

IBM Data Science Professional Certificate Capstone Project

Centers of crime and nearby popular venues in
Tacoma, Washington



Introduction

- This study explores relationships between locations with high rates of reported crime and popular venues nearby in Tacoma, Washington.
- This study could be of interest to public policy makers, law enforcement, and the concerned citizens of Tacoma. If we find crimes clustered around certain types of venues, then we can seek to understand why.

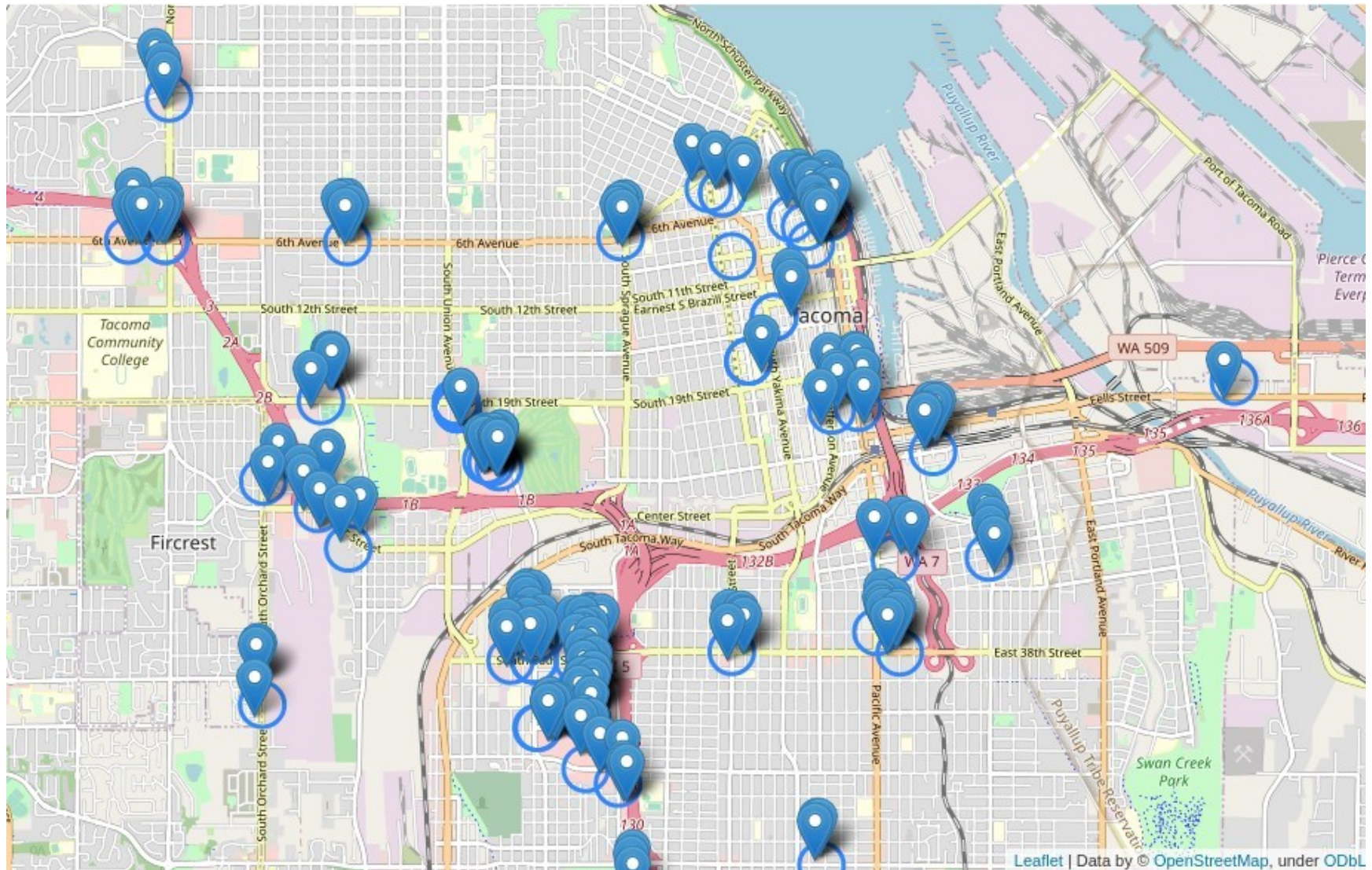
Data

- The Tacoma crime data used in this report is available from cityoftacoma.org at <https://data.cityoftacoma.org/Public-Safety/Tacoma-Crime/wtqi-kpsn/data>.
- Data about venues is from Foursquare.com. I will use the "Venue Recommendations" endpoint, which "returns a list of recommended venues near the current location".

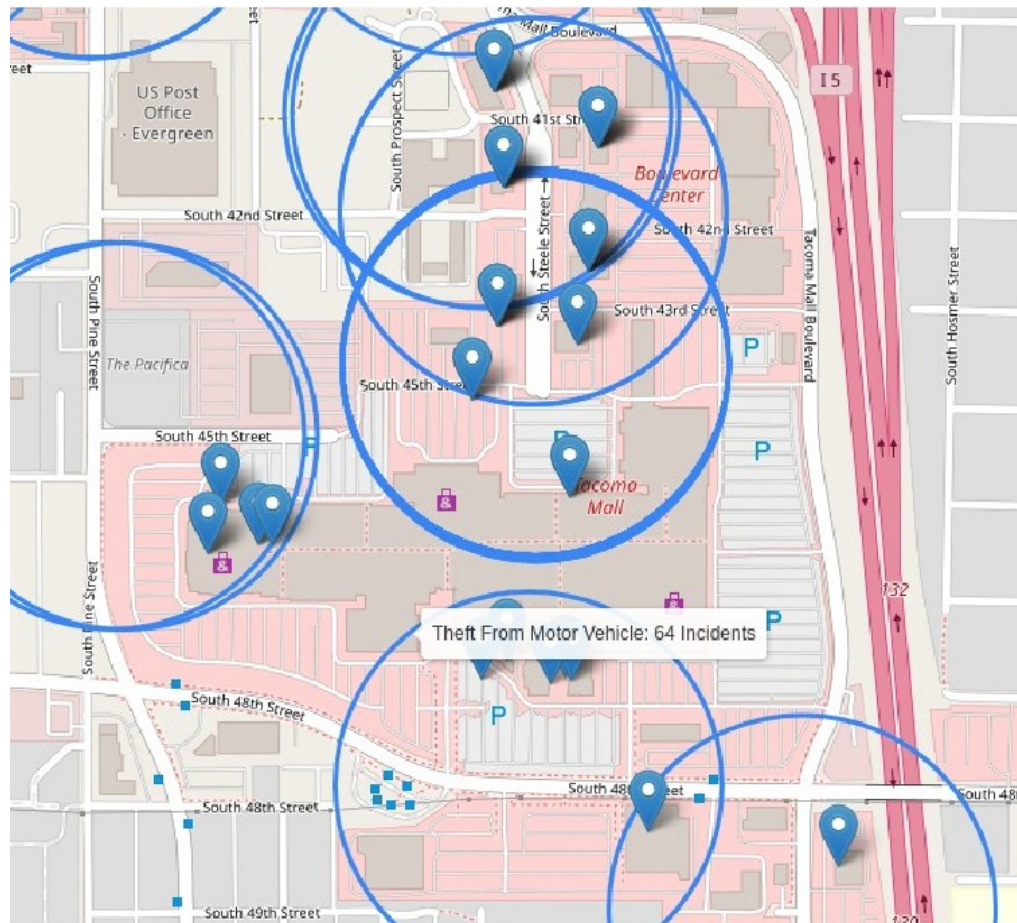
Methodology

- I use Pandas to explore and profile the data. Initially, there are 118,182 rows and 5 columns of crime data. Using the min and max functions on the date column reveals the date range of the data is from January 2014 through December 2019.
- The goal is to find correlations between crimes and venue categories.

Map



Map



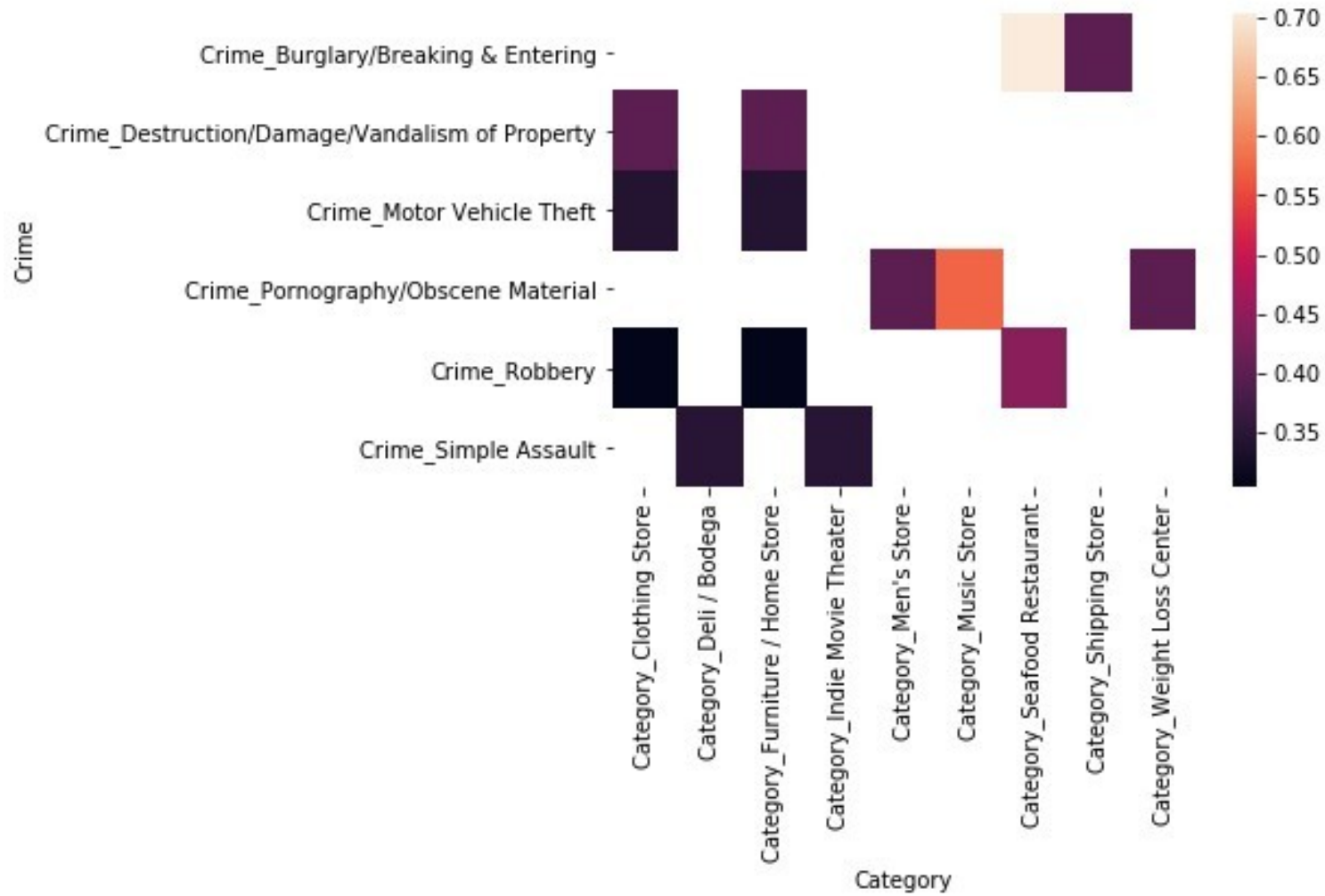
Profile of Data

Latitude Longitude			Crime Count	
• 0	47.217857	-122.467608	Shoplifting	550
• 1	47.217857	-122.467608	All Other Larceny	526
• 2	47.242213	-122.482564	Shoplifting	392
• 3	47.217857	-122.467608	Theft From Motor Vehicle	341
• 4	47.242290	-122.482583	Shoplifting	263
•
• 95	47.242290	-122.482583	Theft From Motor Vehicle	46
• 96	47.242213	-122.482564	Burglary/Breaking & Entering	46
• 97	47.231273	-122.495200	Motor Vehicle Theft	46
• 98	47.238167	-122.479216	All Other Larceny	46
• 99	47.257194	-122.443916	Simple Assault	45

Pearson Correlation

		correlation coef
Crime_Robbery	Category_Clothing Store	0.303273
	Category_Furniture / Home Store	0.303273
Crime_Motor Vehicle Theft	Category_Clothing Store	0.342442
	Category_Furniture / Home Store	0.342442
Crime_Simple Assault	Category_Indie Movie Theater	0.345782
	Category_Deli / Bodega	0.345782
Crime_Burglary/Breaking & Entering	Category_Shipping Store	0.399292
Crime_Destruction/Damage/Vandalism of Property	Category_Clothing Store	0.399292
	Category_Furniture / Home Store	0.399292
Crime_Pornography/Obscene Material	Category_Weight Loss Center	0.399292
	Category_Men's Store	0.399292
Crime_Robbery	Category_Seafood Restaurant	0.441623
Crime_Pornography/Obscene Material	Category_Music Store	0.573753
Crime_Burglary/Breaking & Entering	Category_Seafood Restaurant	0.704907

Heatmap



Conclusion

- In conclusion, I did not find sufficient evidence of any significant correlation between the places where crime occurs and the types of venues in the vicinity.
- I did find that certain crimes are highly correlated with one another, such as Robbery with Destruction/Damage/Vandalism of Property and Motor Vehicle Theft with Destruction/Damage/Vandalism of Property. A likely explanation for this is that a single event often involves both crimes.
- It is also worth note that places like parking lots and garages are not venues, per se, so are not returned by Foursquare's venues API. Visually inspecting the map makes it clear that Theft From Motor Vehicle occurs frequently in large parking areas, such as the Park and Ride garage and the Tacoma Mall. Perhaps more interesting results could be achieved by repeating the study with a different set of location data.