

Coursera Capstone

IBM Applied Data Science Capstone

Opening a New Restaurant in Bengaluru

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- **Introduction**

For many shoppers, tourists visiting Restaurant is a great way to relax and enjoy themselves during weekends and holidays. They can do dine at restaurants, shop at the various outlets. Restaurants destination for all types of shoppers. For retailers, the central location and the large crowd at the Restaurant provides a great distribution channel to market their products and services. Property developers are also taking advantage of this trend to build more Restaurant to cater to the demand. As a result, there are many Restaurant in the city of Bengaluru and many more are being built. Opening Restaurant allows property developers to earn consistent rental income. Of course, as with any business decision, opening a new Restaurant requires serious consideration and is a lot more complicated than it seems. Particularly, the location of the Restaurant is one of the most important decisions that will determine whether the mall will be a success or a failure.

- **Business Problem**

The objective of this capstone project is to analyse and select the best locations in the city of Bengaluru to open a new restaurant. Using data science methodology and machine learning techniques like clustering, this project aims to provide solutions to answer the business question: In the city of Bengaluru, if a property developer is looking to open a new Bengaluru, where would you recommend that they open it?

- **Target Audience of this project**

This project is particularly useful to property developers and investors looking to open or invest in new Restaurant in the capital city Bengaluru. This project is timely as the city is currently suffering from oversupply of Restaurant.

Methodology

- Web scraping Wikipedia page for neighbourhoods list
- Get latitude and longitude coordinates using Geocoder
- Use Foursquare API to get venue data
- Group data by neighbourhood and taking the mean of the frequency of occurrence of each venue category
- Filter venue category by Restaurants
- Perform clustering on the data by using k-means clustering
- Visualize the clusters in a map using Folium

3. Get the geographical coordinates

```
# define a function to get coordinates
def get_latlng(neighborhood):
    # initialize your variable to None
    lat_lng_coors = None
    # loop until you get the coordinates
    while(lat_lng_coors is None):
        g = geocoder.arcgis('{}, Bangalore'.format(neighborhood))
        lat_lng_coors = g.latlng
    return lat_lng_coors
```

```
# call the function to get the coordinates, store in a new list using list comprehension
coors = [ get_latlng(neighborhood) for neighborhood in blr_df["Neighborhood"].tolist() ]
```

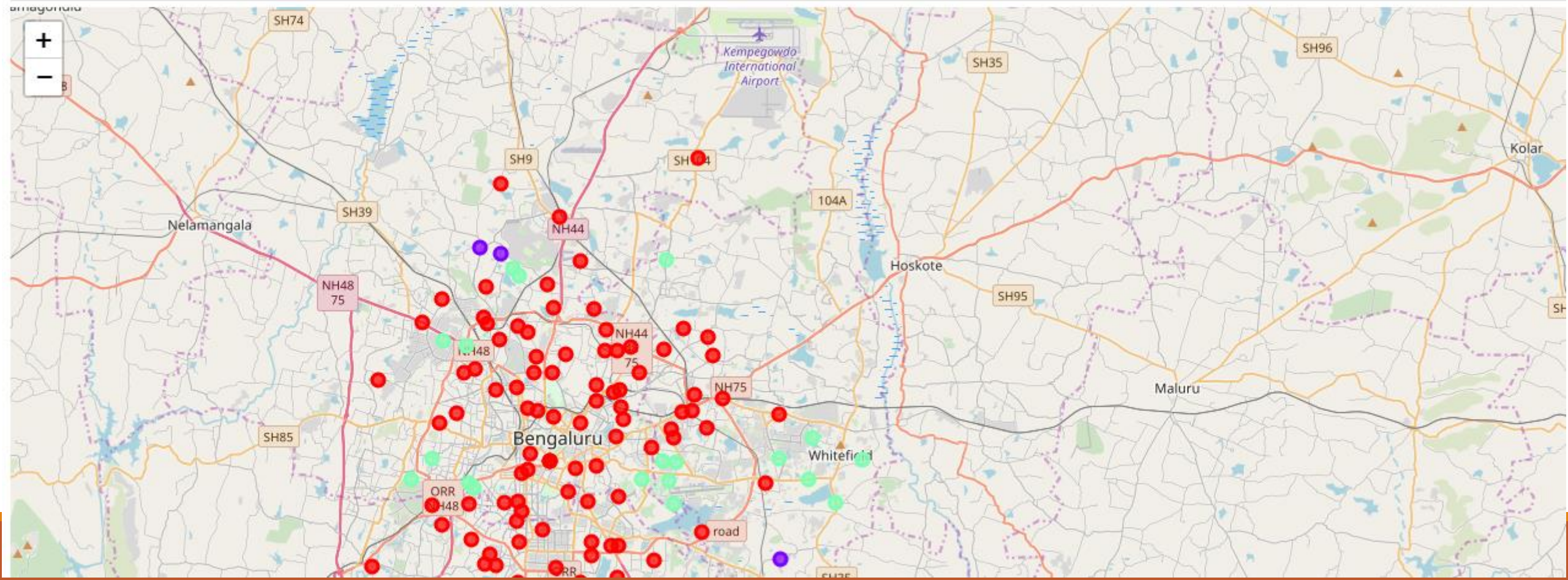
coors

```
[[12.9661800000000065, 77.586900000000007],
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 [13.0830100000000058, 77.547790000000008],
 [12.9000900000000034, 77.604330000000006],
 [12.9030800000000045, 77.624440000000005],
```



```
# add markers to the map
markers_colors = []
for lat, lon, poi, cluster in zip(blr_merged['Latitude'], blr_merged['Longitude'], blr_merged['Neighborhood'], blr_merged['Cluster Labels']):
    label = folium.Popup(str(poi) + ' - Cluster ' + str(cluster), parse_html=True)
    folium.CircleMarker(
        [lat, lon],
        radius=5,
        popup=label,
        color=rainbow[cluster-1],
        fill=True,
        fill_color=rainbow[cluster-1],
        fill_opacity=0.7).add_to(map_clusters)
```

map_clusters



Observations:

Most of the Restaurants are concentrated in the central area of Bengaluru city, with the highest number in cluster 2 and moderate number in cluster 0. On the other hand, cluster 1 has very low number to totally no Restaurant in the neighborhoods. This represents a great opportunity and high potential areas to open new Restaurant as there is very little to no competition from existing malls. Meanwhile, Restaurants in cluster 2 are likely suffering from intense competition due to oversupply and high concentration of Restaurants.

From another perspective, this also shows that the oversupply of Restaurants mostly happened in the central area of the city, with the suburb area still have very few Restaurants. Therefore, this project recommends property developers to capitalize on these findings to open new Restaurants in neighborhoods in cluster 1 with little to no competition. Property developers with unique selling propositions to stand out from the competition can also open new Restaurants in neighborhoods in cluster 0 with moderate competition. Lastly, property developers are advised to avoid neighborhoods in cluster 2 which already have high concentration of Restaurants and suffering from intense competition.



**Thank You
So Much!**