Ames Housing Data
- The Ames-ing Group

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Agenda

1. Background
2. Problem Statement
3. Model Chosen
4. Features Chosen
5. Case Study
6. Conclusion and Recommendations
7. Future Works

1. Background

Cardinals Real Estate Investment LLC
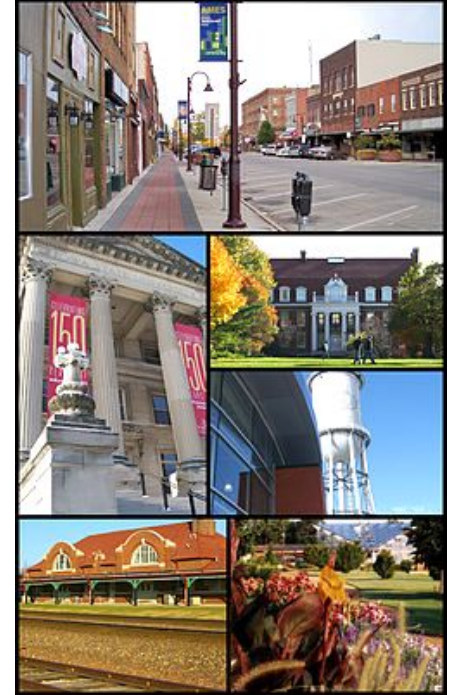
Goals

- Investment return through capital appreciation

- Target assets in Ames, Iowa geographical region

Methodology

- Extensive multi-year data containing 80 features

- Data driven actionable insights

Target Audience

- Investors with a mid-to-long-term outlook, looking for an attractive total returns

Source: Wikipedia

2. Problem Statement

To give superior investment returns to our investors by achieving capital appreciation of property assets through data analysis and modelling

- Buying undervalued assets predicted in our model and resell at fair value.

- Buying assets with features that our model predicts can be renovated to resell at significant price increase.

3. Model chosen

- Home-buyers consider multiple options e.g. size, garage, quality
- Imperfect knowledge of a product
  - Home-buyers look once every 12 years on average

What can our Linear regression model do?

1. Inclusive
2. Immediate
3. Efficient
   - Recommends effective factors for upgrades
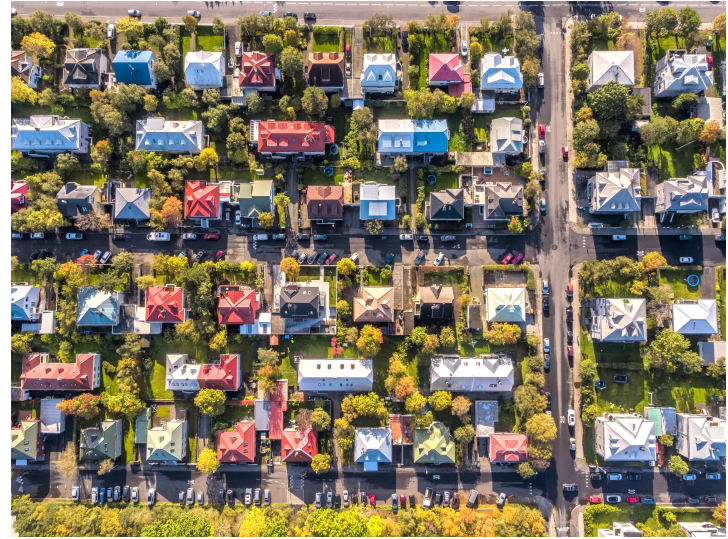
3. Our Model

Historical back-tested 2006-2010

Exhaustive and inclusive modeling
- ○ 10 features

Prognostic
- ○ Determine investment strategy

Actual Sale Price vs Predicted Sale Price

4. Features Chosen

Feature	Coefficient
Overall Qual Gr Liv Area	40,468
Total Basement SF	14,232
Lot Area	7,451
External Qual	7,368
Kitchen Qual	7,260
Basement Qual	7,048
Overall Cond	5,959
Garage Area	5,835
Basement Exposure	5,170
Year Built	4,661

- Features that were significant but not chosen:
  - Neighborhood [Nominal]
  - MS SubClass [Nominal]
  - Basement Finish (Type 1) [Ordinal]
  - Home Functionality [Nominal]

- These features are Categorical

- Only certain values yield high coefficients, while other values are insignificant

# 4. Features Chosen
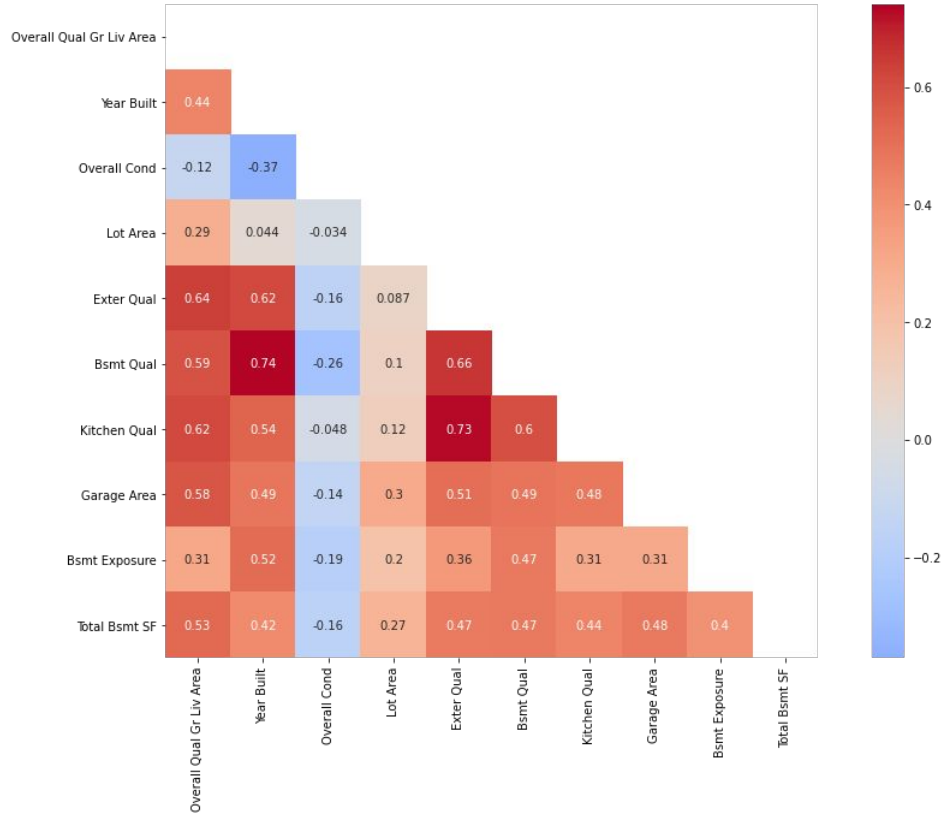
Features that can be worked on:
- Overall Quality
- External Quality
- Kitchen Quality
- Basement Quality
- Overall Condition

Features that cannot be worked on:
- Above Grade Living Area
- Total Basement Square Feet
- Lot Area
- Garage Area
- Year Built

4. Sale Price by Neighbourhood

- StoneBrooke
- Northridge Heights
- Timberland
- Veenker
- Clear Creek

Distribution of sale prices in neighbourhood categories («OverallQual»)
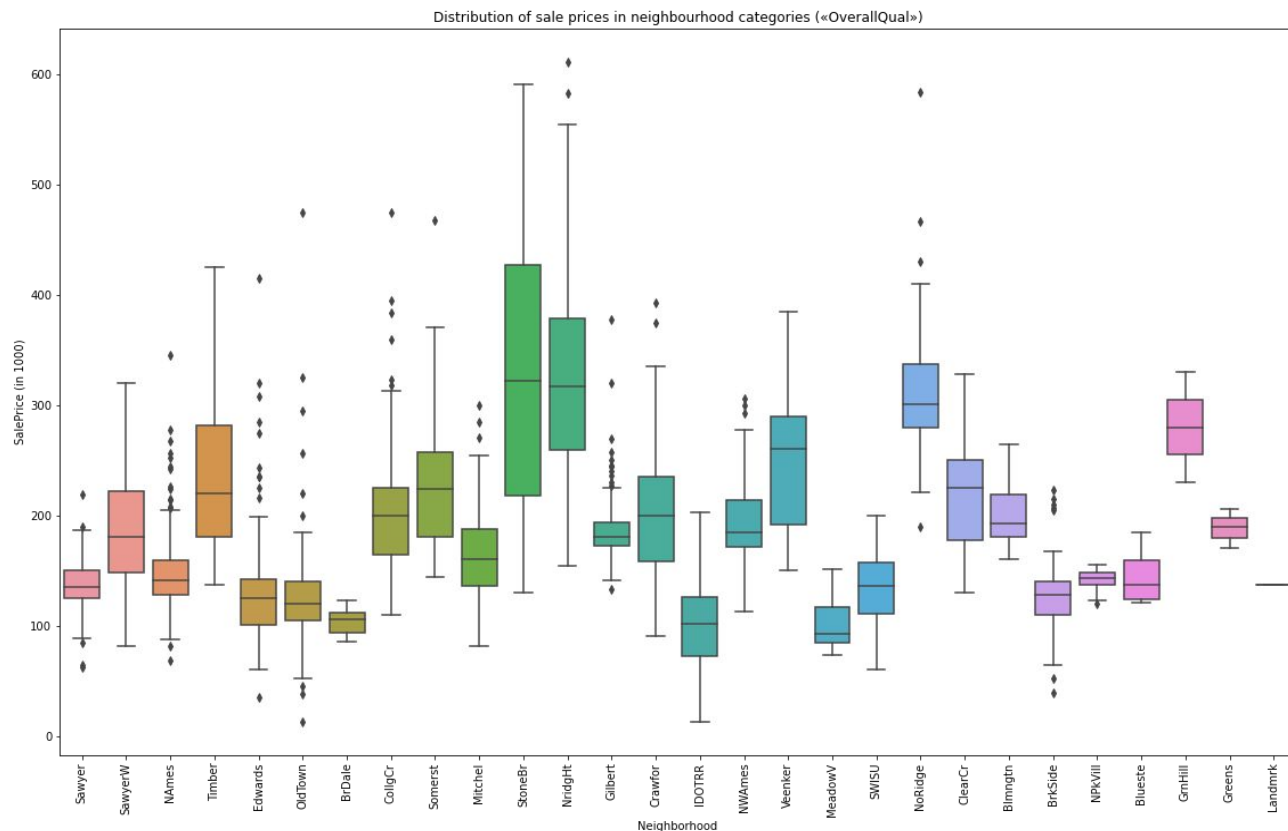
5. Case Study: Stone Brooke

Neighborhood	Lot Area	Overall Quality	Above Grade Living Area	Overall Condition	External Quality	Basement Quality	Kitchen Quality	Total Basement Square Feet	Basement Exposure	Garage Area	Sale Price	
Stone Brooke	3,701	8	1,204	5	Typical	Good	Typical	1,191	No Exposure	461	**130,000**	Buy Price

Neighborhood	Lot Area	Overall Quality	Above Grade Living Area	Overall Condition	External Quality	Basement Quality	Kitchen Quality	Total Basement Square Feet	Basement Exposure	Garage Area	Projected Value	
Stone Brooke	3,701	8	1,204	5	Typical	Good	Typical	1,191	No Exposure	461	**170,468**	Model Value

Neighborhood	Lot Area	Overall Quality	Above Grade Living Area	Overall Condition	External Quality	Basement Quality	Kitchen Quality	Total Basement Square Feet	Basement Exposure	Garage Area	Projected Value	
Stone Brooke	3,701	**9 (+1)**	1,204	**8 (+3)**	Typical	Good	Typical	1,191	No Exposure	461	**188,345**	Value After Renovations

Total Margin	Estimated Costs	Projected Profit	% Profit Margin
$58,000	**- $26,000**	**$32,000**	**24.6%**

6. Conclusion and Recommendations

1. Our **model** has identified the features that will predict **undervalued** properties as well as properties which can be **renovated** to achieve significant investment returns.

2. **Overall quality of housing** in the Ames area have a significant impact on the sale prices. Propose to identify properties that have a **low overall quality** and flip them by **renovating**. The expected selling price after renovation can be estimated using the regression model for profit analysis.

3. In terms of neighbourhood selection, properties in the **StoneBrooke, Northridge Heights, Timberland, Veenker, Clear Creek** area show a high variability in the sale price. There is a potential to earn profit by finding low quality properties in these neighborhoods to renovate and flip them.

7. Future Work

1. **Automated** search of investment opportunities: **Web-scraping/ API** and model prediction to automatically find undervalued properties on web portal listings.

2. Correcting the sale prices for current **market sentiments**. (i.e. In a bear market, the sale prices of properties would be lower as compared to a bull market)

3. Correcting the sale price of properties with **inflation**.