

## **Analysis of Possible Venues for Opening a new Fast Food Joint in India**

**Assumed Client:** An upcoming Restaurant chain intending to open Multicuisine, Multicultural dining experience to customers in India having pan India expansion plan.

### **1. Introduction:**

#### **1.1 Back Ground**

Client wants to have an objective data of penetration of Fast Food, Multi-Cultural cuisine Restaurants in India.

The need is to check which are the upcoming cities and where do they stand as far as presence of Fast Food, Multi-Cultural, Multi cuisine Restaurants is concerned and which are the cities which can be targeted.

#### **1.2 Problem**

- 1) To get Target cities which represent market opportunities
- 2) To get realistic picture of penetration of Fast Food and Multi Cuisine Restaurants in India

### **Approach to the Problem**

#### **1.3 Assumptions:**

It is assumed that certain venues categories such as “Pizza Huts, Multicultural Restaurants, Metro Stations, and Continental Restaurants” are indicative of the taste of the population living there.

From the Four Square Venue Categories these particular Venues categories are used to categorize/group cities across India. The presence or absence of one or more of these venue categories is assumed to be indicative of the taste of population, cultural leanings and hence the measure of business potential for opening a multicuisine restaurant.

## Analysis Approach

- 1) Cities across India are categorized based on selected Venue Categories which are assumed to be indicative of market potential this is an unsupervised learning problem of clustering.

This is intended to answer first problem of client of getting target cities having market potential

- 2) The cities are categorized based on a score which is derived from the presence or absence of selected Venue categories.

This is intended to answer second requirement of client to get the realistic picture of market he is targeting

### 3. Data Sources.

Four Square Location data will be the source for Venues data which will be our Indicators of Modernity.

In order to access the Four Square Location data we have to have a table giving cities across India covering all the Bigger, Medium Sized and the smaller cities of India selected across all the states covering entire geographic region along with their Latitude and Longitude Locations.

This locations data has been downloaded in .csv form

<https://simplemaps.com/data/in-cities>

This table has been selected as it has the list of all Medium, Big and small city locations and is representative of all regions of India

## 4. Feature Selection

The Problem is to identify Market Potential for Restaurant in India .

There are two Features whose selection is critical to the output we get.

- 1) Which are the cities we select to study?
- 2) Which venue categories do we consider as indicative measure quantifying the market potential?

### 1) Which are the cities we select to study?

It is part of General Knowledge that Metro cities are the markets for multicuisine, multicultural Restaurants. However with recent development of E commerce, E Marketing, Penetration of Mobile Phones to all the cities across India population in non-metros also are exposed to non-traditional dining experience.

Owing to diversity of subcontinent and varied food habits the cities selected have to be representing all the states and geographic regions of India.

This is critical to assess the extent to which population in different regions is already having a taste for nontraditional food habits and which are the locations which are not yet exposed to such experiences.

### 2) Which Venue Categories to consider

Selected Venue Categories given by Four Square data are assumed to be indicative of the presence or absence of market potential for intended restaurants.

For the selected representative cities across India data is fetched from Four Square. It is observed that Four square Venue Categories provides broad range output below list gives some of the venue categories for a particular geographic location of a city within radius of 30km

## Venue Categories Fetched from Four Square

Plaza

1	Fast Food Restaurant
2	Multiplex
3	Train Station
4	Snack Place
5	Vegetarian / Vegan Restaurant
6	Hotel
7	Indian Restaurant
8	Mosque
9	Snack Place
10	Paper / Office Supplies Store
11	Market
12	Indian Restaurant
13	Indian Restaurant
14	Indian Restaurant
15	Snack Place
16	Hardware Store
17	Flea Market
18	Indian Restaurant
19	Market
20	Indian Restaurant
21	Indian Restaurant
22	Snack Place
23	Dessert Shop
24	Salon / Barbershop
25	Hotel
26	Electronics Store
27	Multiplex
28	Park
29	Market
30	Italian Restaurant
31	Fast Food Restaurant
32	Indian Restaurant
33	Indian Restaurant
34	Indian Restaurant
35	Indian Restaurant
36	Indian Restaurant
37	South Indian Restaurant
38	Gym / Fitness Center
39	Hotel
40	Plaza
41	Vineyard
42	Coffee Shop
43	Dog Run
44	Chinese Restaurant
45	Fast Food Restaurant
46	Snack Place
47	Historic Site
48	Snack Place
49	Indian Restaurant
50	Business Service
51	Indian Sweet Shop

52	Ice Cream Shop
53	Indian Restaurant
54	Seafood Restaurant
55	Jewelry Store
56	Vegetarian / Vegan Restaurant
57	Diner
58	Dessert Shop
59	Restaurant
60	Indian Restaurant
61	Ice Cream Shop
62	Indian Restaurant
63	Snack Place
64	Road
65	Indian Restaurant
66	Women's Store
67	Coffee Shop
68	Theater
69	Breakfast Spot
70	Indian Restaurant
71	Bar
72	Indian Restaurant
73	BBQ Joint
74	Clothing Store
75	Clothing Store
76	ATM
77	Hotel
78	Fried Chicken Joint
79	IT Services
80	Market
81	Indian Restaurant
82	Hotel
83	Fast Food Restaurant
84	Pizza Place
85	Men's Store
86	Board Shop
87	Historic Site
88	Historic Site
89	Sandwich Place
90	Ice Cream Shop
91	Market
92	Lake
93	Clothing Store
94	Market
95	Food Court
96	Jewelry Store
97	Historic Site
98	Indian Restaurant
99	Park

There are such 793 Venue Categories which we get from Four Square we have to select the venue categories which are indicative of the population's openness to the product or service experience that the client is offering.

## The presence of

'Plaza', 'Multiplex', 'Italian Restaurant', 'Sandwich Place', 'BBQ Joint', 'Pizza Place', 'Chinese Restaurant', 'Fast Food Restaurant', 'Coffee Shop', 'Stadium', 'Asian Restaurant', 'Punjabi Restarant

Venue categories are assumed to be indicative of availability of a market and population which is open to the dining experience which client is offering.

## Which Cities Can be targeted

For each geographical location/city within 50km radius average frequency of presence of each of these venue categories is derived

----Abohar----

	venue	freq
0	Plaza	0.0
1	Multiplex	0.0
2	Italian Restaurant	0.0
3	Sandwich Place	0.0
4	BBQ Joint	0.0
5	Pizza Place	0.0
6	Chinese Restaurant	0.0

----Agartala----

	venue	freq
0	Multiplex	0.11
1	Pizza Place	0.11
2	Chinese Restaurant	0.11
3	Fast Food Restaurant	0.11
4	Coffee Shop	0.11
5	Plaza	0.00
6	Italian Restaurant	0.00

----Ahmadnagar----

	venue	freq
0	Sandwich Place	0.5
1	Plaza	0.0
2	Multiplex	0.0
3	Italian Restaurant	0.0
4	BBQ Joint	0.0
5	Pizza Place	0.0
6	Chinese Restaurant	0.0

----Ahmadābād----

	venue	freq
0	Fast Food Restaurant	0.2
1	Plaza	0.0
2	Multiplex	0.0
3	Italian Restaurant	0.0
4	Sandwich Place	0.0

```

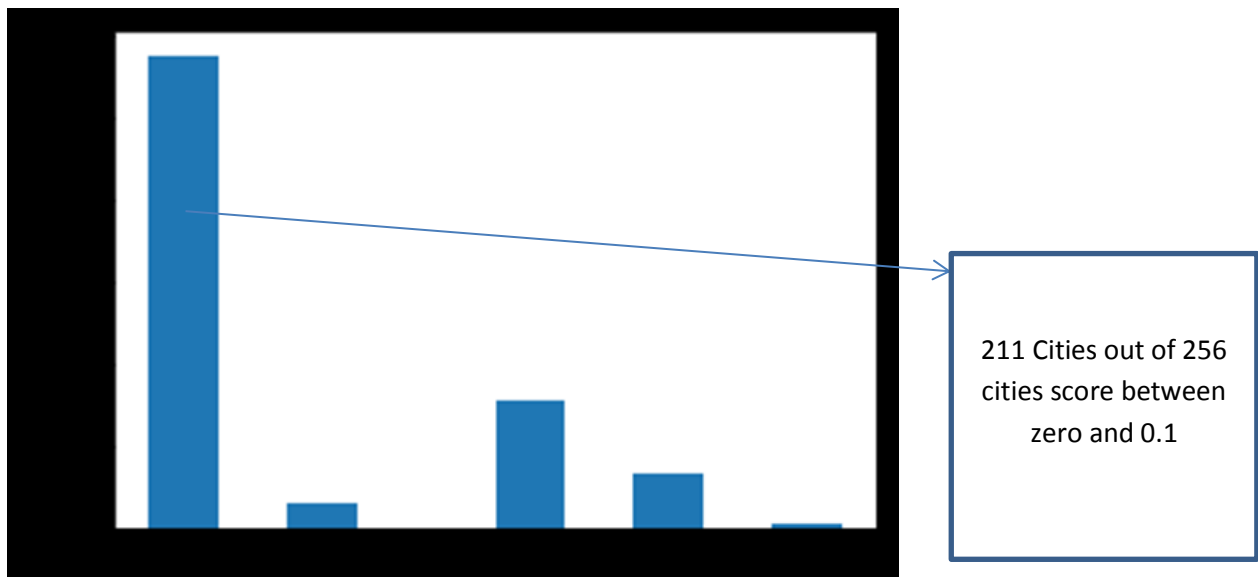
5          BBQ Joint    0.0
6        Pizza Place    0.0
----Aizawl----
          venue  freq
0          Plaza    0.0
1        Multiplex    0.0
2  Italian Restaurant    0.0
3    Sandwich Place    0.0
4          BBQ Joint    0.0
5        Pizza Place    0.0
6  Chinese Restaurant    0.0

```

The Sum of the mean frequency scores Multiplied by 10 is used as a parameter which is used as an indicator of market potential.

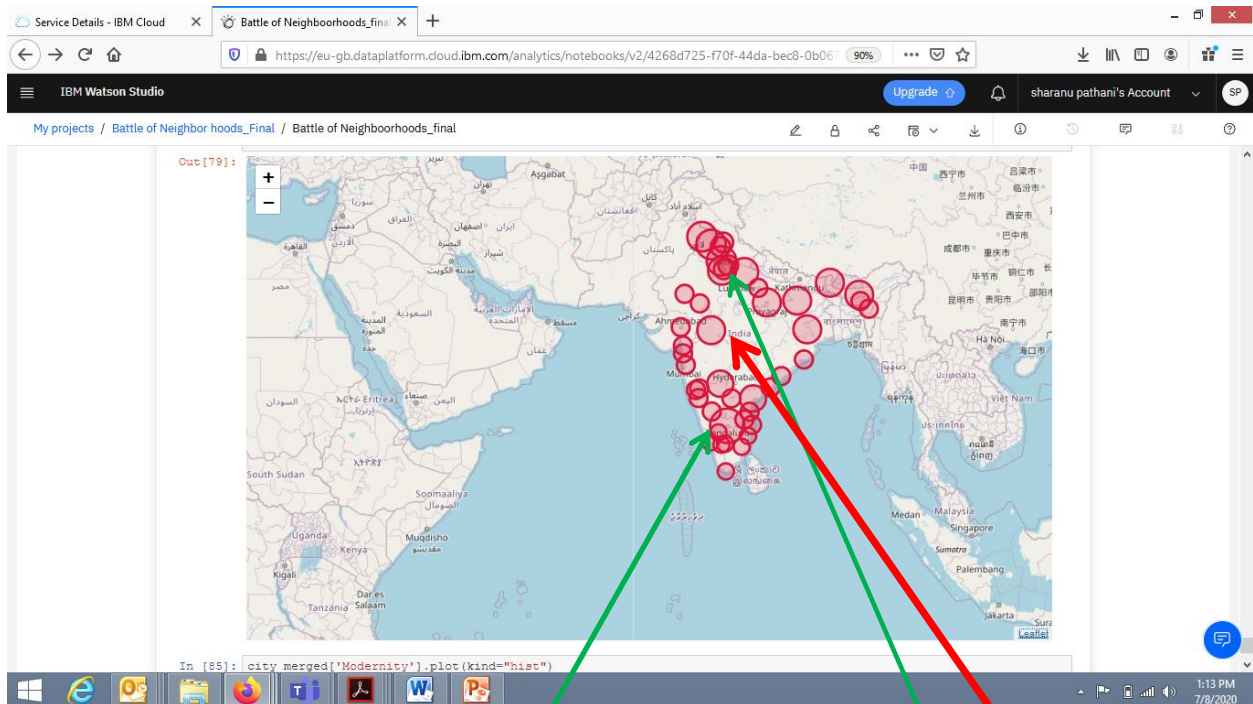
If score is zero that means none of these venues are present and it represents a potential market which has to be validated with other factors before acting.

The Histogram of the scores show that in India most of the locations score Zero and less than 4



45 cities show higher score we would like to see where they are located in geography of India

Bubble Plot is used to show this, the radius of size of Bubble is indicative of the the extent to which the Population is open to new dining experience represented by Multicuisine, Multi-Cultural and non-traditional dining experience

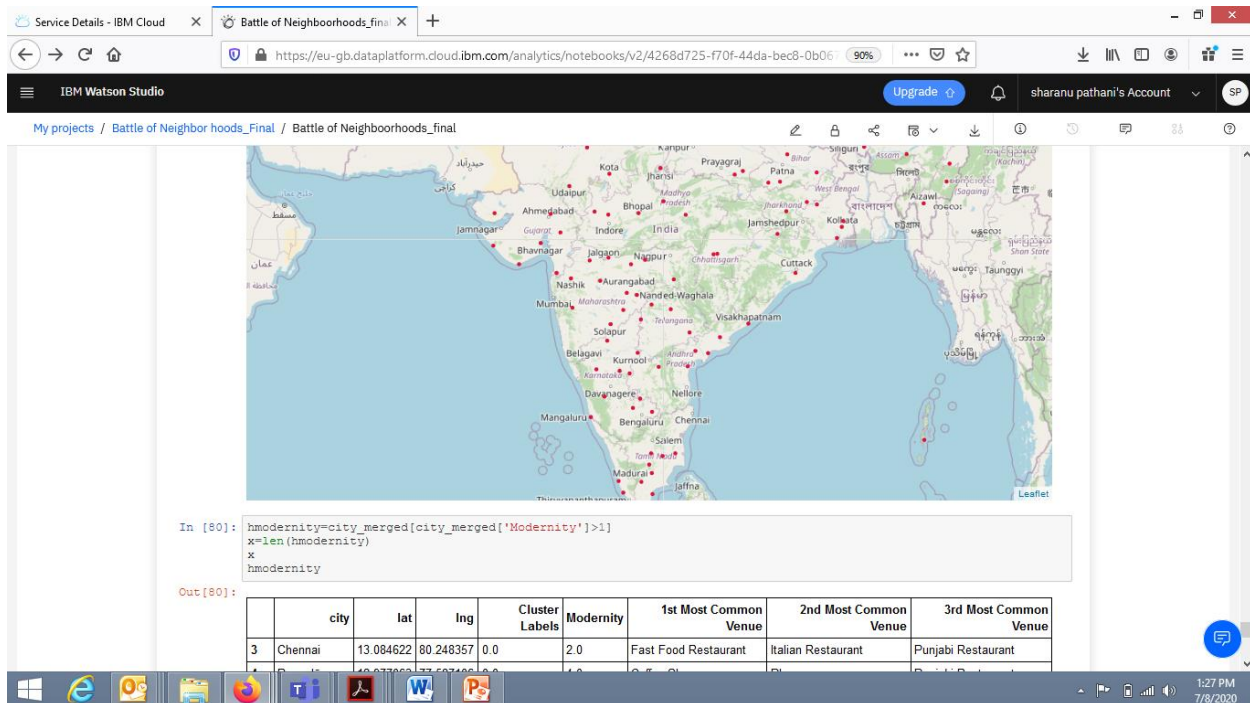


The graph shows that the Southern regions and the National Capital region is where people are more open to non-traditional dining experience while Central Indian regions show almost nil presence of evidence for such market.



This is then compared with the locations of lesser score or zero score show that these locations are dispersed throughout the geography of India

This proves that the Markets for Non-Traditional dining experience is concentrated in few places in South and Tourist locations.



## Clustering

One of the problems that client required to be answered is whether there is pattern in the market situation of India as far as market for Non-Traditional food experience is concerned.

It is assumed that the features (cities and the Venue categories) selected provide such an opportunity to statistically see is there any pattern

## Statistical approach

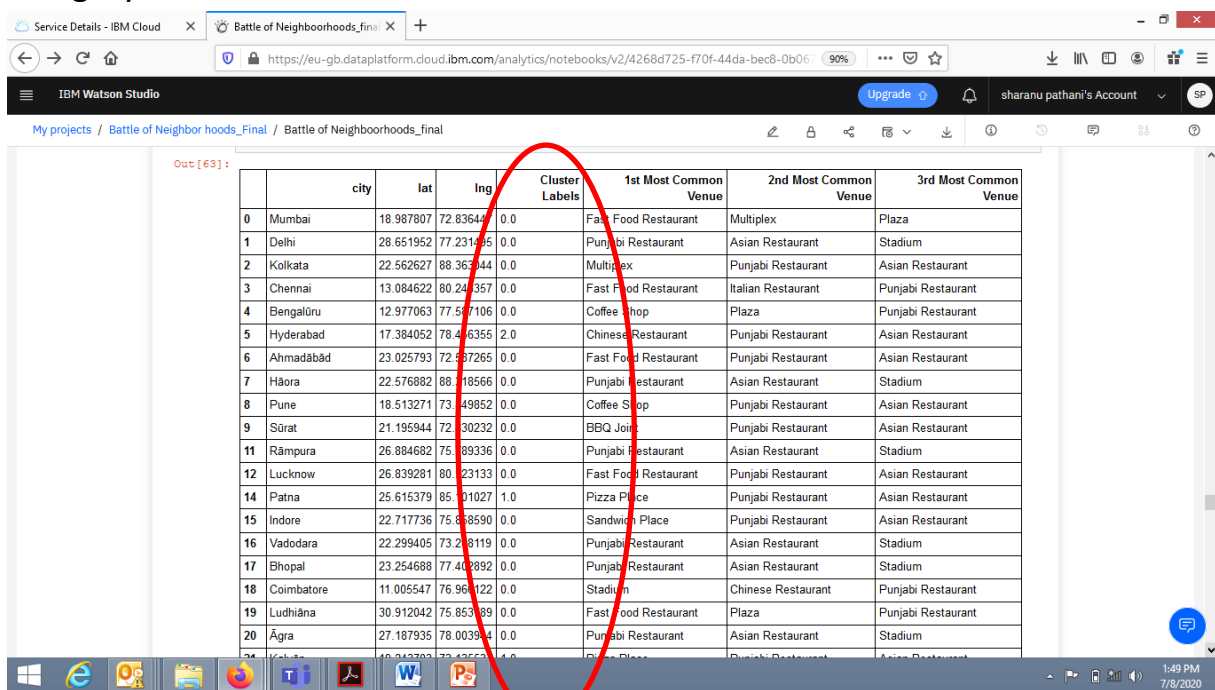
K Means Clustering the unsupervised learning algorithm is suitable for such clustering. The mean score of the

For each city for venue frequency which gives opportunity to quantify the distance between them helps to arrive at groups or clusters.

```
----Ahmadnagar----
      venue  freq
0  Sandwich Place  0.5
1      Plaza      0.0
2      Multiplex  0.0
3  Italian Restaurant  0.0
4      BBQ Joint  0.0
5      Pizza Place  0.0
6  Chinese Restaurant  0.0

----Ahmadābād----
      venue  freq
0  Fast Food Restaurant  0.2
1      Plaza      0.0
2      Multiplex  0.0
3  Italian Restaurant  0.0
4  Sandwich Place      0.0
```

K Means Clustering results give the results assigning each city to a particular category



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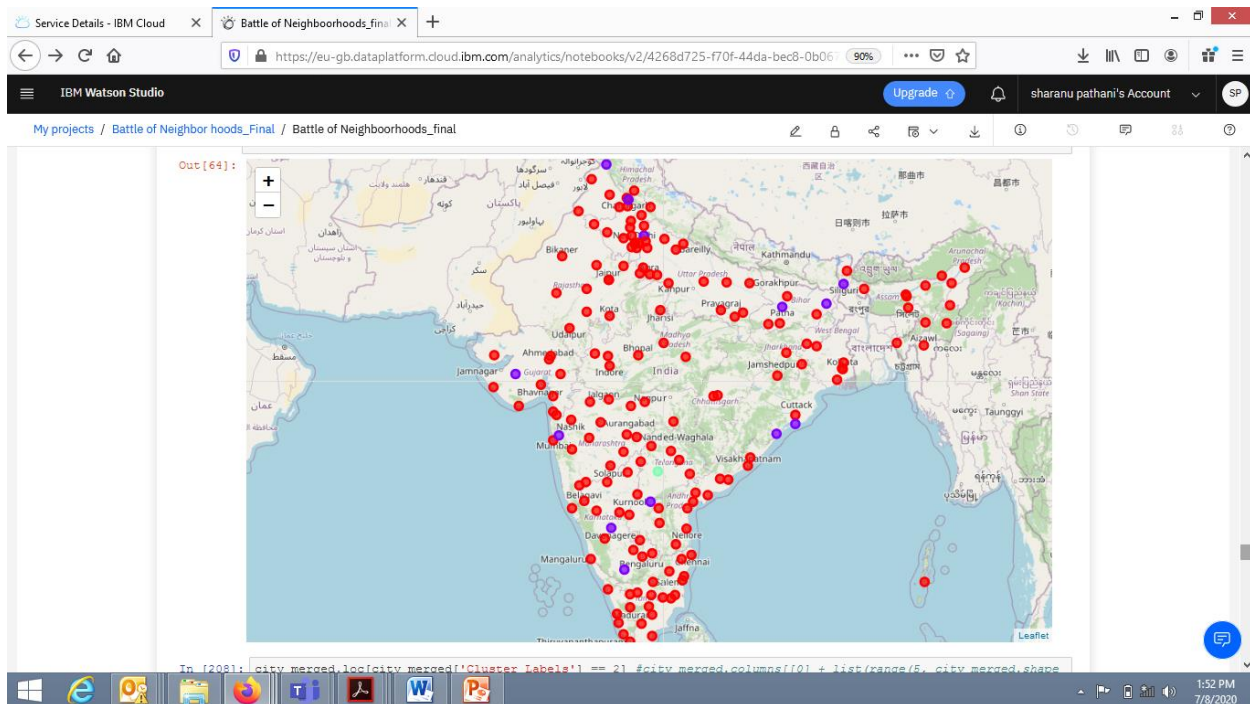
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Out[63]:

	city	lat	lng	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue
0	Mumbai	18.987807	72.836447	0.0	Fast Food Restaurant	Multiplex	Plaza
1	Delhi	28.651952	77.231495	0.0	Punjabi Restaurant	Asian Restaurant	Stadium
2	Kolkata	22.562627	88.363444	0.0	Multiplex	Punjabi Restaurant	Asian Restaurant
3	Chennai	13.084622	80.249357	0.0	Fast Food Restaurant	Italian Restaurant	Punjabi Restaurant
4	Bengaluru	12.977063	77.597106	0.0	Coffee Shop	Plaza	Punjabi Restaurant
5	Hyderabad	17.384052	78.46355	2.0	Chinese Restaurant	Punjabi Restaurant	Asian Restaurant
6	Ahmadābād	23.025793	72.587265	0.0	Fast Food Restaurant	Punjabi Restaurant	Asian Restaurant
7	Hāora	22.576882	88.718566	0.0	Punjabi Restaurant	Asian Restaurant	Stadium
8	Pune	18.513271	73.49852	0.0	Coffee Shop	Punjabi Restaurant	Asian Restaurant
9	Sūrat	21.195944	72.830232	0.0	BBQ Joint	Punjabi Restaurant	Asian Restaurant
11	Rāmpura	26.884682	75.89336	0.0	Punjabi Restaurant	Asian Restaurant	Stadium
12	Lucknow	26.839281	80.23133	0.0	Fast Food Restaurant	Punjabi Restaurant	Asian Restaurant
14	Patna	25.615379	85.101027	1.0	Pizza Place	Punjabi Restaurant	Asian Restaurant
15	Indore	22.717736	75.858590	0.0	Sandwich Place	Punjabi Restaurant	Asian Restaurant
16	Vadodara	22.299405	73.28119	0.0	Punjabi Restaurant	Asian Restaurant	Stadium
17	Bhopal	23.254688	77.402892	0.0	Punjabi Restaurant	Asian Restaurant	Stadium
18	Coimbatore	11.005547	76.964122	0.0	Stadium	Chinese Restaurant	Punjabi Restaurant
19	Ludhiāna	30.912042	75.853389	0.0	Fast Food Restaurant	Plaza	Punjabi Restaurant
20	Āgra	27.187935	78.00394	0.0	Punjabi Restaurant	Asian Restaurant	Stadium
24	Kolkata	22.562627	88.363444	0.0	Pizza Place	Punjabi Restaurant	Asian Restaurant

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## Visualization of Cluster Labels



### Conclusions:

There were three questions which were asked by Client

1) Which cities are to be targeted for opening Multicuisine Restaurants

→ The analysis gives a broader level answer by giving a list of cities having no such restaurants within 50 km radius of geographic Longitude Latitude of the city. These represent potential markets.

2) Which are the Locations at present which are having such markets

→ The analysis gives 45 locations in India which are the markets as of now

3) Is there any Pattern to the cities as far as the potential markets are concerned?

→ The analysis using Four Square Venue Categories data provides 5 Categories

## **Future Course**

- ➔ In Order to act on potential cities they have to be further studied to their similarities as far as Demographics, Economics and other such factors which may help to further categorize them to arrive at their likeness to established markets of India. This gives a focused target cities where there will high probability of acceptance of Multicuisine Nontraditional fooding experience.