Game Café in Hyderabad, India

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Introduction

For many gamers, visiting gaming cafe is a great way to relax and enjoy themselves during weekends and holidays. Gaming companies are also taking advantage of this trend to build more cafes to cater to the demand. As a result, there are many gaming cafes in the city of Hyderabad and many more are being built. Opening these cafes allow gaming developers to earn consistent income. As with any business decision, opening a new cafe requires serious consideration and is a lot more complicated than it seems. Particularly, the location of the cafe is one of the most important decisions that will determine whether the cafe will run or not.

Business Problem

The objective of this project is to analyze and select the best locations in the city of Hyderabad, India, to open a new gaming cafe. This project is mainly focused on geospatial analysis of the Hyderabad City to understand which would be the best place to open a new cafe. Using data science methodology and machine learning techniques like clustering. This project aims to provide solutions to answer the **business question**: In the city of Hyderabad, if a gaming company or a start-up is looking to open a new gaming cafe, where would you recommend them to open it?

Target Audience

- ✓ Gaming Companies.
- ✓ Start-up Companies interested in gaming café.

✓ Gamers who are interested in playing in such cafes.

Data

We need to use the following Data:

✓ List of neighborhoods in Hyderabad.

✓ To plot the map latitude and longitude coordinates are required.

✓ To perform clustering, we need venue data related to gaming cafes in Hyderabad.

Sources and Methods used to extract data

Wikipedia pages related to the city will be the main source of data. We will use **web scraping techniques** to extract the data from these pages, with the help of python requests and **BeautifulSoup packages**. Then we will get the geographical coordinates of the neighborhoods using **Python Geocoder package** which will give us the latitude and longitude coordinates of the neighborhoods.

Source: *Location map from Google*

After that, we will use **Foursquare API** to get the venue data for those neighborhoods. Foursquare has one of the largest database of 105+ million places and is used by over 125,000 developers. Foursquare API will provide many categories of the venue data, we are particularly interested in the **gaming cafe** category in order to help us to solve the business problem put

forward. This is a project that will make use of many data science skills, from web scraping, working with API, data cleaning and wrangling, using machine learning techniques and map visualization. In the next section, we will discuss about methodology and steps taken to analyze the data.

Methodology

First step is to get the *list of neighborhood* of the city. This data can be obtained from Wikipedia page containing the list of neighborhood of Hyderabad. This process is known as **web scrapping.** This process is done by using Python requests and BeautifulSoup packages.

Second step is to get the *geographical coordinates* of the data i.e., list of neighborhood obtained by scrapping the webpage. This coordinates will help us in using the Foursquare API. To get the coordinates geocoder package will be used.

Third step is to *populate the pandas DataFrame* and then *visualize the neighborhoods* in a map using Folium package.
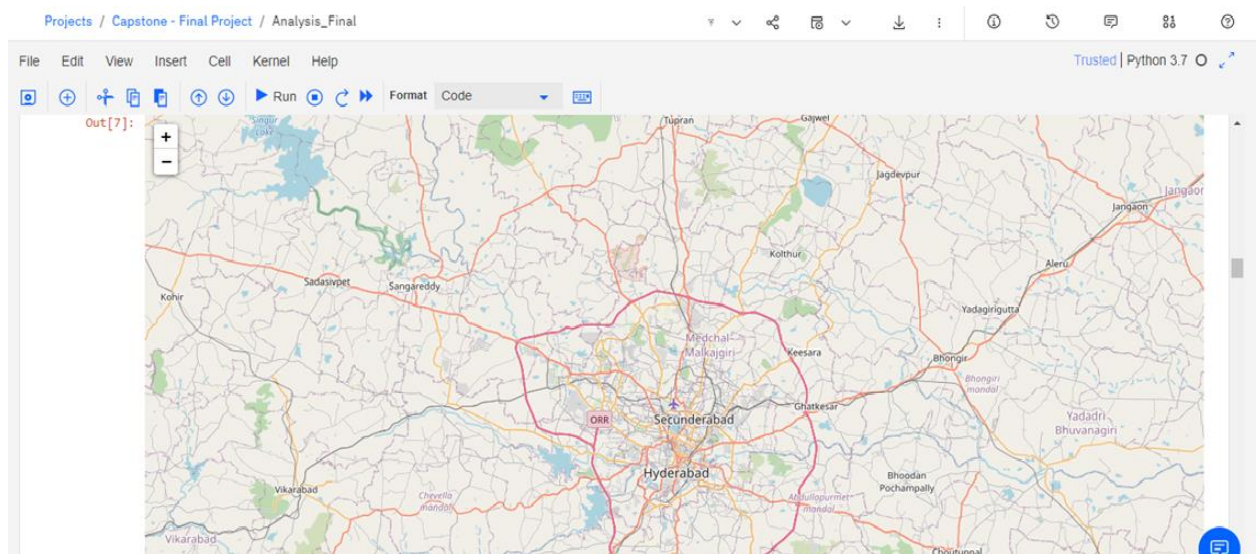
*Source: Map of Hyderabad, India, from Final Project Output*
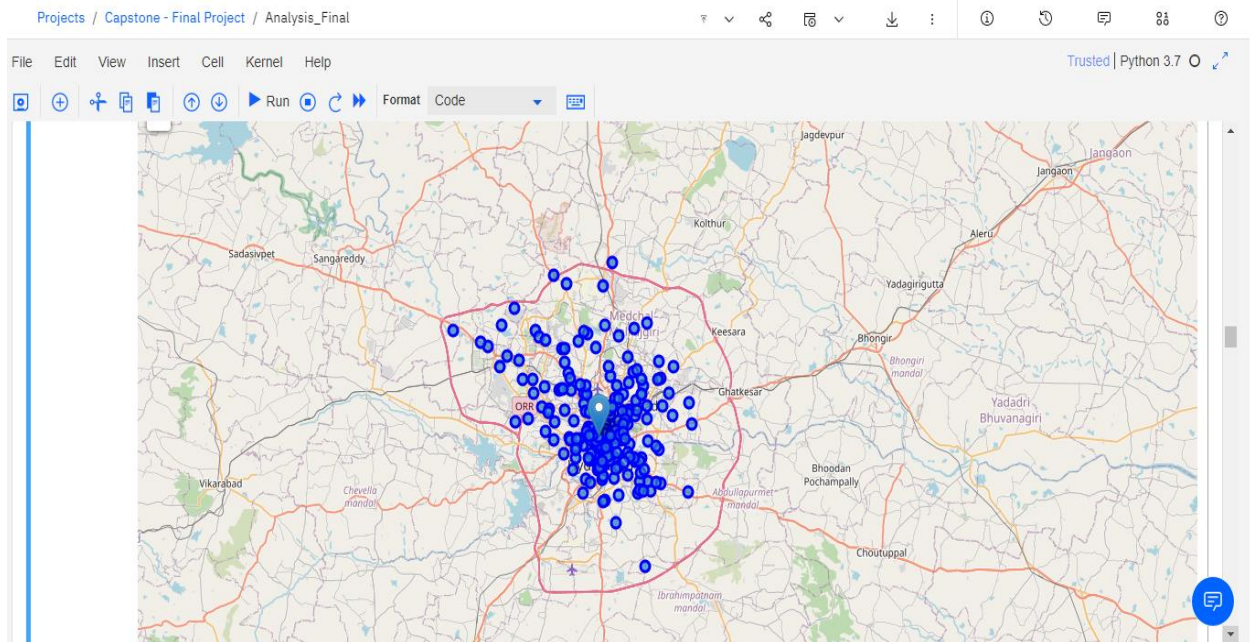
Source: Visualized Map of Hyderabad, India, from Final Project Output

Fourth step is to use the **Foursquare API** which allows application developers to interact with the foursquare platform. The API itself is a RESTful set of addresses to which you can send requests, so there's really nothing to download onto your server.

The process for searching venues in the API is as follows:

- ✓ Search for Cafes in Hyderabad.
- ✓ Result will be returned by the API along with the map.
- ✓ Click on any of the result, it will redirect you to its details page.
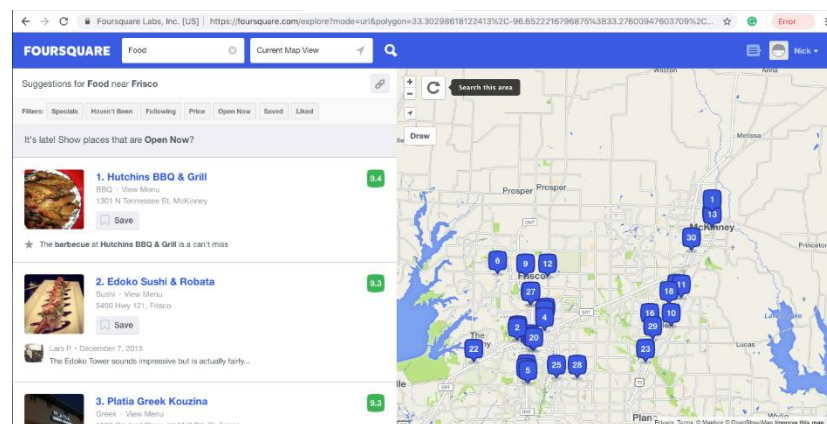
Source: Foursquare API

Fifth step is to *perform clustering* on the data by using *K-mean clustering*. This algorithm identifies k number of centroids and then allocates every data point to the nearest cluster, while keeping the centroids as small as possible. It is one of the simplest and popular unsupervised machine learning algorithms and is suitable to solve such problems. This process will help us to answer the question: Where the new gaming café should be opened?

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(198, 180)
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Out[17]:

	Neighborhoods	ATM	Accessories Store	Afghan Restaurant	American Restaurant	Andhra Restaurant	Arcade	Arts & Crafts Store	Res
0	A. C. Guards	0	0	0	0	0	0	0	
1	A. S. Rao Nagar	0	0	0	0	0	0	0	
2	Abhyudaya Nagar	0	0	0	0	0	0	0	
3	Abids	0	0	0	0	0	0	0	
4	Adikmet	0	0	0	0	0	0	0	
...	...	...	...	...	...	...	...	...	
193	Serilingampally	0	0	0	0	0	0	0	
194	Shah-Ali-Banda	0	0	0	0	0	0	0	
195	Shahran Market	0	0	0	0	0	0	0	
196	Shanker Mutt	0	0	0	0	0	0	0	
197	Shivam Road	0	0	0	0	0	0	0	

198 rows × 180 columns

Source: Output list from Foursquare API

After clustering the above data by using the k-mean algorithm.

Out[23]:

|	Neighborhood	Gaming Cafe	Cluster Labels	Latitude	Longitude
0	A. C. Guards	0	0	17.395015	78.459812
123	Malkajgiri mandal	0	0	17.374930	78.515670
124	Mallapur	0	0	17.447370	78.535200
125	Mallepally	0	0	17.447370	78.535200
126	Manikonda	0	0	17.288640	78.497960
...	...	...	...	...	...
35	Boggulkunta	1	1	17.505990	78.304540
167	Pisal Banda	1	1	17.442320	78.496170
27	Bank Street, Hyderabad	1	1	17.388601	78.476645
84	Jubilee Hills	1	1	17.421967	78.525592
15	Ashok Nagar, Hyderabad	1	1	17.457870	78.538820

198 rows × 5 columns

Source: Output list after clustering the data

Results

As per the analysis, the neighborhoods are divided into 3 clusters based on the frequency of occurrences for "Gaming Café":

➤ Cluster 0: Neighborhoods with high number of gaming cafes (179).

➤ Cluster 1: Neighborhoods with low number of gaming cafes (19).

➤ Cluster 2: Neighborhoods with no gaming cafes (0).
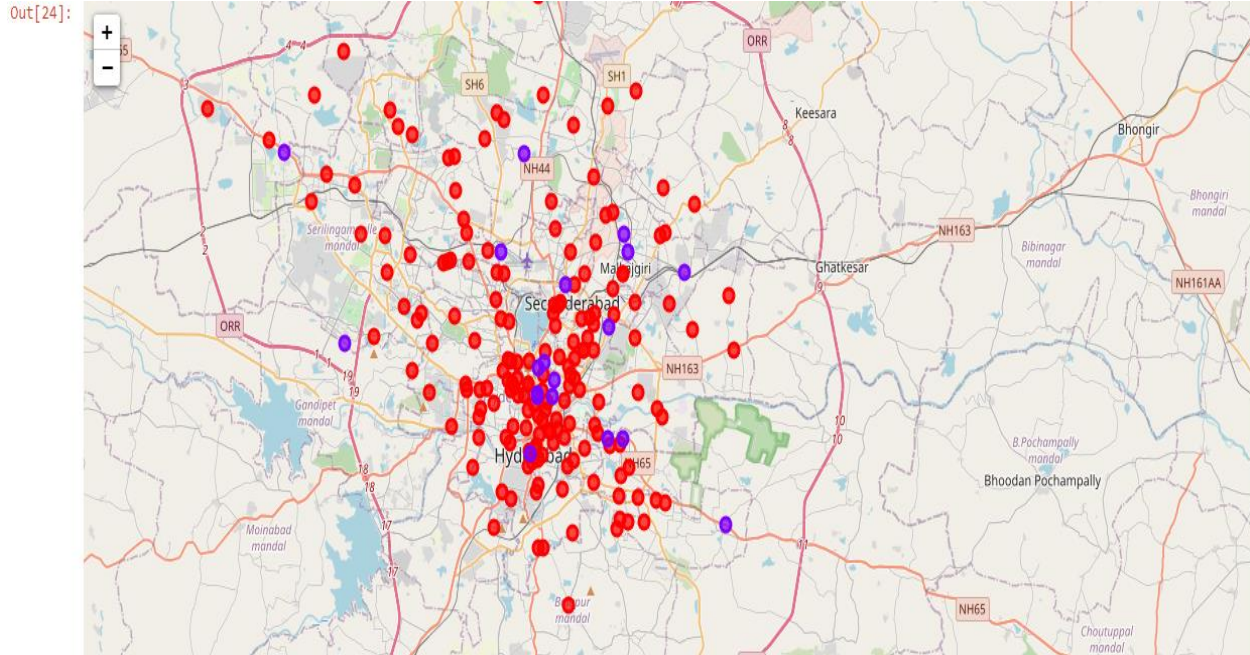
Source: Visualized Map of Hyderabad after Clustering

The dot in red represent Cluster 0 and the ones in blue represent Cluster 1.

Discussion

As per the observation of the results, it is noted that:

- ✓ *Cluster 0* has highest number of Gaming Cafes. Hence it is not recommended.
- ✓ *Cluster 1* has low number of Gaming Cafes. Can open a café here but wow point is needed.
- ✓ *Cluster 2* doesn't have any café. Hence, it is apt for opening a gaming café.

Limitations and Suggestions for Future Research

In this project, the researcher considered only one factor i.e. frequency of occurrence of gaming cafes. Further research could devise a methodology to estimate such data to be used in the clustering algorithm to determine the preferred locations to open a new gaming café. In addition, the researcher used the free account of Foursquare API that came with certain limitation. Further research can be done on this project by using the paid account of this API to overcome the limitations and obtain more useful and relevant results.

Conclusion

As per the research done, it is recommended to open a gaming café in cluster 2 as there are no cafés present.

References

1) https://en.wikipedia.org/wiki/Category:Neighbourhoods_in_ Hyderabad_India
2) https://en.wikipedia.org/wiki/Hyderabad
3) https://www.bestcasinosites.net/blog/gaming-cafes-in-india.php
4) https://archive.esportsobserver.com/lan-cafe-business-india/
5) https://scholarworks.sjsu.edu/cgi/viewcontent.cgi?article=1000&context=art108