EV CHARGING STATION PLANNING

A Coursera Capstone Project

Report by
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1. Introduction

Electric mobility in India is still at its infancy. Little to no initiative from the government and the lack of infrastructure means growth of this industry is difficult. But in recent years cities like Bengaluru and a few other states have introduced policies that incentivize the electric mobility industry. Bengaluru , the IT hub of India is the epicenter of the EV movement in India with several startups like Ather electric gaining popularity with their electric scooters. One of the major challenges that an EV company faces is the setting up of high speed charging stations which is crucial in building a solid infrastructure. Hence it is an important for an EV company to identify locations to set up charging stations

2. Business Problem

The main aim of this study is to be able to identify locations in the city of Bengaluru which would be ideal for setting up EV charging stations. This study will make use of the foursquare API to identify clusters in the city. These clusters can then be used to find locations to set up charging station. .

This study will also help the Bengaluru municipality to take informed measures and make improvements to the current EV policies.

3. The Data

Data used for this study will be the Wikipedia list of Bengaluru neighborhoods. It has records of all the neighborhoods in the city of Bengaluru along with the coordinates of the location.

This data can then be used to identify venues accross the city according to the neighborhood using the explore query of the Foursquare API.

The query sent to the Foursquare API returns a json file which is a list of data of all the venues in a neighborhood. This data includes the Name, Category and coordinates of the venue.

4. Methodology

4.1 Data Cleaning

The list of neighborhoods taken from Wikipedia is first cleaned by removing repetitive rows. Also unwanted columns like area description are removed. To add coordinates of neighborhoods, the geopy library is used and added to the dataframe.

Using this dataframe nearby venues of the neighborhoods are extracted using the explore query of the Foursquare API.

4.2 Modelling

The dataframe containing the venues prepared for modelling by encoding the categories so they can be represented numerically by using the one hot encoding method. Then the mean of each neighborhood is taken for each venue and condensed. After this is done the clustering of the data can commence.

The kmeans clustering tool of the scikitlearn library is used for finding clusters. The number of clusters is set to 5. The data is then clustered. The labels are then merged with the dataframe and visualized using the folium tool. The clusters can then be analyzed.

5. Results

The clusters that are found are analyzed and the key areas are examined. Clearly cluster 0, 3 and 4 are the most popular in terms of density of venues. This means that these areas will have the most traffic. These areas will be the prime locations for setting up the stations. This also ensures that these stations are regularly used.

6. Conclusion

This study shows the use of clustering technique to find the most popular spots in town and the areas with the most footfalls. This study can also be used by the city municipality to create plans to standardize charging stations and improve its policies.