

Increasing the home value in Ames, IA

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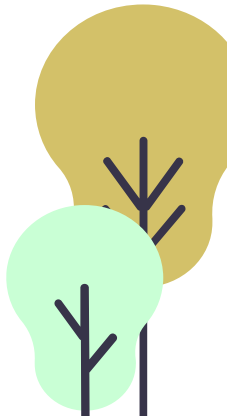
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01 Purpose

Problem Statement

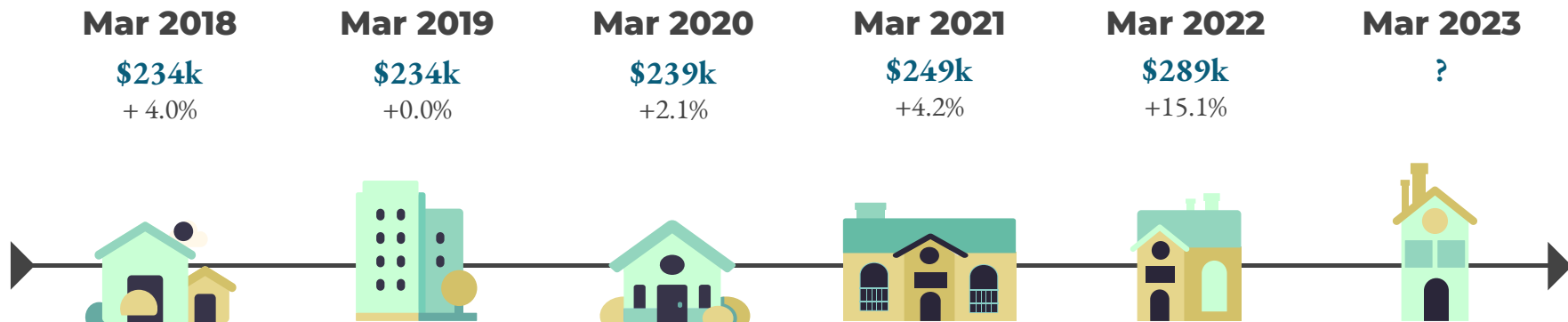
As of March 2022, the median home value in Ames, Iowa is \$286,826. The median home value has not seen much consistency with year over year percent changes in the past 5 years due to the housing crash in 2018/2019 and post COVID-19 economic effects in 2021/2022.

The city of Ames is interested in identifying ways in which they and their residents can do their part to help increase the city's median home value in spite of the continuing post COVID-19 economic effects.

This project aims to identify specific housing features that have a high impact on a home's value using a machine learning lasso regression model, so that the city knows what to consider when building new housing and residents know what to consider when building, updating or selling their home.

02 Background

5-Year Zillow Home Value Index



03 Data

Dataset

The Ames Housing Dataset contains :

- Obtained directly from the Ames Assessor's Office
- 2051 observations spanning from 2006-2011
- 79 features (39 numerical and 40 categorical)
 - Building/House Type & Style
 - Lot & Land
 - Foundation
 - Neighborhood
 - Roof & Exterior
 - Rooms & Square Footage
 - Basement
 - Garage
 - Deck, Porch & Fence
 - Pool

04 Methodology

Machine Learning

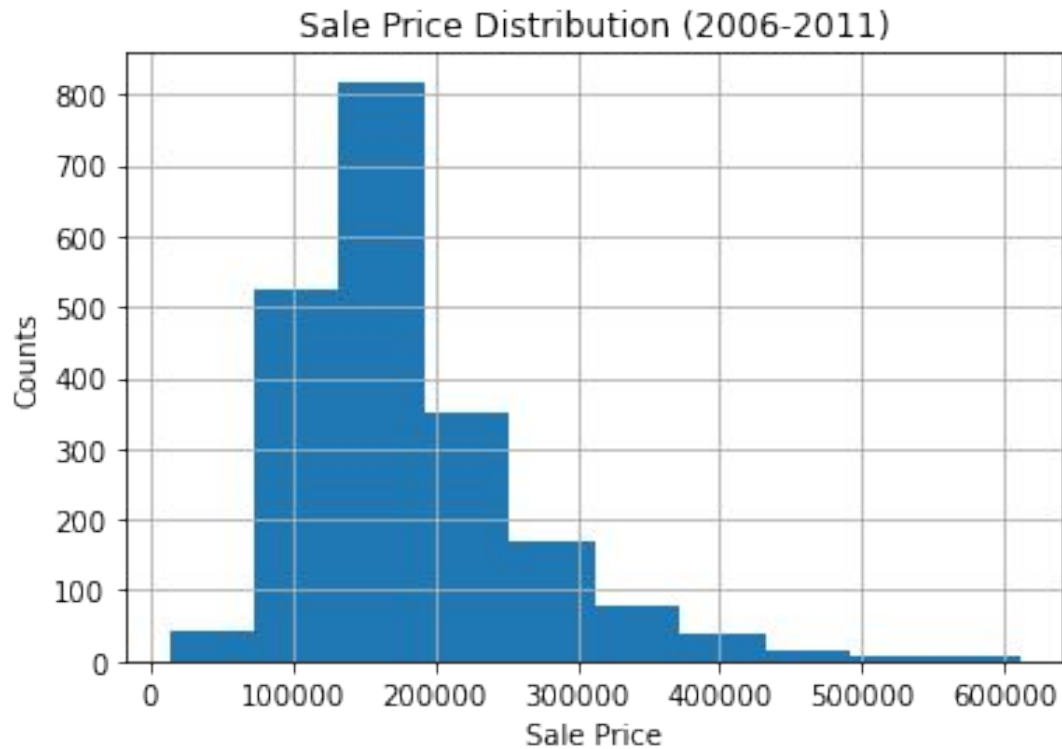
- **What is it?**
 - The process of letting your machine use data to learn the relationship between predictors (housing features) and responses (sale price).
- **Which model was used?**
 - Lasso Regression
 - Linear Regression
 - Regularization → Penalty

LassoCV

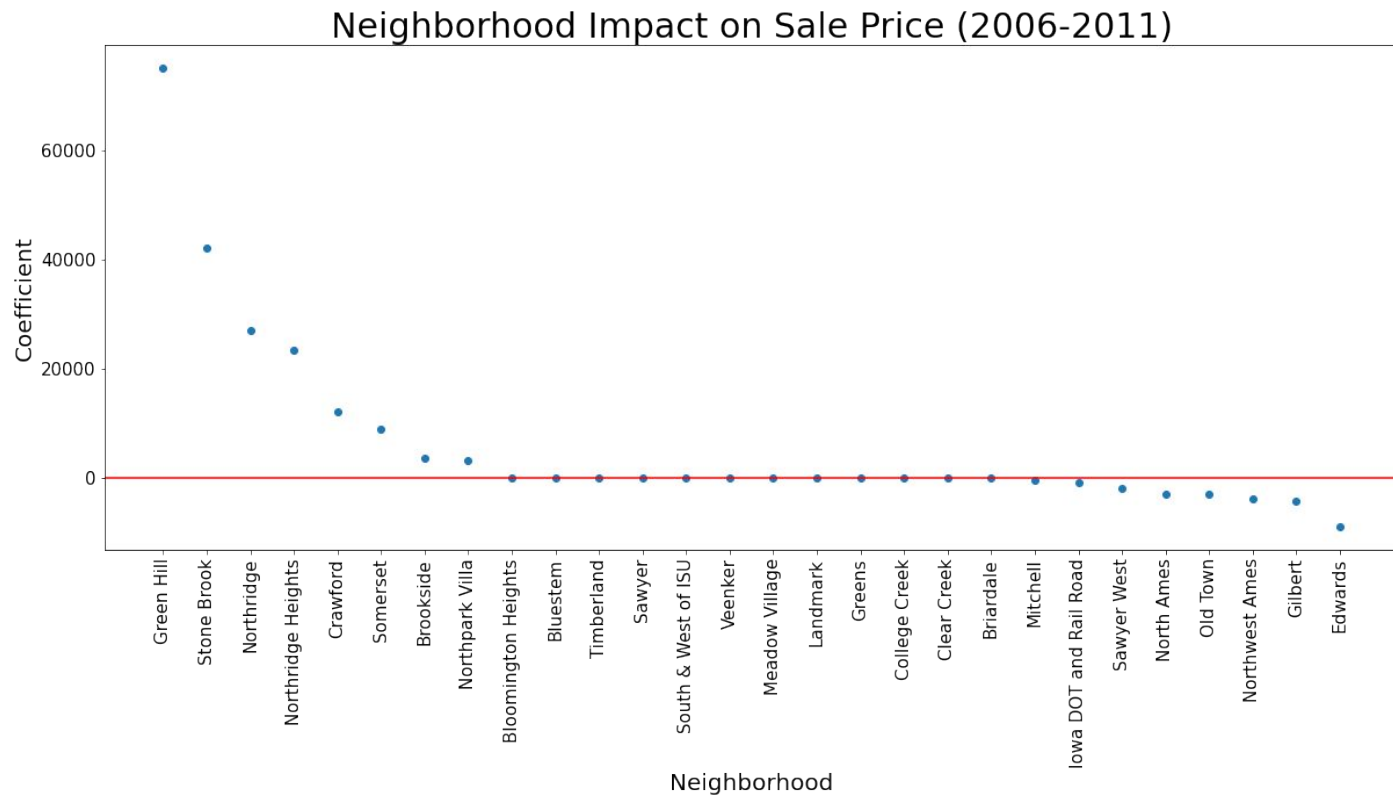
- **Best Performing Alpha**
 - 46.4158883361278
- **Cross Validation Score**
 - 0.838402361575566
- **R² Scores**
 - Training Data: 0.9356412511488261
 - Validation Data: 0.9274721464439819

05 Findings

Home Sale Price Distribution



Neighborhood Impact on Home Sale Price



Neighborhood Insights (Top 5)

Top 5 neighborhoods that increase home value:

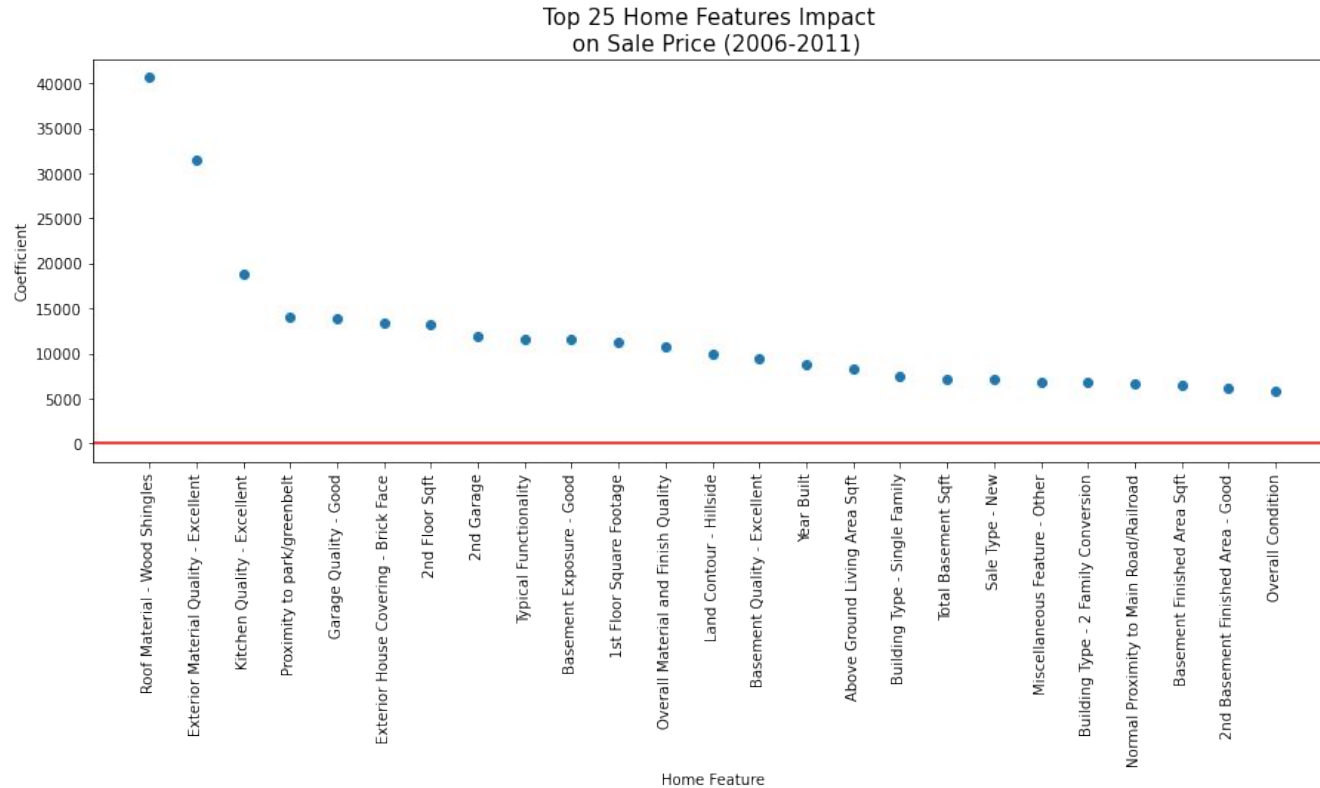
| | Neighborhood | By... |
|---|--------------------|---------|
| 1 | Green Hills | \$75.2k |
| 2 | Stone Brook | \$42.3k |
| 3 | Northridge | \$27.0k |
| 4 | Northridge Heights | \$23.5k |
| 5 | Crawford | \$12.1k |

Neighborhood Insights (Bottom 5)

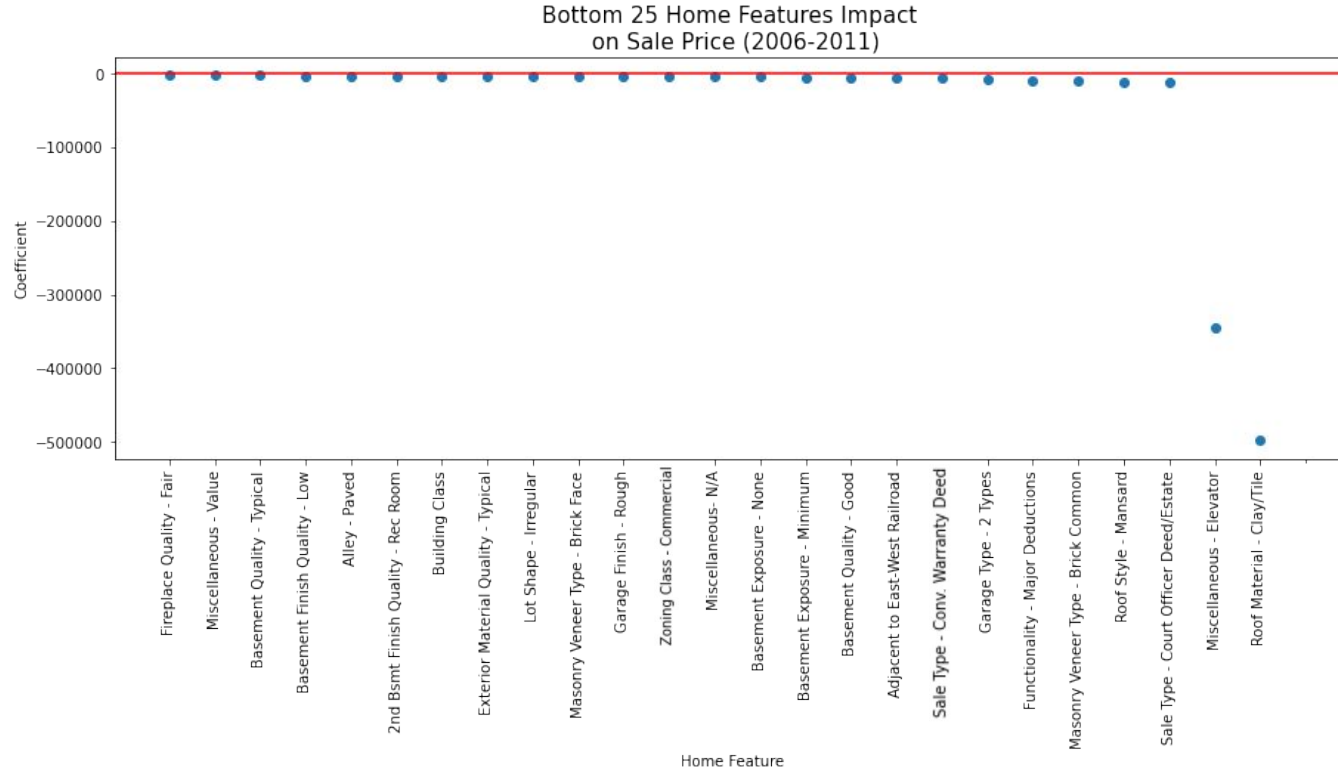
Bottom 5 neighborhoods that decrease home value:

| | Neighborhood | By... |
|---|----------------|--------|
| 1 | Edwards | \$8.9k |
| 2 | Gilbert | \$4.1k |
| 3 | Northwest Ames | \$3.9k |
| 4 | Old Town | \$3.0k |
| 5 | North Ames | \$2.9k |

Top 25 Home Features Impact on Home Sale Price



Bottom 25 Home Features Impact on Home Sale Price



Home Insights (Top 5)

Top 5 home features that increase home value:

| | Feature | By... |
|---|---------------------------------------|---------|
| 1 | Roof Material - Wood Shingle | \$40.7k |
| 2 | Exterior Material Quality - Excellent | \$31.5k |
| 3 | Kitchen Quality - Excellent | \$18.9k |
| 4 | Proximity to a park/greenbelt | \$14k |
| 5 | Garage Quality - Good | \$14k |

Home Insights (Bottom 5)

Bottom 5 home features that decrease home value:

| | Feature | By... |
|---|---------------------------------------|----------|
| 1 | Roof Material - Clay or Tile | \$498.2k |
| 2 | Elevator | \$345.2k |
| 3 | Court Officer Deed/Estate Sale Type | \$12.7k |
| 4 | Roof Style - Mansard | \$12.5k |
| 5 | Masonry Veneer Type - Brick Common | \$10.9k |

06 Conclusion

Recommendations

- Investing in housing in the Green Hills, Stone Brook, Northridge, Northridge Heights and Crawford neighborhoods
- Investing in more parks and green spaces
- Considering:
 - Wood Shingle Roofing (and avoid Clay, Tile or a Mansard style)
 - Excellent Exterior Material Quality (and avoid Common Brick)
 - Excellent Kitchen Quality
 - Good Garage Quality
 - Brick Face Exterior House Covering
 - Second Floor Square Footage
 - Avoiding unnecessary luxury features (elevator, 2 garages)

Next Steps

1. Gaining more insight as to what is considered Excellent, Good, etc. for some of the categorical features
2. A follow-up analysis on an updated housing dataset to see if the findings of this analysis continue to hold true.

Questions?

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