Suggesting Ideal Location to open a Restaurant in Reno Metropolitan area

1. Introduction
1.1 Background
The Reno area is growing due to big companies like Tesla, Panasonic, Google, Apple and Amazon coming in. There are opportunities for small businesses to support the growing population. Investors, with background in the restaurant industry, are interested in opening a new restaurant in the Reno area to capture the opportunity.

1.2 Problem
This research will identify possible store locations with their competitive advantage and rank them from most favourable to least favourable.

1.3 Interest
This is a big investment and location is the first decision that investors need to make. To better ensure the success of their investment, they would like to know where should they open the store and how is the competitive advantage they have based on the location

2. Data acquisition and cleaning

2.1 Data sources
Main data source is obtained through Foursquare API call. We will capture information of venues within 500 meters from the neighborhoods of Reno. The information of neighboor hood location and information captured from based on Washoe county data https://www.washoecounty.us/assessor/online_data/DataDownloads.php

With this information, we can see the overall business landscape of targeted neighborhood areas and provide suggestions based on the popularity of the venues category.

2.2 Data cleaning
We need to import the data from Washoe county data and extract only relevant data for research: neighborhood, total property assess value, longitude, latitude, city.

2.3 Feature selection
We then use Foursquare API to extract the venues and its category as a feature for our clustering problem.

3. Cluster Modeling
After we obtain the venues and their category, we can use one hot encoding to identify the top 10 most popular venues in each neighborhood. Based on this, we can use clustering to identify which clusters are restaurant heavy so that we can focus on the remaining clusters for better competitive market for our new investment.

4. Conclusions
Based on clustering we see that Neighborhood in cluster 5 and 6 has a restaurant/coffee shop as their 1st common venue. We can exclude cluster 5 & 6 (light teal and green) and focus on the remaining neighborhoods cluster to open a restaurant.
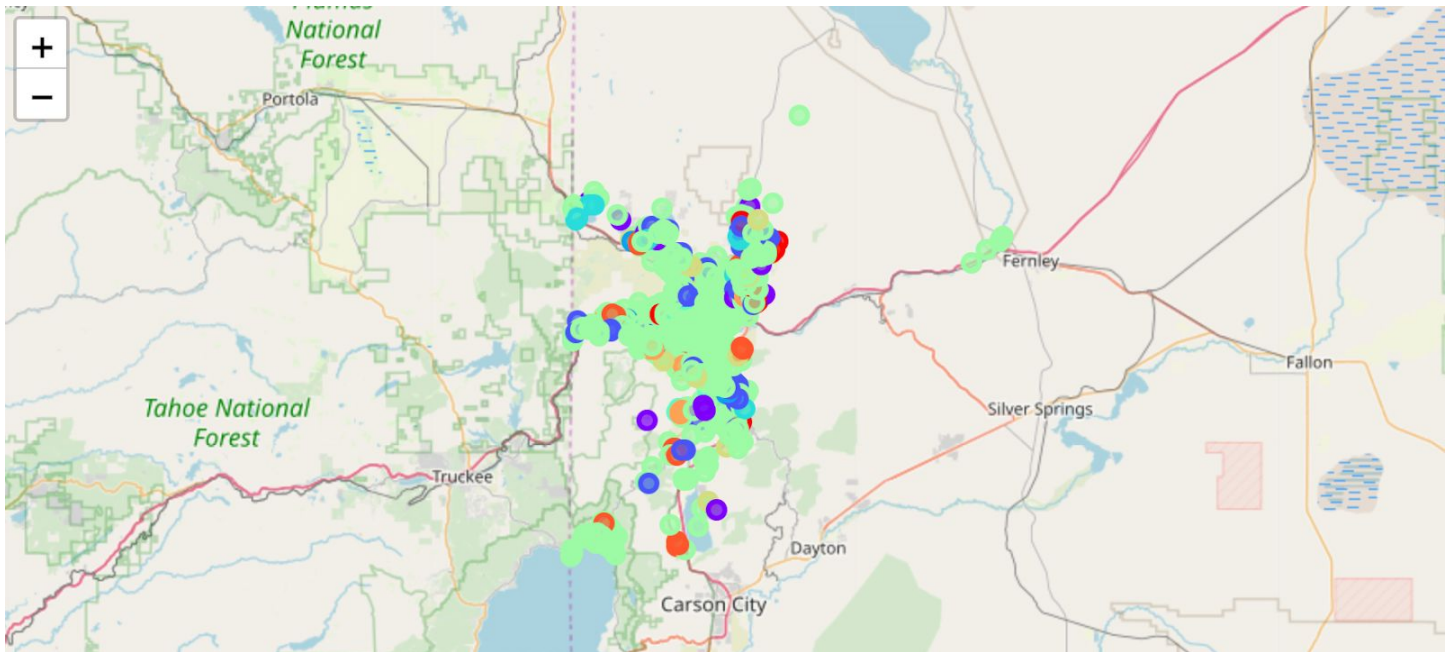
6. Future directions

The next step is to identify the demographic of the area to see which cuisine will give us the most competitive advantage. Depending on the neighborhood demographic and experiences of the chef, we have to choose our location accordingly. Beside products, rent, renovation cost and availability of commercial site are also important factors that can define the success of the business.