

King County Housing Price Analysis

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Overview

- Business Problem
- Data and feature selection
 - Data cleaning
 - Feature selection
- Model Results
- Conclusion
 - Further analysis



Business Problem

- Major tech transformation project at Bank of Seattle
- Streamline mortgage approval
- Collateral Monitoring (Outstanding Mortgage < 70% Collateral)

Data Understanding

King County Housing Sales

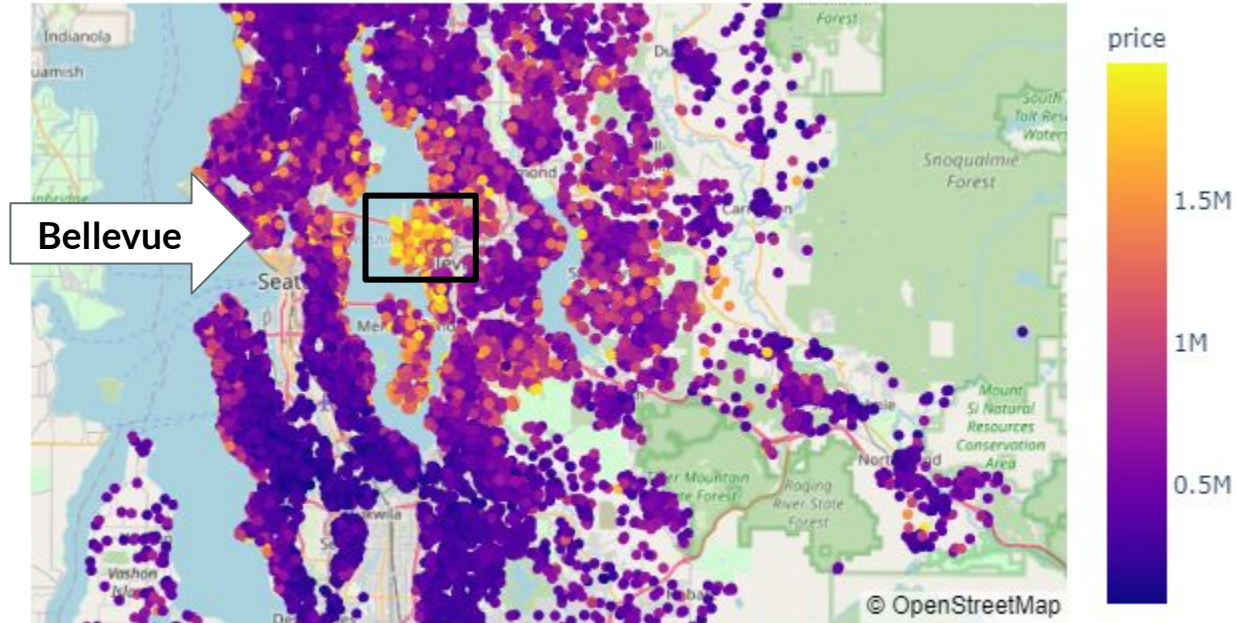
- Informational county website for the public
- Contains 21,000 records of housing sales within the county
- Records contain over 20 specific characteristics of each home sold

Feature Selection

- Measured the correlation between features and price
- Distance(mi) from Bellevue






General Trend in distance






Model Results

Features

Price

Distance		1 mile
Grade		1 level
Square Footage (living area)		100 sqft

	3.4%
	16.4 %
	1.5%

Model Accuracy

- explains 76.6% of the variance in price
- Prediction off by \$184 thousand on average

Conclusion

- 13 features from home inspection
- Easy to use for Mortgage Agents
- Faster approval process
- Seamless integration into risk management system
- Easy risk alarm (Outstanding Mortgage < 70% Collateral)

Future Work

- Reduce error
- Explore relationships between features
- Analyze how the time of year affects home prices

Q&A

Appendix

Bedrooms: number of bedrooms

Bathrooms: number of bathrooms

Sqft_living: total square footage of living space in the home

Sqft_lot: total square footage of the lot

Floors: number of floors

View: quality of view from house

Condition: how good the overall condition of the house is. Related to maintenance of house.

Grade: overall grade of the house. Related to the construction and design of the house.

Yr_built: year when house was built

Sqft_living15: the square footage of interior housing living space for the nearest 15 neighbors

Sqft_lot15: the square footage of the land lots of the nearest 15 neighbors

haver_dist_miles: distance between the house and Bellevue using the Haversine formula

OLS Regression Results

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Dep. Variable:          price    R-squared:          0.766
Model:                  OLS      Adj. R-squared:      0.766
Method:                 Least Squares    F-statistic:      4425.
Date:                   Thu, 07 Oct 2021    Prob (F-statistic):    0.00
Time:                   13:38:44    Log-Likelihood:      -885.91
No. Observations:      16196    AIC:                 1798.
Df Residuals:          16183    BIC:                 1898.
Df Model:               12
Covariance Type:       nonrobust
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	coef	std err	t	P> t	[0.025	0.975]
Intercept	17.5750	0.185	95.090	0.000	17.213	17.937
bedrooms	-0.0266	0.003	-9.207	0.000	-0.032	-0.021
bathrooms	0.0678	0.005	14.296	0.000	0.058	0.077
sqft_living	0.0002	5.02e-06	30.509	0.000	0.000	0.000
sqft_lot	5.44e-07	6.6e-08	8.239	0.000	4.15e-07	6.73e-07
floors	0.0755	0.005	16.067	0.000	0.066	0.085
view	0.0731	0.003	25.847	0.000	0.068	0.079
condition	0.0526	0.003	15.616	0.000	0.046	0.059
grade	0.1524	0.003	48.722	0.000	0.146	0.159
yr_built	-0.0032	9.6e-05	-33.001	0.000	-0.003	-0.003
sqft_living15	7.744e-05	4.84e-06	16.016	0.000	6.8e-05	8.69e-05
sqft_lot15	4.528e-07	1.04e-07	4.353	0.000	2.49e-07	6.57e-07
haver_dist_miles	-0.0347	0.000	-88.630	0.000	-0.035	-0.034