

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.

Out[12]:

	Address	Latitude	Longitude	X	Y	Distance from center
0	Chandni Chowk, Delhi, Delhi	77.183822	28.532484	832288.241552	8.605746e+06	5992.495307
1	Chandni Chowk, Delhi, Delhi	77.182594	28.556040	832888.241552	8.605746e+06	5840.376700
2	Chandni Chowk, Delhi, Delhi	77.181364	28.579591	833488.241552	8.605746e+06	5747.173218
3	Chandni Chowk, Delhi, Delhi	77.180132	28.603137	834088.241552	8.605746e+06	5715.767665
4	Chandni Chowk, Delhi, Delhi	77.178898	28.626678	834688.241552	8.605746e+06	5747.173218
5	Chandni Chowk, Delhi, Delhi	77.177662	28.650215	835288.241552	8.605746e+06	5840.376700
6	Chandni Chowk, Delhi, Delhi	77.176424	28.673748	835888.241552	8.605746e+06	5992.495307
7	Chandni Chowk, Delhi, Delhi	77.190188	28.501921	831388.241552	8.606266e+06	5855.766389
8	Chandni Chowk, Delhi, Delhi	77.188962	28.525491	831988.241552	8.606266e+06	5604.462508
9	Chandni Chowk, Delhi, Delhi	77.187735	28.549056	832588.241552	8.606266e+06	5408.326913

...and let's now save/persist this data into local file.

Fig. Shows Neighborhood and its distance from city centre

Result Analysis

City	Address	Locality	Longitude	Latitude
New Delhi	Ground Floor, Plot 482, Haveli Haider Quli, Near Andhra Bank, Ch	Chandni Chowk	77.224214	28.6564057
New Delhi	5080, Ballimaran Road, Katra Nawab, Chandni Chowk, New Delhi	Chandni Chowk	77.2278068	28.6545089
New Delhi	6283, Main Bara Hindu Rao, Near choti Masjid, MD Ismail Marg, S	Chandni Chowk	77.2094826	28.663599
New Delhi	1984-1985, Gali Paranthé Wali, Chandni Chowk, New Delhi	Chandni Chowk	77.2304115	28.6560115
New Delhi	Shop 2202, Bazar Chitli Qabar, Near Jama Masjid, Chandni Chowk	Chandni Chowk	77.2335101	28.6494534
New Delhi	251, Near Fatehpuri Masjid, Fatehpuri, Chandni Chowk, New Del	Chandni Chowk	77.22398333	28.65688889
New Delhi	382, Kucha Ghasi Ram, Fatehpuri, Chandni Chowk, New Delhi	Chandni Chowk	77.2244176	28.6566711
New Delhi	376, Near Kucha Ghasi Ram, Chandni Chowk, New Delhi	Chandni Chowk	77.2243841	28.6568732
New Delhi	379, Near Kucha Ghasi Ram, Chandni Chowk, New Delhi	Chandni Chowk	77.2243823	28.656851
New Delhi	Old Delhi Railway Station, Mori Gate, Chandni Chowk, New Delhi	Chandni Chowk	77.2280206	28.6606804
New Delhi	187, Church Mission Road, Fatehpuri, Chandni Chowk, New Delhi	Chandni Chowk	77.2231981	28.6578654
New Delhi	5469, Opposite Town Hall, Chandni Chowk, New Delhi	Chandni Chowk	77.2271781	28.6563302
New Delhi	711, Church Mission Road, Fatehpuri, Chandni Chowk, New Delhi	Chandni Chowk	77.2234955	28.658756
New Delhi	659, Church Mission Road, Fatehpuri, Chandni Chowk, New Delhi	Chandni Chowk	77.2234057	28.6581203
New Delhi	Near Sis Ganj Sahib Gurudwara, Chandni Chowk, New Delhi	Chandni Chowk	77.23421395	28.65606667
New Delhi	Platform 3, Old Delhi Railway Station, Chandni Chowk, New Delhi	Chandni Chowk	77.22333167	28.65664
New Delhi	Main Road Near Central Bank, Opposite Paranthé Wali Gali, Chan	Chandni Chowk	77.2305013	28.6561992
New Delhi	Gali Barf Wali, Near Kinari Bazar, Chandni Chowk, New Delhi	Chandni Chowk	77.23	28.66
New Delhi	Opposite Town Hall, Chandni Chowk, New Delhi	Chandni Chowk	77.2268188	28.6565647
New Delhi	9074, Gali Paranthé Wali, Chandni Chowk, New Delhi	Chandni Chowk	77.2307138	28.6560495
New Delhi	42-B, Gali Paranthé Wali, Opposite Central Bank, Chandni Chowk, N	Chandni Chowk	77.2305013	28.6561097
New Delhi	453, Khari Baoli, Chandni Chowk, New Delhi	Chandni Chowk	77.2155012	28.6625615
New Delhi	1894, Main Road, Opposite Dariba Kalan, Chandni Chowk, New D	Chandni Chowk	77.2324772	28.6562981
New Delhi	105-110, Bazar Matia Mahal, Opposite Jama Masjid Gate 1, Chan	Chandni Chowk	77.233555	28.6491441
New Delhi	Gali Paranthé Wali, Chandni Chowk, New Delhi	Chandni Chowk	77.2306151	28.6559026
New Delhi	Shop 1462, Near Sheesh Ganj Sahib Gurudwara, Chandni Chowk	Chandni Chowk	77.2320281	28.656524
New Delhi	934, Kucha Pati Ram, Sitaram Bazar, Chandni Chowk, New Delhi	Chandni Chowk	77.2269535	28.6476635

Fig. Shows the available restaurants in the neighborhood

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```
df_locations['Distance to Italian restaurant'] = distances_to_italian_restaurant
```

In [28]: `df_locations.head(10)`

Out[28]:

	Address	Latitude	Longitude	X	Y	Distance from center	Restaurants in area	Distance to Italian restaurant
0	Chandni Chowk, Delhi, Delhi	77.183822	28.532484	832288.241552	8.605746e+06	5992.495307	0	10000
1	Chandni Chowk, Delhi, Delhi	77.182594	28.556040	832888.241552	8.605746e+06	5840.376700	0	10000
2	Chandni Chowk, Delhi, Delhi	77.181364	28.579591	833488.241552	8.605746e+06	5747.173218	0	10000
3	Chandni Chowk, Delhi, Delhi	77.180132	28.603137	834088.241552	8.605746e+06	5715.767665	0	10000
4	Chandni Chowk, Delhi, Delhi	77.178898	28.626678	834688.241552	8.605746e+06	5747.173218	0	10000
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6	Chandni Chowk, Delhi, Delhi	77.176424	28.673748	835888.241552	8.605746e+06	5992.495307	0	10000
7	Chandni Chowk, Delhi, Delhi	77.190188	28.501921	831388.241552	8.606266e+06	5855.766389	0	10000
8	Chandni Chowk, Delhi, Delhi	77.188962	28.525491	831988.241552	8.606266e+06	5604.462508	0	10000
9	Chandni Chowk, Delhi, Delhi	77.187735	28.549056	832588.241552	8.606266e+06	5408.326913	0	10000

In [29]: `print('Average distance to closest Italian restaurant from each area center:', df_locations['Distance to Italian restaurant'].mean())`

Average distance to closest Italian restaurant from each area center: 10000.0

Fig. Shows available restaurants and its distance in the neighborhood

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
- Google Api

Thank You