Predicting Condo prices in Sao Paulo

IBM APPLIED DATA SCIENCE CAPSTONE

MAIN OBJECTIVE OF THIS PROJECT

Our main goal is to building a machine learning model for predicting condo price in Sao Paulo to help real state investors to make better business decisions.

- Build a simple regression model for predicting land prices in Sao Paulo.
- Improve prediction model by adding data through the Foursquare API.

DESCRIPTION OF THE DATA

Data sources

The main data used for this project will be from two sources:

- The rent/sale condo price in Sao Paulo. (Kaggle)
- The venues in each neighborhood. (FourSquare API)

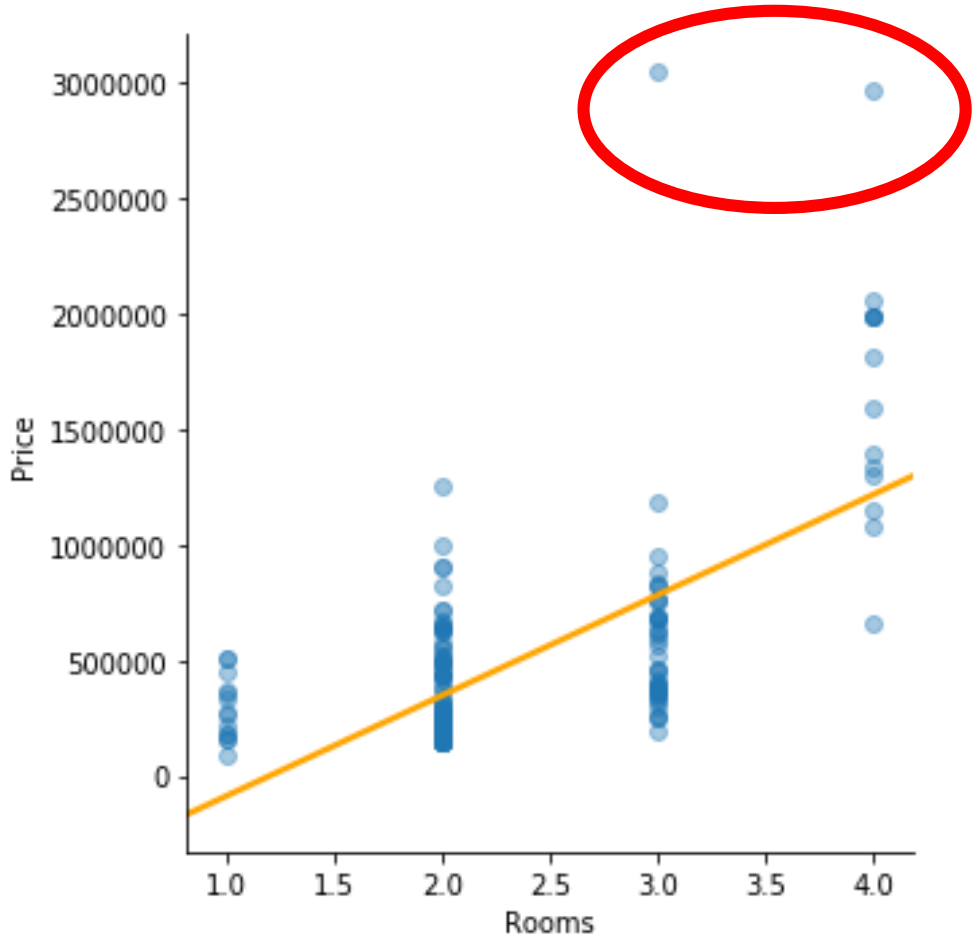
LIMITATIONS

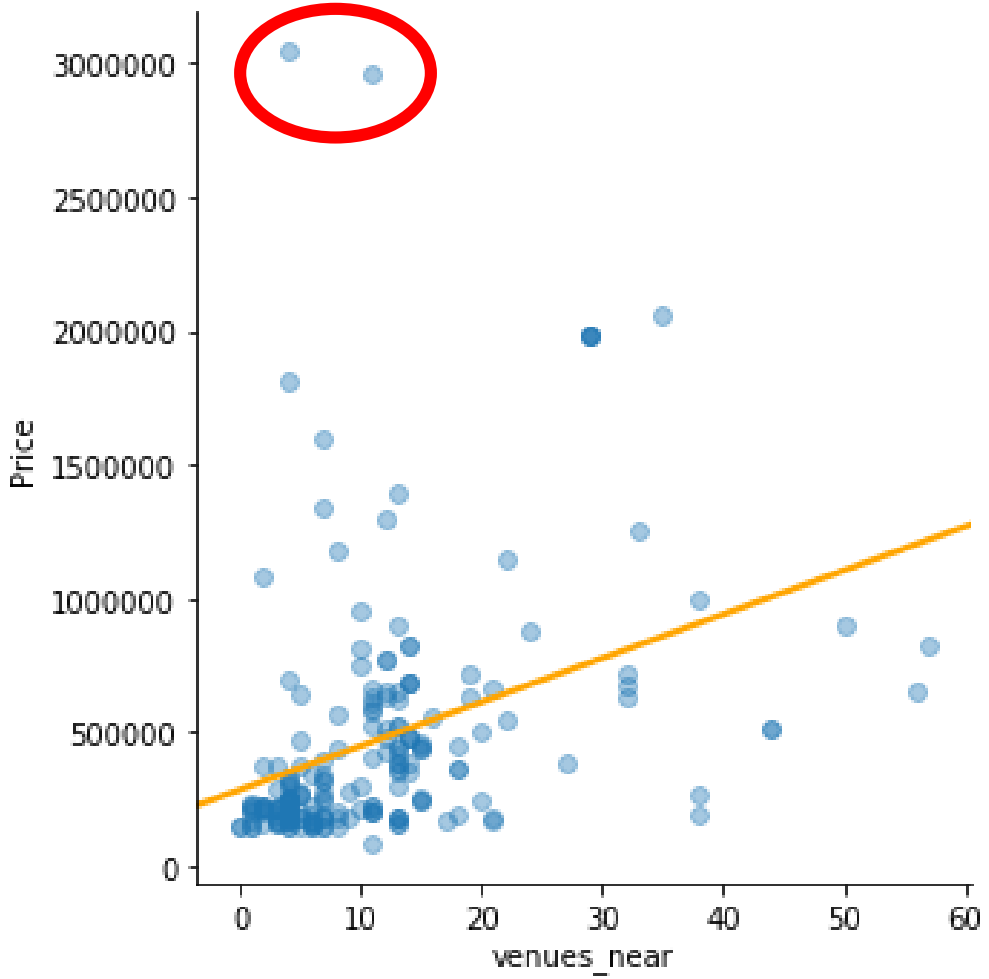
Due to limited calling API from Foursquare each times, we can't use all sale data from the original(6412rows) so in this project, we will focus on recent property marked as 'New' = 1 in the original dataset.

	Price
Price	1.000000
Condo	0.458293
Size	0.834325
Rooms	0.654590
Toilets	0.519361
Suites	0.405709
Parking	0.577019
Elevator	NaN
Furnished	0.000887
Swimming Pool	0.261181
New	NaN
Latitude	0.038552
Longitude	-0.064869
venues_near	0.359275

- We can clearly see that 'Size' affect 'Price' significantly.
- 'Rooms' 'Parking' and 'venues_near' seem slightly affect 'Price'.

PEARSON CORRELATION TABLE





Detect some outliner

Multiple Linear Regression Implementation

MODEL1 : WE USE 'SIZE', 'ROOMS','PARKING' AS FEATURES

MODEL2 : LET'S TAKE 'VENUES_NEAR' INTO ACCOUNT

Model1

- R Square = 0.897
- MSE = 13,160,500,765.816427
- RMSE = 114,719.22578982316

Model2 (add near venues)

- R Square = 0.932
- MSE = 8,703,312,256.41301
- RMSE = 93,291.54439933455

RESULT

WE CAN CONCLUDE THAT MODEL2 IS BETTER THAN MODEL1.

FURTHER DEVELOPMENT

The following are suggestions how this project could be further developed:

- Due to Foursqure limitation in this project,we should use all the dataset(6412rows) from kaggle for building a model.

- Due to wealth difference of each districts in sao paulo,we should categorize the wealth level and then create a model based on each wealth level.

- Find the other features that may affect the condo price for better accuracy.For example,How old,facility rating from resident,etc.