Ideal location to install ATMs – Analysis

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1. Introduction

1.1 Background

Banks set up ATMs for two reasons — to provide service to their customers and to acquire transactions of customers of other banks that will give them some revenue. To service their own customers, banks set up on-site ATMs, those that are next to or in their branches. To get transactions of other bank customers, the ATMs are set up in high-footfall areas such as market places, big residential complexes, big commercial/ office complexes, important junctions, railway stations and bus stands. They service their own customers at these offsite ATMs too. Banks also place ATMs at strategic locations such as airports, trade centres and heritage buildings. They do this predominantly for the sake of publicity, to make their brand visible, even paying a high rental for the space. Such ATM kiosks are brightly lit with attractive interiors.

1.2 Problem

A geo-demographic study of the location is conducted to select a spot for an off-site ATM kiosk. Primary criterion under our consideration is potential footfall. We are given the task to analyse a set of neighborhoods in Chennai, India and provide the details of various diverse venues in the neighborhood. Bank executive team will make an informed decision based on our analysis of the location.

2. Data

2.1 Neighborhood Information

We will use a csv file containing neighborhood information required for our analysis.

2.2 Location Data Provider

Using a Location Data Provider, for a given location we will be able to identify venues nearby. Also how many of each category exist and how each surrounding venue is reviewed by other people. Using Foursquare location data, we will analyse the neighborhoods.

2.3 Features of data to consider

Presence of diverse set of venues such as Shopping centres, restaurants and other entertainment centres is an indicator of high foot traffic and thus potential locations for installing an ATM. For a given neighborhood, we may list the top venues in the neighborhood

and try to cluster the neighborhoods to find similar ones. The JSON data returned by Foursquare will have required information to make this analysis.

3. Exploratory Data Analysis

Lets take a look at the venue data obtained using the Foursquare api. Based on the available data, we will try to cluster the venues.


Venue information returned by Foursquare
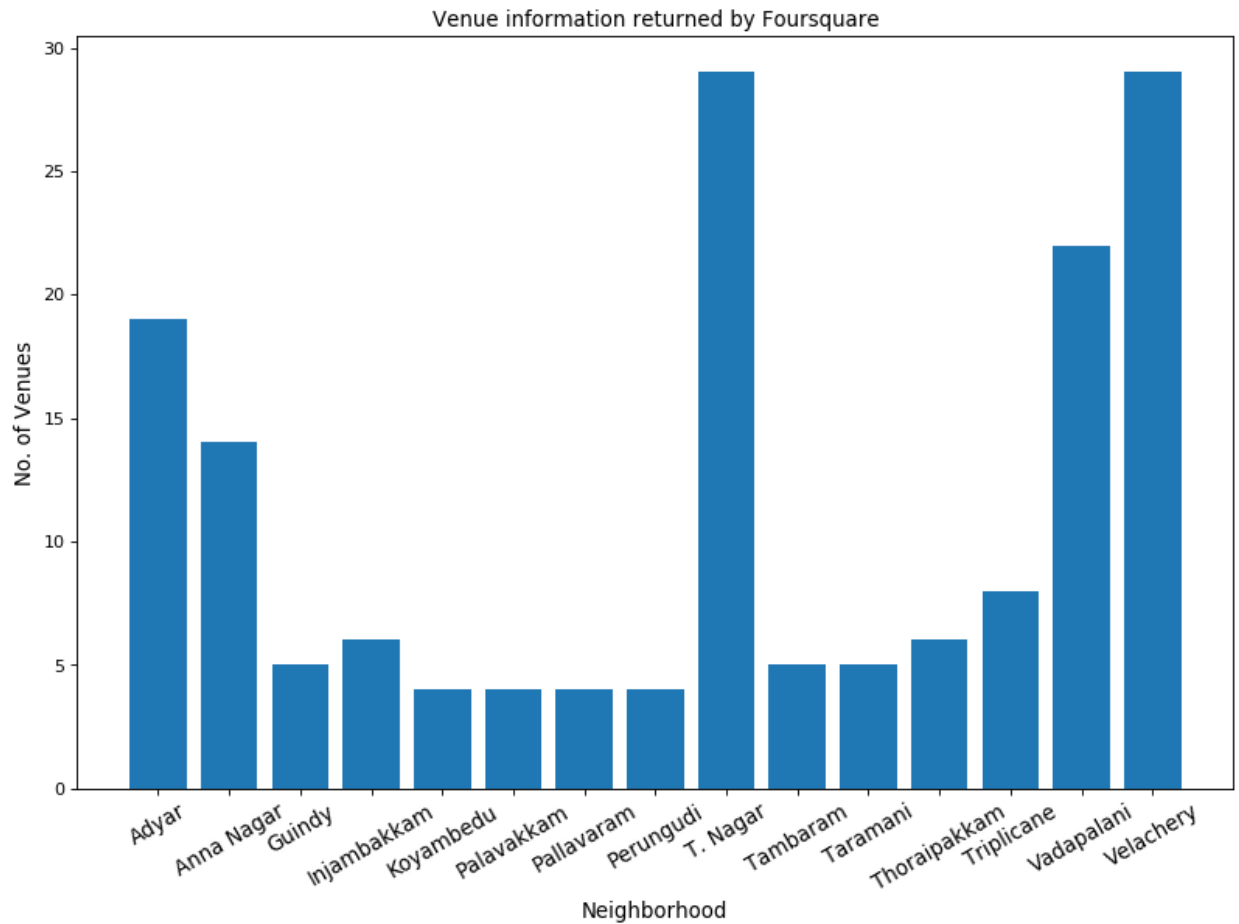
Let's take a look at the diversity of categories of venues present in each neighborhood. This is a good indication of an attactive neighborhood.
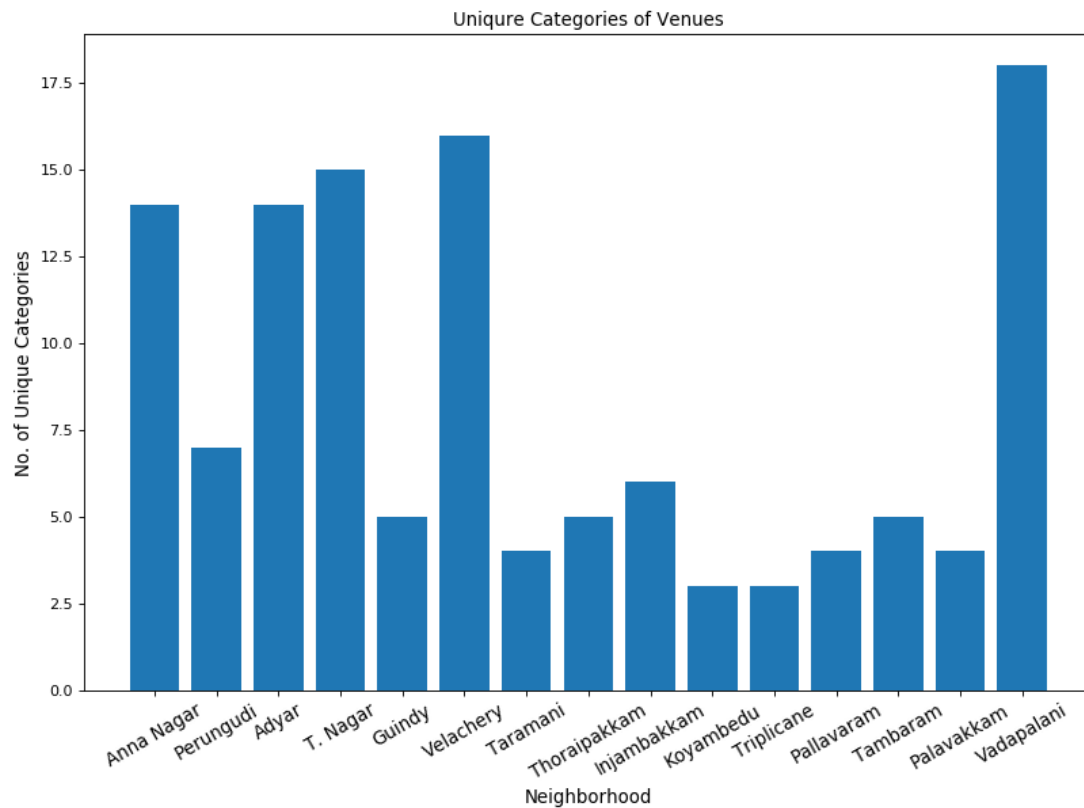
4. Clustering

Once we obtain information on various venues and categories in a neighborhood, we used Machine Learning technique, Clustering, to identify similar neighborhoods to make our analysis easier. Clustering is a non-supervised machine learning algorithm that groups similar items into same set of clusters. We use elbow method to determine the number of clusters.
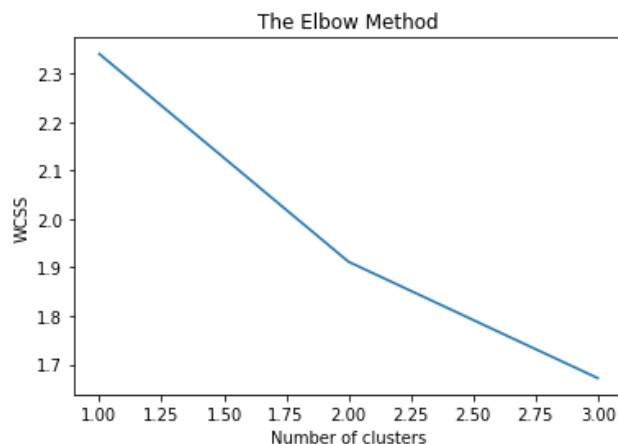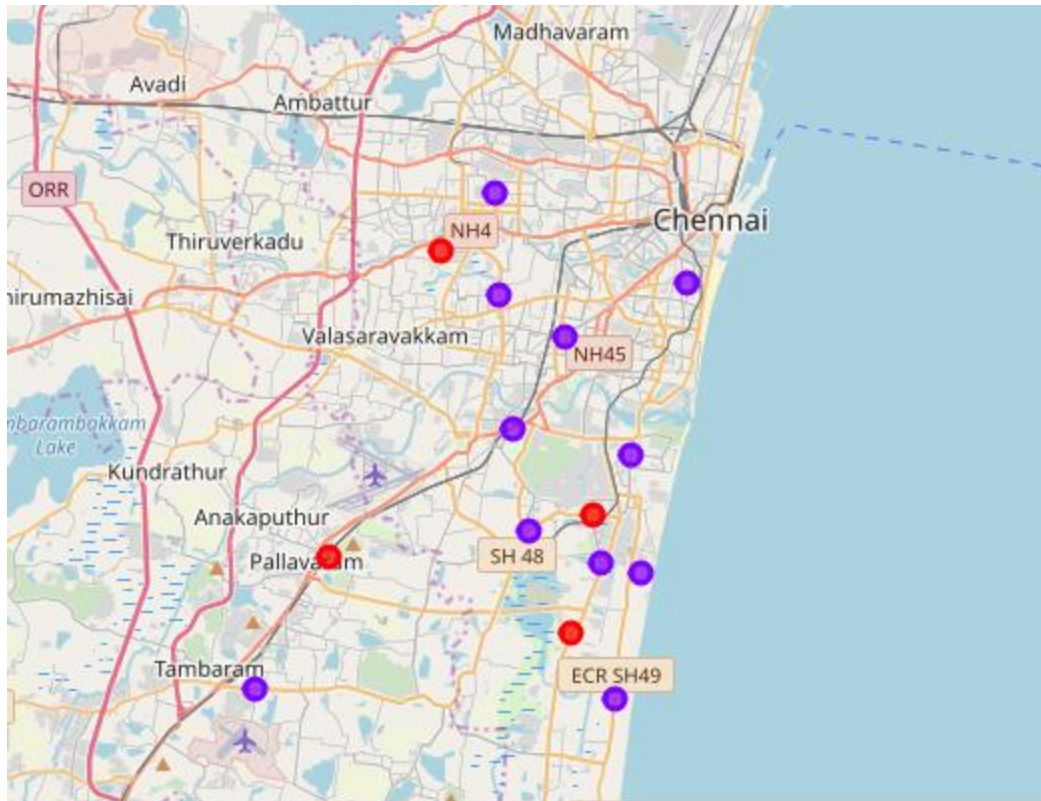
The above figure shows the clusters of neighborhoods.

5. Conclusions

Our analysis shows that restaurants and food courts are the majority occupants in most neighborhoods. High foot traffic can also be mapped to presence of Clothing stores as well as Department stores which are widely used.

First cluster has less diverse neighborhoods in terms of variety of catergories present. From second cluster, Anna Nagar, Adyar, T.Nagar, Vadapalani and Velachery have more diverse set of venues and therefore will experience high foot traffic compared to other neighborhoods under analysis. These also have more number of venues returned and hence points to the fact that they are indeed attractive neighborhoods. Second cluster neighborhoods are better locations to consider.

6. Future Directions

While the primary criterion is potential footfall, other factors such as rent, adequate power supply, connectivity, availability of parking space for customers' vehicles, security risk profile of the location and nearest cash feeder branch should be taken into account.