

# CAPSTONE PROJECT – BATTLE OF NEIGHBORHOODS

## CAFE VENUE DATA ANALYSIS OF SALEM

### INTRODUCTION

Salem is a city in the South Indian state of Tamil Nadu, having a population of around 8.29 lakhs and a population density of 9,079/km<sup>2</sup>. The city covers an area of about 124 km<sup>2</sup>. As seen from the figures, Salem is a city with high population density. Being a crowded city, it leads the owners of shops and social sharing places in the city to where the population is dense. On an investor's point of view, it is expected to prefer that the type of business is less intense. At the same time an investor may want to choose the venue according to the social places density. However, it is difficult to obtain information that will guide an investor in this direction. So considering these problems, we can create a map which enables us to choose the desired location.

### TARGET AUDIENCE

Who will be more interested in this project? What type of clients or a group of people would be benefitted?

1. Business personnel who wants to invest or open a café in Salem. This analysis will be a comprehensive guide to start or expand coffee shops.
2. The target market for coffee, includes drip coffee drinkers, coffee shop lovers, specialty coffee drinkers, and whole bean buyers.
  - **Drip Coffee Drinkers:** The latest research has found that 77 percent of adults in the United States drink coffee on a daily basis. Depending on the price you charge for a cup of coffee, your target market may be students and business workers on their way to work or class.
  - **Coffee Shop Lovers:** People who spend time at shops and cafes where specialty drinks and regular cups of coffee are available along with an inviting atmosphere – rather than coming in to grab a cup of coffee.
  - **Specialty Coffee Drinkers:** Espressos, cappuccinos, lattes, and mochas are just the start, if you want to sell specialty coffee drinks. The target market for this coffee product consists of those who love specific ingredients in their coffee-based beverage.
  - **Whole Bean Buyers:** Another target market consists of people who buy whole bean coffee to make at home or in the office. These buyers ask to have the beans ground in the store, or they grind the coffee themselves, for the freshest cup possible. This audience buys whole beans by the pound in different flavors from various regions.

## DATA DESCRIPTION

To list the data as needed, the following are used.

1. Foursquare API is used to get the most common values of city. The Foursquare API is also used to collect the information about the competitors in the neighborhood.
2. The Geolocator is used to get the coordinates of each place

To consider the problems, given the size of the project and for simplicity only the following scenario will be addressed.

1. Query the FourSquare website for the coffee shops in Salem.
2. Use the FourSquare API to get supplemental geographical data about the top sites.
3. Finally select and appropriate location for a new coffee shop to be started.

## GETTING RESULTS OF COFFEE SHOPS

By querying the Four Square API the details of the venues like its ID, city, address, latitude, longitude etc as shown below

```
results = requests.get(url).json()
```

```
# assign relevant part of JSON to venues
venues = results['response']['venues']

# tranform venues into a dataframe
dataframe = json_normalize(venues)
dataframe.head()
```

	categories	hasPerk	id	location.address	location.cc	location.city	location.country	location.cross
0	[[{'id': '4bf58dd8d48988d128941735', 'name': 'C...	False	52db9cd9498ebca1d3f51623	Ms Coffee Bar	IN	Salem	India	Maravanari
1	[[{'id': '4bf58dd8d48988d1e0931735', 'name': 'C...	False	5cfafb1a588e36002cfff6f3	NaN	IN	Salem	India	NaN
2	[[{'id': '4bf58dd8d48988d1e0931735', 'name': 'C...	False	5294f0b8498e21323862c9af	SKS Hospital Salem	IN	NaN	India	NaN
3	[]	False	4ef06e074690b5157450e76c	@IP building	IN	NaN	India	NaN
4	[[{'id': '4bf58dd8d48988d16d941735', 'name': 'C...	False	4c513bda1c67ef3b239611b9	Shevaroy's Food Mall	IN	Salem	India	Meyyanur Roac roads

## GETTING SUPPLEMENTAL GEO DATA

Using the ID field, it is possible to get further supplemental geographical details about each of the sites from FourSquare using the following API call:

```
url = 'https://api.foursquare.com/v2/venues/search?client_id={}&client_secret={}&ll={},{}&v={}&query={}&radius={}&limit={}'.format(CLIENT_ID, CLIENT_SECRET, latitude, longitude)
url
```

8]: 'https://api.foursquare.com/v2/venues/search?client\_id=4E132IAZHY1W2KQMT2C85EZIGCUL5VVGPSZ34RBTZLOV&client\_secret=VEINKI54F43PC5YX48PAYDCKP0RMQKSBB4DLZITUZ3MLKLMR&ll=11.6612012,78.1602498&v=20191105&query=Coffee shopsCafeRestaurants&radius=50000&limit=100'

The results return a table which provided the necessary details required.

	name	categories	address	cc	city	country	crossStreet	distance	formattedAddress	labeledLatLngs	lat	lng	postalCode	state	id
0	ms coffee bar	Cafeteria	Ms Coffee Bar	IN	Salem	India	Maravanani	108	[Ms Coffee Bar (Maravanani), Salem 636007, Tam...	[['label': 'display', 'lat': 11.66179943084718...	11.661799	78.161041	636007	Tamil Nadu	52db9cd9498ebca1d3f51623
1	Palani Appa Filter Coffee	Coffee Shop	NaN	IN	Salem	India	NaN	202	[Salem 636007, Tamil Nadu, India]	[['label': 'display', 'lat': 11.662223, 'lng':...	11.662223	78.158714	636007	Tamil Nadu	5cfa1b1a588e38002cfff8f3
2	Coffee day coffee	Coffee Shop	SKS Hospital Salem	IN	NaN	India	NaN	1378	[SKS Hospital Salem, India]	[['label': 'display', 'lat': 11.66979323756267...	11.669793	78.151140	NaN	NaN	5294f0b8498e21323862c9ef
3	Coffee day beverages	None	@IP building	IN	NaN	India	NaN	2991	[@IP building, India]	[['label': 'display', 'lat': 11.64347499556045...	11.643475	78.139621	NaN	NaN	4ef09e074690b5157450e78c
4	Coffee World	Café	Shevaroy's Food Mall	IN	Salem	India	Meyyanur Road, 5 roads	4628	[Shevaroy's Food Mall (Meyyanur Road, 5 roads),...	[['label': 'display', 'lat': 11.683652, 'lng':...	11.683652	78.124510	NaN	Tamil Nadu	4c513bda1c87ef3b239611b9

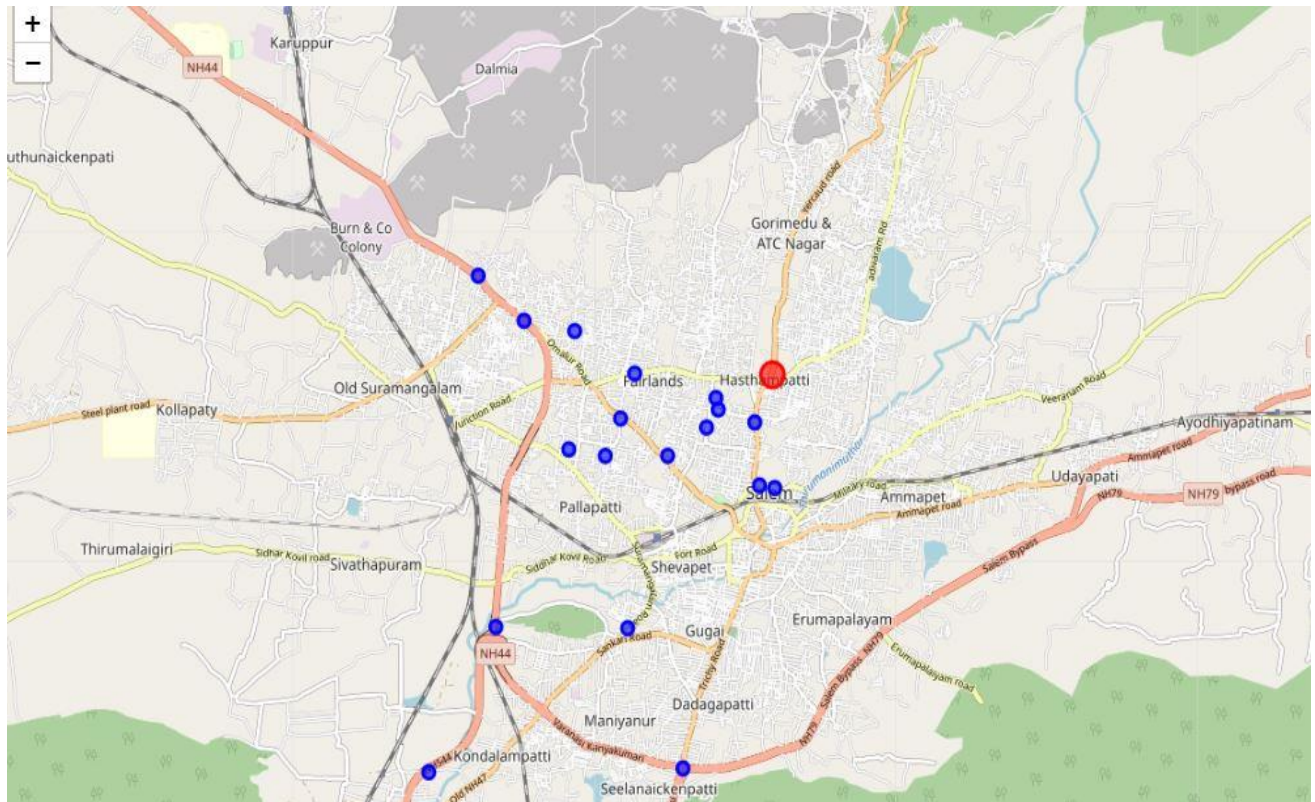
From this the required attributes are retrieved.

## METHODOLOGY

The FourSquare API is utilized to explore the city limits and find the necessary venues. It is designed in such a way the radius is 50000 meter. Here is a head of the list of the venues name, category , ID, city. Distance, latitude, longitude information from the FourSquare API.

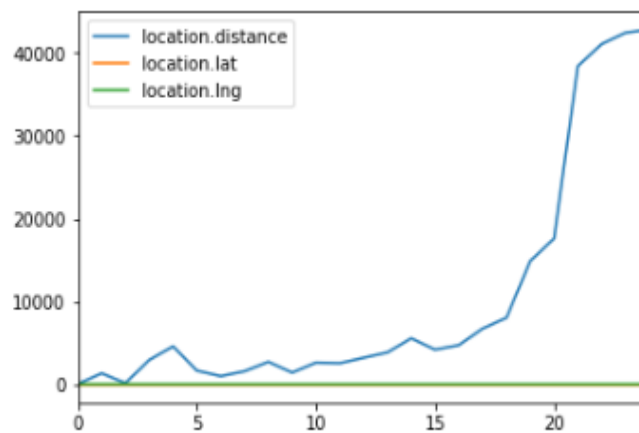
location.lat	location.lng	location.postalCode	location.state	name
11.661799	78.161041	636007	Tamil Nadu	ms coffee bar
11.669793	78.151140	NaN	NaN	Coffee day coffee
11.662223	78.158714	636007	Tamil Nadu	Palani Appa Filter Coffee
11.643475	78.139621	NaN	NaN	Coffee day beverages
11.683652	78.124510	NaN	Tamil Nadu	Coffee World

Folium python library is used Python to visualize geographical details of the city and a map of the city is created with all the coffee shop information superimposed on top. The latitude and longitude values are used to get the visual as below.



## EXPLORATORY DATA ANALYSIS:

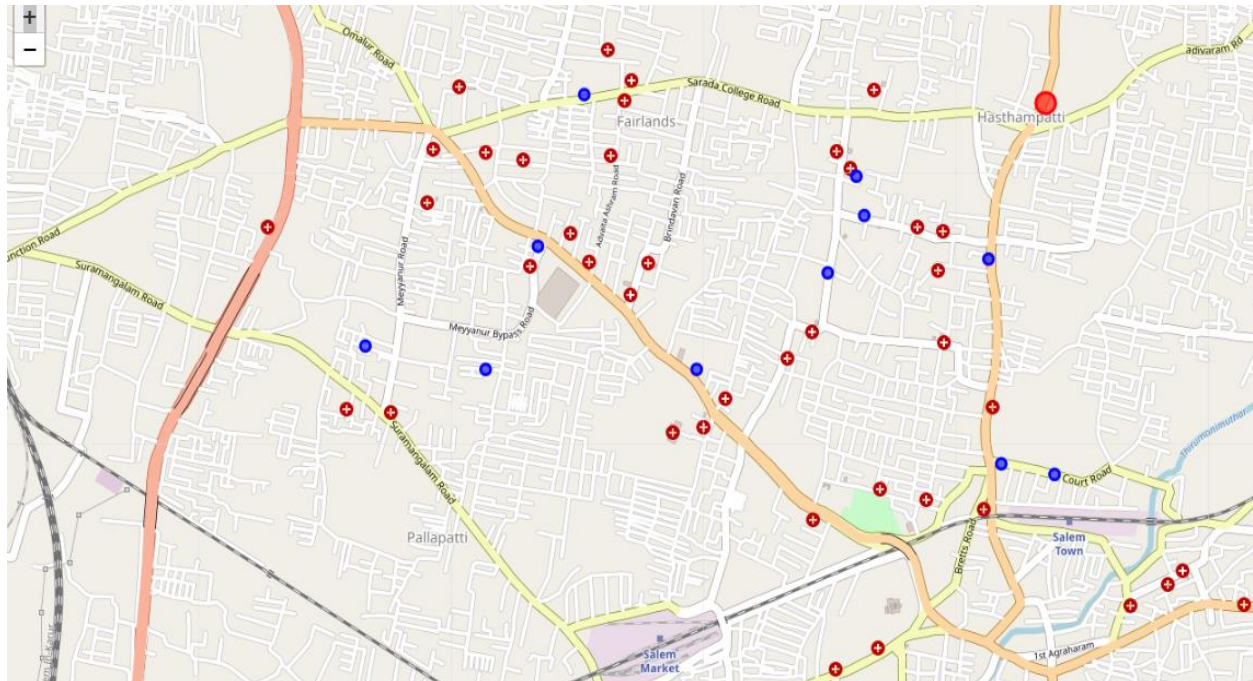
The first step of exploratory data analysis is to examine the venues (Cafes) and Restaurant data frame to determine any relation between them. The below line plot depicts the possibilities with neighborhood information based on the latitude and longitude values:



## RESULTS:

The result depends on given latitude and longitude information and we can increase the possibility with more latitude and longitude information. From the related information in the table a map of the city is obtained as a choropleth map which also has the below information.

- Blue spots – Cafe / Coffee Shop
- Red + spots – Hospitals
- Big single red spot – New hotel



## DISCUSSIONS:

As mentioned earlier, Salem is a city with a high population density. Data analysis is performed through the information by adding the co-ordinates of cafes and coffee shops in the district. Although all of the goals of this project were met there is definitely room for further improvement and development. Foursquare API proved to be a good source of data and easily accessible.

However, the goals of the project were met and, with some more work, could easily be developed into a fully pledged application that could support a business person searching appropriate locations around the city for starting a new business. The study ends by visualizing the information obtained.

## **CONCLUSION**

As a result, people are turning to new cities to start a business or work. For this reason, people can achieve better outcomes through the access to the platforms where such information is provided.

This report may be helpful to someone planning on opening a cafe in Salem, by comparing the current offers and neighborhood profile. However, it may not cover all the variables so it shall not be used as a single decision making tool. This not only applies or helps the investors but also city managers can manage the city more regularly by using similar data analysis types or platforms