# Battle of the Neighborhoods – Bangalore (Coursera Capstone Project)

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## Introduction/Business Problem

Every year thousands of fresh college graduates move to Bangalore to start their professional careers. Being a fresh college graduate myself, I know the problems associated with choosing neighborhoods when moving to a new place.
This project aims to target this young audience and help them make informed decisions when moving to Bangalore.
The insights from this project can help people gain information of the neighborhoods present in Bangalore.

## Data

For the dataset, I am using the dataset with pincodes for locations across India provided by the government of India. The dataset also includes the coordinates for the diffierent pincode locations present in bangalore. The pincode wise data will be used to get the different neighborhoods and their coordinates. The foursquare API will then be used to get nearby venues and cluster the neighborhoods based on the venues they contain.

Link for the dataset -

https://data.gov.in/catalog/all-india-pincode-directory#web_catalog_tabs_block_10

1) The image below represents the initial data obtained from the government of India dataset.

```
[80]: df = df[~df['latitude'].isna()]
      df.head()
```

[80]:

| | officename | pincode | officeType | Deliverystatus | divisionname | regionname | circlename | Taluk | Districtname | statename | Telephone | Related Suboffice | Related Headoffice |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **5154** | Prakashamnagar S.O | 500016 | S.O | Non-Delivery | Secunderabad | Hyderabad City | Andhra Pradesh | Secunderabad | Hyderabad | TELANGANA | 040-23463750 | NaN | Secunderabad H.O |
| **52180** | Arabic College S.O | 560045 | S.O | Delivery | Bangalore East | Bangalore HQ | Karnataka | Bangalore North | Bangalore | KARNATAKA | 080-25432636 | NaN | Bangalore G.P.O. |
| **52187** | Bellandur S.O | 560103 | S.O | Delivery | Bangalore East | Bangalore HQ | Karnataka | Bangalore South | Bangalore | KARNATAKA | 080-28441625 | NaN | H.A.L II Stage H.O |
| **52201** | Domlur S.O | 560071 | S.O | Delivery | Bangalore East | Bangalore HQ | Karnataka | Bangalore North | Bangalore | KARNATAKA | 080-25356966 | NaN | H.A.L II Stage H.O |
| **52204** | Dr. Shivarama Karanth Nagar S.O | 560077 | S.O | Delivery | Bangalore East | Bangalore HQ | Karnataka | Bangalore North | Bangalore | KARNATAKA | NaN | NaN | Bangalore G.P.O. |

```
[81]: df_bangalore = df[df['Districtname']=='Bangalore']
      df_bangalore = df_bangalore[['officename','longitude','latitude']]
      df_bangalore.reset_index(inplace=True,drop=True)
      df_bangalore.head()
```

[81]:

| | officename | longitude | latitude |
|---|---|---|---|
| **0** | Arabic College S.O | 77.6206 | 13.0291 |
| **1** | Bellandur S.O | 77.6760 | 12.9298 |
| **2** | Domlur S.O | 77.6359 | 12.9611 |
| **3** | Dr. Shivarama Karanth Nagar S.O | 77.6293 | 13.0681 |
| **4** | Fraser Town S.O | 77.6164 | 13.0005 |

2) The image below represents the Data after processing venues with Foursquare API

[87]:

| | Neighborhood | Neighborhood Latitude | Neighborhood Longitude | Venue | Venue Latitude | Venue Longitude | Venue Category |
|---|---|---|---|---|---|---|---|
| **0** | Arabic College S.O | 13.0291 | 77.6206 | Fiat Aadya Service Center | 13.030655 | 77.620240 | Auto Workshop |
| **1** | Arabic College S.O | 13.0291 | 77.6206 | D.K Communications | 13.027063 | 77.622548 | Electronics Store |
| **2** | Arabic College S.O | 13.0291 | 77.6206 | Kamal da Dhaba | 13.027063 | 77.622548 | Indian Restaurant |
| **3** | Arabic College S.O | 13.0291 | 77.6206 | New Krishna Sagar | 13.026125 | 77.622722 | Indian Restaurant |
| **4** | Bellandur S.O | 12.9298 | 77.6760 | Kicks On Grass | 12.930045 | 77.679679 | Soccer Field |

3) The top Venues for each neighborhood were analyzed and are represented in the image below

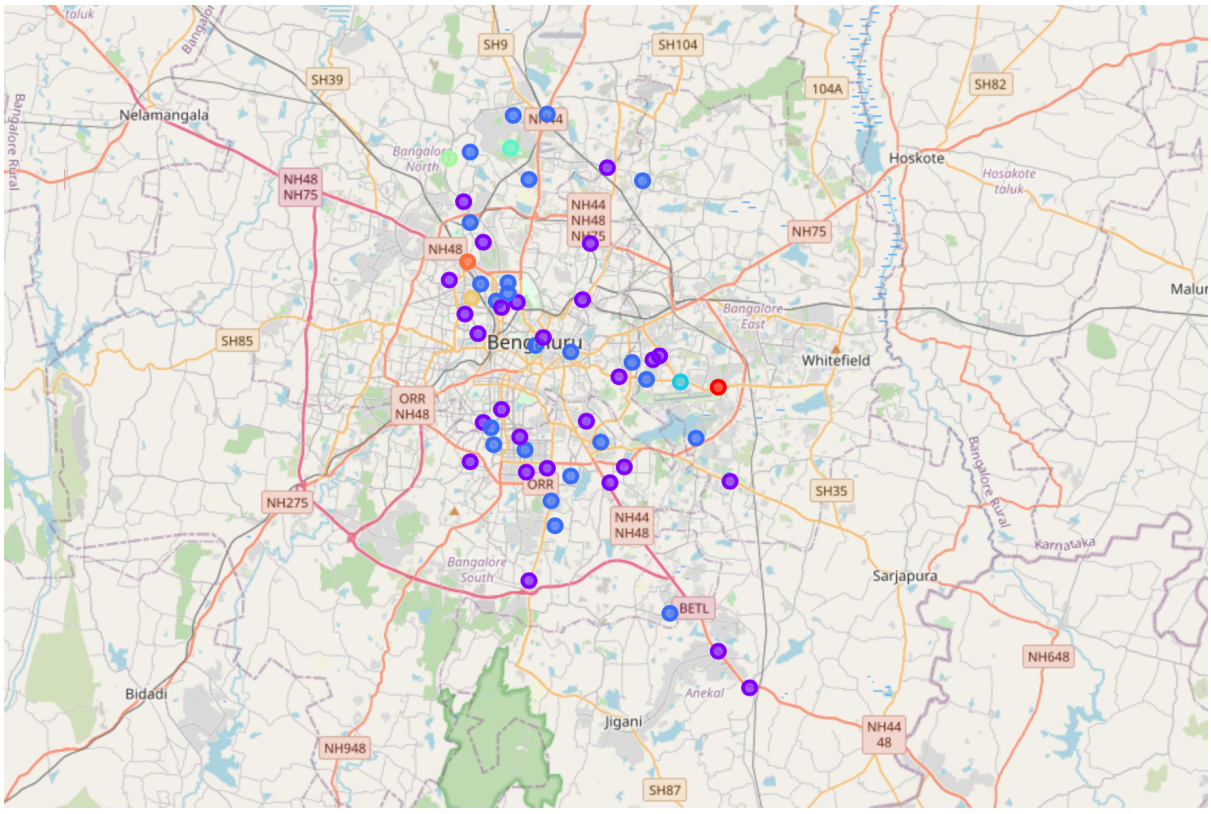
[94]:

| | Neighborhood | 1st Most Common Venue | 2nd Most Common Venue | 3rd Most Common Venue | 4th Most Common Venue | 5th Most Common Venue | 6th Most Common Venue | 7th Most Common Venue | 8th Most Common Venue | 9th Most Common Venue | 10th Most Common Venue |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Arabic College S.O | Indian Restaurant | Electronics Store | Auto Workshop | Deli / Bodega | Donut Shop | Dog Run | Diner | Dim Sum Restaurant | Dessert Shop | Department Store |
| 1 | Ashoknagar S.O (Bangalore) | Indian Restaurant | Diner | Park | Breakfast Spot | Convenience Store | Indie Movie Theater | Szechuan Restaurant | Dance Studio | Dim Sum Restaurant | Dessert Shop |
| 2 | B Sk II Stage S.O | Ice Cream Shop | Gym | Pizza Place | Fast Food Restaurant | Cupcake Shop | Diner | Dim Sum Restaurant | Dessert Shop | Department Store | Deli / Bodega |
| 3 | Bangalore G.P.O. | Indian Restaurant | Café | Chinese Restaurant | Capitol Building | Dance Studio | Bakery | Intersection | Park | Hotel | Fried Chicken Joint |
| 4 | Bannerghatta Road S.O | Café | Office | Cafeteria | Indian Restaurant | Sandwich Place | Food Court | Yoga Studio | Dance Studio | Dim Sum Restaurant | Dessert Shop |

## The Model

The algorithm used for clustering the neighborhood is K-Means.
The optimal K has been specified as 8 based on the silhouette score.

The output of clustered neighborhoods is as follows



## Conclusion

The similar neighborhoods in Bangalore have been visualized. These will aid for decision making when planning to move to Bangalore.
The complete project has been implemented using open-source datasets.