Capstone Project

BATTLE OF NEIGHBORHOODS

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INTRODUCTION

I live in a city called Kolkata. It's one of metropolitan city in India. French author Dominique Lapierre called this City of Joy, It can be considered as food capital of India. So recently one of my friend Reshmi Mazumdar wished to open a Chinese restaurant in Kolkata. But she is not sure about the location where she should open her restaurant. So she discussed with me about her dream project as she was aware about my learning Data science in Coursera.

So I thought below business problem for her:

- She should open her restaurant in a location where there are enough customers and minimum competitor restaurant.
- We should explore all the qualified venues in Kolkata to decide best location for Chinese restaurant.
- Need to know what category of customers are available whether they are target customers by their age.
- Based on all the information we need to maximize score and decide the best location.

DATA

To help Reshmi Mazumdar for her dream project we need below data:

- All area names of Kolkata which we have researched and make a csv file.
- Based on area name we have accessed longitude and latitude data by using geolocator.
- Based on area name, longitude and latitude data we have accessed nearby venues by foursquare API.
- For each location we got N numbers of venues with different categories i.e. Chinese restaurant, cinema, station etc.

IMPLEMENTATION

We have collected below data from different source and make a csv file which has been kept in Github repository:

https://github.com/amit58/Coursera_Capstone/blob/master/Kolkata_Neighborhood_Data.csv

	AREA_NAME
0	Alipore, Kolkata, India
1	Baguiati, Kolkata, India
2	Baishnabghata Patuli Township, Kolkata, India
3	Ballygunge, Kolkata, India
4	Bara Bazar, Kolkata, India

Next we have used GeoPy library to access longitude and latitude data for each location in the csv file and saved in another csv file.

https://github.com/amit58/Coursera_Capstone/blob/master/Kolkata_Location_Data.csv

	Area	Latitude	Longitude
0	Alipore, Kolkata, India	22.531243	88.331398
1	Baguiati, Kolkata, India	22.610218	88.427972
2	Ballygunge, Kolkata, India	22.519162	88.372192
3	Bara Bazar, Kolkata, India	22.580179	88.352810
4	Behala, Kolkata, India	22.500847	88.317961

Using above location data we have created below neighborhood map of Kolkata:
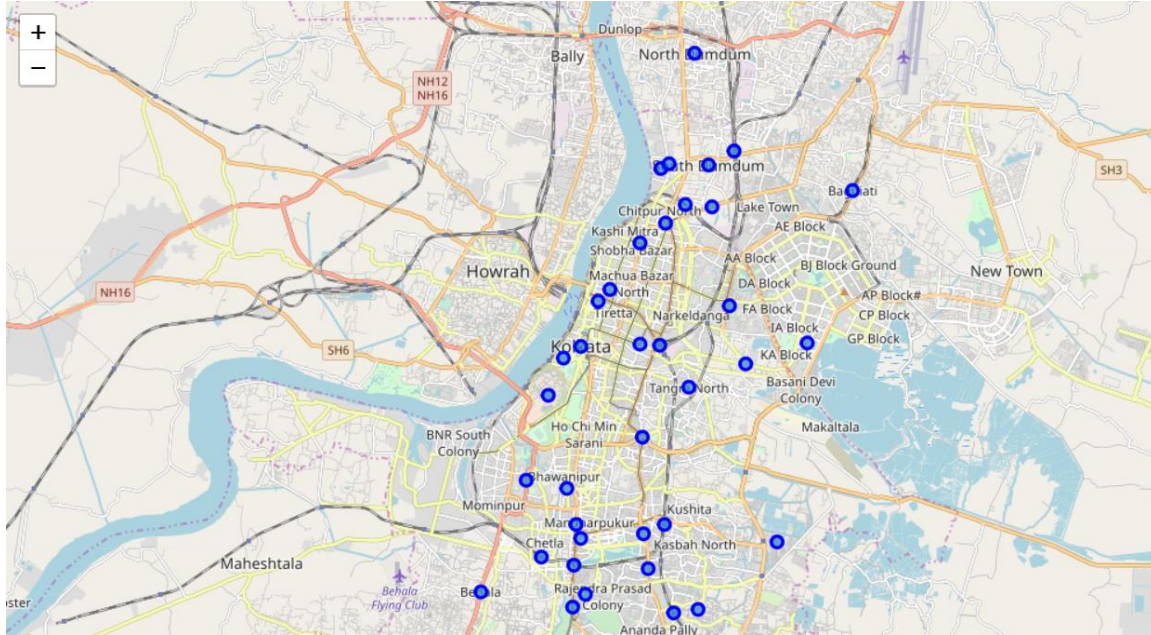
We have accessed venues data by using FourSquare API

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Alipore, Kolkata, India	22.531243	88.331398	Taj Bengal	22.537459	88.334066	Hotel
1	Alipore, Kolkata, India	22.531243	88.331398	India Restaurant & Caterer	22.538904	88.322278	Awadhi Restaurant
2	Alipore, Kolkata, India	22.531243	88.331398	Victoria Memorial	22.545844	88.342890	History Museum
3	Alipore, Kolkata, India	22.531243	88.331398	Chinoiserie	22.537733	88.334327	Chinese Restaurant
4	Alipore, Kolkata, India	22.531243	88.331398	Balaram Mullick & Radharaman Mullick	22.533097	88.347082	Indian Sweet Shop

Next we have analyzed each venue based on below categories as these categories influence the location of the restaurant mostly.

1. Chinese restaurant
2. Railway station
3. Bus station
4. Shopping mall
5. Movie theater
6. Theme park

We have given negative weightage if Chinese restaurant is available around the venue as this this the direct competitor of the business. So we have grouped data as below.

	Neighborhood	Chinese Restaurant	Park	Train Station	Bus Station	Multiplex	Indie Movie Theater	Shopping Mall
0	Alipore, Kolkata, India	6	2	0	0	2	0	2
1	Baguiati, Kolkata, India	3	1	2	1	8	0	4
2	Ballygunge, Kolkata, India	9	2	0	0	3	0	3
3	Bara Bazar, Kolkata, India	1	3	0	0	4	1	3
4	Behala, Kolkata, India	3	2	0	0	2	0	1

Below is the final data frame to calculate total score

	Neighborhood	Chinese Restaurant	Park	Shopping Mall	Station	Cinema	total
0	Alipore, Kolkata, India	6	2	2	0	2	1.0
1	Baguiati, Kolkata, India	3	1	4	3	8	13.5
2	Ballygunge, Kolkata, India	9	2	3	0	3	1.5
3	Bara Bazar, Kolkata, India	1	3	3	0	5	7.5
4	Behala, Kolkata, India	3	2	1	0	2	1.5

RESULT

Finally we have ordered data descending by Total score to get best location at the top of the data frame.

	index	Neighborhood	Chinese Restaurant	Park	Shopping Mall	Station	Cinema	total
0	1	Baguiati, Kolkata, India	3	1	4	3	8	13.5
1	41	Tala, Kolkata, Kolkata, India	2	1	3	3	7	12.0
2	40	South Dumdum, Kolkata, India	2	1	3	4	6	12.0
3	39	Shyambazar, Kolkata, India	2	2	3	2	7	11.0
4	6	Belgachia, Kolkata, India	2	1	3	2	7	11.0

CONCLUSION

Based on the maximum score we have found we can conclude the she should open her Chinese restaurant in below Location:

Baguiati, Kolkata, India