Opening A New Gym in Austin, TX

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Business Problem

- Great Austin, TX has a population of approximately 2.2 Million

- A number of Fortune 500 companies, such as, Dell, 3M, Amazon, Apple, Google, IBM, Intel, Oracle have headquarters or regional offices in Austin.

- People in the city are health conscious and look for services for their wellbeing.

- Identify suitable a location(s) to open a new Gym to fulfill that demand.

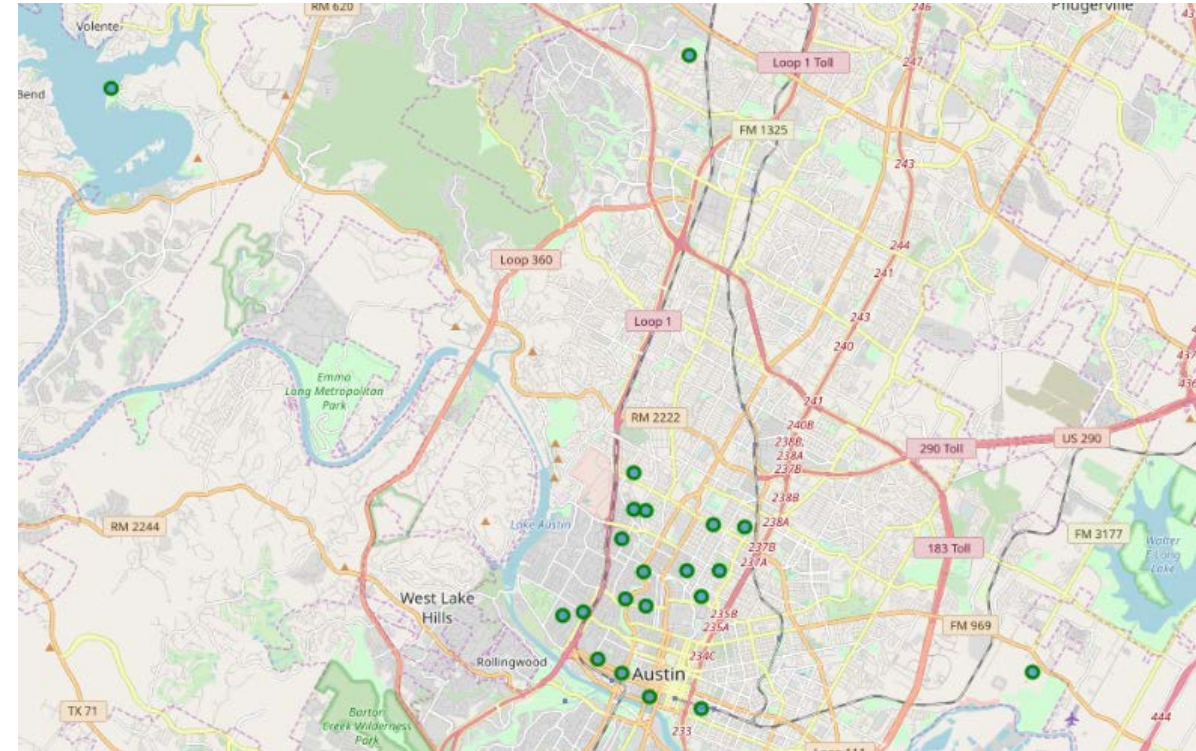- Single location for individual or multiple location for big business.

Data Description

- Data Required:
  - List of Neighborhoods in Austin, TX.
  - Latitude and the Longitude of the Neighborhoods.
  - Venue data, specifically related to Gym.

- Sources of Data
  - Wikipedia page for neighborhood
  - 'https://en.wikipedia.org/wiki/List_of_Austin_neighborhoods'
  - Geocoder package for Latitude and Longitude
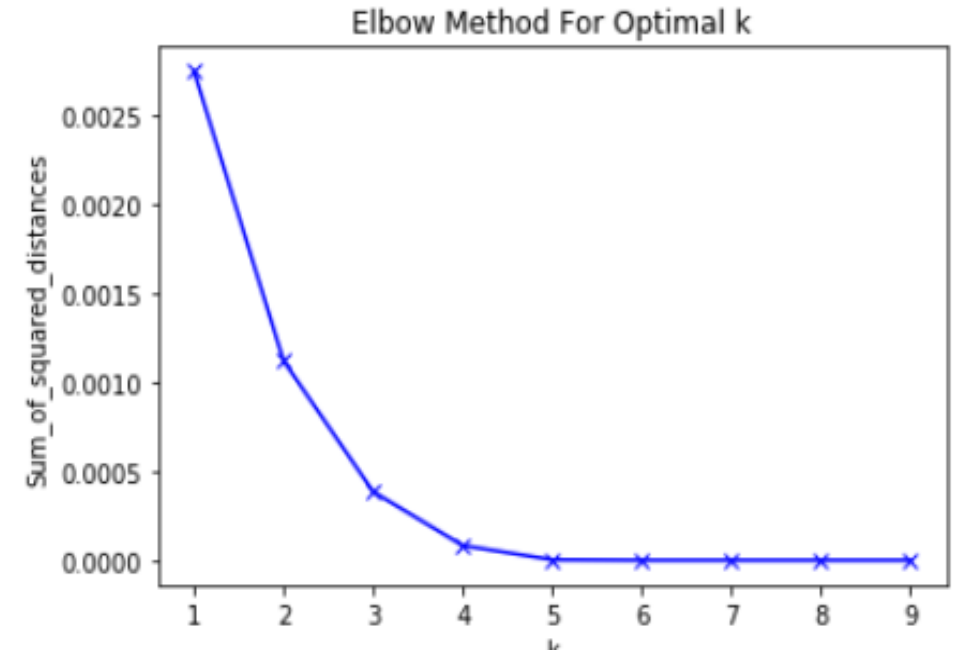 - Foursquare API for venue data

Methodology

- Web scraping Wikipedia page for neighborhood list.

- Get Latitude and Longitude coordinates using Geocoder package.

- Use folium to create a Austin map and superimpose its neighborhoods.

- Use Foursquare API to get venue data.

- Group data by neighborhood and taking the mean of the frequency of occurrence of each venue category.
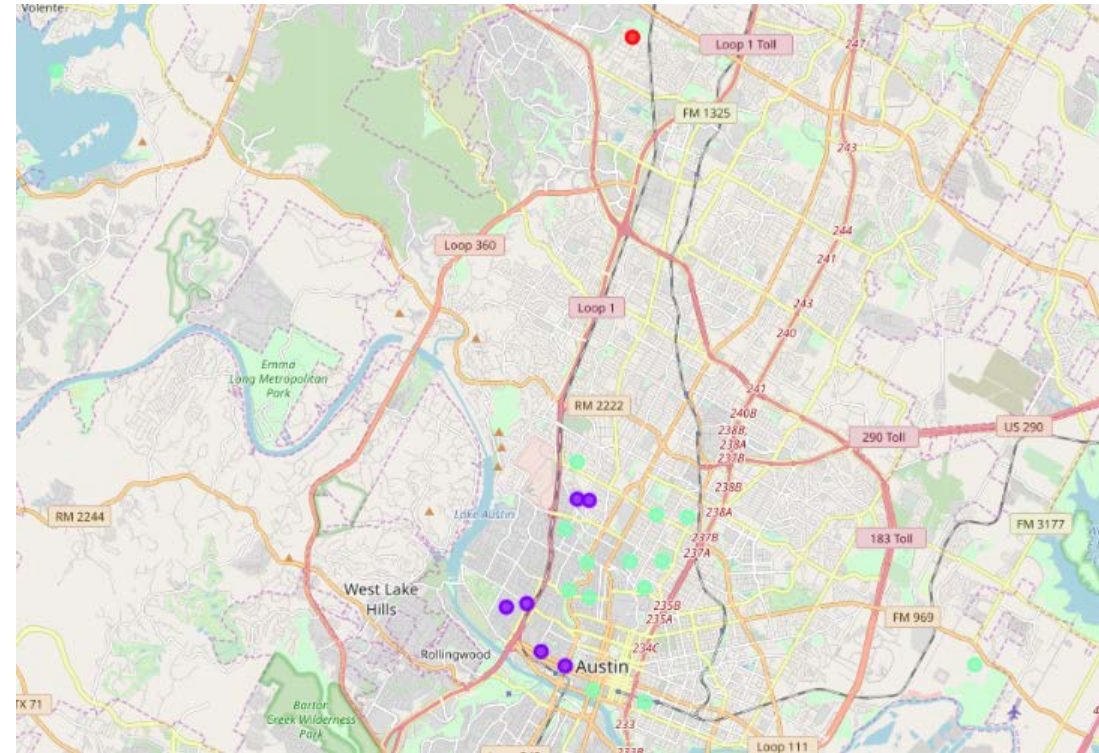
Methodology (Contd.)

- Filter venue category by Gym.

- Determine an optimal value of K of 3 for K-means algorithm by elbow method.

- Perform clustering on the data by K-means clustering.

- Visualize the clusters in a map using folium.

Elbow Method For Optimal k

Results

- Categorize the neighborhoods into 3 clusters
  - Cluster 0: Neighborhoods with a high concentration of gyms (red circle on the map)

  - Cluster 1: Neighborhoods with a moderate number of gyms (purple circles on the map)

  - Cluster 2: Neighborhoods with a few number to no gyms (mint circles on the map)

Discussions

- Most of the gyms are located in cluster 0, which is located north of Austin downtown.

- A moderate number of gyms are located in cluster 1, which is mostly west and north of the city.

- A very few gyms are located in cluster 2 and located on east and north side of the city.

Conclusions and Recommendations

- Open new a Gym in cluster 2 neighborhoods with little or no competition.

- Final decision on an optimal Gym location will be made by stakeholders based on the following:

  - Attractiveness of each location (proximity to park or water).

  - Proximity to major roads, real estate availability, prices.

  - Social and economic dynamics of every neighborhood etc.