

Support Venues

Find Venues that are common to a specified venue

Our example is going to be to find venues that support Police Stations

Introduction

TL;DR; *Going to find out what restaurant to open that best serves police stations, and which station(s) will benefit the most.*

Problem Description

- The purpose of this project is to find the best place for an associated business. For example, around a hospital you will most likely find pharmacies, or a Pawn shop and a Casino. Now we may think that police officers love donuts, so donut shops may be clustered around police stations. Is this true or just a stereotype? This project we will identify the most common restaurants around police stations in a particular city, then we will determine which type of restaurant around a particular police station that someone should open.

Why do I want to do this?

- Intellectual curiosity on my part, but it does have some important impacts for others. First, it gives someone an opportunity to choose the best business to support an organization that they love. For me that would be to support local law enforcement.

Why is this important, and who would be interested?

- Someone who wants to support an organization, but still open a successful business would be interested in the results of this project. For example, you might be a retired police officer in a new city. You may have your own opinions on what is best, but this city is different. The data provided by this project would give you a greater chance of success while still supporting the law enforcement community that you love.

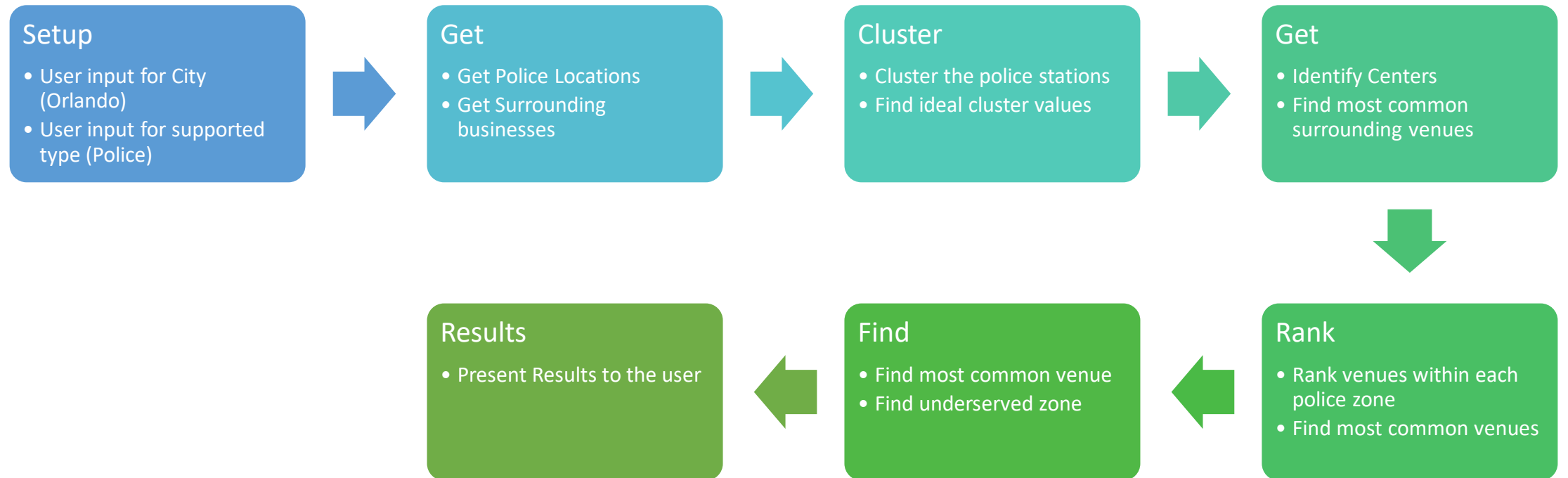
Data

TL;DR; *Get locations of police stations, Find closest businesses, K-means cluster, find most common, apply suggestion to least common.*

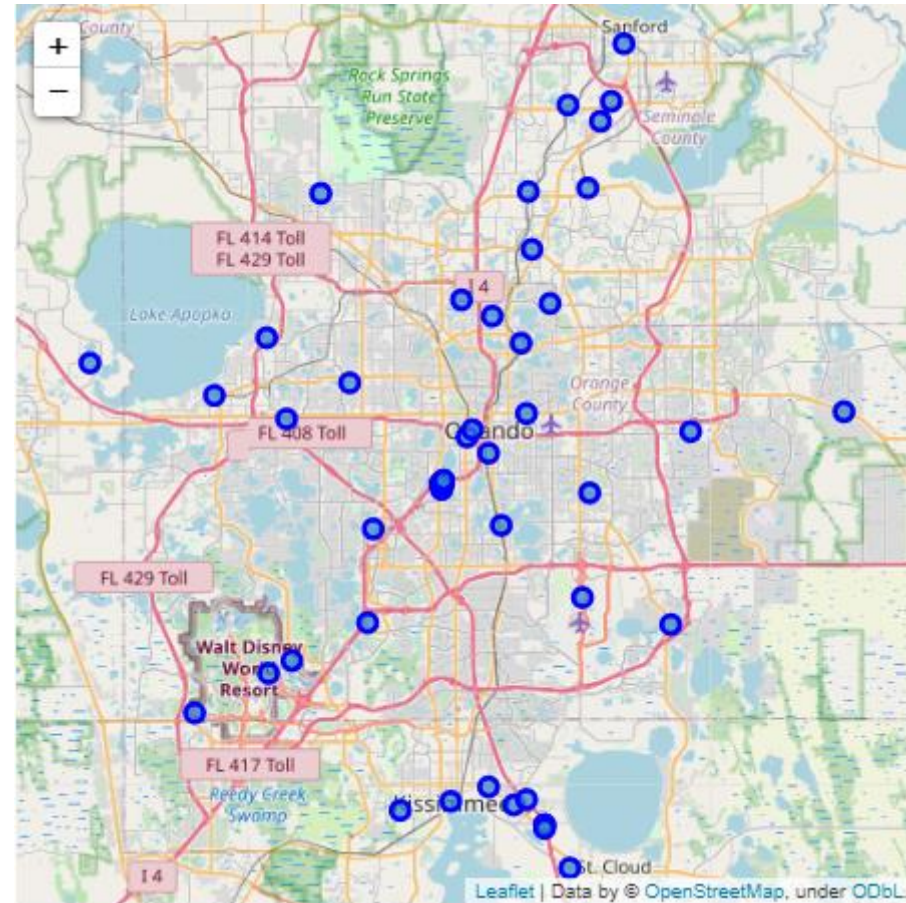
You can read more in the report:

https://github.com/coursera-coder/Coursera_Capstone/blob/master/Applied%20Data%20Science%20Capstone.pdf

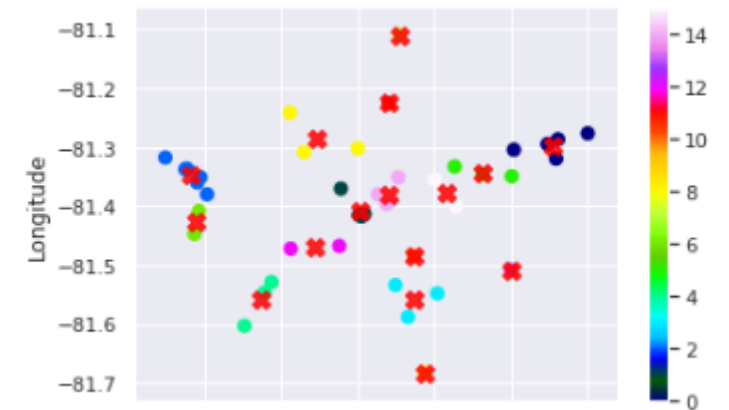
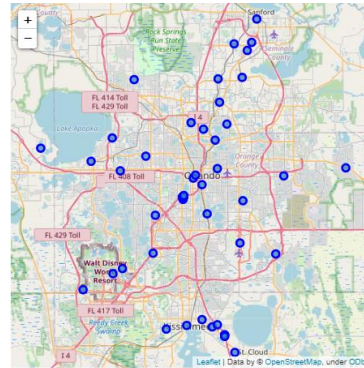
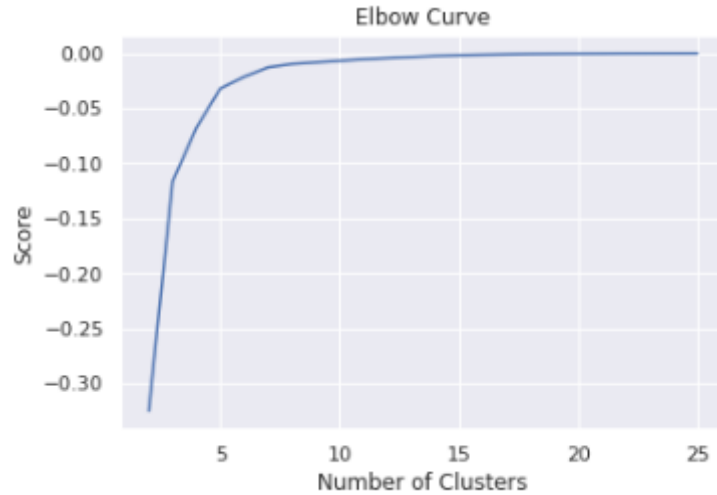
Methodology Top Level



Police Stations:

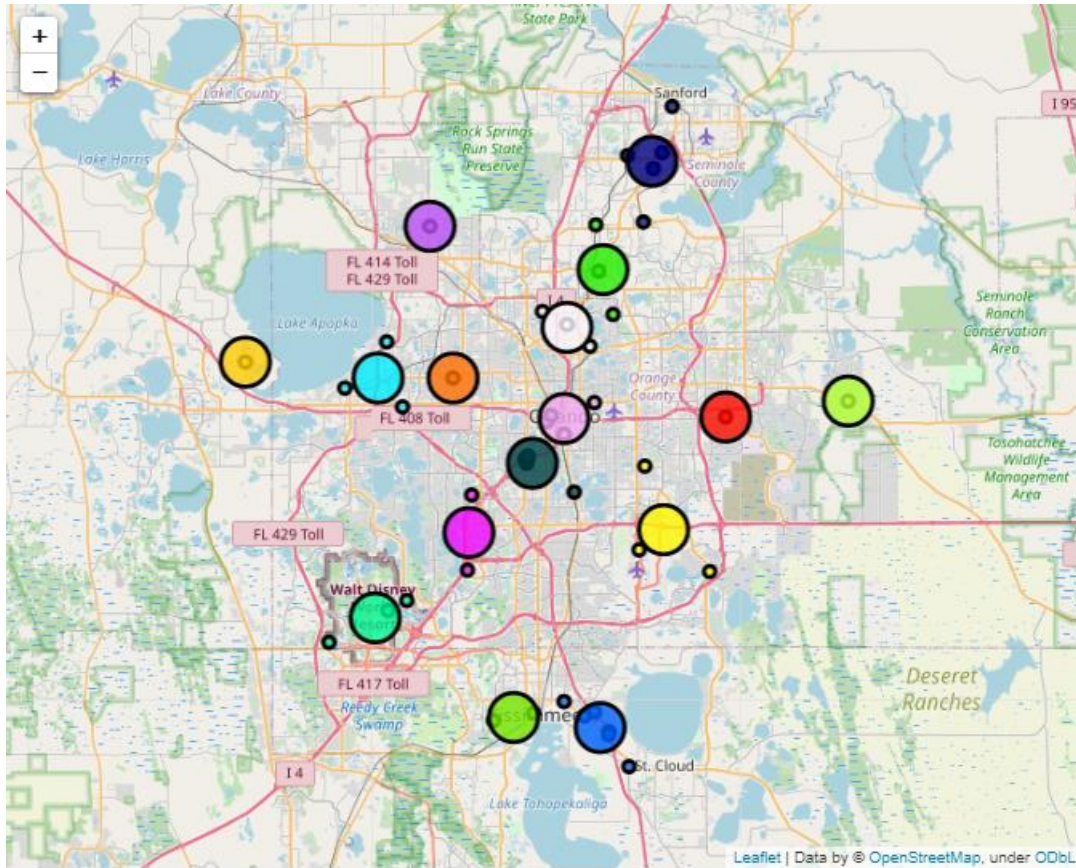


Find Ideal Number of Clusters K-Means



Our max is 16, We will use this number for KMeans for this run.

Clustered Map



- Each color is the cluster
- Small circles are Police Stations
- Large circles are Cluster Centers

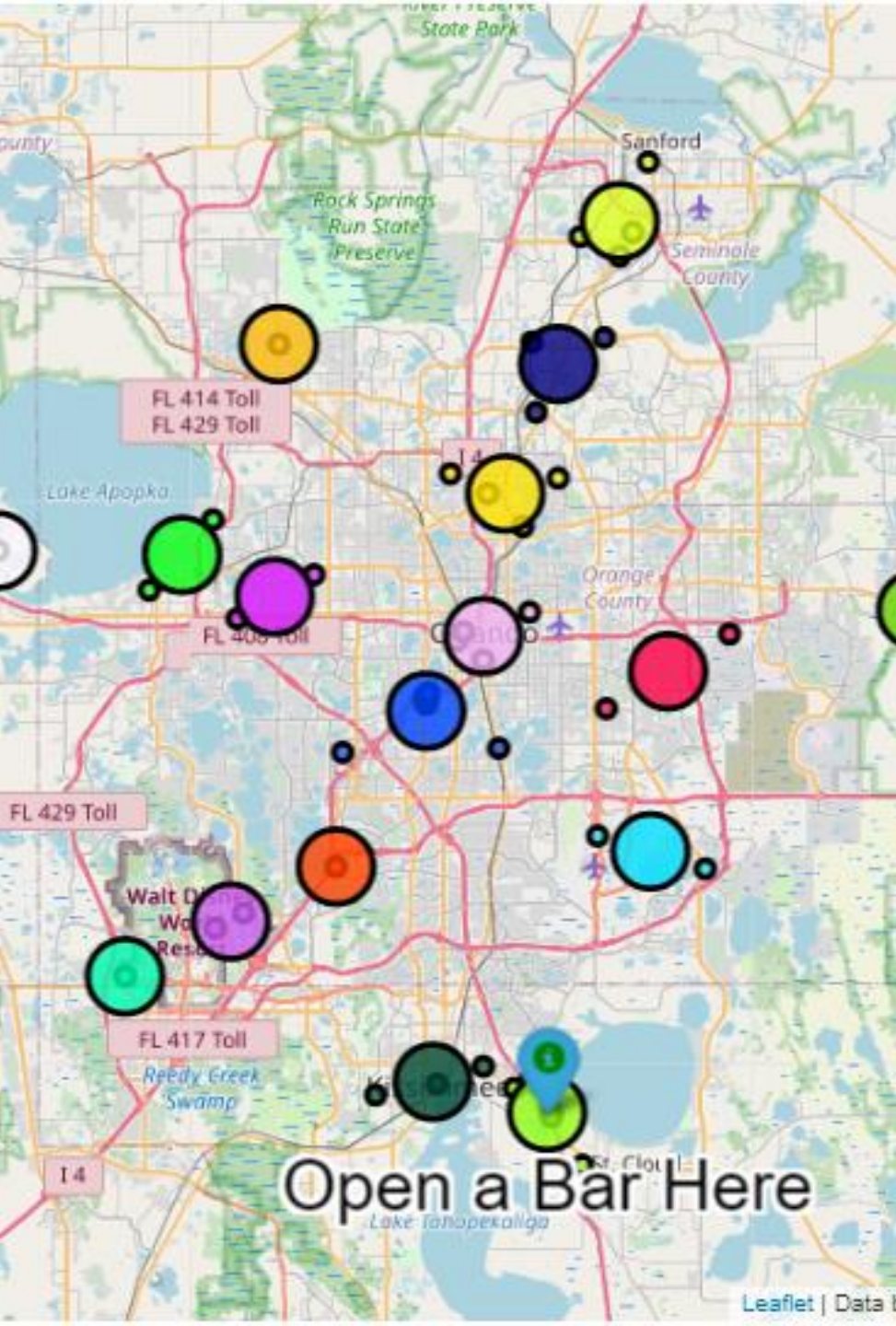
Ranking

	Venue	Commonality
0	Bar	0.080321
1	American Restaurant	0.056225
2	Lounge	0.048193
3	Hotel	0.044177
4	Convenience Store	0.040161
5	Steakhouse	0.028112
6	Pizza Place	0.028112
7	Cocktail Bar	0.024096
8	Mexican Restaurant	0.024096
9	Burger Joint	0.024096

Venue commonality is added across each of the top 10 venues in each cluster. It is then sorted lowest to highest.

We identify the top venue, and the most underserved cluster for our recommendation

Top 15 Most Common Venues by Cluster													
	Cluster	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue	Score	
	0	1	Karaoke Bar	Lake	Video Store	Food & Drink Shop	Cosmetics Shop	Cuban Restaurant	Dessert Shop	Discount Store	Dive Bar	Donut Shop	0.104418
	1	6	Airport Terminal	Gym	Baseball Field	Boat or Ferry	Video Store	French Restaurant	Cuban Restaurant	Dessert Shop	Discount Store	Dive Bar	0.104418
	2	3	Carpet Store	Video Store	Food & Drink Shop	Cosmetics Shop	Cuban Restaurant	Dessert Shop	Discount Store	Dive Bar	Donut Shop	Event Space	0.104418
	3	11	Liquor Store	Auto Workshop	Financial or Legal Service	French Restaurant	Cosmetics Shop	Cuban Restaurant	Dessert Shop	Discount Store	Dive Bar	Donut Shop	0.112450
	4	8	Airport Service	Burger Joint	Food & Drink Shop	Cosmetics Shop	Cuban Restaurant	Dessert Shop	Discount Store	Dive Bar	Donut Shop	Event Space	0.144578
	5	0	Flower Shop	Convenience Store	Office	Video Store	Cosmetics Shop	Cuban Restaurant	Dessert Shop	Discount Store	Dive Bar	Donut Shop	0.176707
	6	15	Cosmetics Shop	Southern / Soul Food Restaurant	Video Store	Flower Shop	Convenience Store	Cuban Restaurant	Dessert Shop	Discount Store	Dive Bar	Donut Shop	0.176707
	7	5	Convenience Store	Mexican Restaurant	Intersection	Smoothie Shop	Garden Center	Construction & Landscaping	Mobile Phone Shop	Fast Food Restaurant	Bookstore	Furniture / Home Store	0.232932
	8	2	Convenience Store	Video Store	Grocery Store	Chinese Restaurant	Sandwich Place	Donut Shop	Fast Food Restaurant	Pharmacy	Intersection	Ice Cream Shop	0.248996
	9	9	Hotel	Video Store	Food & Drink Shop	Convenience Store	Cosmetics Shop	Cuban Restaurant	Dessert Shop	Discount Store	Dive Bar	Donut Shop	0.257028
	10	7	Convenience Store	Pizza Place	Food & Drink Shop	American Restaurant	Auto Workshop	Cosmetics Shop	Cuban Restaurant	Dessert Shop	Discount Store	Dive Bar	0.329317
	11	4	Hotel Bar	Lounge	Hotel Pool	American Restaurant	Bus Stop	Resort	Buffet	Ice Cream Shop	Jewelry Store	Laundromat	0.361446
	12	13	Pizza Place	American Restaurant	Discount Store	Steakhouse	Fast Food Restaurant	Food & Drink Shop	Convenience Store	Cosmetics Shop	Cuban Restaurant	Dessert Shop	0.393574
	13	14	Bar	Lounge	Cocktail Bar	American Restaurant	Restaurant	Burger Joint	Art Gallery	Basketball Stadium	Cuban Restaurant	Pizza Place	0.610442
	14	12	Hotel	American Restaurant	Steakhouse	Pizza Place	Bar	Mexican Restaurant	Restaurant	Theme Park Ride / Attraction	Pool	Gym	0.618474



Recommendation: “Open a Bar”

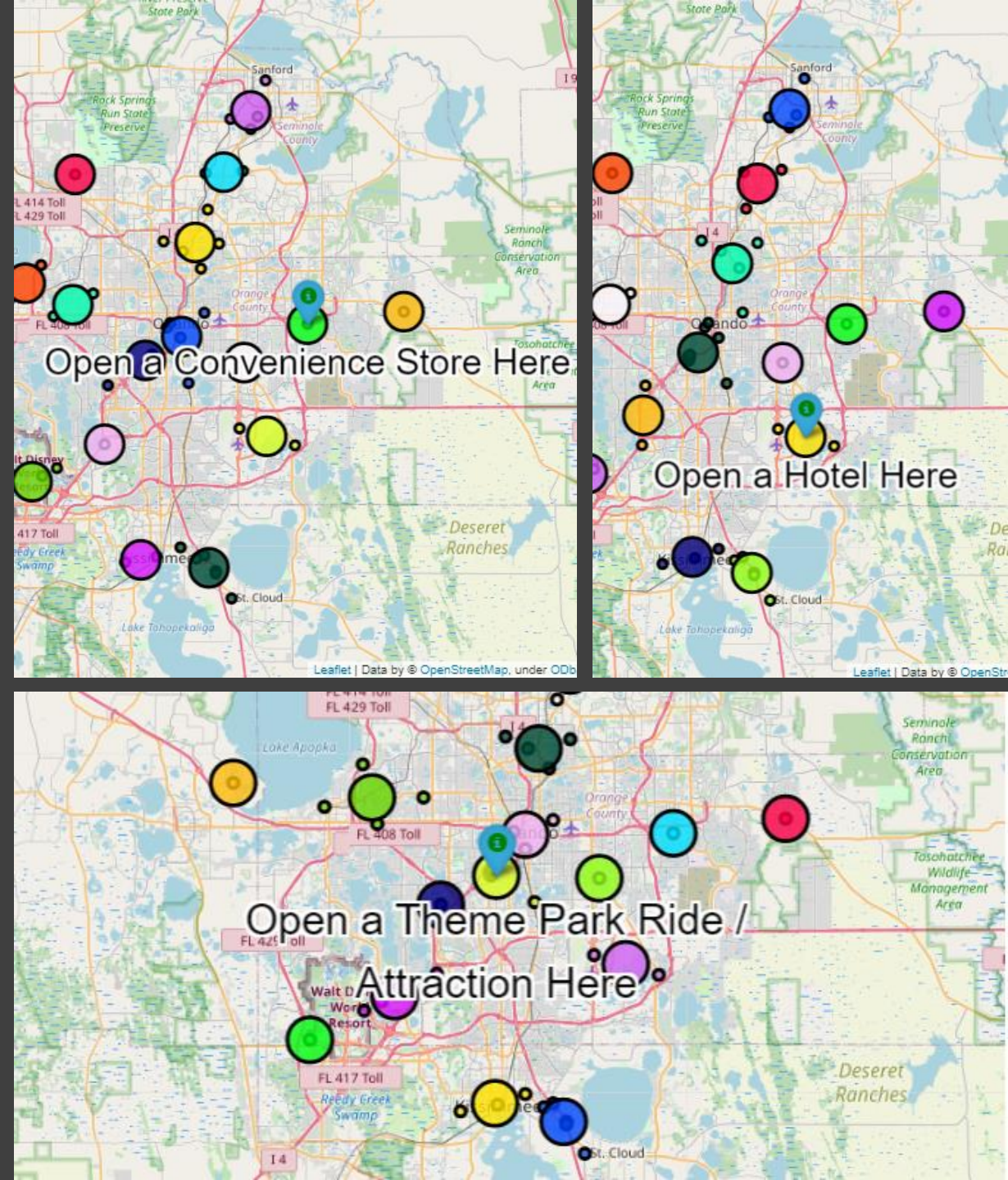
- The most popular venue around police stations are bars.
- The cluster of police stations with the fewest bars is the light green one on the map.
- All recommendations were data driven. No manipulation of data or massaging. This was done so that we could run it for any location for any relationship.

Different runs give different answers

When we run the same city at different times, we get different answers.

This could be due to:

- Not enough data collected
 - API limits
 - Not enough venues close by
- Time of day
 - Foursquare gives different answers based on time of day.



Can run on any
city!

Here is:
Seattle
Washington

