BANGALORE NEIGHBORHOODS

INTRODUCTION

Bengaluru (also called Bangalore) is the capital of India's southern Karnataka state. The center of India's high-tech industry, the city is well known for its parks and nightlife. So as a result of this there is a severe population and traffic problem which is only increasing every year due to more people wanting to move to Bangalore. Searching for a good place to live in Bangalore is a very tedious task for newcomers.

BUSINESS PROBLEM

The main objective of this project is to simplify the task of searching for the ideal location in Bangalore to relocate so that they can enjoy the peace and tranquility that Bangalore has to offer with its abundance of parks and lakes and also being close to authentic south Indian restaurants to get the best Bangalore experience.

AUDIENCE

This project will be useful for anyone who wants to move to Bangalore or someone who wants to build/buy a home in the city. It can also be useful for finding the best places to visit to get a full experience of Bangalore.

DATA

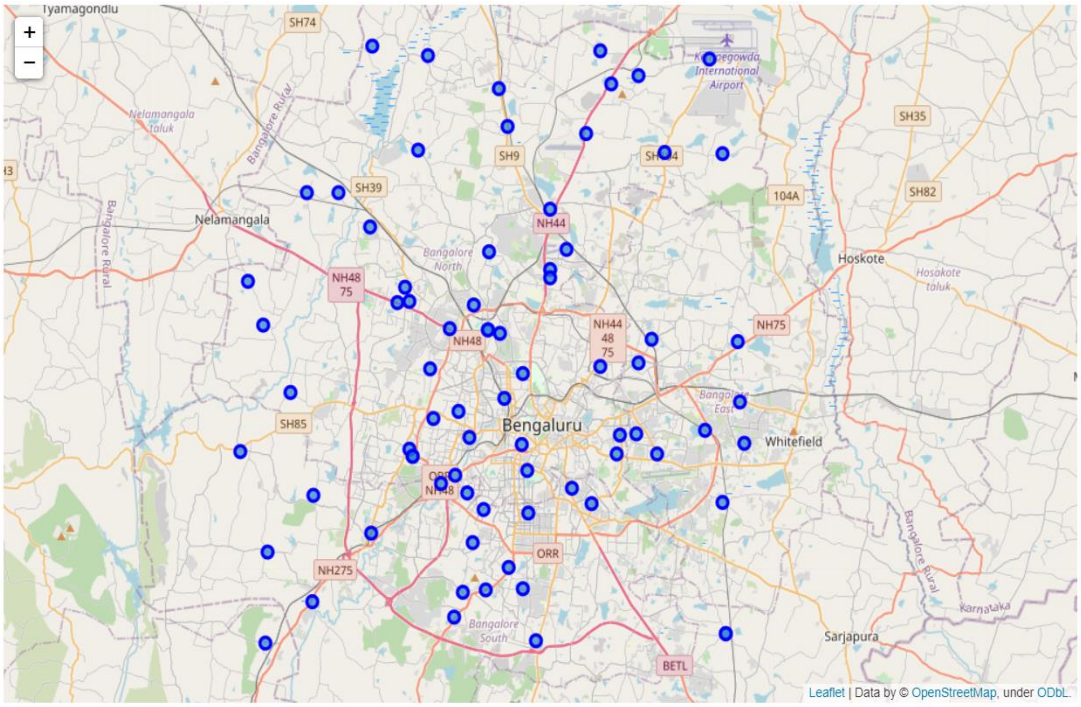
- Bangalore Neighborhoods dataset obtained from Kaggle consisting of the latitude and longitude values for all the neighborhoods in the city which will be used to obtain information about the nearby venues for Clustering.
- South Indian restaurants and parks data retreived from Foursquare API,which will be used to generate our ideal locations in the city and cluster them based on similarity for the user.

	Neighborhood	Latitude	Longitude
0	Agram	45.813177	15.977048
1	Amruthahalli	13.066513	77.596624
2	Attur	11.663711	78.533551
3	Banaswadi	13.014162	77.651854
4	Bellandur	58.235358	26.683116

Location data for the Neighborhoods

METHODOLOGY

After reading in the Neighborhoods data from the Kaggle dataset and visualizing the Neighborhoods using Folium I immediately noticed that we had Neighborhoods outside of the city and some even in other cities. So I decided to keep only the Neighborhoods in and around Bangalore and removed all the other ones.



Next I used the Foursquare API to explore the Neighborhoods and get the venues data for each Neighborhood by setting a radius of 1.8Km and limit of 100 venues. The API returned back 2170 venues for the 67 Neighborhoods I had selected.

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Amruthahalli	13.066513	77.596624	The Druid Garden	13.063946	77.591492	Brewery
1	Amruthahalli	13.066513	77.596624	Big Straw	13.063414	77.591192	Bubble Tea Shop
2	Amruthahalli	13.066513	77.596624	Swensen's	13.063476	77.590793	Ice Cream Shop
3	Amruthahalli	13.066513	77.596624	Shivas Kabab Corner	13.062748	77.591789	Indian Restaurant
4	Amruthahalli	13.066513	77.596624	Jus'Trufs Chocolate Shop and Cafe	13.072510	77.603859	Café
...	...	...	...	...	...	...	...
2165	Thippasandra	12.973936	77.650998	Barista	12.966273	77.641432	Café
2166	Thippasandra	12.973936	77.650998	Chili's Grill & Bar	12.969237	77.641414	Tex-Mex Restaurant
2167	Thippasandra	12.973936	77.650998	Esplanade	12.969199	77.641473	Indian Restaurant
2168	Thippasandra	12.973936	77.650998	Bob's	12.969481	77.651839	Indian Restaurant
2169	Thippasandra	12.973936	77.650998	Green pepper	12.968723	77.648875	Indian Restaurant

2170 rows × 7 columns

Using the Venues data from the API I grouped all the Neighborhoods to display the top 20 venues of each Neighborhood to better understand what's more popular there.

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	...	11th Most Common Venue	12th Most Common Venue	13th Most Common Venue	14 C
0	Achitnagar	Indian Restaurant	Bakery	Asian Restaurant	Falafel Restaurant	Food Court	Food & Drink Shop	Food	Flea Market	Financial or Legal Service	...	Fast Food Restaurant	Farmers Market	Farm	Ele
1	Adugodi	Indian Restaurant	Café	Dessert Shop	Chinese Restaurant	Ice Cream Shop	Bookstore	Pizza Place	Coffee Shop	Lounge	...	Multiplex	Bar	Bakery	E
2	Amruthahalli	Indian Restaurant	Ice Cream Shop	Café	Department Store	Flea Market	Dhaba	Fast Food Restaurant	Resort	Light Rail Station	...	Chinese Restaurant	Building	Bubble Tea Shop	Res
3	Bagalgunte	Pizza Place	Indian Restaurant	Hobby Shop	Gas Station	Yoga Studio	Eastern European Restaurant	Flea Market	Financial or Legal Service	Field	...	Farmers Market	Farm	Falafel Restaurant	Ele
4	Bagalur S.O (Bangalore)	Food Truck	Sports Club	Memorial Site	Yoga Studio	Food & Drink Shop	Food	Flea Market	Financial or Legal Service	Field	...	Farmers Market	Farm	Falafel Restaurant	Ele

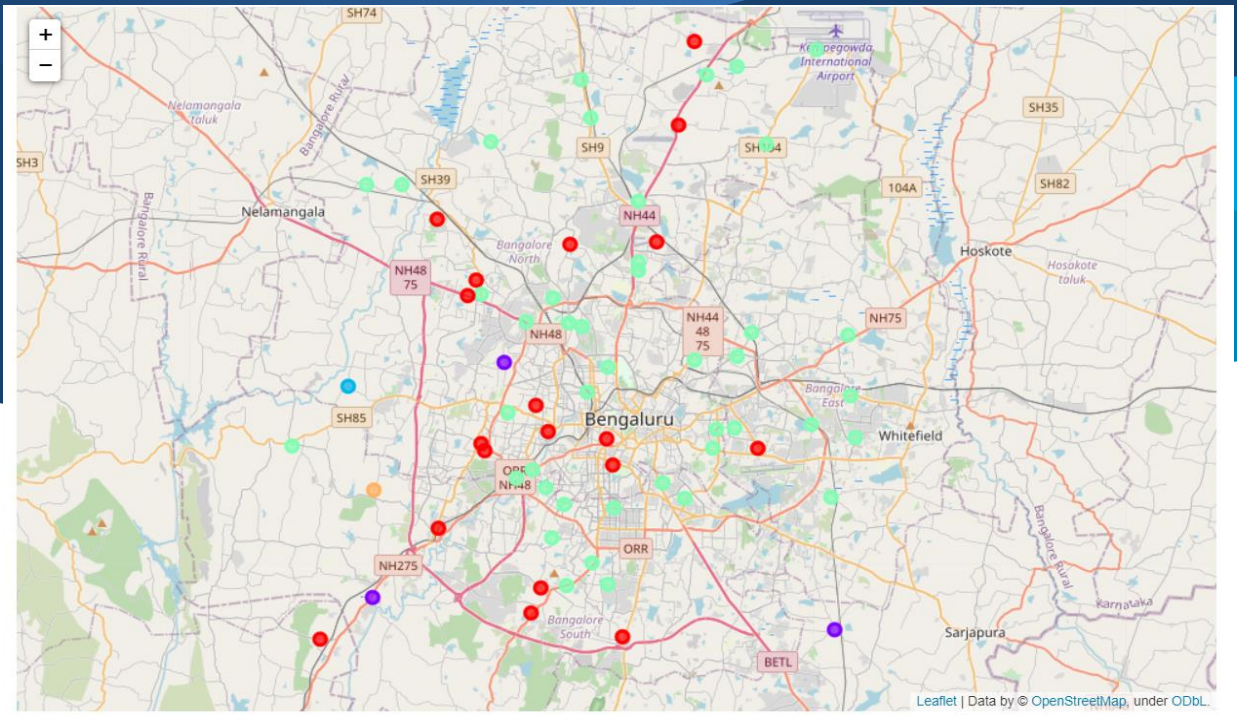
Now it was time to use the Unsupervised Machine learning algorithm K-MEANS to cluster the Neighborhoods based on the similarity of their venue categories. After some trial and error I decided to settle on the k-value of 5 as it gave the optimal result.

RESULTS

After applying the K-Means clustering algorithm and obtaining the labels for the Neighborhoods, I merged the labels to the venues dataframe to get the final table below.

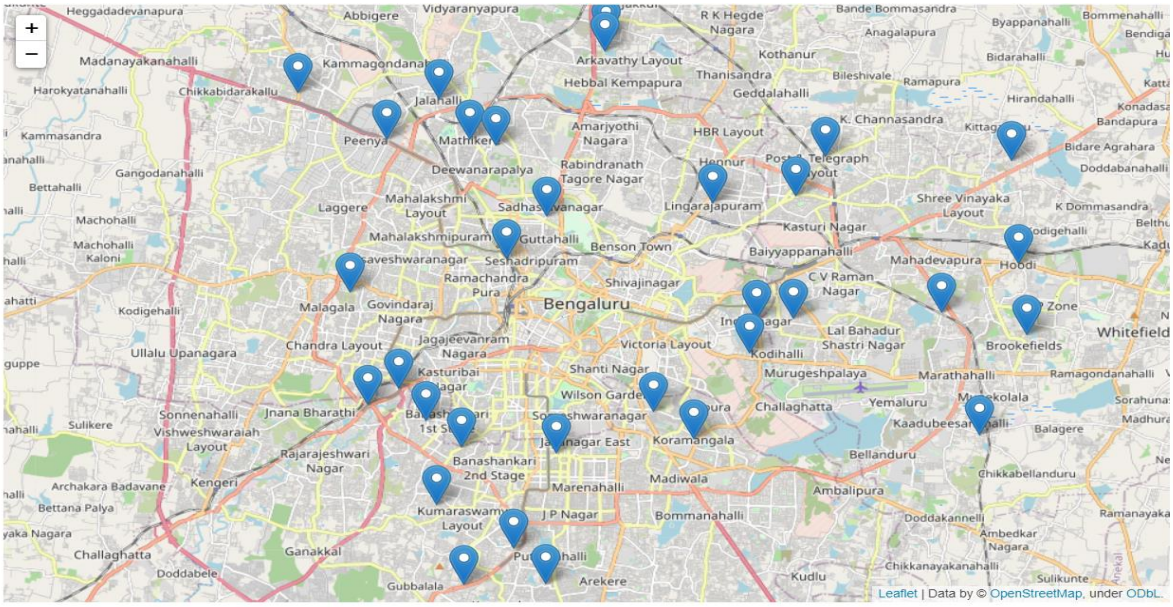
	Neighborhood	Latitude	Longitude	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	...	11th Most Common Venue	12th Most Common Venue	13th Most Common Venue	14th Co
0	Achitnagar	13.091176	77.483482	0	Indian Restaurant	Bakery	Asian Restaurant	Falafel Restaurant	Food Court	Food & Drink Shop	...	Fast Food Restaurant	Farmers Market	Farm	Elec
1	Adugodi	12.942847	77.610416	3	Indian Restaurant	Café	Dessert Shop	Chinese Restaurant	Ice Cream Shop	Bookstore	...	Multiplex	Bar	Bakery	B
2	Amruthahalli	13.066513	77.596624	3	Indian Restaurant	Ice Cream Shop	Café	Department Store	Flea Market	Dhaba	...	Chinese Restaurant	Building	Bubble Tea Shop	Rest
3	Bagalgunte	13.056649	77.504822	0	Pizza Place	Indian Restaurant	Hobby Shop	Gas Station	Yoga Studio	Eastern European Restaurant	...	Farmers Market	Farm	Falafel Restaurant	Elec
4	Bagalur S.O (Bangalore)	13.133187	77.668709	3	Food Truck	Sports Club	Memorial Site	Yoga Studio	Food & Drink Shop	Food	...	Farmers Market	Farm	Falafel Restaurant	Elec

Visualizing the cluster labels using Folium map



From the above results we can observe that most of the Neighborhoods fall in the 0th cluster(red marker) or the 3rd cluster(green marker). As my objective was to find Neighborhoods which had more number of Parks and South Indian restaurants, I identified the Neighborhoods with Parks and South Indian restaurants included in the top 20 venues of each Neighborhood

On observing these Neighborhoods, I discovered that most of them belong to the third cluster(green marker) and decided that the Neighborhoods in the third cluster would be the ideal locations to live in Bangalore and marked them in the map below.



DISCUSSIONS

Bangalore is a very big city and heavily populated, so to cluster neighborhoods based on their venues is a challenging task especially when the all the neighborhoods are very similar to each other. So in order to get a satisfactory result I set the location radius to 1.8Km while making the API call for the venues.

Most of the Neighborhoods had Indian restaurant as the top venue category. So they would have good Indian restaurants regardless but good South Indian restaurants are fewer compared to general Indian restaurants.

Finally I visualized my ideal locations in Bangalore for people to enjoy their stay in the city.

CONCLUSION

I hope this project will prove useful to anyone wanting to move to Bangalore or build a home in the city.

Real estate firms can also benefit from such analysis and can take more informed decisions in the future.