

Detecting Optimal Neighborhood to open a new restaurant.

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Overview

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Motivation

- High migration of people
- Reputation of Indian cuisine all over the world
- Increase in population
- High Business opportunity
- Development of the neighborhood
- Food: one of the three fundamental things to survive

Introduction

- New Delhi is the capital city of India.
- High tourist attraction as well as migration of people for jobs etc.
- Low number of proper Indian cuisine restaurant which serves all the main menu of Indian subcontinent.
- Being one of the oldest and centre of the city the neighborhood provides a great business opportunity.

Challenges

- High number of restaurants in Delhi
- Detection of location with low or zero restaurants in vicinity
- Collection of data of the type and number of the restaurants
- Detection of location close to basic facilities like transport, water, park etc.

Problem Description

- Finding an optimal location for a restaurant.
- Specifically, targeted to stakeholders interested in opening an restaurant in Delhi, India.

Problem Statement

- Detecting Optimal Neighborhood to open a new restaurant.

Proposed Approach

- There are lots of restaurants in Delhi.
- Try to detect locations that are not already crowded with restaurants. We are also
- Particularly interested in areas with no or very few restaurants in vicinity. We would also prefer locations as close to city center as
- Keeping in mind that first two conditions mentioned are met.

Average number of restaurants in every area with radius=300m: 1.6456043956043955

Out[24]:

	Address	Latitude	Longitude	X	Y	Distance from center	Restaurants in area
0	Rashtrapati Bhawan, President's Estate, New De...	28.614329	77.186362	7.112147e+06	5.494666e+06	5992.495307	0
1	Mother Teresa Crescent,, New Delhi 110011, Delhi	28.612026	77.189214	7.112747e+06	5.494666e+06	5840.376700	1
2	Mother Teresa Crescent,, New Delhi 110011, Delhi	28.609723	77.192066	7.113347e+06	5.494666e+06	5747.173218	0
3	Mother Teresa Crescent,, New Delhi 110011, Delhi	28.607420	77.194918	7.113947e+06	5.494666e+06	5715.767665	0
4	Teen Murti Road, New Delhi, Delhi	28.605117	77.197770	7.114547e+06	5.494666e+06	5747.173218	0
5	Teen Murti Road, New Delhi, Delhi	28.602815	77.200621	7.115147e+06	5.494666e+06	5840.376700	0
6	Teen Murti Road, New Delhi, Delhi	28.600512	77.203471	7.115747e+06	5.494666e+06	5992.495307	1
7		28.619964	77.184343	7.111247e+06	5.495186e+06	5855.766389	0
8	Talkatora Rd, New Delhi 110004, Delhi	28.617661	77.187196	7.111847e+06	5.495186e+06	5604.462508	0
9	Rashtrapati Bhawan, President's Estate, New De...	28.615357	77.190049	7.112447e+06	5.495186e+06	5408.326913	0

Fig. Shows Neighborhood and its distance from city centre

Result Analysis

Out[40]:

	Latitude	Longitude	X	Y	Restaurants nearby	Distance to Indian restaurant
0	28.612888	77.204520	7.114397e+06	5.496382e+06	0	632.261995
1	28.612504	77.204995	7.114497e+06	5.496382e+06	0	575.719880
2	28.615362	77.202283	7.113847e+06	5.496468e+06	0	1026.852208
3	28.614978	77.202759	7.113947e+06	5.496468e+06	0	936.014747
4	28.614595	77.203234	7.114047e+06	5.496468e+06	0	847.243622
5	28.614211	77.203709	7.114147e+06	5.496468e+06	0	761.262047
6	28.613827	77.204184	7.114247e+06	5.496468e+06	0	679.130366
7	28.613443	77.204659	7.114347e+06	5.496468e+06	0	602.425267
8	28.613059	77.205134	7.114447e+06	5.496468e+06	0	533.492598
9	28.612675	77.205609	7.114547e+06	5.496468e+06	0	475.723135

Fig. Shows the nearby restaurants in the neighborhood

Out[26]:

	Address	Latitude	Longitude	X	Y	Distance from center	Restaurants in area	Distance to Indian restaurant
0	Rashtrapati Bhawan, President's Estate, New De...	28.614329	77.186362	7.112147e+06	5.494666e+06	5992.495307	0	623.702623
1	Mother Teresa Crescent,, New Delhi 110011, Delhi	28.612026	77.189214	7.112747e+06	5.494666e+06	5840.376700	1	147.376217
2	Mother Teresa Crescent,, New Delhi 110011, Delhi	28.609723	77.192066	7.113347e+06	5.494666e+06	5747.173218	0	611.910563
3	Mother Teresa Crescent,, New Delhi 110011, Delhi	28.607420	77.194918	7.113947e+06	5.494666e+06	5715.767665	0	1202.975197
4	Teen Murti Road, New Delhi, Delhi	28.605117	77.197770	7.114547e+06	5.494666e+06	5747.173218	0	1799.962253
5	Teen Murti Road, New Delhi, Delhi	28.602815	77.200621	7.115147e+06	5.494666e+06	5840.376700	0	2241.089273
6	Teen Murti Road, New Delhi, Delhi	28.600512	77.203471	7.115747e+06	5.494666e+06	5992.495307	1	1961.284306
7		28.619964	77.184343	7.111247e+06	5.495186e+06	5855.766389	0	1551.420294
8	Talkatora Rd, New Delhi 110004, Delhi	28.617661	77.187196	7.111847e+06	5.495186e+06	5604.462508	0	979.601815

Fig. Shows the available restaurants in the neighborhood

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['New Delhi', 'Delhi', 'India']	=> 3.3km from Connaught
['Sansad Marg, Connaught Place', 'New Delhi 110001', 'Delhi', 'India']	
=> 1.4km from Connaught	
['Shop No 3, North Avenue (MP Market)', 'New Delhi', 'Delhi', 'India']	
=> 3.2km from Connaught	
['3, Kasturba Gandhi Marg', 'New Delhi', 'Delhi', 'India']	=
> 1.5km from Connaught	
['New Delhi', 'New Delhi 110001', 'ND', 'India']	=> 3.6km fr
om Connaught	
['India']	=> 2.5km from Connaught
['Parliament Street', 'Delhi 110001', 'Delhi', 'India']	=>
2.3km from Connaught	
['India']	=> 2.7km from Connaught
['Bangla Sahib Lane (Connaught Place)', 'New Delhi 110001', 'Delhi', 'India']	
=> 1.6km from Connaught	
['11 (Ashoka Road)', 'New Delhi', 'Delhi', 'India']	=> 2.4km
from Connaught	
['India']	=> 2.5km from Connaught
['India']	=> 1.9km from Connaught
['Delhi', 'Delhi', 'India']	=> 3.5km from Connaught
['Barakhamba Road', 'New Delhi 110001', 'Delhi', 'India']	=>
1.0km from Connaught	
['Connaught Place', 'New Delhi 110001', 'Delhi', 'India']	=>

Fig. Shows available neighborhood and its distance from city center

Conclusion

- Helped to identify Delhi areas close to center with low number of restaurants
- Aided stakeholders in narrowing down the search for optimal location for a new restaurant
- Others factors which affect the decision are:
 1. Attractiveness of each location (proximity to park or water),
 2. Levels of noise / proximity to major roads,
 3. Real estate availability, prices
 4. Social and economic dynamics of every neighborhood etc.

Future Scope

- Used for comparing neighborhoods of two major cities.
- Finding optimal location for opening any other kind of business:
 1. Real estate
 2. Supermarkets
 3. Stores
- Finding optimal neighborhood for living.

References

- https://en.wikipedia.org/wiki/New_Delhi
- Foursquare Api

Thank You