

Housing Prices

What features matter?

Who are we?

- Stephen, Jordan, and Nemo
- Consultants for housing prediction
- Looking at the **Ames Housing Dataset**

Problem Statement

Using past data of housing sales in Iowa as a training model, we need to create a prediction model to find the best prices for houses based on their features and conditions.

Presentation Dictionary

Content	Page
Why should you care?	5
Models Used	7
Visualisation	11
Recommendations	15

Why should you care?

- **Prediction:** Better approximate pricing = Fairer transactions
- **Inference:**
 - **Companies:** Optimisation of housing
 - **Housebuyers:** Know what to look out for when buying or renovating

Ames Dataset

- Information from Dean De Cock
- Based in **Ames, Iowa**
- Data between **2006-2010**
- **81 features** and **2000+ rows** to consider (sale prices, garages, kitchen...)

Presentation Dictionary

Content	Page
Why should you care?	5
Models Used	7
Visualisation	11
Recommendations	15

Models used

- **Linear Regression** and its variants
- **Easy Interpretation**
- Good prediction **if assumptions are met**

Variants of Linear Regression

- **Ridge Regression:** Coefficients can only be minimised, non-zeroed
- **Lasso Regression:** Coefficients can be zeroed
- **ElasticNet:** Mix of Ridge and Lasso

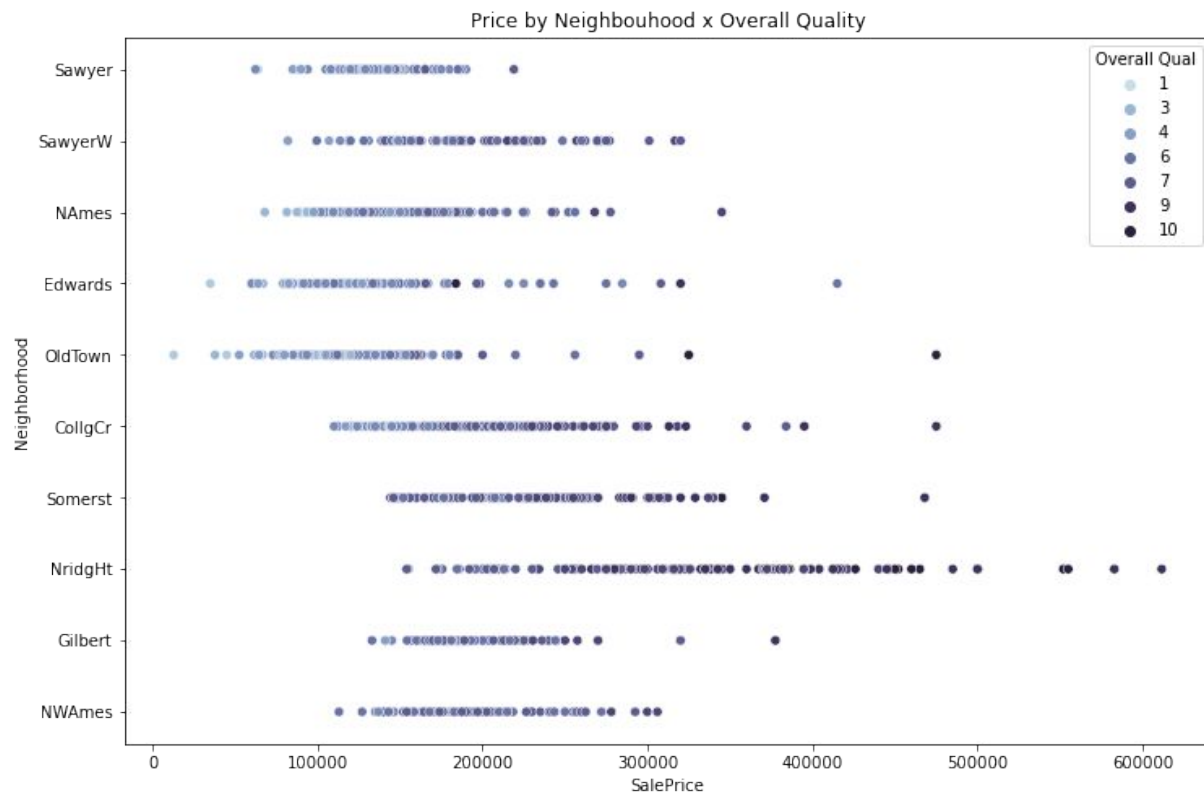
Presentation Dictionary

Content	Page
Why should you care?	5
Models Used	7
Visualisation	11
Recommendations	15

Visual graphs

- The most important factor driving house prices - Neighborhood
- Scatter plots are used to compare one more factor at each time
 - Overall quality
 - Kitchen quality
 - Garage size (by number of cars)
 - Year built
- Top 10 areas of neighborhood (by number of transactions) are studied

Neighborhood vs Overall Quality



- **Positive correlation between Price and Overall Quality**
- **Some areas (NridgHt) have a higher proportion of dark dots (i.e. more high quality properties)**

Neighborhood vs Kitchen Quality



- Lower quality, Typical (TA) and fair (Fa) kitchens at the low end of price, vs good (Gd) and excellent (Ex) ones at the high end

Presentation Dictionary

Content	Page
Why should you care?	5
Models Used	7
Visualisation	11
Recommendations	15

Major Positive factors affecting House prices

- The most important positive features:
 - **Above Ground Living Area** in square feet
 - **Overall Quality**
 - **Neighborhood** (Northridge Heights commands highest premium)
 - **Houses built later**

Major Negative factors affecting House prices

- The most important negative features:
 - **Brickface veneers** = Cheaper prices!!
 - **Having a small garage** = Cheaper prices!!!
 - **Non-Excellent kitchen quality** - buyers not impressed

Recommendations: To Companies

- “What kind of homes should I build?”
 - Build **1 story houses** instead of 2 family conversions
- “Where should I build them?”
 - Choose **Northridge Heights and Stone Brook**

Recommendations: To Homebuyers

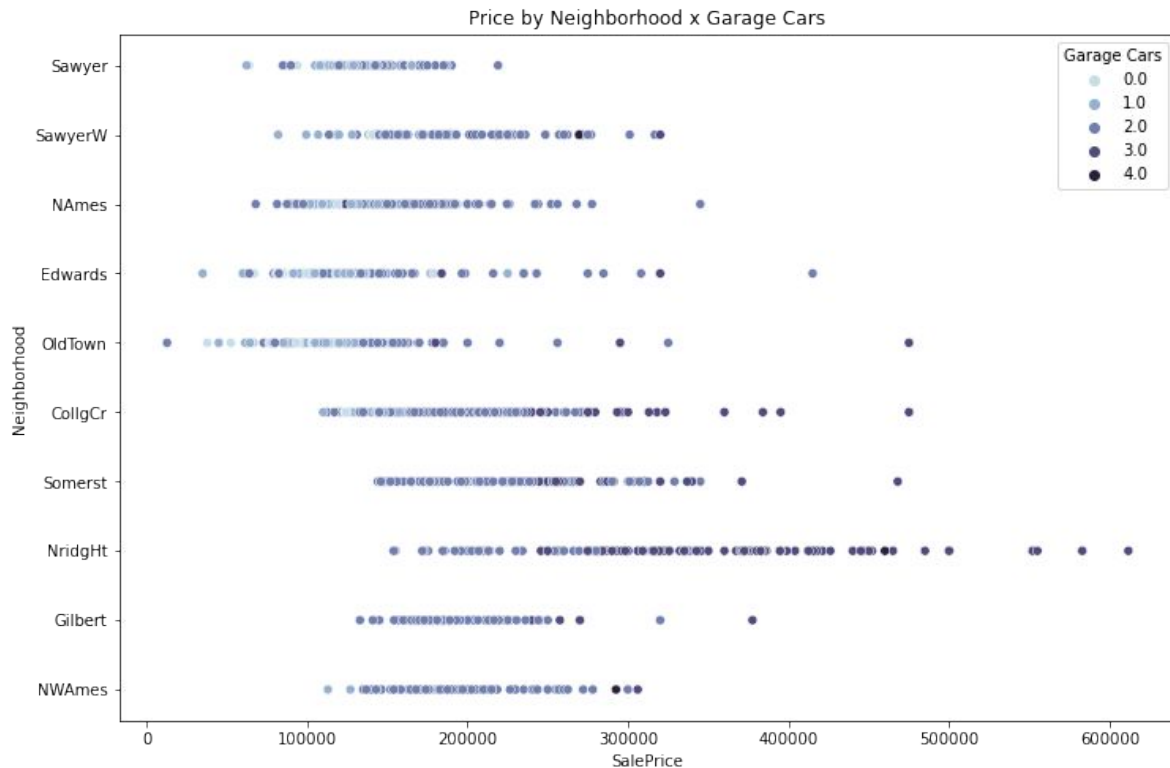
- If price is your concern
 - Buy a **lower quality** house in a **worse condition**... and Renovate!
 - go for a cheaper neighborhood like **Brookside**
- “But I want to stay at expensive neighborhoods like **Northridge Heights !**”
 - Buy a house with a small **garage (just 1 car instead of 2)**

Thank You!

Additional graphs - bedrooms



Additional graphs - garage size by car



Additional graphs - veneer



Additional graphs - Year Built

