
Optimal Location and Rating for a new Restaurant in Bangalore

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02 Data Acquisition and Cleaning

03 Analysis

04 Results and Discussion

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Introduction

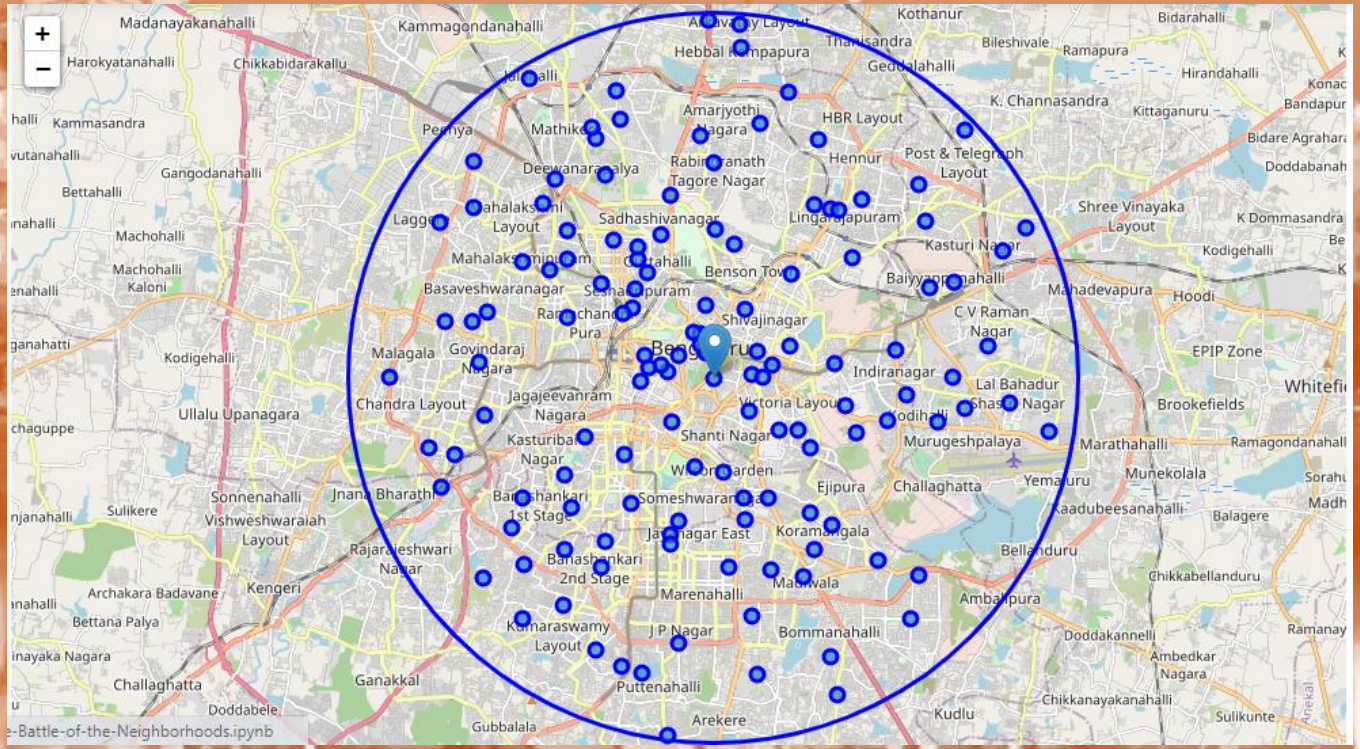
Bangalore

With over 2000 restaurants, Bangalore is India’s one of the most diverse city in terms of Restaurants

We will detect neighborhoods in Bangalore suited best for a restaurant. And then predict its rating

Data Acquisition and Cleaning

Google API



From Google API, we extracted neighboord's centre and Bangalore's Centre. And restricted that to 10 kms radius from Bangalore's Centre

Foursquare API

Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Neighborhood Distance	Venue	Venue Latitude	Venue Longitude	Venue Distance from center	Venue Id	Venue Category
Bangalore City	12.971599	77.594563	0.0	Toscano	12.971980	77.596066	168	4bc1cd90b492d13a4e74a660	Italian Restaurant
Bangalore City	12.971599	77.594563	0.0	Shiro	12.971900	77.596236	184	4b895510f964a520442c32e3	Japanese Restaurant
Bangalore City	12.971599	77.594563	0.0	Café Noir	12.971995	77.596001	162	4baef172f964a5202ce33be3	French Restaurant
Bangalore City	12.971599	77.594563	0.0	J W Kitchen	12.972410	77.594592	90	523de40611d2996a150886fc	Asian Restaurant
Bangalore City	12.971599	77.594563	0.0	Bengaluru Baking Co.	12.971761	77.595128	63	51efe570498e01081549f692	Bakery

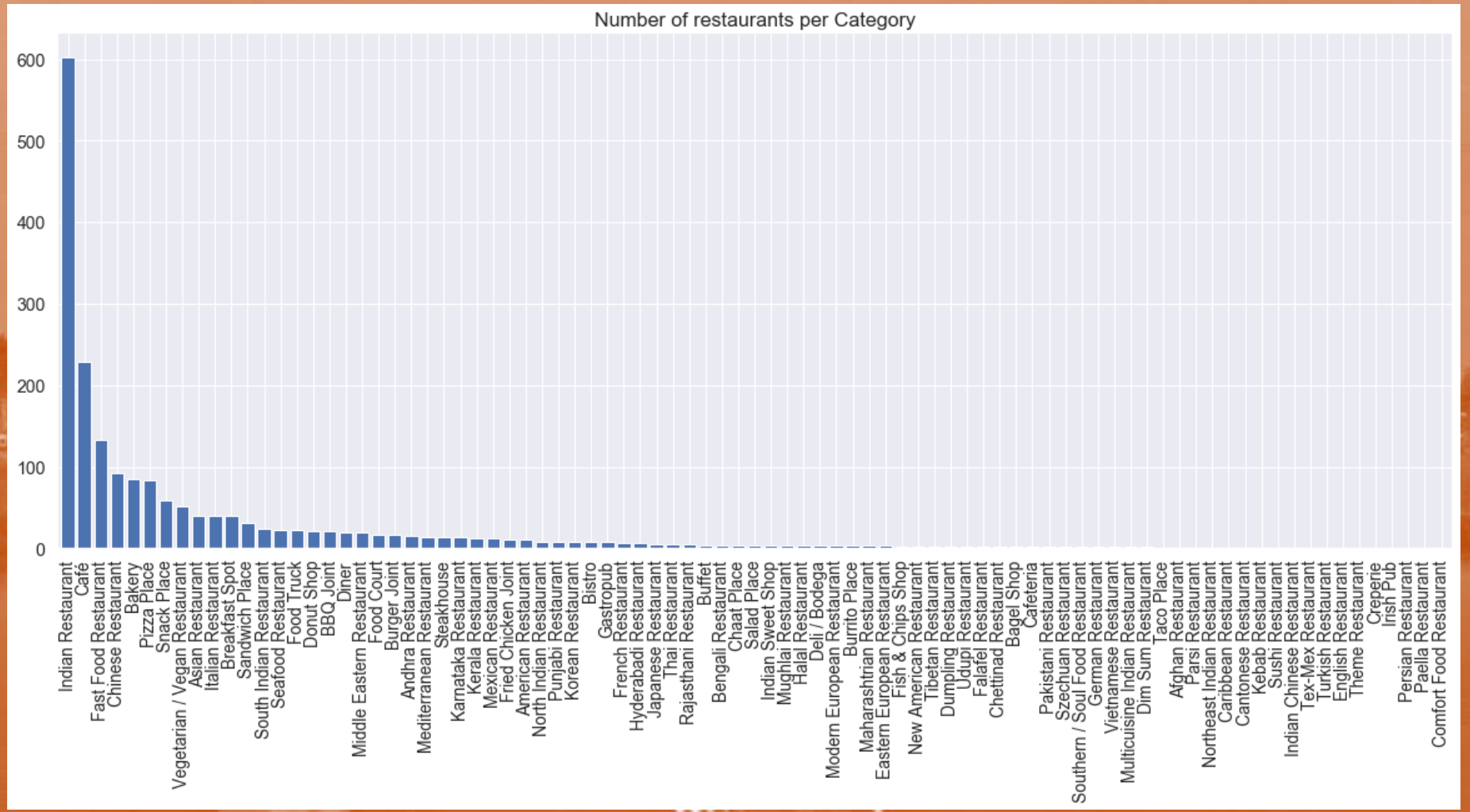
Using Foursqure API, we got restaurants for all neighbourhood.

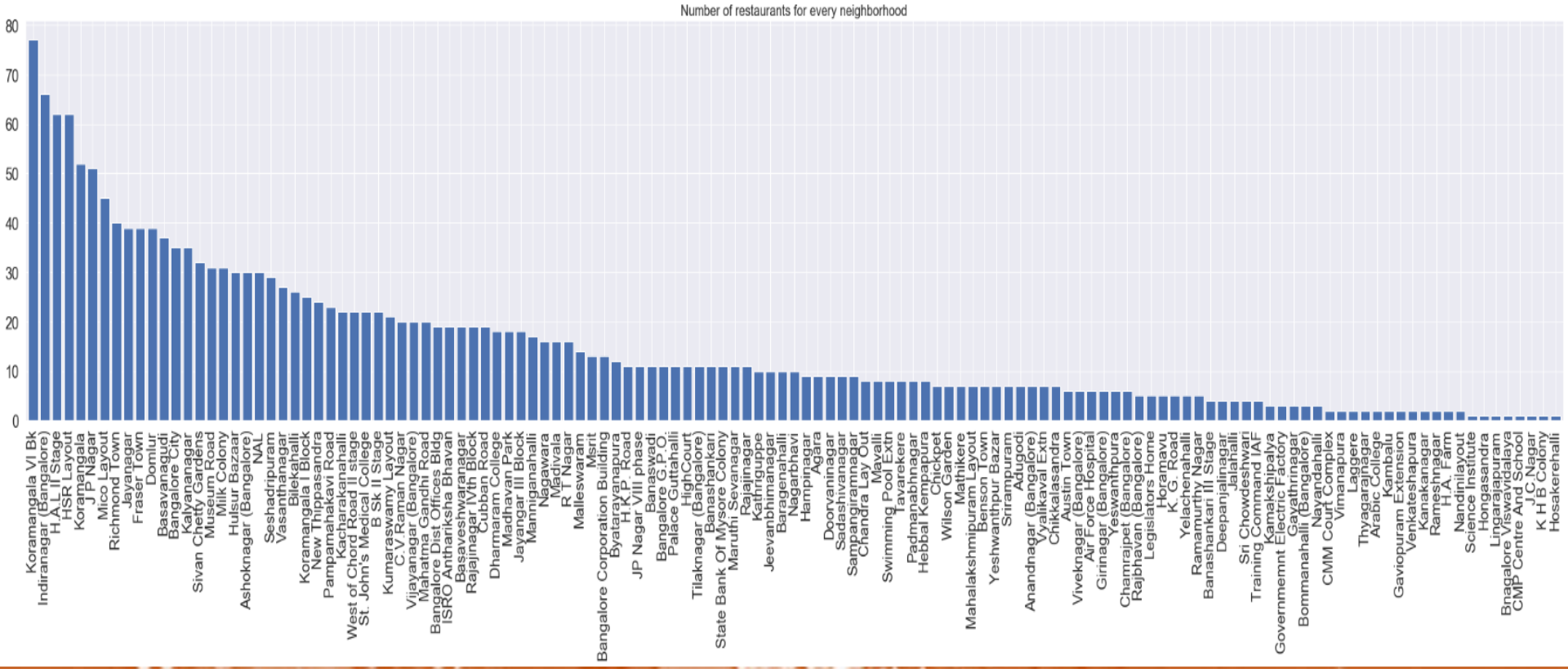
Zomato API

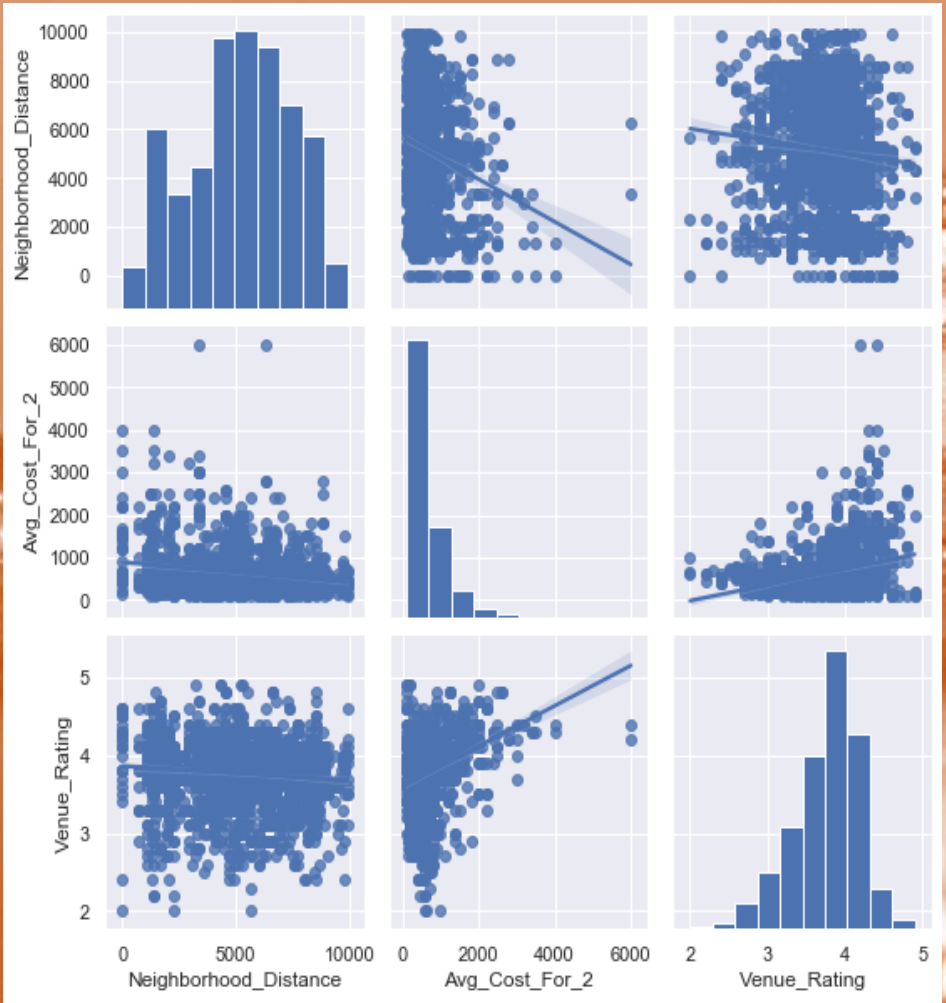
Venue_Id	Venue_Lat	Venue_Lng	Venue_Dist	Avg_Cost_For_2	Venue_Cuisines	Table_Booking	Online_Order	Venue_Rating	Venue_Res_Type
534d46b2498e81f5e91eddda	13.010413	77.648123	8.0	600.0	North Indian, Mughlai, Biryani, Chinese	0.0	1.0	3.8	Casual Dining
4c3c263b980320a1f9468ae4	12.935222	77.624375	11.0	1600.0	Continental, Mediterranean, North Indian, Chin...	1.0	1.0	3.9	Casual Dining
4d9cdc26c593a1cd66205319	12.996995	77.614308	12.0	200.0	Bakery, Fast Food, Beverages	0.0	0.0	3.0	Dessert Parlour
4be67bb32457a593aae7ac15	12.978357	77.640717	12.0	600.0	Pizza, Fast Food, Finger Food, American	0.0	1.0	3.3	Casual Dining
4bab3b34f964a520a99a3ae3	13.005642	77.569207	14.0	300.0	Fast Food	0.0	1.0	3.3	Quick Bites

Using Zomato Api, we extracted few extra details of restaurants which we got from Four Square API

Data Analysis

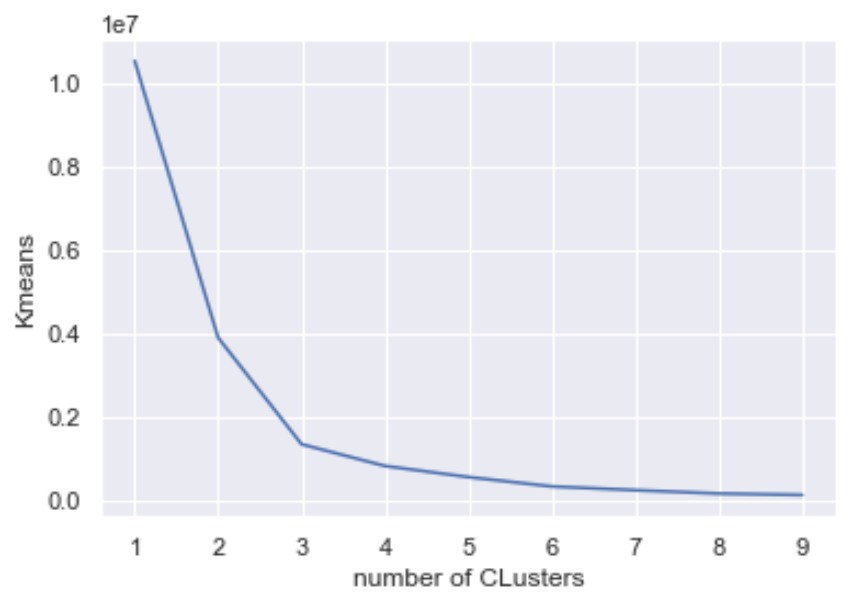

Number of restaurants per Category
600
500
400
300
200
100
0
Indian Restaurant
Café
Fast Food Restaurant
Chinese Restaurant
Bakery
Pizza Place
Snack Place
Vegetarian / Vegan Restaurant
Asian Restaurant
Italian Restaurant
Breakfast Spot
Sandwich Place
South Indian Restaurant
Seafood Restaurant
Food Truck
Donut Shop
BBQ Joint
Diner
Middle Eastern Restaurant
Food Court
Burger Joint
Andhra Restaurant
Mediterranean Restaurant
Steakhouse
Karnataka Restaurant
Kerala Restaurant
Mexican Restaurant
Fried Chicken Joint
American Restaurant
North Indian Restaurant
Punjabi Restaurant
Korean Restaurant
Bistro
Gastropub
French Restaurant
Hyderabadi Restaurant
Japanese Restaurant
Thai Restaurant
Rajasthani Restaurant
Buffet
Bengali Restaurant
Chaat Place
Salad Place
Indian Sweet Shop
Mughlai Restaurant
Halal Restaurant
Deli / Bodega
Modern European Restaurant
Burrito Place
Maharashtrian Restaurant
Eastern European Restaurant
Fish & Chips Shop
New American Restaurant
Tibetan Restaurant
Dumpling Restaurant
Udupi Restaurant
Falafel Restaurant
Chettinad Restaurant
Bagel Shop
Cafeteria
Pakistani Restaurant
Szechuan Restaurant
Southern / Soul Food Restaurant
German Restaurant
Vietnamese Restaurant
Multicuisine Indian Restaurant
Dim Sum Restaurant
Taco Place
Afghan Restaurant
Parsi Restaurant
Northeast Indian Restaurant
Caribbean Restaurant
Cantonese Restaurant
Kebab Restaurant
Sushi Restaurant
Indian Chinese Restaurant
Tex-Mex Restaurant
Turkish Restaurant
English Restaurant
Theme Restaurant
Creperie
Irish Pub
Persian Restaurant
Paella Restaurant
Comfort Food Restaurant

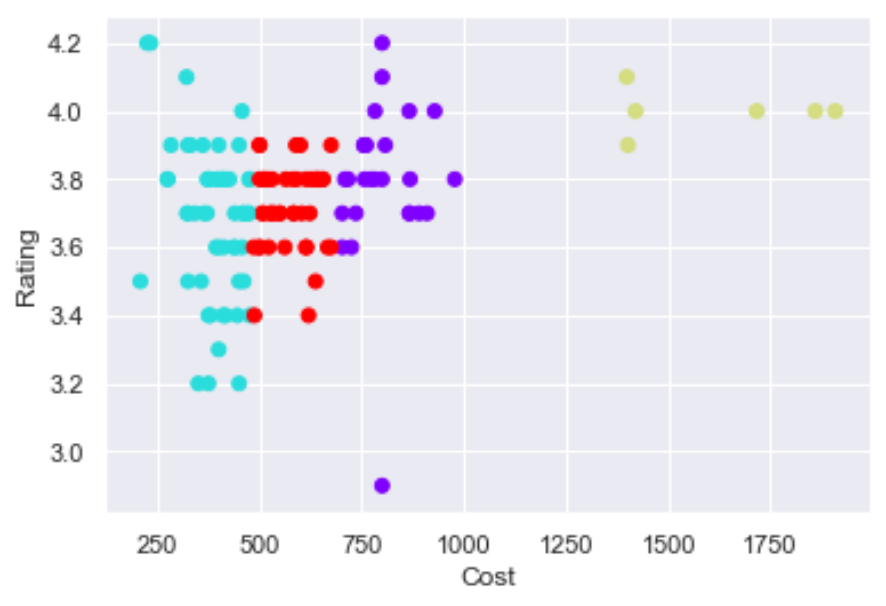

Number of restaurants for every neighborhood
80
70
60
50
40
30
20
10
0
Koramangala VI Bk
Indiranagar (Bangalore)
H.A.L II Stage
HSR Layout
Koramangala
J P Nagar
Mico Layout
Richmond Town
Jayanagar
Fraser Town
Domlur
Basavanagudi
Bangalore City
Kalyananagar
Sivan Chetty Gardens
Museum Road
Milk Colony
Hulsur Bazaar
Ashoknagar (Bangalore)
NAL
Seshadripuram
Vasanthanagar
Bilekahalli
Koramangala I Block
New Thippasandra
Pampamahakavi Road
Kacharakanahalli
West of Chord Road II stage
St. John's Medical College
B Sk II Stage
Kumaraswamy Layout
C.V.Raman Nagar
Vijayanagar (Bangalore)
Mahatma Gandhi Road
Bangalore Dist Offices Bldg
ISRO Anthariksha Bhavan
Basaveshwaranagar
Rajajinagar IVth Block
Cubbon Road
Dharmaram College
Madhavan Park
Jayangar III Block
Manniganahalli
Nagawara
Madivala
R T Nagar
Malleswaram
Msrit
Bangalore Corporation Building
Byatarayanapura
H.K.P. Road
JP Nagar VIII phase
Banaswadi
Bangalore G.P.O
Palace Guttahalli
HighCourt
Tilaknagar (Bangalore)
Banashankari
State Bank Of Mysore Colony
Maruthi Sevanagar
Rajajinagar
Kathriguppe
Jeevanbhimanagar
Baragenahalli
Nagarbhavi
Hampinagar
Agara
Doorvaninagar
Sadashivanagar
Sampangiramnagar
Chandra Lay Out
Mayalli
Swimming Pool Extn
Tavarekere
Padmanabhnagar
Hebbal Kempapura
Chickpet
Wilson Garden
Mathikere
Mahalakshmipuram Layout
Benson Town
Yeshwanthpur Bazar
Srirampuram
Adugodi
Anandnagar (Bangalore)
Vyalikaval Extn
Chikkalasandra
Austin Town
Viveknagar (Bangalore)
Air Force Hospital
Girinagar (Bangalore)
Yeswanthpura
Chamrajpet (Bangalore)
Rajbhavan (Bangalore)
Legislators Home
Horamavu
K. G. Road
Yelachenahalli
Ramamurthy Nagar
Banashankari III Stage
Deepanjalinagar
Jalahalli
Sri Chowdeshwari
Training Command IAF
Kamakshipalya
Governmemnt Electric Factory
Gayathrinagar
Bommanahalli (Bangalore)
Nayandahalli
CMM Court Complex
Vimanapura
Laggere
Thyagarajnagar
Arabic College
Kambalu
Gaviopuram Extension
Venkateshapura
Kanakanagar
Rameshnagar
H.A. Farm
Nandinilayout
Science Institute
Hongasandra
Lingarajapuram
Bnagalore Viswavidalaya
CMP Centre And School
J.C.Nagar
K H B Colony
Hosakerehalli



Relationship between Neighborhood Distance, Average rating and Average Price for 2

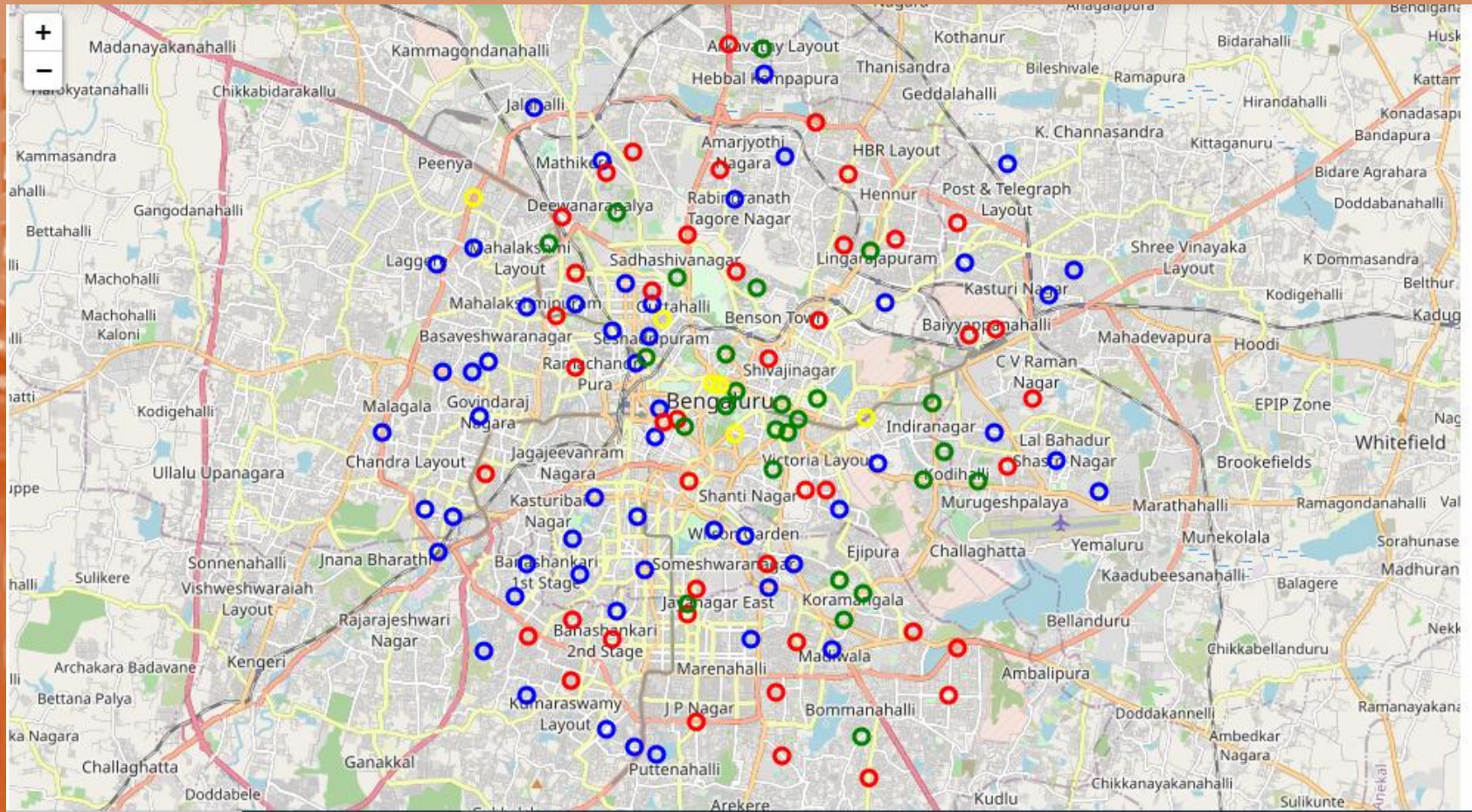
Clustering Neighbourhood





Neighborhood clustering by KMEANS, using average cost and Rating

Clustering Neighbourhood



User Selection- Venue Category

Results and Discussions

Best Neighborhood- User Selection Venue Category

distance=0.1
average_rating=0.05
average_cost=0.05
total_res=0.15

user_selected_average_rating=0.25
user_selected_average_cost=0.1
user_selected_total_res=0.3

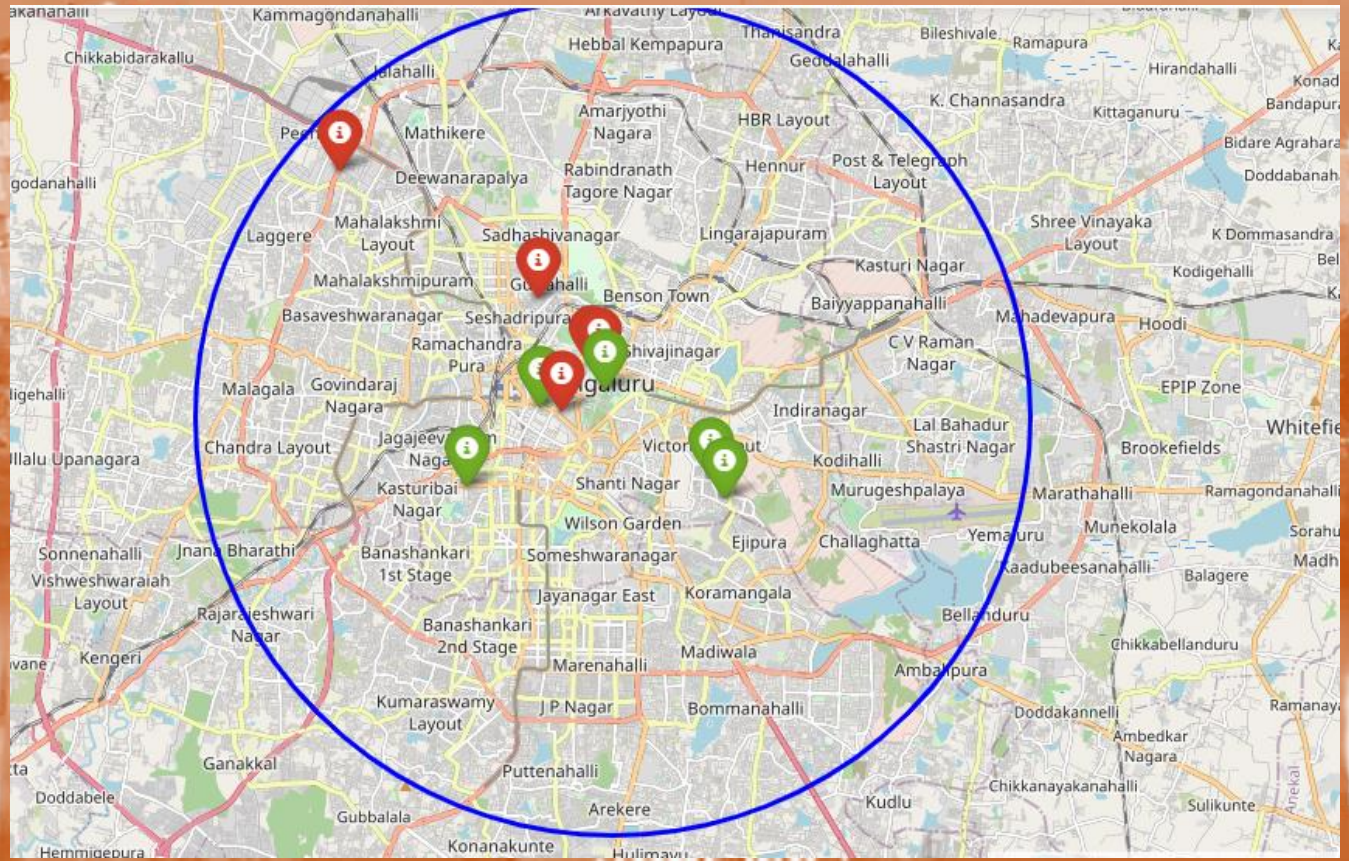
After a long discussion with stakeholder on above analysis, we came to a conclusion on weightage of each feature which we need to take in consideration for the project

Best Neighborhood- User Selection Venue Category

Neighborhood	Neighborhood Distance	Avg_Cost_For_2	Venue_Rating	Total Restaurants	User Selected-avg cost	User Selected-venue Rating	User Selected-Total Restaurants	Neighborhood_Lat	Neighborhood_Lng	Weightage
Legislators Home	1362	1860	4.0	4	1733	4.2	3	12.982845	77.589609	0.365716
Palace Guttahalli	3386	1909	4.0	11	2230	3.9	5	12.997414	77.578042	0.320346
Yeswanthpura	8859	1716	4.0	6	1800	4.1	1	13.025030	77.534024	0.300818
CMM Court Complex	1249	800	4.2	2	200	4.2	1	12.973127	77.583151	0.297917
Rajbhavan (Bangalore)	1259	1420	4.0	4	100	3.9	1	12.982467	77.591303	0.283893
HighCourt	729	890	3.7	11	1150	3.4	2	12.977874	77.592635	0.268478
Viveknagar (Bangalore)	3270	416	3.8	6	575	4.2	2	12.954487	77.619072	0.262048
K. G. Road	1797	510	3.7	4	483	3.9	3	12.974276	77.578219	0.248898
Austin Town	2728	641	3.8	6	600	3.7	2	12.958768	77.615995	0.245467
Chamrajpet (Bangalore)	3875	341	3.7	6	150	4.2	1	12.956987	77.562140	0.243401

Using the above weightage and user selected restaurant type, we were able to give top 10 neighbo urhood, suited for the stakeholder

Best Neighborhood- User Selection Venue Category



Red marker – top 5

Green marker – next 5

Rating Prediction - Classification

Algorithm	Jaccard	F1-score	LogLoss
KNN	0.70	0.69	NA
Decision Tree	0.75	0.75	NA
SVM	0.69	0.69	NA
LogisticRegression	0.63	0.57	0.63

Decision tree was able to predict better than all 4 models tried. It was able to predict rating of 75% of restaurant correctly, using cuisines, online booking, delivery option, res_type, distance, average price as features

Conclusion

Conclusion

Purpose of this project was to identify Bangalore Neighborhood, suitable for any kind of restaurant preferred by st akeholder. By using Google , Foursquare and Zomato Api we were able to get restaurant details of all Neighborho od in Bangalore , which further helped us in finding the best Neighborhood. Also we were able to classify restaura nts using a decision tree model and label them as below average and above average Rating.

Final decision on optimal restaurant location will be made by stakeholders based on specific characteristics of nei ghbourhoods and locations in every recommended zone, taking into consideration additional factors like attractive ness of each location (proximity to park or water), levels of noise / proximity to major roads, real estate availability, prices, social and economic dynamics of every Neighborhood etc.


Thank you