

An aerial photograph of Seattle, Washington, featuring the Space Needle in the foreground. The city skyline is visible in the background, with numerous skyscrapers and buildings. The city is situated on a peninsula, with water visible to the right. The image has a blue tint.

FLATIRON SCHOOL KING COUNTY HOUSE MARKET ANALYSIS

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Overview

King County Dataset



- **Data:** King County House Sales
- Over 21k observations
- Data collected between 2014 & 2015
- 21 variables provided in the dataset

School District Dataset



- **Data:** King County School Districts by zip code
- 2019 Best School Niche Ranking used for analysis (refer to Appendix A)

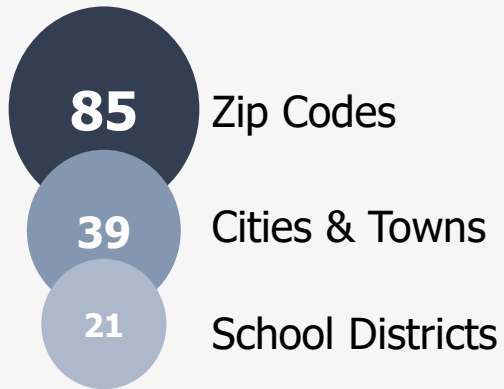
Methodology

1. Define business questions
2. Explore Dataset
3. Clean Dataset
4. Prepare Working Dataset
5. Regression Modeling
6. Data Engineering
7. Model Testing

Business Questions

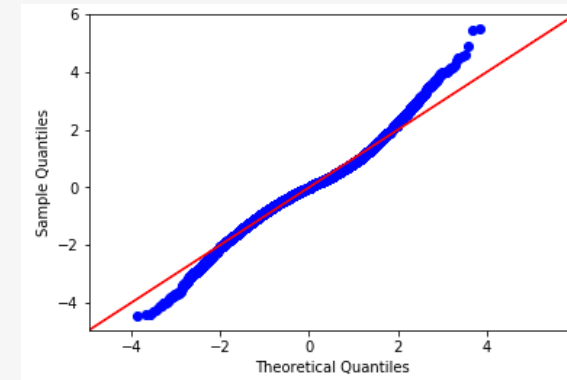
- Does school district ranking have relation with house appraisal?
- What are the school districts with better house appraisal?
- What is more influential in the appraisal of a house: sqft lot OR sqft living?

Model: King County House Appraisal



Model Accuracy

- 18 Variable Model
- Adj R-squared: 0.748
- Train MSE: 0.070
- Test MSE: 0.071



QQ Plot of Model

Top 7 King County School Districts (Based on Model)				
Model Ranking	Niche Ranking	School District	Example Predicted Model Price	Percentage difference
1	2	Mercer Island	\$ 1,000,000.00	100%
2	1	Bellevue	\$ 890,873.55	89%
3	7	Seattle	\$ 837,994.56	84%
4	3	Lake Washington	\$ 764,713.96	76%
5	4	Isaaquah	\$ 725,880.96	73%
6	5	Shoreline	\$ 681,709.21	68%
7	13	Snoqualmie Valley	\$ 597,179.11	60%

- 1% increase in Sqft_living = 0.7752% increase in price
- 1% increase in Sqft_lot = 0.0452% increase in price
- 1 unit change in any School District = $\beta \times 100\%$ increase in price

**Used the Niche 2019 Best School Ranking to compare model ranking and draw conclusions. More info about the Niche Ranking in Appendix A.*

Model - Visualizations

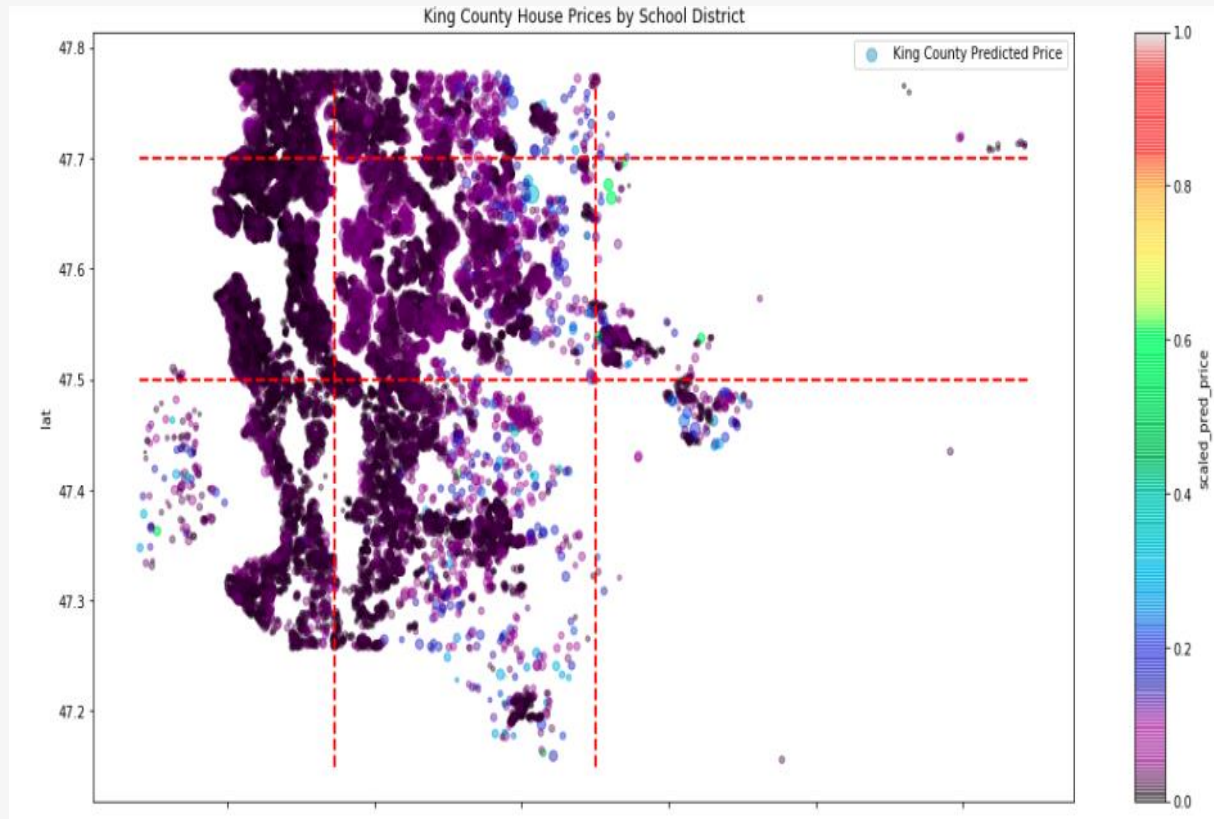


Figure 1. King County Model Predicted House Prices

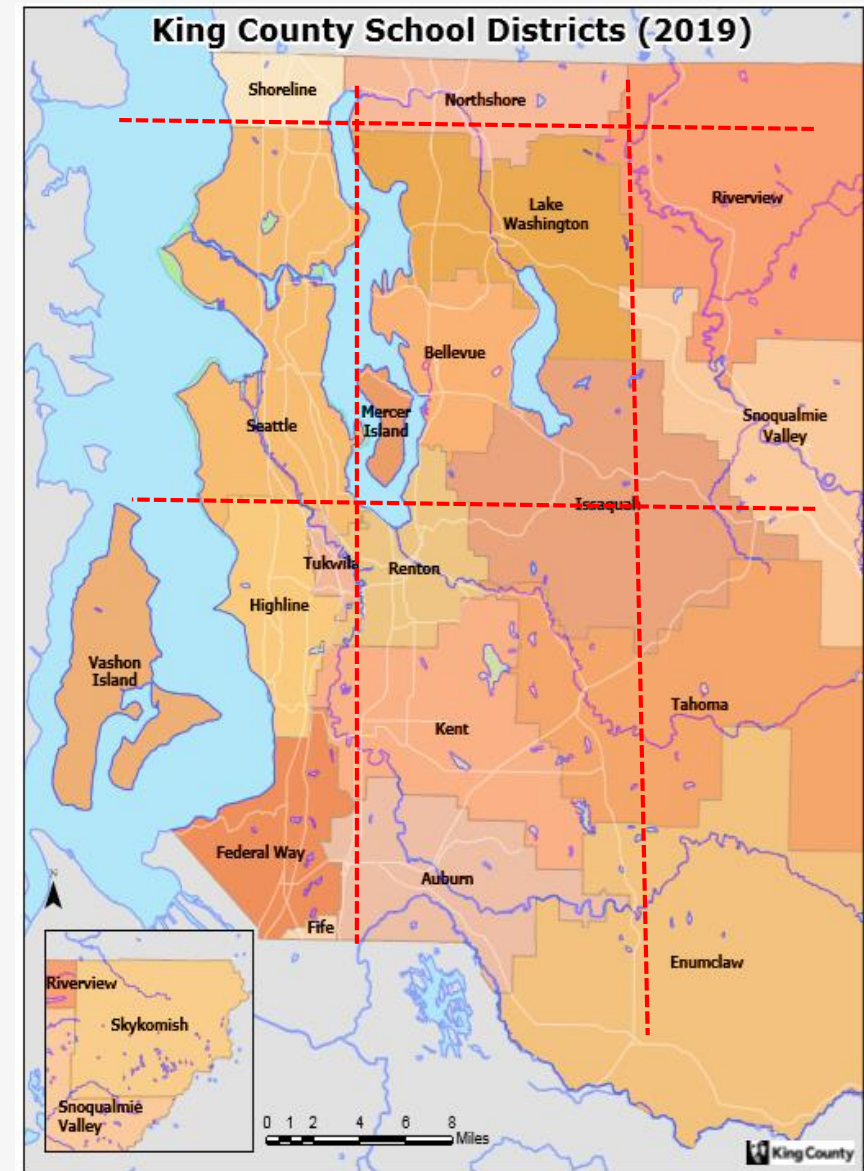


Figure 2. King County School Districts

Model - Visualizations

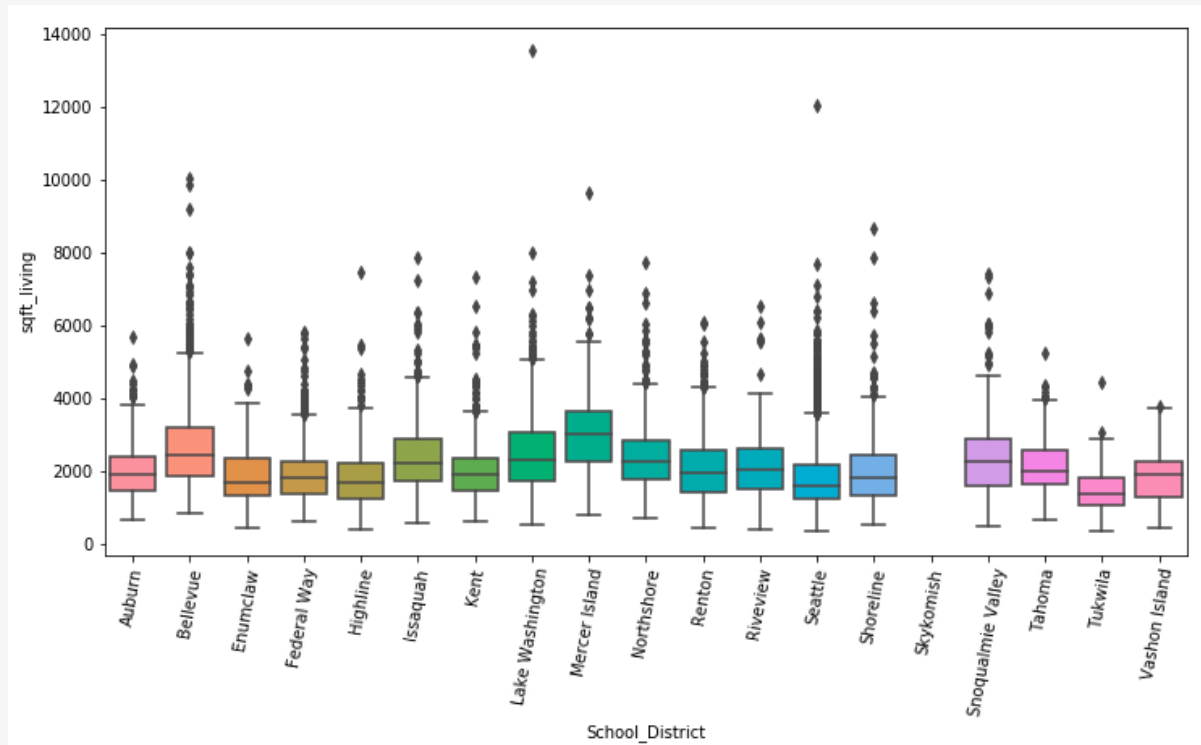


Figure 3. Sqft_living King County Boxplots

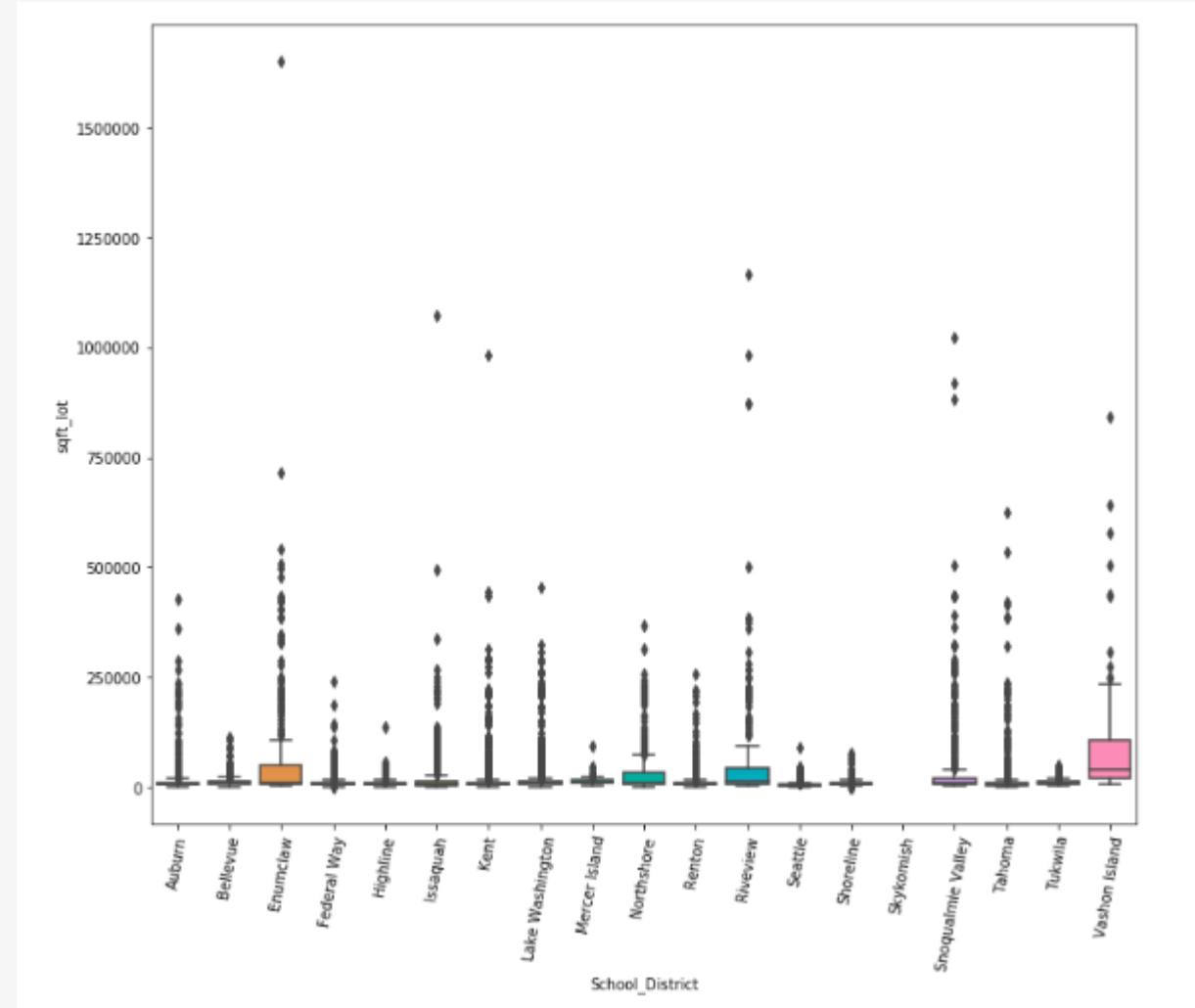


Figure 4. Sqft_lot King County Boxplots

Conclusions & Recommendations

Conclusions:

- School District Niche Ranking had high correlation with the model's coefficient ranking (see table)
- The list of School Districts with better house appraisal is listed in table
- According to the model, sqft_living has bigger influence in the final price of the house

Recommendations:

- Consider buying a house in Lake Washington as it is top 3 School District according to 2019 Niche Ranking and it costs 76% of what you would pay in Mercer Island.
- Consider getting a smaller house in a bigger lot to get the best possible price and later remodel/add sqft living to increase overall value.

Top 7 King County School Districts (Based on Model)		
Model Ranking	Niche Ranking	School District
1	2	Mercer Island
2	1	Bellevue
3	7	Seattle
4	3	Lake Washington
5	4	Isaqua
6	5	Shoreline
7	13	Snoqualmie Valley

Thank
you

Appendix Section

Appendix A



2019 Niche Best Schools

The 2019 Best School Districts ranking is based on rigorous analysis of key statistics and millions of reviews from students and parents using data from the U.S. Department of Education. Ranking factors include state test scores, college readiness, graduation rates, SAT/ACT scores, teacher quality, public school district ratings, and more

Niche Best Schools Source:

<https://www.niche.com/k12/search/best-school-districts/c/king-county-wa/>

2019 Niche Best School Rankings		
Factor	Description	Weight
Academics Grade	Based on state assessment proficiency, SAT/ACT scores, and survey responses on academics from students and parents.	50.00%
Teachers Grade	Based on teacher salary, teacher absenteeism, state test results, and survey responses on teachers from students and parents.	15.00%
Culture & Diversity Grade	Based on racial and economic diversity and survey responses on school culture and diversity from students and parents.	10.00%
Parent/Student Surveys on Overall Experience	Niche survey responses scored on a 1-5 scale regarding the overall experience of students and parents in the district.	10.00%
Health & Safety Grade	Based on chronic student absenteeism, suspensions/expulsions, and survey responses on the school environment from students and parents.	5.00%
Resources & Facilities Grade	Based on expenses per student, staffing, and survey responses on facilities from students and parents.	5.00%
Clubs & Activities Grade	Based on expenses per student and survey responses on clubs and activities from students and parents.	2.50%
Sports Grade	Based on the number of sports, participation, and survey responses on athletics and athletic facilities from students and parents.	2.50%

Appendix B

Q1 Model interpretation details:

- Dependent variable (price) was log transformed to help normalize the residuals
- Independent variables Sqft_living and Sqft_lot were log transformed to help normalize the residuals
- School District variables were not transformed as they are categorical values

A 1% increase in Sqft_living = 0.7752% increase in price

A 1% increase in Sqft_lot = 0.0452% increase in price

A 1 unit change in any School District = beta*100% increase in price

	OLS Model Coefficients				Base Price * Beta%	Base Price * Beta%	Base Price * (100*Beta)%	
School District	Beta School District	Beta sqft_living	Beta sqft_lot	Base Price (constant)	sqft_living Increase	sqft_lot Increase	School District Increase	Predicted Price after 1% Increase
Mercer Island	0.5652	0.7752	0.0452	6.7375	0.052229	0.003045	3.808035	10.60080945
Bellevue	0.3935	0.7752	0.0452	6.7375	0.052229	0.003045	2.65120625	9.4439807
Seattle	0.3103	0.7752	0.0452	6.7375	0.052229	0.003045	2.09064625	8.8834207
Lake Washington	0.195	0.7752	0.0452	6.7375	0.052229	0.003045	1.3138125	8.10658695
Isaqua	0.1339	0.7752	0.0452	6.7375	0.052229	0.003045	0.90215125	7.6949257
Shoreline	0.0644	0.7752	0.0452	6.7375	0.052229	0.003045	0.433895	7.22666945
Snoqualmie Valley	-0.0686	0.7752	0.0452	6.7375	0.052229	0.003045	-0.4621925	6.33058195