Predicting winning bids for homes on the market in Portland

Helping you navigate the home buying process!

Emily Lorenzen
Metis Bootcamp
Project 2 - Linear Regression

Portland’s real estate market is sizzling hot!

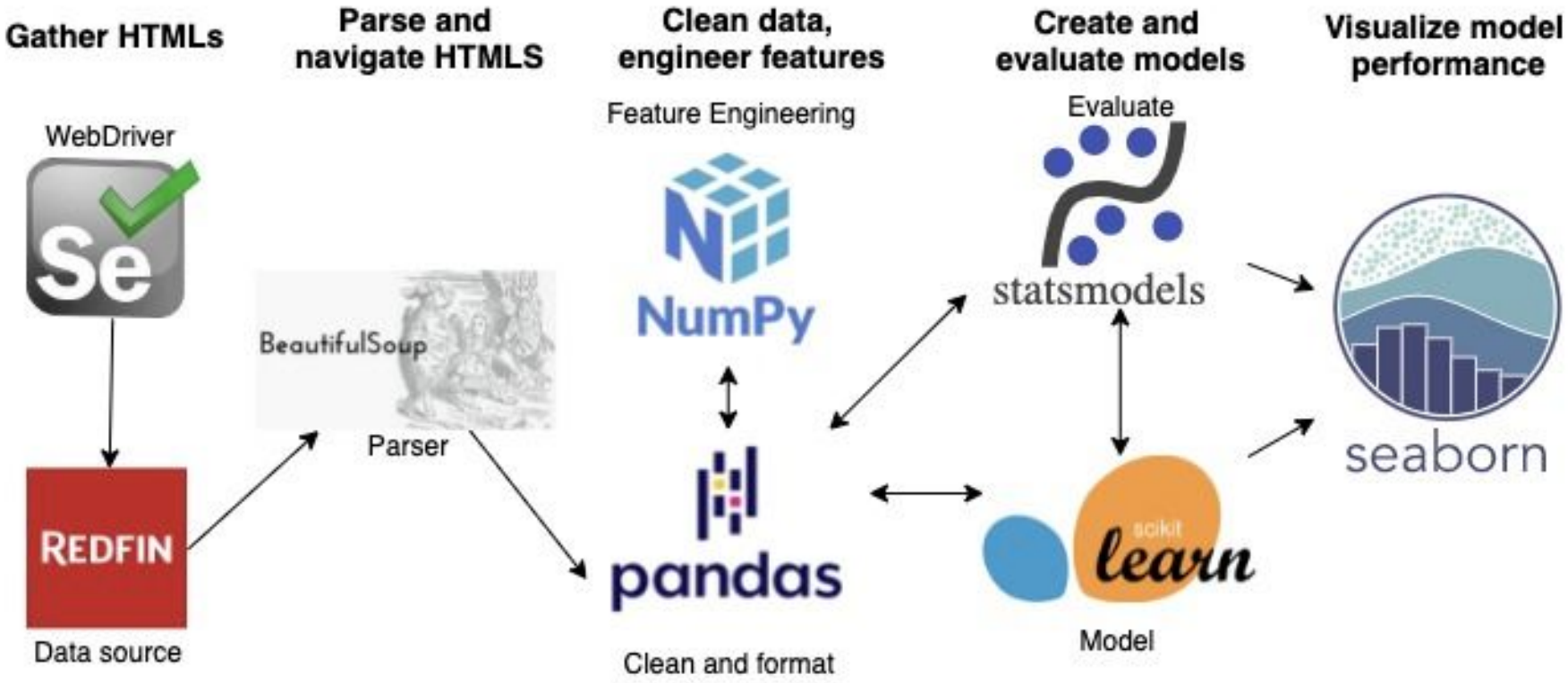
The situation:

- Record-low inventory has created huge competition for houses on sale
- Buyers must move quickly, homes are selling FAST!
- About ~65% of homes are being sold ABOVE asking price

My analysis:

- Scrape redfin.com to collect information on sold homes from the past three months
- Calculate the percent difference between selling price and asking price, the target feature
- Create a linear regression model using machine learning that predicts the percent difference between selling and asking price.

Data and Workflow



Target Variable and Features

Target

$$\frac{\text{(Sold Price - Listed Price)}}{\text{Listed Price}}$$

or

$$\frac{\text{(Sold Price - Changed Price)}}{\text{Changed Price}}$$

Features

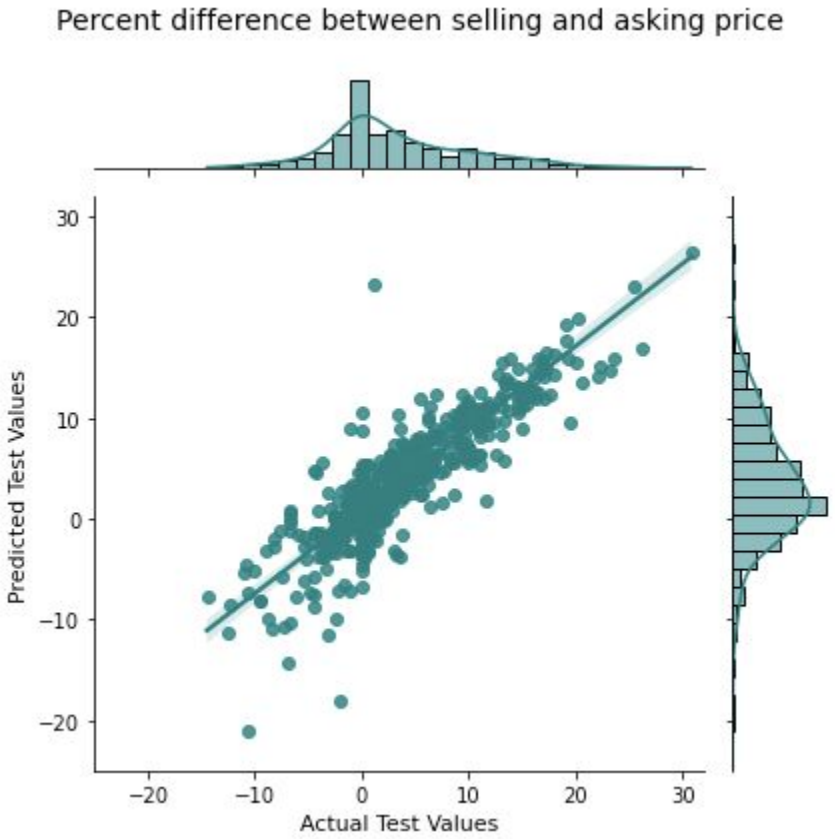
Listed price	Beds	Baths	Home Size
Property Type	Website Views	Likes on Redfin	Walk Score
Area of Portland	Year Built	Price/ square foot	Lot Size

Model of choice - Performance on validation data

Metric	Training	Validation
R^2	0.784	0.782
RMSE	3.52%	3.53%
MAE	2.36%	2.37%

R^2 cross-validation results: 0.709 +- 0.068

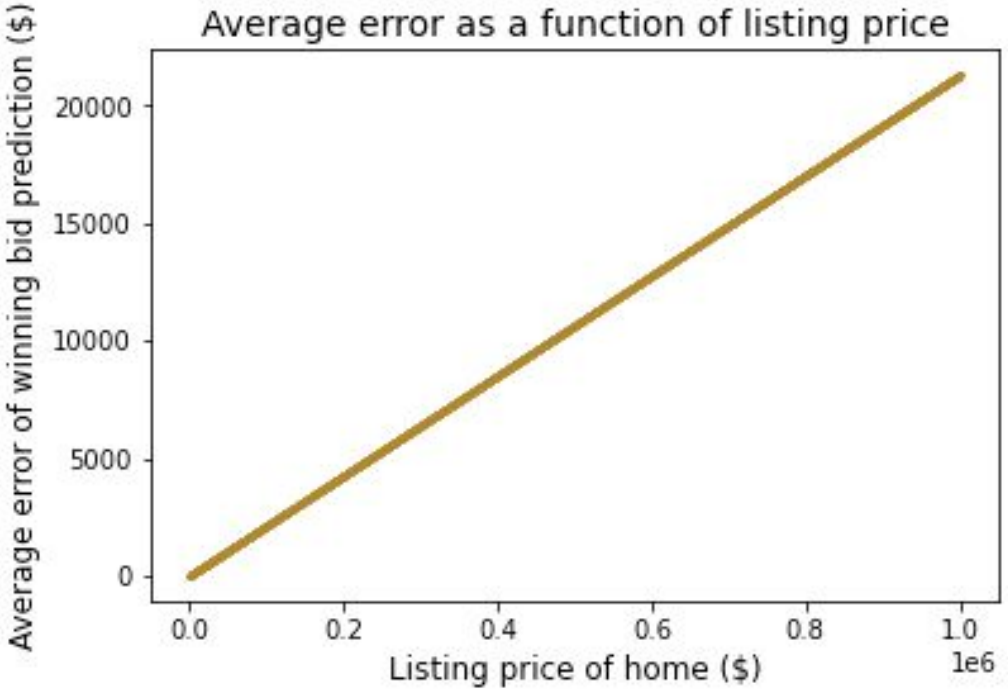
Model of choice - Performance on test data



Metric	Model	Test
R^2	0.788	0.732
RMSE	3.50%	3.52%
MAE	2.13%	2.25%

R^2 cross-validation results: 0.732 +- 0.056

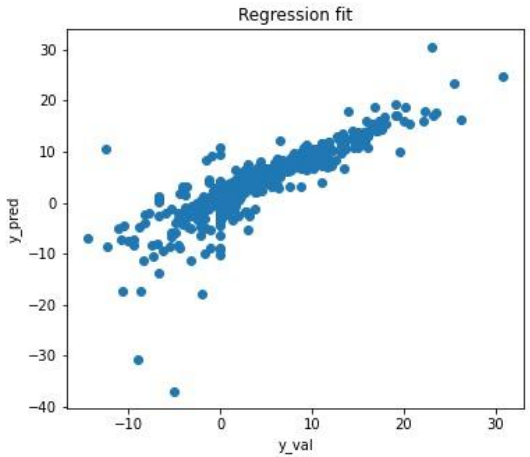
Predictive value of the linear regression model

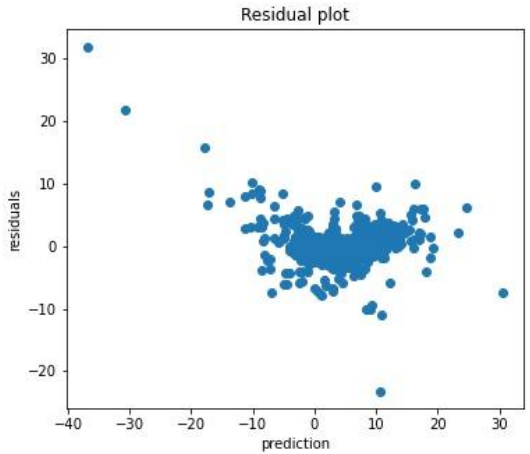


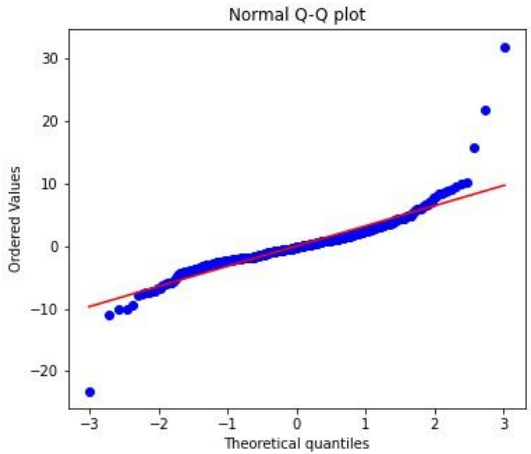
The final winning bid price for a home with an asking price of $500,000 will have an average magnitude of error that translates to ~$12,000

Future directions - Refine the model

- Include additional features such as population density, crime rate, and % down payment as feature in the linear regression model
- Use regularization to reduce number of features and increase interpretability
- Determine why residuals are higher at the extreme ends of the test data, especially the lower end







Portland homes are selling above asking prices