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Applied Data Science

Coursera Capstone Project

Battle of the Neighborhoods:

Location selection for a

Restaurant start-up

INTRODUCTION

Most startups find choosing a location for their businesses difficult. Even after streamlining to a populated City or State, narrowing down to a specific Local Government Area without bias is usually an issue. I aim to solve this issue by Engineering a system that analyses the different areas in a State and gives the Entrepreneur the best possible location to start with.

For this project, **the target audience are restaurants just starting up or planning to open a branch in a new city**. Having had interactions with quite a number of Entrepreneurs facing this dilemma and I am sure the results of this will be useful to them. This analysis assumes that these restaurants target office workers as customers and thus aims to provide feedback that will help in pinpointing areas densely populated with Offices and Organizations. For restaurants startups going into food delivery but with limited resources to go all round the city, I will be suggesting groups of Neighborhoods for them to start with.

This can of course be easily tweaked if need be. One of the aims of this project is to create a system that can be easily modified to suit a new situation.

The selected state for this project is Lagos, Nigeria as it is where I reside currently and I aim to provide a local solution to this problem.

DATA

Getting data for this project was a nigh herculean task but I was successful. I was able to obtain this json file from the HUMANITARIAN DATA EXCHANGE JSON REPOSITORY. It contains the geographical details of Local Government Areas in Nigeria and I plan to extract those of Lagos from it. A section of the .json file is displayed below:


```
{"type":"Feature","geometry":{"type":"Polygon","coordinates":[[[3.332283973693848,6.648791790008602],[3.328931093216056,6.643056869506893],[3.326539993286247,6.623510837554989],[3.31771993637085,6.620203971862793],[3.301352977752799,6.620390892028865],[3.290610074996948,6.627117156982422],[3.286653041839657,6.653451919555721],[3.28961110115057,6.672671794891414],[3.30701494216919,6.657254219055176],[3.317653894424552,6.644631862640495],[3.332283973693848,6.648791790008602]]]},"properties":{"ID_0":163,"ISO":"NGA","NAME_0":"Nigeria","ID_1":25,"NAME_1":"Lagos","ID_2":507,"NAME_2":"Agege","HASC_2":null,"CCN_2":0,"CCA_2":null,"TYPE_2":"Local Authority","ENGTYPE_2":"Local Authority","NL_NAME_2":null,"VARNAME_2":null}},{"type":"Feature","geometry":{"type":"Polygon","coordinates":[[[3.307024002075252,6.477795124054069],[3.3164160251618,6.482667922973633],[3.326337099075317,6.482730865478516],[3.338913917541618,6.475834846496696],[3.342958927154598,6.455029010772762],[3.331623077392578,6.452916145324821],[3.322557926178035,6.446716785430908],[3.312277078628597,6.454857826232967],[3.306322097778434,6.471779823303223],[3.307024002075252,6.477795124054069]]]},"properties":{"ID_0":163,"ISO":"NGA","NAME_0":"Nigeria","ID_1":25,"NAME_1":"Lagos","ID_2":508,"NAME_2":"Ajeromi/Ifelodun","HASC_2":null,"CCN_2":0,"CCA_2":null,"TYPE_2":"Local Authority","ENGTYPE_2":"Local Authority","NL_NAME_2":null,"VARNAME_2":null}}
```


From this data, the different Local Government Areas in Lagos state can be obtained. The geopy library can then be used to get the latitude and longitude for each one of them. The Polygon coordinates in this json file can be used to display a Choropleth to visualize the result of the analysis.

I also plan to use the Foursquare location data to get information about the offices in the different areas and their corresponding categories. Below is a sample Data Frame of the foursquare search result for Kosofe Local Government Area in Lagos using an office query.

As seen, the names of the offices can be obtained. The category they belong to can also be obtained. With this information and some further analyses, a clustering algorithm can be run to determine Local Government Areas that are similar to each other. The latitude and longitude of each office can also be gotten which is useful for visualization with the folium library.

[41]:

	name	categories	lat	lng
0	Ketu Kosofe Post Office	Post Office	6.592355	3.394546
1	Office Everything	Paper / Office Supplies Store	6.613891	3.357690
2	Ketu Kosofe Post Office	Post Office	6.605957	3.384407
3	Akinwunmi Ambode Campaign Office	Non-Profit	6.550345	3.389895
4	FRSC Office Bariga	Government Building	6.549866	3.393374
5	Dstv office at yaba	Miscellaneous Shop	6.551776	3.378519
6	LASAA Office, Alpha Plaza	Building	6.616348	3.386052