

AMES HOUSING

Case Study

by Umar Kasan





Problem Statement

As a realtor, you may be interested in a few factors, such as

Potential market for house flipping:

- Features that gives highest ROI after renovation
- Features that have the highest demand

Current demand of Houses in AMES:

- Places of interest (University, Parks, Malls, etc)
- Future Places of Interest

Potential Investment opportunity in AMES:

- Historical Price trend
- Price based on features

Thus, we will be applying machine learning to predict the price of houses in AMES

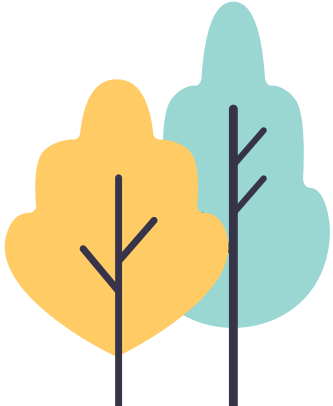




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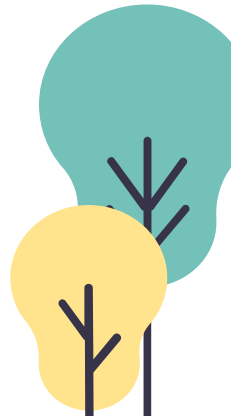
Modeling

Here we use several models to
predict the dataset

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Conclusion

Recommendation based on
the findings layed out



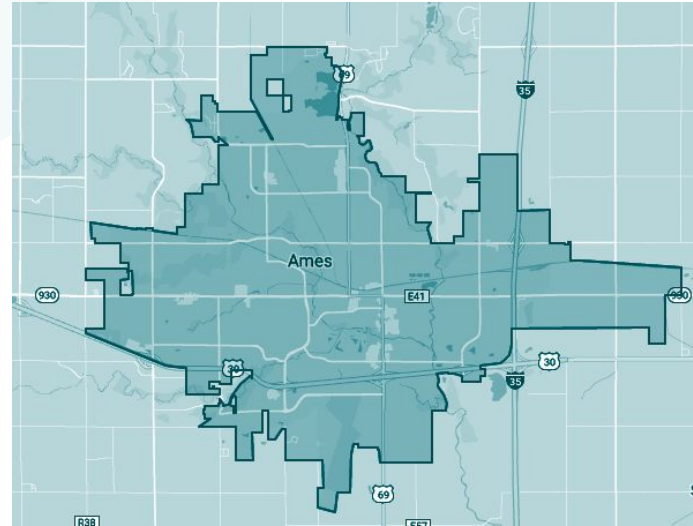
Ames, Iowa

Ames is a city in Story County, Iowa, United States approximately 30 miles (48 km) north of Des Moines in central Iowa.

In 2010, Ames was ranked ninth on CNNMoney's "Best Places to Live" list.

In 2017, Ames had a population of 66,498.

It has a land area of 65.86 km²



AMES IOWA

WHAT SETS AMES APART?

IOWA State University

Supports 16,811 employees and h

United States Department of Energy national laboratory

It is located in the University itself

Lowest unemployment rate

Ames is a city that does well in times of recession, lowest of 2.5% 2016





DATASET



WEB SCRAPING

Web Scraping Realtor.com to obtain
market information.

361 Observation
Currently 6 up to 12 variance



UCLA Dataset

Kaggle.com

2051 observation
81 variance

DATASET

Description

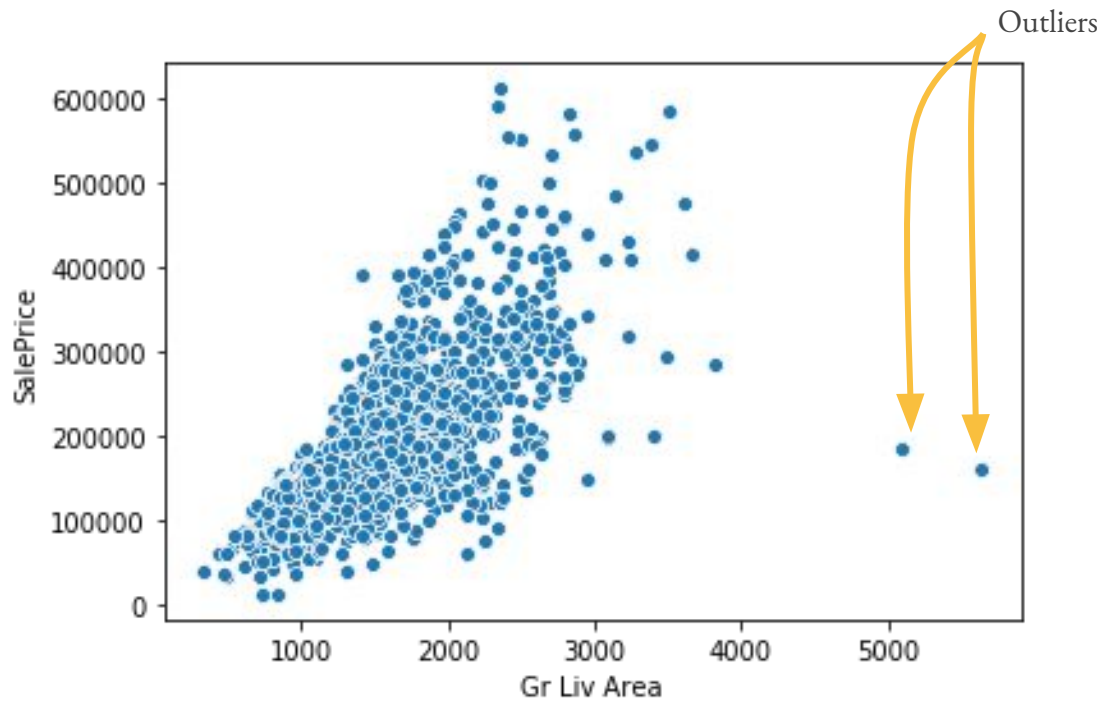
Nominal

PID, MS Zoning, Roof Style, Roof Matl, Exterior 1, Exterior 2, Mas Vnr Type, Street, Alley, Land Contour, Lot Config, Neighborhood, Condition 1, Condition 2, Bldg Type, House Style, Foundation, Heating, Central Air, Garage Type, Misc Feature, Sale Type, Sale Condition

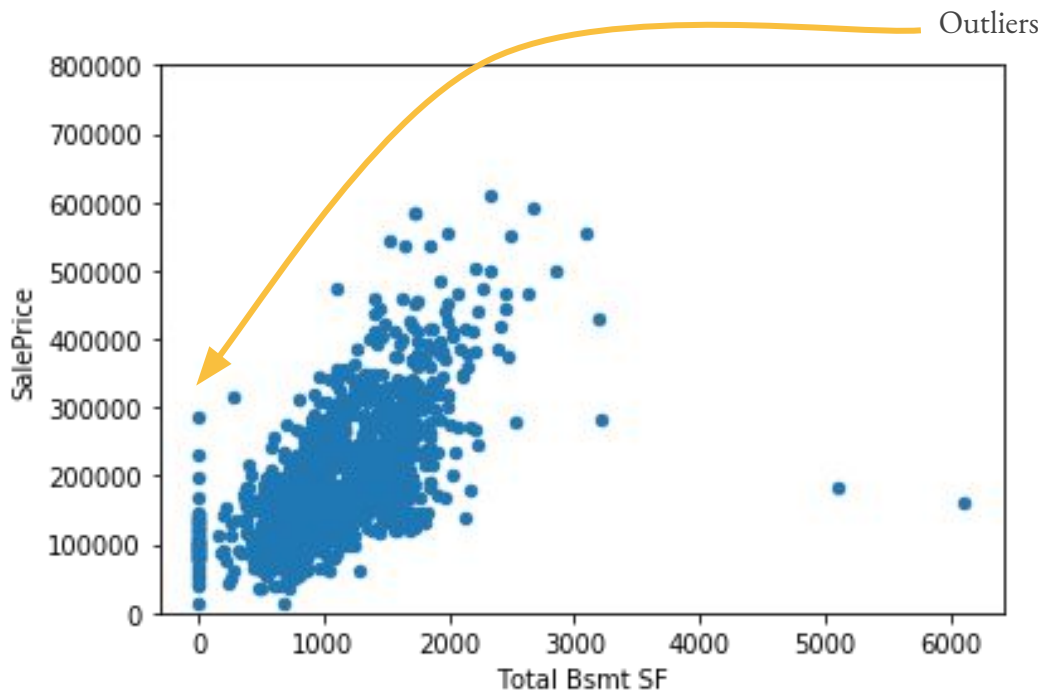
Ordinal

Lot Shape, Utilities, Land Slope, Overall Qual, Overall Cond, Exter Qual, Exter Cond, Bsmt Qual, Bsmt Cond, Bsmt Exposure, BsmtFin Type 1, BsmtFin Type 2, HeatingQC, Electrical, KitchenQual, Functional, FireplaceQu, Garage Finish, Garage Qual, Garage Cond, Paved Drive, Pool QC, Fence

Data Cleaning



Data Cleaning





Correlation

High correlation between
features and Sale Price



GetDummies

Creates 1 category per
observation

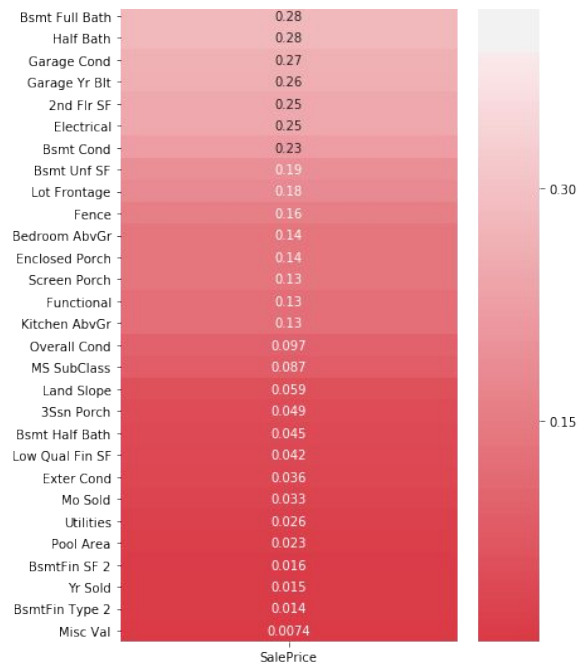
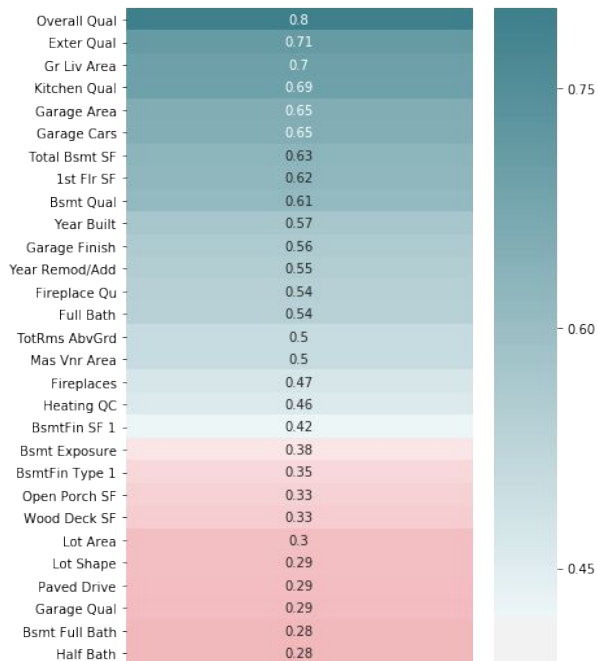
185 variance



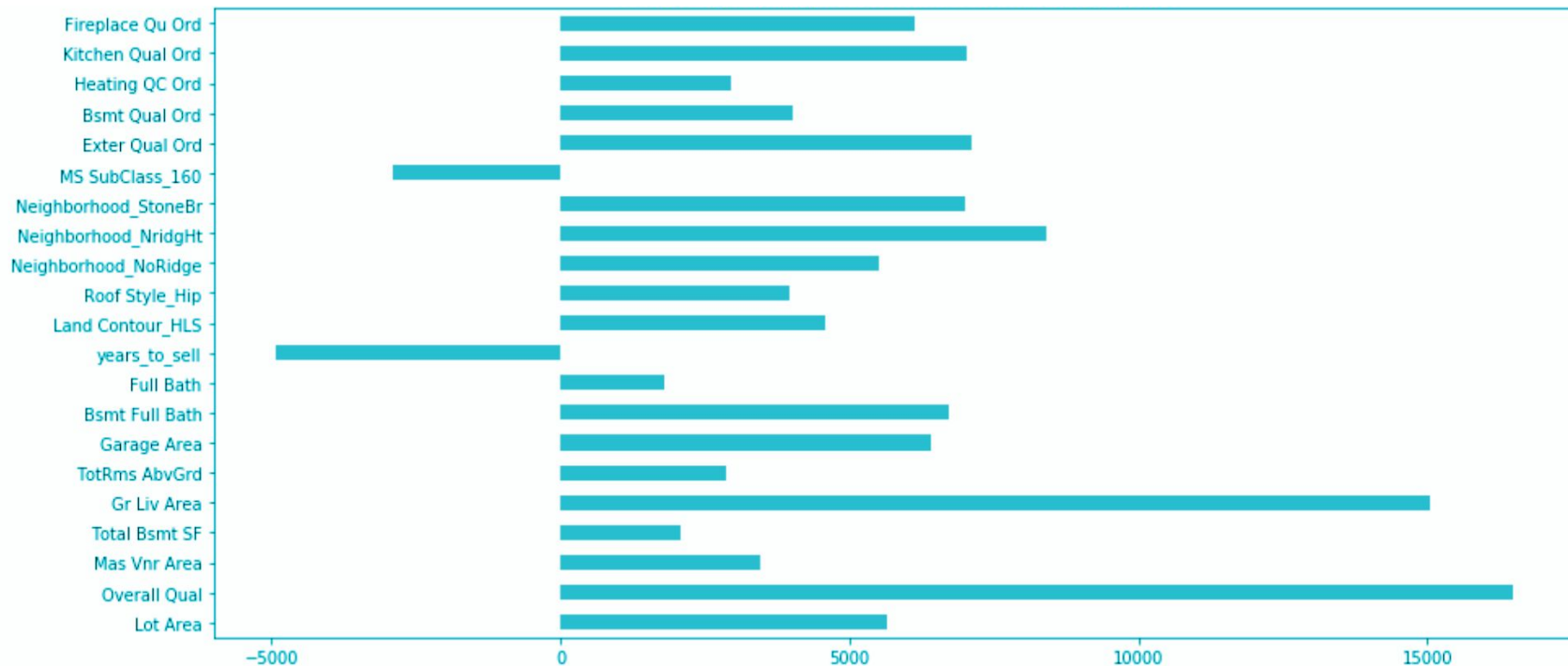
Elastic Net

Lasso or Elastic net helps to
bring some of the features
down to 0

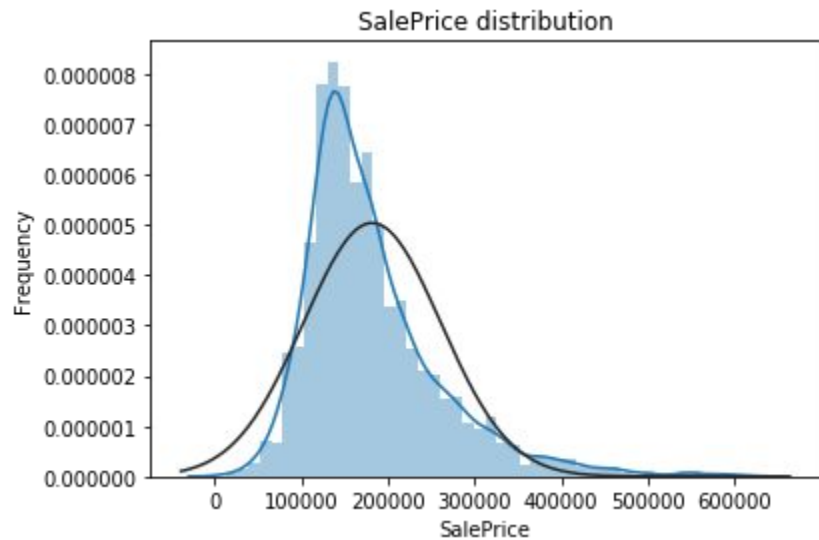
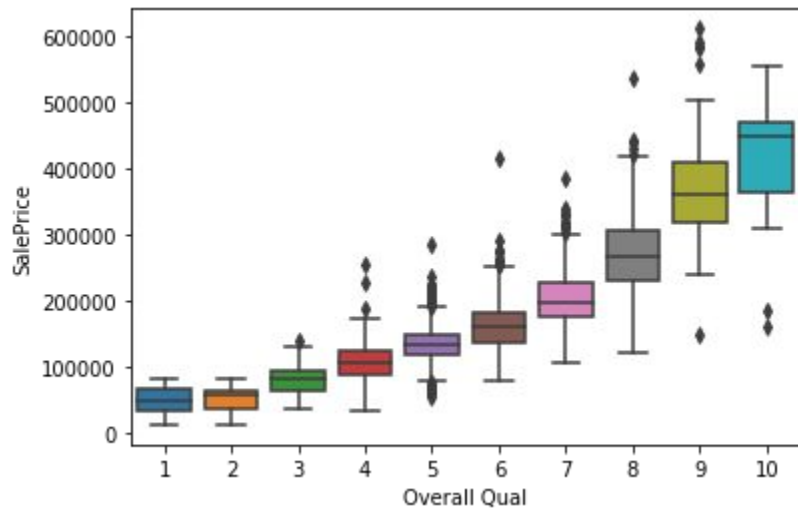
CORRELATION



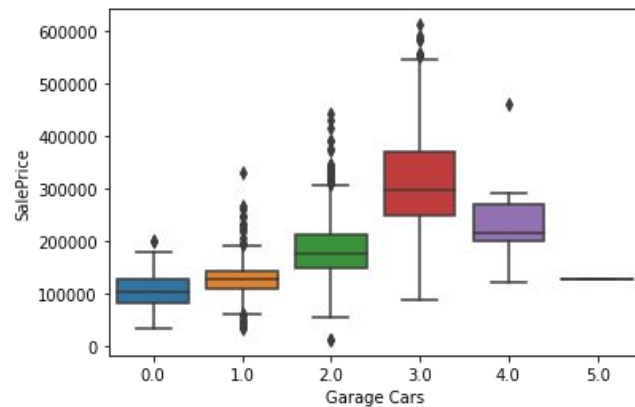
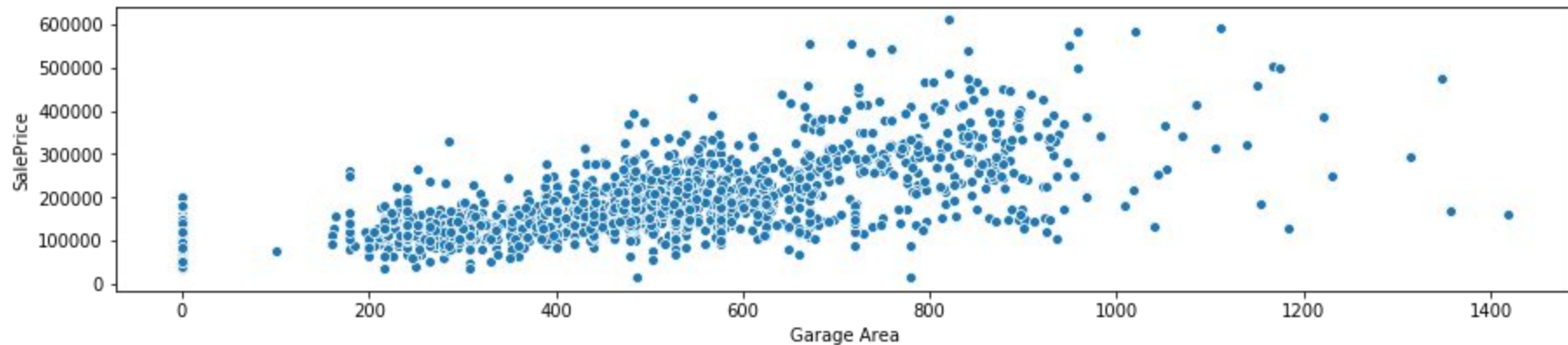
Feature Engineering



Feature Engineering



Feature Engineering



BUYER Decisions



LOCATION

Neighbourhood
Schools
Distance to work

BUILT

Age
Quality
Space

FURNISHING

Basement
Garage
Baths

ENVIRONMENT

Lawn
Porch
Pavements



Models:



Elastic Net

R: 85.87%

RMSE: \$28529.5



GBoost

R: 80.87%

RMSE: \$22167.6



Kernel

R: 80.87%

RMSE: \$74525.3



XG Boost

R: 80.87%

RMSE: \$21613.1



Conclusion

Renovation

There seems to be a favor for high quality products, showcasing a house refitted with luxury materials fetch the highest price

Location

Neighbourhood such as North Ridge

Living Space

Having the lowest Cost per Square feet is a good indicator of undervaluation

Trend

More research need to be done

AGE

Investing in houses that have recently built

Model

XGBoost produces the best result

THANKS

Does anyone have any questions?

umarksn@gmail.com

+65 9756 6740



RESOURCES

A stylized illustration in the bottom right corner of the slide. It features a yellow house with a dark blue roof and a dark blue door. Behind the house are several trees represented by dark blue trunks and yellow and teal circular canopies. A white cloud is visible in the light blue background above the house.

Reference

- ◀ Kaggle.com
- ◀ <https://www.zipdatamaps.com/nh-ames-neighborhood-north-ridge-heights>
- ◀