



PREDICTING LOCATIONS FOR RENTAL HOUSING BUSINESS INFLUENCED BY NEIGHBOUR VENUES

STAKEHOLDERS OPTING FOR RENTAL HOUSE SERVICE AS BUSINESS.

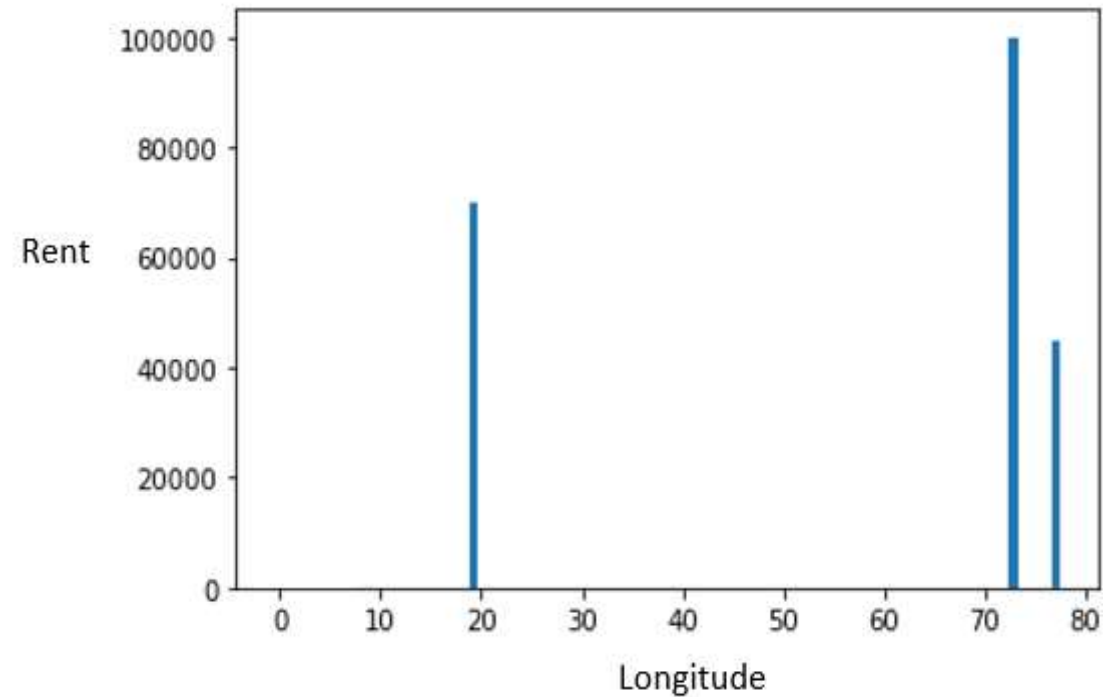
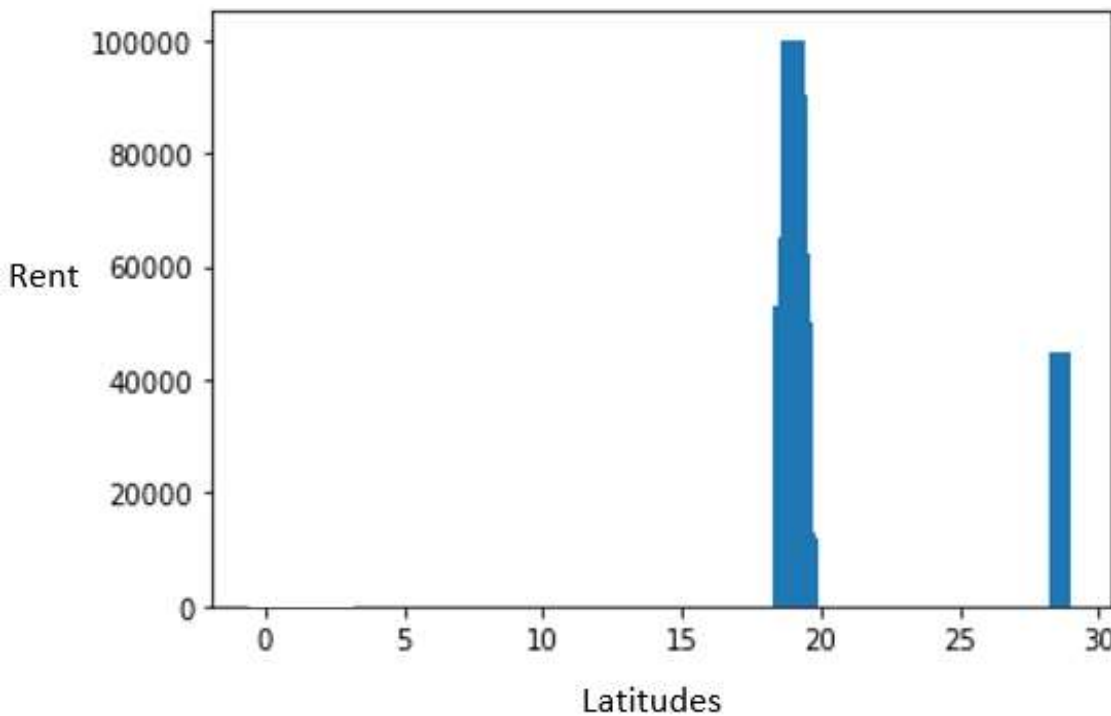
- It is an important decision for stakeholders to select a proper estate property to set up rental business.
- Along with this decision there comes high competition from other agencies and broker.
- Once we study the patterns of the houses in our dataset we will work on determining different suitable location with potential.
- Here potential refers to higher return profits based on high rents, overall area quality, area facility, accommodation, etc.
- This will help stakeholders understand the trends in the system so that they plan out their strategies accordingly.
- This information will also be helpful for people in need of houses, apartments on rent.

DATA

- The following data has been collected from MagicBricks a Rental Housing online service platform.
- It is dated to be of month January 2020.
- It originally consisted of 17 feature columns. They were rather unnecessary for our project and were discarded. (E.g. Email id of the broker, poster date, agent name, house id, etc)
- In here I will explain the features in this final dataset:
- Rows: 419, Columns: 9.
 - 1] area - Area of the house in square feet.
 - 2] bathroom_num - Number of bathrooms.
 - 3] bedroom_num - Number of bedrooms.
 - 4] developer - Name of the building developer.
 - 5] type - House type i.e. apartment, condos,etc.
 - 6] latitude - latitude coordinates.
 - 7] longitude - longitude coordinates.
 - 8] rent - Monthly Rent of the house.
 - 9] locality - House vicinity.

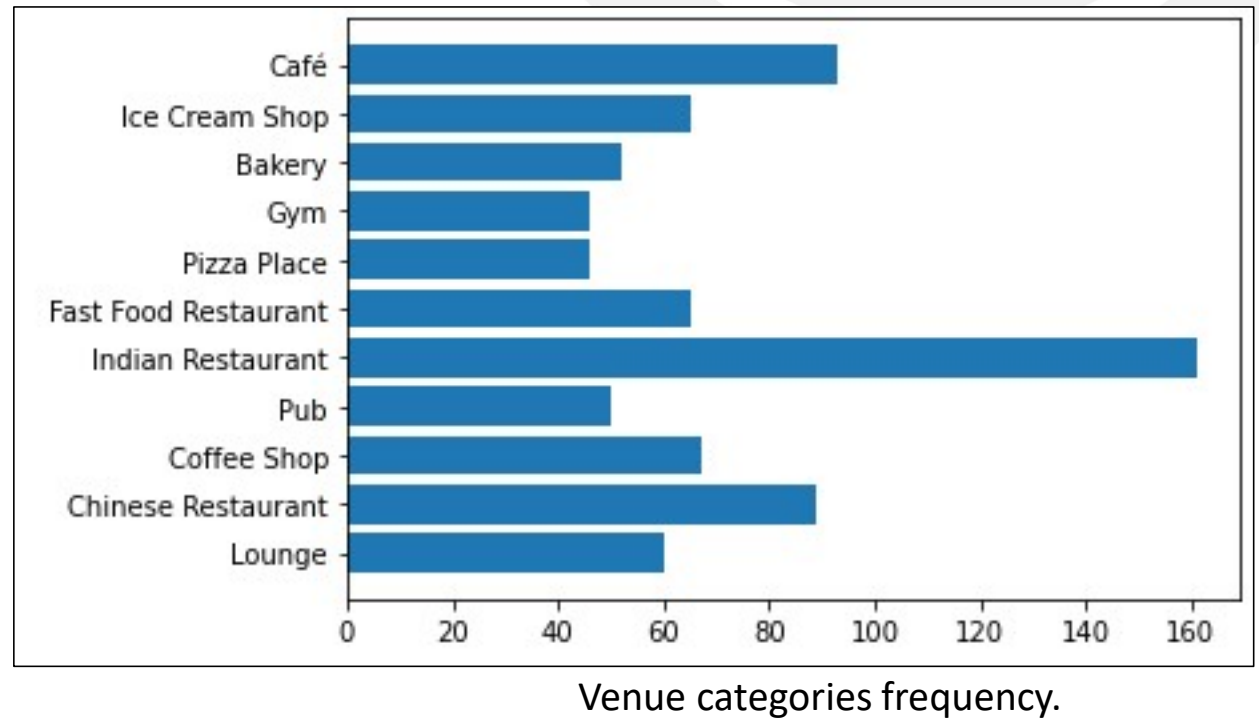
area	bathroom_num	bedroom_num	developer	latitude	locality	longitude	rent	type
1000	1	1	House of Hiranandni	19.048395	Chembur	72.906829	35000	Apartment

- In our data set we have locations of areas in terms of latitude and longitude. By plotting each parameter of location against rent prices we get the following graph.
 - We notice that the rent prices of houses between 19~20 latitude, 72~77 longitude is the highest. Centre location of the Mumbai city is Kurla West having co-ordinates: longitude=72.877, latitude = 19.075.
- We then use this data to create grid of location candidates.



- Here we have our top 10 occurring venue categories for our MagicBricks data set houses. We make use of the popular venues list we acquired from the previous data set and use them to filter our location grids. The filtered locations now consist of instances with many popular venue categories. We then plot these 63 location points on our map.

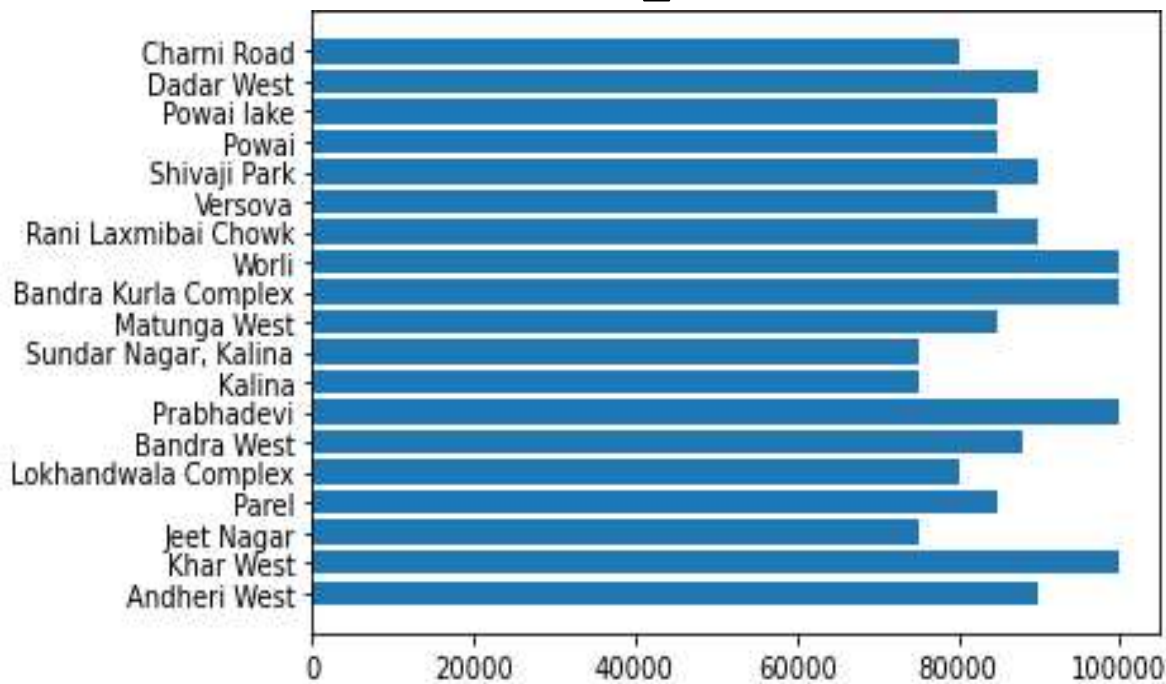
Sr. No.	Top 10 venue categories with highest frequency.
1	Indian Restaurant
2	Café
3	Chinese Restaurant
4	Coffee Shop
5	Fast Food Restaurant
6	Ice Cream Shop
7	Lounge
8	Bakery
9	Pub
10	Pizza Place



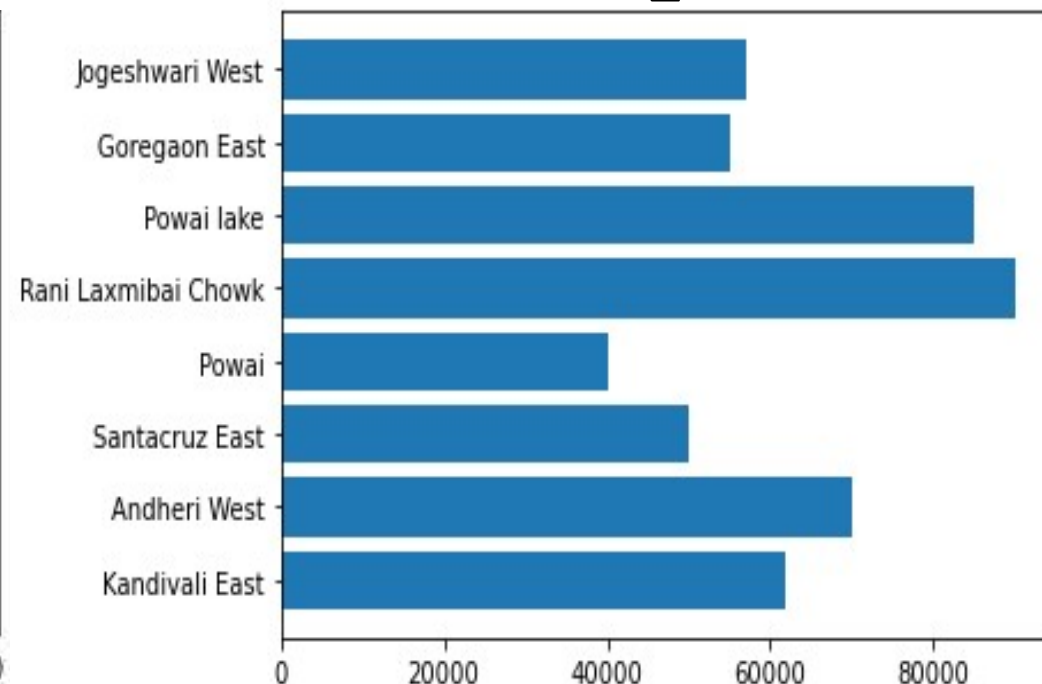
HERE WE HAVE TWO BAR GRAPHS IN WHICH RELATIONSHIP IS PRESENTED BETWEEN LOCALITY AND MAXIMUM RENT PRICE OF HOUSES IN THAT LOCALITY. FIGURE 1 IS A GRAPH WHICH MAINLY CONSISTS LOCALITY OF SOUTHERN PART OF MUMBAI CITY AND FIGURE 2 CONSISTS MAINLY OF NORTHERN PART OF MUMBAI CITY.

WE CAN POINT OUT THAT MOSTLY THE SOUTHERN PARTS OF THE CITY HAS HIGHER POTENTIAL FOR EARNING PROFITS AS RENTAL HOUSING SERVICES.

1



2



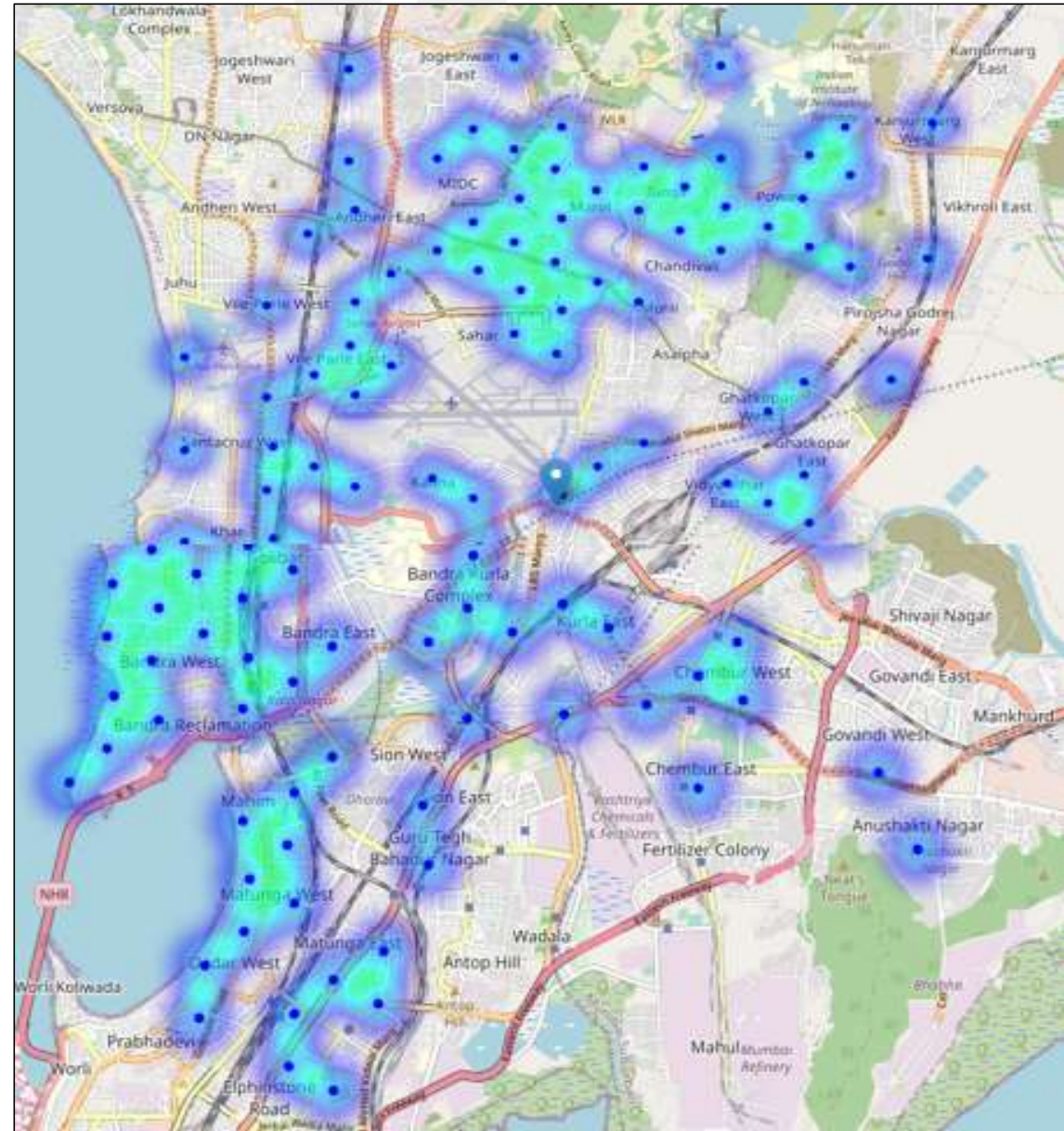
Mumbai City Map – Folium

We have 63 location candidates with high potential for Rental House Business.

Now these locations point out a specific area which satisfies the popular venues condition.

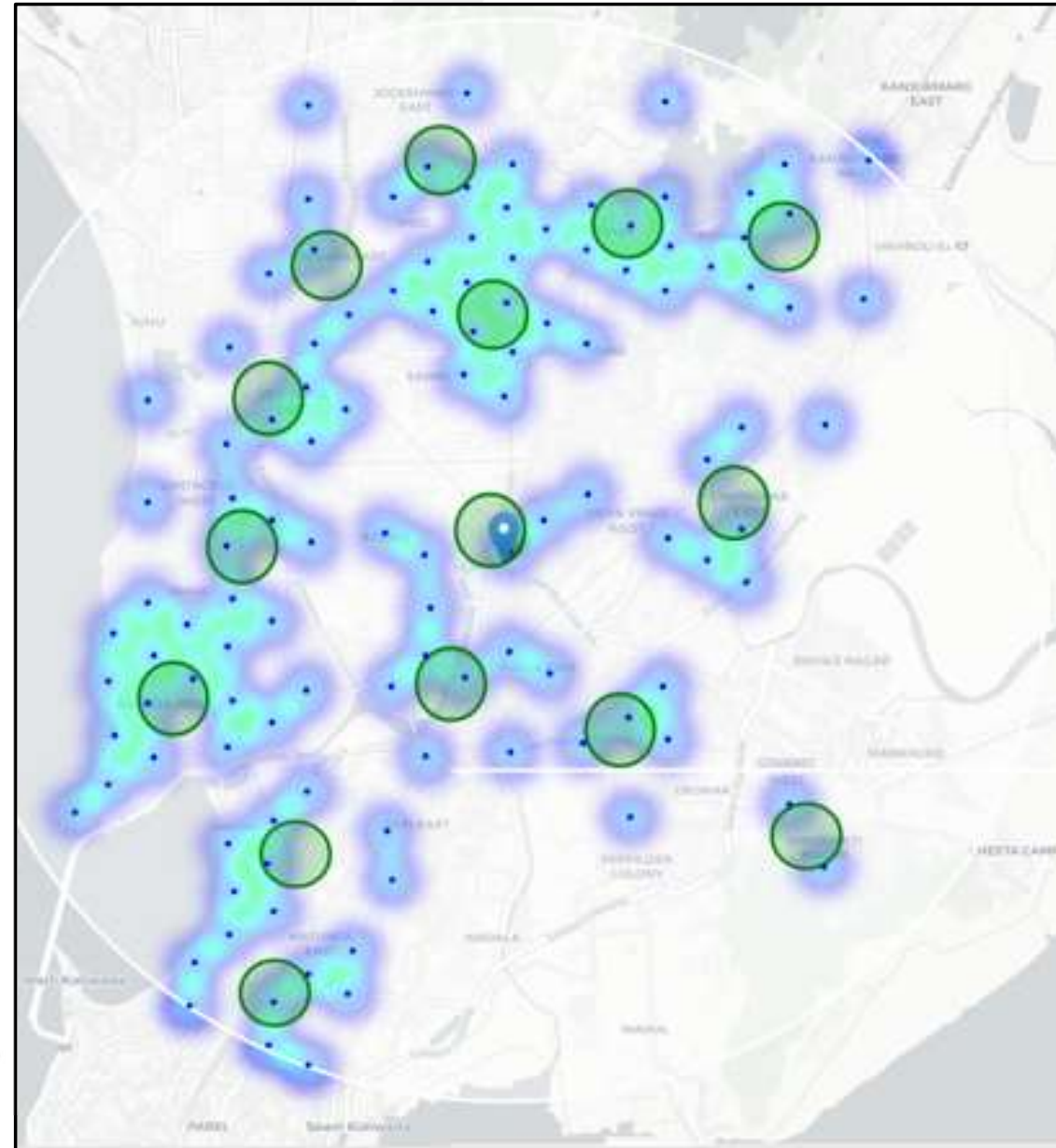
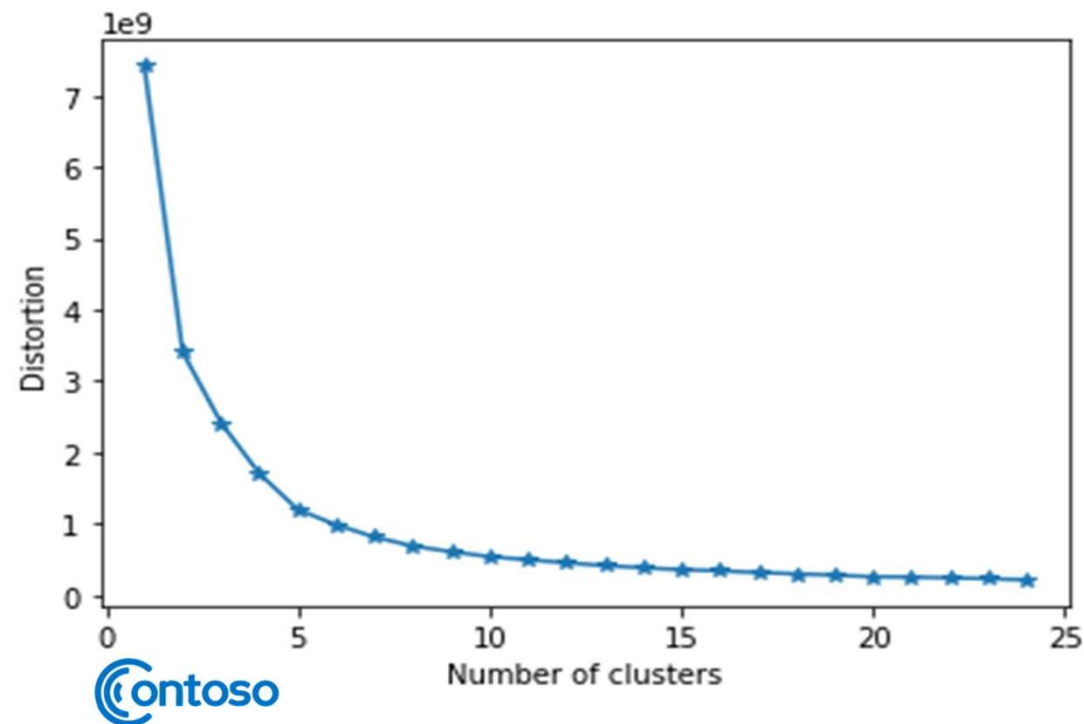
We need an approximate extent of an area for our business to look for estate property.

As you can see the extent of an area is quite displayed by the heatmap in this folium map.



Kmeans Clustering Model was implemented for our 63 candidate locations.

The number of clusters were determined by the below graph plotted for number of clusters versus distortion.



CONCLUSION AND FUTURE DIRECTIONS

- The model provides area of interests based on the neighbour venues.
- It is directed towards stakeholders of Rental Housing Service,
- The venues collected by the Foursquare API isn't reliable when the venues are small or unpopular, unregistered places, etc.
- Hence it leads to loss in neighbour venues categories.
- For the next step, stakeholders concerned with this model will have to sweep through the potential cluster areas for suitable estate property for their business.