Venue Location Analysis using Foursquare and other Python’s libraries

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Abstract

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# Introduction

A critical factor when opening a franchise is to determine if the location is suited for such venue. Other factors, such as distance from other franchises of the same corporation or competitor franchises are also important, as well as the need for people traffic through the location (Franchise Help, 2019). The business problem discussed in this paper relates to the need of a franchisee to validate a location for a new venue given by his corporate sponsor. Mr. John Doe received a proposed location in the town of Falling Waters, WV to open a fast food franchise. Event when the corporation’s suggestion looks appealing, he wanted to know more about the rationale, or come to his own conclusion to decide if he should proceed.

I proposed the use of Foursquare to collect a dataset of all businesses in the area and use data science techniques to analyze the dataset and see what we could learn from it. In the following sections of this paper, I will describe the dataset, the methodology and main components used in the exploratory analysis of the data and the resulting discovery.

## The Dataset

The proposed location is a small shopping center located at [39.56375, -77.887494]. The first approach in generating a data set was to map out all businesses in a 10-miles radius of this location. Businesses included all categories, competitors, such as fast food restaurants, and any other businesses that could serve similar menu items, such as small coffee shops or sandwich. places). To generate the dataset, at first, my approach was to use the above coordinates and run a single search. Unfortunately, that approach returned a number of businesses smaller than the actual number of business in the area. I then decided to list all coordinated of small towns in the area and loop through them to generate single outputs, then aggregate them into a super data frame. This approach resulted in a data frame with 368 business.

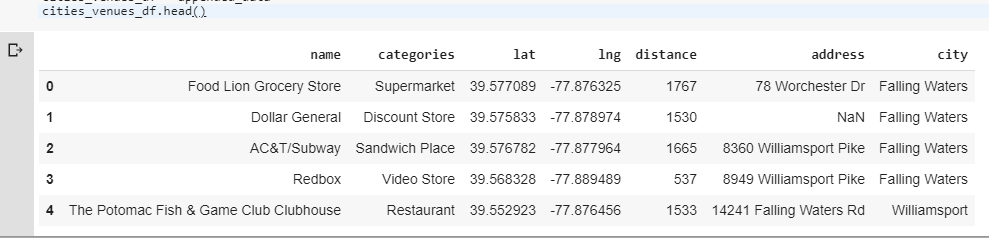


Fig. 1 (Data Frame of surrounding businesses)

The dataframe above describe each venue as a row with the corresponding features of name of the venue, categories, latitude, longitude, the distance of the venue in relation to the proposed location, its address and the corresponding city or town. A very important feature here is the “distance” from the proposed location, for both, competing businesses, and non-competing. For competing businesses such as those of the same category as the new franchise, it will give us an idea of how strong the competition may or may not be in the proposed location, and for non-competing businesses, we can learn about the potential customers traffic in the area.

## Methodology

The first step in the exploratory data analysis of the above dataset was to produce a visual depiction of where the businesses are in relation to the proposed location. Using folium, a library the builds on the strengths of Python’s data wrangling capabilities and leaflet.js, I was able to produce a map and superimposed all businesses by their coordinates. To have a better view of where each corresponding town is, I overplayed each town as a colored circle enclosing the businesses.

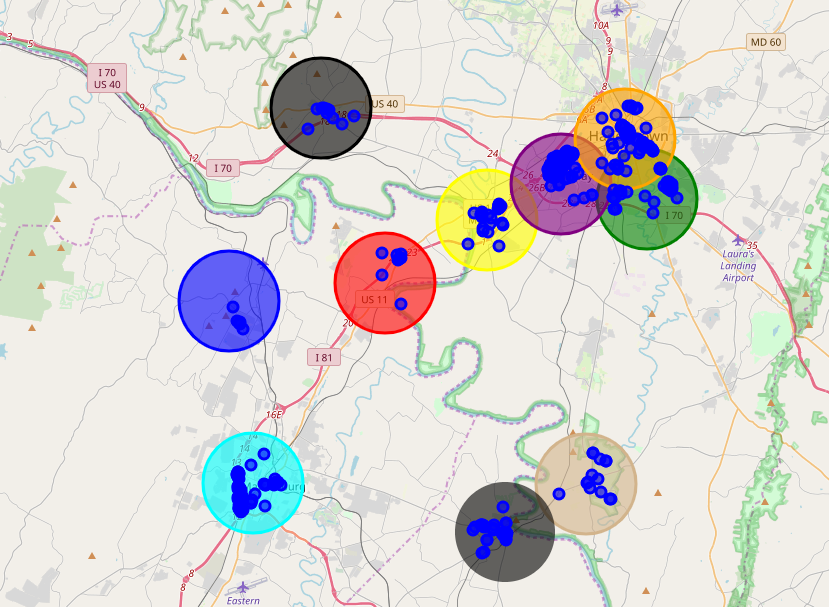


Fig. 2-Businesses locations and towns.

The map above shows how the businesses are naturally clustered within the different town’s boundaries. Later, we can see if using an algorithm such as KMeans produces a similar clustering. There were 112 unique business categories identified, the array below shows each category.



Fig. 3 -Array of businesses categories

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References

Franchise Help (2019). Where Is The Best Location To Open Your Franchise? Extracted from URL: https://www.franchisehelp.com/franchisee-resource-center/where-is-the-best-location-to-open-your-franchise-/

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