



Opportunities to Increase Home Values in Ames

Gabe Cano
November 15, 2020



Problem Statement

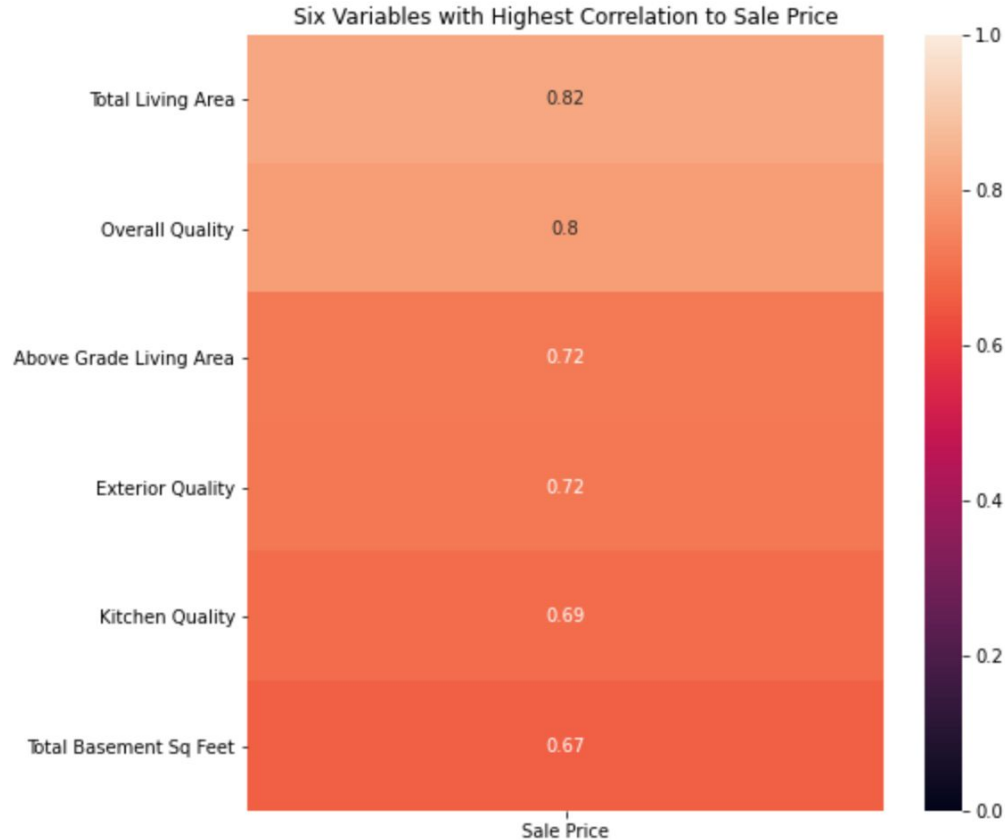
When upgrading a home, it is difficult to decide which features to renovate because it's often unclear which focus areas will lead to a higher sale price. This project analyzes a wide array of features for homes across Ames, Iowa, to recommend which factors to emphasize when flipping houses in the region.

Procedure and Methodology

- Cleaned Ames Housing dataset, analyzed variable relationships, and combined related variables to create new ones
- Modeled with scaled data to evaluate how accurately different house factors predicted sale price
- Visualized primary findings

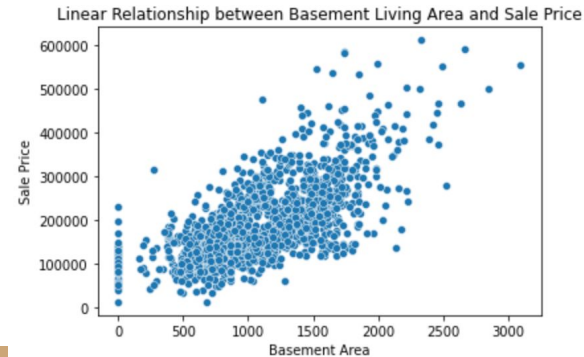
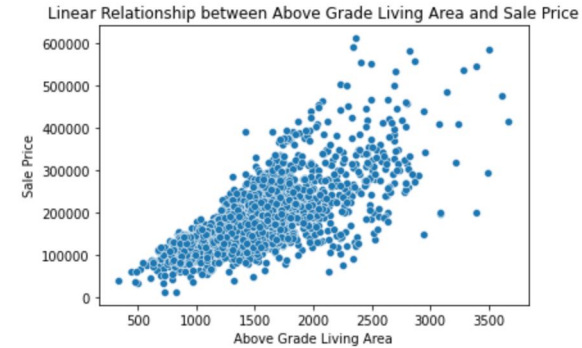
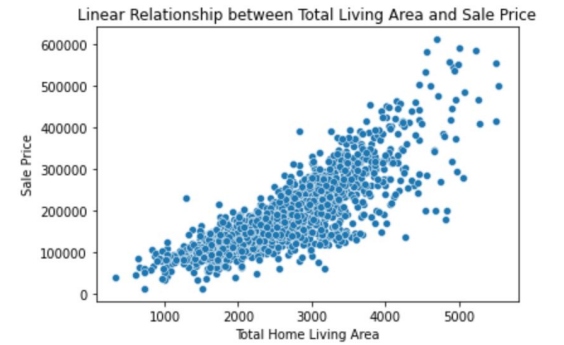
High-Correlation Variables

- The most strongly related factors indicating home sale price focus on:
 - Quality (upkeep, modernity, etc.)
 - Square Footage
- Ways to improve these high-correlation variables:
 - Annex new rooms to the home
 - Renovate the kitchen
 - Give exterior a fresh paint job or new high-end stone veneer



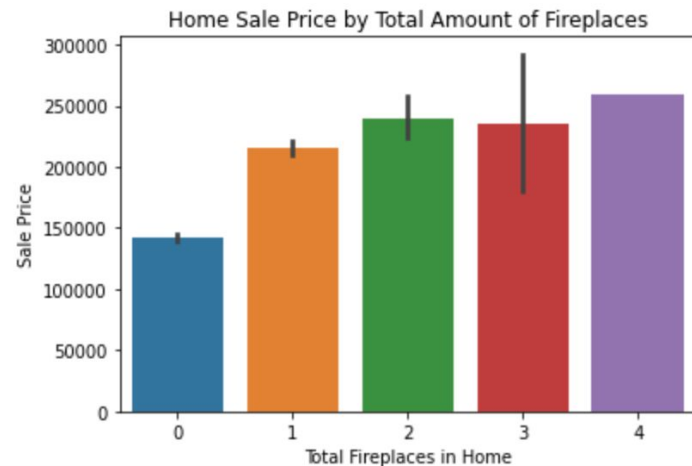
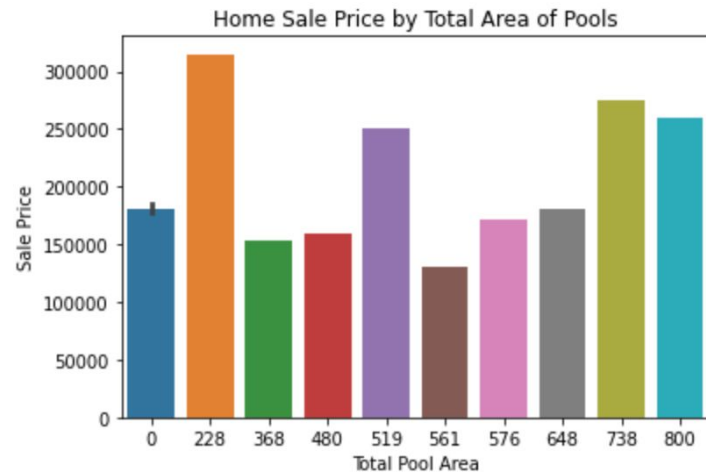
Area Metrics Relationship to Sale Price

- Square foot area metrics have strong positive correlations with sale price
- Once the total square footage of a home surpasses about 4,000 sq feet, the relationship with sale price becomes less linear
 - This pattern is similarly shown with above grade and basement areas around 2,000 feet



Insignificant Variables

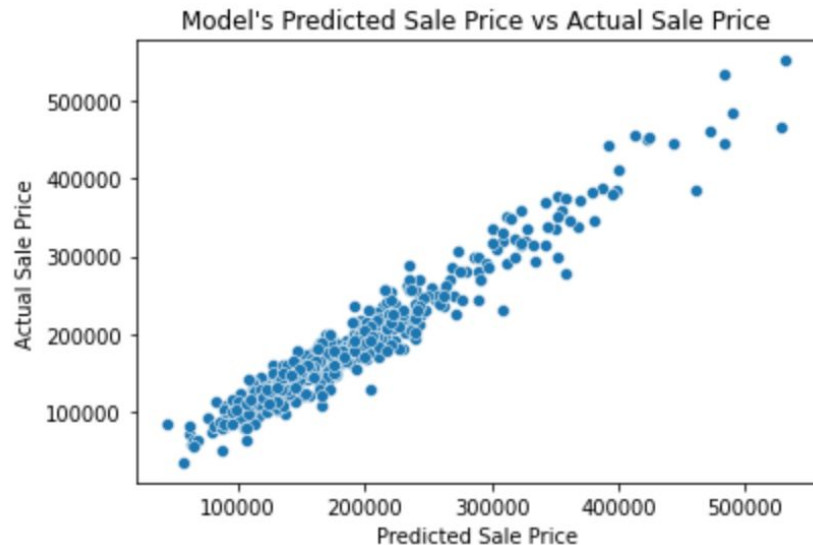
- Stick to the basics of increasing square footage and improving *quality* (not quantity!) of home amenities:
 - Don't spend resources expanding pool size
 - After building one fireplace, there's no strong need to build more



Model Coefficient Top Results

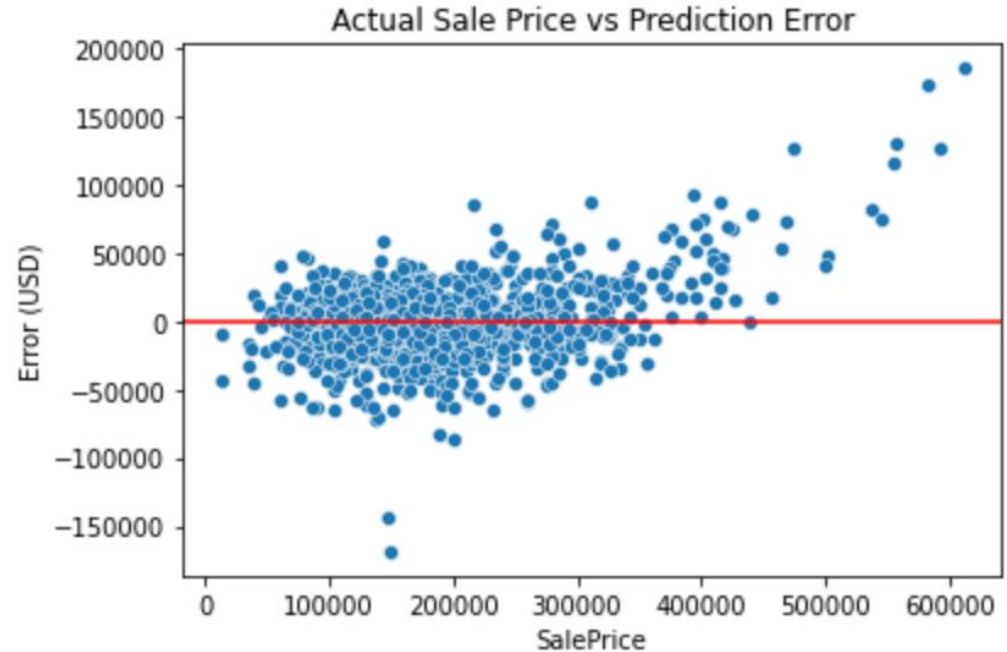
- The model's top three coefficients match the top three from the initial correlation heatmap
- The predicted home sale prices have a linear relationship with the actual home sale prices

Feature	Coefficient
Above Grade Living Area	16151.9
Overall Quality	13932.2
Total Living Area	13698.3



Actual Sale Price vs Model Prediction Error

- The prediction model began to underpredict the sale price once homes exceeded \$400,000
- The data presented should be considered more for flipping homes that are less expensive



Conclusion

- Focus on increasing square footage of the home, perhaps by annexing a new dining area, den, or game room
- Focus on improving the quality of what's already in the house
- Focus less on building new amenities for the home, such as constructing a larger pool or adding multiple fireplaces
- Note that these variables predicted sale price values less accurately as sale price exceeded \$400,000