

Coursera Capstone Project

for IBM Professional Certification in Data Science

“The Battle of the Neighborhoods”

Analysis of business opportunities near Metro stations in Delhi.

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Problem Statement

Delhi, officially the National Capital Territory of Delhi (NCT), is a city and a union territory of India. The NCT covers an area of 1,484 square kilometers having population of about 18.6 millions.

Delhi Metro Rail Corporation Limited(DMRC) is a Centre-state Public Sector company that operates the Delhi Metro having about 250 stations.

Question: if we were to consider an investment opportunity to start a business near metro stations, what would be the recommended business and where would be the best place to do it?

Elements to consider:

- Proximity of Businesses to Metro stations.
- Metro station opening date.
- Station Layout

Preliminary Analysis

Proximity of Businesses to Metro stations:

There are few metro stations which are having different businesses like Shopping Mall, Restaurant, Coffee Shop, Hotels, Bookstore, Gift Shops, Mobile and Laptop shops, Pizza store, Bakery, etc. due to this these metro stations are always crowded. Also there is traffic and parking problem. While other metro stations having much space around don't have much business and people living nearby have to travel to far away places to spend their time. So we will explore the possibilities at other stations.

Metro station opening date:

Based on the opening date of metro station we will explore opportunities. Stations opened recently have very less businesses, so these are great opportunities. Also people nearby these stations will welcome the setups like Pizza store, Gift shops, etc. and they don't need to travel far away to get their needs fulfilled.

Station Layout:

There are 2 types of station layout: Elevated and Underground.

Stations having Underground layout are usually crowded places and are not great opportunities to start business as there is not much space available there and rent is high. While area near by elevated stations are spacious, so these are the places of our choice to start a business.

Data Overview

The data that we will use for this analysis is a combination of data from Wikipedia page(List of Delhi Metro stations) and the location venue information in foursquare.

Source 1: DelhiMetroData.csv

Source 2: Venue data via Foursquare

We will first determine the most likely neighborhood for setting a business based on proximity to metro station.

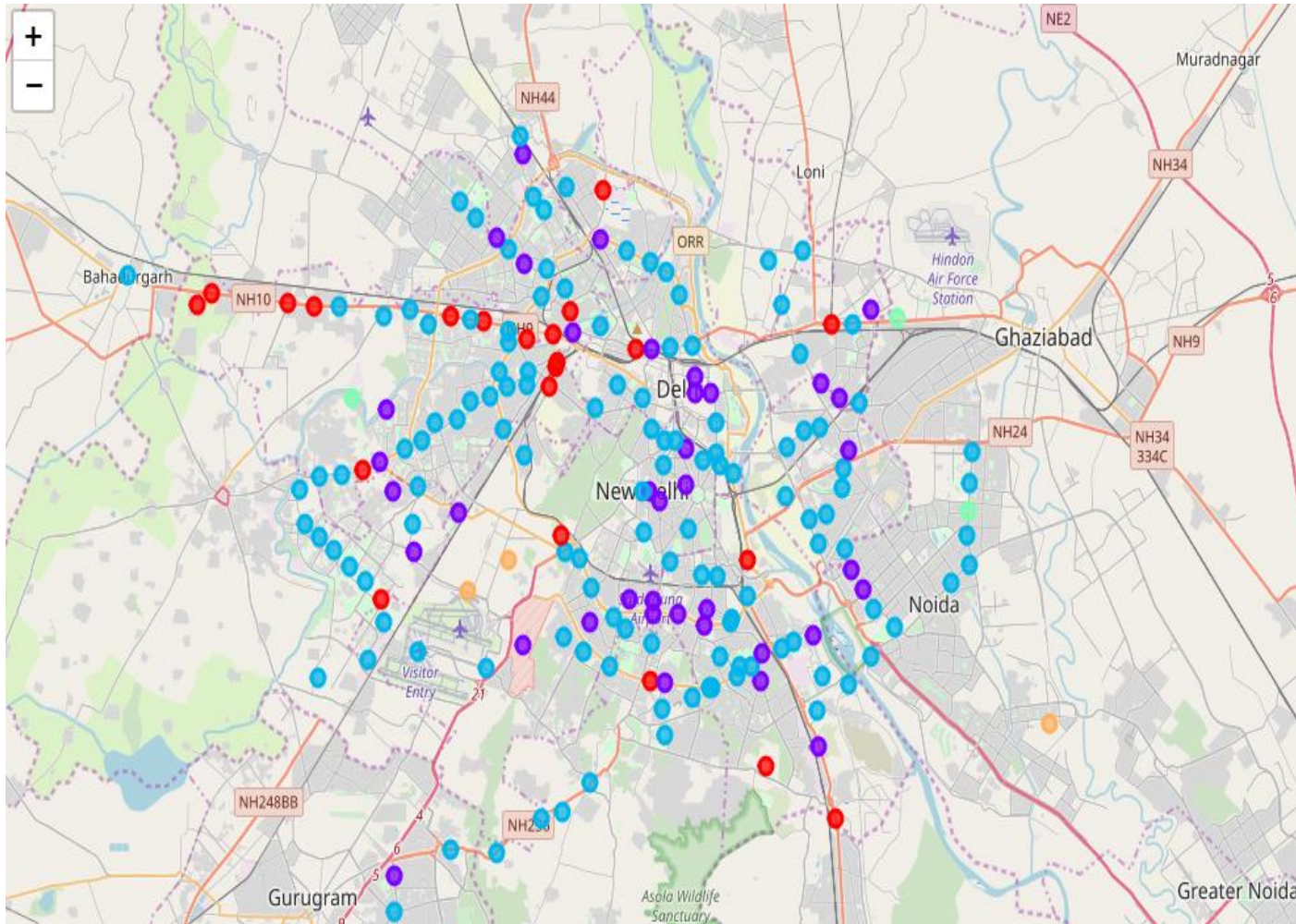
Using clustering techniques developed in previous exercises in the capstone project, we will examine the most common venues by neighborhood listed in Foursquare.

Preliminary Analysis

	StationName	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
0	AIIMS	Indian Restaurant	Memorial Site	Market	Restaurant	Yoga Studio
1	Adarsh Nagar	Indian Restaurant	Burger Joint	Yoga Studio	Fabric Shop	Food Truck
2	Akshardham	Athletics & Sports	Hindu Temple	Yoga Studio	Food Truck	Food Court
3	Anand Vihar ISBT	Clothing Store	Multiplex	Indian Restaurant	Café	Gym
4	Arjan Garh	Hotel	Light Rail Station	Furniture / Home Store	Yoga Studio	History Museum
5	Ashok Park Main	Train Station	Yoga Studio	Electronics Store	Food Truck	Food Court
6	Ashram	Dessert Shop	Bowling Alley	Bakery	Neighborhood	Yoga Studio
7	Azadpur	Indian Restaurant	Park	Bus Station	Yoga Studio	Electronics Store
8	Badarpur Border	IT Services	Train Station	Yoga Studio	Eastern European Restaurant	Food Court
9	Bahadurgarh City	Pharmacy	Bus Station	French Restaurant	Food Truck	Food Court
10	Barakhambha Road	Indian Restaurant	Hotel Bar	Coffee Shop	Molecular Gastronomy Restaurant	Gastropub
11	Bata Chowk	Asian Restaurant	Shopping Mall	Hotel	Multiplex	Food
12	Bhikaji Cama Place	Lounge	Hotel	Café	Asian Restaurant	Gym / Fitness Center
13	Botanical Garden	Bus Station	Hotel	Light Rail Station	Flea Market	Bakery
14	Central Secretariat	Music Venue	Indian Restaurant	Spiritual Center	Yoga Studio	Food Court
15	Chandni Chowk	Indian Restaurant	Market	Snack Place	Dessert Shop	Train Station

This will be done to find the most common venue types at each metro stations.

Initial Mapping of Metro Stations



Will focus on small clusters of metro stations which are recently opened.

Secondary Analysis

	Venue Category	Venue
0	Indian Restaurant	144
1	Hotel	80
2	Café	80
3	Fast Food Restaurant	70
4	Coffee Shop	68
5	Pizza Place	53
6	Chinese Restaurant	40
7	Restaurant	35
8	Shopping Mall	27
9	Bar	25
10	Bakery	23

Indian Restaurant, Café, Fast Food Restaurant, Coffee Shop, Pizza Place, Chinese Restaurant are the most common venue types. So we will consider those station having very less or none of these venues.

	StationName	Opened	Layout	Latitude	Longitude	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
129	Noida Sector 59	2019-03-09	Elevated	28.606529	77.372642	3	Business Service	Electronics Store	Food Truck	Food Court	Food & Drink Shop
172	Shaheed Nagar	2019-03-08	Elevated	28.678230	77.335647	3	Business Service	Music Venue	Yoga Studio	Food Court	Food & Drink Shop
177	Shiv Vihar	2018-10-31	Elevated	28.648123	77.050612	3	Business Service	Electronics Store	Food Truck	Food Court	Food & Drink Shop

Cluster-4

	StationName	Opened	Layout	Latitude	Longitude	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
22	Delhi Cantonment	2018-03-14	Elevated	28.588856	77.132399	4	ATM	Electronics Store	Food Truck	Food Court	Food & Drink Shop
163	Sadar Bazaar Cantonment	2018-05-29	Elevated	28.577151	77.111153	4	ATM	Food	Electronics Store	Food Truck	Food Court
181	Sikandarpur	2010-06-21	Elevated	28.528424	77.415394	4	ATM	Electronics Store	Food Truck	Food Court	Food & Drink Shop

Cluster-5

Final Selection

Noida Sector 59, Shaheed Nagar, Shiv Vihar, Delhi Cantonment, Sadar Bazaar Cantonment and Sikandarpur are the station of our choice. All these metro stations, except Sikandarpur, are recently opened, in year 2018/19. Sikandarpur is opened in 2010 and not much developed so we are dropping it from consideration.

So to start any or all of the business like Indian Restaurant, Café, Fast Food Restaurant, Coffee Shop, Pizza Place, Chinese Restaurant at these metro stations will be profitable and having less competition from other business.

Delhi Cantonment and Sadar Bazaar Cantonment are crowded places, so here risk is very low to start business.