

Coursera Capstone

Applied Data Science Capstone (IBM)

Opening a New Restaurant in Delhi, India

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Chapter 1: Introduction

Not only in weekend but also in weekdays many of us prefer to eat from any restaurant because of tasty and variety of foods. But every time we can't able to find good restaurant for any party, family meet, friend meet or normal taste change. This happens because many places has lot of restaurant and many has none. So where there is lot of restaurants, we have lot of option to choose. Now if anyone wants to open his/her restaurant in Delhi, he/she should know about the diversity of the restaurant in different places. And if he/she knows the details they can easily open his/her restaurant successfully. But many of them fails to become successful because of lack of knowledge. So this is a project which helps to those person who wants to open their restaurant in Delhi and become them successful. It is a project where I have separated some areas based on the density of restaurants and choose some area where anyone can run their restaurant successfully without any competition or less competition.

Chapter 2: Business Problem

To start a successful restaurant we have to face some problems which are:

- High competition
- Market Demand
- Area population density
- Area economic condition
- Area location
- Quality foods and services
- Good maintenance

We can't solve all the problem easily but this project can help to solve the major problem among the above mentioned which is none other than "High competition". It occurs due to high concentration of restaurant in a place.

Chapter 3: Proposed solution

Here we are trying to find some areas which has less or no competition between the restaurants. Because a newly opened restaurant needs some time to grow and successful. We have clustered the areas of Delhi where there are high to no restaurant, so that anyone can easily understand where to open a restaurant and where to not. The final solution with proper analysis is given below.

Chapter 4: Data and its uses

To solve this problem we need the following data:

- List of neighbourhoods in Delhi
- Latitude and longitude coordinates of those neighbourhood
- Venue data, particularly for restaurant

- ✚ The list of neighbourhoods in Delhi data is taken by scrapping this Wikipedia page - https://en.wikipedia.org/wiki/Category:Neighbourhoods_in_Delhi.
- ✚ The Latitude and longitude coordinates of those neighbourhood are taken with the help of python package [Geocoder](#).
- ✚ The venue data of those neighbourhoods are taken by [Foursquare API](#).

Chapter 5: Methodology

This project is done in **Python** programming language in different stages. All the steps are briefly described below.

The very first step is to import all the necessary libraries and packages to execute our plan step by step. If there is any libraries missing this project will not execute.

Then to collect the data I have referred Wikipedia for the neighbourhoods of Delhi. The link of the Dataset is given in 'Data' chapter of this report. To collect that data I have done web scrapping of that page and stored in a data frame.

After that our next step is to add latitude and longitude of each neighbourhood. For that I have used **Geocoder** package.

The next step is to find all the venue using **Foursquare API**. After collecting the venue details I have filtered the data for only **Restaurant** with the neighbourhood, latitude and longitude details.

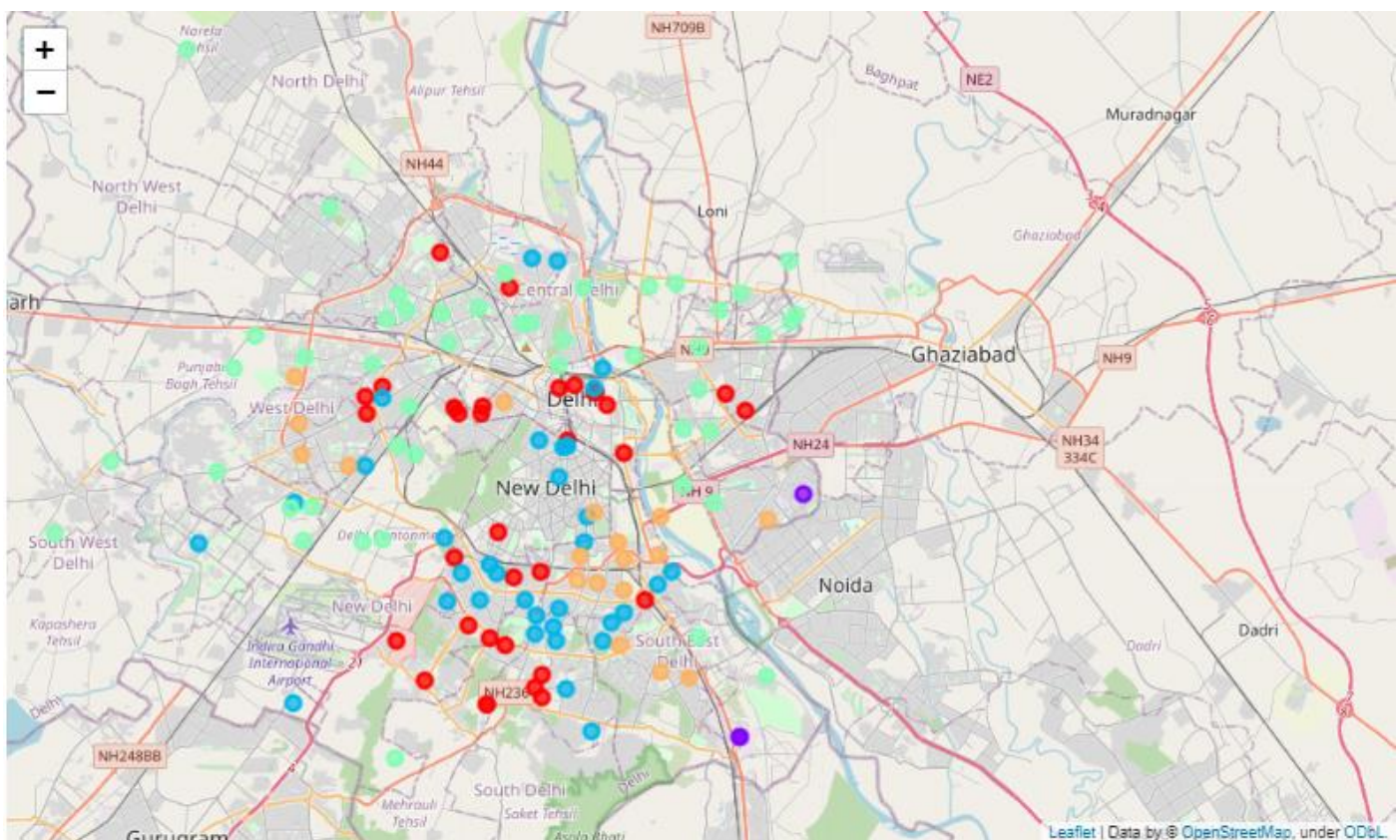
After all these things done properly I have clustered in **5** groups using K-means clustering. This clustering is done by the concentration of restaurant in different areas of Delhi. And this is how is project is executed step by step.

Chapter 6: Result

The results from the K-means clustering show that we can categorize the neighbourhoods into 5 clusters based on the concentration of Restaurant.

- Cluster 0: Neighbourhood with the fourth highest concentration of restaurants [C-0]*
- Cluster 1: Neighbourhood with the highest concentration of restaurants [C-1]*
- Cluster 2: Neighbourhood with the third highest concentration of restaurants [C-2]*
- Cluster 3: Neighbourhood with no existence or very low no. of restaurants [C-3]*
- Cluster 4: Neighbourhood with the second highest concentration of restaurants [C-4]*

The result of the clustering are visualized in the map below:



[* 'C-n' means Cluster-n with their colour in the map]

Chapter 7: Discussion

There are so many restaurants, which are located in different areas of the central part of Delhi. If we observe the concentration of restaurant based on cluster then we can say cluster 1 > cluster 4 > cluster 2 > cluster 0 > cluster 3. From here we can easily understand that the competition is very high in cluster 1 and very less to no competition in cluster 0. That means this is great opportunity to open a restaurant in cluster 3. Therefore, this project recommends property developers to capitalize on these findings to open new restaurant in neighbourhoods in cluster 3 with little to no competition. Property developers with unique selling propositions to stand out from the competition can also open new restaurant in neighbourhoods in cluster 0, 2 and 4 with moderate competition. Lastly, property developers are advised to avoid neighbourhoods in cluster 2 which already have high concentration of restaurant and suffering from intense competition.

Chapter 8: Conclusion

In this project, I have gone through the process of identify business problem, proposed solution, specifying data required, extracting and preparing data, and clustering the data into 5 clusters based on the frequency of the restaurants in Delhi, India. Also at last I have given some recommendation for those people who wants to open a new restaurants in Delhi, India. The final answer of the business problem is the neighbourhood in cluster 3 is the most preferred location to open a new restaurants to avoid the competitions and be successful easily.