Battle of the Neighborhoods

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Location analysis for opening a New Restaurant in Chennai

Introduction

- This project explores the best locations for opening a restaurant in Chennai city

- Food Business is always the best one. Since there are a lot of Restaurants available, analysis is required to find out the affordable area and to find out available venues in the area.

- This report explores which neighborhoods of Chennai and their land values per Sq. Ft and most common venues in each neighborhood.

- The result is grouped to 5 groups based on the area prices.

Data

- Chennai locations and land prices are taken from https://www.livechennai.com/Propertyratesinchennai.asp
- Sample Data

Price Range - (Rs/Sqft)			
Locality	Min	Max	Average Price
Adyar	10,180	17,159	13,670
Alwarpet	10,991	18,401	14,696
Ambattur	4,176	5,936	5,056
Ambattur Industrial Estate	4,548	6,111	5,330
Anna Nagar	7,799	12,880	10,340
Anna Nagar West	6,350	10,554	8,452
Arcot Road	5,966	10,103	8,035
Avadi	3,271	4,427	3,849

Loading of Data

- Data is loaded into Data frame.


```
In [10]: df_price
```

Out[10]:

	Locality	Min	Max	Average Price
0	Adyar	10,180	17,159	13,670\t
1	Alwarpet	10,991	18,401	14,696\t
2	Ambattur	4,176	5,936	5,056\t
3	Ambattur Industrial Estate	4,548	6,111	5,330
4	Anna Nagar	7,799	12,880	10,340
5	Anna Nagar West	6,350	10,554	8,452
6	Arcot Road	5,966	10,103	8,035
7	Avadi	3,271	4,427	3,849
8	Chromepet	3,933	6,058	4,996

Data Processing

- Data loaded into df is processed like removing the special characters, converting string to number.

- Processed Data:

Out[11]:

	Locality	Min	Max	Average Price
0	Adyar	10180	17159	13670
1	Alwarpet	10991	18401	14696
2	Ambattur	4176	5936	5056
3	Ambattur Industrial Estate	4548	6111	5330
4	Anna Nagar	7799	12880	10340

Methodology

- Location coordinators are obtained by geolocator.

	Locality	Min	Max	Average Price	Latitude	Longitude
0	Adyar	10180	17159	13670	13.006450	80.257779
1	Alwarpet	10991	18401	14696	13.033860	80.254549
2	Ambattur	4176	5936	5056	13.112886	80.159862
3	Ambattur Industrial Estate	4548	6111	5330	13.092285	80.167549
4	Anna Nagar	7799	12880	10340	13.087200	80.216442

Map

- Locations are plotted in map.
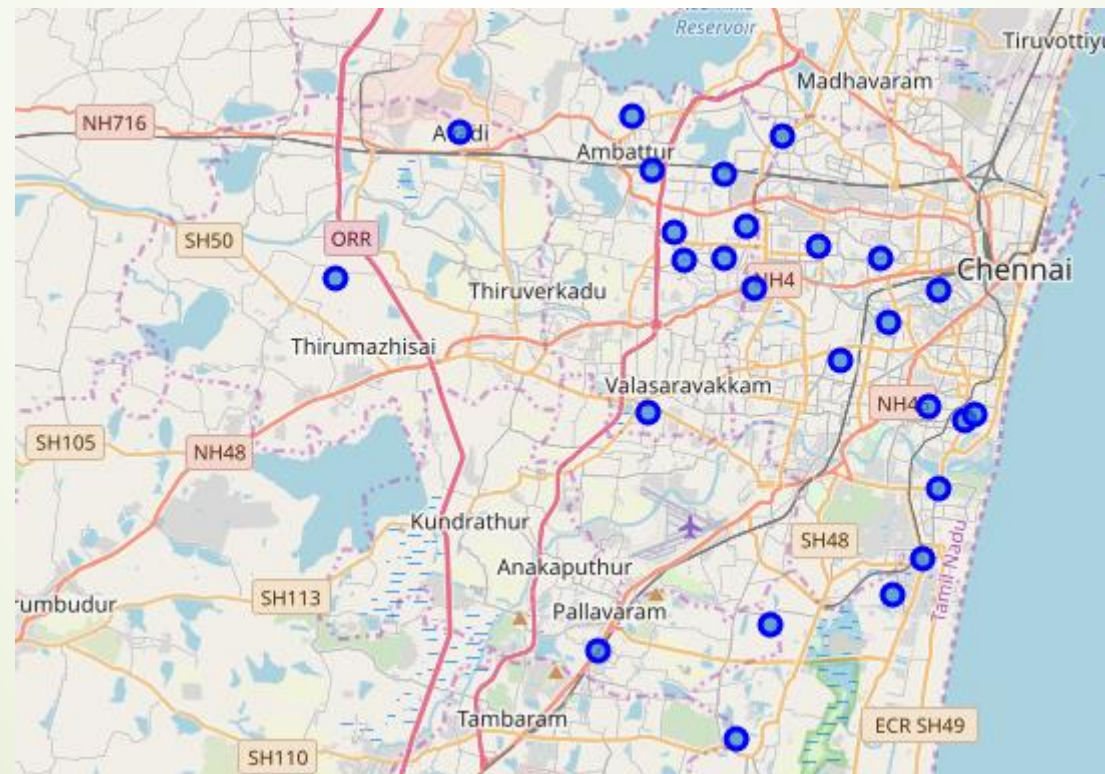
Foursquare API

- Foursquare API is used to fetch the venues in the given areas.

location_venues

	Street	Street Latitude	Street Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Adyar	13.006450	80.257779	Bombay Brassiere	13.006961	80.256419	North Indian Restaurant
1	Adyar	13.006450	80.257779	Cool Biz	13.006632	80.257275	Juice Bar
2	Adyar	13.006450	80.257779	Prems Graama Bhojanam	13.006345	80.253995	Vegetarian / Vegan Restaurant
3	Adyar	13.006450	80.257779	Adyar Ananda Bhavan	13.005824	80.257368	Indian Restaurant
4	Adyar	13.006450	80.257779	Aavin Milk Booth	13.007646	80.259153	Grocery Store
5	Adyar	13.006450	80.257779	McDonald's	13.006632	80.254255	Fast Food Restaurant
6	Adyar	13.006450	80.257779	Rainforest Restaurant	13.006993	80.257767	Indian Restaurant

Grouping data

- Finding top most venues for the neighborhood.

	Street	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	Adyar	Indian Restaurant	Electronics Store	North Indian Restaurant	Ice Cream Shop	Rock Club	Fast Food Restaurant	Coffee Shop	Lounge	Café	Juice Bar
1	Alwarpet	Bakery	Japanese Restaurant	Café	Restaurant	Sandwich Place	Gym	Juice Bar	Coffee Shop	Breakfast Spot	Bookstore
2	Ambattur	Multiplex	Movie Theater	River	Wine Shop	Daycare	Dessert Shop	Electronics Store	Farmers Market	Fast Food Restaurant	Food Court
3	Ambattur Industrial Estate	Fried Chicken Joint	Pizza Place	Fast Food Restaurant	Food Court	Cosmetics Shop	Department Store	Dessert Shop	Electronics Store	Farmers Market	Food Truck

Clustering of Data

- Using K-Means, clustering the data based on Land Average price.

```python
# set number of clusters
kclusters = 5

chennai_grouped_clustering = chennai_grouped.drop('Locality', 1)

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

# check cluster labels generated for each row in the dataframe
kmeans.labels_[0:50]
```
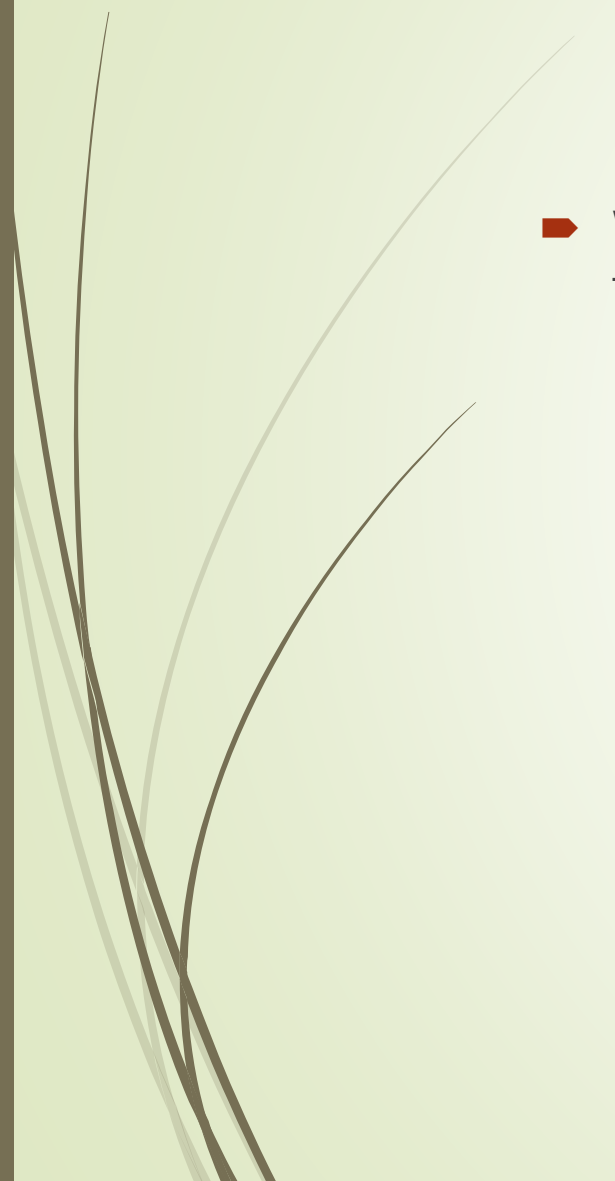
Plotting the Clusters
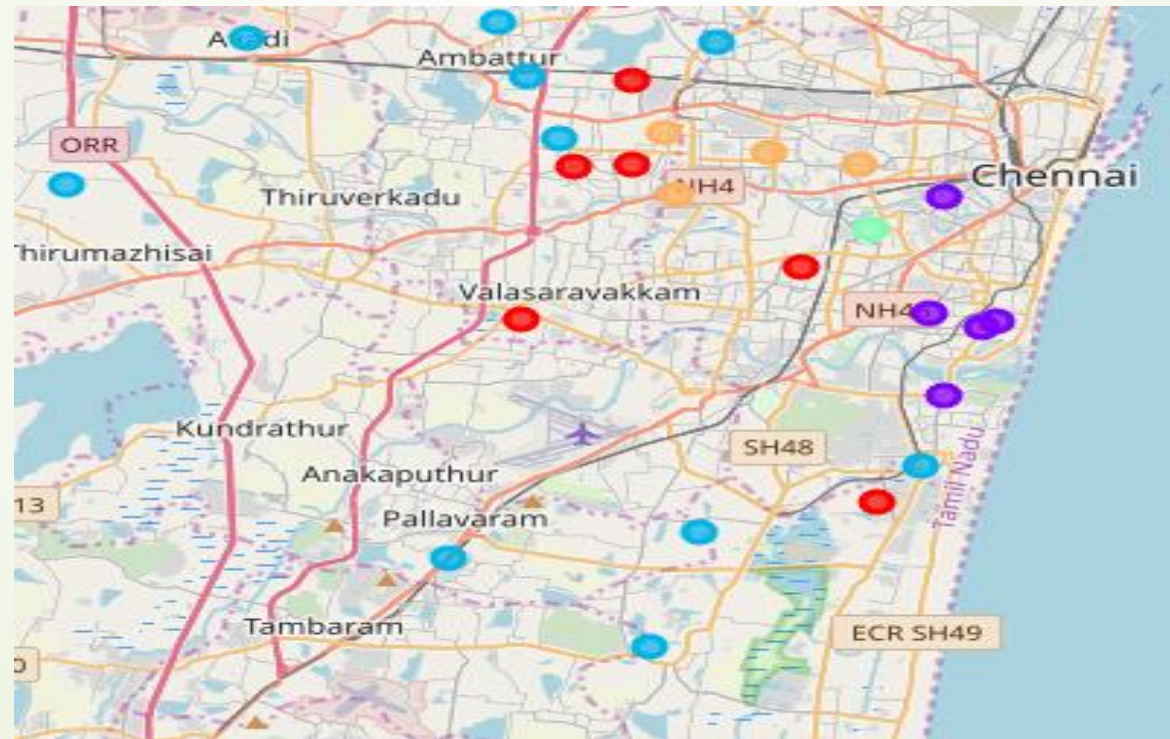
Result

- With the grouping we find the locations under cluster affordable range and also there is less number of restaurant compared to other clusters.

	Locality	Average Price	Latitude	Longitude	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
2	Ambattur	5056	13.112886	80.159862	2	Multiplex	Movie Theater	River	Wine Shop	Daycare	Dessert Shop	Electronics Store	Farmers Market	Fast Food Restaurant	Food Court
3	Ambattur Industrial Estate	5330	13.092285	80.167549	2	Fried Chicken Joint	Pizza Place	Fast Food Restaurant	Food Court	Cosmetics Shop	Department Store	Dessert Shop	Electronics Store	Farmers Market	Food Truck
7	Avadi	3849	13.125476	80.094090	2	Art Gallery	IT Services	Rental Service	Wine Shop	Fried Chicken Joint	Dessert Shop	Electronics Store	Farmers Market	Fast Food Restaurant	Food Court
8	Chromepet	4996	12.952190	80.141168	2	Indian Restaurant	Ice Cream Shop	Shopping Mall	Movie Theater	Clothing Store	Bus Station	Road	Light Rail Station	Big Box Store	Bakery
9	East Coast Road	4865	53.394805	-1.441633	2	Wine Shop	Breakfast Spot	Coffee Shop	Brewery	Hardware Store	Gym	Grocery Store	Gourmet Shop	Furniture / Home Store	Hotel

Conclusion

- With the above analysis we came to conclusion of which are best locations for opening a restaurant in Chennai.

Thank you