

# Capstone Final Assignment

## Week 4 and 5

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### Problem Definition:

Bengaluru is the city of dreams for every techie. One of my friends who has recently got selected in a reputed IT company wants to relocate in suburbs of Bengaluru. My task is to suggest him a suitable neighborhood that could support his demands.

Foursquare shall prove to be the go-to guy for me in this regard. I shall take the location details based on the various criteria specified by my friend. I will feed them to the Foursquare website and will then fetch the location details to ponder over.

### Data Required:

I shall be using Foursquare location data for this project. I will find the residential areas in the city where the to-lets are available for single men. My next aim is to filter the area based on if there is

1. A Gym
2. Food Restaurant
3. A Multiplex
4. A Bus Station

in the vicinity of the neighborhood. I shall use my Foursquare data to find out the suitable place to stay for my friend in this way.

### Methodology:

I approached my problem in following:

1. Finding the neighborhoods in Bangalore where an affordable stay can be made. For this I referenced internet search and collected the list of such neighborhoods.

2. I located these neighborhoods based on the latitude and longitude using geospatial data module 'geocoder'.
3. These latitudes and longitudes were fed to the 'Foursquare' API and list of various nearby places was formed.
4. Finally a final list of likable places was carved out by taking intersections of the place sets found in earlier searches. More on this in the 'Results & Discussion' section.

## Results:

The list of locations to be considered for the project:

1. The list of neighborhoods that can be considered for living.

Name
Cantonment area,Bangalore
Domlur,Bangalore
Indiranagar,Bangalore
Malleswaram,Bangalore
Pete area,Bangalore
Sadashivanagar,Bangalore
Seshadripuram,Bangalore
Shivajinagar,Bangalore
Ulsoor,Bangalore
Vasanth Nagar,Bangalore
Bellandur,Bangalore
CV Raman Nagar,Bangalore
Hoodi,Bangalore
Krishnarajapuram,Bangalore
Mahadevapura,Bangalore
Marathahalli,Bangalore
Varthur,Bangalore
Whitefield,Bangalore
Banaswadi,Bangalore

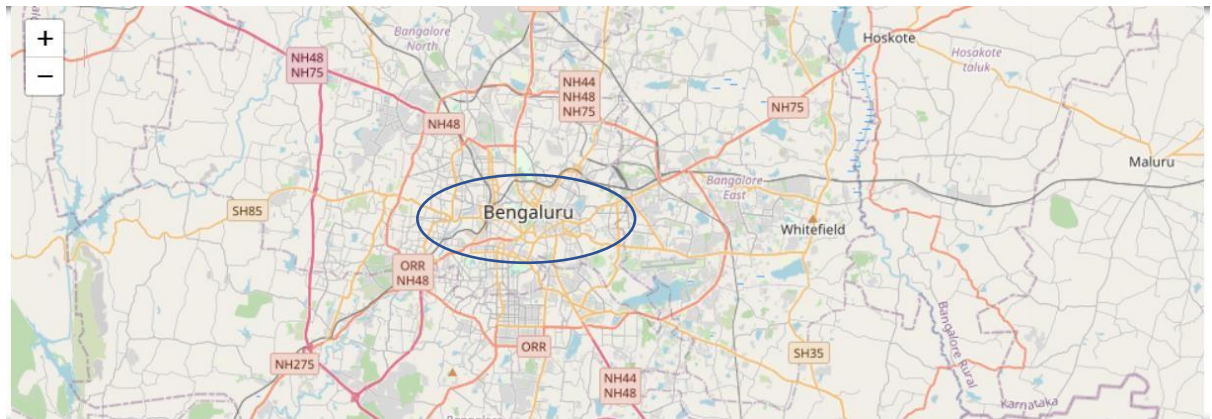
HBR Layout,Bangalore
Horamavu,Bangalore
Kalyan Nagar,Bangalore
<b>Name</b>
Kammanahalli,Bangalore
Lingarajapuram,Bangalore
Ramamurthy Nagar,Bangalore
Hebbal,Bangalore
Jalahalli,Bangalore
Mathikere,Bangalore
Peenya,Bangalore
R. T. Nagar,Bangalore
Vidyaranyaपुरa,Bangalore
Yelahanka,Bangalore
Yeshwanthpur,Bangalore
Bommanahalli,Bangalore
Bommasandra,Bangalore
BTM Layout,Bangalore
Electronic City,Bangalore
HSR Layout,Bangalore
Koramangala,Bangalore
Madiwala,Bangalore

2. Now we couple these locations with their respective latitudes and longitudes:

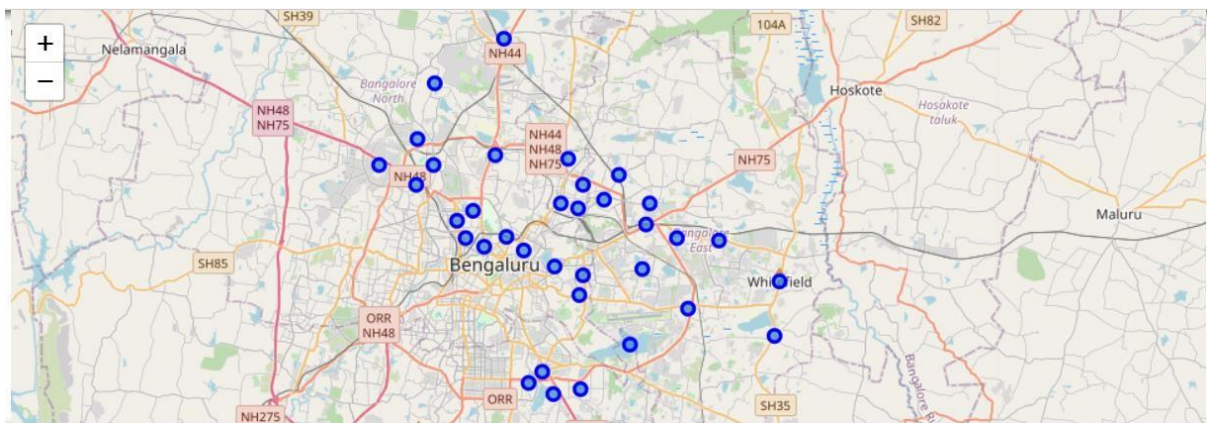
Name	Latitude	Longitude
Cantonment area,Bangalore	12.993687	77.598000
Domlur,Bangalore	12.962467	77.638196
Indiranagar,Bangalore	12.973291	77.640467
Malleswaram,Bangalore	13.002735	77.570325
Pete area,Bangalore	13.003246	76.101064
Sadashivanagar,Bangalore	13.007708	77.579589
Seshadripuram,Bangalore	12.993188	77.575342
Shivajinagar,Bangalore	12.986391	77.607542
Ulsoor,Bangalore	12.977879	77.624670
Vasanth Nagar,Bangalore	12.988721	77.585169
Bellandur,Bangalore	12.935772	77.666761
CV Raman Nagar,Bangalore	12.976618	77.673032
Hoodi,Bangalore	12.991903	77.716201
Krishnarajapuram,Bangalore	13.000509	77.675394
Mahadevapura,Bangalore	12.993498	77.692416
Marathahalli,Bangalore	12.955257	77.698416
Varthur,Bangalore	12.940615	77.746994
Whitefield,Bangalore	12.969637	77.749745
Banaswadi,Bangalore	13.014162	77.651854
HBR Layout,Bangalore	13.035870	77.632360

Horamavu,Bangalore	13.027331	77.660151
Kalyan Nagar,Bangalore	13.022142	77.640337
<b>Name</b>	<b>Latitude</b>	<b>Longitude</b>
Kammanahalli,Bangalore	13.009346	77.637709
Lingarajapuram,Bangalore	13.011768	77.627829
Ramamurthy Nagar,Bangalore	13.012022	77.677782
Hebbal,Bangalore	13.038218	77.591900
Jalahalli,Bangalore	13.046453	77.548380
Mathikere,Bangalore	13.032888	77.557374
Peenya,Bangalore	13.032942	77.527325
R. T. Nagar,Bangalore	13.029448	80.230906
Vidyaranyapura,Bangalore	13.076641	77.557732
Yelahanka,Bangalore	13.100698	77.596345
Yeshwanthpur,Bangalore	13.021835	77.547686
Bommanahalli,Bangalore	12.908945	77.623904
Bommasandra,Bangalore	12.816244	77.691611
BTM Layout,Bangalore	12.915177	77.610282
HSR Layout,Bangalore	12.911623	77.638862
Koramangala,Bangalore	13.292399	77.751926
Madiwala,Bangalore	12.921227	77.617951

3. Now we locate our city of interest-Bangalore on the map.



4. Next, we mark the neighborhoods on the map. [Refer table on p.2]



5. Now we find the places according to our criteria. Our first criteria is a 'gym'. Here all those places are enlisted which have at least 1 gym in the vicinity of 2 km.

Venue Name	Venue Latitude	Venue Longitude	Venue Category
Energy Fitness Centre	12.989589	77.597131	Gym / Fitness Center
The Leela Spa & Fitness Centre	12.961124	77.648514	Spa
The Tribe Cult Fitness	12.980738	77.640515	Gym / Fitness Center
Affinity Gym	13.009358	77.579678	Gym

Venue Name	Venue Latitude	Venue Longitude	Venue Category
Affinity Gym	13.009358	77.579678	Gym
Affinity Gym	13.009358	77.579678	Gym
Fitness First	12.971153	77.607010	Gym
The Tribe Cult Fitness	12.980738	77.640515	Gym / Fitness Center
Fitness One	13.001221	77.577104	Gym
Sobha Lakeview Clubhouse	12.929097	77.672374	Gym
Bangalore Games And Fitness Institute	12.976395	77.673035	Gym / Fitness Center
Central Park Clubhouse	12.994270	77.729227	Gym / Fitness Center
Gold's Gym	12.994386	77.660744	Gym
NCC Maple Heights Gym	12.993809	77.683218	Gym
ZELA	12.942457	77.694914	Gym
Golds Gym	12.972217	77.750529	Gym / Fitness Center
Bon Ami Gym	13.021292	77.657489	Gym
Cult	13.026561	77.633782	Gym / Fitness Center
Bon Ami Gym	13.021292	77.657489	Gym



Cubo Fitness	13.021756	77.640016	Gym
Cubo Fitness	13.021756	77.640016	Gym
4S Fitness	13.025407	77.629496	Gym / Fitness Center
Godrej Woodsman Estate	13.054715	77.595815	Gym
international fitness centre	13.034830	77.557855	Gym
crunch fitness regime	13.030998	77.570374	Gym
Maverick Fitness	13.035546	80.239628	Gym / Fitness Center
SnapFitness	13.077049	77.558323	Gym
Snap Fitness Yelahanka	13.098181	77.584642	Gym
Galaxy Club - Brigade Gateway	13.011772	77.556788	Gym / Fitness Center
<b>Venue Name</b>	<b>Venue Latitude</b>	<b>Venue Longitude</b>	<b>Venue Category</b>
Core Fitness	12.913980	77.609382	Gym
Core Fitness	12.913980	77.609382	Gym
Snap Fitness	12.911908	77.644173	Gym
Gold's Gym	12.933583	77.621559	Gym

6. Now we move to our next criteria that the place should have restaurant near by.

Venue Name	Venue Latitude	Venue Longitude	Venue Category
Ujwal Bar & Restaurant	12.992280	77.594473	Indian Restaurant
Lavonne	12.963909	77.638579	Café
Krispy Kreme Doughnuts	12.970094	77.640671	Bakery
Asha Sweet Center	12.999371	77.571322	Snack Place
Suvarna Gate	13.003102	76.099373	Indian Restaurant
Asha Sweet Center	12.999371	77.571322	Snack Place
Asha Sweet Center	12.999371	77.571322	Snack Place
Samarkand	12.980616	77.604668	Afghan Restaurant
Yauatcha	12.973318	77.620072	Asian Restaurant
Masala Klub	12.984993	77.585115	Indian Restaurant
Cafe Coffee Day	12.924097	77.670549	Café
Kabab Souq	12.972259	77.679608	Indian Restaurant
Masala Chai	12.992018	77.702983	Café
Uttam Sagar	13.011732	77.667882	Indian Restaurant
BelgYum	12.997362	77.696744	Creperie
Bengaluru Steak House	12.950549	77.698460	Steakhouse
Domino's Pizza	12.956000	77.741000	Pizza Place
Herbs and Spices	12.968145	77.750862	Eastern European Restaurant
Venue Name	Venue Latitude	Venue Longitude	Venue Category
Al Amanah	13.015631	77.639408	Falafel Restaurant
Adyar Ananda Bhavan	13.041035	77.624513	Vegetarian / Vegan Restaurant
Rasta Cafe	13.020604	77.643209	Bistro

Thran	13.021657	77.640438	Korean Restaurant
Al Amanah	13.015631	77.639408	Falafel Restaurant
Connie's	13.014932	77.633026	Steakhouse
Uttam Sagar	13.011732	77.667882	Indian Restaurant
Huliyappa Donne Biryani	13.026804	77.590756	Indian Restaurant
Mezzaluna	13.042339	77.554738	Italian Restaurant
Thalassery Restaurant	13.029953	77.562116	Kerala Restaurant
Palette, Taj Vivanta	13.029171	77.540681	Restaurant
New Bombay Halwa House	13.042786	80.233486	Indian Restaurant
Domino's Pizza	13.078761	77.559073	Pizza Place
Cafe Coffee Day	13.099390	77.588282	Café
Chili's	13.011297	77.555114	Mexican Restaurant
Cafe Coffee Day	12.916659	77.620249	Café
Domino's Pizza	12.824414	77.684356	Pizza Place
Adyar Ananda Bhavan (A2B)	12.916653	77.609745	Vegetarian / Vegan Restaurant
Here & Now	12.913618	77.638243	Burger Joint
Chechi's Mess	12.926053	77.617939	Indian Restaurant

7. Our third criteria was having a bus station within a walkable distance.

Venue Name	Venue Latitude	Venue Longitude	Venue Category
Shivaji Nagar Bus Stand	12.983187	77.603106	Bus Station
Doopanhalli bus stop	12.963907	77.641624	Bus Station
HAL 2nd Stage 12th Main bus stop	12.970124	77.641193	Bus Station
Hassan KSRTC Bus Stand	12.998097	76.104269	Bus Station
Gayathri Vihar Bus Stop	13.013464	77.584205	Bus Station
Shivaji Nagar Bus Stand	12.983187	77.603106	Bus Station
HAL 2nd Stage 12th Main bus stop	12.970124	77.641193	Bus Station
(VRL) Vijayanand Roadlines	12.980617	77.575596	Bus Station
Bayanpalya bus stop	12.924704	77.671388	Bus Station
Malleshpalya Bus Stand	12.974652	77.670879	Bus Station
Hoodi Bus Stop	12.992148	77.715785	Bus Station
Tin Factory	12.996619	77.668989	Bus Station
Mahadevpura	12.991452	77.687106	Bus Station
Marathahalli Underbridge	12.956225	77.701178	Bus Station
Ramagondanahalli Bus Stop	12.947888	77.742059	Bus Station
Brookbond bus stop	12.964010	77.748653	Bus Station
Banaswadi Ring Road Bus Stop	13.019483	77.654530	Bus Station
Hennur Crossroad Bus Stop	13.028486	77.631370	Bus Station
Banaswadi Ring Road Bus Stop	13.019483	77.654530	Bus Station
Babusapalya Bus Stop	13.022495	77.647457	Bus Station
ITC Bus Stop	12.998523	77.625955	Bus Station

Kasturi Nagar Bus Stop	13.003558	77.663240	Bus Station
Hebbal Bus Terminus	13.040231	77.589654	Bus Station
Gokula Bus stop	13.039891	77.557428	Bus Station
<b>Venue Name</b>	<b>Venue Latitude</b>	<b>Venue Longitude</b>	<b>Venue Category</b>
Mathikere ,Bengaluru	13.033745	77.558318	Bus Station
Peenya	13.035414	77.519476	Bus Station
C I T Nagar Bus Stop	13.028381	80.230517	Bus Station
Vidyaranyapura Bus Stand	13.083066	77.557320	Bus Station
Yeshwantpur Metro Station	13.024709	77.547805	Bus Station
Roopena Agrahara	12.911401	77.626509	Bus Station
KPN	12.821757	77.686390	Bus Station
Udupi Garden Bus stop	12.916604	77.610206	Bus Station
HSR-BIAS Bus Stop	12.912765	77.638200	Bus Station
SRS Travels	12.925805	77.617363	Bus Station

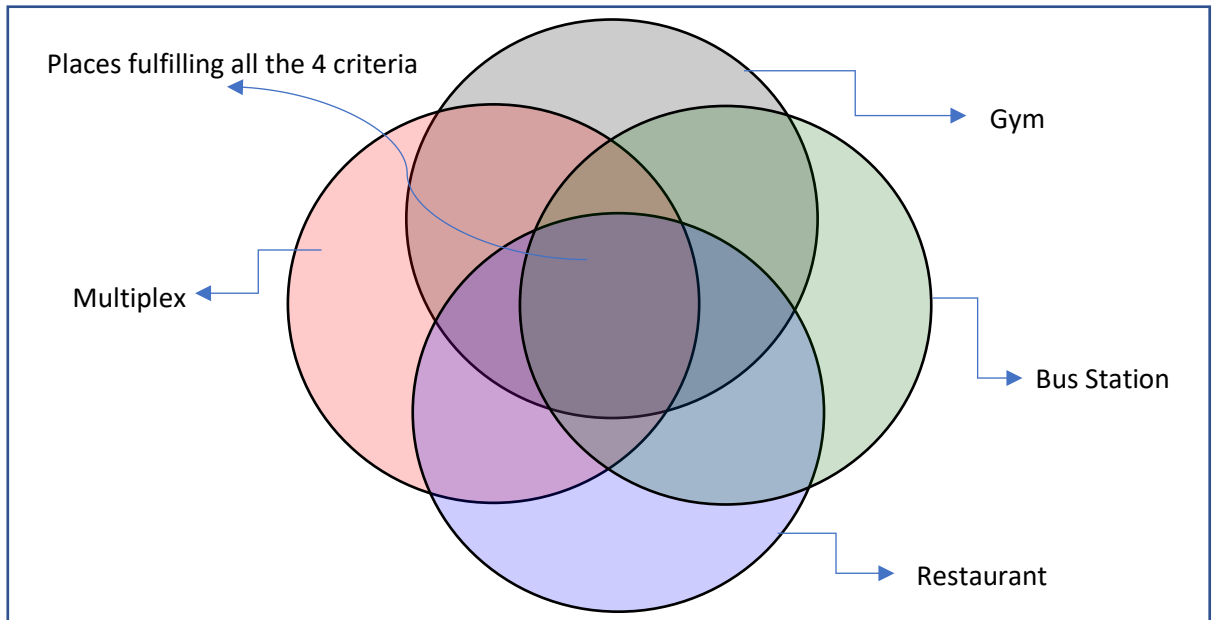
8. Finally we need a multiplex theatre near by our location.

Venue Name	Venue Latitude	Venue Longitude	Venue Category
Fun Cinemas	12.988326	77.594769	Multiplex
INOX Lido Mall	12.966868	77.640919	Multiplex
INOX Lido Mall	12.966868	77.640919	Multiplex
INOX	12.991699	77.570569	Multiplex
Cauvery Theatre	13.002542	77.583405	Movie Theater
INOX	12.991699	77.570569	Multiplex
Lavanya Theatre	12.984622	77.614693	Multiplex
Inox Lido Mall	12.973078	77.621315	Multiplex
INOX	12.991699	77.570569	Multiplex
PVR	12.926328	77.675347	Multiplex
Cinepolis	12.989299	77.728127	Movie Theater
Venue Name	Venue Latitude	Venue Longitude	Venue Category
Gopalan Cinemas	12.993075	77.663948	Multiplex
PVR Market City	12.997531	77.695813	Multiplex
Innovative Multiplex	12.951922	77.698981	Multiplex
INOX Forum Value Mall	12.959807	77.747662	Multiplex
PVR Cinemas Elements Mall	13.045222	77.626789	Multiplex
Cinépolis	13.001441	77.632615	Multiplex
Cinépolis	13.001441	77.632615	Multiplex
PVR Vaishnavi	13.024152	77.548733	Multiplex
Carnival Cinemas	13.040407	77.518138	Multiplex
Devi Multiplex	13.033621	80.238647	Multiplex

INOX Cinemas	13.094407	77.595550	Multiplex
PVR Vaishnavi	13.024152	77.548733	Multiplex
PVR Cinemas	12.907622	77.601082	Multiplex
PVR Cinemas	12.934389	77.611184	Multiplex

9. Now we take intersection of all the latitudes and longitudes found in the four look ups that we performed.

The reason behind taking intersection of these sets is to shortlist only those locations which satisfy all the four look up criteria. A Venn Diagram shall make it a lot easier to understand.





10. Now finally we put this result in a tabular format.

This list gives us the names along with the latitudes & longitudes of those places.

This concludes our study.

Name	Latitude	Longitude
Cantonment area,Bangalore	12.993687	77.598000
Domlur,Bangalore	12.962467	77.638196
Indiranagar,Bangalore	12.973291	77.640467
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Madiwala,Bangalore	12.921227	77.617951

## Conclusion:

1. Using geospatial database like 'Foursquare' and deploying that data through the python coding is an unbelievably efficient way to find places of our interests; whatever hard or complex criteria might be considered.
2. The geospatial database coupled with as strong language as python opens up many exciting windows for any creative person to come up with different solutions for dayto-day problems.