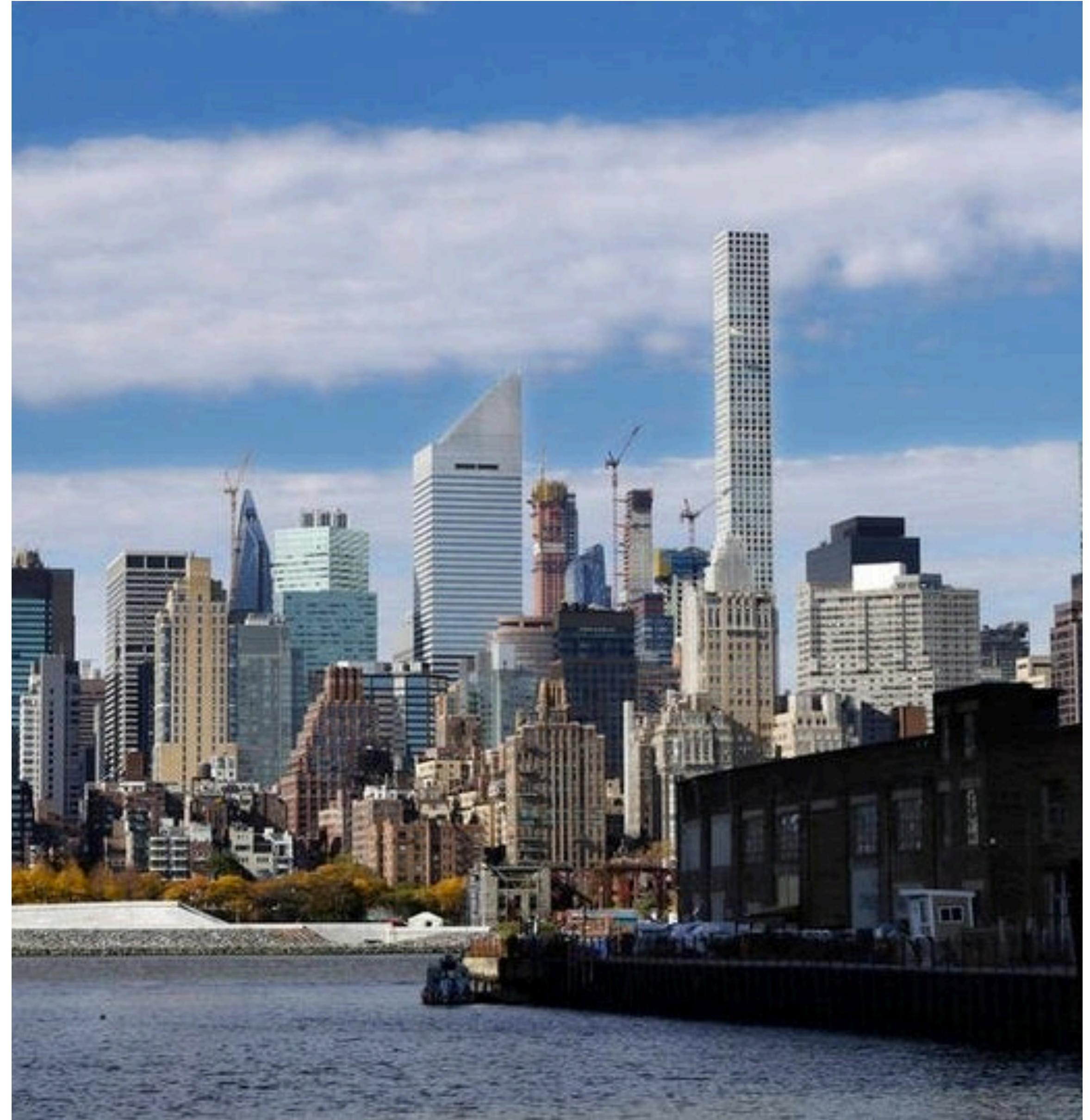




CAPSTONE PROJECT

NEW INDIAN RESTAURANT IN QUEENS, NY, USA



Introduction : Problem

A Person wants to Open an Indian Restaurant and looking for good location in Queens,Ny. Where

- 1. Location is less crowded with restaurant*
- 2. No Indian restaurants in vicinity*
- 3. Location is close to city centre*

*The Objective is to find a solution using google geocode API and Foursquare API
location data*

Data Understanding:

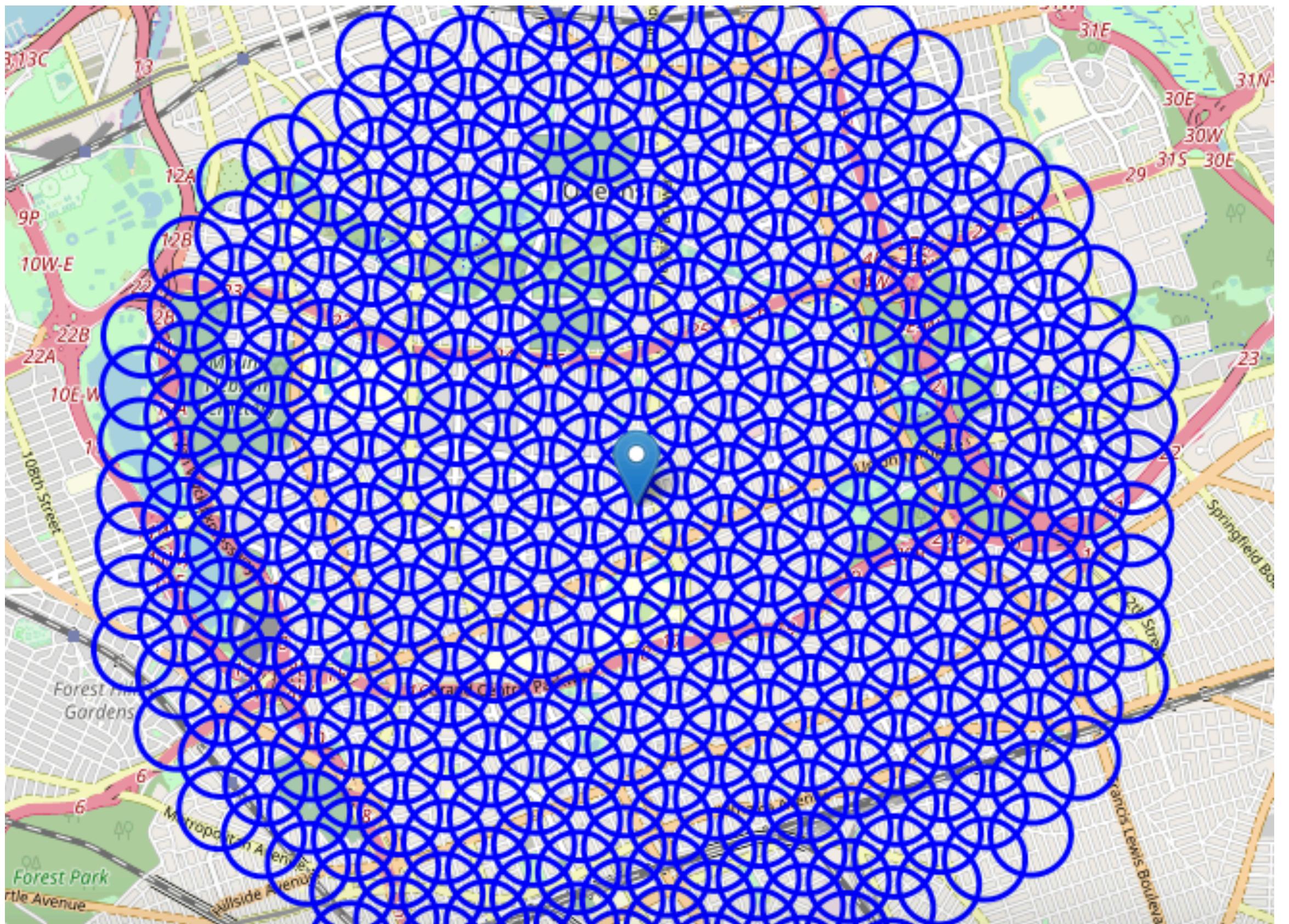
- * *To Find a solution of above problem we would be looking for the data of neighbourhood:*
 - 1. Number of existing restaurants*
 - 2. Number of Indian restaurants*
 - 3. Distance of Indian restaurants*
 - 4. Distance of neighbourhood from the city center*

Defining Neighbourhood:

- * ***We will define our neighbourhoods as a circular areas with a radius of 300 meters so our neighbourhood centres will be 600 meters apart***
- * ***This will create hexagonal grid of circular candidate area, equally spaced , centred on city centre of Queens, Ny, and with in 6km from the city centre will be created***

Hexagonal grid of cell around city

1. Using Google geocoded API Coordinate of City Centre Queens, Ny [40.7282239, -73.7948516]
2. Algorithmically 364 neighbourhood centres generated and visualised



Foursquare API

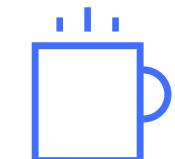
Using of Foursquare API to get information on restaurant in each neighbourhood



Total Restaurants : **592**



Total Indian Restaurant : **28**



Indian Restaurant (%) : **4.73 %**



Avg.No.of Restaurant : **2.78**

Visualisation of Foursquare Data

Green : Restaurants

Red: Indian Restaurants

Restaurants :

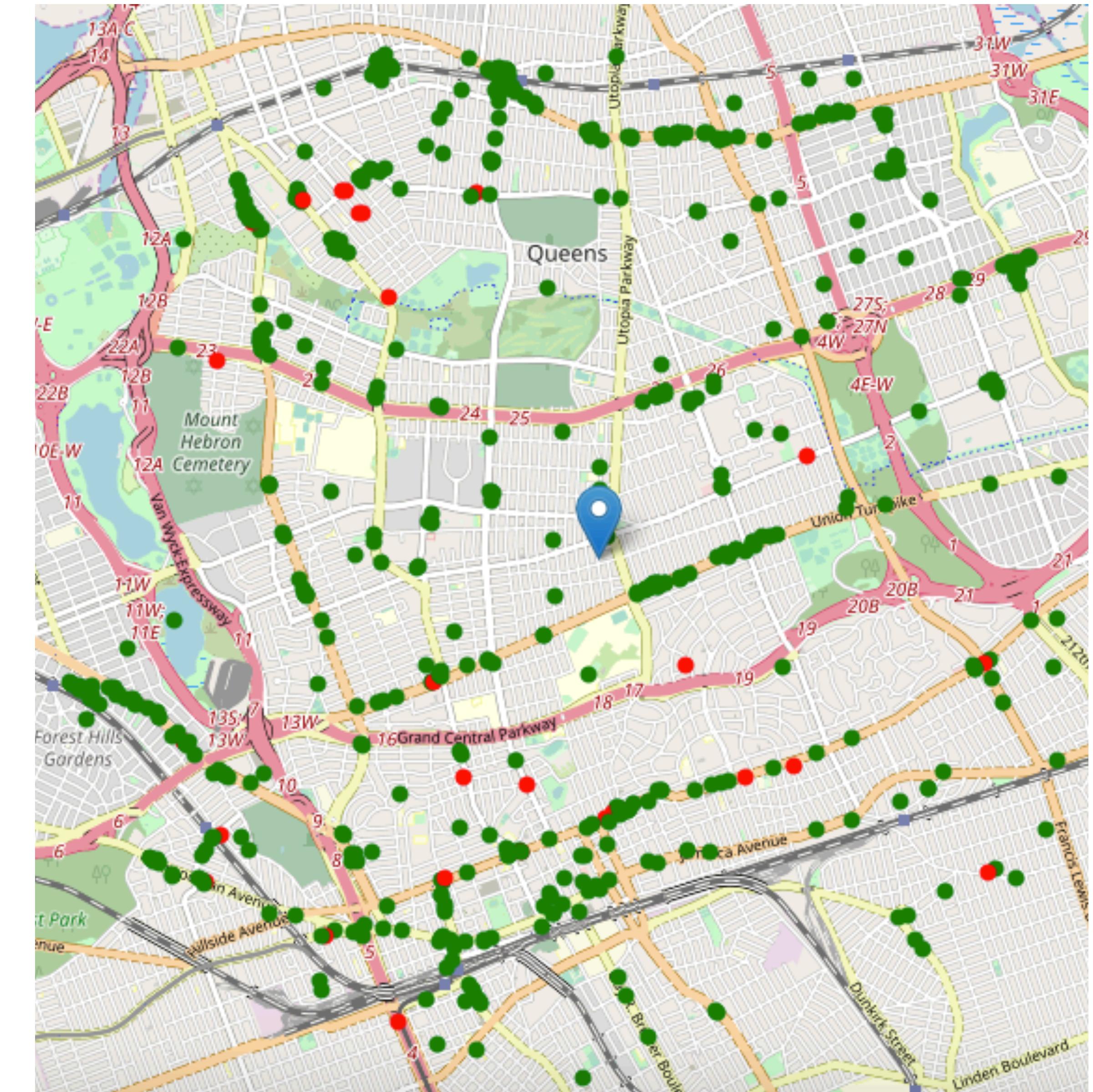
592

Indian Restaurants :

28



IBM / COURSERA



Methodology:

* *We will put our efforts on exploring the areas of Queens the have*

1. Low restaurant density.

2. Less Member of Indian restaurants.

3. Our Analysis area Limit will be 6km around city centre

Methodology:

- * **Step 1:** *Collect the required data of location and category of every restaurant within 6km from Queens centre*
- * **Step 2 :** *Analysis, calculation and exploration of restaurant density across different areas of Queens, using heatmaps to identify a few promising areas to center with low number of restaurants*
- * **Step 3:** *Find most promising areas and within those create clusters of location that meet basic requirements, no more than 2 restaurants in radius of 250 meters, will present map of all such locations but also create clusters using k-means locations to identify general zones/neighbourhoods/address which should be a starting point for final street level*

Analysis

Number of restaurant in every candidate

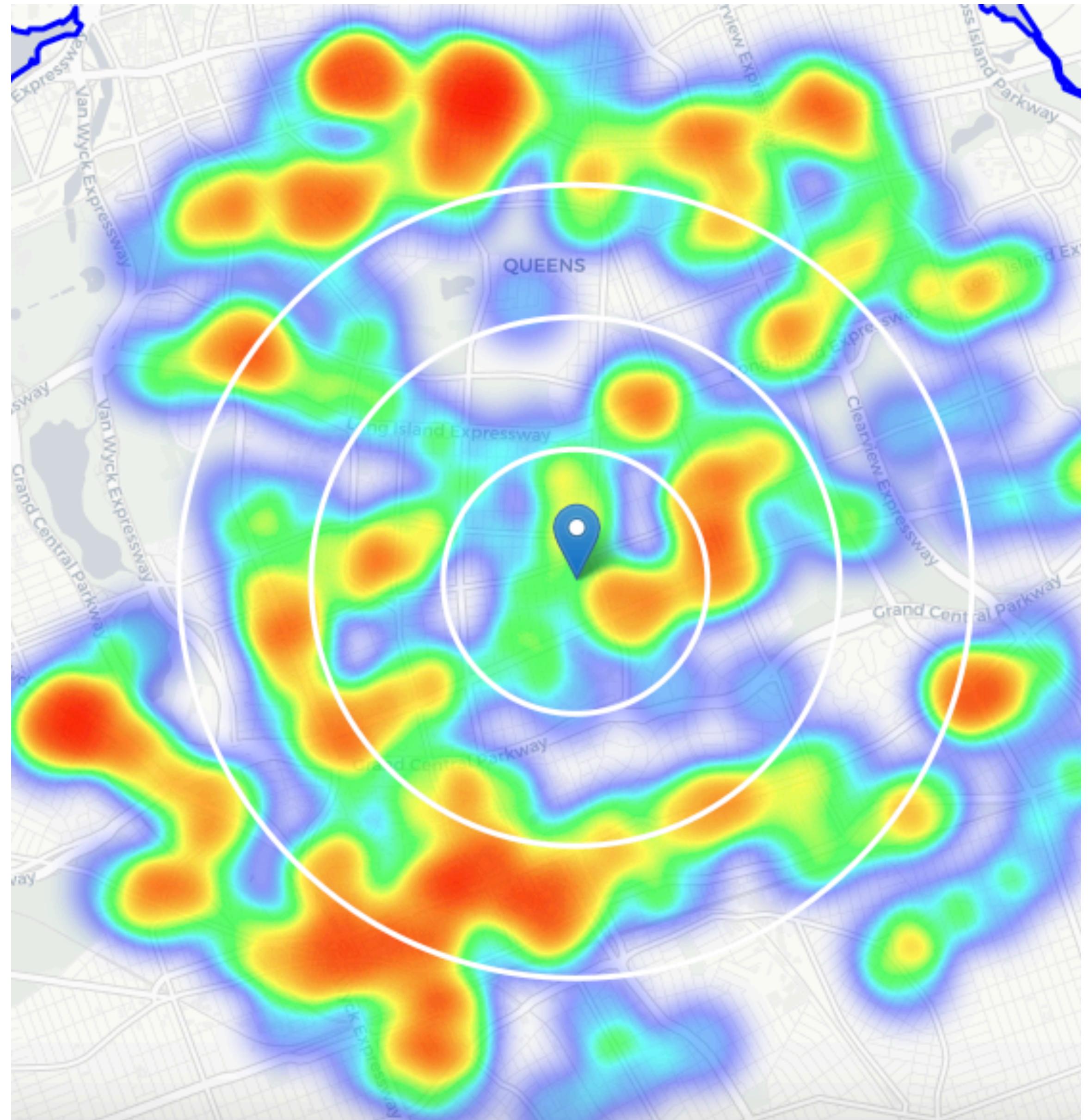
	Address	Latitude	Longitude	X	Y	Distance from center	Restaurants in area
0	93-46 210th Pl, Queens Village, NY 11428	40.716520	-73.751049	-5.820665E+06	9.836718E+06	5992.495307	2
1	211-30 90th Ct, Jamaica, NY 11428	40.720054	-73.750895	-5.820065E+06	9.836718E+06	5840.376700	1
2	89-28 213th St, Queens Village, NY 11427	40.723589	-73.750740	-5.819465E+06	9.836718E+06	5747.173218	1
3	214-46 Whitehall Terrace, Jamaica, NY 11427	40.727124	-73.750586	-5.818865E+06	9.836718E+06	5715.767665	0
4	218-17 Grand Central Pkwy, Jamaica, NY 11427	40.730659	-73.750431	-5.818265E+06	9.836718E+06	5747.173218	0
5	220-24 Hartland Ave, Jamaica, NY 11427	40.734194	-73.750276	-5.817665E+06	9.836718E+06	5840.376700	2
6	220-72 77th Ave, Flushing, NY 11364	40.737730	-73.750122	-5.817065E+06	9.836718E+06	5992.495307	2
7	204-12 100th Ave, Jamaica, NY 11423	40.711321	-73.755302	-5.821565E+06	9.837237E+06	5855.766389	1
8	93-52 Francis Lewis Blvd, Jamaica, NY 11428	40.714855	-73.755149	-5.820965E+06	9.837237E+06	5604.462508	1
9	90-21 208th St, Jamaica, NY 11428	40.718389	-73.754995	-5.820365E+06	9.837237E+06	5408.326913	1

DATA SET



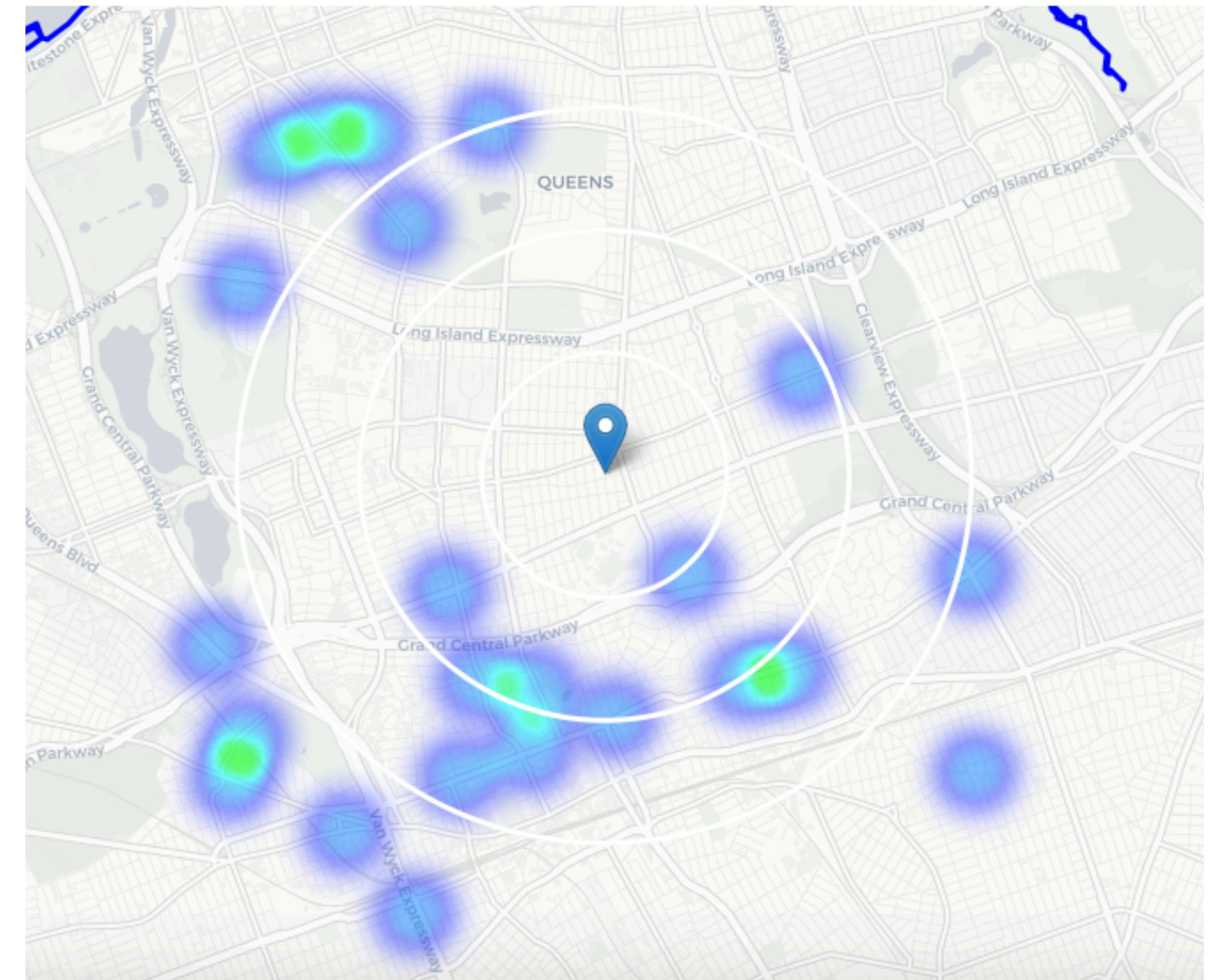
Density of Restaurants Heat map

1.Density of restaurants with Boards of
Queens,Ny on our map and a few circles
indicating distance of 1km , 2km, 3km from
Queens,Ny



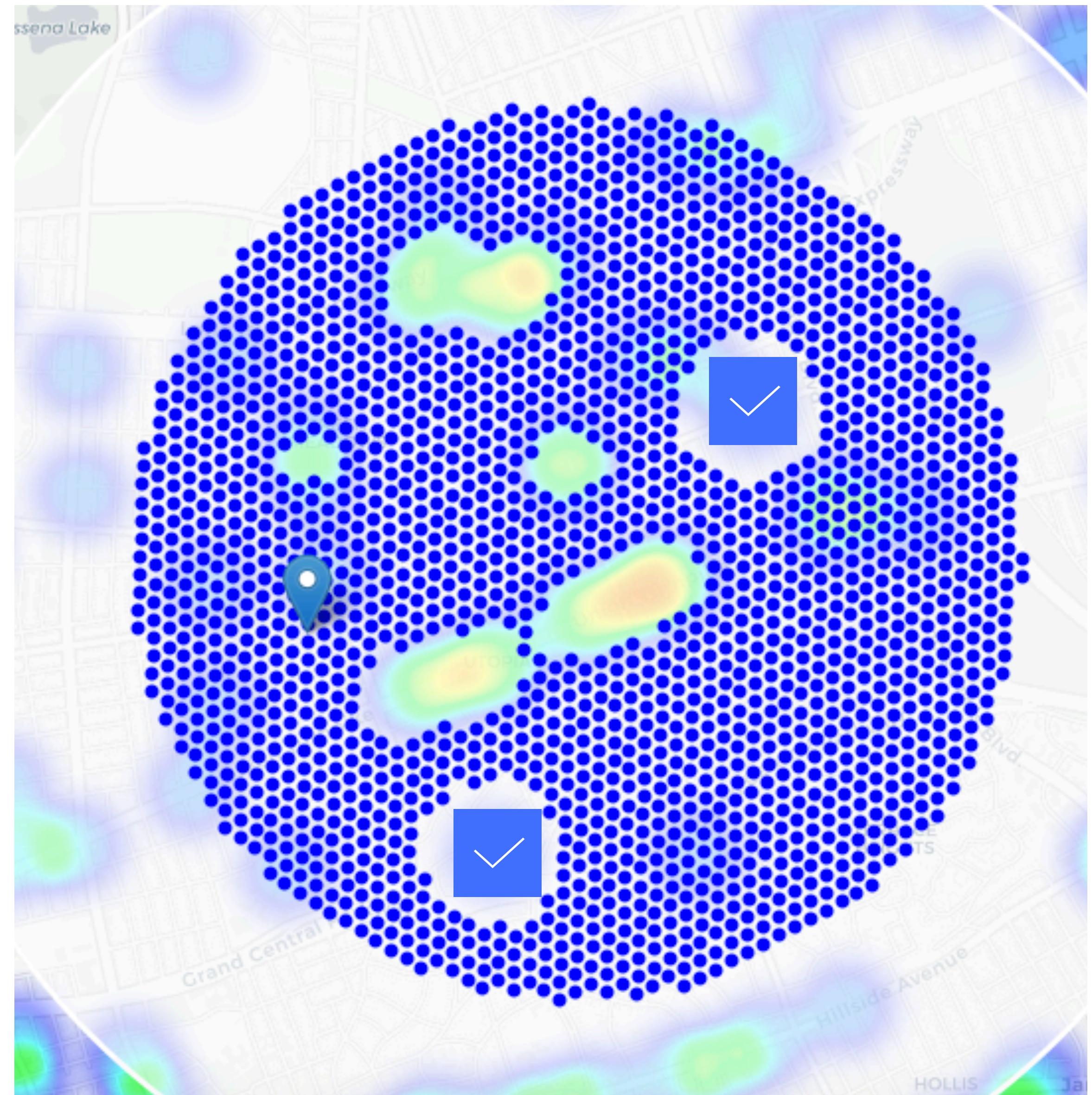
Density of Indian restaurants Heat map

1. *Indian restaurants represent a subset of 3.75% of all restaurants in Queens,Ny*
- 2.*Higher density of Indian restaurant in south-west, North from Queens*
- 3.*Low density of Indian restaurant in north-east, east from Queens*



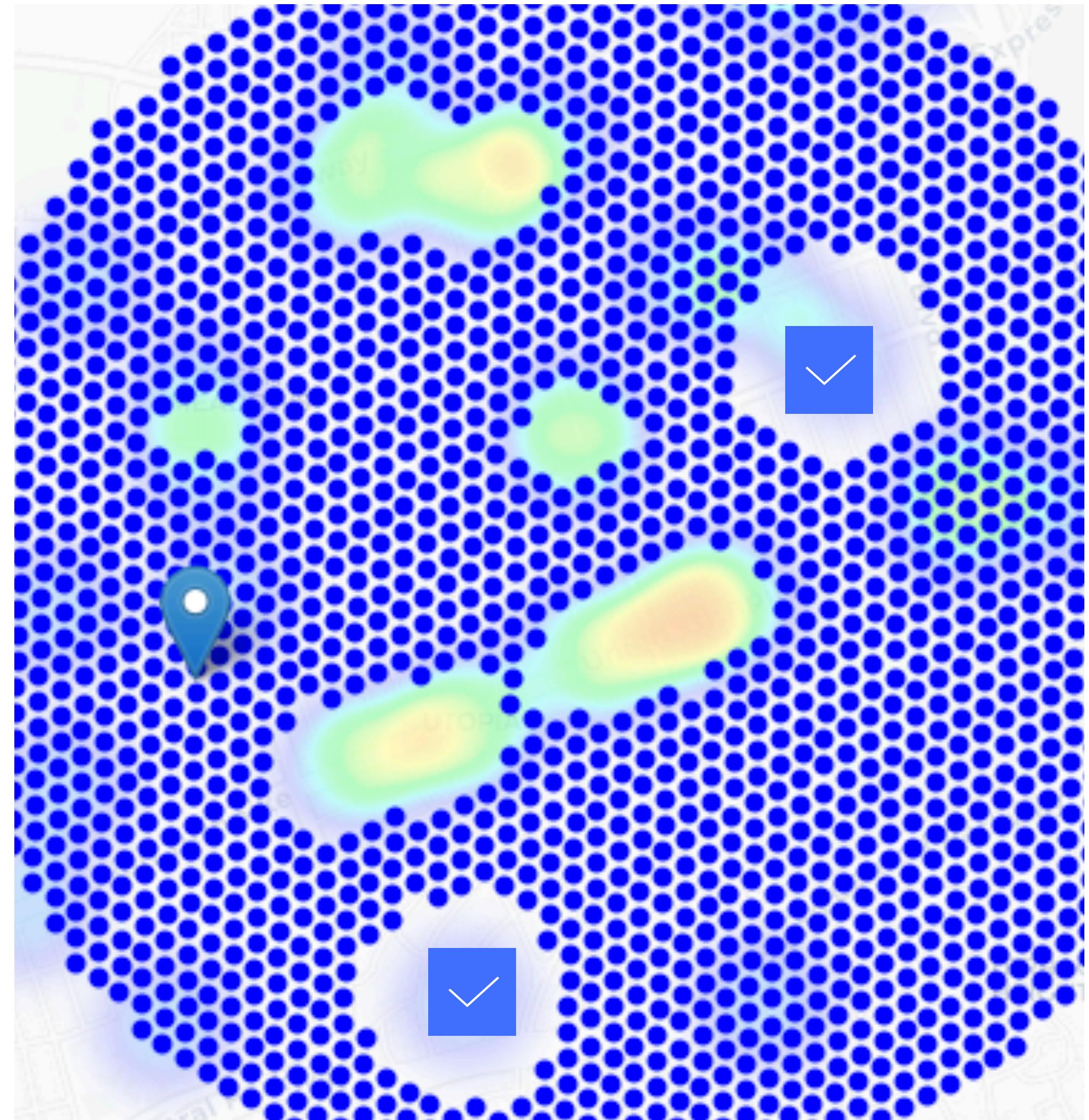
Preferred Location For Indian restaurant

- ✓ Location Filtered as per the following conditions
- ✓ *For Restaurant - Radius = 250 m, Maximum restaurant = 2*
- ✓ *For Indian Restaurant - Radius 400 , restaurant = 0*



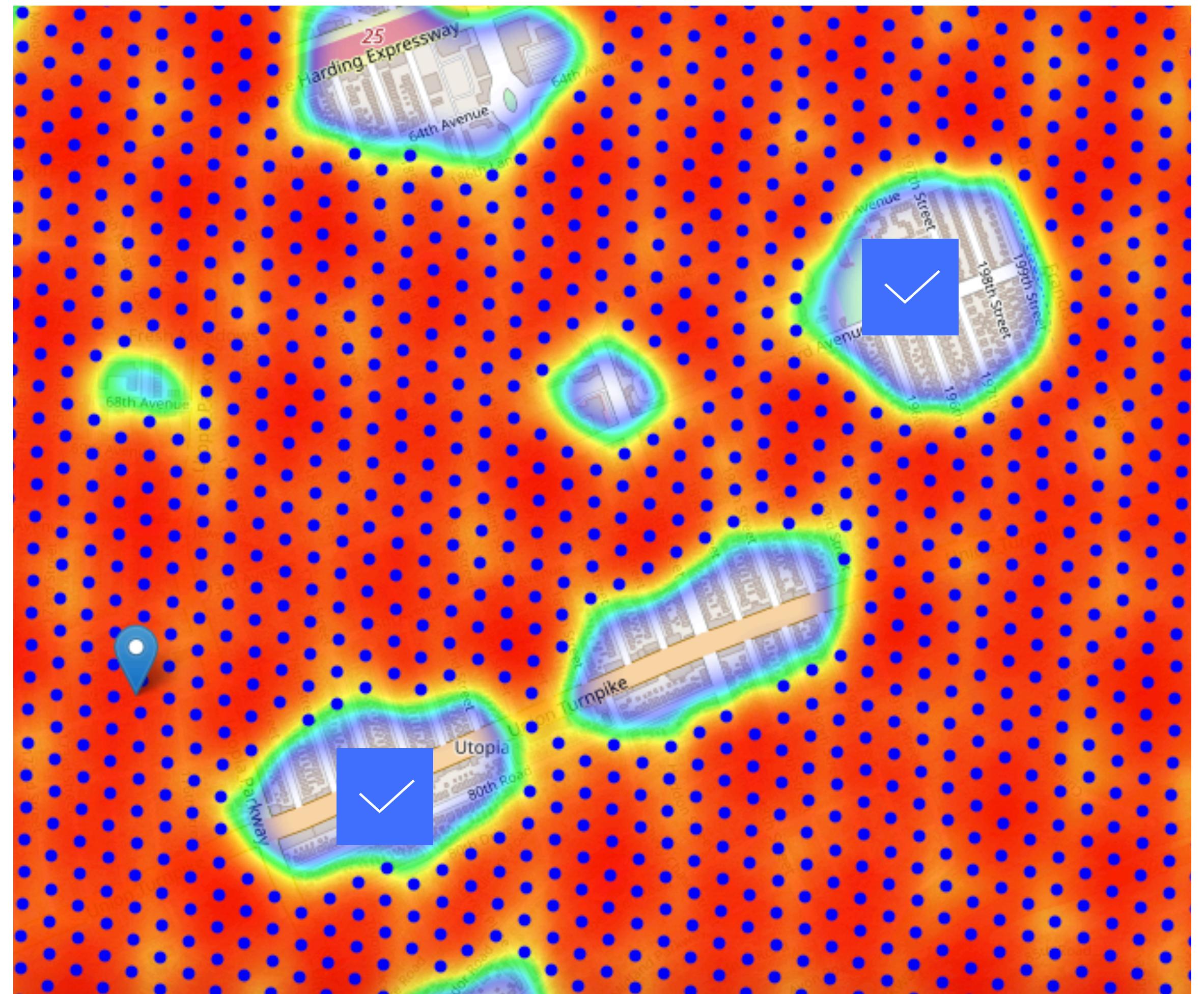
Good Location For Indian restaurant

- ✓ Location filtered as per the following conditions
- ✓ *For Restaurant - Radius = 250 m, Maximum restaurant = 2*
- ✓ *For Indian Restaurant - Radius 400 , restaurant = 0*



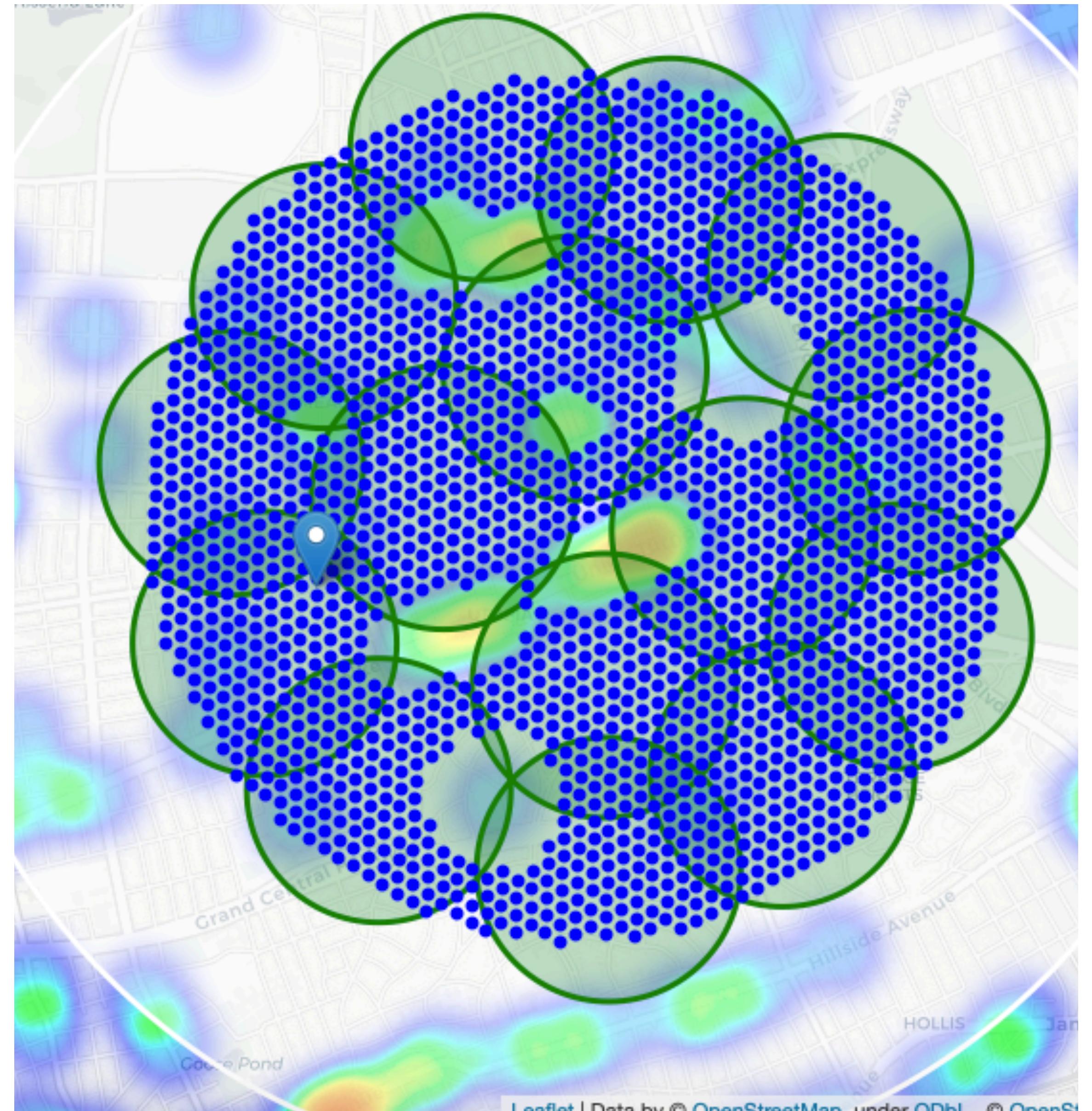
Good Location For Indian restaurant Heat- Map

- ✓ Location filtered as per the following conditions
- ✓ For Restaurant - Radius = 250 m, Maximum restaurant = 2
- ✓ For Indian Restaurant - Radius 400 , restaurant = 0



Clustering of Good Location

- ☀ K - Means Clustering
- ☀ 15 Cluster of good locations
- ☀ 2095 Locations with no more then 2 restaurants
- ☀ 2146 Locations with no Indian restaurants within 400m
- ☀ 1980 Locations Both Conditions met



Area centers recommended for further analysis

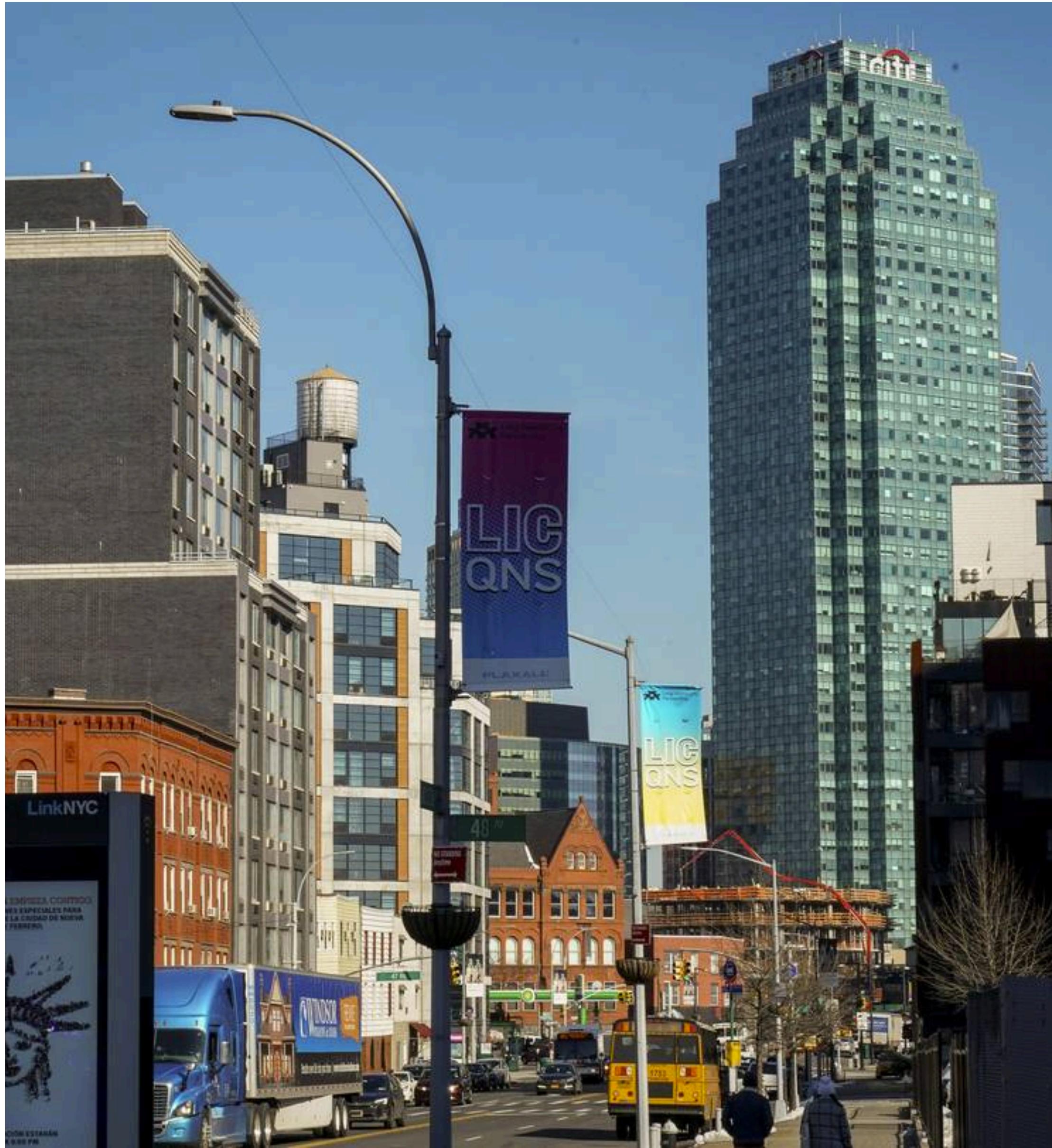


Conclusion:

- * *1. Objective of this project was to assist stakeholders in identifying areas close to center of Queens,Ny,USA with low number of restaurants (particularly Indian restaurants) for opening a new Indian restaurant.*
- * *2. Using Foursquare data we calculated density of restaurants to identify boroughs that justify the further analysis of two major tourist locations (jamaica and Meadows,Auburndale), and then generated extensive collection of locations which satisfy some basic requirements regarding existing nearby restaurants.*
- * *3. Clustering of those locations was then performed in order to create major zones of interest (containing greatest number of potential locations) and addresses of those zone centers were created to be used as starting points for final exploration by stakeholders.*

Conclusion:2

- * *4. Final decision on location of restaurant will be made by stakeholders based on specific characteristics of neighborhoods and locations in every recommended zone.*
- * *5. Additional factors: Stakeholder can consider additional factors like*
 - 1. Attractiveness of each location (proximity to park or water)
 - 2. Levels of noise / proximity to major roads
 - 3. Real estate availability
 - 4. Real estate Prices
 - 5. Social and economic dynamics of every neighborhood etc.



Thanks
Srinivasan
Paramasivam

