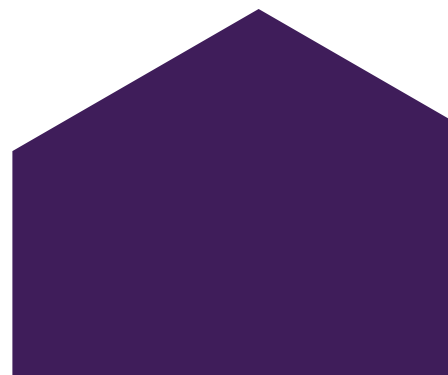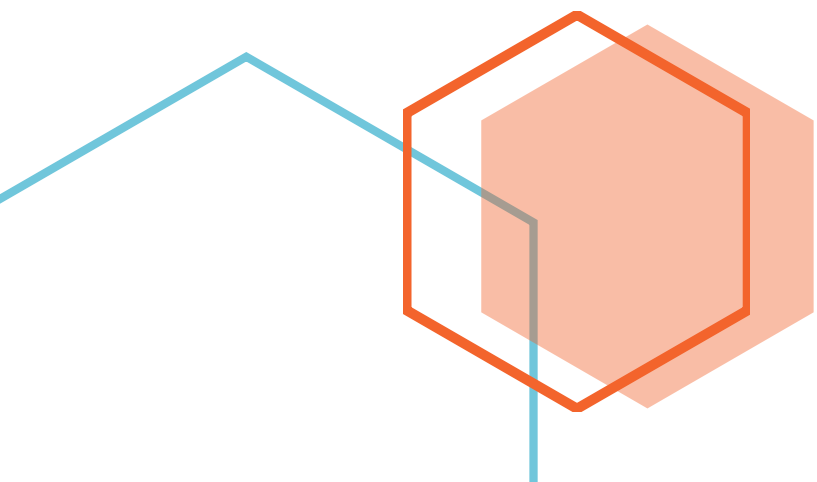# IBM Data Science Professional Capstone Project

[Battle of Neighborhood's]

[Following report summarizes the details and methodologies used in finding an appropriate place to open a new Gaming Café in the city of Chennai.]

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INTRODUCTION / BUSINESS PROBLEM

Chennai is formally known as Madras is the capital of Tamil Nadu, India which is situated on the Coromandel Coast of Bay of Bengal. Chennai is one of the most visited cities in India by foreign tourists. According to The Quality of Living Survey Chennai is the safest city in India. Chennai is one of the top 10 cities in India which have highest literacy rate. This one of the reason people wants to set up their companies in Chennai. It is also known as the Detroit of India because more than one-third of India's automobile industry is based in the Chennai. It is also the fifth largest city in terms of population with 8.2 million people in the urban agglomeration. Mr. X is planning to open a Gaming café as he sees growing popularity of Online multiplayer games among the youth in the city.
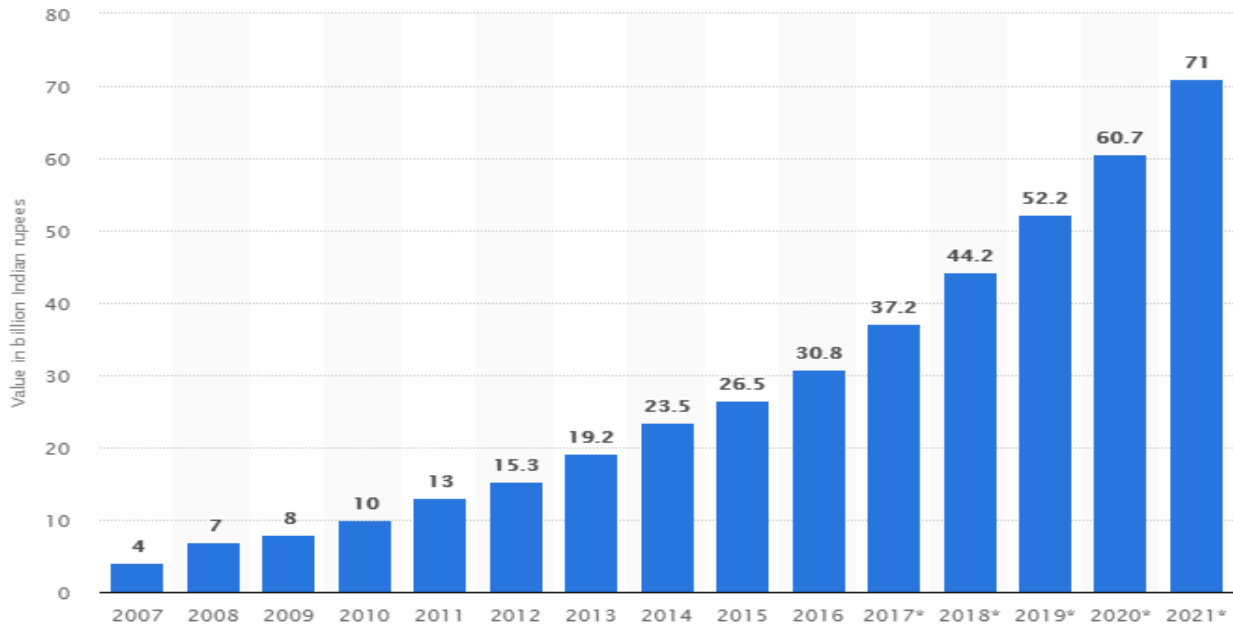
PROBLEM DESCRIPRION, STAKE HOLDERS (Target audience)

Mr. X is looking for advice, to where he should open his café for a profitable and steady business. Gaming cafés are popular among children and youth who come as a group and dwell in café for 4-5 hours playing single or multi player. Mostly the target customers are of age group 10-25. Although having good ambience, computers & network, snacks and beverages sometimes they fail because they are not able to reach out more customers or due to competition among neighboring cafes or due to bad location. It is very important to strategically plan the location to open a new business. Various factors need to be studied in order to decide on the Location such as:

1. What is the population of customers are we looking for? Who are the customers and their background?

2. Demographics of the city, Locations of Schools and colleges.

3. Are there any Food stalls, Restaurants, Market place etc. nearby so that the ingredients can be purchased fresh to maintain quality and cost?

4. Are there any venues like, Entertainment zones, Parks, Shopping malls etc. nearby where floating population is high etc.

5. Who are the competitors in that location? Untapped market or Saturated market?

6. Nearby computer and hardware stores or service centers, areas with high speed network connectivity.

My main goal is to provide him good locations to opening a Gaming café where he can reach out to large number of customers and have less competition.

Value of the gaming industry in India from 2007 to 2021 (in billion Indian rupees)

Chennai Startup Launches India's Biggest Gaming Café in Nungambakkam, Chennai

DATA:

This section describes the data we need to solve the problem, sources of data and techniques used.

Types of data:

1. We need all the names and locations of neighborhood's in the city of Chennai.
2. We need the venues like shops, shopping malls, restaurants, schools, colleges and other venues nearby each neighborhood to identify the type of neighborhood.

Sources of data:

1. List of neighborhoods are derived from Wikipedia page given below.
    https://en.wikipedia.org/wiki/Template:Neighbourhoods_of_Chennai
2. All the data regarding neighborhood venues in each neighborhood is derived from FOURSQUARE API using sandbox developer account.
3. List of latitude and longitude of neighborhood's are derived from OpenStreetMap Nominatim API for academic purpose.

Methodology/Techniques used:

1. First step is to scrape data from Wikipedia page for the names of neighborhoods. I have used pandas, request and beautiful soup module to do this.

V · T · E	Neighbourhoods of Chennai	[hide]
	Adyar · Adambakkam · Alapakkam · Alandur · Alwarpet · Alwarthirunagar · Ambattur · Aminjikarai · Anna Nagar · Anna Nagar West · Annanur · Andarkuppam · Arumbakkam · Ashok Nagar · Athipattu · Avadi · Ayanavaram · Besant Nagar · Chepauk · Chembarambakkam · Chengalpattu · Chetput · Chitlapakkam · Choolai · Choolaimedu · Chromepet · Edayanchavadi · Egmore · Ennore · Ernavoor · Foreshore Estate · Georgetown · Greenways Road · Guduvancheri · Gummidipoondi · Guindy · Guindy TVK Estate · ICF Colony · Injambakkam · Irumbuliyur · Irungattukottai · The Island · K. K. Nagar · Karapakkam · Karanodai · Kathivakkam · Kattankulathur · Kavaraipettai · Kelambakkam · Kilpauk · Kodambakkam · Kodungaiyur · Kolathur · Korattur · Kosappur · Kottivakkam · Kotturpuram · Kovalam · Kovilambakkam · Koyambedu · Kundrathur · Madambakkam · Madipakkam · Madhavaram · Madhavaram Milk Colony · Maduravoyal · Mamallapuram · Manali · Manali New Town · Manapakkam · Mandavelli · Mangadu · Manjambakkam · Maraimalai Nagar · Mathur · Medavakkam · Meenambakkam · Minjur · Mogappair · Moolakadai · Muttukadu · Mylapore · Nandanam · Nandambakkam · Nandiambakkam · Nanganallur · Navalur · Neelankarai · Nerkundram · Nesapakkam · Nolambur · Nungambakkam · Padi · Palavakkam · Palavanthangal · Pallavaram · Pallikaranai · Pammal · Panagal Park · Park Town · Parry's Corner · Pattabiram · Pattaravakkam · Pazhaverkadu · Peerkankaranai · Perambur · Periapalayam · Perumbakkam · Perungalathur · Perungudi · Pondy Bazaar · Ponneri · Poonamallee · Porur · Potheri · Pudhur · Purasawalkam · Puzhal · Puzhuthivakkam · Red Hills · Royapettah · Royapuram · Sadayankuppam · Saidapet · Santhome · Semmencherry · Sholavaram · Sholinganallur · Shenoy Nagar · Singaperumalkoil · Siruseri · Sithalapakkam · Sriperumbudur · Sunguvarchatram · Surapet · Sowcarpet · St. Thomas Mount · T. Nagar · Tambaram · Tharamani · Teynampet · Thirumangalam · Thirumazhisai · Thirumullaivoyal · Thiruninravur · Thiruvanmiyur · Thiruvidandhai · Thiruporur · Thuraipakkam · Tirusulam · Tiruverkadu · Tiruvottiyur · Tolgate · Tondiarpet · Triplicane · Trustpuram · Urapakkam · Vadapalani · Vadaperumbakkam · Valasaravakkam · Vallalar Nagar · Vanagaram · Vandalur · Velachery · Veppampattu · Vichoor · Villivakkam · Vinayagapuram · Virugambakkam · Vyasarpadi · Washermanpet · West Mambalam	

2. Then I've called OpenStreetMap Nominatim API to get the locations coordinates in latitude and longitude.

3. Then I have merged data into one data frame. We get a total of 142 neighborhood's and locations

	Neighbourhood	Latitude	Longitude
0	Adyar	13.006450	80.257779
1	Adambakkam	12.982221	80.209121
2	Alapakkam	13.049901	80.165435
3	Alandur	12.994373	80.194284
4	Alwarpet	13.033860	80.254549
5	Alwarthirunagar	13.047486	80.183669
6	Ambattur	13.119375	80.150765
7	Aminjikarai	13.072140	80.220545

Fig 1: List of neighborhood's and locations

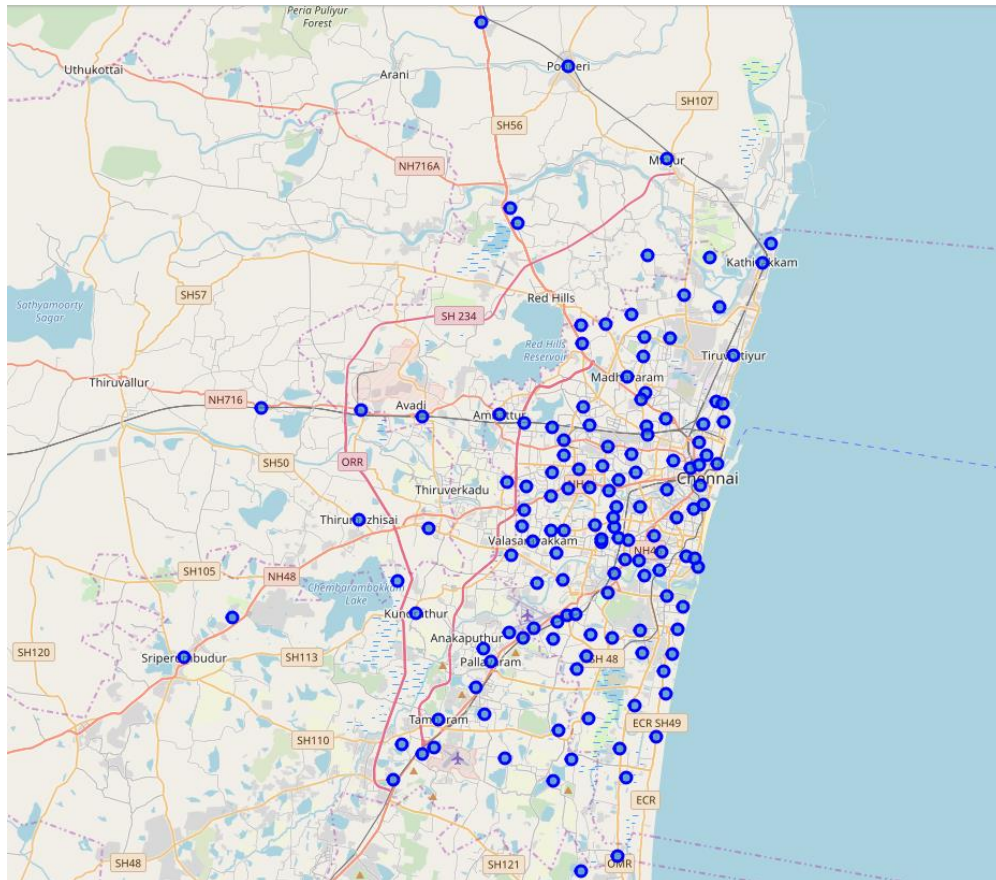4. Then I've mapped all the neighborhoods onto the map

Fig 2: Neighborhoods of Chennai

5. Next step is to make calls to FOURSQUARE API to retrieve additional information about the nearby venues of neighborhood and grouped them

Neighbourhood	Neighbourhood Latitude	Neighbourhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
Adambakkam	4	4	4	4	4	4
Adyar	32	32	32	32	32	32
Alandur	3	3	3	3	3	3
Alapakkam	4	4	4	4	4	4
Alwarpet	24	24	24	24	24	24
Alwarthirunagar	8	8	8	8	8	8
Ambattur	5	5	5	5	5	5
Aminjikarai	16	16	16	16	16	16
Anna Nagar	23	23	23	23	23	23
Anna Nagar West	4	4	4	4	4	4
Arumbakkam	4	4	4	4	4	4

Fig 3: Neighborhoods and venues

6. Doing some one hot coding and clustering the neighborhood using K-Means clustering and then finally visualize it on map. So following figure shows neighborhoods which are similar.
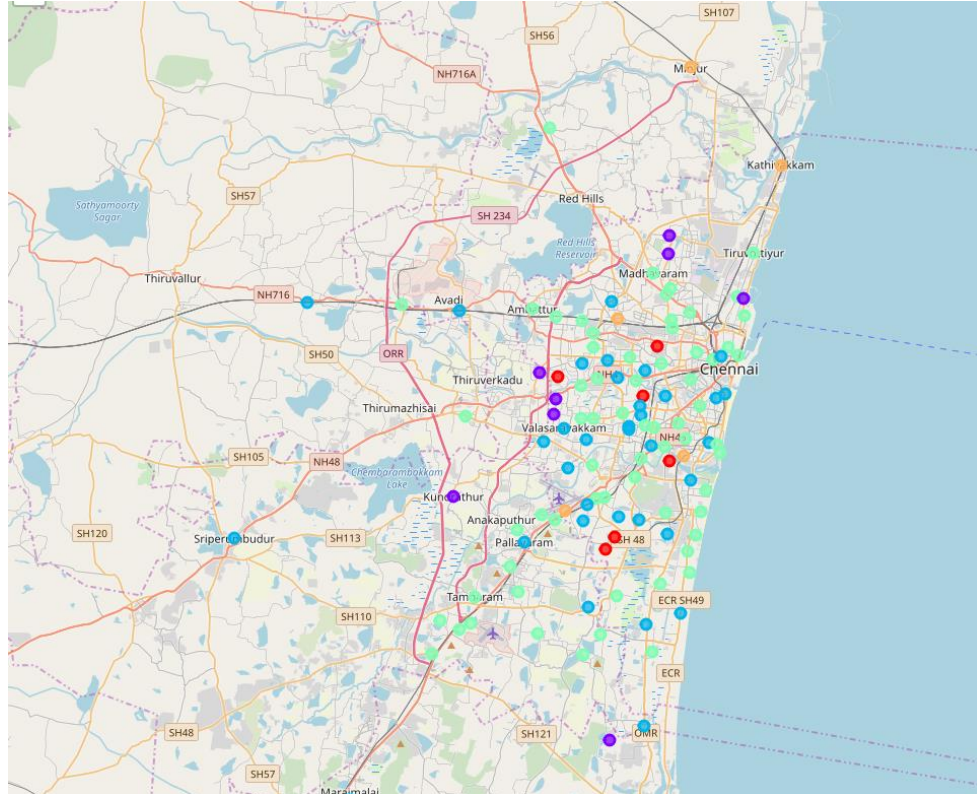

Fig 4: Neighborhood segmentation and clustering

7. Then I've selected the neighborhood which are colored sky blue, which are posh neighborhoods and people really come out to spend money for gaming and it has all the necessary amenities close by for the Gaming Café.as discussed earlier.

	Neighbourhood	Latitude	Longitude
0	Adyar	13.006450	80.257779
1	Adambakkam	12.982221	80.209121
2	Arumbakkam	13.074371	80.208131
3	Ashok Nagar	13.040073	80.215925
4	Avadi	13.118274	80.101543
5	Chepauk	13.063630	80.281278
6	Injambakkam	12.918937	80.251295
7	Karapakkam	12.911707	80.227720

Fig 5: Potential areas for opening Gaming café

8. Now after selecting these neighborhoods I found out the number of schools and colleges nearby these neighborhoods
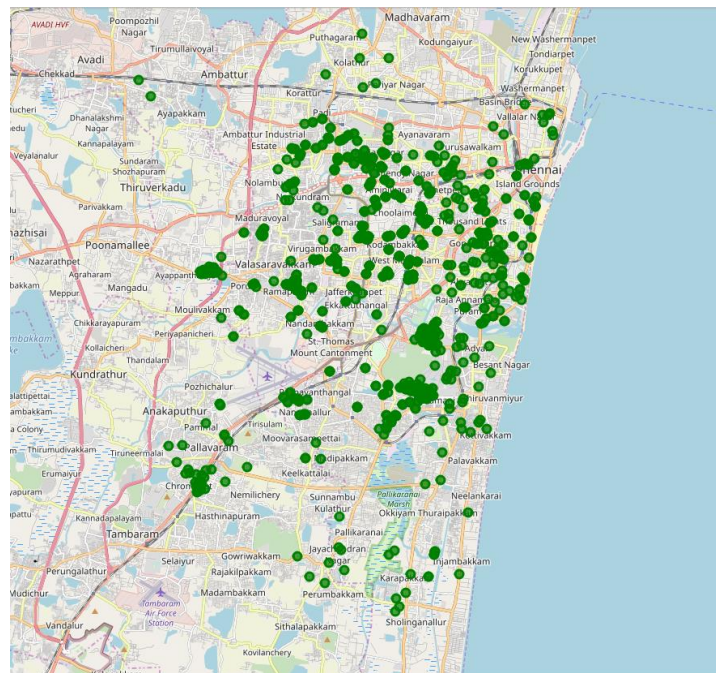

Fig 6: Schools and Colleges near the potential areas for opening Gaming Café

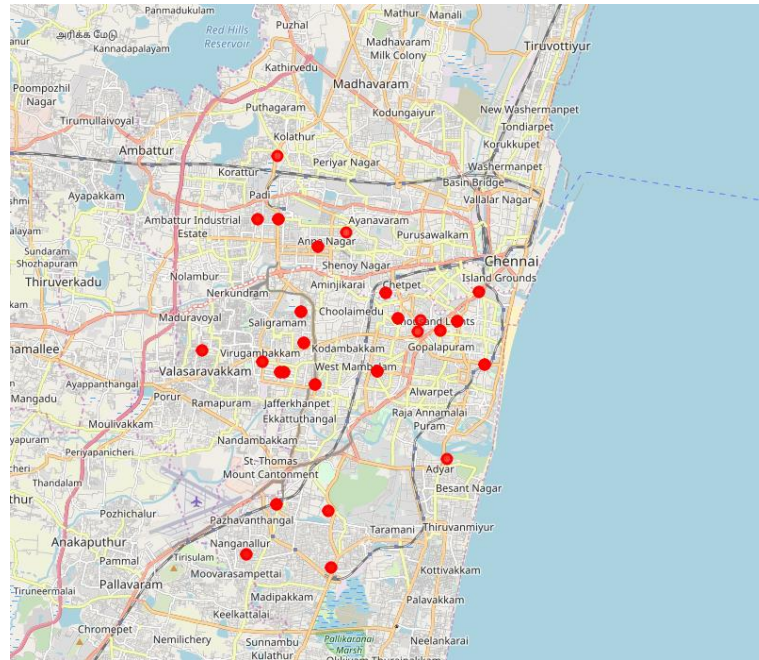9. Identifying already existing Gaming Café in the potential areas

Fig 7: Gaming café in potential areas

10. Then we normalize the data and assign some weight and decide on which is the better place to open the gaming café. The location has maximum number of schools and colleges along with minimum competition. The list is given below.

	Neighbourhood	Score
15	Mylapore	2.407837
28	T. Nagar	2.134150
22	Perungudi	2.119606
0	Adyar	1.440166
23	Porur	1.195423
34	Velachery	0.474279
21	Pallavaram	-0.185772
2	Arumbakkam	-0.320260
9	Kodambakkam	-0.483052

Fig 8: Locations for opening Gaming Café

Result and Conclusion:

From the above analysis we conclude that **Mylapore** is a place where you find many colleges and schools and there is less competition. The area is potentially close to food sources and other necessary amenities needed to operate business and there is availability of high-speed network and continuous power in this area. It's a rich locality wherein people are looking out to spend their money hanging around in café and shops along with their friends. This is right place even to scale up business if required because of high demand and low supply of such services. You can find more people willing to work for reasonable costs for the café. Considering all the factors mentioned above I find **Mylapore** as the best place to set up a Gaming café in city of Chennai.