

Market research: Expanding a Restaurant chain into the market in Bengaluru city, India.

Rahul Nayak

May 23rd 2020

1. Introduction

1.1 Background

Vasudev Krishna a hotelier runs a chain of Indian restaurants under the brand name of Vaikunta Experience in the city of Mumbai, India. Building on the success of his venture he wants to expand his business into the city of Bengaluru, India. While doing his research Vasudev finds out that his friend Arjuna, an aspiring data scientist has recently completed the IBM DATA SCIENCE professional certificate. Vasudev has requested Arjuna to help him with his problem.

Bengaluru (also called Bangalore) is the capital of India's southern Karnataka state. The centre of India's high-tech industry, the city is also known for its parks and nightlife.

1.2 Business Problem

Vasudev wants to expand his restaurant chain into the markets of Bengaluru, India. But first, he must do some research. His main dilemma is to decide as to where will he locate his restaurants in Bengaluru. He wants to expand into areas that have the least Indian restaurants in their vicinity, neighbourhoods that are not known for their restaurants. He is confident that his food will find takers as his food is literally the food of the gods. Hence, he enlists the help of his dear friend Arjuna, who with his recent experience with machine learning techniques and the foursquare API has promised Vasudev that he will solve his dilemma. Arjuna has promised Vasudev that he will look up details on all the neighbourhoods in Bengaluru and find out which of them have popular Indian restaurants within them and will suggest locations in Bengaluru where Vasudev can establish his restaurants.

1.3 Interest

The findings of this project will not only help the fictional Vasudev Krishna but will be helpful for anyone who is looking to bring their business into Bengaluru. The Jupyter notebook is available [here](#). [1] By editing the fields one can adapt the code to suit the business problem pertaining to the city of Bengaluru.

2. Data acquisition and cleaning

2.1 Data sources

First most, a list of neighbourhoods in Bengaluru will be needed. This list will be obtained from [here](#) [2], a table containing neighbourhood names with respect to its postal code. This table will have to be read into a data frame.

Next, we will need the latitude and longitude for each neighbourhood. for this we will use the google maps search nearby function. (data compiled into a csv file available [here](#))[3]

Next, we will use the Foursquare API to make calls (The tutorial can be found [here](#))[4] to get the top 10 venues in each neighbourhood.

2.2 Data Cleaning

The list of Bengaluru neighbourhoods is as such:

Table 1. Raw data scraped from [here](#). [2]

	Neighborhood	Pin_Code
1	A F station yelahanka	560063
2	Adugodi	560030
3	Agara	560034
4	Agram	560007
5	Air Force hospital	560007

Here multiple neighbourhoods have the same Pin code and hence they had to be merged together as such:

Table 2. Raw data merged based on common Pin code.

	Pin_Code	Neighborhood
0	560001	Bangalore Bazaar,Bangalore.,Brigade Road,Cubba...
1	560002	Avenue Road,Bangalore City,Bangalore Corporati...
2	560003	Aranya Bhavan,Malleswaram,Palace Guttahalli,Sw...
3	560004	Basavanagudi,Lalbagh West,Mavalli,Pasmpamahaka...
4	560005	Fraser Town,Jeevanahalli
...
94	562107	Attibele,Bidaraguppe,Mayasandra,Neralur,Yadava...
95	562125	Dommasandra,Handenahalli,Kugur,Sarjapura
96	562130	Chikkanahalli,Chunchanakuppe,Kadabagere,Tavare...
97	562149	Bagalur,Bandikodigehalli,Doddagubbi,Kannur
98	562157	Bettahalsur,Chikkajala,Doddajala,Hunasamaranah...

Next, all these neighbourhoods need location data that contains the latitude and longitude. The google maps search nearby function was used to collect the location data, the geocoder package geopy may also be used for the same. The compiled data is as such:

Table 3. Raw data with location data.

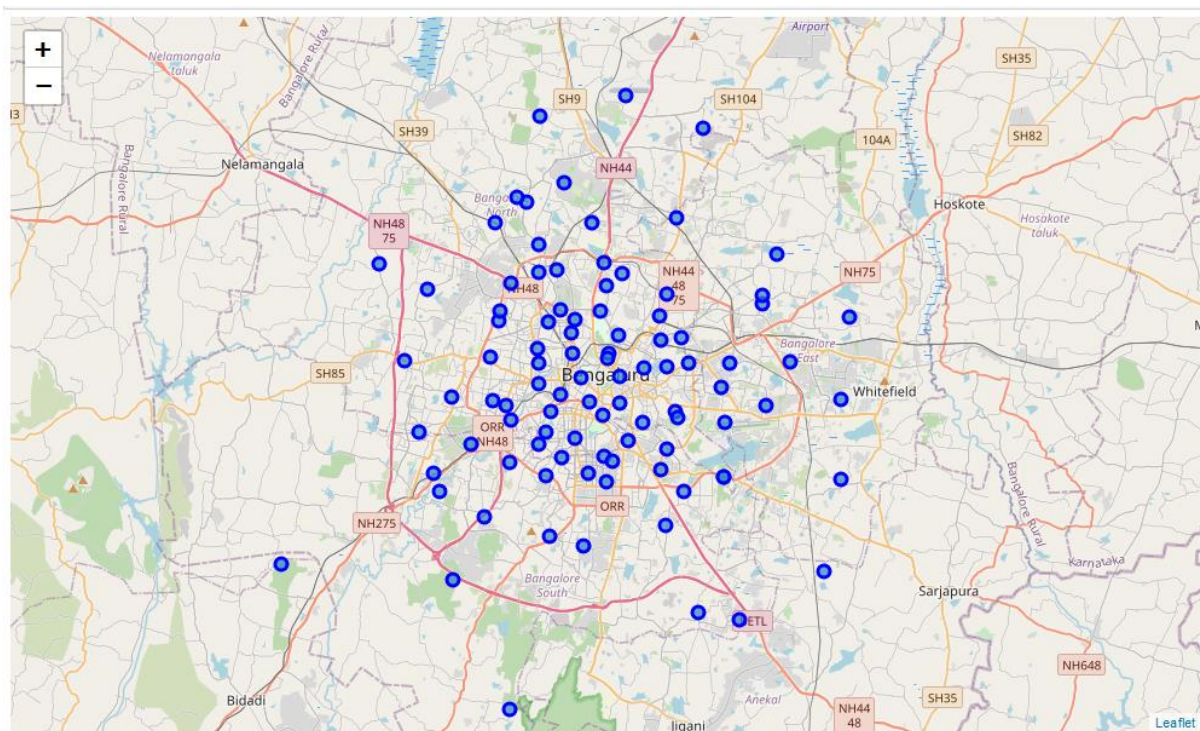
	Pin_Code	Neighborhood	Latitude	Longitude
0	560001	Bangalore Bazaar,Bangalore.,Brigade Road,Cubba...	12.977776	77.599500
1	560002	Avenue Road,Bangalore City,Bangalore Corporati...	12.963811	77.582112
2	560003	Aranya Bhavan,Malleswaram,Palace Guttahalli,Sw...	13.002018	77.571651
3	560004	Basavanagudi,Lalbagh West,Mavalli,Pasmpamahaka...	12.943886	77.573945
4	560005	Fraser Town,Jeevanahalli	12.998097	77.622781

3. Methodology

3.1 Exploratory Data Analysis

The collected data is visualised by superimposing the collected data on a map of Bengaluru. Python folium library was used for this purpose to get the visuals.

Fig 1. Raw data visualised on a map of Bengaluru.



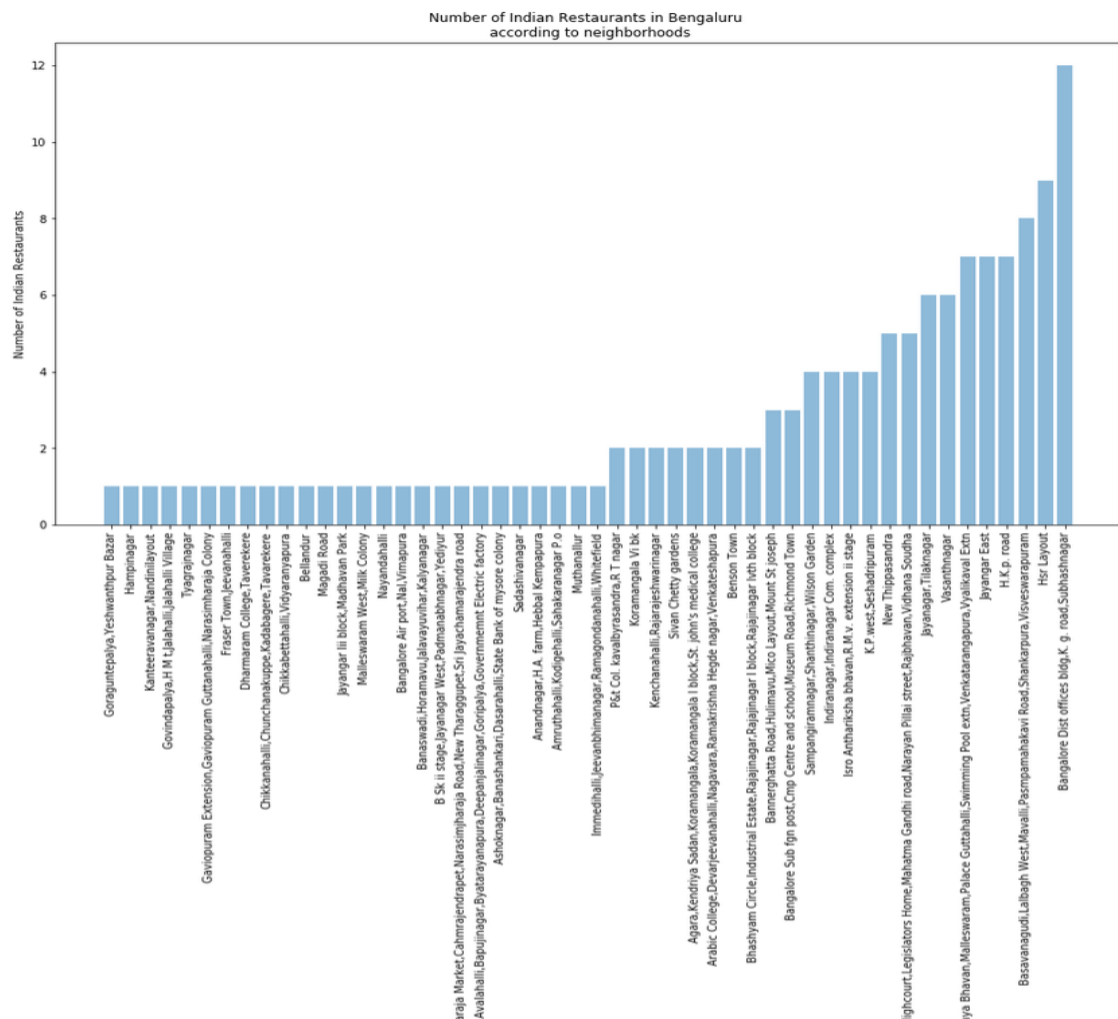
To further our analysis, Foursquare API[5] is used to get the top 100 venues for each neighbourhood and compiled into a table.

Table 4. A collection of top 100 venues for each neighbourhood.

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Bangalore Bazaar,Bangalore.,Brigade Road,Cubba...	12.977776	77.5995	M. Chinnaswamy Stadium	12.978144	77.599223	Cricket Ground
1	Bangalore Bazaar,Bangalore.,Brigade Road,Cubba...	12.977776	77.5995	Hard Rock Cafe Bengaluru	12.976389	77.601468	American Restaurant
2	Bangalore Bazaar,Bangalore.,Brigade Road,Cubba...	12.977776	77.5995	Shiro, UB City	12.976748	77.599066	Lounge
3	Bangalore Bazaar,Bangalore.,Brigade Road,Cubba...	12.977776	77.5995	Cubbon Park	12.977042	77.595277	Park
4	Bangalore Bazaar,Bangalore.,Brigade Road,Cubba...	12.977776	77.5995	Church Street Social	12.975559	77.602579	Pub

Now this is grouped by neighbourhoods to show the count of Indian restaurants and is visualised in a bar plot.

Fig 2. Bar plot of Indian restaurants in different neighbourhoods.



3.2 K Means Clustering

In summary 147 unique venue categories are returned by the Foursquare API and the top 10 venue categories for each neighbourhood was summarised in a table.

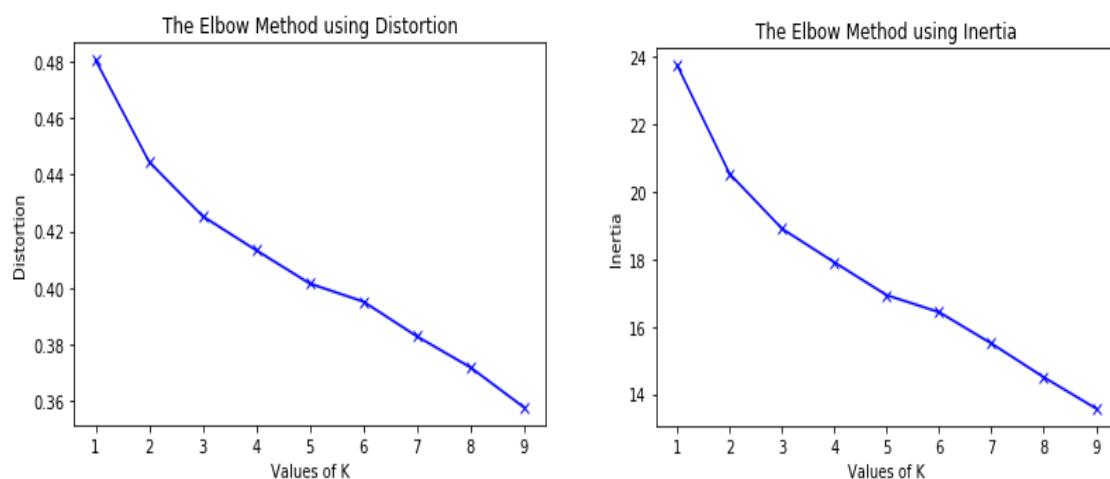
Table 5. Top 10 venues per neighbourhood.

	Neighborhood	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
0	A F station yelahanka	Airport Service	Women's Store	Eastern European Restaurant	Field	Fast Food Restaurant	Farmers Market	Farm
1	Adegudi,Hosur Road	Bus Station	Fast Food Restaurant	Café	Women's Store	Farmers Market	Farm	Falafel Restaurant
2	Agara,Kendriya Sadan,Koramangala,Koramangala I...	Indian Restaurant	Café	Ice Cream Shop	Furniture / Home Store	Eastern European Restaurant	Fast Food Restaurant	Farmers Market
3	Agram,Air Force hospital	ATM	Convenience Store	Field	Fast Food Restaurant	Farmers Market	Farm	Falafel Restaurant
4	Amruthahalli,Kodigehalli,Sahakaranagar P.o	Café	Bakery	Ice Cream Shop	Indian Restaurant	Sandwich Place	Light Rail Station	Snack Place

We have some common venue categories in neighbourhoods. For this reason, the unsupervised machine learning K-means algorithm is used to cluster the neighbourhoods. K-Means algorithm is one of the most common cluster methods of unsupervised learning.

In order to determine the optimal number of clusters, the elbow method was used wherein the distortions and inertia was compared as follows.

Fig 3. Plots for elbow method used to determine the optimum number of clusters.



We find the Elbow: the point after which the distortion/inertia start decreasing in a linear fashion to be 6. Hence the optimum number of clusters are 6.

After clustering the data, the following table was generated containing neighbourhood data with their cluster numbers.

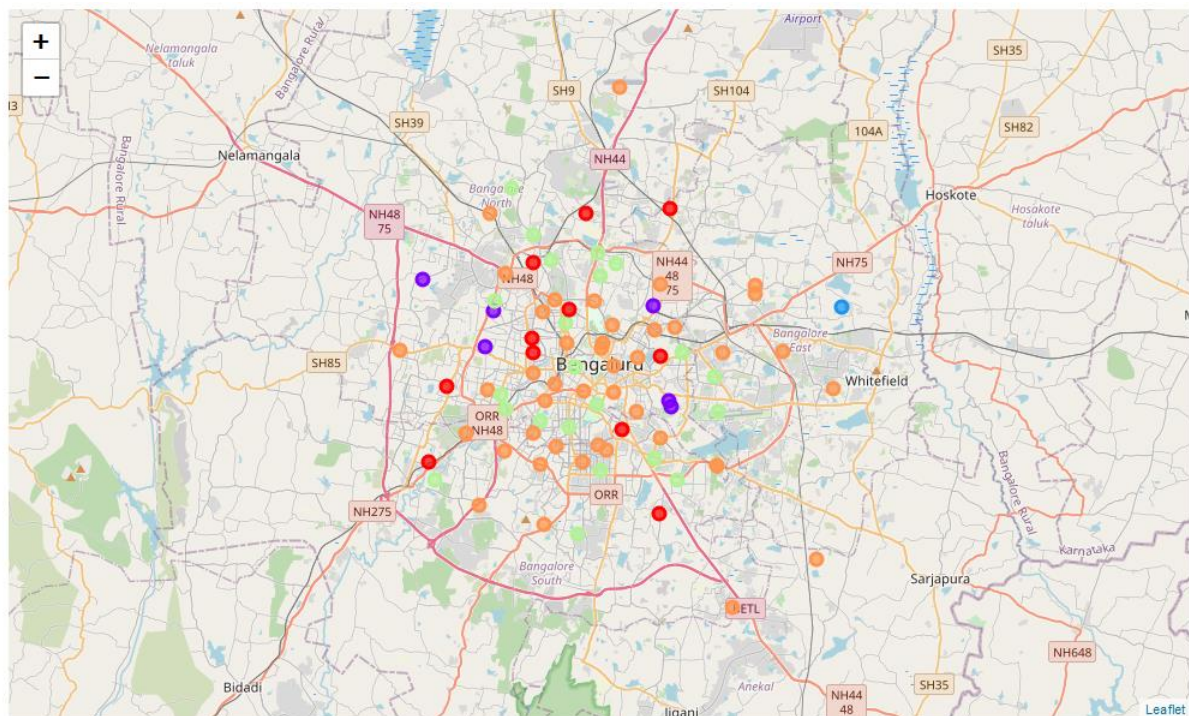
Table 6. Neighbourhood data with cluster labels.

	Cluster Labels	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7 th C V
0	5	A F station yelahanka	Airport Service	Women's Store	Eastern European Restaurant	Field	Fast Food Restaurant	Farmers Market	F
1	0	Adugodi,Hosur Road	Bus Station	Fast Food Restaurant	Café	Women's Store	Farmers Market	Farm	F R
2	4	Agara,Kendriya Sadan,Koramangala,Koramangala I...	Indian Restaurant	Café	Ice Cream Shop	Furniture / Home Store	Eastern European Restaurant	Fast Food Restaurant	F M
3	1	Agram,Air Force hospital	ATM	Convenience Store	Field	Fast Food Restaurant	Farmers Market	Farm	F R
4	0	Amruthahalli,Kodigehalli,Sahakaranagar P.O	Café	Bakery	Ice Cream Shop	Indian Restaurant	Sandwich Place	Light Rail Station	S P

3.2 Examination of clusters

The clusters are visualised on a map of Bengaluru.

Fig 4. Cluster superimposed on a map of Bengaluru.



Each cluster is isolated to find its differentiating factor.

Table 7. Cluster 1

	Neighborhood	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
7	H.A.I ii stage,Hulsur Bazaar,Someswarapura	0	Pool	Bakery	Burger Joint	Women's Store	Electronics Store
9	Bhashyam Circle,Industrial Estate,Rajajinagar,...	0	Bakery	Indian Restaurant	Café	Breakfast Spot	Snack Place
20	Gayathrinagar,Okalipuram,Ramachandrapuram,Srir...	0	Café	Fast Food Restaurant	Park	Bakery	Eastern European Restaurant
29	Adugodi,Hosur Road	0	Bus Station	Fast Food Restaurant	Café	Women's Store	Farmers Market
50	M S r road,Mathikere,Msrit	0	Music Venue	Park	Indie Movie Theater	Bakery	Women's Store
54	Rv Niketan	0	Vegetarian / Vegan Restaurant	Bakery	Women's Store	Electronics Store	Field

Table 8. Cluster 2

	Neighborhood	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
6	Agram,Air Force hospital	1	ATM	Convenience Store	Field	Fast Food Restaurant	Farmers Market	Farm	Falafel Restaurant
53	Peenya I stage,Peenya li stage,Peenya Small in...	1	ATM	Convenience Store	Field	Fast Food Restaurant	Farmers Market	Farm	Falafel Restaurant
65	Domlur	1	ATM	Bakery	Electronics Store	Field	Fast Food Restaurant	Farmers Market	Farm
73	Basaveshwaranagar,K H b colony,Kamakshipalya	1	ATM	Home Service	Eastern European Restaurant	Fast Food Restaurant	Farmers Market	Farm	Falafel Restaurant
76	Kacharakanahalli,Lingarajapuram,St. thomas town	1	ATM	Bakery	Electronics Store	Field	Fast Food Restaurant	Farmers Market	Farm
78	Avani Sringeri mutt,Basaveswaranagar li stage,...	1	ATM	Bakery	Department Store	Pizza Place	Hockey Arena	Field	Crick Ground

Table 9. Cluster 3

	Neighborhood	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
61	Devanagundi,Kadugodi,Kalkunte,Kannamangala,Med...	2	Furniture / Home Store	Women's Store	Flea Market	Fast Food Restaurant	Farmers Market	Farm

Table 10. Cluster 4

	Neighborhood	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
98	Bettahalsur,Chikkajala,Doddajala,Hunasamaranah...	3	Dhaba	Women's Store	Electronics Store	Field	Fast Food Restaurant	Farmer Market

Table 11. Cluster 5

	Neighborhood	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
2	Aranya Bhavan,Malleswaram,Palace Guttahalli,Sw...	4	Indian Restaurant	Vegetarian / Vegan Restaurant	Coffee Shop	Pizza Place	Ice Cream Shop
3	Basavanagudi,Lalbagh West,Mavalli,Pasmpamahaka...	4	Indian Restaurant	Restaurant	Fast Food Restaurant	Convenience Store	Athletics & Sports
8	Bangalore Dist offices bldg,K. g. road,Subhash...	4	Indian Restaurant	Hotel	Bed & Breakfast	Bus Station	Dessert Shop
12	Govindapalya,H M t,Jalahalli,Jalahalli Village	4	Fast Food Restaurant	Plaza	Indian Restaurant	Shopping Mall	Eastern European Restaurant
16	Bangalore Air port,Nal,Vimapura	4	Food Truck	Indian Restaurant	Garden	Café	Department Store
18	Gaviopuram Extension,Gaviopuram Guttanahalli,N...	4	Fast Food Restaurant	Indian Restaurant	Breakfast Spot	South Indian Restaurant	Women's Store
23	Anandnagar,H.A. farm,Hebbal Kempapura	4	Indian Restaurant	Train Station	Bakery	Lake	Women's Store
25	Avalahalli,Bapujinagar,Byatarayanapura,Deepanj...	4	Metro Station	Indian Restaurant	Travel & Transport	Café	Department Store

Table 12. Cluster 6

	Neighborhood	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
0	Bangalore Bazaar,Bangalore.,Brigade Road,Cubba...	5	Indian Restaurant	Lounge	Café	Chinese Restaurant	Fa: Re
1	Avenue Road,Bangalore City,Bangalore Corporati...	5	Theater	South Indian Restaurant	Indian Restaurant	Market	Ele Stc
4	Fraser Town,Jeevanahalli	5	Coffee Shop	Indian Restaurant	Shopping Mall	Chinese Restaurant	Ca
5	J.C.nagar,Training Command ia f	5	Field	Farmers Market	Vegetarian / Vegan Restaurant	Event Space	Bu:
10	Jayangar lli block,Madhavan Park	5	Stadium	Indian Restaurant	Clothing Store	Jewelry Store	Loi
11	Science Institute	5	Bookstore	Women's Store	Flea Market	Fast Food Restaurant	Fai Ma

The examination of the clusters reveals that the cluster 5 with cluster label=4 has Indian restaurant and other eateries as the top common venues.

Hence the cluster 5 will be removed from our final neighbourhood data. The remaining clusters are grouped together and examined. The instances of Indian restaurants occurring in the other clusters as top venue is dropped as well.

4. Results

The clustering exercise has grouped Bengaluru neighbourhoods into 6 clusters and it is found that one of the clusters have Indian restaurants and other eateries as their differentiating factors. The remaining clusters are grouped together to give the final list of neighbourhoods to the client. Hence out of the 99 available neighbourhoods 57 viable neighbourhoods have been isolated that do not have Indian restaurants as their top common venue.

Table 13. Final data

	Pin_Code	Neighborhood	Latitude	Longitude	Pin_Code	Cluster Label	1st Most Common	2nd Most Common	3rd Most Common	4th Most Common	5th Most Common
1	560002	Avenue Road	12.96381	77.58211	560002	5	Theater	South Indian Restaurant	Indian Restaurant	Market	Electronic Field
2	560005	Fraser Town	12.9981	77.62278	560005	5	Coffee Shop	Indian Restaurant	Shopping	Chinese Restaurant	Café
3	560006	J.C.nagar,	13.01423	77.58792	560006	5	Field	Farmers Market	Vegetarian	Event Space	Bus Station
4	560007	Agram,Air	12.95835	77.63086	560007	1	ATM	Convenience	Field	Fast Food	Farmers Market
5	560008	H.A.I ii sta	12.98297	77.6261	560008	0	Pool	Bakery	Burger Joint	Women's	Electronic
6	560010	Bhashyam	12.98541	77.55344	560010	0	Bakery	Indian Restaurant	Café	Breakfast	Snack Place
7	560011	Jayangar I	12.9339	77.59005	560011	5	Stadium	Indian Restaurant	Clothing Store	Jewelry Store	Lounge
8	560012	Science In	13.01427	77.56575	560012	5	Bookstore	Women's	Flea Market	Fast Food	Farmers Market
9	560015	Jalahalli V	13.06275	77.52851	560015	5	Gym	Women's	Eastern European	Fast Food	Farmers Market
10	560016	Doorvanir	13.0178	77.68054	560016	5	IT Service	Supermarket	Optical Shop	ATM	Vegetarian
11	560018	Chamrajpe	12.9587	77.55992	560018	5	Juice Bar	Vegetarian	Movie Theater	Eastern European	Fast Food
12	560020	K.P.west,S	12.99075	77.57252	560020	5	Clothing Store	Indian Restaurant	Fast Food	Coffee Shop	Donut Shop
13	560021	Gayathrin	12.99309	77.55277	560021	0	Café	Fast Food	Park	Bakery	Eastern European
14	560022	Goragunte	13.02964	77.53709	560022	5	Seafood Restaurant	Bar	Wine Bar	Mediterranean	Hotel
15	560023	Magadi Road	12.97367	77.55302	560023	5	Toll Plaza	Indian Restaurant	Fast Food	Shopping	Multiplex
16	560025	Bangalore	12.96279	77.59932	560025	5	Chinese Restaurant	Hotel	Indian Restaurant	Pizza Place	Coffee Shop
17	560028	Tyagrajna	12.93269	77.56654	560028	5	Convenience	Indian Restaurant	Department	Park	Arts & Crafts
18	560029	Dharmara	12.93063	77.59474	560029	5	Pub	Tea Room	Bookstore	Indian Restaurant	Department
19	560030	Adegodi,H	12.9426	77.6042	560030	0	Bus Station	Fast Food	Café	Women's	Farmers Market
20	560033	Malkand L	12.99901	77.63448	560033	5	Fast Food	Clothing Store	Department	Shopping	Multiplex
21	560036	Devasand	13.02274	77.68014	560036	5	IT Service	Mobile Phone	Supermarket	Electronic	Fast Food
22	560039	Nayandah	12.94013	77.51466	560039	5	Auto Garage	Miscellaneous	Indian Restaurant	Optical Shop	South Indian
23	560040	Chandra L	12.9647	77.52701	560040	5	South Indian	Café	Farmers Market	Sandwich	Restaurant
24	560042	Sivan Ch	12.98265	77.613	560042	5	Women's	Indian Restaurant	Clothing Store	Shopping	Jewelry Store
25	560043	Banaswad	13.023	77.62591	560043	5	Shopping	Indian Restaurant	Chinese Restaurant	Tea Room	Women's
26	560047	Austin Town	12.95268	77.61197	560047	5	Cosmetics	Spa	Field	Fast Food	Farmers Market
27	560048	Hoodi, Mal	12.98591	77.69615	560048	5	Coffee Shop	Chinese Restaurant	Shoe Store	Sandwich	Bus Station
28	560050	Ashoknagar	12.94007	77.55309	560050	5	Hotel	Indian Restaurant	Fried Chicken	Café	Snack Place
29	560053	Balepete,	12.96805	77.56563	560053	5	Coffee Shop	Shopping	Multiplex	Women's	Eastern European
30	560054	M S Road	13.03517	77.55289	560054	0	Music Venue	Park	Indie Movie	Bakery	Women's
31	560055	Malleswami	13.00818	77.55874	560055	5	Café	Chinese Restaurant	Italian Restaurant	Supermarket	Multiplex
32	560058	Peenya I s	13.02595	77.49006	560058	1	ATM	Convenience	Field	Fast Food	Farmers Market
33	560059	Rv Niketan	12.92429	77.49356	560059	0	Vegetarian	Bakery	Women's	Electronic	Field
34	560061	Chikkalas	12.90019	77.52235	560061	5	Food Truck	Afghan Restaurant	Ice Cream	Farm	Noodle House
35	560063	A F station	13.13282	77.60274	560063	5	Airport Se	Women's	Eastern European	Field	Fast Food
36	560066	Immediha	12.96519	77.72486	560066	5	Pizza Place	Indian Restaurant	Chinese Restaurant	Tea Room	Eastern European
37	560067	Devanagur	13.01067	77.7297	560067	2	Furniture	Women's	Flea Market	Fast Food	Farmers Market
38	560068	Bommanah	12.89516	77.62499	560068	0	Department	Bakery	Women's	Electronic	Field

39	560070	B Sk ii stag	12.92282	77.55726	560070	5	South Indi	Convenie	Jewelry St	Electronic	Restauran
40	560071	Domlur	12.95518	77.6319	560071	1	ATM	Bakery	Electronic	Field	Fast Food
41	560072	Nagarbha	12.96621	77.50375	560072	0	Sandwich	Breakfast	CafÃ©	Women's	Fast Food
42	560077	Kothanur	13.06533	77.63155	560077	0	Photograp	Asian Res	Kerala Res	CafÃ©	Middle Ea
43	560078	J P nagar,J	12.8897	77.5592	560078	5	Bus Statio	Boarding	Indie Mov	Tennis Co	Women's
44	560079	Basaveshv	12.98865	77.52571	560079	1	ATM	Home Ser	Eastern Eu	Fast Food	Farmers M
45	560080	Sadashiva	13.00904	77.57377	560080	0	Playgroun	Dessert Sh	Fast Food	Bakery	CafÃ©
46	560084	Kacharaka	13.01138	77.6216	560084	1	ATM	Bakery	Electronic	Field	Fast Food
47	560085	Banashanl	12.93041	77.53703	560085	5	Juice Bar	Snack Plac	Park	Donut Shc	Farmers M
48	560086	Avani Srin	13.00865	77.53019	560086	1	ATM	Bakery	Departme	Pizza Plac	Hockey Ar
49	560091	Viswanee	12.98638	77.47721	560091	5	Gas Statio	Restauran	Women's	Fast Food	Farmers M
50	560092	Amruthah	13.06262	77.58308	560092	0	CafÃ©	Bakery	Ice Cream	Indian Res	Sandwich
51	560093	C.V.ramar	12.98542	77.66145	560093	5	Burger Joi	Women's	Flea Mark	Fast Food	Farmers M
52	560095	Koramang	12.93731	77.62564	560095	5	Pub	Pizza Plac	CafÃ©	Indian Res	Italian Res
53	560099	Muthanall	12.84327	77.66748	560099	5	Hotel	Coffee Sh	Forest	CafÃ©	Indian Res
54	560103	Bellandur	12.9224	77.65799	560103	5	Bike Shop	Lake	Indian Res	Coffee Sh	Field
55	562125	Dommasa	12.87034	77.71496	562125	5	Cricket Gr	Baseball S	Women's	Electronic	Field
56	562130	Chikkanah	12.9224	77.65799	562130	5	Bike Shop	Lake	Indian Res	Coffee Sh	Field
57	562157	Bettahals	13.18755	77.56299	562157	3	Dhaba	Women's	Electronic	Field	Fast Food

5. Discussions

Bengaluru is a big city with diverse population. With a population of about 8500000, there is a huge market for any kind of business. This project dealt with the problem of expanding an existing business into a new city. Having knowledge about the competition beforehand can give a big advantage.

K means clustering algorithm was used to get clusters. The number of clusters being determined by elbow method. Many neighbourhoods were not grouped into any clusters and had to be dropped. This can be remedied by setting different values of clusters; however, this is for a future project.

The real estate prices can also be introduced into the data for clustering to give more meaning to the analysis, however such data required for this project is not easily available and hence in a future project this can be implemented.

6. Conclusion

Computing power has increased significantly over the years and computers have become affordable. Cloud services can also be used to warehouse data and one can also rent powerful computers on the cloud to conduct data analysis and machine learning projects.

With the variety, velocity and volume of data generated everyday it is paramount that we make use of the data to get ahead of the competition.

This project has given a very small glimpse into the world of data analysis and machine learning showing us the infinite potential of machine learning and artificial intelligence.

References

[1] The jupyter notebook containing python codes used for the project.

https://nbviewer.jupyter.org/github/TheNayak/Coursera_Capstone/blob/master/Peer%20review%203%20final.ipynb

[2] Bengaluru neighbourhood details

<https://www.mapsofindia.com/pincode/india/karnataka/bangalore/>

[3] Location data for Bengaluru neighbourhoods.

http://s000.tinyupload.com/?file_id=04845440732025580094

[4] Foursquare API Tutorial

<https://www.coursera.org/learn/applied-data-science-capstone/home/week/2>

[5] Foursquare API

<https://developer.foursquare.com/>