Predicting the Best Neighborhood for Opening a Shopping Mall in Lagos, Nigeria

Ayodeji Jackson Folusho

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Introduction

- **1.1 Background**

Given the peculiarity of Lagos being the largest commercial city, in Nigeria and West Africa, a lot of investors show keen interest in the entertainment industry especially in shopping malls to address needs of the growing middle class and the rapid urbanization of Lagos.

- **1.2 Problem**

The project aims to solve the problem of identifying the best neighborhoods in Lagos for set up of a shopping mall. Best Neighborhood implies a suburb or cluster of suburbs that would yield the best return and profitability for investors through repeated patronage of services provided by the mall

- **1.3 Interest**

Interests are property developers and investors looking to make investments in Lagos targeted at the entertainment / shopping sector

Data acquisition and cleaning (1/2)

- **2.1 Data Methodology**

1. Obtain data by building a dataframe of neighborhoods in Lagos, Nigeria by web scraping the data from Wikipedia page,

2. Get the geographical coordinates of the neighborhoods and obtain venue data for the neighborhoods from Foursquare API.

3. Explore and Cluster the neighborhoods

4. Select the best cluster to open a new shopping Mall

- **2.2. Data Sources**

A web based source , Wikipedia https://en.wikipedia.org/wiki/Category:Local_Government_Areas_in_Lagos_State which contained a list of Local Government Areas also known as Neighborhoods was used for Web scraping and invariably extracting the required data .

- **Other data science techniques used include but are not limited to**

Data Cleaning

Data Wrangling

K-means clustering (Machine Learning)

Map Visualization (Folium)

Data acquisition and cleaning (2/2)

- **Data Analysis**

As earlier stated the first step was to get the data from the Wikipedia page by web scraping using Python requests and beautifulsoup packages to extract the list of neighborhoods data.

The list of name wouldn't suffice for the scope of this project and it was therefore important to get the geographical coordinates using the geocoder package. This also enabled us to use the Foursquare API in gathering venue information.

The data was populated into the pandas df (dataframe) which was visualized using the Folium package (Map)

The Foursquare API was a very useful tool as it enabled us to get the top 100 venues that are within a radius of 2000 meters using my Foursquare ID and Secret Key obtained by registering an account on Foursquare Developer.

Another step involves grouping the rows taking into account mean frequency of occurrence. This is a first step in preparing the data for use in clustering. Data was also filtered using "Shopping Mall" which is our focal category for this project

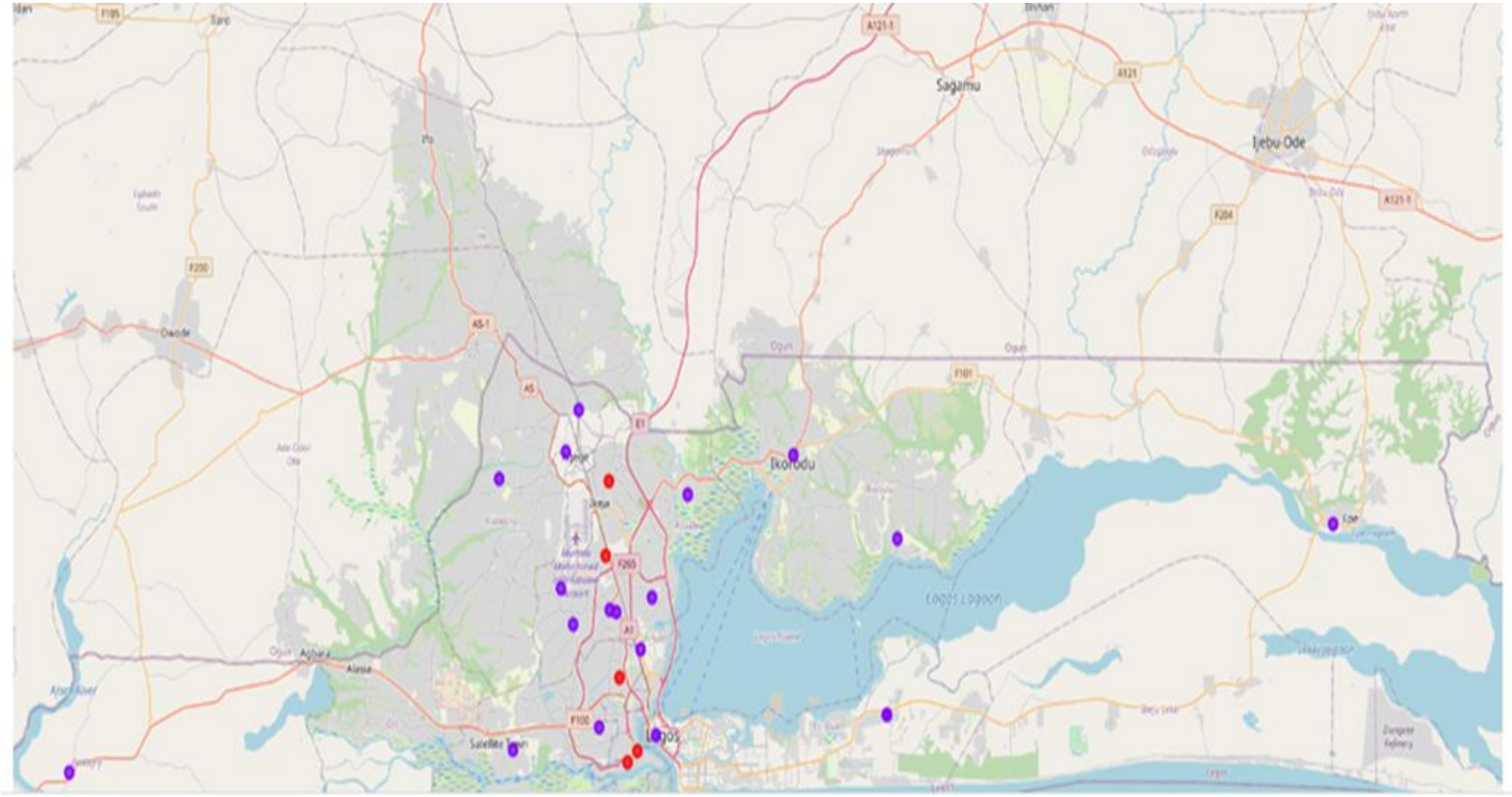
Clustering is carried out using k-means clustering. The Neighborhoods were clustered into 2 based on their frequency of occurrence using the "shopping mall" filter

Results (1/2)

- The results from the k-means clustering show that we can categorize the neighborhoods into 2

- Clusters based on the frequency of occurrence for “Shopping Mall”:
  - **Cluster 0**: Neighborhoods with moderate number of shopping malls
  - **Cluster 1**: Neighborhoods with low number to no existence of shopping malls

Results (2/2)



The results of the clustering are visualized in the map below with cluster 0 in red color, cluster 1 in purple color,

Conclusion

Most of the shopping malls are concentrated in Neighborhoods around cluster 0 with little concentration in Cluster 1. Cluster 1 represents a good opportunity for set up of a shopping mall due to little or no competition. property Developers and investors could have a quick return on investment by investing in this area. This in itself would however require further strategic studies to understand why shopping malls are not well situated in the cluster but from a stand point of data science. Cluster 1 presents a very good opportunity

References

- https://en.wikipedia.org/wiki/Category:Local_Government_Areas_in_Lagos_State
- Report: https://cocl.us/coursera_capstone_report
- Notebook: https://cocl.us/coursera_capstone_notebook
- Presentation: https://cocl.us/coursera_capstone_presentation