Introduction: Business Problem

This project deals with analysing the neighborhoods of Chennai, which would help people who want to start Restaurants, Cafes, etc. The Foursquare API is used to access the venues in the neighborhoods.

These venues are using the k-means clustering algorithm and Folium map is used to visualize the clusters superimposed on the map of Chennai.

Target Audience:

The target audience is anyone who planning to start their food business at a location in Chennai. This project would help them find the optimal location based on the category of their business such as,

- How restaurants are spread out in Chennai
- The best location to start new restaurants in Chennai

Data:

The wikipedia page of Chennai neighborhoods-
https://en.wikipedia.org/wiki/List_of_neighbourhoods_of_Chennai , has been used to obtain the neighborhoods with its latitude and longitude positions.

Methodology

Foursquare obtaines around 870 venues for 176 neighborhoods.
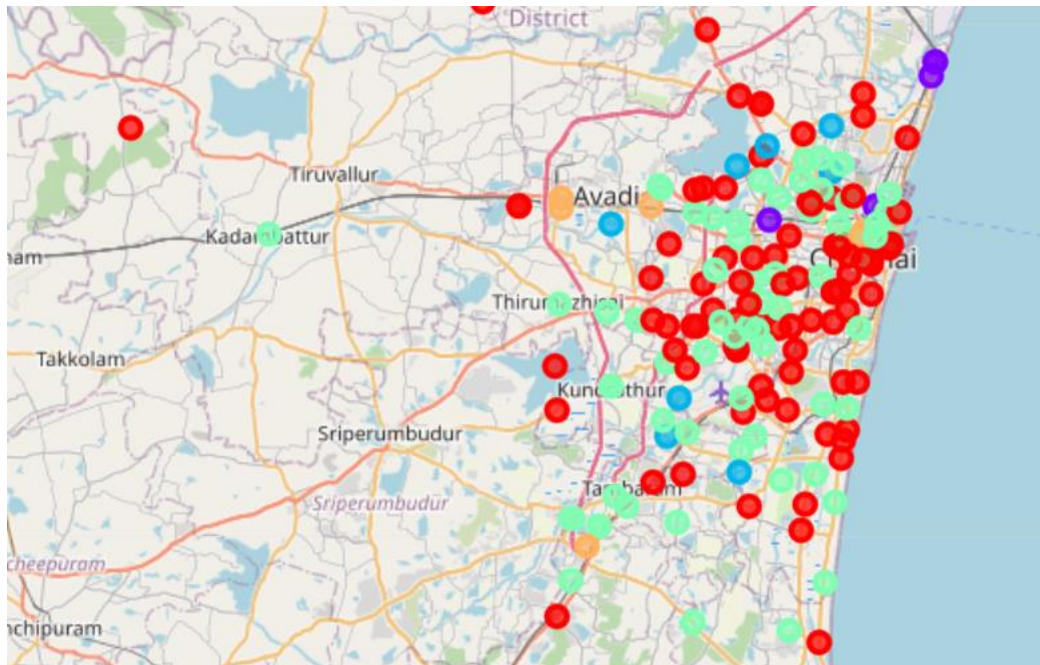
We use:

- one hot encoding on the obtained data set

- K-means clustering

Analysis

By analysing the dataset, we got our top 10:

- Cluster that are crowded
- Venues
- Venue Categories

-   Neighborhoods where these venues are present

The above Folium map shows the nieghborhoods are spread across the entire city of Chennai into 5 different clusters: 0,1 , 2 ,3 and 4.

Further analysis revealed that the venues are concentrated majorly in cluster 0 and 3:

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Out[106]:
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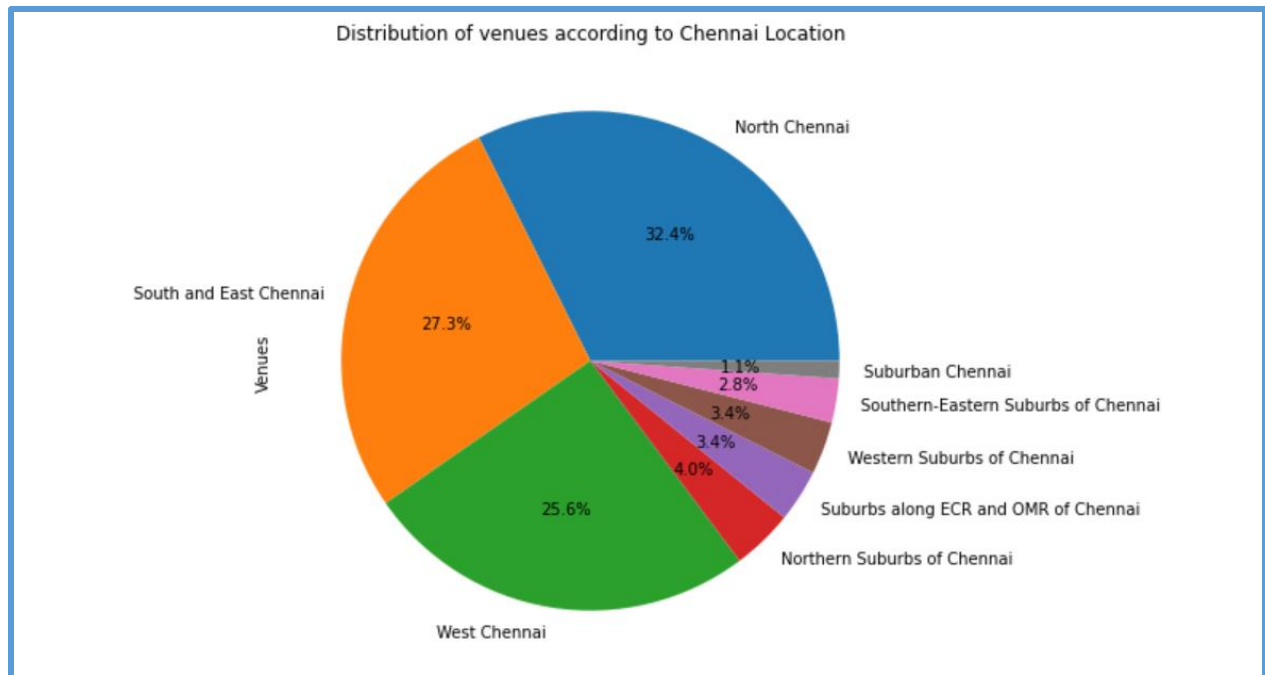|	Neighborhoods
Cluster Labels	
0	85
3	71
2	8
4	7
1	5

Further dividing Neighborhoods on different zones, reveals an interesting fact that North Chennai has most of the Venues captured by Foursquare API, followed by West Chennai.

Location	Venues
North Chennai	57
South and East Chennai	48
West Chennai	45
Northern Suburbs of Chennai	7
Suburbs along ECR and OMR of Chennai	6
Western Suburbs of Chennai	6
Southern-Eastern Suburbs of Chennai	5
Suburban Chennai	2

Distribution of venues according to Chennai Location

With the data gathered, we could find the Top10 sections of:

- Total venues
- Venues Categories
- Neighborhoods with most venue Categories

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Top 10 Neighborhoods with most venue categories:
+----+-----------------+----------------+
|    | Neighborhood    |  Total venues  |
|----+-----------------+----------------|
|  0 | T. Nagar        |             30 |
|  1 | Gopalapuram     |             30 |
|  2 | Anna Nagar      |             30 |
|  3 | Kelambakkam     |             30 |
|  4 | Vadapalani      |             28 |
|  5 | Thousand Lights |             26 |
|  6 | Besant Nagar    |             21 |
|  7 | Broadway        |             21 |
|  8 | Guindy          |             16 |
|  9 | Kancheepuram    |             15 |
+----+-----------------+----------------+
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Top 10 Venue Categories in Chennai:
+----+------------------------------+---------+
|    | Venue Category               |  Count  |
|----+------------------------------+---------|
|  0 | Indian Restaurant            |     115 |
|  1 | Fast Food Restaurant         |      36 |
|  2 | Hotel                        |      30 |
|  3 | Café                         |      29 |
|  4 | Pizza Place                  |      28 |
|  5 | Vegetarian / Vegan Restaurant|      28 |
|  6 | Department Store             |      27 |
|  7 | Train Station                |      25 |
|  8 | Bakery                       |      22 |
|  9 | Clothing Store               |      22 |
+----+------------------------------+---------+
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Top 10 Venues in Chennai:
+----+-----------------------+---------+
|    | Venue                 |  Count  |
|----+-----------------------+---------|
|  0 | Domino's Pizza        |      20 |
|  1 | Cafe Coffee Day       |      12 |
|  2 | Hotel Saravana Bhavan |      12 |
|  3 | Subway                |      11 |
|  4 | KFC                   |       9 |
|  5 | Axis Bank ATM         |       7 |
|  6 | Starbucks             |       6 |
|  7 | HDFC Bank ATM         |       5 |
|  8 | Ibaco                 |       5 |
|  9 | Reliance Fresh        |       5 |
+----+-----------------------+---------+
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Conclusion

- Neighborhoods in Cluster 1,2 and 4 might be good to start a hotel/restaurant as the density of such venue categories is much less compared to other clusters
- Indian Restaurants are the most in terms of category. Hence, starting other cuisines could gather most customer footfalls
- Opening restaurants near Train stations (25 in count) and clothing store (22 in count) would attract customers to restaurants who come to these areas.