Opening new Coffee Shop in Nagpur, India

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Introduction

Background

Nowadays everyone wants to open a business. Everyone wants to be an entrepreneur. But only some of them succeed because of lack of pre planning. Before opening any business, the market analysis is most important. What kind of business should I open, what are trends in market, what are the preferences of local people of that city etc ? After doing research on these topics, the main problem arises 'Where should I open my business?"
Here comes the part of data science.

The aim of this project is to find the right neighbourhood where it will be more profitable to open a **Coffee Shop**. In this notebook we will explore each neighbourhood of city of **Nagpur, India**, using neighbourhood data from **Wikipedia**, data regarding venues in each neighbourhood from **Foursquare API**.
Nowadays Coffee shops are one of the most visited venues. So if anyone wants to open a business, Coffee shop will be the best suggestion. The success of a Coffee Shop depends upon various factors , such as ambience , rivals , location , rates etc. .Out of these, Location largely decides the success of a coffee shop.

Interested Audience

The target audience for such a project is twofold.Firstly, any person who is thinking of opening a new coffee shop in Nagpur and secondly , a well establish coffee shop in Nagpur who is willing to expand his business by opening new branches . These people can get the data of neighbourhoods where it will be suitable for opening the coffee shop .

Data

Data Sources

To get location and other information about various venues in Nagpur, I used three sources and decided to combine the data from both of them together.

-Wikipedia:

First I fetched the list of neighbourhoods in Nagpur from **Wikipedia** and assign it to a pandas dataframe using **Beautiful Soup** parser for getting list from html file .

-Google Search:

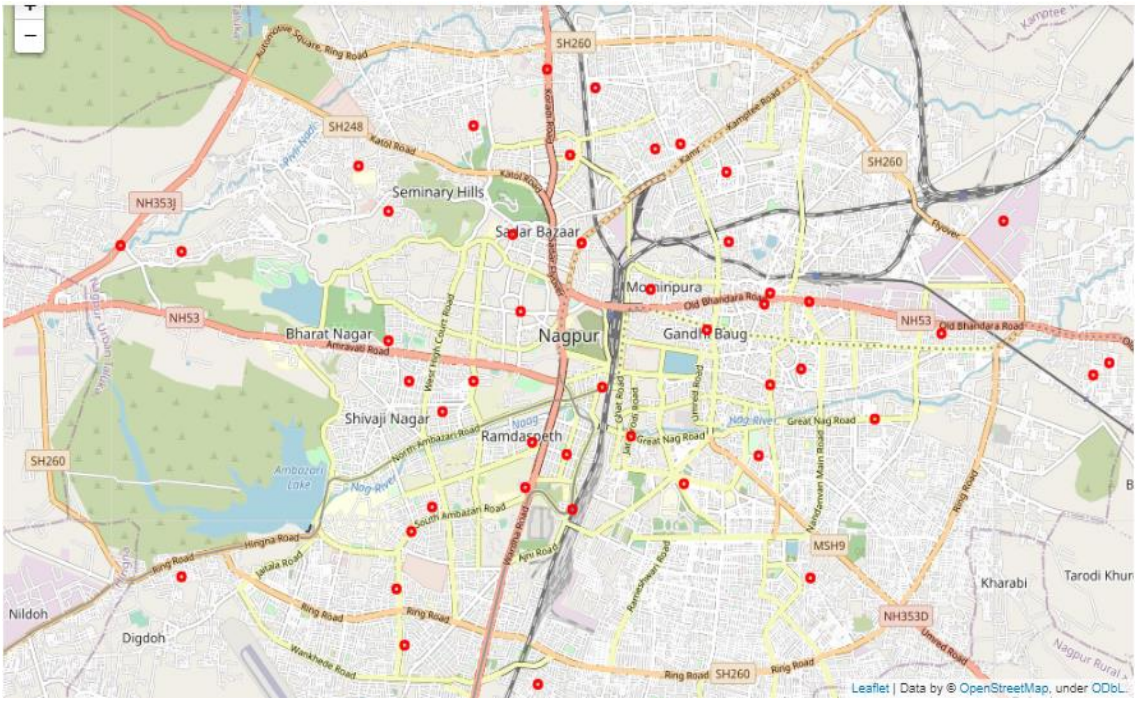
Unfortunately due to lack of data available I have to get latitudes and longitudes manually by searching Coordinates of each neighbourhood in **Google** and then assigning these to each neighbourhood in data frame.

-Foursquare API :

I used the Foursquare API to fetch venues in Nagpur starting from the middle up to 5 Kilometers in each direction.Using the Foursquare's explore API (which gives venues recommendations), I collected venue names, categories and locations (latitude and longitude).

From Foursquare API I retrieved the following for each venue:

- **Name:** The name of the venue.
- **Category:** The category type as defined by the API.
- **Latitude:** The latitude value of the venue.
- **Longitude:** The longitude value of the venue.



Methodology

This project aims at identifying the best places for opening new **Coffee Shop** in Nagpur based on coffee shops in each neighbourhood. This would enable any businessman to identify the neighbourhoods where he/she wants to open a new Coffee Shop.

First, we retrieved the data of neighbourhoods in Nagpur from Wikipedia and then parse the required list using Beautiful Soup library. We find latitudes and longitudes of each neighbourhood using Google . Data Frame having neighourhood , its latitude and longitude is created.

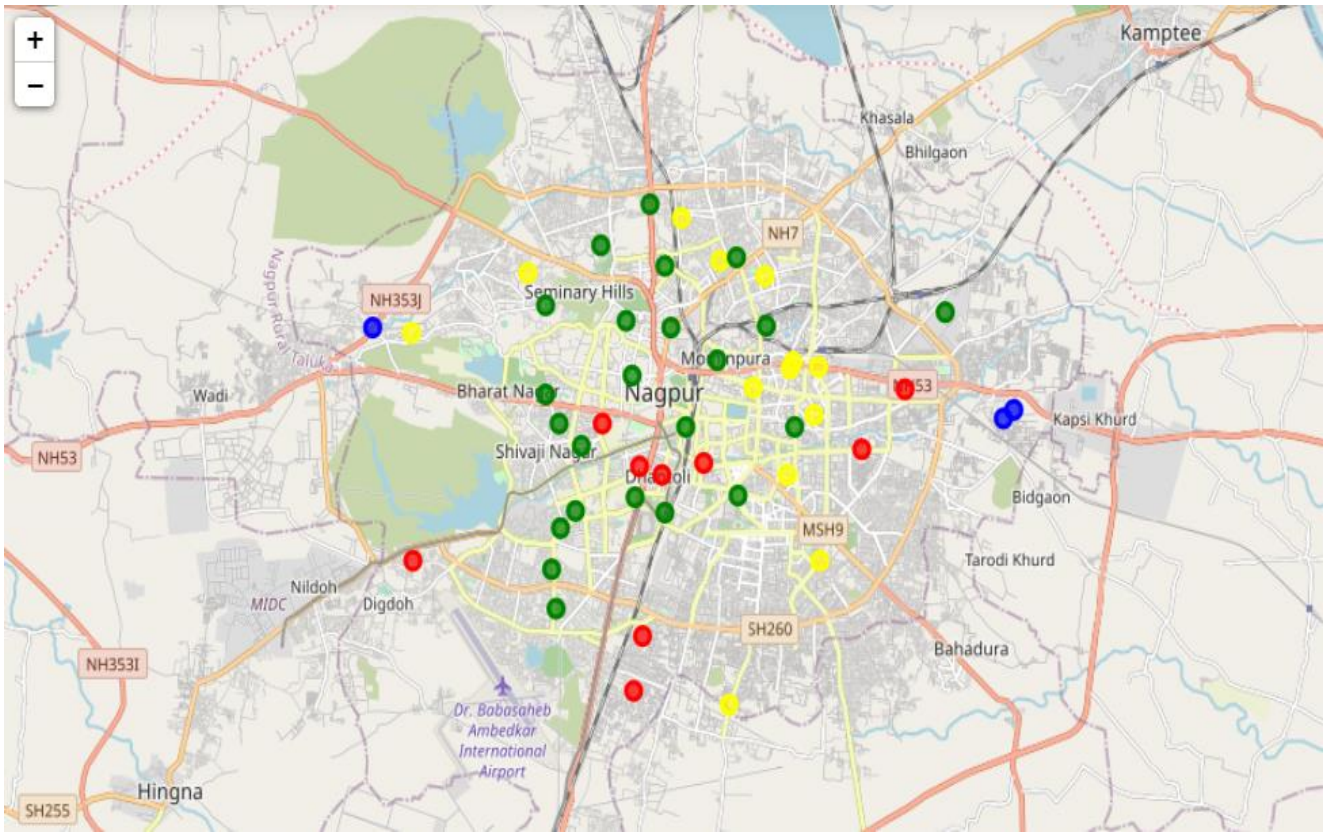
	Neighbourhoods	Latitude	Longitude
0	Mahal — The oldest locality in Nagpur. Nagpur ...	21.1432	79.1121
1	Sitabuldi[2]	21.1430	79.087
2	Dhantoli[3]	21.1341	79.0816
3	Itwari[4]	21.1539	79.1111
4	Mominpura[5]	21.1557	79.0942

Secondly, we then fetched the data regarding venues near by each neighbourhood using Foursquare API and then explored the data retrieved from the API on the map . We'll use One Hot Encoding Method on Venue Categories and then grouped data on the basis of Neighbourhoods. As our interest is on Coffee Shops only , we'll get a new data frame with Coffe Shops and Neighbourhoods .

	Neighbourhood	Coffee Shop
0	Ajni	0.092784
1	Ashok Nagar	0.061224
2	Bajaj Nagar	0.087912
3	Bezanbagh	0.070175
4	Bhandewadi	0.000000

Next, we'll cluster the Coffee Shops data and find the Kmeans labels . Then we'll created a new data frame having Cluster labels, Neighbourhoods, Latitudes, Longitudes and Coffee Shop .

Finally we'll create and plot a map with different clusters. We'll examine each clusters and their neighbourhoods . This will allow us to clearly identify which neighbourhoods can be recommended for opening a new Coffee Shop.



Finally, we'll discuss and conclude neighbourhoods where a Coffee Shop can be opened .

Result and Discussion

From the above , we can see that the neighbourhoods are divided into following clusters.

Cluster 1:

This consists of **23** neighbourhoods , which are moderately crowded by Coffe Shops. It would be more risky to open New Coffee shop in these neighbourhoods.

Cluster 2:

This cluster consists of neighbourhoods **without** Coffee Shops . There are three neighbourhoods Bhandewadi , Pardi and Vayusena Nagar with no coffee shop. It will be most suitable to open a new Coffee Shop in one of these areas as there will be no competition with large market.

Cluster 3:

This Cluster consists of neighbourhoods with scarcely crowded Coffee Shops. There are total 14 neighbourhoods in this cluster : Ashok Nagar ,Bezanbagh ,Gandhibagh , Gandhinagar ,GittiKhadan , Itwari , Jaripatka ,Lakadganj , Manewada ,Mangalwari ,Maskasath ,Reshimbagh and Sakkardara.

It will be more suitable to open new coffee Shop in these areas because these areas are having less number of Coffee shop present.

Cluster 4:

This consists of following **9** neighbourhoods:

Dhantoli , Giripeth ,Manish Nagar, Nandanvan , Narendra Nagar , Rajendra Nagar, Ramdaspeth , Tukdoji Chowk And Wardhaman Nagar**.** It will be least profitable to open a new Coffee Shop in these areas because these areas are already crowded by well-established Coffee Shops.

Limitations and Suggestions for Future Research

In this project, we only consider one factor i.e. frequency of occurrence of coffee shops, there are other factors such as population and income of residents that could influence the location decision of a new coffee shop. However, to the best knowledge of this researcher such data are not available to the neighbourhood level required by this project. Future 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 coffee shop. In addition, this project made use of the free Sandbox Tier Account of Foursquare API that came with limitations as to the number of API calls and results returned. Future research could make use of paid account to bypass these limitations and obtain more results.

Conclusion

In this project our aim was to find neighbourhoods where it will be suitable to open a new Coffee shop . We explored each neighbourhood of city of **Nagpur , India**, using neighbourhood data from **Wikipedia** , data regarding venues in each neighbourhood from **Foursquare API**. Finally we create and plot a map with different clusters.

After examining each clusters and their neighbourhoods we found that the neighbourhoods Bhandewadi , Pardi and Vayusena Nagar have no coffee shop. It will be **most suitable** to open a new Coffee Shop in one of these ares as there will be no competition with large market.

Also neighbourhoods Ashok Nagar , Bezanbagh, Gandhibagh ,Gandhinagar ,Gitti ,Khadan ,Itwari ,Jaripatka ,Lakadganj ,Manewada ,Mangalwari ,Maskasath , Reshimbagh and Sakkardara have less number of Coffee Shops . It will be profitable to open new Coffee Shop in these neighbourhoods also.

References

Wikipedia : List of neighbourhoods in Nagpur

https://en.wikipedia.org/wiki/List_of_localities_in_Nagpur

Google Search : Latitudes and Longitudes for each neighbourhood .

Foursquare API :

https://developer.foursquare.com/