

Ames Housing Analysis & Prediction

Selling Sunset

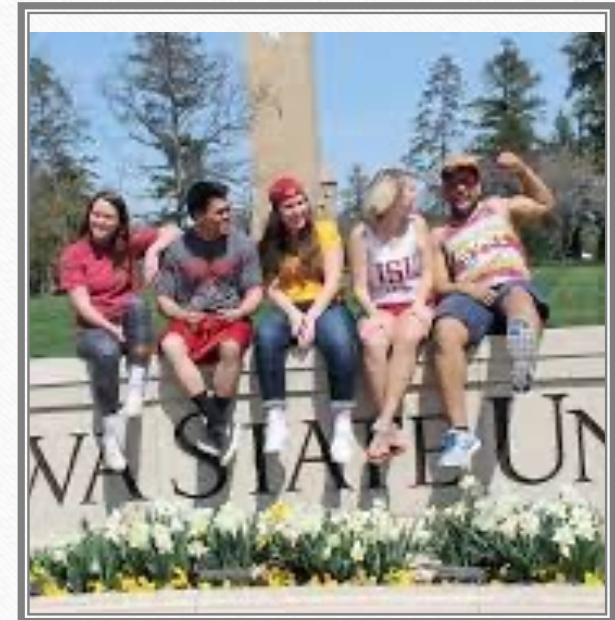


Problem Statement

- Create a model to predict house prices
- Using the model, identify features to increase house prices

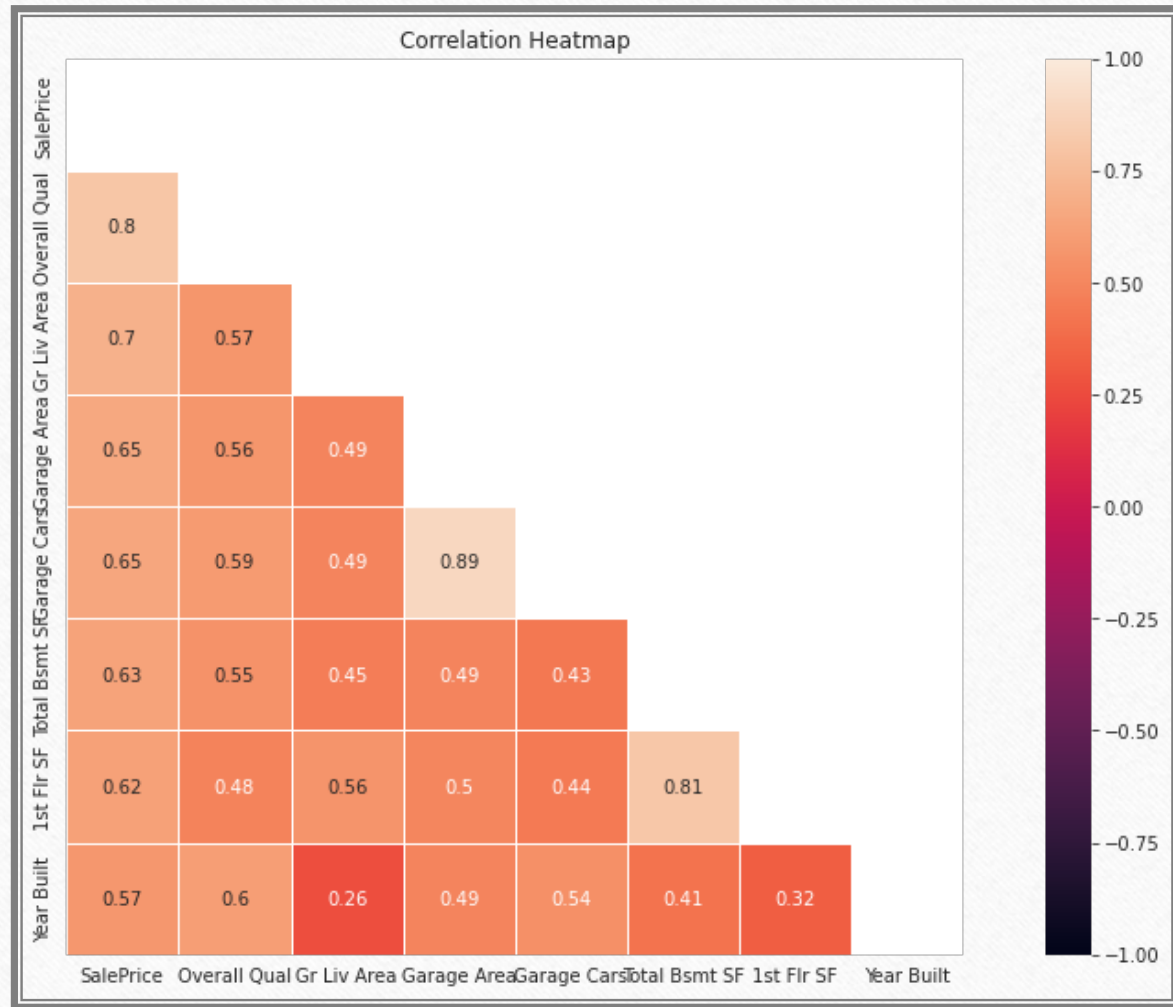
Background on Ames

- Ames, Iowa is a Collegetown. Home to Iowa State University (ISU)
- Half the population of Ames are students of Iowa State University.
- Low owner-occupied housing rate



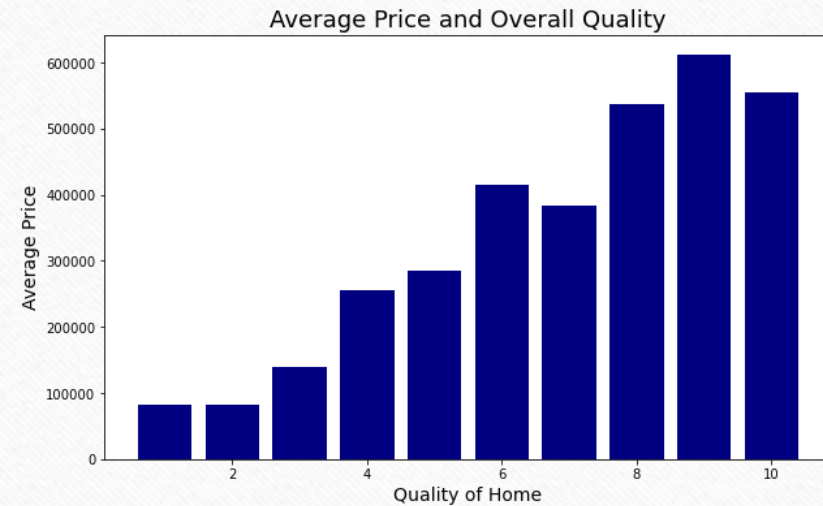
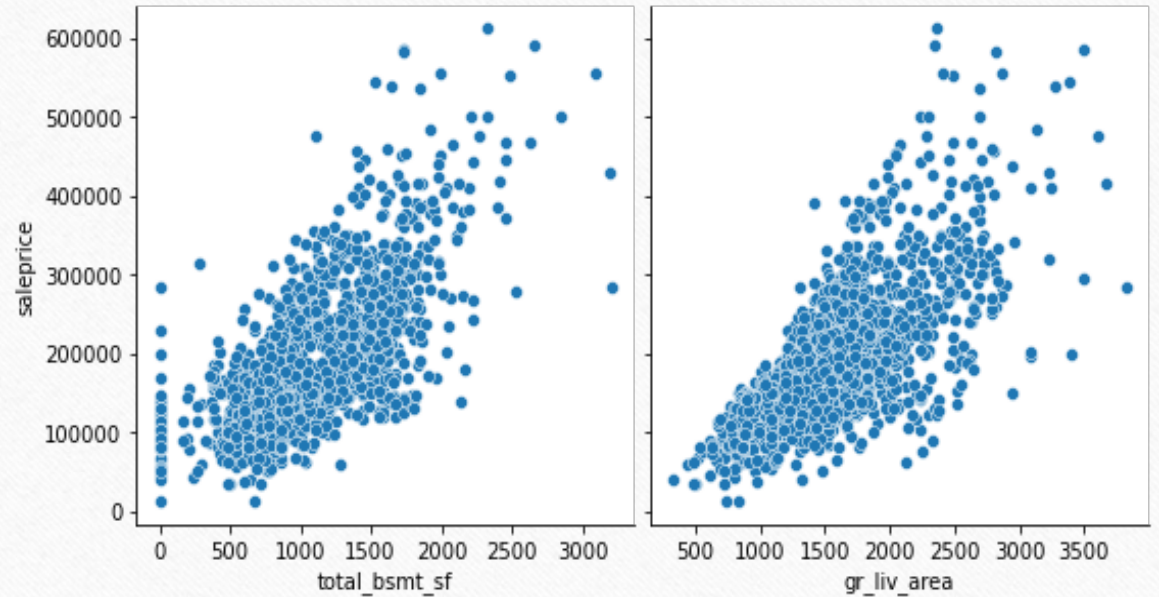
Exploratory Data Analysis (EDA)

Rank	Variable	Correlation
1	Overall Quality	0.8
2	Exterior Quality	0.71
3	Ground Living Area	0.7
4	Kitchen Quality	0.69
5	Garage Area	0.65
6	Garage Cars	0.65
7	Total Basement SF	0.63
8	1st Flr SF	0.62
9	Basement Quality	0.61
10	Year Built	0.57



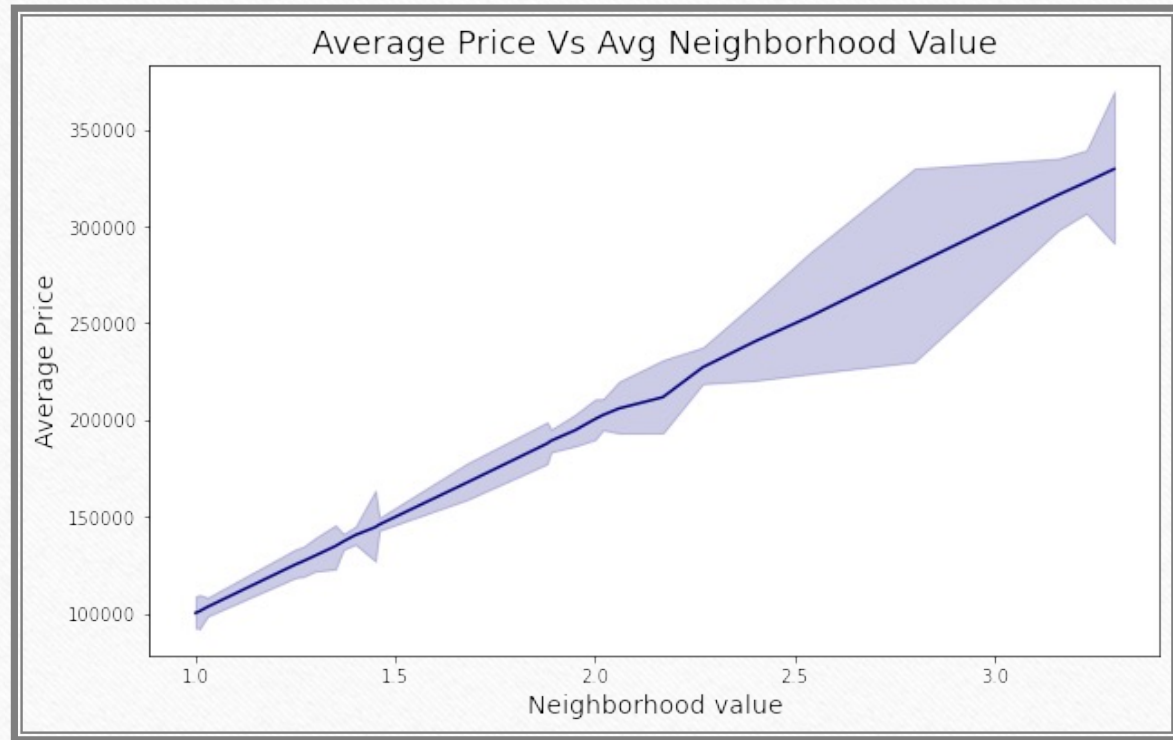
Exploratory Data Analysis (EDA)

- Size and Quality are the most important features.
- Both have strong correlation to price



Exploratory Data Analysis (EDA)

- Neighborhood also have a strong correlation to price
- Assigned avg housing prices to each neighborhoods

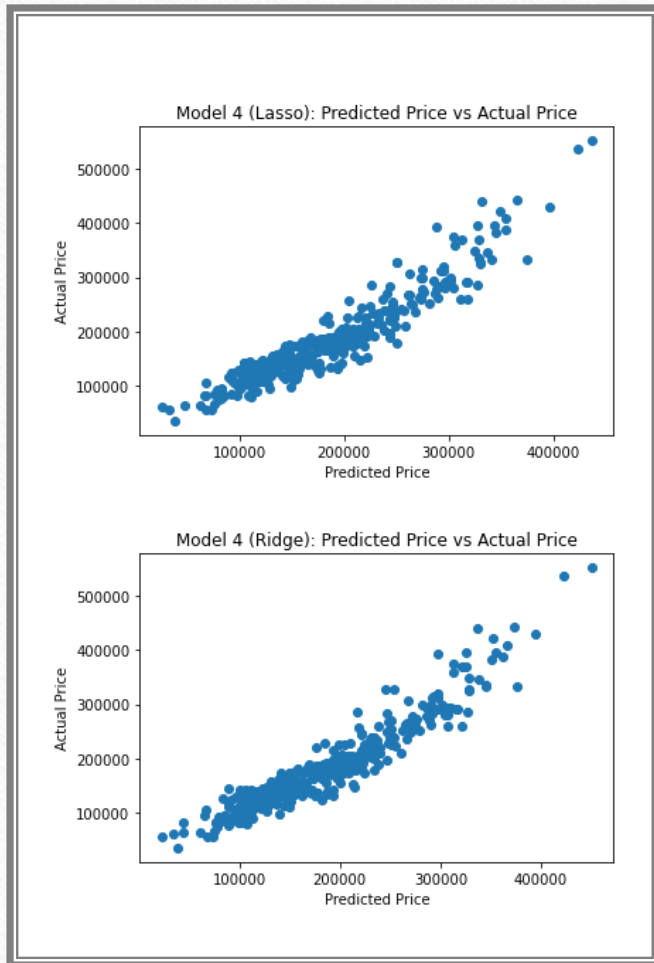


Models Used

- 33 features

-
- Quality
 - Overall
 - Exterior
 - Kitchen
 - Basement
 - Heating
 - Size
 - Ground Living Area
 - Total Basement SF
 - Garage Area
 - Rooms
 - Total Rooms
 - Total Bathrooms
 - Location
 - Neighborhood
 - Zone Classification
 - Garage Area
 - Property characteristics
 - Lot Shape
 - Lot Config
 - Bldg Type
 - Foundation
 - Function
 - Sale Type

Models Used



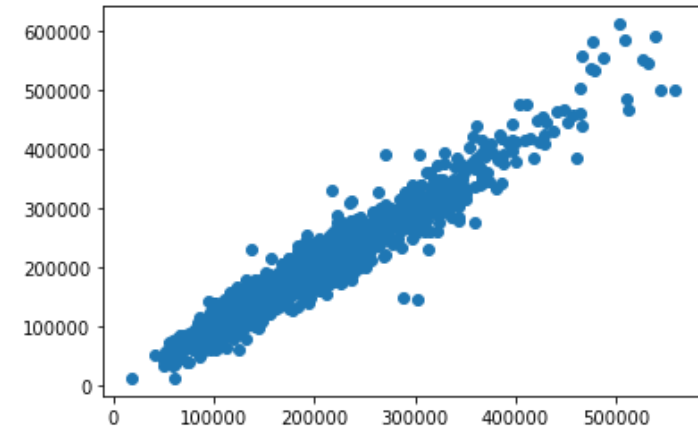
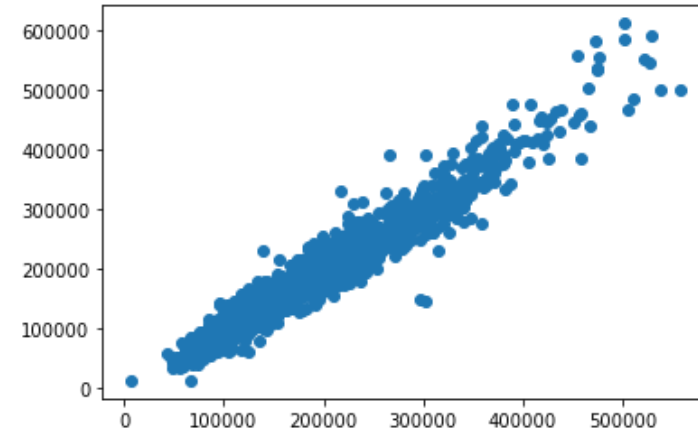
- Lasso and Ridge regularization was utilized.
- Slight curvature
- Polynomial feature was used to further tune the model

Final Model Used

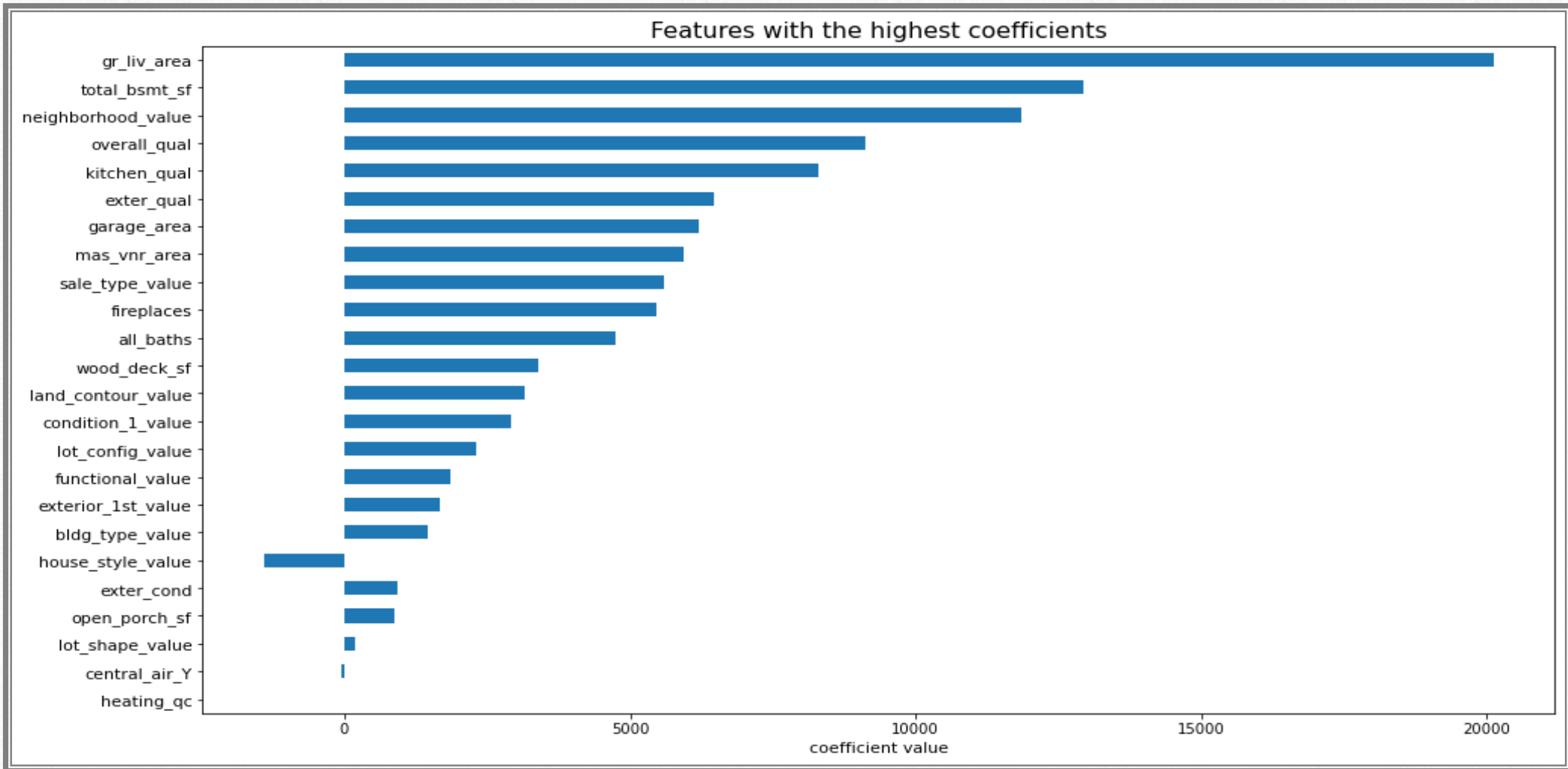
Final Model

Lasso $\alpha = 71.62$

Ridge $\alpha = 72.33$



Top Coefficients



Tradeoffs

- Using polynomial features
- Having too many features
 - Run the risk of overfitting
- Group categorical variables by avg price

Future areas of investigation

- Sales data was provided between 2006 - 2010.
- Inflation data can be incorporated to the model.
- Apply model to other similar cities.