Setting up a Craft Beer Brewery

Capstone Project: Battle of Neighborhood

By: Prashant Gautam

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Introduction

Craft beer or Freshly brewed beer or organic beer is getting popularity very quickly in India. Freshly brewed beers are chemical free, preservative free, essence free and glycerin free.

Besides being fresh a Craft beer also gives a chance to people to taste new flavors, new kinds of beer and most importantly get a beer with local ingredients e.g. Ragi (locally grown Finger Millet) beer, local fruit flavored etc…

With the increasing demand, a number of breweries are mushrooming in major cities like Mumbai, Bangalore, Delhi, Pune and Chandigarh. A study revealed that in 2018 there were around 60 microbreweries in India and the growth rate of such breweries is 100% year on year since 2016.

Business Need

There are many new vendors who are interested to setup breweries to cater to rocketing demands in India.

Existing vendors, based on the past growth numbers, would also like to extend the craft beer experience from micro-breweries dine-in to freshly brewed craft beer in bars of hotel, restaurants and pubs.

This requires breweries to be located at strategic locations to supply freshly crafted beer to the customers at hotels, restaurants and pubs.

- Craft beer does not have preservatives, so it should replenished quickly and regularly
- Hence, the breweries should be near hotels, restaurants and pubs to reduce the cost of transportation as well as reduce operating margins

Target Audience

Business clients who are already running a beer business or clients who are trying to start a Craft beer business and do not know where to expand or setup their breweries in Bangalore

Scope

I scoped the problem to Bangalore city as this is the IT city of India and is growing very fast. Bangalore's major part of population is Software Engineers who are loving (based on study) a healthier substitute of canned beer

I would consider only the major localities of Bangalore where a Craft beer business can get substantial volumes

Data Sources

- Localities:
    - To get the major localities of Bangalore we will scrape Wikipedia and extract the major localities of the city.
        - https://en.wikipedia.org/wiki/List_of_neighbourhoods_in_Bangalore
- Coordinates for each locality:
    - We will use geopy.geocoder Nominatim to get the location coordinates each locality
- Venues in and around those localities :
    - We will use Foursquare apis to get the venues

Data Preparation

1. Localities of Bangalore from Wikipedia will be scrapped and converted into DataFrame.
    a) The localities of Bangalore are described tables based on the regions like Northern, North-Eastern, Southern, South-Eastern, Eastern, Western and Central
    b) Take the names (1st Column) of the from every regional table
    c) Consolidate into one DataFrame having just one column called "Localities"
2. Names of localities will be used to get location coordinates
    a) Just to avoid clashes append the locality name with Bangalore
    b) Pass it Nominatim, iterate and append the coordinates to respective localities
3. Extracting the venues near the localities using Foursquare APIs.

a) Get the list of venues around the coordinates with suitable radius and limit =100

b) List of venues then can be grouped on basis Localities

c) Find the most popular venues

d) Use kmeans to get the top most popular venue categories

e) Mark the clusters on the map

f) Analysis the clusters for best possible localities

Methodology

Clustering

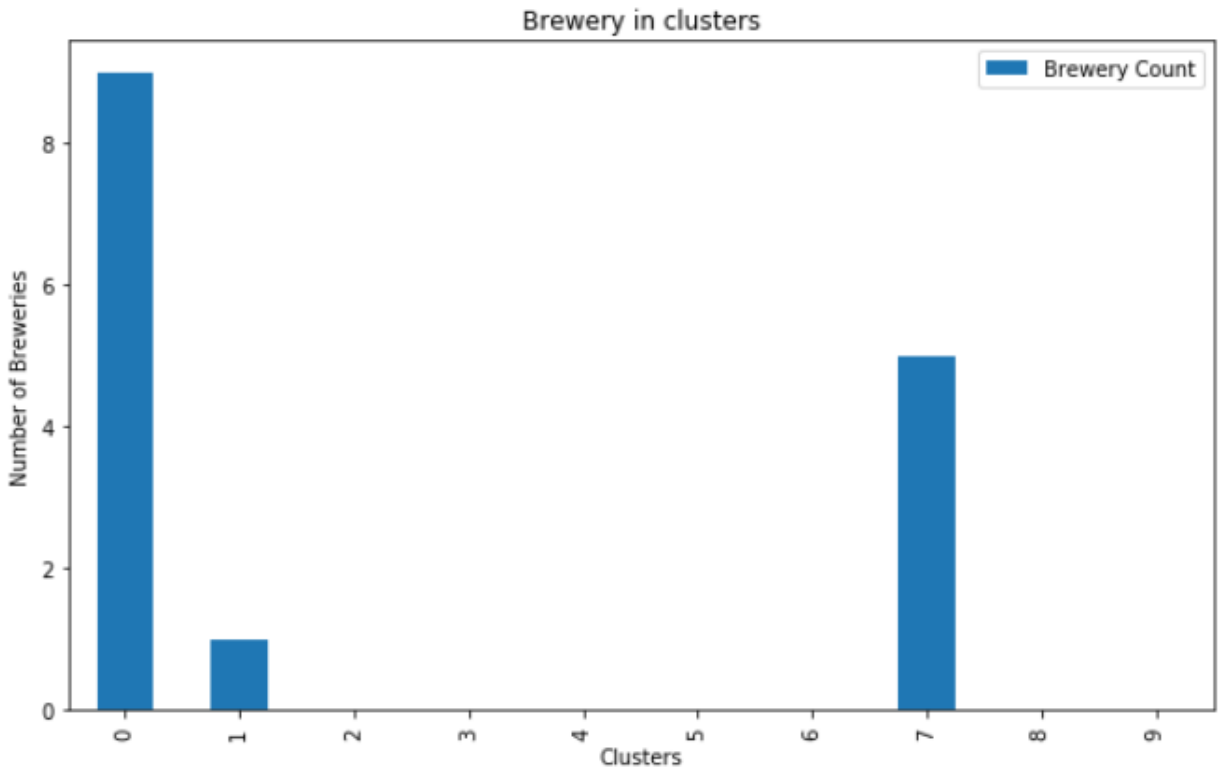
Identifying the most popular venues and clustering them to find which of the clusters are most suitable for setting up new / start Craft beer distribution is done using KMeans clustering algorithm.

After multiple iteration it was observed that best possible clusters are found when n_cluster is 10. KMeans is executed with different centroid seeds and using k-means++ for finding smart convergence.

Analysis based on number of venues

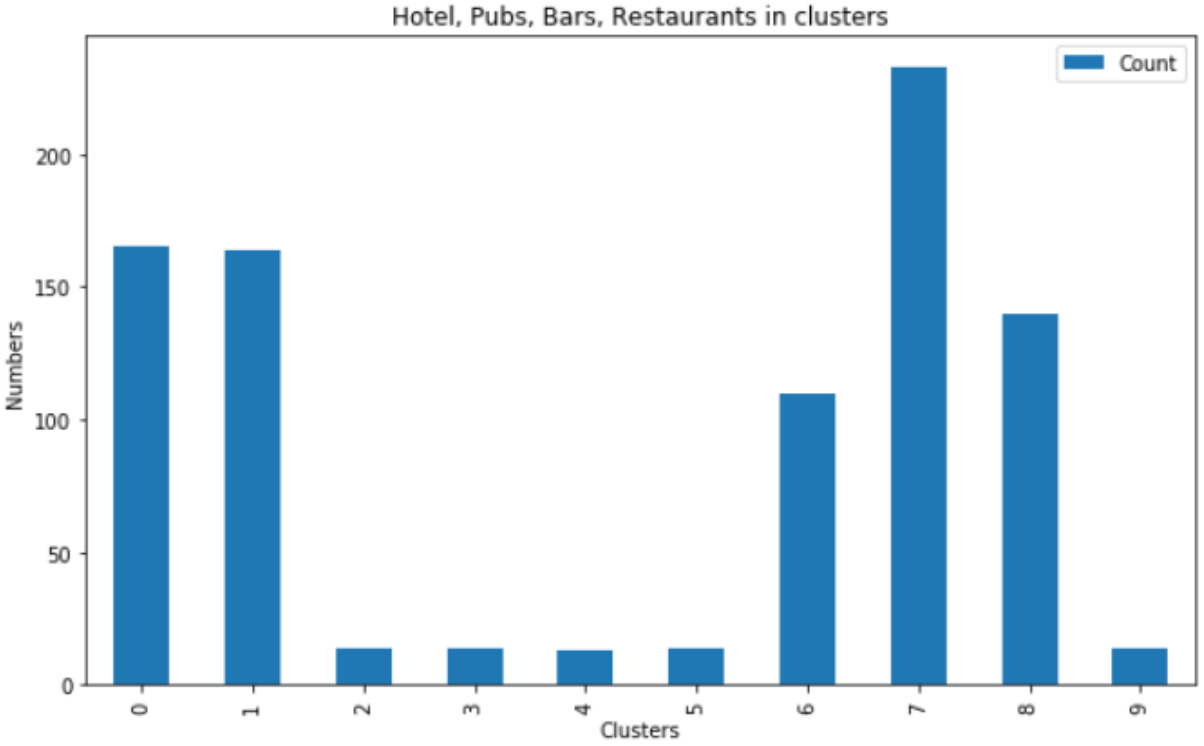
Number of Breweries

If we get to know that how many breweries that a cluster has we can get a better understanding of what would be our competition in that clusters. So, a bar graph with number of breweries would help us understand it better. This would be important information to decide on setting up new Craft beer brewery.



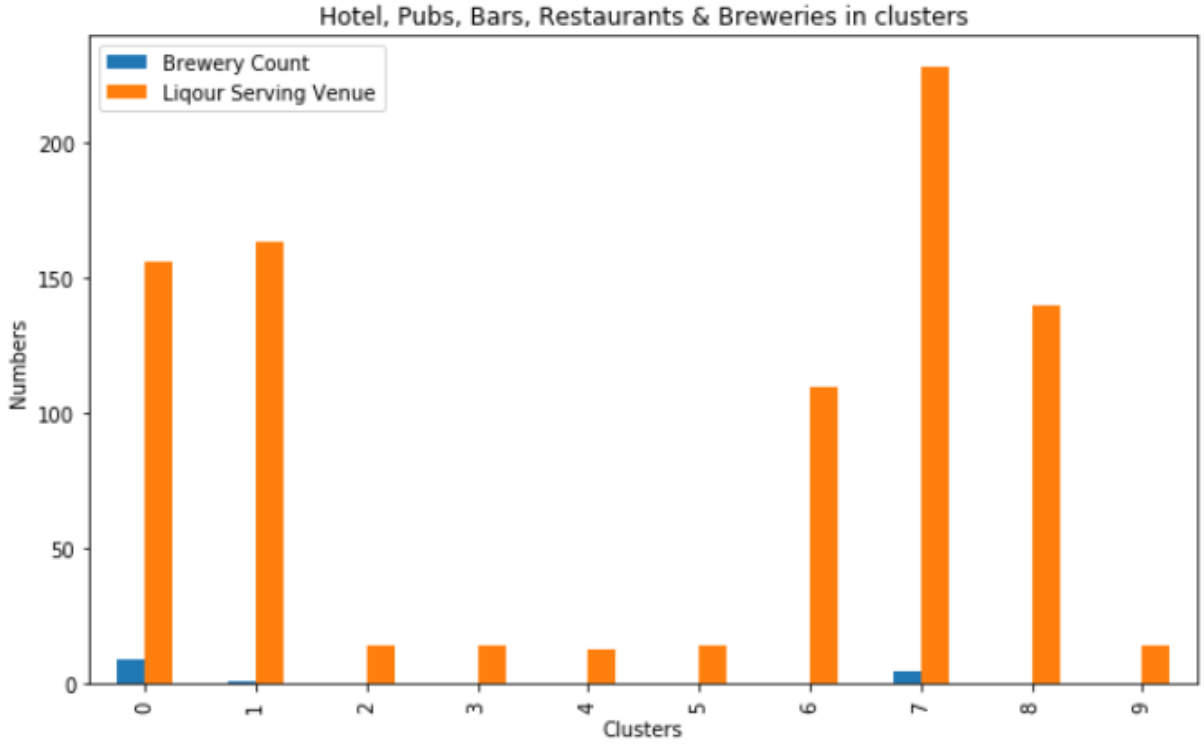
Number of Point of Sale

For distribution aspect of Craft beer, we need to know how many potential Point of Sale are available in that cluster. Potential point of sales are restaurants, hotel, bars and pubs. Filtering and counting the potential point of sales in a cluster would gives us a better understanding of distribution potential of the cluster.



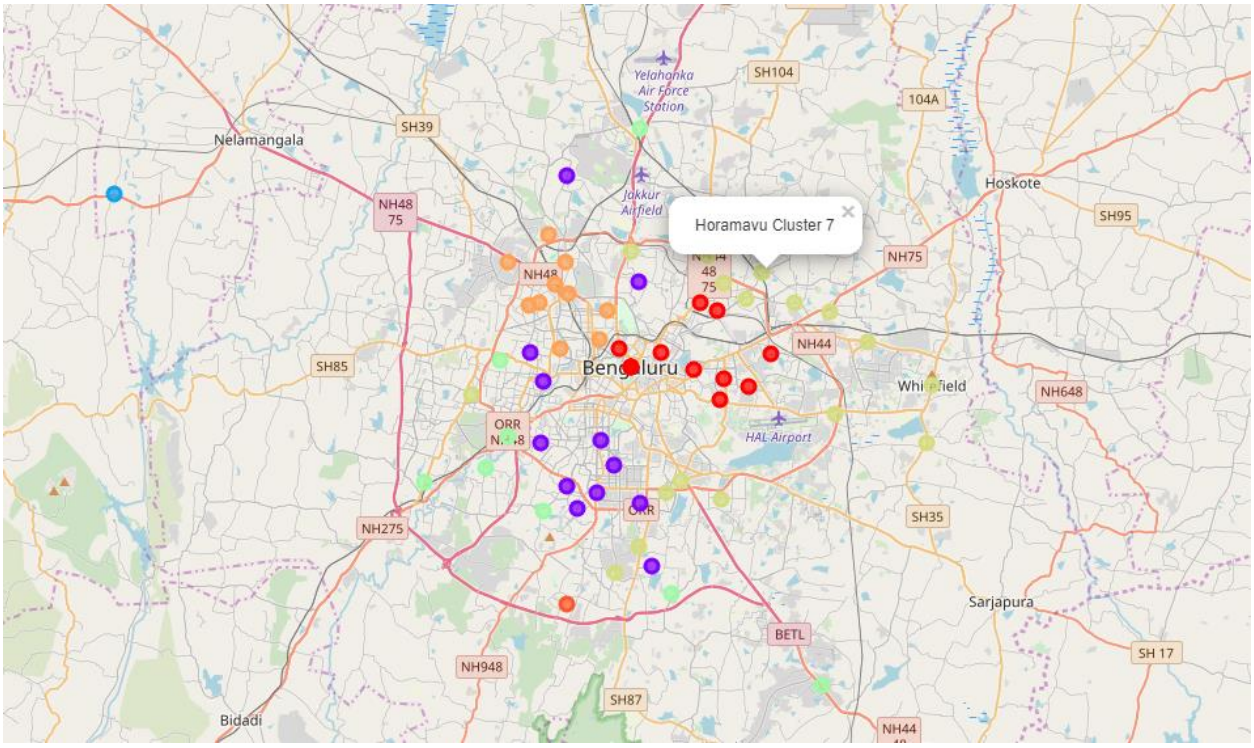
Combined Numbers

Combination of the these to bar charts would give us an understanding of existing competition and potential of distribution in all the clusters together in one bar chart.



Analysis based on map

With above bar charts it is clear that, which of clusters should be considered and which one of them are not so interesting for Craft beer brewery. Now we should also look at the clusters on a map which gives us an understanding of clusters in terms of how close they are located and how far are these clusters from the Bangalore City Center.



Results

The results of above analysis revolve around the following factors number of breweries, number of point of sales, proximity between the clusters and distance from the city center.

- Cluster 1 is suitable for existing breweries to start Distribution and not recommended to setup new Brewery as there are already many Breweries available
- Cluster 7 is suitable for Dine In Only but at the localities near city center (as seen in map) to get enough footfall.
- Cluster 8 is suitable for Dine In and Distribution only at localities away from the cluttered part of cluster (i.e. avoid localities very near to each other as seen in map)
- Cluster 2,5,9 are suitable for Dine In purpose as there no Breweries in these clusters, but there are not much distribution options as number of liquor serving venues are not much
- Rest of the clusters are not recommended for setting up breweries.

Discussion and Conclusion

Using the clustering approach, we could find the most suitable cluster for both dine in as well as exploring the distribution model. Bangalore is a big city with more than 12million people residing in the city. It is estimated that more that around 3million IT and IT related professionals are there in Bangalore and growing. Finding a right place to setup up such a brewery could be tricky when the high spending population (by local standards) is scattered across the city.

Foursquare provided a considerable amount of information about venue and their categories. Based on the data available we could find potential clusters and also potential dine in and distribution options.

But, if we could get more information about venues like if the liquor is served in the restaurants that we got from Foursquare or list of licensed liquor point of sale. This information would have given more confidence to the analysis.

Further to the analysis we could also extend this study with other factors like grading of the point of sales of liquor and proximity to the offices and residential areas.

Thank you

Prashant Gautam