

Location Based Hospital Clustering

**COURSERA
CAPSTONE**

IBM Professional degree

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INTRODUCTION

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Humans have many cravings and they will fight for all of them. However, we cannot create a quandary by bringing life on one hand and other things on the other hand. Hear most people will pick life over any other thing out there. That brings us no surprise, after all we are living organisms.

Even though we are willing to do anything in order to save our life, unreachability of hospitals is the paramount among all for losing life in the first place. Consider, there is a accident almost 80% of the time the person who got involved in the accident can sustain if he gets the appropriate treatment at appropriate time.

This project is about analyzing various neighborhoods in Hyderabad, India. As a result, we get a detail idea about various neighborhoods opening doors for building a new hospital.

BUSINESS PROBLEM

We will never run out of investors on earth. Since the inception of the modern medical structure and the fear people having on their lives. Most people are considering hospitals as the primary sources to invest.

This project is about analyzing and clustering various locations in Hyderabad, India, which is a cosmopolitan city. Since it is a cosmopolitan city a lot of investors are willing to invest in this land to find out quests. Finally, after completing this project we will be classifying the locations with the density of hospitals. If somebody want to start a new hospital, they can use this analysis to start one at places where the density is very less. As a result, they will be making huge money.

DATA ACQUISITION

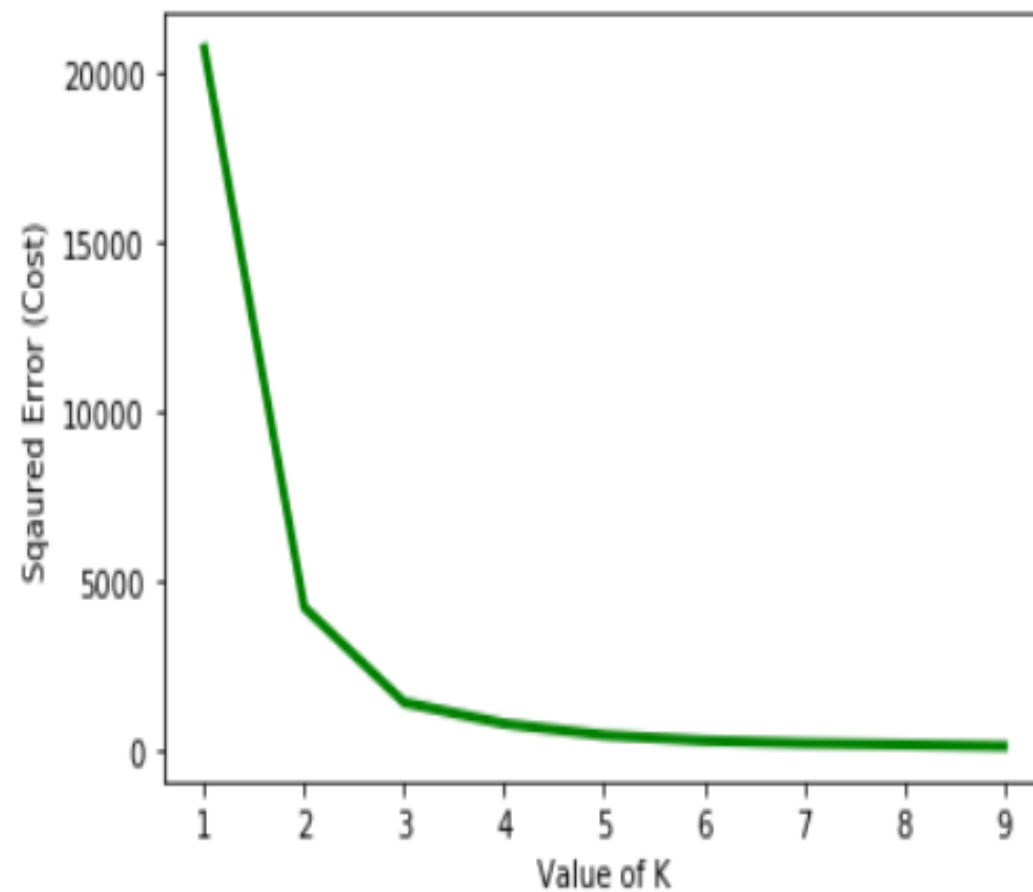
1. Using the BeautifulSoup library scrape the Wikipedia site where the neighborhoods data of Hyderabad, India, is available. Then cast it into a dataframe.
2. Using geolocator package get the location data then append those latitudes and longitudes to the dataframe.
3. Using foursquare get the venues belong to the medical category with a kilometer radius.
4. Finally count the hospitals in each location and add this as a column to the dataframe.

As a result of the above steps, we get dataset containing neighborhoods, latitudes, longitudes, and number of hospitals.

METHODOLOGY

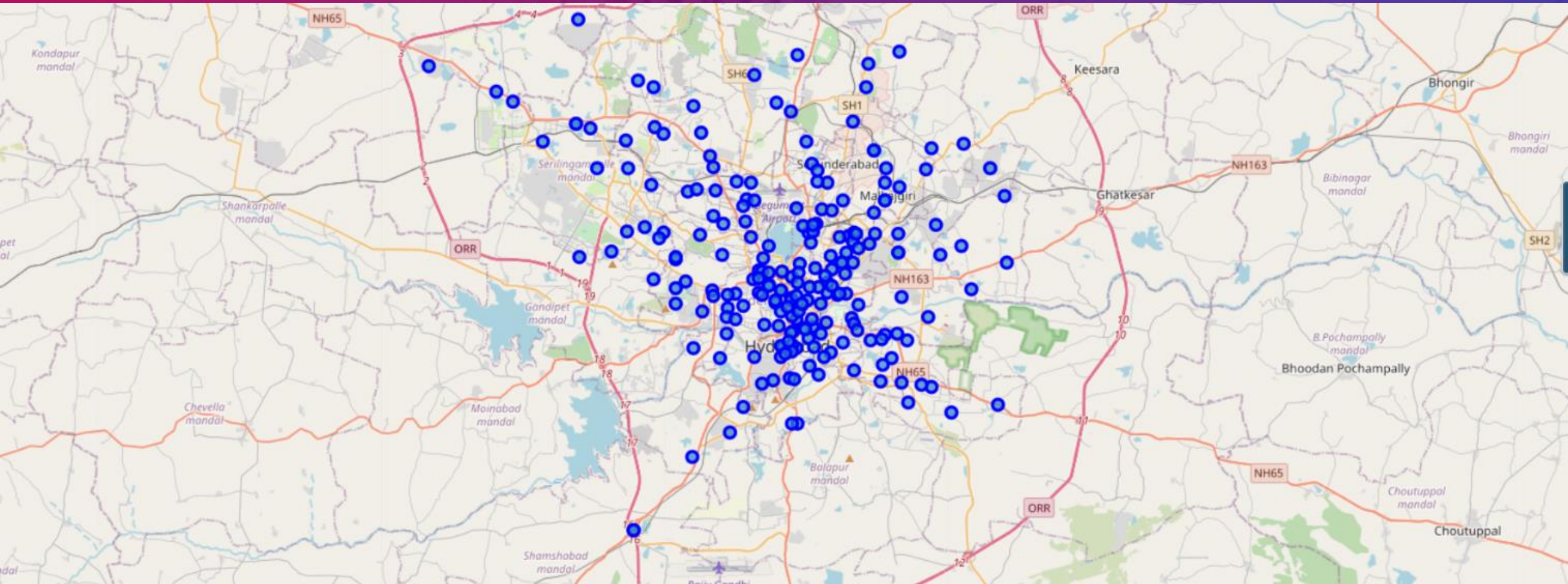
1. Using beautifulsoup package scrape the data from Wikipedia.
2. Create a dataframe of neighborhoods in Hyderabad, India.
3. Get the Latitude and Longitude co-ordinates using the Geocoder package.
4. As we have all the neighbourhoods and exact location co-ordinates from the entire city. Now we can use Foursquare API to gather the venues of hospitals.
5. Create a Folium map to checkout everything went fine.
6. Calculate the best k value for K-means. As per analysis best value of K is 3.

BEST K VALUE



MAP VIEW OF THE PROCESSED DATA BEFORE CLUSTERING

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RESULTS

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After training the algorithm it will result in the labels for each neighborhood. So, let's add the list of neighborhoods to the dataframe and call that column as "Labels". Now the dataframe is equipped with all the required columns.

Let's see the mean of each label

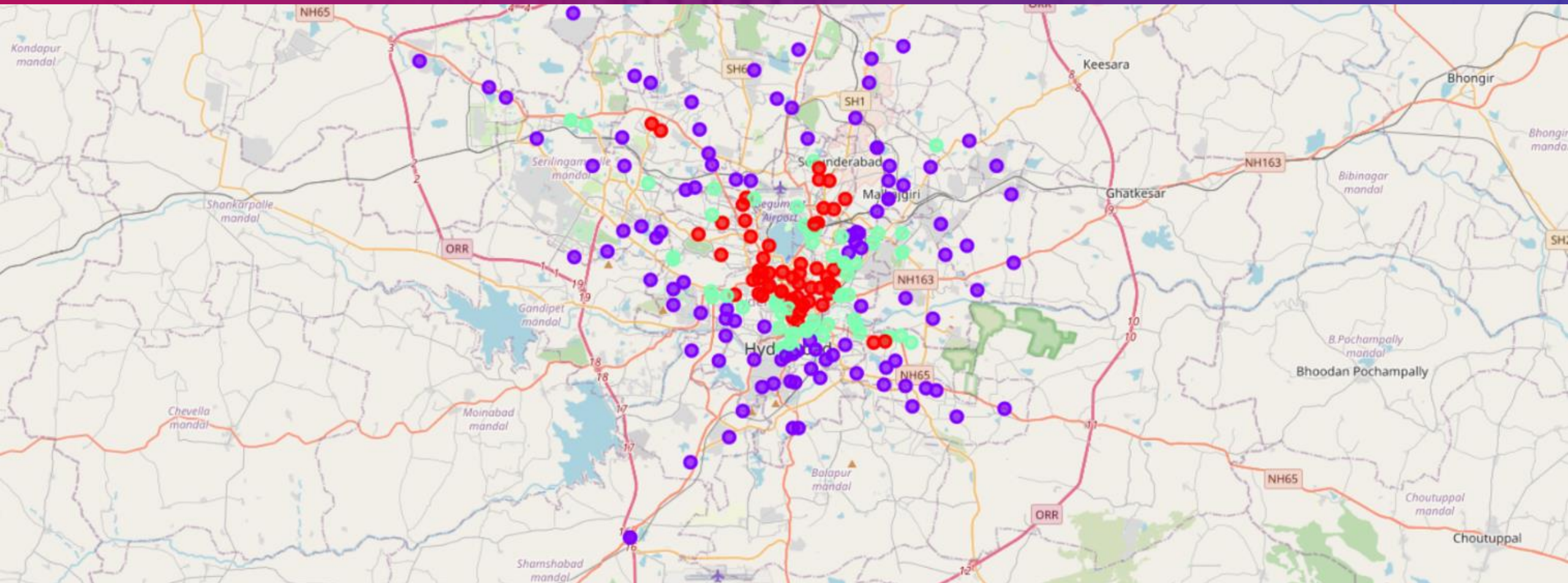
Cluster 0 – Red – 25 hospitals per kilometer.

Cluster 1 – blue – 2 hospitals per kilometer.

Cluster 2 – mint green – 13 hospitals per kilometer.

MAP AFTER CLUSTERING AND LABELING

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DISCUSSION

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On observing the above depiction of various clusters on the map it is clear that high density of hospitals was in the very center of the city. The plausible reason is because that is the old city and it is densely populated. This cluster is colored with red. Then this cluster is surrounded by another cluster that is cluster 2 which is in mint green. This delineates the fact that the expansion of the city at this place started long back compared to the next layer. Here there is an average of 13 hospitals per km radius. Finally, there is another layer which is surrounding the previous two layers. Even though these are densely populated and the residential plot of high-income group. It was not colonized by many hospitals. This group is depicted with a blue color and it has an average of 2 hospitals per km radius.

CONCLUSION

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This project is about analyzing the frequency of the hospitals in different neighborhoods in Hyderabad, India. The main aim of this research is to give valuable information to the venture capitalists who are willing to invest in the hospital sector. If they are investing in the low frequency group, they are going to get high influx of the patients. Along with that it will also be helpful for the patients because the hospitals are evenly distributed so, it is easy to reach one. As a result, a patient can reach to a hospital on time. This is a kind of Win-Win situation where both the investors and the normal people are going to get benefitted.

The background is a complex, abstract composition of overlapping, semi-transparent geometric shapes, primarily hexagons and polygons, in a variety of colors including shades of blue, green, yellow, red, and grey. The shapes are layered, creating a sense of depth and movement. The text "THANK YOU" is centered over this background.

THANK YOU