

BENTLEY & CO. BANK

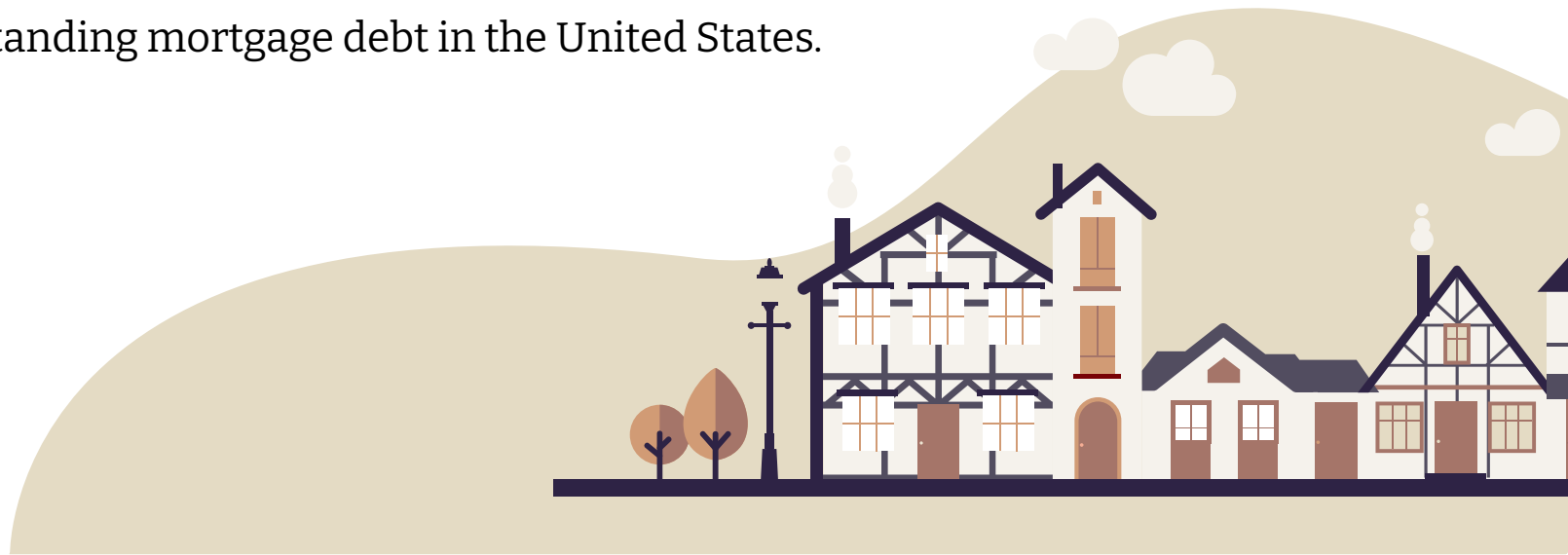
MORTGAGES

Author: Jason Lombino



\$17 TRILLION

Outstanding mortgage debt in the United States.



FINDINGS

The value of a home can be predicted easily by:

- Location
- Construction & Design
- Living Space

Useful when appraisal is not feasible.



AGENDA



01 BUSINESS UNDERSTANDING

02 DATA & METHODS

03 MODELS

04 RECOMMENDATIONS

05 FUTURE CONSIDERATIONS

01

BUSINESS

UNDERSTANDING





BUSINESS UNDERSTANDING

Estimate home prices without
long & costly appraisals.

02

DATA & METHODS



DATA



K.C. HOME SALES

- Living Space
- No. Bedrooms
- No. Bathrooms
- Other Features



ZIP CODES

Associate each home
with a city.

METHODS

1

E. D. A.

Initial exploration
of the data.

2

MODELS

Iterative modeling
using SKLearn &
Statsmodels.

3

VALIDATION

Verifying
accuracy
of models.

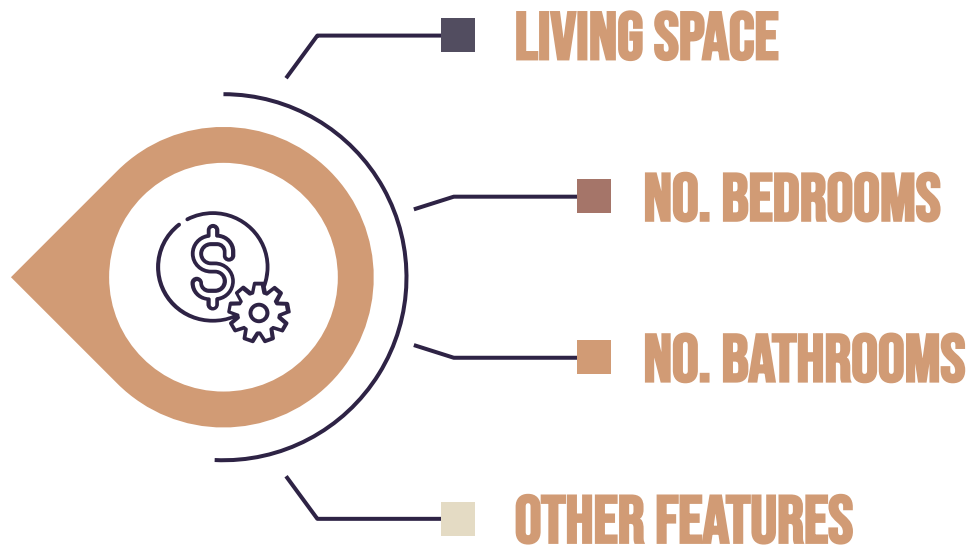


03

MODELS



MODEL INPUTS



1. BASIC MODEL

- Living space as only predictor
- Poor performance
 - Average error of \$175,000



2. IMPROVED MODEL

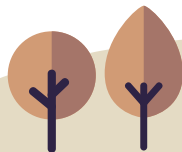
- Uses all available predictors
- Slightly better performance
 - Average error of \$120,000



3. BEST MODEL



- Uses all 'good' predictors
- Log transformed data
- Best performance
 - Average error < \$100,000



LIVING SPACE

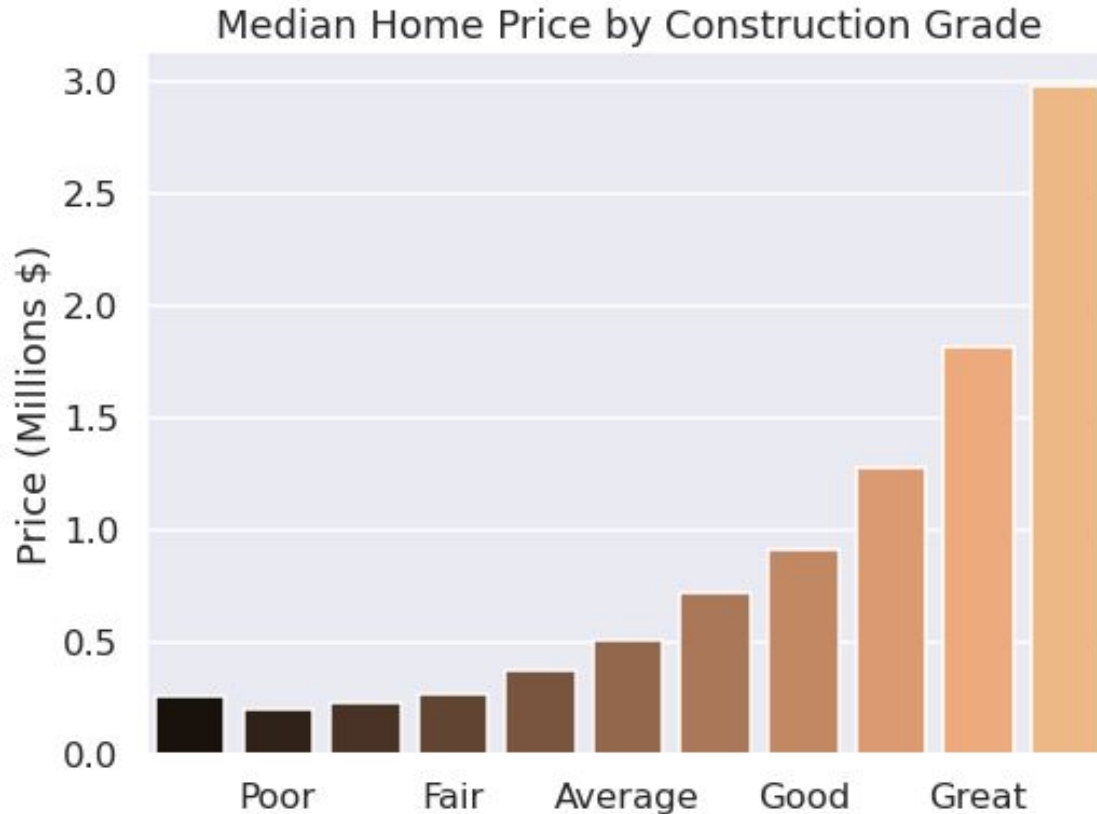


LIVING SPACE

Coefficient:
0.423



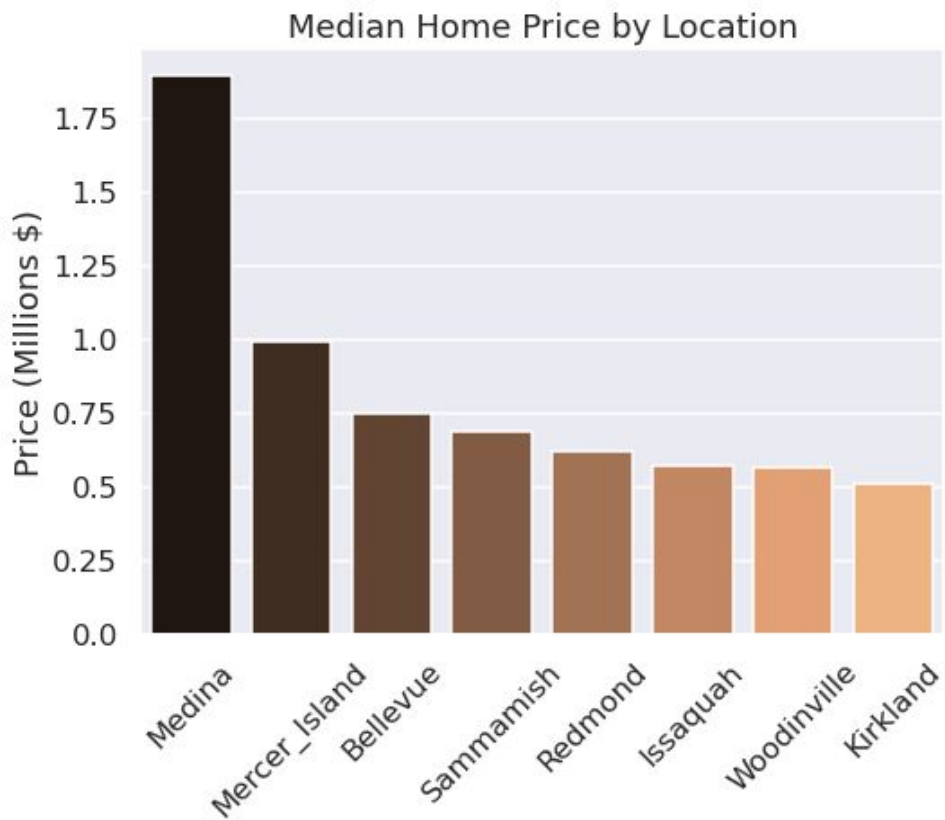
CONSTRUCTION GRADE



GRADE
Coefficient:
0.171



LOCATION



MEDINA

Coefficient:
1.178

MERCER_ISLAND

Coefficient:
0.777

BELLEVUE

Coefficient:
0.685

SAMMAMISH

Coefficient:
0.499

04

RECOMMENDATIONS



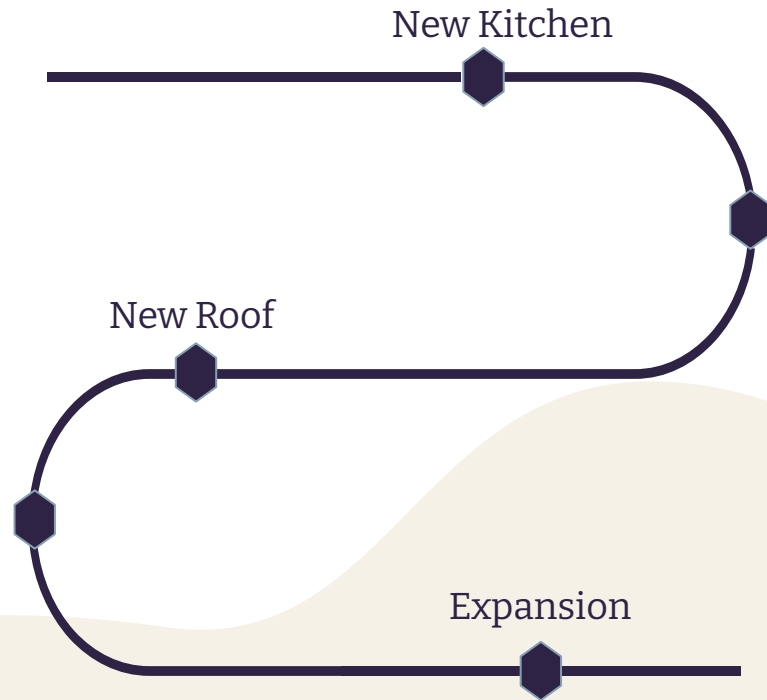
ESTIMATES

Use model for initial mortgage estimates (pre-appraisal).



RENOVATIONS

Estimate the pricing impact of renovations without additional appraisals.



05

FUTURE CONSIDERATIONS



FUTURE CONSIDERATIONS

■ SCOPE

Where are other markets for mortgages?

■ SPECIFICITY

Individual models for each city?

■ PROPERTY TYPES

Commercial properties?
Rental prices?



THANK YOU!

Do you have any questions?

[Project Repository](#)

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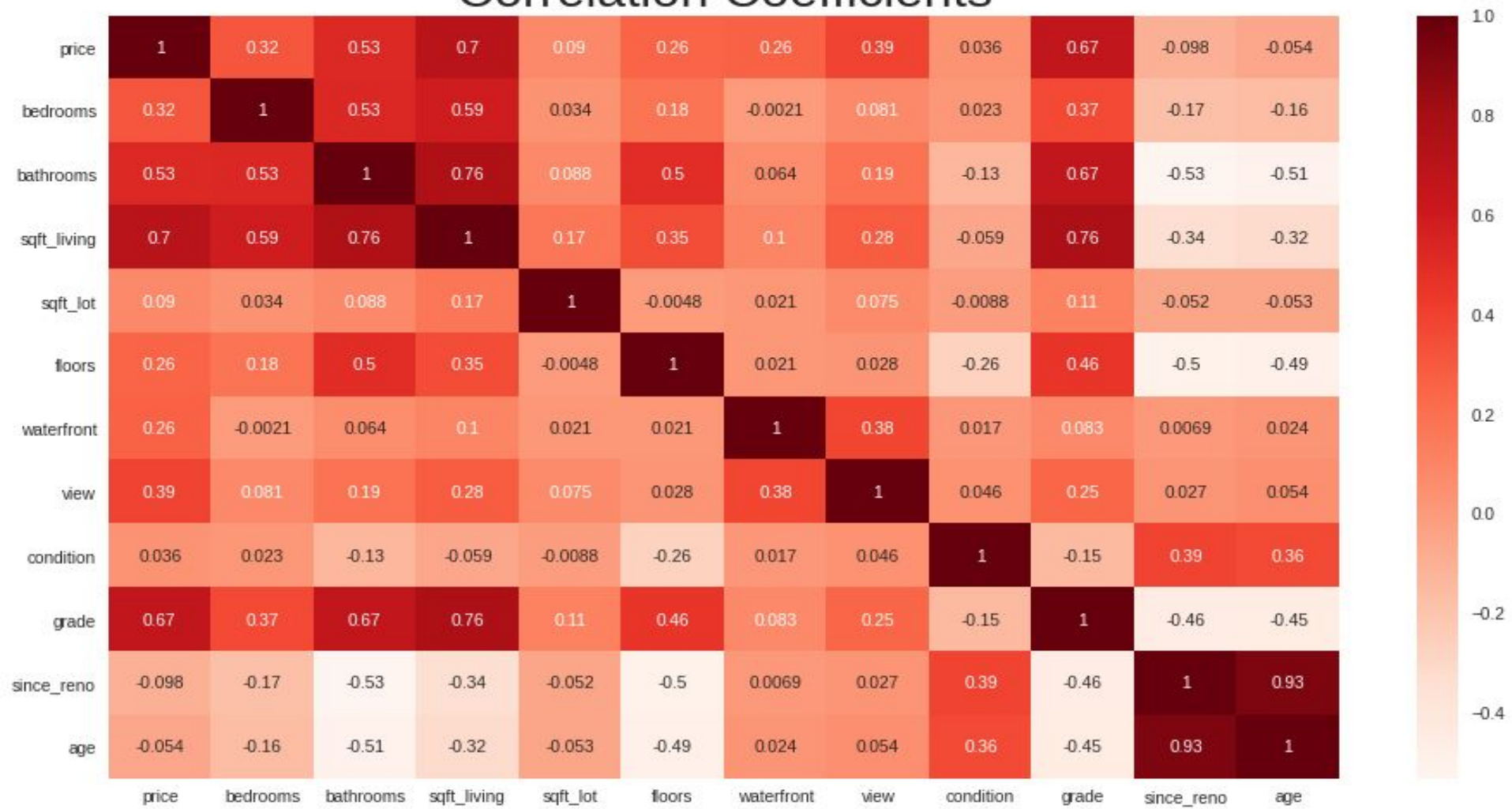


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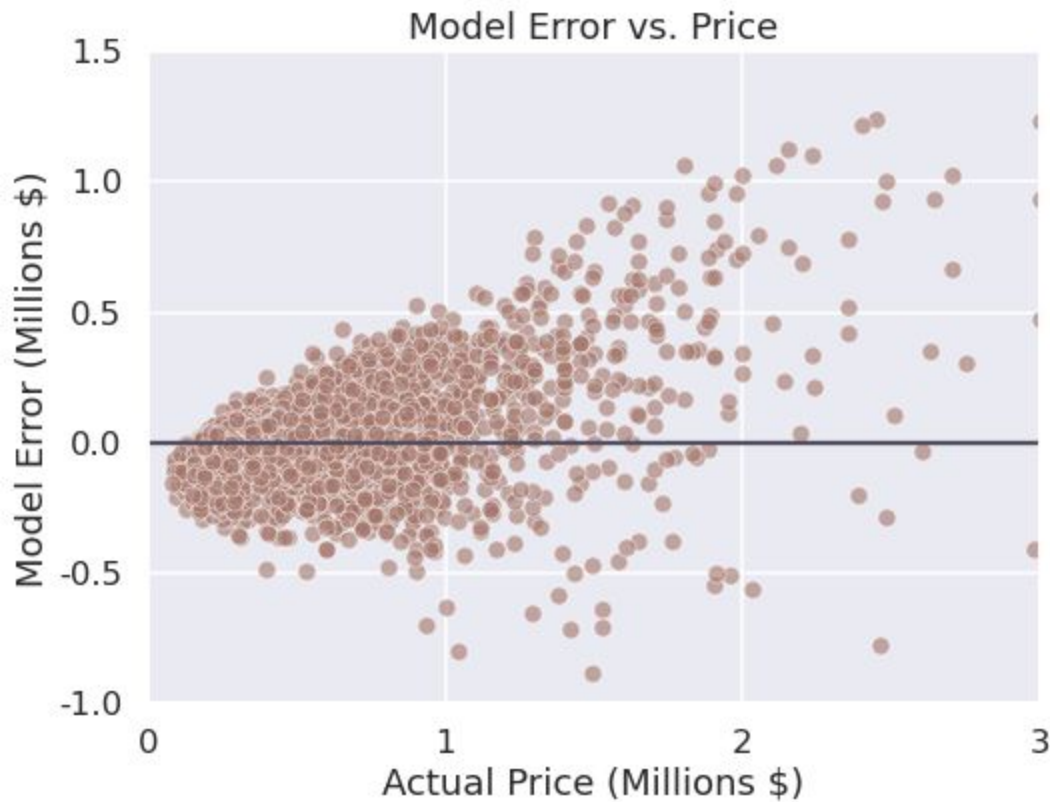
APPENDIX



Correlation Coefficients



HOMOSCEDASTICITY?



NORMALITY?

