



YOUR-HOME-QUOTE PRICE PREDICTION MODEL

Prepared by Ray Chia, Graham
James Lim, Leonard Ng, Chua HB



PROBLEM STATEMENT: STRUGGLING TO FIGURE OUT WHAT IS THE “RIGHT PRICE” FOR A HOUSE?

Your-Home-QuoteSMdashboard is the answer.

AS SIMPLE AS...

Provide the following information into Your-Home-QuoteSMdashboard.

- *Simple questionnaire on your House Quality*
- *Total Living Room Square Footage*
- *Year Built*
- *Location*
- *Garage Information*
- *Kitchen Quality*
- *Number of Fireplace*

And other information.

MODEL DEVELOPMENT

Ames Assessor
Office Property
Sales data

Over 2000 past
transactions between
2006 and 2010

Exploratory Data
Analysis

Extensive data cleaning
and analysing

Baseline Model
Evaluation

Multiple baseline model
evaluations

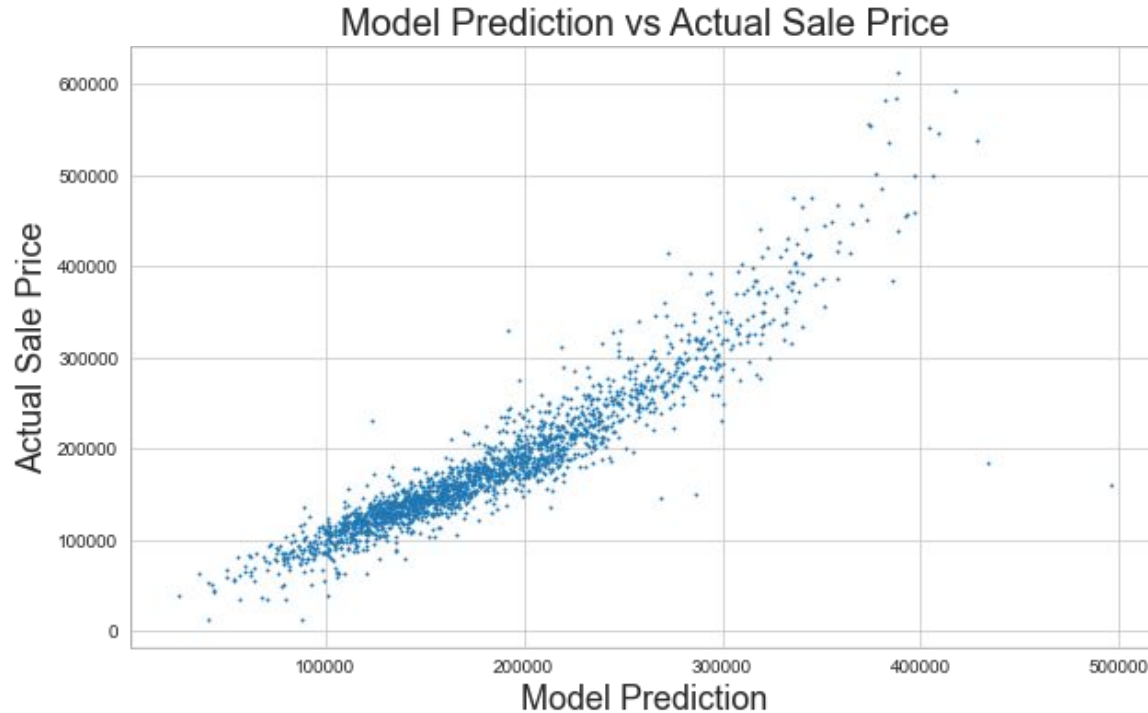
Model
Optimization

Feature engineering

Production
Model

Work in progress,
Continuous
Improvements and
Optimizations

HOW GOOD IS OUR MODEL?



Actual vs Model predicted prices for 2000 over transactions between 2006 to 2010

HOW GOOD IS OUR MODEL?

Our Optimized model predicts home prices within
10% of the average Ames home price

±\$18,000

- MAE: \$18,000 (average absolute price gap between actual and model prediction)
- R^2 : 0.90 (Goodness of fit between actual and model)

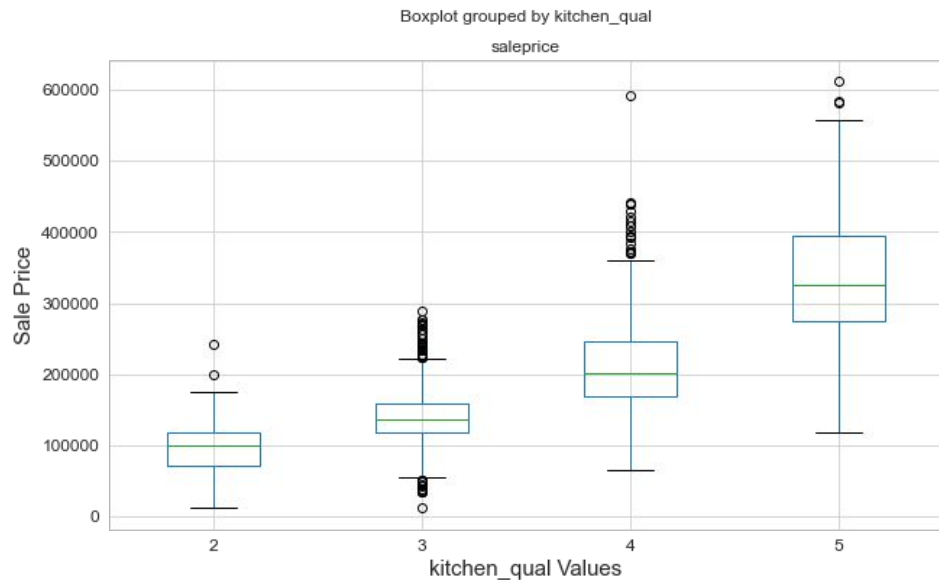
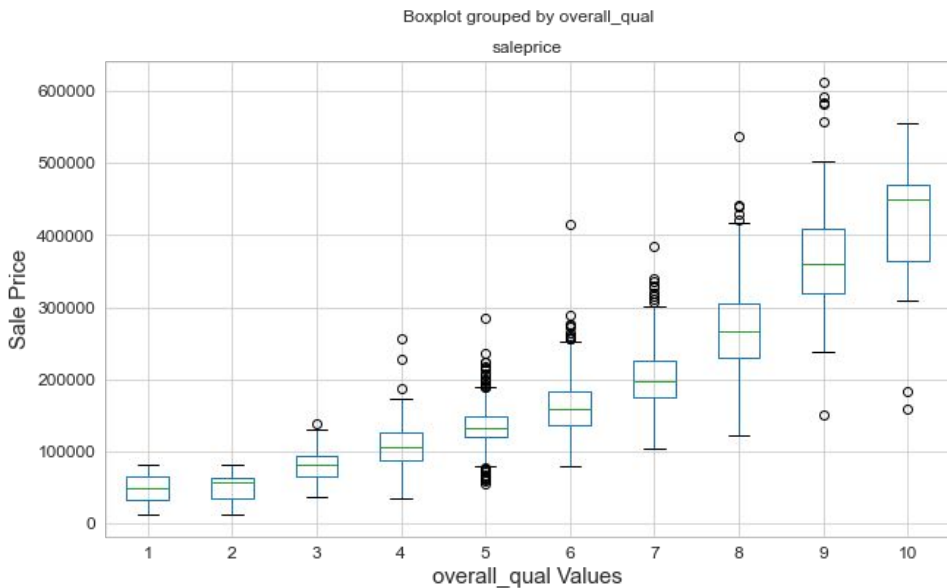
WHAT ARE THE IMPORTANT FACTORS?

- Table lists the property characteristics that have the highest influence on house prices.
- They can be categorized as
 - Quality
 - Size
 - Location
 - Age

variable	coef	abs_coef
overall_qual	8414.001263	8414.001263
gr_liv_area	7385.904130	7385.904130
neighborhood_NridgHt	7102.070363	7102.070363
1st_flr_sf	6101.158977	6101.158977
misc_val	-5874.155776	5874.155776
kitchen_qual	5706.916878	5706.916878
exter_qual	5621.805719	5621.805719
neighborhood_StoneBr	4898.563322	4898.563322
bsmt_exposure	4753.289996	4753.289996
totrms_abvgrd	4542.904159	4542.904159
mas_vnr_area	4401.278082	4401.278082
garage_cars	4334.126576	4334.126576
garage_area	3876.116568	3876.116568
neighborhood_NoRidge	3820.633970	3820.633970
screen_porch	3703.752142	3703.752142

QUALITY FACTORS?

- Quality has one of the highest influences on property price
- Typical buyers will pay higher premium for good kitchen quality
- Potential sellers should seek to continuously upkeep their kitchen conditions



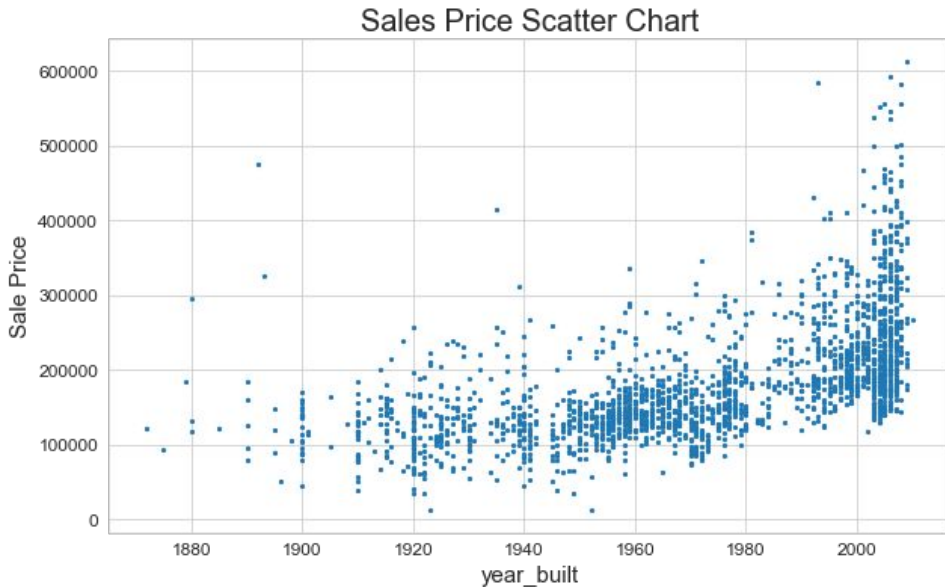
SIZE FACTORS?

- Larger properties will command higher prices. However, not all size aspects are equally important.
- Most buyers will pay more for larger ground-level and 1st floor spaces



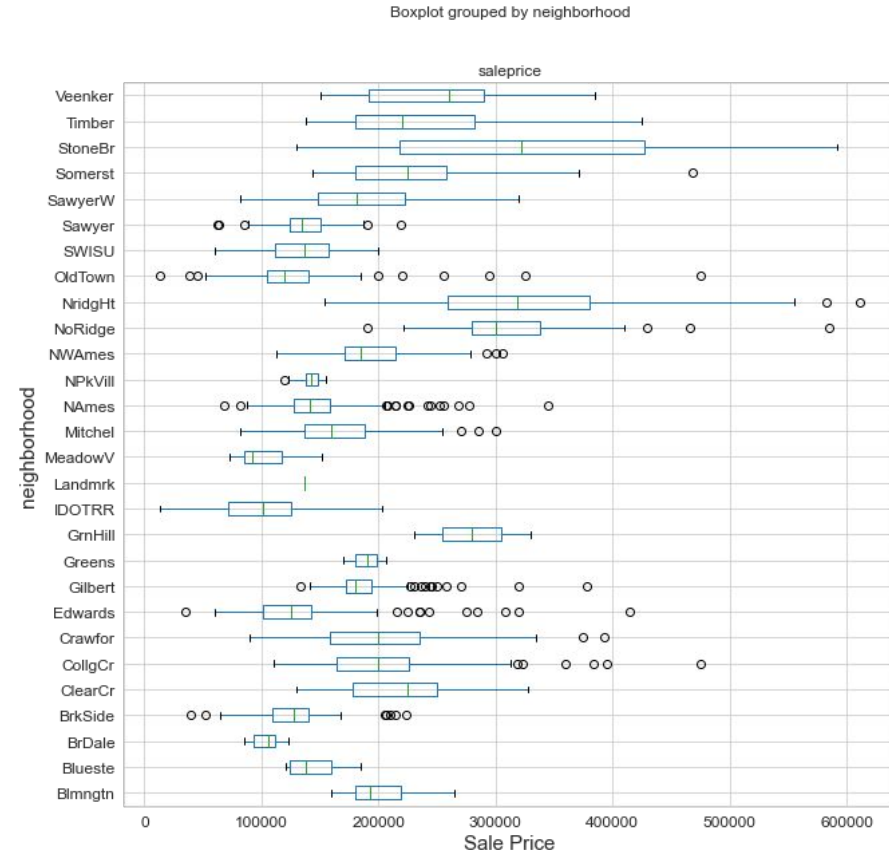
AGE FACTORS?

- Newer Properties will command higher premiums
- Likely related to better upkeep and quality



LOCATION, LOCATION, LOCATION

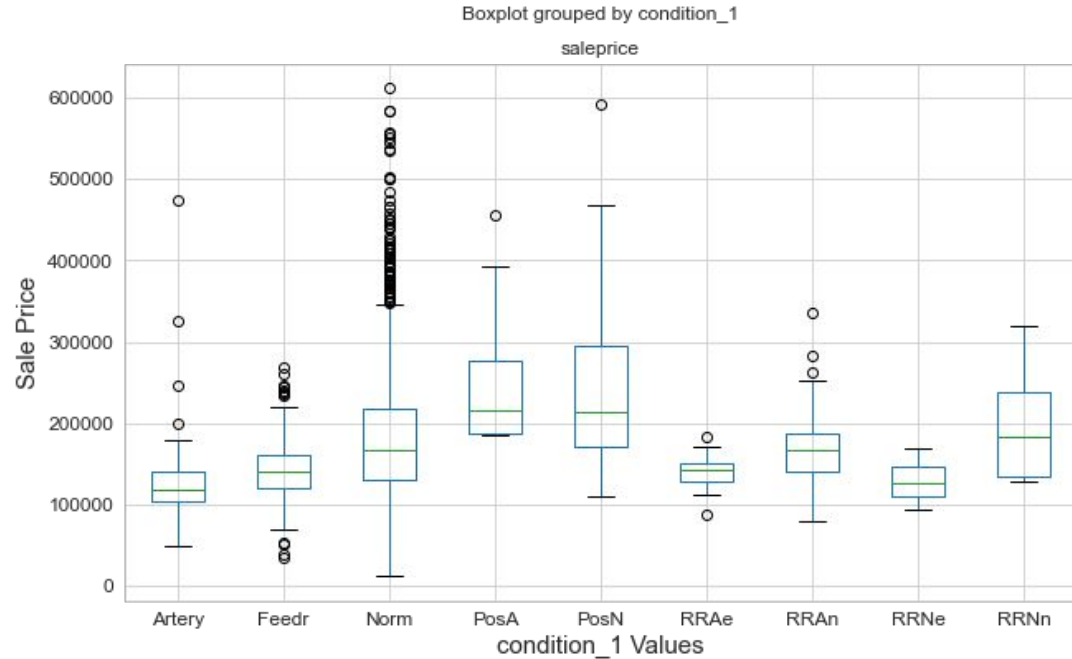
- Different neighborhoods will command different price premiums.
- Northridge Heights, Stone Brook and Northridge properties tend to show high price variance
- Property investors seeking to gain from asset appreciation should pay special attention to which neighborhood to invest



LOCATION, LOCATION, LOCATION

- Properties located within or near parks, greenbelt and other offsite features commands higher premium
- Properties located close to railroads, feeder, arterial streets will have lower prices.

Artery	Adjacent to arterial street
Feedr	Adjacent to feeder street
Norm	Normal
RRNn	Within 200' of North-South Railroad
RRAn	Adjacent to North-South Railroad
PosN	Near positive off-site feature--park, greenbelt, etc.
PosA	Adjacent to postive off-site feature
RRNe	Within 200' of East-West Railroad
RRAe	Adjacent to East-West Railroad



Market Variables: The Economy

- Although our model is awesome, it's not perfect!
- Macro Factors Exist!
- General Economy?
- Interest Rates and Loans?



Market Variables: The Neighbourhood

- Shopping Malls?
- Schools? E.g. Iowa State University
- Attractions and New Development Projects?



Source: [Best Ames Schools | Ames, IA School Ratings | Best Schools](#)

Other Variables: The House

- Aesthetics and the Architecture
- Energy Efficiency
- **Return on Investment**



Thank you! Questions?