

Finding locations in Kauai for a State Farm Dealership

Final Report for Coursera IBM Applied Data Science Capstone

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Business Problem

- State Farm Insurance is a national chain of independently owned insurance dealerships who contract with State Farm for the right to establish a dealership which will exclusively sell State Farm insurance products from a retail location. Currently, the island of Kauai, Hawaii has no State Farm dealerships. Supposing that we are interested in opening a State Farm dealership on Kauai, the purpose of this investigation is to understand the characteristics of locations that currently support State Farm Dealerships elsewhere in Hawaii and compare them with various areas of Kauai to determine suitable candidates to establish a State Farm dealership. We will study existing State Farm Dealership locations through a variety of descriptive and predictive analytic techniques on neighborhood data, using these results to find similar Kauai neighborhoods.

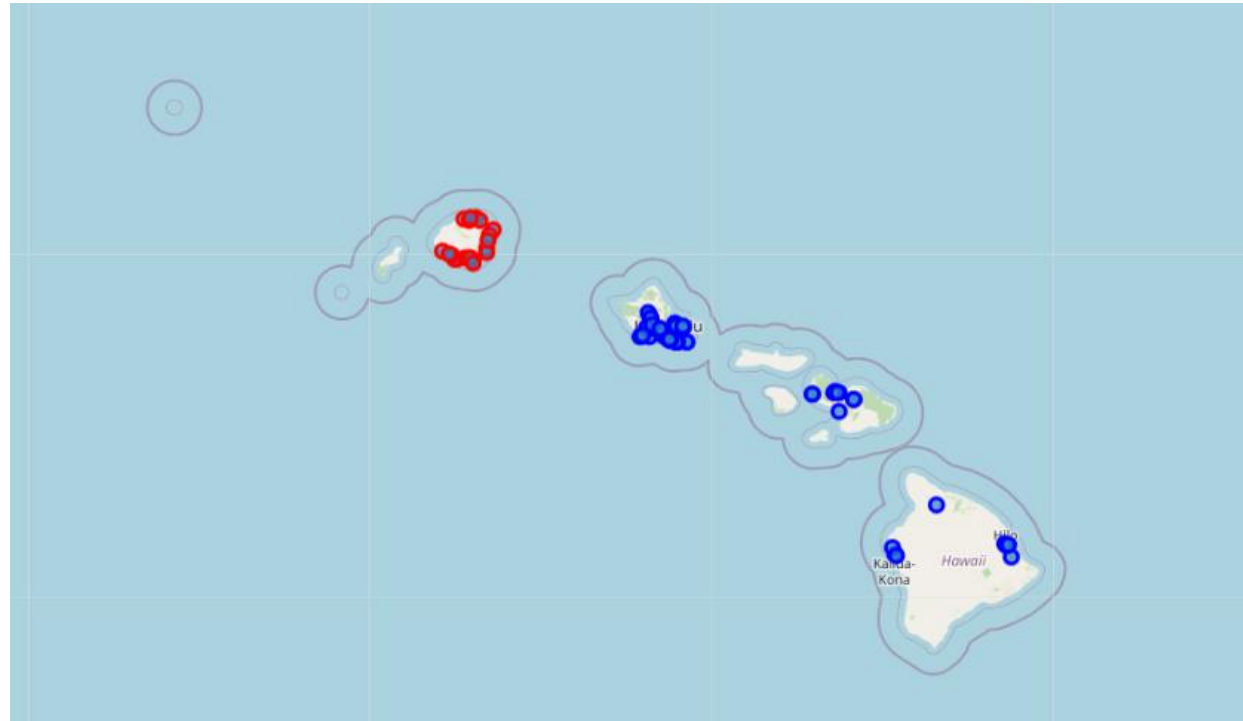
Data

- We will use two primary data sources to conduct our investigation:
- Location data on every existing State Farm dealership in the United States, including longitude, latitude and full address (approximately 19,000 records)
- Neighborhood data from the FourSquare Developer API regarding the types of commercial establishments in proximity to these dealerships.
- To prepare the data set, we will load relevant Python libraries and then acquire the State Farm and the FourSquare data. Finally, we will load data on potential Kauai agency locations.

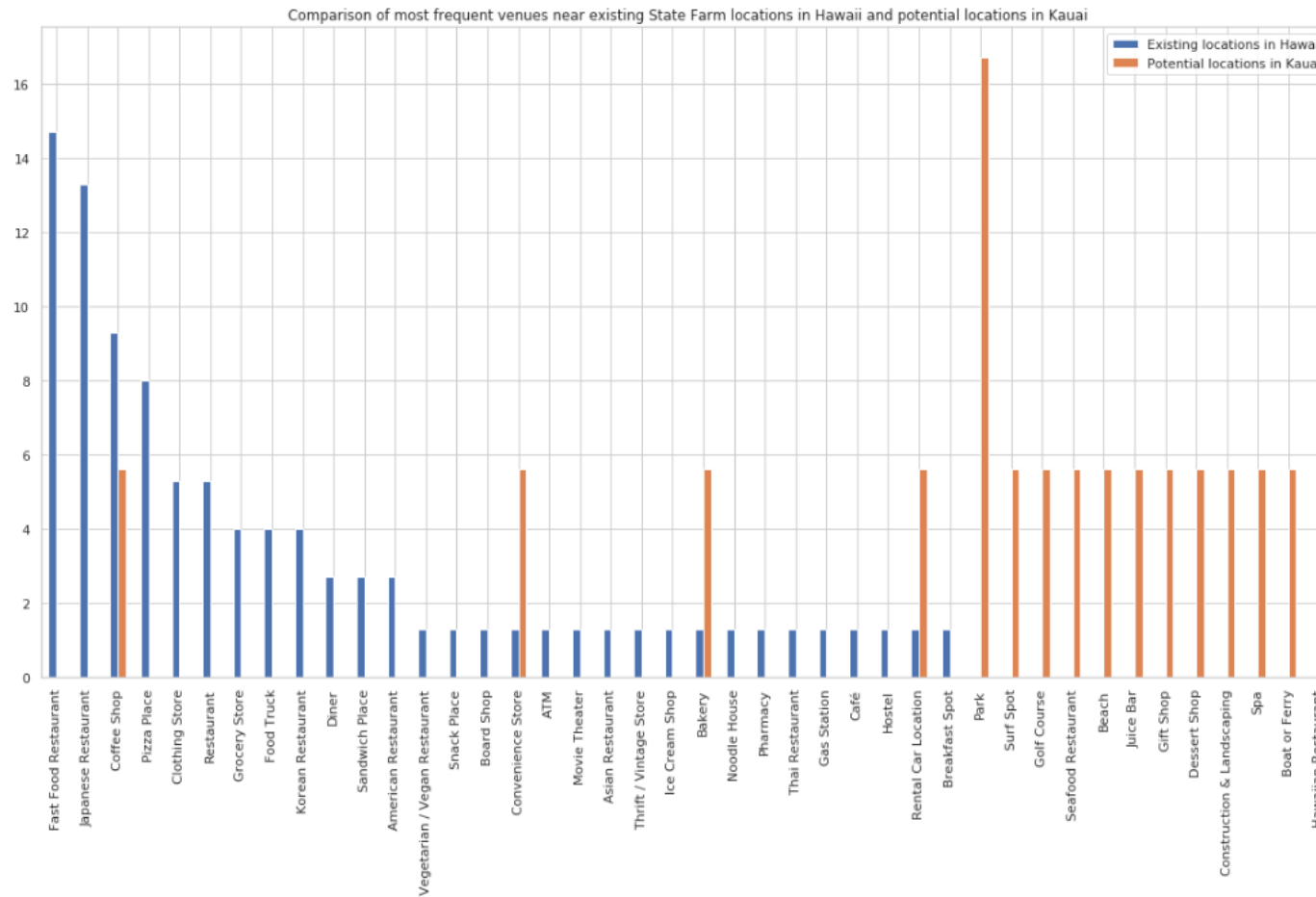
Methodology

- We shall approach our problem from several angles:
- Descriptive analysis of neighborhoods of existing State Farm agencies on other islands in Hawaii.
- K-means clustering on existing State Farm locations and their nearby venues which will be used to measure potential Kauai locations based on the size of the overall cluster they adhere to as well as their distance to the centroid of that cluster.
- We shall find a list of potential locations in Kauai using these two approaches, and develop a final list of potential locations based on those locations which are present on both lists.

Potential locations in Kauai and Existing locations on other Hawaiian Islands



Venue comparison of potential Kauai locations to existing locations



BEST OVERLAP:

Kaunakani

Koloa

Lawai

Lihue

K-means Clustering Approach

- Clustering existing locations by nearby venues and comparing these to potential locations in Kauai yields the following best matches
 - Hanalei
 - Hanapepe
 - Kilauea
 - Koloa
 - Waimea
- Comparing the results to the EDA approach yields only one location:
 - Koloa

Map of Best Potential Locations



Best location from EDA
shown in Orange and
from k-means clustering
in Blue

Final Location KOLOA
shown with blue
indicator.

Discussion and Conclusion

- **Discussion**

- The analyses provided were successful in establishing a single location for the State Farm agency in Kauai (Koloa). Although the analysis used two distinct *methods*, it was fundamentally predicated on the notion that a good location for an insurance agency can be determined by looking at nearby venues of existing agencies. While this seems like a reasonable consideration, we should introduce other indicators of an agency location viability, such as real estate values, population demographics, accessibility and likely foot traffic.

- **Conclusion**

- Using rudimentary *Exploratory Data Analysis* and *k-means clustering* can indicate viability of an insurance location based on the narrow view of finding similarities with successful insurance agency locations regarding other nearby venues. In our analysis of comparing potential locations in Kauai with existing locations on other islands in Hawaii, we were able to suggest a candidate location for our agency. However, we recommend further study of other characteristics before settling on a location.