Coffee Shop | Gym | Go Kart Track |
| 8 | Gateshead_NE8 | Gym | Art Gallery | Sandwich Place | Supermarket | Warehouse Store |
| 9 | Gateshead_NE9 | Coffee Shop | Grocery Store | Pub | Indian Restaurant | Pharmacy |
| 10 | HOUGHTON LE SPRING_DH4 | Bar | Italian Restaurant | Martial Arts Dojo | Soccer Field | Warehouse Store |
| 11 | HOUGHTON LE SPRING_DH5 | Indian Restaurant | Stadium | Sports Club | Pet Store | Warehouse Store |
| 12 | Hebburn_NE31 | Soccer Field | Bar | Supermarket | Pub | Italian Restaurant |
| 13 | Jarrow_NE32 | History Museum | Track | Bar | Light Rail Station | Warehouse Store |
| 14 | Newcastle upon Tyne_NE15 | Golf Course | Supermarket | Restaurant | Chinese Restaurant | Warehouse Store |

Example, please see full report for details

Clustering - grouping together a set of objects (postcode areas) in a way that objects in the same cluster are more similar to each other than to objects in other clusters.

K-Means Clustering Algorithm was used.
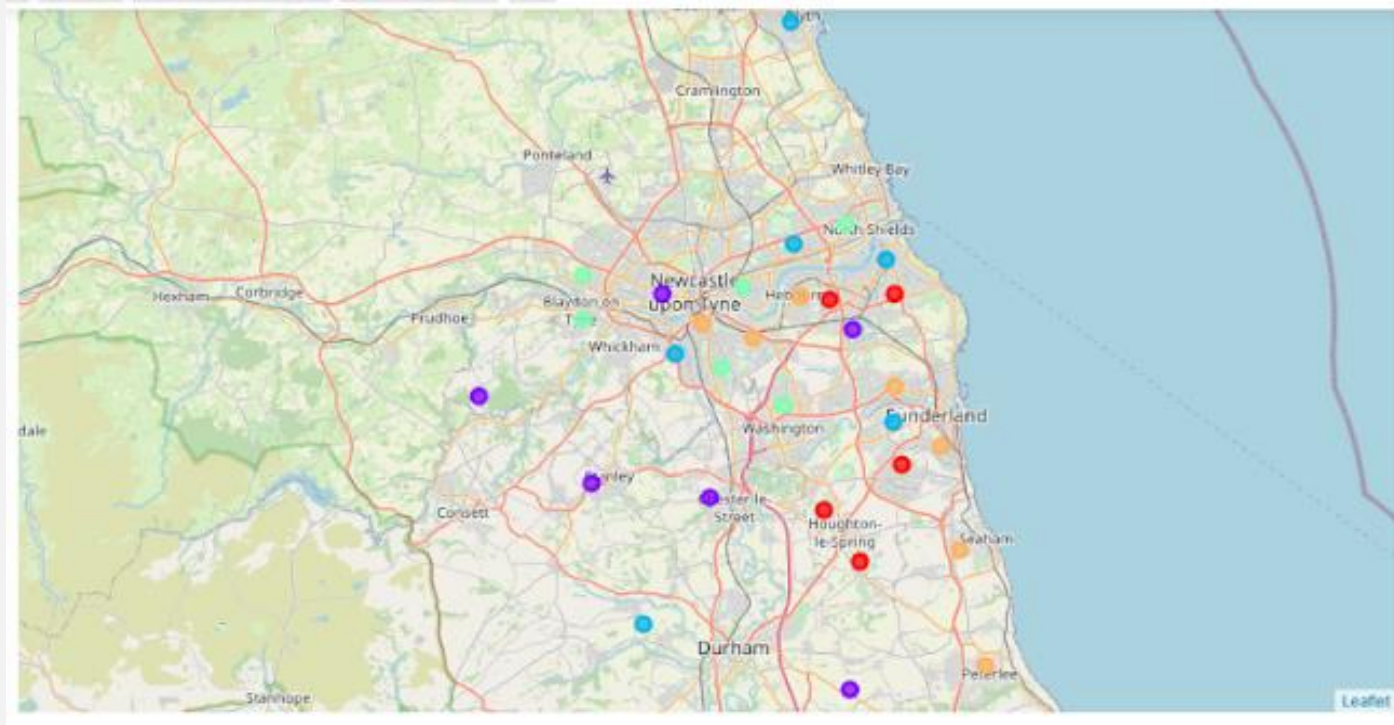
# Results

For new buyer potential list of post codes areas numbers was decreased from 132 to 32.

Based on buyers priority further on following Clusters characteristics can be used to proceed with particular houses details/viewings.

- **First Cluster –** Has significant amount of restaurants.

- **Second Cluster –** More rural area with less restaurants, probably more 'laidback lifestyle'

- **Third Cluster –** Quite in a **middle** between clusters 1 and 2. Has restaurants/shops but has sport facilities and park as well.

- **Fourth Cluster -** Store areas with big malls and supermarkets

- **Fifth Cluster –** Sports/outdoor areas.

## SUMMARY / FUTURE USE

- In this study, north-east UK postcode locations were analysed to narrow the choice potential buyer needs to make in terms of buying a property.

- Postcodes were choosing based on criteria's and clustering was made.

- Based on lifestyle, potential buyer can now choose the cluster and explore details of particular houses in this area. So instead of exploring more than 130 postcode districts, buyer can start exploring 6-7 districts

- Using APIs available from Property selling websites, we also can add specific properties which are on sale.

- As some of the clusters are quite close to each other, recommendation will be to explore 2-3 clusters to list the properties. Using APIs it should be quick process.