

A Closer Look at Property Prices in Toronto

Barzin Doroodgar
June 7, 2020

Introduction

Toronto has one of the most expensive real estate markets in North America.

Understand what is it about a given neighbourhood that impacts the property prices.

The audience of this report is anyone who might be interested in investing in the Toronto real estate market

Data

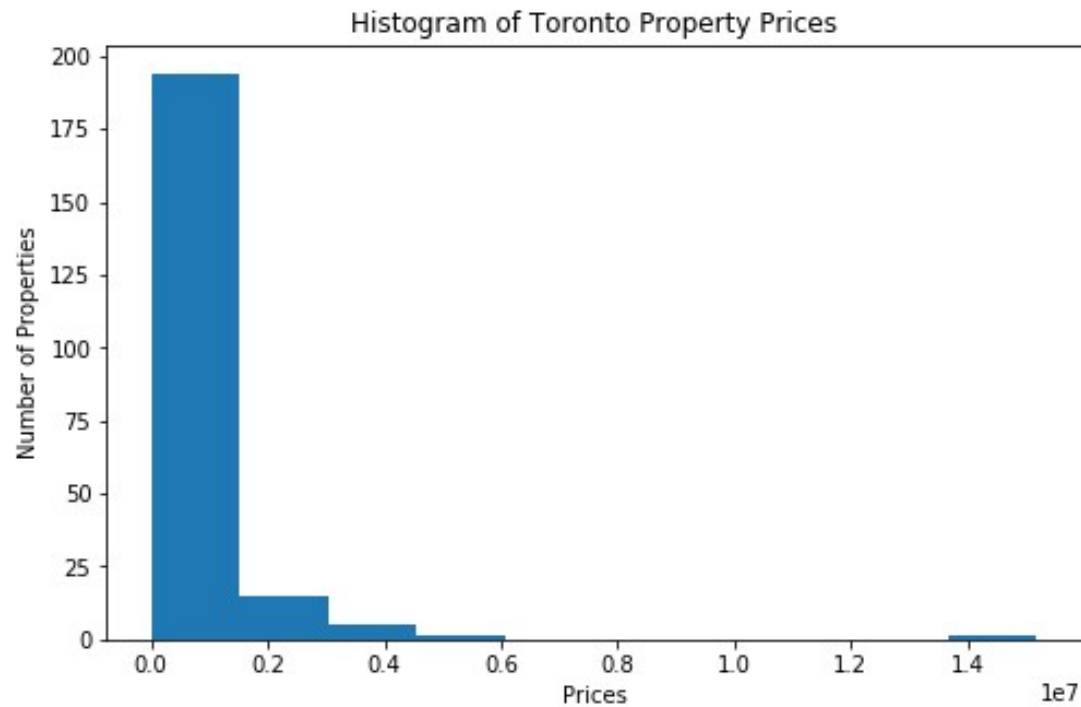
House Sales in Ontario from kaggle: Property prices, neighbourhood, latitude, longitude

Foursquare: API that provides location data (restaurants, gyms, schools, parks) given a location (latitude, longitude)

Combined datasets give us what we need to analyze prices relation to various location data

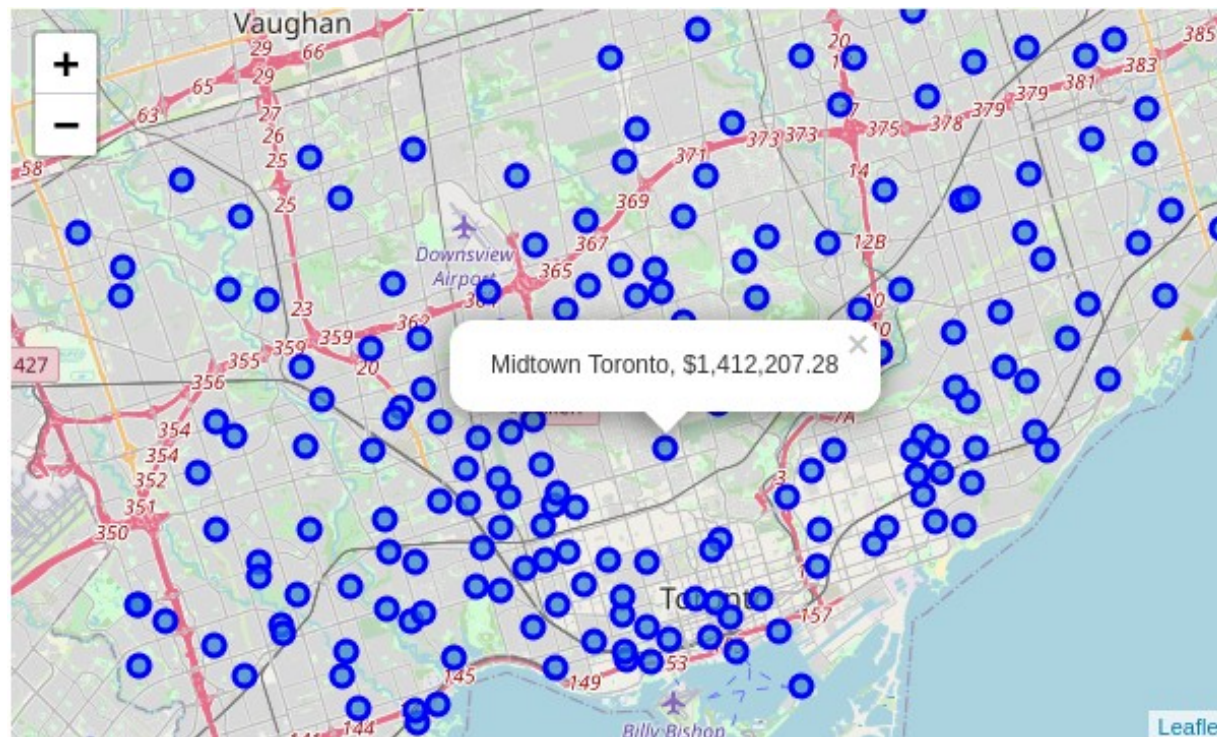
Methodology

Basic Statistical Analysis



Methodology

Interactive map helps us look closer at price distribution



Data Analysis

Pearson Correlation

- Find positively and negatively correlated features

$$r = \frac{\sum (x - \bar{x})(y - \bar{y})}{\sqrt{\sum (x - \bar{x})^2 \sum (y - \bar{y})^2}}$$

Logistic Regression with Lasso Regularization

- Naturally maps the target value with a weighted combination of features.
- The higher the weight of the feature, the more impact it has on the target value

Results

Pearson Correlation: Features positively correlated to price

Ice Cream Shop	0.555208
Playground	0.325820
Gas Station	0.304605
Bubble Tea Shop	0.164910
Café	0.161757
Boutique	0.156044
Speakeasy	0.120337
Men's Store	0.060565
Restaurant	0.054502
Nail Salon	0.045300
Bar	0.040667
Sandwich Place	0.032995
Bank	0.028493
Yoga Studio	0.028243
Cheese Shop	0.027636
Latitude	0.022561
Gastropub	0.021897
Music Venue	0.019851
Venue Count	0.010476

Results

Pearson Correlation: Features negatively correlated to price

Pizza Place	-0.161243
Fast Food Restaurant	-0.131237
Arts & Crafts Store	-0.127560
Moving Target	-0.102029
Intersection	-0.096330
Bakery	-0.095666
Convenience Store	-0.090548
Wings Joint	-0.088101
Korean Restaurant	-0.077799
Shoe Store	-0.075897
Historic Site	-0.069627
Vietnamese Restaurant	-0.068871
Caribbean Restaurant	-0.061951
Middle Eastern Restaurant	-0.059073
Sushi Restaurant	-0.057590
Farmers Market	-0.049677
Longitude	-0.046943
Lounge	-0.046001
Shopping Mall	-0.044079

Results

Logistic Regression with Lasso Regularization:

Three Features with highest impact:

1) Venue Count (positive correlation): proximity to a lot of venues increases the property price.

2) Cafe (positive correlation): high end cafes

3) Pizza Place (negative correlation): affordable fast food

All three features were in the top features in Pearson correlation results.

Conclusion

Property prices in Toronto analyzed to uncover the effect of different features to the price.

Prices are positively correlated with high end shops and restaurants, latitude of the property (north-south position) and number of venues in the area.

Prices are negatively correlated with more affordable pizza and fast food places, as well as longitude of the property (east-west position).