

Differences of Amenities between High Income vs Low Income in Lubbock

Stan Logie

February 28, 2021

1. Introduction/ Background Problem

Residents within the Lubbock area have complained that Mayor Dan Pope is not doing enough to help the East side of Lubbock which is mainly low-income households. Lubbock is a fast-growing city in West Texas and is like many growing cities across the United States. In one of the latest “Lunch with the Mayor” events, one resident complained that there is not much to do on the East side while the higher income side of Lubbock is getting all the attention. It is these complaints that have inspired this project to look at the most common venues within low-income and high-income neighborhoods in Lubbock.

2. Data acquisition and cleaning

The data used in this project originally came from the US Census Bureau but was taken from the site: <https://statisticalatlas.com/place/Texas/Lubbock/Household-Income>. From this site, the top 10 and the bottom 10 neighborhoods were taken and investigated further. GPS coordinates were found using google maps. This data was manually structured into a dataframe and used during this project. The Foursquare API will also be used for this project and combine these GPS coordinates to look around a pre-defined radius and return all the venues within the area. These venues will be taken and the top 3 most common venues will be returned. After looking into why only 16 of the 20 neighborhoods returned information from the Foursquare API, it was found some neighborhoods had no venues within radius. 3 out of 4 of these neighborhoods were classified as low-income neighborhoods.

3. Methodology

The exploratory data analysis in this project was kept simple in which the low income and high income had the total 3 most common venues counted and put into a bar graph. Machine Learning was also used to cluster similar areas based on the venues based on the k-nearest algorithm.

4. Results

As mentioned previously, we found the 3 most common venues, grouped them by income level, and made a count of the results. The resulting bar graph can be found below for both the low-income and high-income neighborhoods.

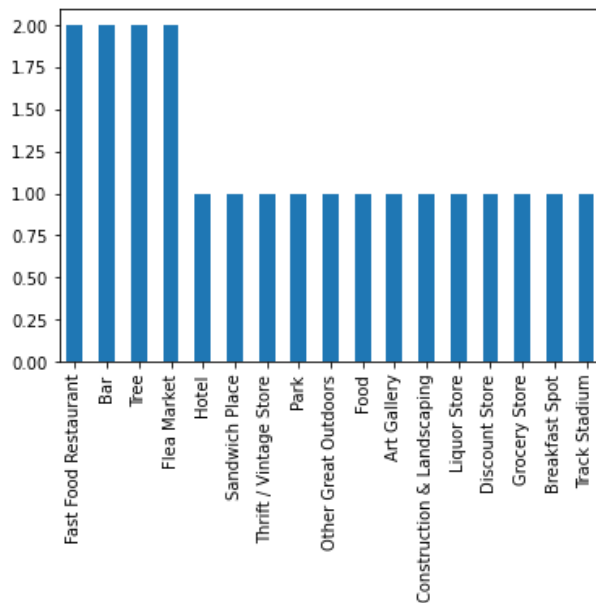


Figure 2 Low Income

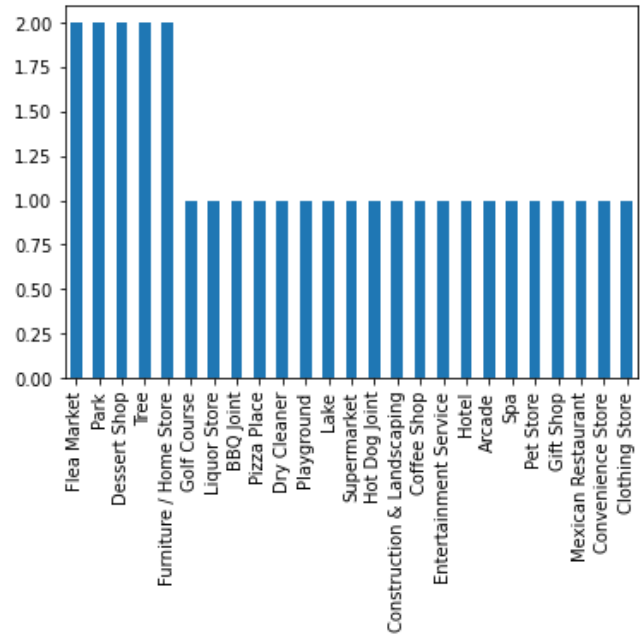
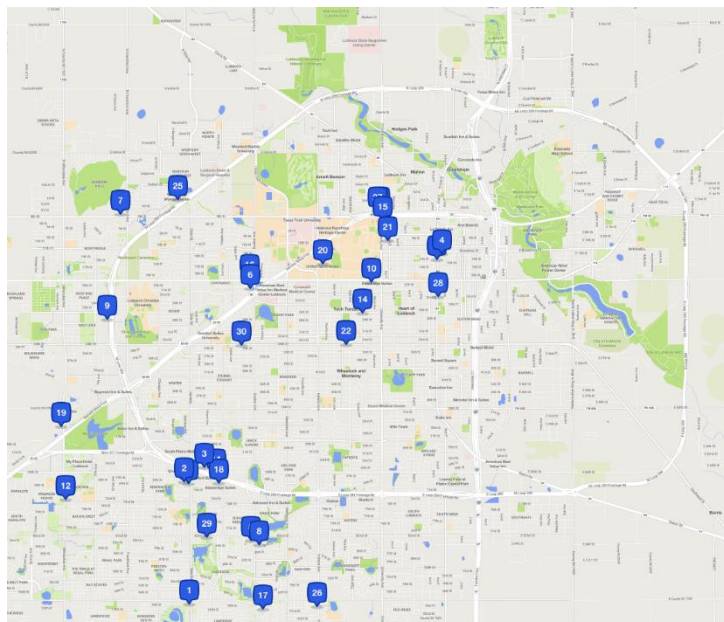


Figure 1 High Income

From the above graphs you can see that the most common venues for Low-Income neighborhoods in Lubbock were Fast Food Restaurants, Bars, Tree, and Flea Markets. High Income neighborhoods most common venues were: Flea Markets, Parks, Dessert Shops, Tree, and Furniture Stores. There are also many more fun activities within the High-Income areas such as Spas, Pizza Places, BBQ, Coffee shops, Golf Courses, and Mexican Restaurants.

5. Discussion

While the results appear to indicate the residents are correct in thinking that more entertainment options are needed in Low Income areas there is one major flaw in this analysis. We are assuming that the Foursquare API is taking in all the available venues which is not true. Let us look at the map below for what Foursquare shows in the Lubbock Area.



Lubbock has many more available venues than the places seen in the map above. There is a clear lack of data on the East side of the city in part because it is more zoned to industrial warehouses than fun places to go and eat. The Folium map below was generated from our python code to show where the GPS coordinates are of the neighborhoods analyzed.



It is clear why some neighborhoods would lack data on the east side given the lack of Foursquare venues there. Machine learning clustering was used but due to the lack of data it would overfit the data even with low values of k . Due to this, the code for clustering was left in the Notebook but the results were omitted. This analysis could be applied much better in an area like Dallas that has more foursquare data and an increased number of neighborhoods analyzed.

5. Conclusion

What can we conclude from our results above? We now know that according to the foursquare API there are Bars and Fast Food Restaurants in low-income areas but there are not many options for other fun activities. High-Income neighborhoods on the other hand have a wide variety of available options to them. We also found that oddly Flea Markets are common among both High and Low Income areas in Lubbock.