



Modeling Ames Housing Prices

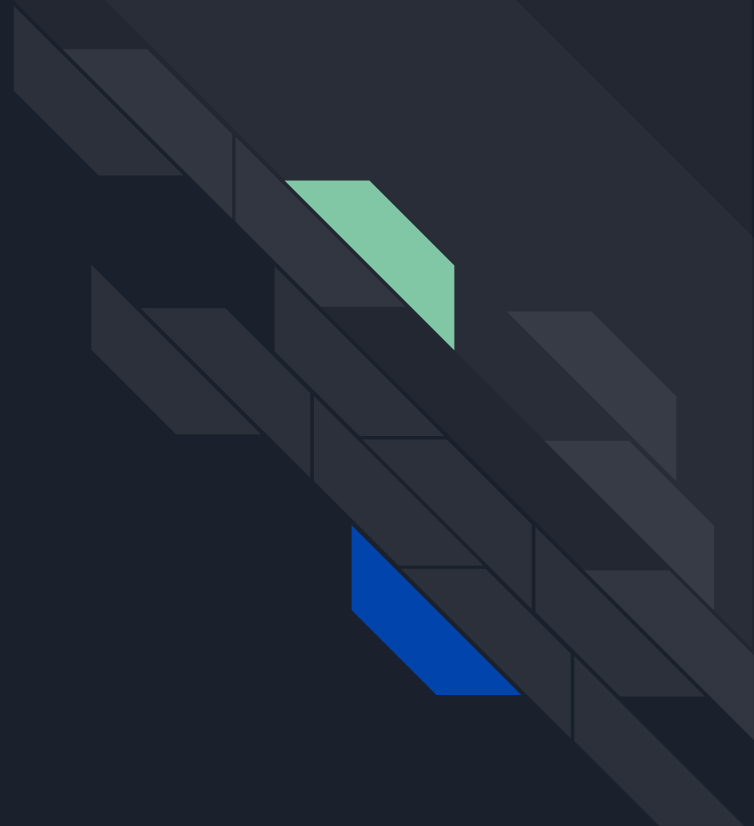
A look into what is affecting house sale prices in Ames, Iowa.
Looking to determine major factors that influence the price of homes.

The Problem:

Acclaimed real estate firm House Sellers Plus has had a sudden change in leadership! Following a mid-life crisis executive director Jerry Seller has stepped down. Taking his place is his inexperienced son, Ben Seller. Ben has brought in a data science expert to provide the groundwork on evaluating the value of all the homes currently owned by the firm in Aimes, Iowa.

The Resources:

Thankfully the Ames Assessor's Office has provided to the firm a collection of data on the sale of houses in the area, which can be used to gain some insight into the housing market in the city.





Background on the Data and The Housing Market:

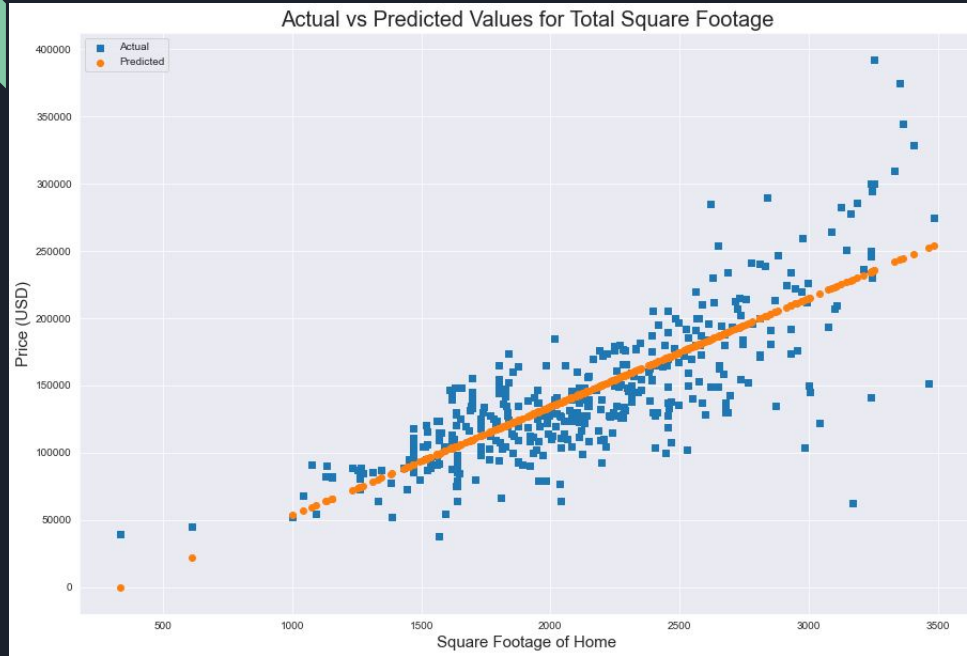
According to an article written for Opendoor, a digital platform for buying and selling residential real estate, two of the most essential factors affecting the price of a house are the overall home size, and the age of the house.

This data set provides access to both of those house features along with the price that the house was sold for. The plan will be to look at the effect of these two factors on house prices.

The data set is also very rich with lots of other information. A model will be built using several of these factors (including some that made their way into the Opendoor article as well). This model will be able to help determine factors have a major effect determining the price of homes in the city.

<https://www.opendoor.com/w/blog/factors-that-influence-home-value#:~:text=The%20local%20market,homes%20it's%20a%20seller's%20market.>

Assessing the Impact of Total House Size:

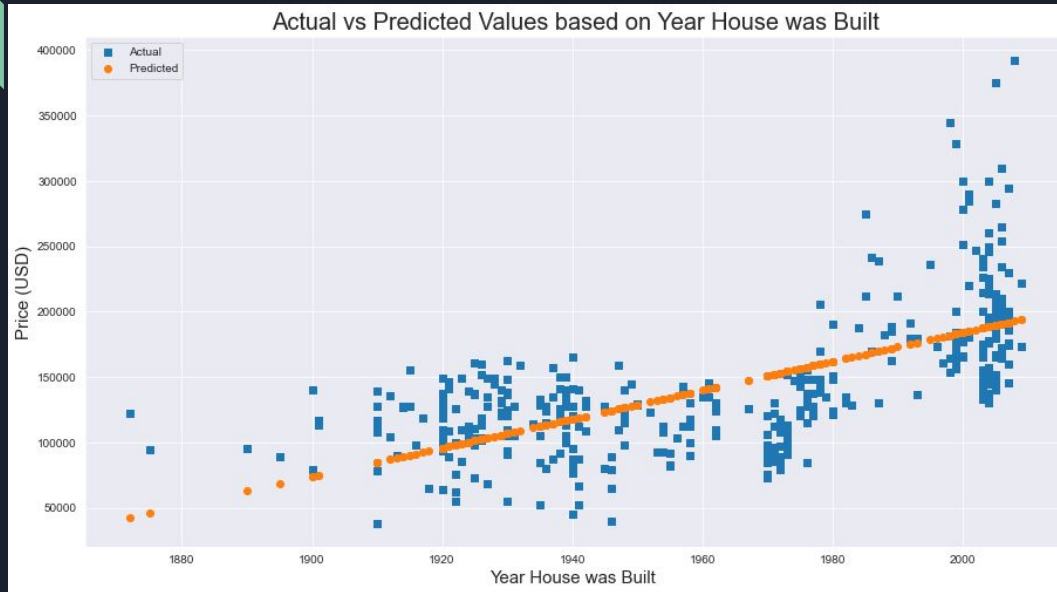


This simple model helps provide us with a few important insights about the effect of house size:

- Increase in square footage will normally result in a increase in sell price.
- For every increase in the square footage by 1 square foot, the house price increases by \$80 USD.
- Housing prices are less predictable for large houses based on square footage alone.

This graph shows in blue the actual house values vs the house values predicted by a simple models.

Assessing the Impact of House Age:

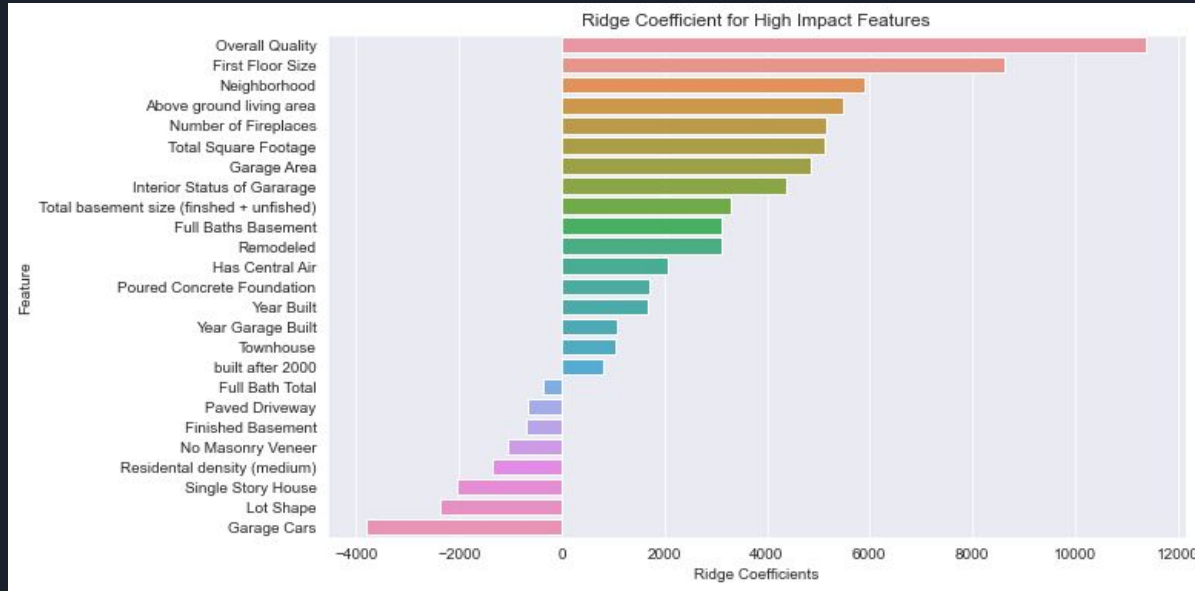


This simple model helps provide us with a few important insights about the effect of house age:

- Newer houses are worth more money!
- Houses built in the seventies seem to struggle.
- For every year newer a house was built, it will see a \$1103 USD increase in price.

This graph shows the predicted house prices in orange, vs the actual sale price for the model based on house age.

A More Complex Model For Predicting:



A bar chart showing the Ridge coefficients for a more complex model.

Using a more complex model for predicting house sale price can help us look at what house features have big impact on the price of a house!

In this graph the most important information is how BIG the bars are, looking at bars that are larger than other allows us to see their relative strength in the model.

Conclusions and Recommendations:

Using several models it is possible to assess the home value of all the homes Ben Seller finds himself suddenly in control of:

- The overall size of the house is a big determining factor in the price, and the age also has a moderate influence.
- Factors such as the neighborhood the house is in, the number of fireplaces, and whether or not the house have central air can play a key role in determining house prices.
- One of the most important features is the overall quality of the house.

This project recommends the following going forward to Mr. Seller:

- Evaluate the size and location of all of your newly acquired houses to get an estimate of the houses value.
- With more data an effective model can be built to more accurately predict the price of the houses you are trying to sell.

