

Analysing areas in Liverpool for opening a new restaurant.

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IBM Applied Data Science Capstone

Introduction:

Liverpool is ranked at No. 6 on the list of the most visited UK cities. It is noted for its culture, architecture, and transport links. The city is closely associated with the arts, especially music; the popularity of the Beatles, widely regarded as the most influential musical act in history, contributed to the city's status as a tourist destination. Since then, Liverpool has continued to produce many notable musicians and record labels—musicians from the city have produced 56 No. 1 hit singles, more than any other city in the world.

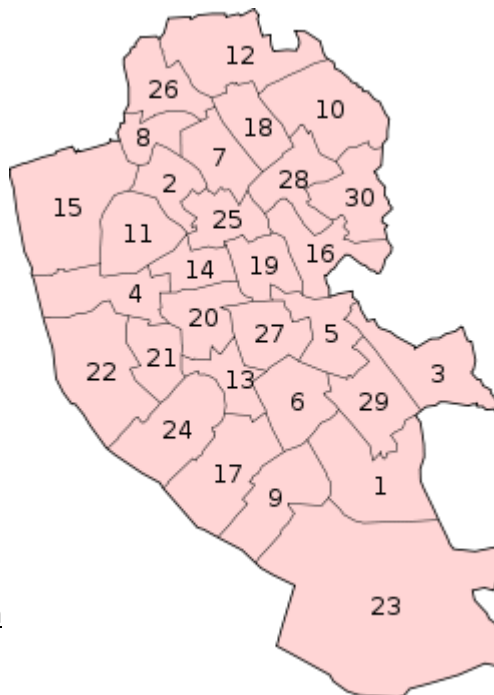
Business opportunity:

Liverpool has a variety of international and local restaurants. In which area or neighbourhood of Liverpool would it be a good place to start a profitable restaurant.

Data sources:

Neighbourhood and areas of Liverpool from Wikipedia:

1. [Allerton and Hunts Cross](#)
2. [Anfield](#)
3. [Belle Vale](#)
4. [Central](#)
5. [Childwall](#)
6. [Church](#)
7. [Clubmoor](#)
8. [County](#)
9. [Cressington](#)
10. [Croxteth](#)
11. [Everton](#)
12. [Fazakerley](#)
13. [Greenbank](#)
14. [Kensington and Fairfield](#)
15. [Kirkdale](#)



16. [Knotty Ash](#)
17. [Mossley Hill](#)
18. [Norris Green](#)
19. [Old Swan](#)
20. [Picton](#)
21. [Princes Park](#)
22. [Riverside](#)
23. [Speke-Garston](#)
24. [St Michaels](#)
25. [Tuebrook and Stoneycroft](#)
26. [Warbreck](#)
27. [Wavertree](#)
28. [West Derby](#)
29. [Woolton](#)
30. [Yew Tree](#)

Geographical coordinates from the areas of Liverpool using GeoPy library.

Venue data from Foursquare API.

Methodology:

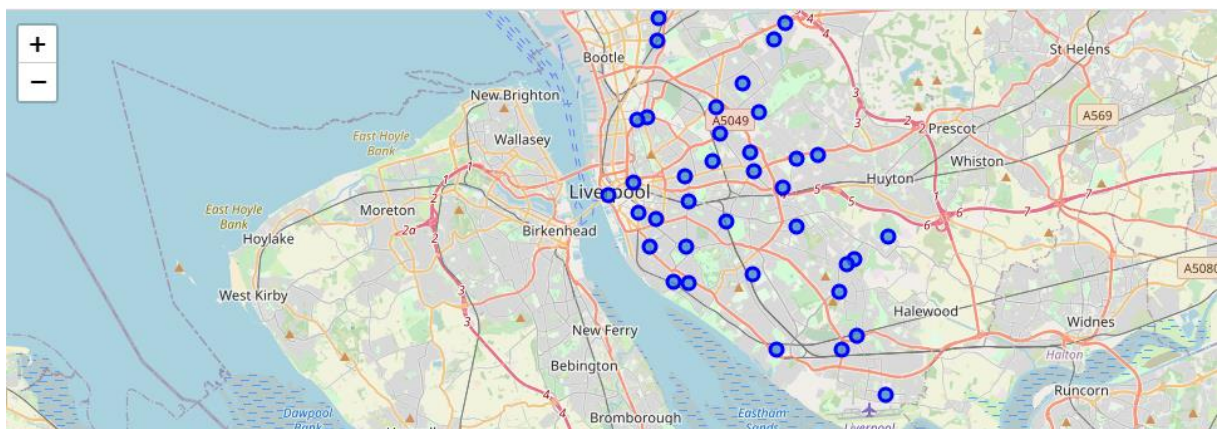
Feature Extraction

- One hot encoding

Unsupervised learning

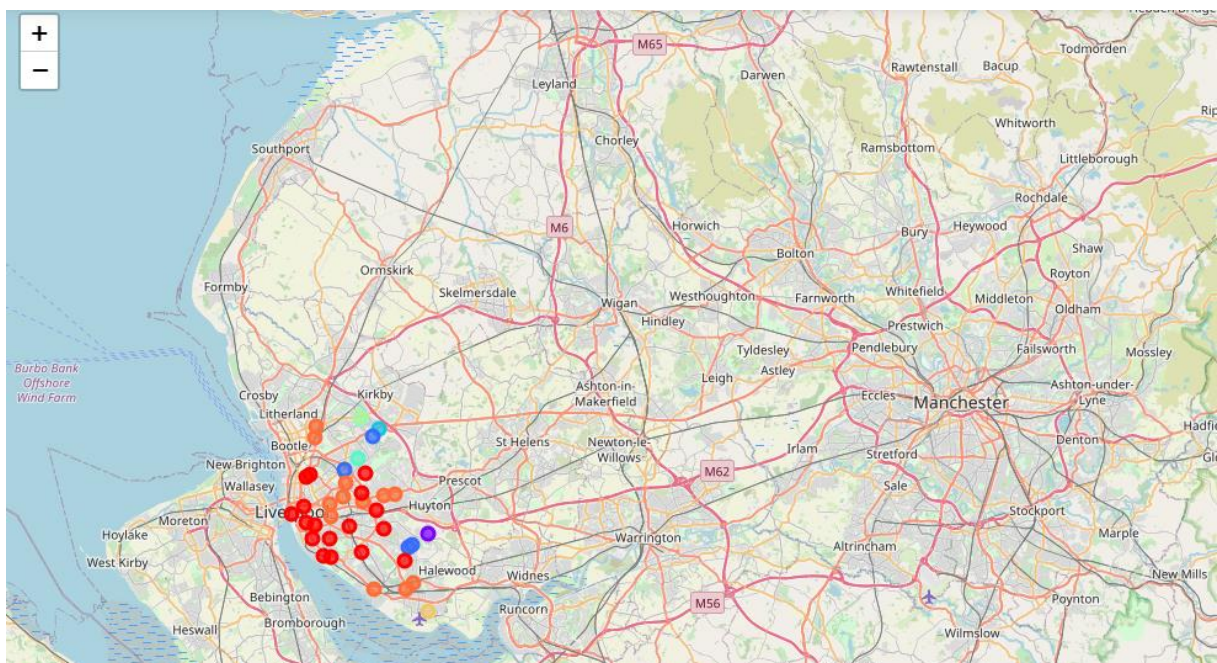
- using K-Means clustering

Plotting with Folium



Results:

Visualization of clusters



As we can see from the clusters, cluster 1 was the cluster with the highest numbers of restaurants. Cluster 1 is also in the most attractive tourist areas of the city.

Discussion:

Most profitable neighbourhood for starting a restaurant would be in cluster 1, Dingle, Garston and Chinatown. Kensington and Fairfield in cluster 8 also came out as potential area of starting a restaurant. Rental and house prices will be an issue, regarding the central areas but this is out of the scope of this project.

The K-Means model worked very well and clustered similar neighbourhoods together.

Conclusion:

Data analysis and visualization of data can be extremely helpful on determine where to start a restaurant, or where to buy a house, amongst other things. Folium and Beautiful soap in Python make it easy to analyse geographical locations. In this project we analysed the areas of Liverpool and was able to find an profitable area where a business owner could start a restaurant.

References:

[Wikipedia](#)

[Foursquare](#)

[Folium](#)