

Capstone Project - The Battle of Neighborhoods

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1. Introduction

1.1 Background

India is a fast-growing country with its population majority migrating towards the Metro cities of the nation. These cities provide lot of economical growth opportunities. Due the opportunities they offer, these cities have already exhausted their resources and have no place to accommodate more migrants from different parts of the country.

To solve this problem, suburbs were constructed so that these metro cities can continue accommodating migrants from different part of the country. As people come into these metro areas, it becomes very difficult to choose a place of one's liking and once settled it becomes very difficult to move out of that area due to the costs involved in moving

2.2 Problem

Delhi is the capital of India and witnesses one of the highest immigrants from different parts of the country. Due to the number

of immigrants, Delhi had exhausted its infrastructure in the 1990's itself. To solve this problem, two main suburbs were established i.e. Noida and Gurugram.

These two suburbs have grown over time and have unique experiences to offer. When a person moves to Delhi, they generally tend to settle in one of these suburbs. As people come from different backgrounds, it becomes very difficult to choose which suburb to live and in which area to live

This project aims at solving this problem by analyzing both the suburbs and it's areas. It also tries to find how similar both suburbs are.

2. Data:

In this project, we will analyze two main suburbs of Delhi i.e. **Noida** and **Gurugram**

Both of these suburbs are divided into sectors. The data about these sectors can be obtained by their respective Municipal Corporations and on the internet

Noida has 169 sectors while Gurugram has 115 sectors

We can then obtain the geographical coordinates of the sectors of each suburbs using a geoencoder. Using foursquare, we can explore each sector and then do our analysis about each sector and the suburb as a whole

At the end, we can compare both the suburbs on the venues they have to see how similar they are.

3. Methodology:

3.1 Determining Noida Sectors geographical coordinates

We get the sectors from Noida Authority or from the web. Now using a geoencoder, we determine the latitude and longitude of each sector

	Sector	Lat	Long
0	Sector 1	28.590229	77.312458
1	Sector 2	28.585080	77.315262
2	Sector 3	28.580568	77.318870
3	Sector 4	28.583683	77.322966
4	Sector 5	28.588790	77.321146
...
158	Sector 159	28.586853	77.327393
159	Sector 160	28.505160	77.371456
160	Sector 161	28.586853	77.327393
161	Sector 162	28.586853	77.327393
162	Sector 163	28.475835	77.554479

163 rows × 3 columns

3.2 Determining Gurugram Sectors geographical coordinates

We get the sectors from Gurugram Municipal corporation or from the web. Now using a geocoder, we determine the latitude and longitude of each sector

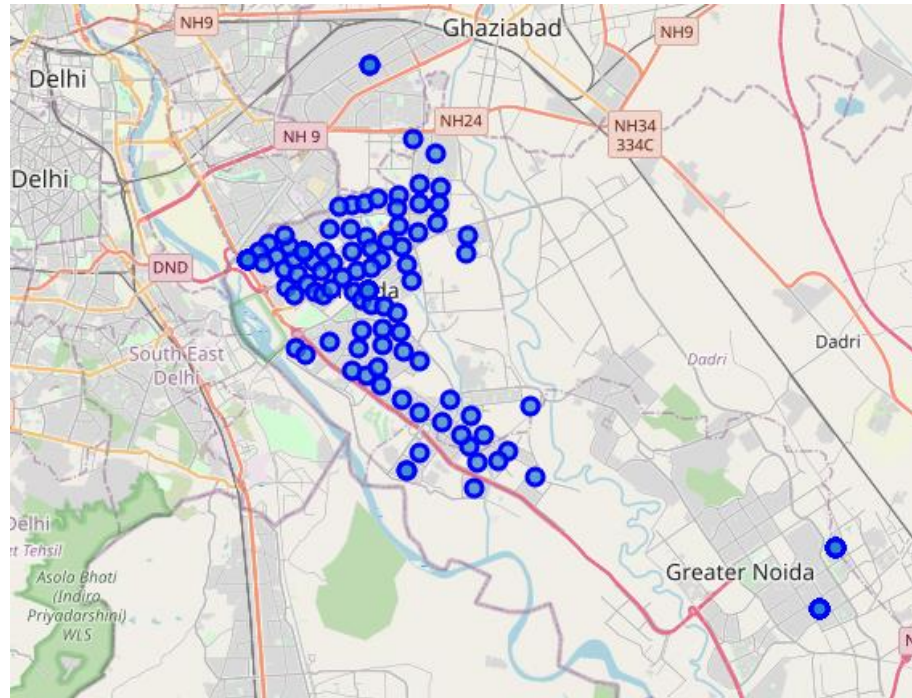
	Sector	Lat	Long
0	Sector 1	28.360102	76.948375
1	Sector 2	28.509050	77.034283
2	Sector 3	28.362766	76.919326
3	Sector 4	28.369716	76.912161
4	Sector 5	28.367354	76.926724
...
110	Sector 111	28.522277	77.033620
111	Sector 112	28.520340	77.018861
112	Sector 113	28.528665	77.025028
113	Sector 114	28.531880	77.011779
114	Sector 115	28.535643	77.006944

115 rows × 3 columns

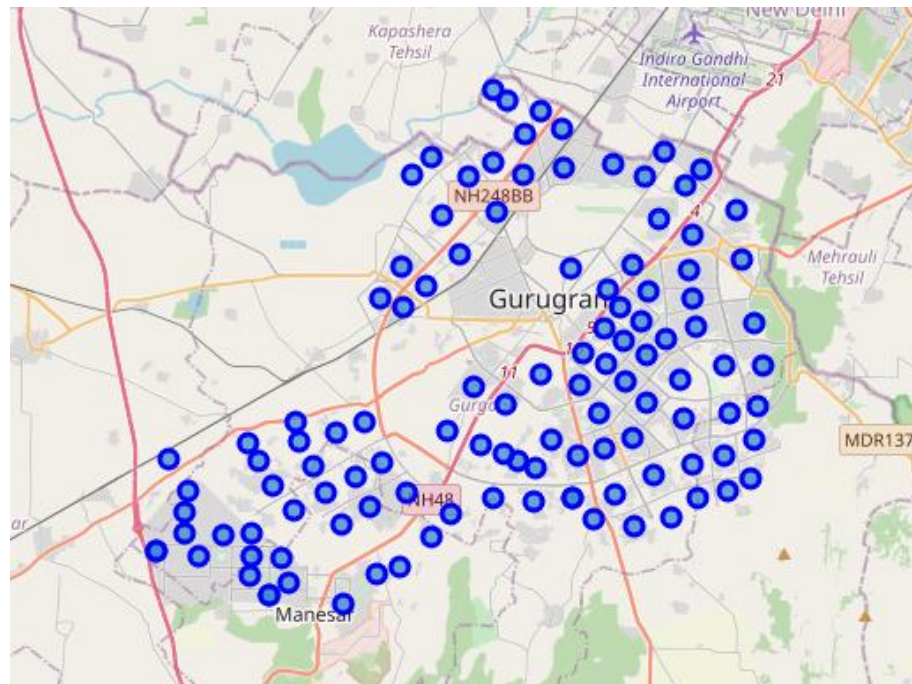
3.3 Plotting the sectors on a map

We now plot the sector coordinates on a map.

Plotting Noida sector locations on map:



Plotting Gurugram sector locations on map:



3.4 Getting the near by venues in each sector of Noida using foursquare

Using foursquare API, we fetch nearby venues for each sector in Noida. We search in the radius of 500 mtrs

	Sector	Sector Latitude	Sector Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Sector 1	28.590229	77.312458	Cafe Coffee Day	28.591626	77.308197	Coffee Shop
1	Sector 1	28.590229	77.312458	Nirulas Hotel	28.586437	77.313750	Hotel
2	Sector 1	28.590229	77.312458	Axis Bank ATM	28.593310	77.308980	ATM
3	Sector 2	28.585080	77.315262	Nirula's Ice-Cream	28.583401	77.314420	Indian Restaurant
4	Sector 2	28.585080	77.315262	Fresh Food Factory - Accha Khao Accha Khilao	28.580971	77.317292	Indian Restaurant

We then check how many venues each sector has

	Sector Latitude	Sector Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
Sector						
Sector 1	3	3	3	3	3	3
Sector 10	7	7	7	7	7	7
Sector 100	7	7	7	7	7	7
Sector 101	5	5	5	5	5	5
Sector 102	2	2	2	2	2	2
...
Sector 91	2	2	2	2	2	2
Sector 93	3	3	3	3	3	3
Sector 94	2	2	2	2	2	2
Sector 96	2	2	2	2	2	2
Sector 97	2	2	2	2	2	2

138 rows × 6 columns

We find that there are 81 unique venue categories in all sectors of Noida

3.5 Using foursquare API, we fetch nearby venues for each sector in Gurugram. We search in the radius of 500 mtrs

	Sector	Sector Latitude	Sector Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Sector 2	28.509050	77.034283	Palam Vihar Vyapar Kendra Market	28.508788	77.030992	Market
1	Sector 2	28.509050	77.034283	Cafe Coffee Day (CCD)	28.508034	77.030053	Café
2	Sector 2	28.509050	77.034283	Ansals Palam Vihar	28.507063	77.030621	Shopping Mall
3	Sector 2	28.509050	77.034283	Moti Mahal Deluxe	28.507045	77.029738	Asian Restaurant
4	Sector 5	28.367354	76.926724	Justanned	28.368784	76.926430	Accessories Store

We then check how many venues each sector has

	Sector Latitude	Sector Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
Sector						
Sector 107	2	2	2	2	2	2
Sector 108	2	2	2	2	2	2
Sector 113	1	1	1	1	1	1
Sector 114	1	1	1	1	1	1
Sector 13	2	2	2	2	2	2
Sector 16	1	1	1	1	1	1
Sector 17	4	4	4	4	4	4
Sector 19	1	1	1	1	1	1
Sector 2	4	4	4	4	4	4
Sector 20	4	4	4	4	4	4
Sector 21	4	4	4	4	4	4
Sector 22	8	8	8	8	8	8
Sector 23	3	3	3	3	3	3
Sector 24	4	4	4	4	4	4
Sector 25	1	1	1	1	1	1
Sector 26	10	10	10	10	10	10
Sector 27	43	43	43	43	43	43
Sector 28	5	5	5	5	5	5
Sector 29	36	36	36	36	36	36
Sector 30	7	7	7	7	7	7

We find that there are 86 unique venue categories in all sectors of Noida

3.6 Finding the top 5 venues for each sector in Noida and Gurugram

We take the mean of the venues of each sector in Noida and Gurugram. We do this by converting venue category into One Hot encoded representation

Noida top 5 locations per sector

	Sector	1st most common venue	2nd most common venue	3rd most common venue	4th most common venue	5th most common venue
0	Sector 1	ATM	Coffee Shop	Hotel	Flea Market	Department Store
1	Sector 10	Multiplex	Movie Theater	Metro Station	Food Truck	Café
2	Sector 100	Multiplex	Movie Theater	Metro Station	Food Truck	Café
3	Sector 101	Indian Restaurant	Department Store	Hotel	Farm	Women's Store
4	Sector 102	Plaza	Food Truck	Women's Store	Fast Food Restaurant	Cosmetics Shop
...
133	Sector 91	Women's Store	Hotel	Flea Market	Department Store	Dessert Shop
134	Sector 93	Gym	Pizza Place	Grocery Store	Gift Shop	Garden
135	Sector 94	River	Other Great Outdoors	Women's Store	Farm	Convenience Store
136	Sector 96	Concert Hall	Golf Course	Fast Food Restaurant	Cosmetics Shop	Department Store
137	Sector 97	Concert Hall	Golf Course	Fast Food Restaurant	Cosmetics Shop	Department Store

138 rows x 6 columns

Gurugram top 5 locations per sector

	Sector	1st most common venue	2nd most common venue	3rd most common venue	4th most common venue	5th most common venue
0	Sector 107	Clothing Store	Cricket Ground	Yoga Studio	Convenience Store	Deli / Bodega
1	Sector 108	Tennis Court	Badminton Court	Yoga Studio	Falafel Restaurant	Cricket Ground
2	Sector 113	ATM	Falafel Restaurant	Cricket Ground	Deli / Bodega	Department Store
3	Sector 114	Food Truck	Yoga Studio	Falafel Restaurant	Cricket Ground	Deli / Bodega
4	Sector 13	ATM	Market	Electronics Store	Cricket Ground	Deli / Bodega
5	Sector 16	Lounge	Yoga Studio	Cricket Ground	Deli / Bodega	Department Store
6	Sector 17	Shoe Store	Pizza Place	Indian Restaurant	Lounge	Yoga Studio
7	Sector 19	Hotel	Yoga Studio	Falafel Restaurant	Cricket Ground	Deli / Bodega
8	Sector 2	Café	Asian Restaurant	Market	Shopping Mall	Yoga Studio
9	Sector 20	Hotel	Clothing Store	Cafeteria	Yoga Studio	Electronics Store
10	Sector 21	Coffee Shop	Pizza Place	Indian Restaurant	Middle Eastern Restaurant	Donut Shop
11	Sector 22	Indian Restaurant	Miscellaneous Shop	Pizza Place	Burger Joint	Shopping Mall
12	Sector 23	Indian Restaurant	Dessert Shop	Yoga Studio	Falafel Restaurant	Cricket Ground
13	Sector 24	Coffee Shop	Bed & Breakfast	Gym	Restaurant	Cricket Ground
14	Sector 25	Pool	Yoga Studio	Coffee Shop	Cosmetics Shop	Cricket Ground
15	Sector 26	Coffee Shop	French Restaurant	Hotel	Chinese Restaurant	Café
16	Sector 27	Café	Indian Restaurant	Bakery	Restaurant	Italian Restaurant
17	Sector 28	Indian Restaurant	Tea Room	Department Store	Donut Shop	Yoga Studio
18	Sector 29	Hotel	Indian Restaurant	Brewery	Café	Chinese Restaurant
19	Sector 30	Multiplex	Tea Room	Department Store	Indian Restaurant	Residential Building (Apartment / Condo)
20	Sector 31	Department Store	Fried Chicken Joint	Café	Indian Sweet Shop	Bakery
21	Sector 32	Coffee Shop	Cricket Ground	Hotel	Fast Food Restaurant	Scenic Lookout
22	Sector 34	Clothing Store	Motorcycle Shop	Yoga Studio	Convenience Store	Cricket Ground
23	Sector 35	Tea Room	Yoga Studio	Electronics Store	Cosmetics Shop	Cricket Ground
24	Sector 37	Bakery	Outdoor Supply Store	Yoga Studio	Electronics Store	Cosmetics Shop
25	Sector 38	Shop & Service	Fried Chicken Joint	North Indian Restaurant	Electronics Store	Cosmetics Shop

3.7 Categorizing this data into clusters

We now know the top 5 venue categories of each sector for Noida and Gurugram. We need to find similar sectors so that we get an idea how each sector fares against each other. To do this, we use the K-means clustering algorithm and process this into 5 clusters. K-means will place each sector into a cluster and that will help us in seeing which areas are having similar venue categories. We will discuss the results in the result sections

4. Results

4.1 Noida Results

We saw that Noida sectors got categorized into 5 clusters. We also saw that Noida had few sectors which did not have any nearby venue

The first category of sectors have Wine Bar, Pharmacy and Fast Food restaurants as top 3 venues

	Sector	Lat	Long	Cluster Labels	1st most common venue	2nd most common venue	3rd most common venue	4th most common venue	5th most common venue
71	Sector 72	28.475835	77.554479	0.0	Wine Bar	Pharmacy	Fast Food Restaurant	Cosmetics Shop	Department Store
74	Sector 75	28.475835	77.554479	0.0	Wine Bar	Pharmacy	Fast Food Restaurant	Cosmetics Shop	Department Store
103	Sector 104	28.475835	77.554479	0.0	Wine Bar	Pharmacy	Fast Food Restaurant	Cosmetics Shop	Department Store
105	Sector 106	28.475835	77.554479	0.0	Wine Bar	Pharmacy	Fast Food Restaurant	Cosmetics Shop	Department Store
106	Sector 107	28.545932	77.376561	0.0	Pharmacy	Food Truck	Women's Store	Fast Food Restaurant	Cosmetics Shop
109	Sector 110	28.475835	77.554479	0.0	Wine Bar	Pharmacy	Fast Food Restaurant	Cosmetics Shop	Department Store
139	Sector 140	28.475835	77.554479	0.0	Wine Bar	Pharmacy	Fast Food Restaurant	Cosmetics Shop	Department Store
147	Sector 148	28.475835	77.554479	0.0	Wine Bar	Pharmacy	Fast Food Restaurant	Cosmetics Shop	Department Store
157	Sector 158	28.475835	77.554479	0.0	Wine Bar	Pharmacy	Fast Food Restaurant	Cosmetics Shop	Department Store
162	Sector 163	28.475835	77.554479	0.0	Wine Bar	Pharmacy	Fast Food Restaurant	Cosmetics Shop	Department Store

The second category of sectors have Plaza, Food Truck and Women's store as top 3 venues

	Sector	Lat	Long	Cluster Labels	1st most common venue	2nd most common venue	3rd most common venue	4th most common venue	5th most common venue
68	Sector 69	28.583792	77.303193	1.0	Plaza	Food Truck	Women's Store	Fast Food Restaurant	Cosmetics Shop
76	Sector 77	28.583792	77.303193	1.0	Plaza	Food Truck	Women's Store	Fast Food Restaurant	Cosmetics Shop
77	Sector 78	28.583792	77.303193	1.0	Plaza	Food Truck	Women's Store	Fast Food Restaurant	Cosmetics Shop
79	Sector 80	28.583792	77.303193	1.0	Plaza	Food Truck	Women's Store	Fast Food Restaurant	Cosmetics Shop
85	Sector 86	28.583792	77.303193	1.0	Plaza	Food Truck	Women's Store	Fast Food Restaurant	Cosmetics Shop
88	Sector 89	28.583792	77.303193	1.0	Plaza	Food Truck	Women's Store	Fast Food Restaurant	Cosmetics Shop
101	Sector 102	28.583792	77.303193	1.0	Plaza	Food Truck	Women's Store	Fast Food Restaurant	Cosmetics Shop
102	Sector 103	28.583792	77.303193	1.0	Plaza	Food Truck	Women's Store	Fast Food Restaurant	Cosmetics Shop
108	Sector 109	28.583792	77.303193	1.0	Plaza	Food Truck	Women's Store	Fast Food Restaurant	Cosmetics Shop
110	Sector 111	28.583792	77.303193	1.0	Plaza	Food Truck	Women's Store	Fast Food Restaurant	Cosmetics Shop
112	Sector 113	28.583792	77.303193	1.0	Plaza	Food Truck	Women's Store	Fast Food Restaurant	Cosmetics Shop
113	Sector 114	28.583792	77.303193	1.0	Plaza	Food Truck	Women's Store	Fast Food Restaurant	Cosmetics Shop
114	Sector 115	28.583792	77.303193	1.0	Plaza	Food Truck	Women's Store	Fast Food Restaurant	Cosmetics Shop

The third category of sectors have ATM, Hookah Bar and Chinese Restaurant as top 3 venues

	Sector	Lat	Long	Cluster Labels	1st most common venue	2nd most common venue	3rd most common venue	4th most common venue	5th most common venue
5	Sector 6	28.592977	77.318694	2.0	ATM	Bed & Breakfast	Flea Market	Department Store	Dessert Shop
8	Sector 9	28.586853	77.327393	2.0	ATM	Hookah Bar	Chinese Restaurant	Bar	Sandwich Place
29	Sector 30	28.573302	77.339173	2.0	Gym	Sandwich Place	Cosmetics Shop	Department Store	Dessert Shop
80	Sector 81	28.586853	77.327393	2.0	ATM	Hookah Bar	Chinese Restaurant	Bar	Sandwich Place
82	Sector 83	28.525151	77.398608	2.0	ATM	Comfort Food Restaurant	Convenience Store	Department Store	Dessert Shop
86	Sector 87	28.586853	77.327393	2.0	ATM	Hookah Bar	Chinese Restaurant	Bar	Sandwich Place
115	Sector 116	28.586853	77.327393	2.0	ATM	Hookah Bar	Chinese Restaurant	Bar	Sandwich Place
116	Sector 117	28.586853	77.327393	2.0	ATM	Hookah Bar	Chinese Restaurant	Bar	Sandwich Place
117	Sector 118	28.586853	77.327393	2.0	ATM	Hookah Bar	Chinese Restaurant	Bar	Sandwich Place
118	Sector 119	28.586853	77.327393	2.0	ATM	Hookah Bar	Chinese Restaurant	Bar	Sandwich Place
124	Sector 125	28.586853	77.327393	2.0	ATM	Hookah Bar	Chinese Restaurant	Bar	Sandwich Place
125	Sector 126	28.586853	77.327393	2.0	ATM	Hookah Bar	Chinese Restaurant	Bar	Sandwich Place
126	Sector 127	28.586853	77.327393	2.0	ATM	Hookah Bar	Chinese Restaurant	Bar	Sandwich Place
128	Sector 129	28.586853	77.327393	2.0	ATM	Hookah Bar	Chinese Restaurant	Bar	Sandwich Place
129	Sector 130	28.586853	77.327393	2.0	ATM	Hookah Bar	Chinese Restaurant	Bar	Sandwich Place
130	Sector 131	28.586853	77.327393	2.0	ATM	Hookah Bar	Chinese Restaurant	Bar	Sandwich Place
133	Sector 134	28.586853	77.327393	2.0	ATM	Hookah Bar	Chinese Restaurant	Bar	Sandwich Place

The fourth category of sectors have Multiplexes, Movie theater and Metro station as top 3 venues

	Sector	Lat	Long	Cluster Labels	1st most common venue	2nd most common venue	3rd most common venue	4th most common venue	5th most common venue
4	Sector 5	28.588790	77.321146	3.0	ATM	IT Services	Indian Restaurant	Café	Fast Food Restaurant
6	Sector 7	28.572644	77.354761	3.0	Multiplex	Movie Theater	Metro Station	Food Truck	Café
7	Sector 8	28.572644	77.354761	3.0	Multiplex	Movie Theater	Metro Station	Food Truck	Café
9	Sector 10	28.572644	77.354761	3.0	Multiplex	Movie Theater	Metro Station	Food Truck	Café
10	Sector 11	28.572644	77.354761	3.0	Multiplex	Movie Theater	Metro Station	Food Truck	Café
...
123	Sector 124	28.548304	77.327806	3.0	Café	Women's Store	Convenience Store	Department Store	Dessert Shop
127	Sector 128	28.572644	77.354761	3.0	Multiplex	Movie Theater	Metro Station	Food Truck	Café
131	Sector 132	28.511689	77.376770	3.0	Pizza Place	Construction & Landscaping	Women's Store	Fast Food Restaurant	Cosmetics Shop
134	Sector 135	28.498005	77.400033	3.0	Coffee Shop	Business Service	Hotel	Pizza Place	Fast Food Restaurant
135	Sector 136	28.507924	77.401673	3.0	Pharmacy	Metro Station	Cafeteria	Women's Store	Farm

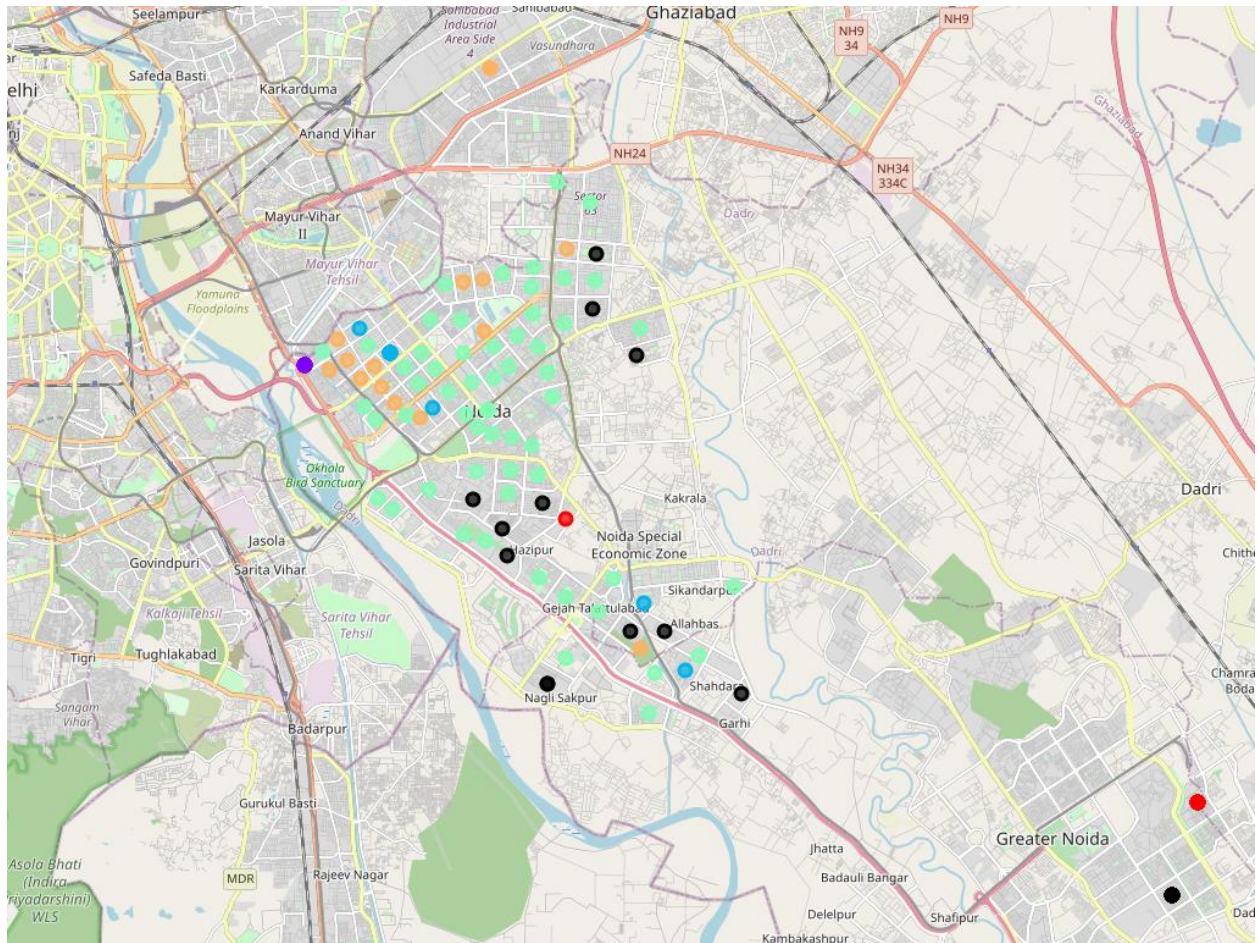
The fifth category of sectors have Restaurants, Shops and Hotels as top venues

	Sector	Lat	Long	Cluster Labels	1st most common venue	2nd most common venue	3rd most common venue	4th most common venue	5th most common venue
0	Sector 1	28.590229	77.312458	4.0	ATM	Coffee Shop	Hotel	Flea Market	Department Store
1	Sector 2	28.585080	77.315262	4.0	Indian Restaurant	Hotel	Women's Store	Flea Market	Department Store
2	Sector 3	28.580568	77.318870	4.0	Indian Restaurant	Plaza	Coffee Shop	Train Station	Tea Room
3	Sector 4	28.583683	77.322966	4.0	Hookah Bar	Indian Restaurant	Women's Store	Flea Market	Department Store
14	Sector 15	28.582798	77.310222	4.0	Indian Restaurant	Metro Station	Restaurant	Women's Store	Fast Food Restaurant
15	Sector 16	28.657092	77.355491	4.0	Indian Restaurant	Department Store	Hotel	Farm	Women's Store
18	Sector 19	28.578397	77.324769	4.0	Indian Restaurant	Flea Market	Tea Room	Clothing Store	Pizza Place
22	Sector 23	28.592354	77.353813	4.0	Hotel	Food Truck	Women's Store	Flea Market	Department Store
26	Sector 27	28.574677	77.328728	4.0	Indian Restaurant	Pizza Place	Bakery	Hotel	Women's Store
28	Sector 29	28.570832	77.335821	4.0	Indian Restaurant	Gourmet Shop	South Indian Restaurant	Snack Place	Fast Food Restaurant
37	Sector 38	28.657092	77.355491	4.0	Indian Restaurant	Department Store	Hotel	Farm	Women's Store
54	Sector 55	28.604326	77.348029	4.0	Hotel	Indian Restaurant	Women's Store	Flea Market	Department Store
56	Sector 57	28.605034	77.353468	4.0	Hotel	Indian Restaurant	Liquor Store	Women's Store	Fast Food Restaurant
63	Sector 64	28.612483	77.377031	4.0	Hotel	Italian Restaurant	Café	Women's Store	Fast Food Restaurant
90	Sector 91	28.514003	77.397681	4.0	Women's Store	Hotel	Flea Market	Department Store	Dessert Shop
100	Sector 101	28.657092	77.355491	4.0	Indian Restaurant	Department Store	Hotel	Farm	Women's Store

Then we have few sectors which don't have any venues near by it.

	Sector	Lat	Long	Cluster Labels	1st most commonn venue	2nd most commonn venue	3rd most commonn venue	4th most common venue	5th most common venue
44	Sector 45	28.550602	77.350513	NaN	NaN	NaN	NaN	NaN	NaN
46	Sector 47	28.549828	77.370070	NaN	NaN	NaN	NaN	NaN	NaN
64	Sector 65	28.611299	77.385332	NaN	NaN	NaN	NaN	NaN	NaN
67	Sector 68	28.453040	77.547376	NaN	NaN	NaN	NaN	NaN	NaN
69	Sector 70	28.597638	77.384324	NaN	NaN	NaN	NaN	NaN	NaN
72	Sector 73	28.453040	77.547376	NaN	NaN	NaN	NaN	NaN	NaN
75	Sector 76	28.453040	77.547376	NaN	NaN	NaN	NaN	NaN	NaN
78	Sector 79	28.453040	77.547376	NaN	NaN	NaN	NaN	NaN	NaN
83	Sector 84	28.453040	77.547376	NaN	NaN	NaN	NaN	NaN	NaN
84	Sector 85	28.518080	77.404489	NaN	NaN	NaN	NaN	NaN	NaN
91	Sector 92	28.518177	77.394897	NaN	NaN	NaN	NaN	NaN	NaN
94	Sector 95	28.453040	77.547376	NaN	NaN	NaN	NaN	NaN	NaN

Below is the map of Noida sectors based on category



Red = Category 1

Purple = Category 2

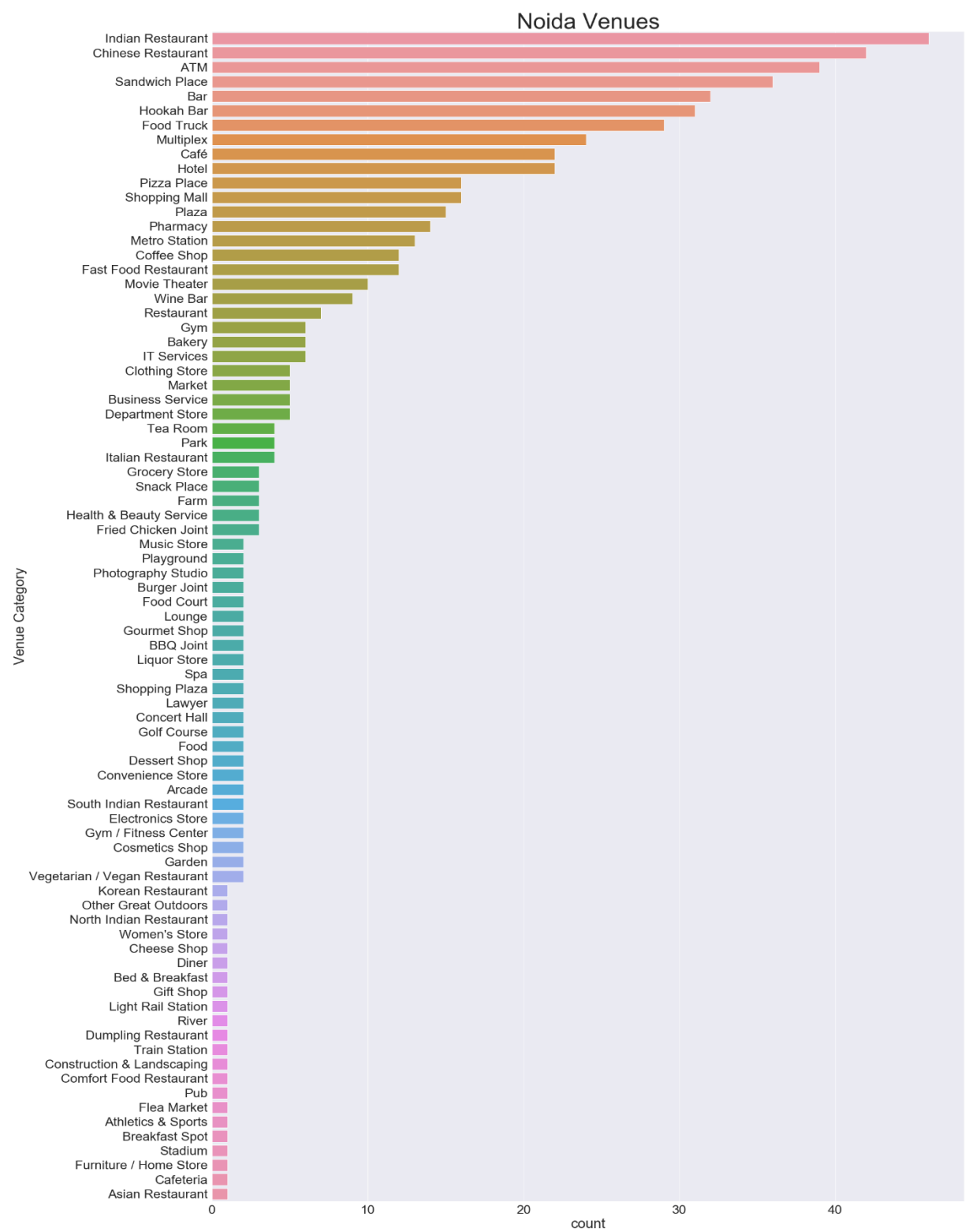
Dark Blue = Category 3

Light Green = Category 4

Orange = Category 5

Black = No venue near by

Venue Category in Noida as a city



4.2 Gurugram Results

We saw that Gurugram sectors got categorized into 5 clusters. We also saw that Gurugram had few sectors which did not have any nearby venue

The first category of sectors have Restaurants, Eateries as its top venues

Sector	Lat	Long	Cluster Labels	1st most commonn venue	2nd most commonn venue	3rd most commonn venue	4th most common venue	5th most common venue
16 Sector 17	28.475804	77.060777	0.0	Shoe Store	Pizza Place	Indian Restaurant	Lounge	Yoga Studio
20 Sector 21	28.514363	77.073009	0.0	Coffee Shop	Pizza Place	Indian Restaurant	Middle Eastern Restaurant	Donut Shop
21 Sector 22	28.506318	77.065518	0.0	Indian Restaurant	Miscellaneous Shop	Pizza Place	Burger Joint	Shopping Mall
22 Sector 23	28.510319	77.053009	0.0	Indian Restaurant	Dessert Shop	Yoga Studio	Falafel Restaurant	Cricket Ground
27 Sector 28	28.474130	77.082572	0.0	Indian Restaurant	Tea Room	Department Store	Donut Shop	Yoga Studio
38 Sector 39	28.442367	77.050472	0.0	Pizza Place	Yoga Studio	Coffee Shop	Cosmetics Shop	Cricket Ground
39 Sector 40	28.450043	77.057709	0.0	Indian Restaurant	Bakery	Supermarket	Market	Electronics Store
82 Sector 83	28.398109	76.973287	0.0	Indian Restaurant	Yoga Studio	Falafel Restaurant	Cricket Ground	Deli / Bodega

The second category of sectors have ATM, Market, Grounds as its top venues

Sector	Lat	Long	Cluster Labels	1st most commonn venue	2nd most commonn venue	3rd most commonn venue	4th most common venue	5th most common venue
4 Sector 5	28.367354	76.926724	1.0	ATM	Accessories Store	Falafel Restaurant	Cricket Ground	Deli / Bodega
7 Sector 8	28.376183	76.891795	1.0	ATM	Falafel Restaurant	Cricket Ground	Deli / Bodega	Department Store
12 Sector 13	28.474600	77.036719	1.0	ATM	Market	Electronics Store	Cricket Ground	Deli / Bodega
112 Sector 113	28.528665	77.025028	1.0	ATM	Falafel Restaurant	Cricket Ground	Deli / Bodega	Department Store

The third category of sectors have Café, Stores as its top venue

	Sector	Lat	Long	Cluster Labels	1st most commonn venue	2nd most commonn venue	3rd most commonn venue	4th most common venue	5th most common venue
1	Sector 2	28.509050	77.034283	2.0	Café	Asian Restaurant	Market	Shopping Mall	Yoga Studio
6	Sector 7	28.376028	76.912215	2.0	Advertising Agency	Yoga Studio	Falafel Restaurant	Cricket Ground	Deli / Bodega
15	Sector 16	28.467613	77.051080	2.0	Lounge	Yoga Studio	Cricket Ground	Deli / Bodega	Department Store
18	Sector 19	28.503091	77.081748	2.0	Hotel	Yoga Studio	Falafel Restaurant	Cricket Ground	Deli / Bodega
19	Sector 20	28.508496	77.087939	2.0	Hotel	Clothing Store	Cafeteria	Yoga Studio	Electronics Store
23	Sector 24	28.494481	77.101304	2.0	Coffee Shop	Bed & Breakfast	Gym	Restaurant	Cricket Ground
24	Sector 25	28.486089	77.084224	2.0	Pool	Yoga Studio	Coffee Shop	Cosmetics Shop	Cricket Ground
25	Sector 26	28.477931	77.103221	2.0	Coffee Shop	French Restaurant	Hotel	Chinese Restaurant	Café
26	Sector 27	28.464657	77.083951	2.0	Café	Indian Restaurant	Bakery	Restaurant	Italian Restaurant
28	Sector 29	28.466920	77.067131	2.0	Hotel	Indian Restaurant	Brewery	Café	Chinese Restaurant
29	Sector 30	28.461158	77.056236	2.0	Multiplex	Tea Room	Department Store	Indian Restaurant	Residential Building (Apartment / Condo)
30	Sector 31	28.454004	77.049718	2.0	Department Store	Fried Chicken Joint	Café	Indian Sweet Shop	Bakery
31	Sector 32	28.445804	77.041317	2.0	Coffee Shop	Cricket Ground	Hotel	Fast Food Restaurant	Scenic Lookout
33	Sector 34	28.428003	77.011568	2.0	Clothing Store	Motorcycle Shop	Yoga Studio	Convenience Store	Cricket Ground
34	Sector 35	28.414567	77.001869	2.0	Tea Room	Yoga Studio	Electronics Store	Cosmetics Shop	Cricket Ground
	Sector						North Indian		

The fourth category of sectors has Food trucks as the top venue

	Sector	Lat	Long	Cluster Labels	1st most commonn venue	2nd most commonn venue	3rd most commonn venue	4th most common venue	5th most common venue
50	Sector 51	28.428701	77.066688	3.0	Food Truck	ATM	Women's Store	Furniture / Home Store	Donut Shop
113	Sector 114	28.531880	77.011779	3.0	Food Truck	Yoga Studio	Falafel Restaurant	Cricket Ground	Deli / Bodega

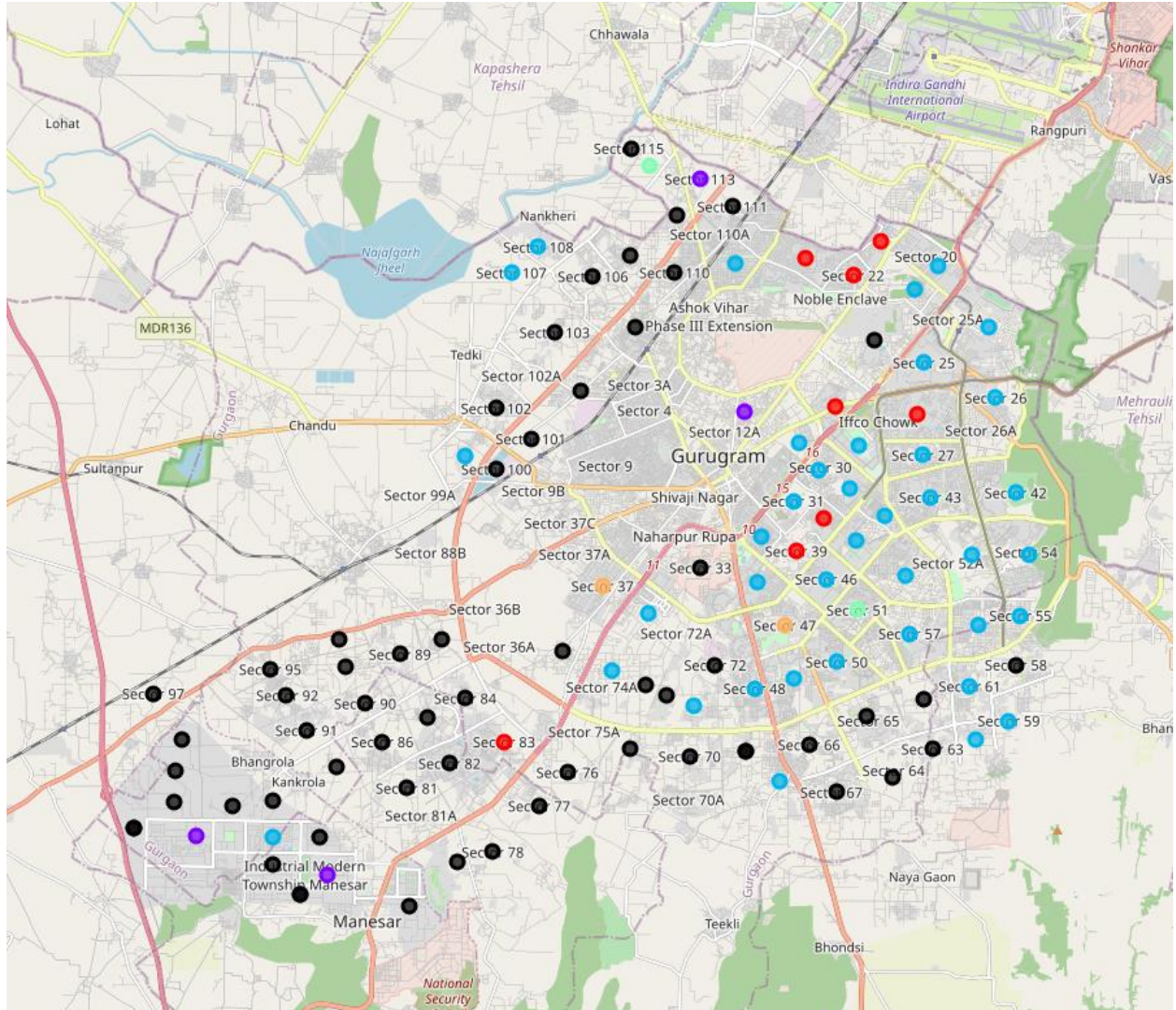
The fifth category of sectors has Bakery as top venue

	Sector	Lat	Long	Cluster Labels	1st most commonn venue	2nd most commonn venue	3rd most commonn venue	4th most common venue	5th most common venue
36	Sector 37	28.434268	76.999294	4.0	Bakery	Outdoor Supply Store	Yoga Studio	Electronics Store	Cosmetics Shop
46	Sector 47	28.425157	77.047513	4.0	Bakery	Yoga Studio	Falafel Restaurant	Cricket Ground	Deli / Bodega

Then we have few sectors which don't have any venues near by.

	Sector	Lat	Long	Cluster Labels	1st most commonn venue	2nd most commonn venue	3rd most commonn venue	4th most common venue	5th most common venue
0	Sector 1	28.360102	76.948375	NaN	NaN	NaN	NaN	NaN	NaN
2	Sector 3	28.362766	76.919326	NaN	NaN	NaN	NaN	NaN	NaN
3	Sector 4	28.369716	76.912161	NaN	NaN	NaN	NaN	NaN	NaN
5	Sector 6	28.375922	76.924549	NaN	NaN	NaN	NaN	NaN	NaN
8	Sector 9	28.384099	76.886134	NaN	NaN	NaN	NaN	NaN	NaN
9	Sector 10	28.391377	76.886385	NaN	NaN	NaN	NaN	NaN	NaN
10	Sector 11	28.378143	76.875377	NaN	NaN	NaN	NaN	NaN	NaN

Below is the map of Gurugram sectors based on category



Red = Category 1

Purple = Category 2

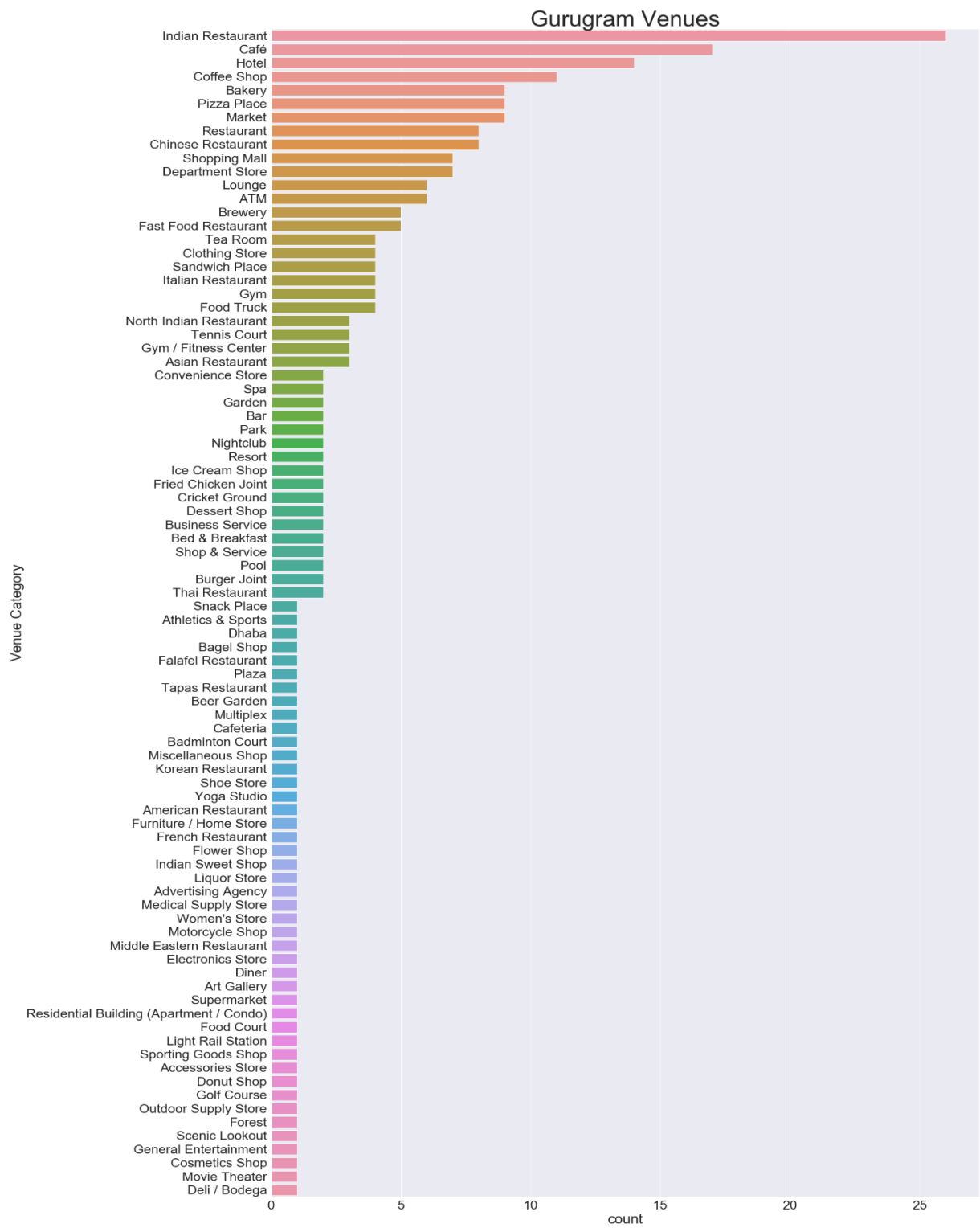
Dark Blue = Category 3

Light Green = Category 4

Orange = Category 5

Black = No venue near by

Venue Category in Gurugram as a city



The similarity between Noida and Gurugram is 58.5% (Jaccard Index)

Discussion

After doing an analysis of Noida and Gurugram we can now have a better overview about both the suburbs. We can see what are the most common venue in both the suburbs and what each sector offers. We also understand that both the suburbs are almost 60% similar and offer various venues that are needful in a daily life. If one is looking for a high life style, then Gurugram has more sectors to live in. However, if ne is looking for a decent lifestyle and want a mix of everything, Noida seems to be more preferable.

Conclusion

Having access to such data in very vital in decision making on which area to settle. Without such an analysis, it becomes difficult to decide and at times we miss out on areas which could have suited us well.

This project not only helps one to decide where to live, this can be used by real estate agents to better suggest the location to their clients based on their personal preferences.