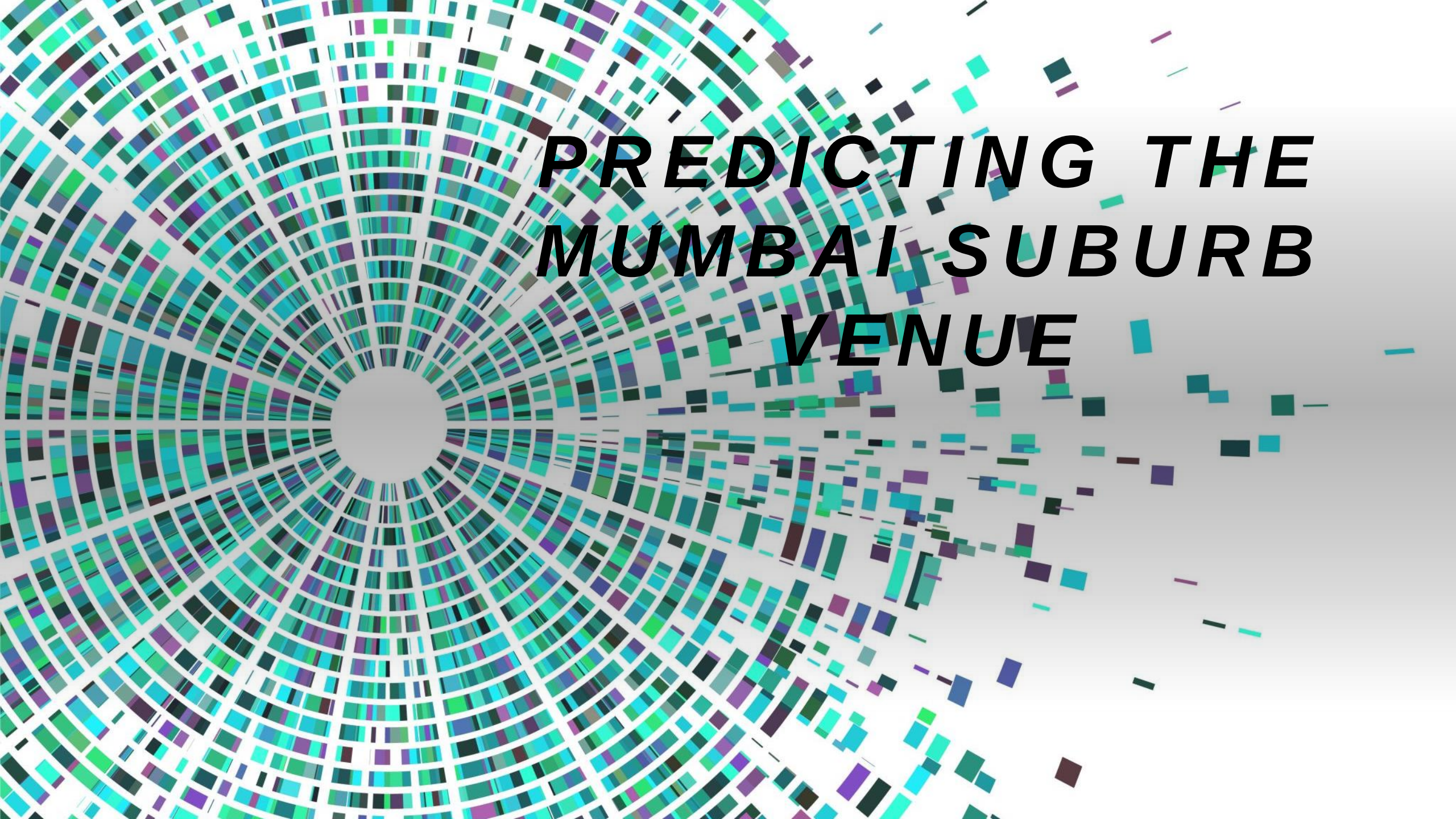

PREDICTING THE
MUMBAI SUBURB
VENUE

PREDICTING THE TOP 10 VENUE OF EACH NEIGHBORHOODS OF MUMBAI.

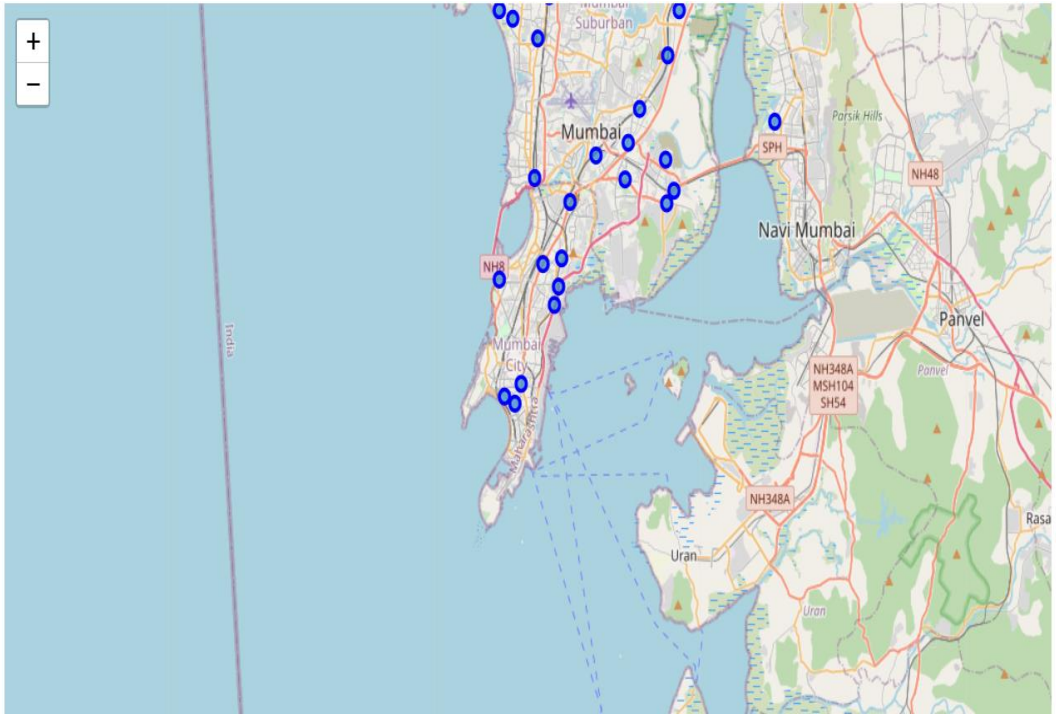
- **Mumbai is the sixth most populous metropolitan area in the world:**
- **-** a population of over 23 million. A such populated city has so many shops and restaurants.
- How to search for a specific type of venues, to explore a particular venue
- How a person lost in the city can found shops near his position.
- What we search ? **Top 10 venue of each neighborhoods of Mumbai.**

DATA ACQUISITION AND CLEANING

- **Mumbai Suburb dataset:** https://en.wikipedia.org/wiki/Category:Suburbs_of_Mumbai it is an old dataset dated from 2009.
- Data downloaded from source will be put in a dataframe object
- Coordinates data will be put in other dataframe and then merge into the first one
- **There are 199 uniques categories of shop (restaurant). So there is 2738 samples and 199 features.**

METHODOLOGY

Creation of the neighborhood of mumbai map



199 uniques cathegories

```
venues_df['VenueCategory'].unique()
```

```
array(['Bakery', 'Ice Cream Shop', 'Falafel Restaurant',
       'Indian Restaurant', 'Coffee Shop', 'Pub', 'Pizza Place',
       'Sandwich Place', 'Breakfast Spot', 'Chinese Restaurant',
       'Multiplex', 'Juice Bar', 'Café', 'American Restaurant', 'Diner',
       'Snack Place', 'Seafood Restaurant', 'Maharashtrian Restaurant',
       'Cocktail Bar', 'Gym / Fitness Center', "Women's Store",
       'BBQ Joint', 'Bar', 'Lounge', 'Fast Food Restaurant',
       'Residential Building (Apartment / Condo)',
       'Vegetarian / Vegan Restaurant', 'Spa', 'Electronics Store',
       'Asian Restaurant', 'Smoke Shop', 'Food Truck', 'Liquor Store',
       'Athletics & Sports', 'Fish Market', 'Tea Room', 'Park',
       'Martial Arts Dojo', 'Hotel', 'Food', 'Plaza', 'Bus Station',
       'Sports Bar', 'Platform', 'Food & Drink Shop', 'Hot Dog Joint',
       'Fried Chicken Joint', 'Dessert Shop', 'Gourmet Shop',
       'Sports Club', 'Deli / Bodega', 'Restaurant', 'German Restaurant',
       'Modern European Restaurant', 'Salad Place', 'College Auditorium',
       'French Restaurant', 'Performing Arts Venue', 'Sushi Restaurant',
       'Bookstore', 'Arcade', 'Cupcake Shop', 'Event Space',
       'Farmers Market', 'Fish & Chips Shop', 'Italian Restaurant',
       'Hookah Bar', 'Road', 'Bagel Shop', 'Indie Movie Theater',
       'Brazilian Restaurant', 'Clothing Store', 'Gluten-free Restaurant',
       'Beer Bar', 'Big Box Store', 'Train Station', 'Shopping Mall',
       'Scenic Lookout', 'Historic Site', 'Department Store', 'Theater',
       'Burger Joint', 'Gym', 'Convenience Store',
       'Molecular Gastronomy Restaurant', 'Pet Store',
       'Mexican Restaurant', 'Hotel Bar', 'Basketball Court',
       'Movie Theater', 'Gift Shop', 'Donut Shop', 'Gaming Cafe',
       'Grocery Store', 'Sporting Goods Shop', 'Miscellaneous Shop',
       'Golf Course', 'Pharmacy', 'Market', 'Punjabi Restaurant',
       'Garden', 'Playground', 'General Entertainment', 'Supermarket',
       'Pool', 'Soccer Field', 'Outdoors & Recreation', 'Neighborhood',
```

One hot encoding per neighborhood with Park, Garden and Playground

```
kl_mall = kl_grouped[["Neighborhoods","Park","Garden","Playground"]]
kl_mall
```

	Neighborhoods	Park	Garden	Playground
0	Andheri	0.010000	0.000000	0.000000
1	Anushakti Nagar	0.000000	0.000000	0.000000
2	Baiganwadi	0.000000	0.000000	0.000000
3	Bandra	0.020000	0.000000	0.000000
4	Bhandup	0.000000	0.000000	0.000000
5	Borivali	0.010000	0.000000	0.000000
6	Charkop	0.017544	0.000000	0.000000
7	Chembur	0.000000	0.025000	0.012500
8	Dahisar	0.000000	0.000000	0.000000
9	Devipada	0.010638	0.000000	0.000000
10	Dombivli	0.000000	0.000000	0.000000
11	Eastern Suburbs (Mumbai)	0.000000	0.025641	0.000000
12	Ghatkopar	0.000000	0.000000	0.000000
13	Goregaon	0.000000	0.000000	0.000000
14	Grant Road	0.000000	0.010000	0.000000
15	Jogeshwari	0.000000	0.000000	0.000000
16	Juhu	0.000000	0.010000	0.010000

MACHINE LEARNING

- **Kmeans method to analysed the data**

- 3 Clusters

We set the number of cluster and run kmeans

```
kclusters = 3

kl_clustering = kl_mall.drop(["Neighborhoods"], 1)

# run k-means clustering
kmeans = KMeans(n_clusters=kclusters, random_state=0).fit(kl_clustering)

# check cluster labels generated for each row in the dataframe
kmeans.labels_[0:10]
```

```
array([0, 1, 1, 0, 1, 0, 0, 2, 1, 0], dtype=int32)
```

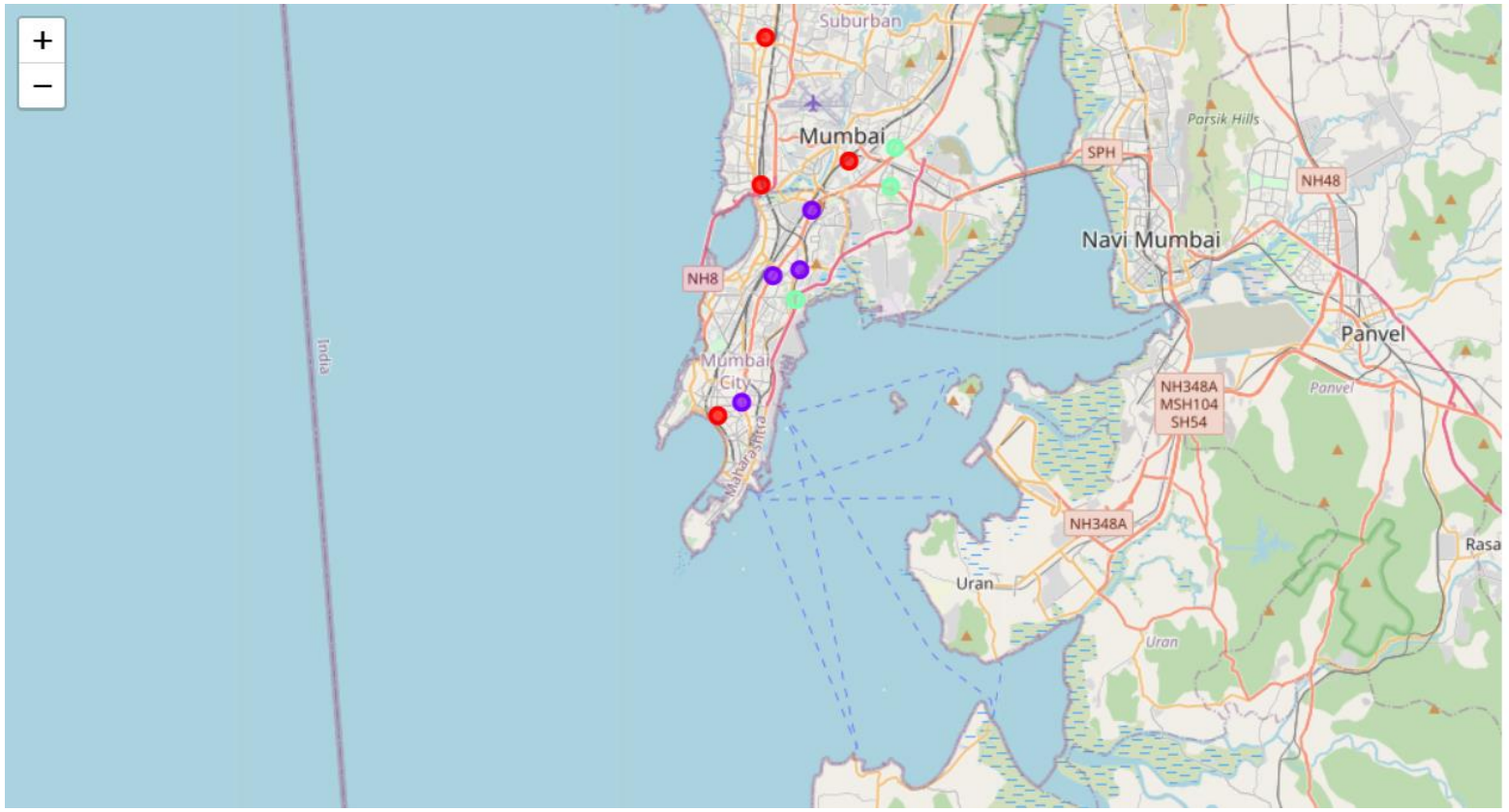
```
kl_merged = kl_merged.drop(kl_merged[(kl_merged.Park == 0) & (kl_merged.Garden == 0) & (kl_merged.Playground == 0)].index)
kl_merged.sort_values(["Cluster Labels"], inplace=True)
print(kl_merged.shape)
kl_merged
```

```
(18, 7)
```

	Neighborhood	Park	Garden	Playground	Cluster Labels	Latitude	Longitude
0	Andheri	0.010000	0.000000	0.000000	0	19.118470	72.841770
3	Bandra	0.020000	0.000000	0.000000	0	19.054370	72.840170
5	Borivali	0.010000	0.000000	0.000000	0	19.229360	72.857510
6	Charkop	0.017544	0.000000	0.000000	0	19.208660	72.826120
9	Devipada	0.010638	0.000000	0.000000	0	19.224690	72.866050
26	Mulund	0.013514	0.000000	0.013514	0	19.171830	72.955650
22	Mahavir Nagar (Kandivali)	0.013158	0.000000	0.000000	0	19.210940	72.841370
21	Kurla	0.011364	0.000000	0.011364	0	19.064980	72.880690
17	Kalyan	0.010000	0.000000	0.000000	0	18.953940	72.820370
18	Kandivali	0.012987	0.000000	0.000000	0	19.211900	72.837500
31	Sion, Mumbai	0.000000	0.013514	0.000000	1	19.043410	72.863320
16	Juhu	0.000000	0.010000	0.010000	1	19.014920	72.845220

RESULT

The final map we display represent the cluster per neighborhoods



C O N C L U S I O N

- we can see that there is 11 important cluster in mumbai suburb where there is the top venues of the neighborhoods.
- I have conscious that my project looks like what we did with toronto but I am novice and I thought it was beter to train myself.