

# Clustering and Neighborhood Analysis – Hyderabad

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# Business Problem

- Analysis of Neighborhoods is critical for Investing in Residential Property
- Investors, real estate agents and Individuals look property with good ROI.
- Prices of the land plays a key factor
- Trade off between Price and Amenities is necessary

# Prices Data

- Locality and Prices data from below webpage is used

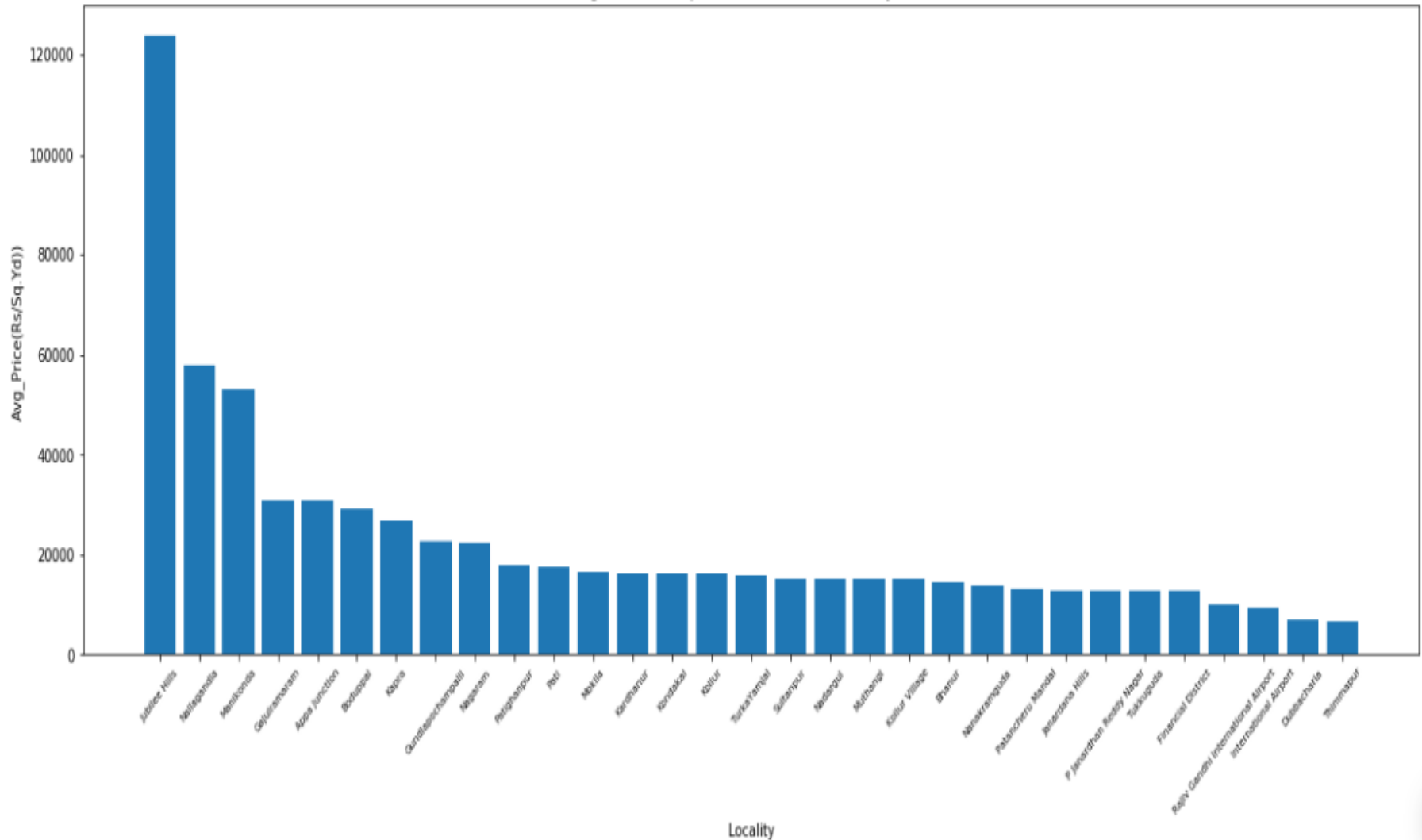
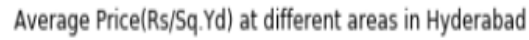
<https://www.99acres.com/property-rates-and-price-trends-in-hyderabad>

- Data uploaded to IBM cloud data assets
- Data accessed and loaded into Notebook
- Average price calculated for analysis

## Contd...

	Locality	Price_Min_Rs_per_SqYd	Price_Max_Rs_per_SqYd	Avg_Price_Rs_per_SqYd
0	Appa Junction	26392	35190	30791.0
1	Bhanur	13005	16065	14535.0
2	Boduppal	26775	31365	29070.0
3	Dubbacharla	6885	6885	6885.0
4	Financial District	12622	12622	12622.0

# Locality vs Prices



# Coordinates Data

- Locality and Coordinates data from Nominatim API.

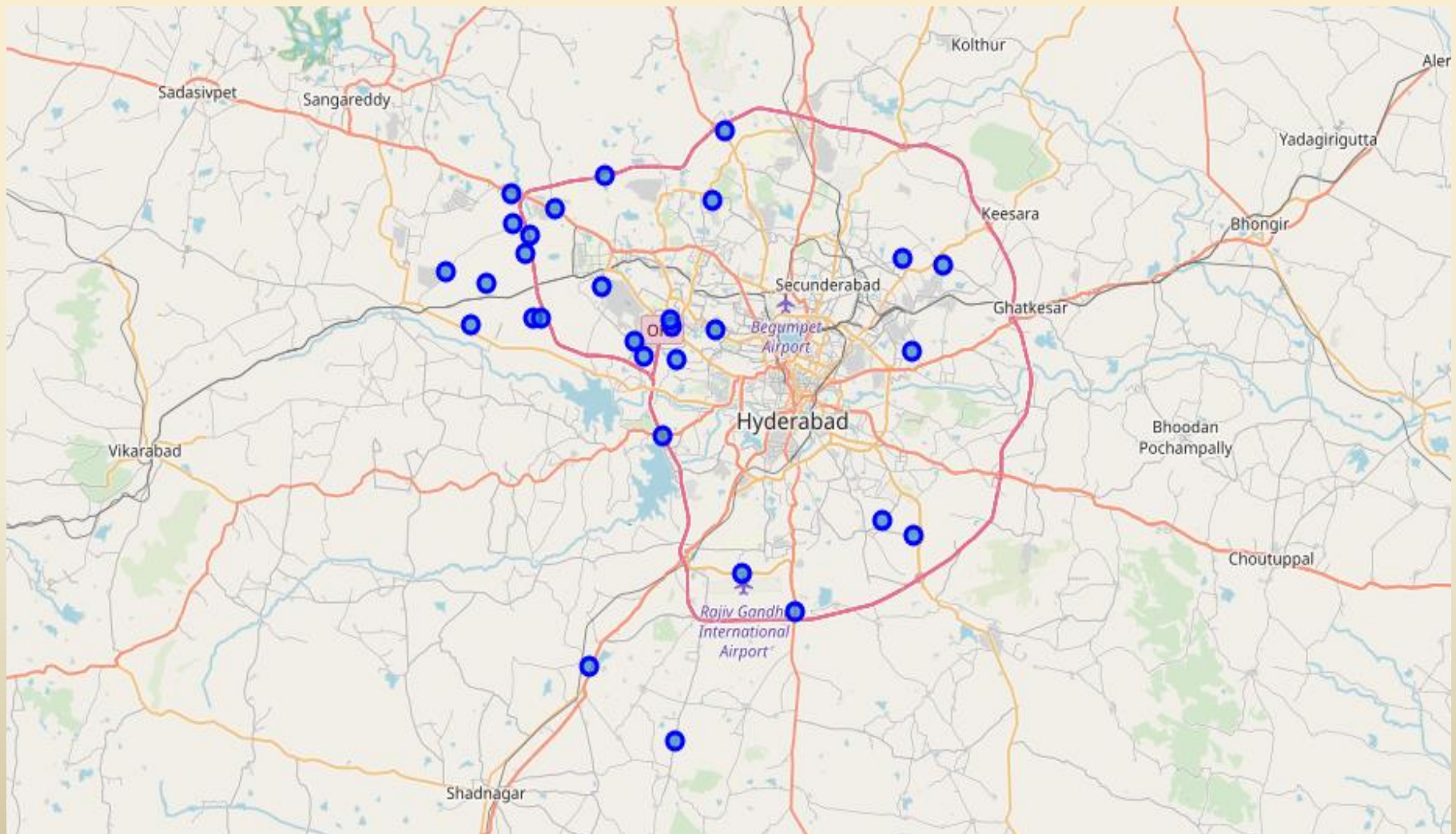
<https://nominatim.openstreetmap.org>

- Data uploaded to IBM cloud data assets
- Data accessed and loaded into Notebook

# Coordinates Data

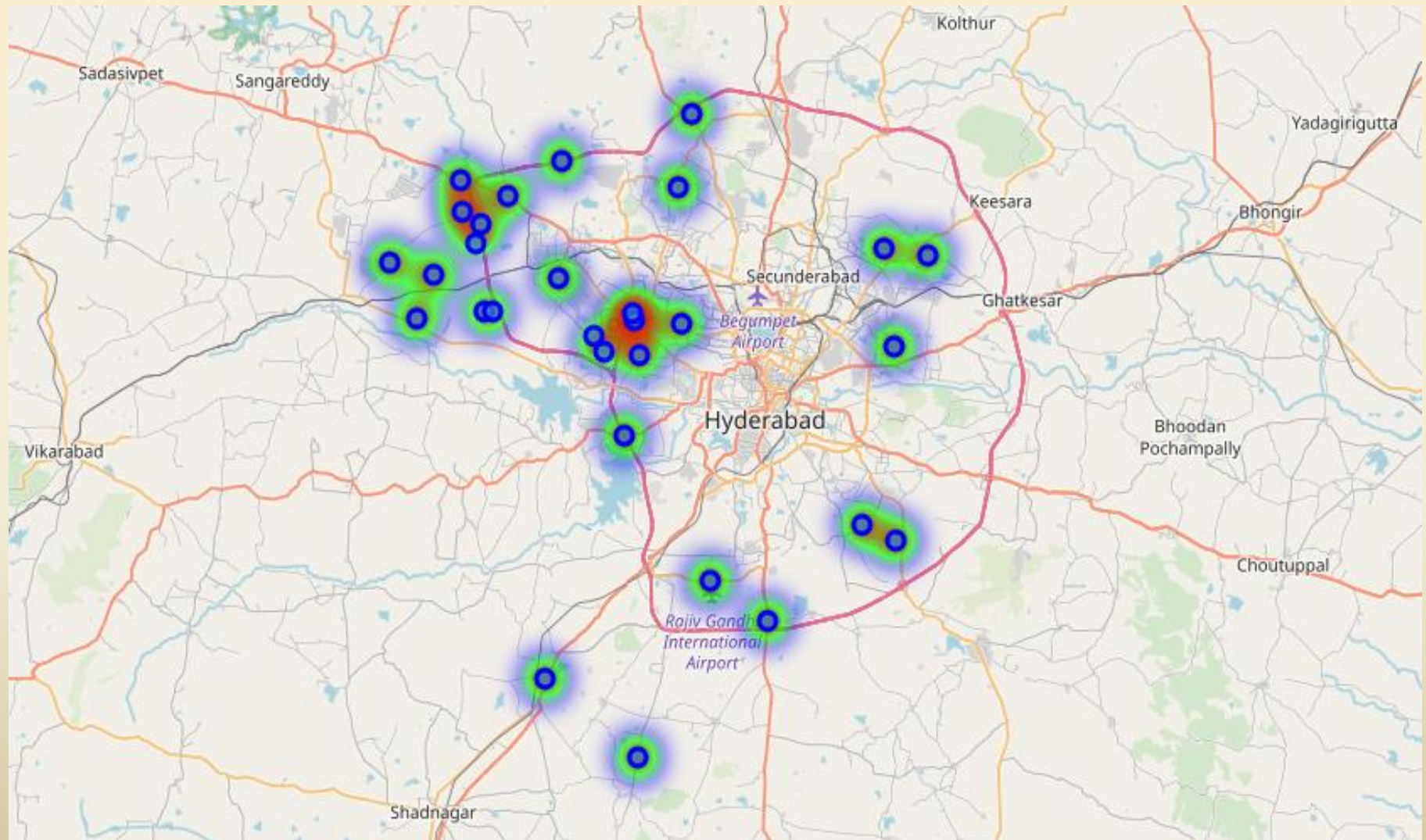
	Locality	Latitude	Longitude
0	Appa Junction	17.349710	78.360158
1	Bhanur	17.478825	78.169449
2	Boduppall	17.416539	78.580225
3	Dubbacharla	17.107689	78.370912
4	Financial District	17.412001	78.343023

# Data on Geo-Map using Folium





# Heat Map of Prices



# Explore Top 10 Venues in each Area

- Explore venues in each area within 1000<sub>mtrs</sub>.

<https://api.foursquare.com>

- Group venues by areas.
- Get frequency and normalized value of each venue category.
- Feed data to K-Mean clustering

# Contd..

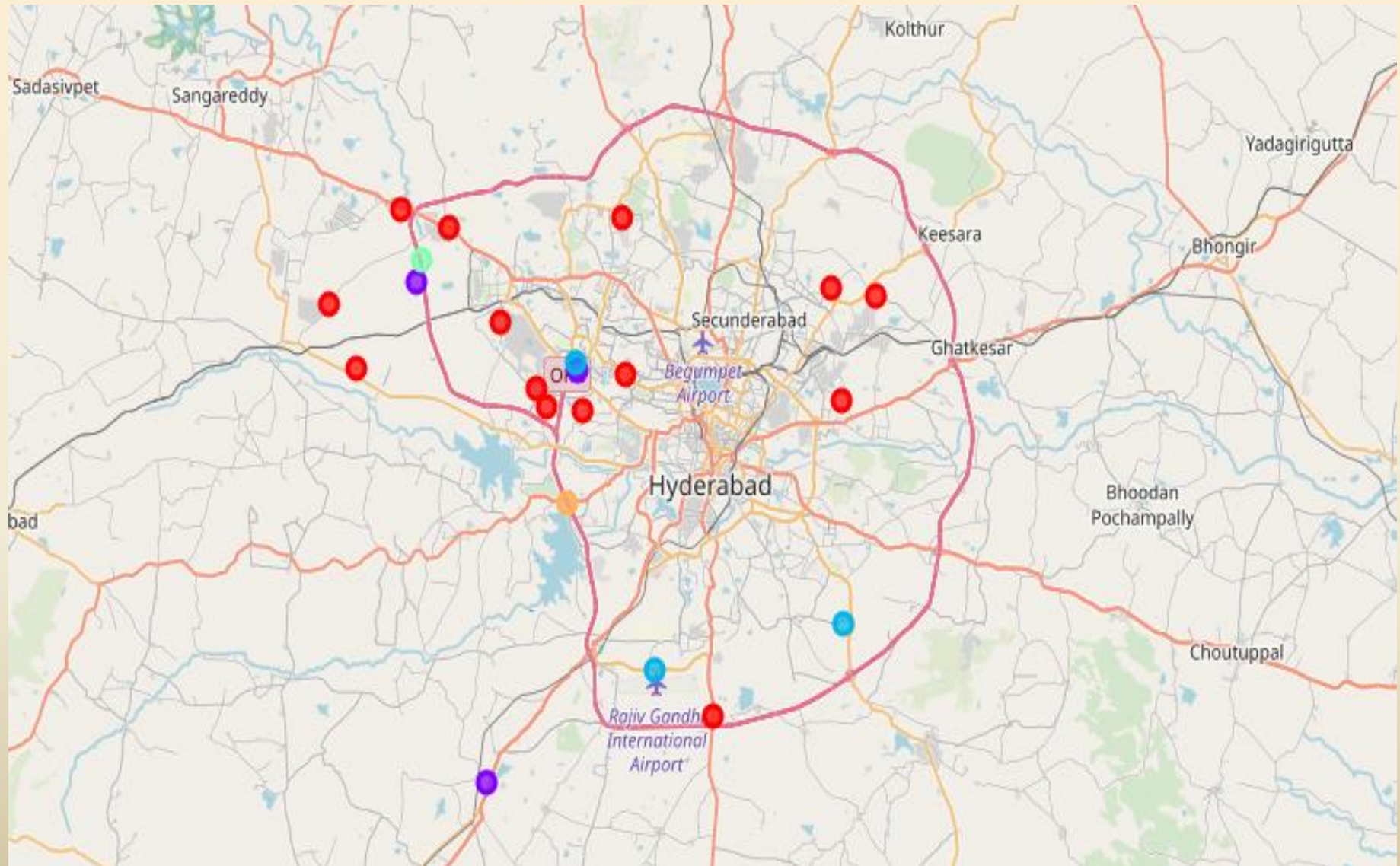
	Neighborhoods	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	Appa Junction	Athletics & Sports	Vegetarian / Vegan Restaurant	Deli / Bodega	Clothing Store	Cocktail Bar	Coffee Shop	Comfort Food Restaurant	Convenience Store	Cupcake Shop	Dairy Store
1	Bhanur	Indie Movie Theater	Vegetarian / Vegan Restaurant	Furniture / Home Store	Clothing Store	Cocktail Bar	Coffee Shop	Comfort Food Restaurant	Convenience Store	Cupcake Shop	Dairy Store
2	Boduppal	Dairy Store	Pharmacy	Pizza Place	Vegetarian / Vegan Restaurant	Chinese Restaurant	Clothing Store	Cocktail Bar	Coffee Shop	Comfort Food Restaurant	Convenience Store
3	Financial District	Café	Food Court	Hotel	Spa	South Indian Restaurant	Coffee Shop	Pizza Place	Dairy Store	Chinese Restaurant	Clothing Store
4	Gajulramaram	Multiplex	Café	Chinese Restaurant	Clothing Store	Cocktail Bar	Coffee Shop	Comfort Food Restaurant	Convenience Store	Cupcake Shop	Dairy Store

# K-Means Clustering

- Unsupervised Machine Learning method.
- Clustering based on similarities.
- Cluster group of 5 is selected.



# Clusters



# Results and Conclusion

- Cluster-0 consists of large number of areas
- This cluster has best amenities suitable for living like ATM, Restaurant, Supermarket, Pharmacy and Cloth Stores
- However prices are high.
- Cluster-1 has comparatively less developed venues and nominal prices.

# Future Scope

- Other features like below can be used for better decision making.
  - population densities
  - Industrial locations
  - Roadways
  - Water body proximity etc