



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

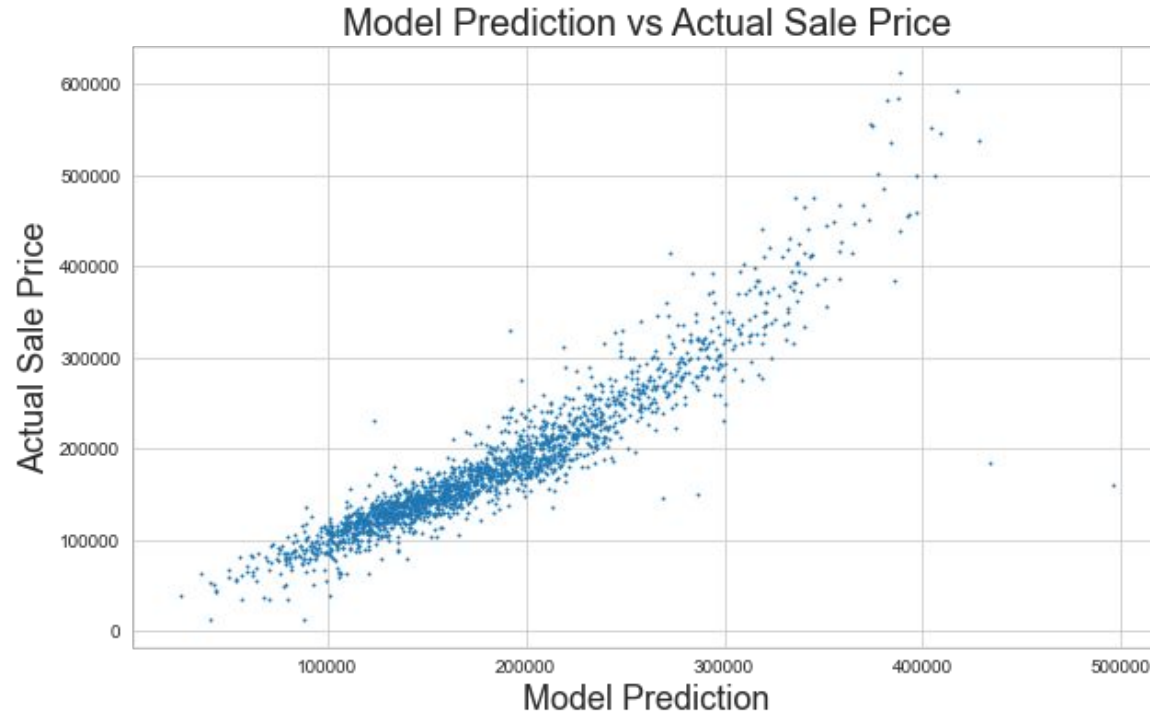
Model
Optimization

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
9% of the average Ames home price

±\$14,975

- MAE: \$15,000 (ave absolute error between actual and model prediction)
- RMSE: \$ 21,500 (ave root squared error between actual model prediction)
- R^2 : 0.926 (Goodness of fit between actual and model, 1.0 being a perfect model)

WHAT ARE THE IMPORTANT FACTORS?

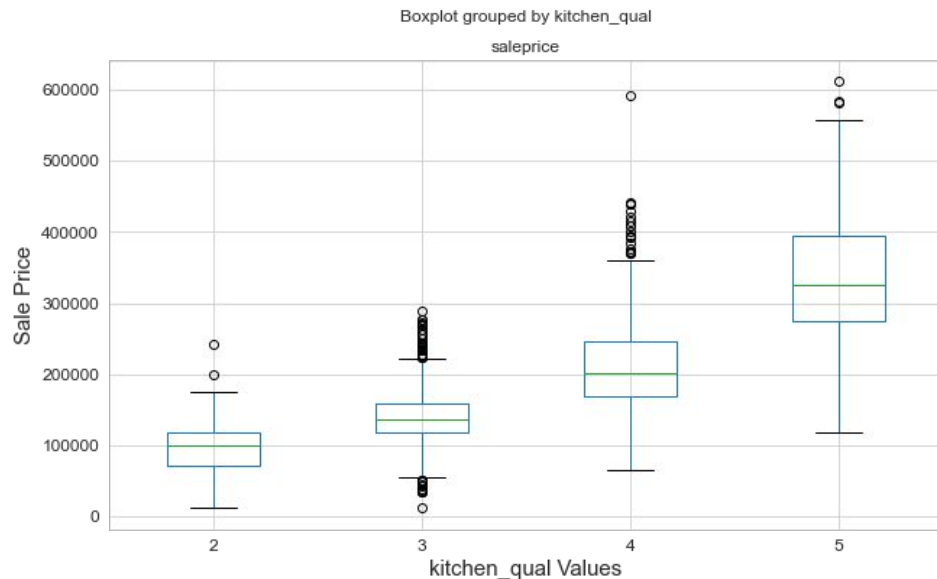
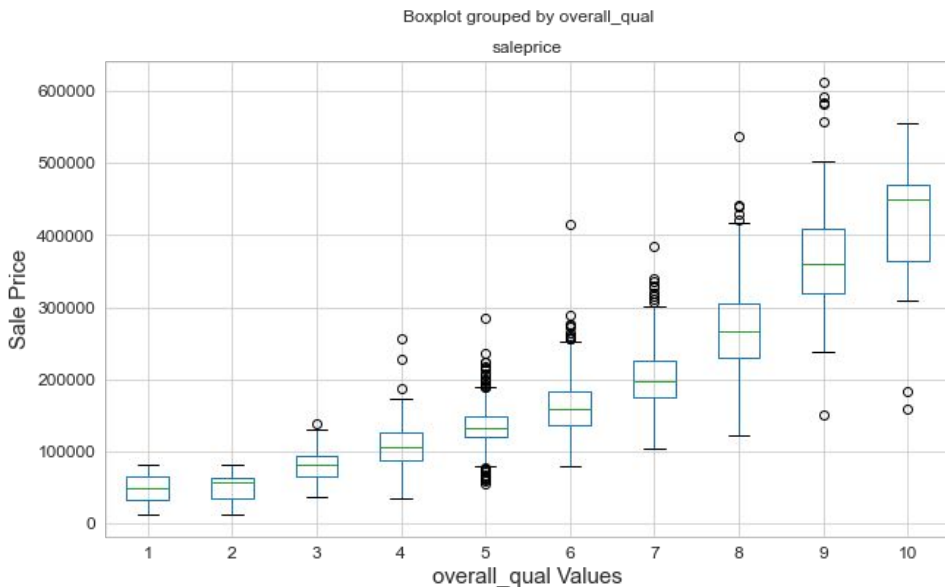
- They can be categorized under
 - Quality
 - Size
 - Location
 - Age

	variable	coef	abs_coef
24	gr_liv_area	15918.349537	15918.349537
4	overall_qual	10620.994936	10620.994936
19	total_bsmst_sf	8664.583787	8664.583787
15	bsmtfin_sf_1	8327.968675	8327.968675
103	neighborhood_NridgHt	6486.984845	6486.984845
0	lot_area	5865.719664	5865.719664
8	mas_vnr_area	5811.342372	5811.342372
9	exter_qual	5745.548791	5745.548791
6	year_built	5454.173562	5454.173562
109	neighborhood_StoneBr	5148.473843	5148.473843
31	kitchen_qual	4927.021312	4927.021312
13	bsmt_exposure	4835.874093	4835.874093
5	overall_cond	4566.293105	4566.293105
32	totrms_abvgrd	4278.618695	4278.618695
39	garage_area	4244.386173	4244.386173

* Larger abs_coef indicate stronger influence on property price

QUALITY FACTORS?

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



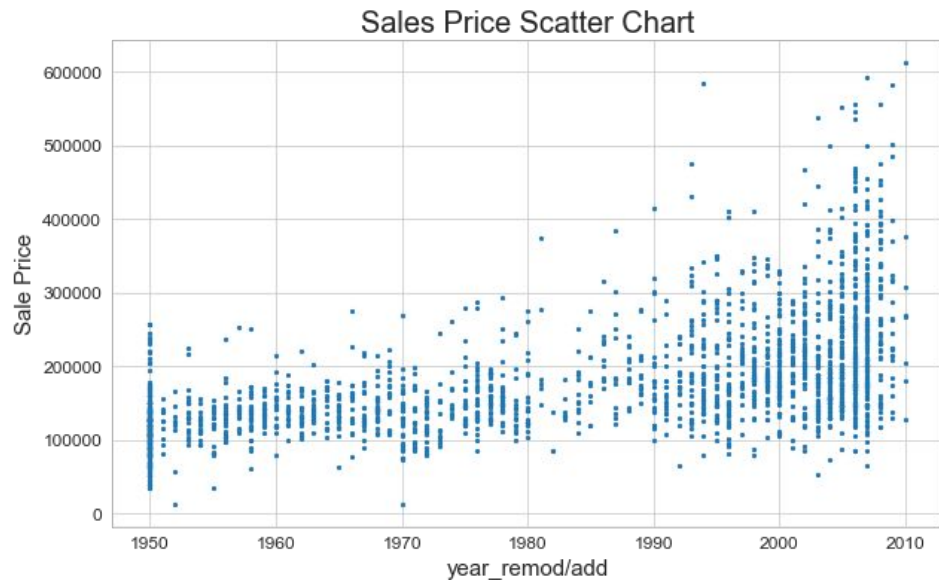
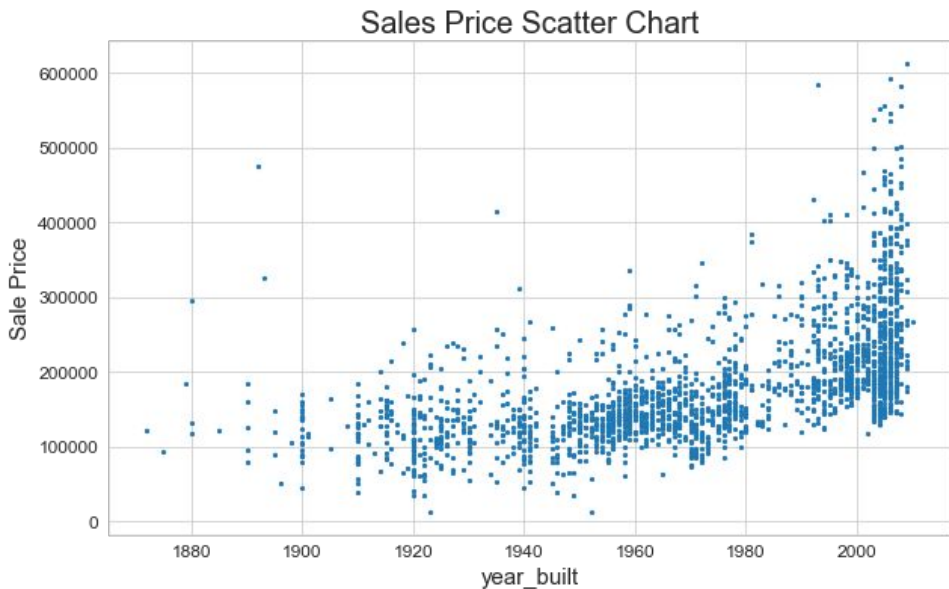
SIZE FACTORS?

- 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



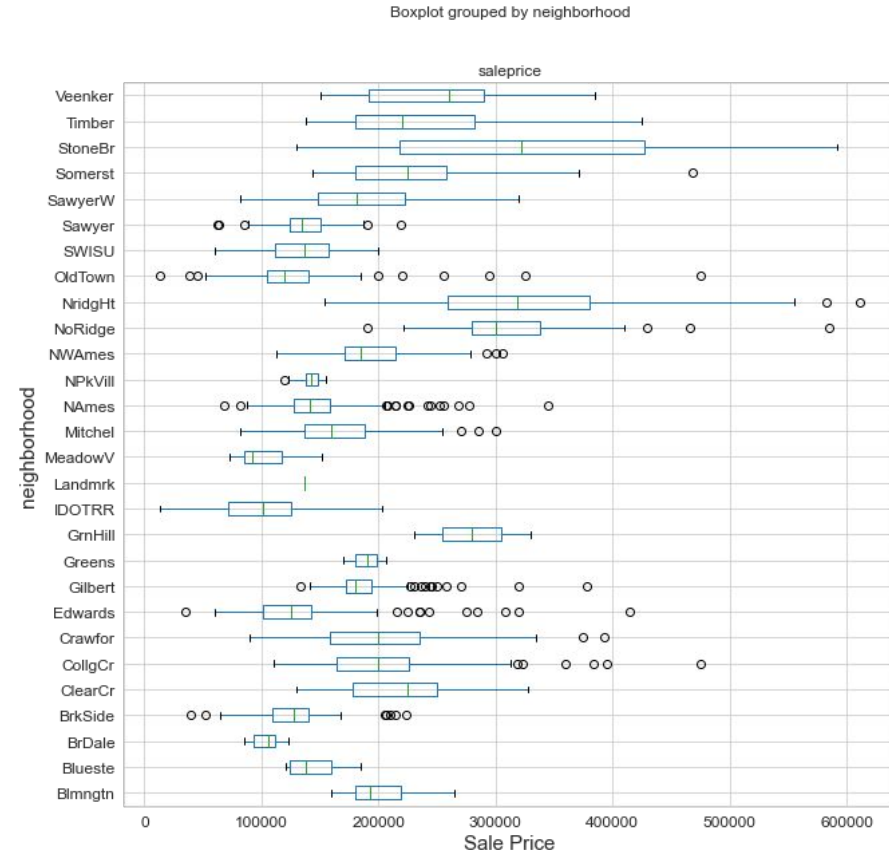
AGE FACTORS?

- Newer Properties will command higher premiums
- Likely related to better upkeep and quality
- Budget conscious buyers can consider properties built before 1990



LOCATION, LOCATION, LOCATION

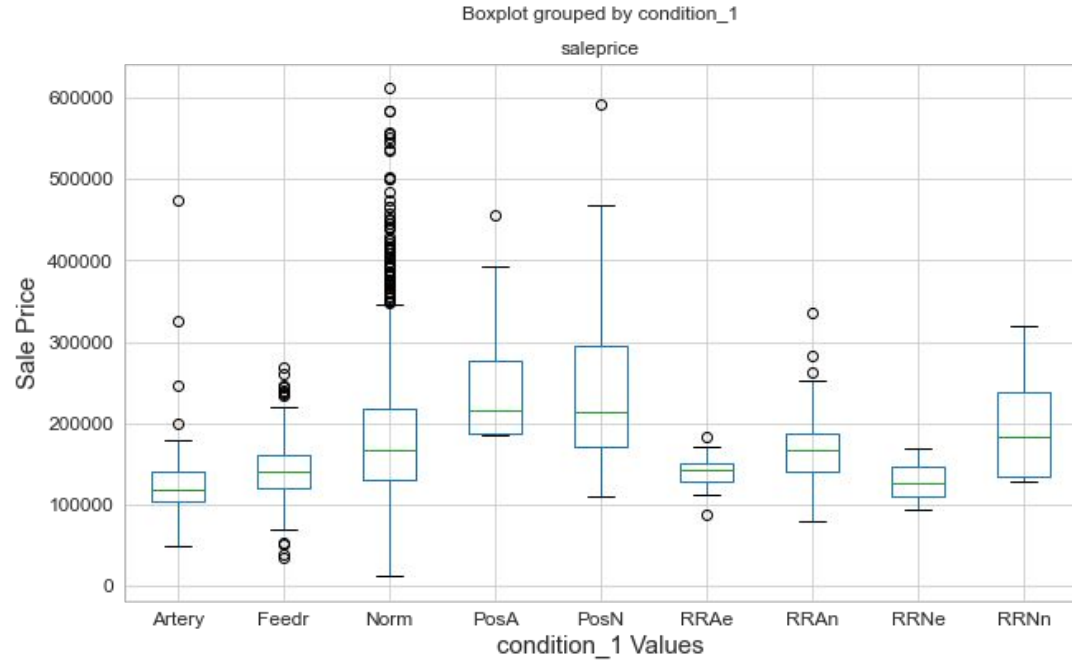
- Different neighborhoods will command different price premiums.
- Northridge Heights, Stone Brook and Northridge properties tend to show high price variance
- Property investors seeking to gain from asset appreciation should pay special attention to which neighborhood to invest



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?