Analyzing Neighbourhoods of Manchester For F&B Business

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Source: *https://www.visitbritain.com/gb/en/england/northern-england/manch*

Introduction

Manchester is the one of the biggest cities in UK and UK is the second-most populous country with a population of 2.9 millions that comprise of various people from all over the world with many etnhicities in it.

Business Problem

- Start an food & beverages business
- Neighbourhood that is good for start a new business

Data Collection

- Neighbourhoods of Manchester from Wikipedia page through data scraping
- Geographical coordinates of the neighbourhoods using GeoPy library
- Venue data from FourSquare using FourSquare API

Methodology

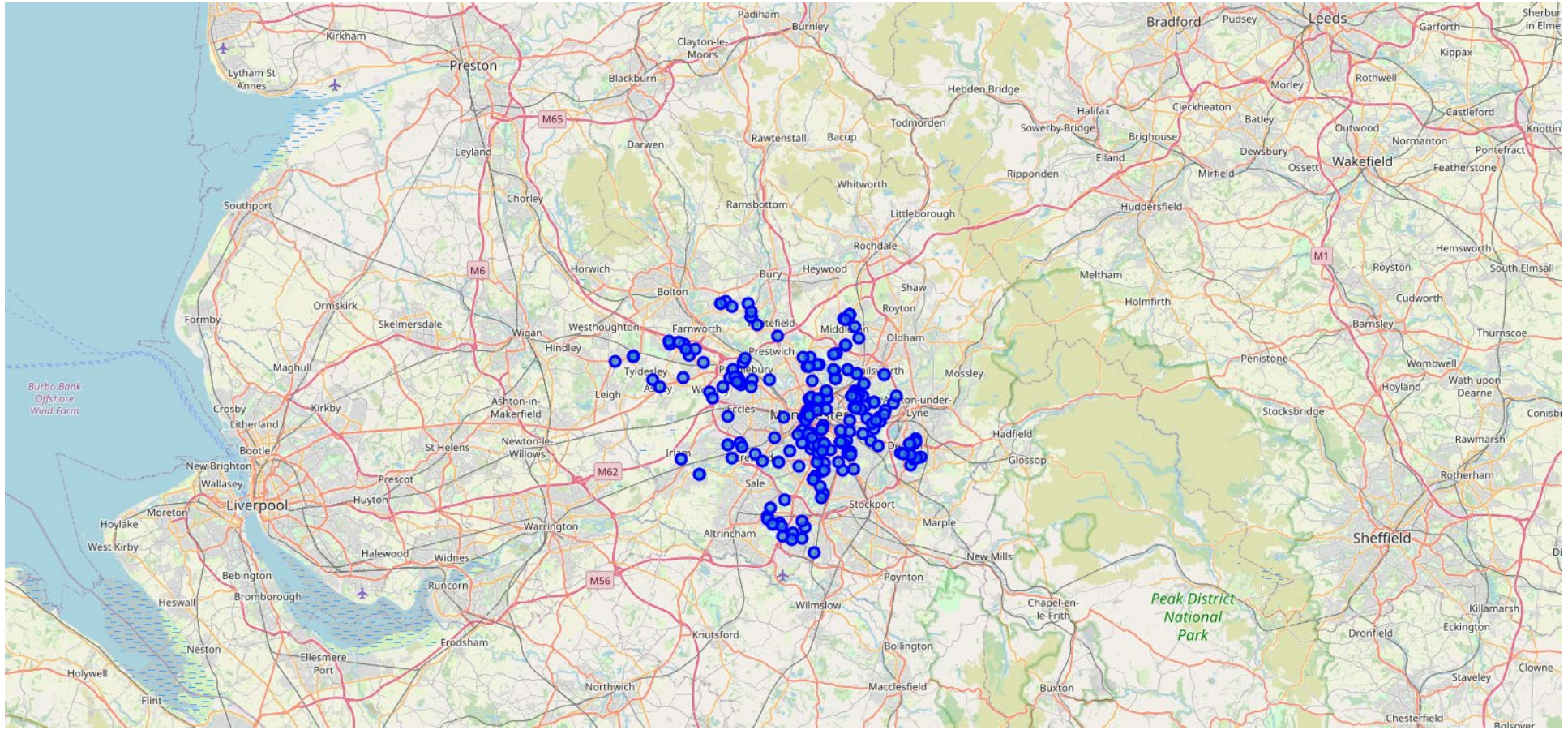
- Feature Extraction
  - Hot Encoding

```
[18] man_hot = pd.get_dummies(explore_man[['Venue Category']], prefix="", prefix_sep="")


     # Add neighbourhood column back to dataframe
     man_hot['Neighbourhood'] = explore_man['Neighbourhood']


     # Move neighbourhood column to the first column
     fixed_columns = [man_hot.columns[-1]] + man_hot.columns[:-1].values.tolist()
     man_hot = man_hot[fixed_columns]

     man_hot.head()
```

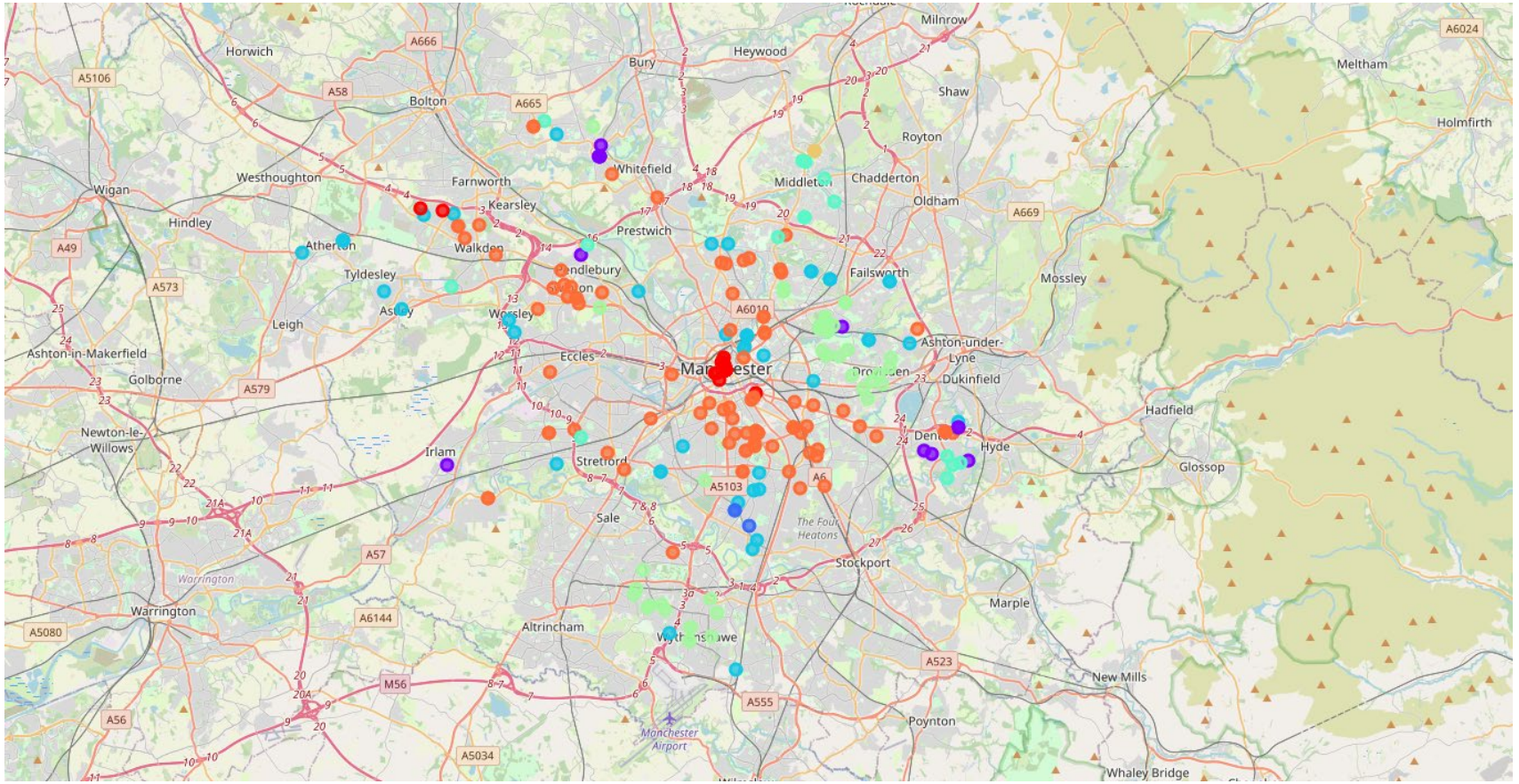
- Unsupervised Learning
  - K-Means Clustering

```
[24] max_range = 15 #Max range 15 (number of clusters)

     from sklearn.metrics import silhouette_samples, silhouette_score


     indices = []
     scores = []

     for man_clust in range(2, max_range) :

         # Run k-means clustering
         man_gc = man_grouped_clustering
         kmeans = KMeans(n_clusters = man_clust, init = 'k-means++', random_state = 0).fit_predict(man_gc)

         # Gets the score for the clustering operation performed
         score = silhouette_score(man_gc, kmeans)

         # Appending the index and score to the respective lists
         indices.append(man_clust)
         scores.append(score)
```

- Plotting
  - Using Folium



- Results
  - Cluster Visualizations



- The neighbourhood that had the most number of food and beverages business was cluster number 4.

- Discussion

  - The best neighbourhoods for starting the food and beverages business are present in cluster 4

  - After studying all four clusters, it is recommended to the client that neighbourhoods such as Brondesbury, Crooked Billet and Burlington Estate that fall in cluster 4 look like good locations for starting their food and beverage business.

  - The client can go ahead and make a decision depending on other factors like availability and legal requirements that are out of scope of this project.

- Conclusion

  - Machine learning and data analysis techniques that used in this project is very helpful in determining solutions of certain business problems

  - Python's libraries such as GeoPy, Folium and BeautifulSoup help us to analyse a geographical location with very easy and effective way

  - The Manchester's neighbourhoods will be a good recommendation of neighbourhoods for our client to start their food and beverages business


THANK YOU