

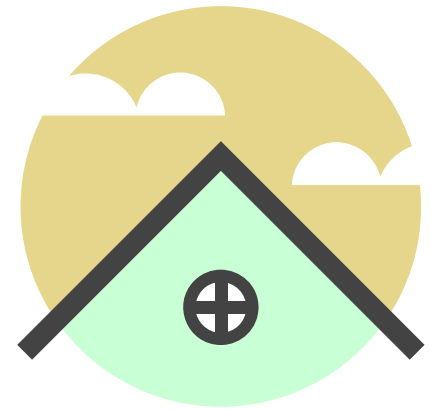
Understanding Kings County House Sale Prices

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Module 2 Project



Real estate is an enormously competitive field. The chances are that your area already has at least one or two successful and popular real estate brokers and real estate companies actively engaged in the marketplace.

Understanding the Kings County housing market and considering a specific niche will help you build more successful real estate business and you give you a leg up on the competition.



Goal

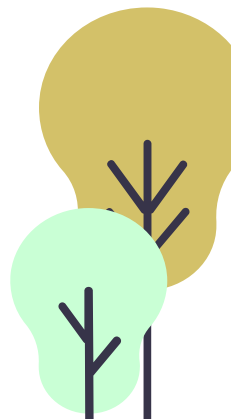
- Gain an understanding of features that affect house sale prices
- Build a model to predict house sale prices



21,597 entries of houses sold in Kings County, Washington in 2014 and 2015

Example of house features in data:

- price - home sale price
- bedrooms - number of Bedrooms/House
- bathrooms - number of bathrooms/bedrooms
- sqft_living - square footage of the home
- sqft_lot - square footage of the lot
- floors - floors (levels) in house
- waterfront - House which has a view to a waterfront
- condition - How good the condition is (Overall)
- grade - overall grade given to the housing unit, based on King County grading system
- yr_renovated - Year when house was renovated
- zipcode - zip



Methodology



Obtain

Data was obtained via
kc_house_data.csv



Scrub and Clean

Removed erroneous
and null values.
Removed unnecessary
columns.



Explore

Created visualizations
to understand data and
applied feature
engineering



Transform

One-hot-coding,
normalization, log
transformation



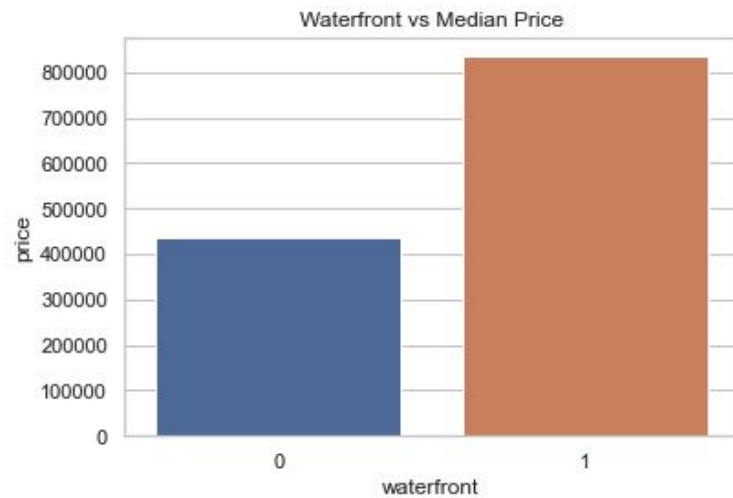
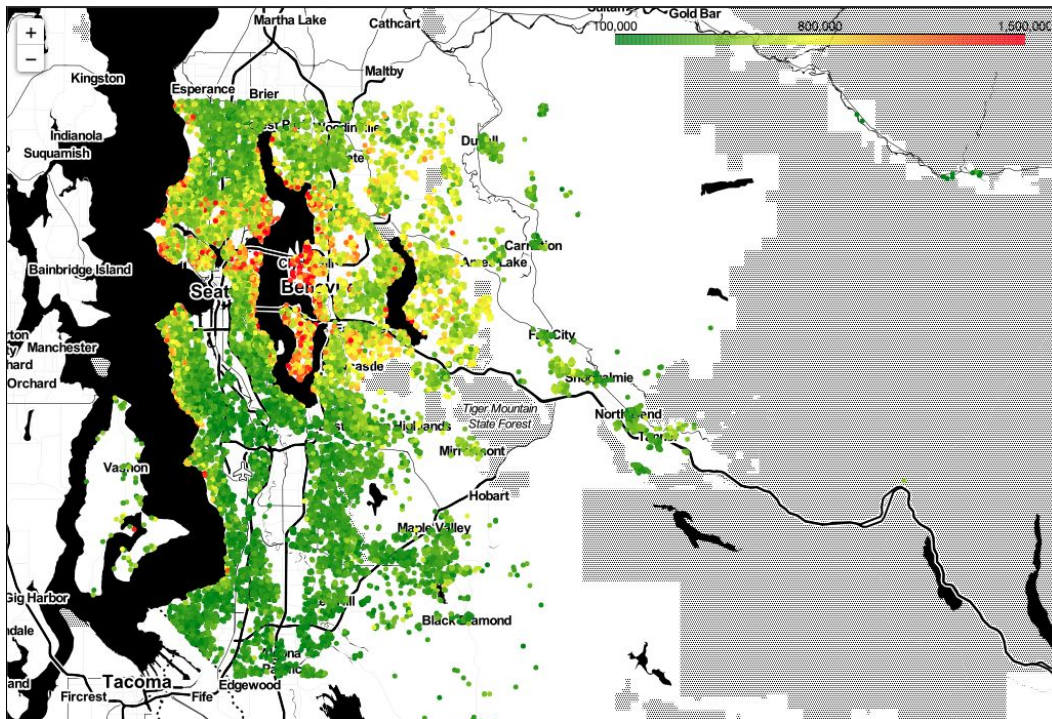
Model

Ordinary Least Squares
Regression

Key Features

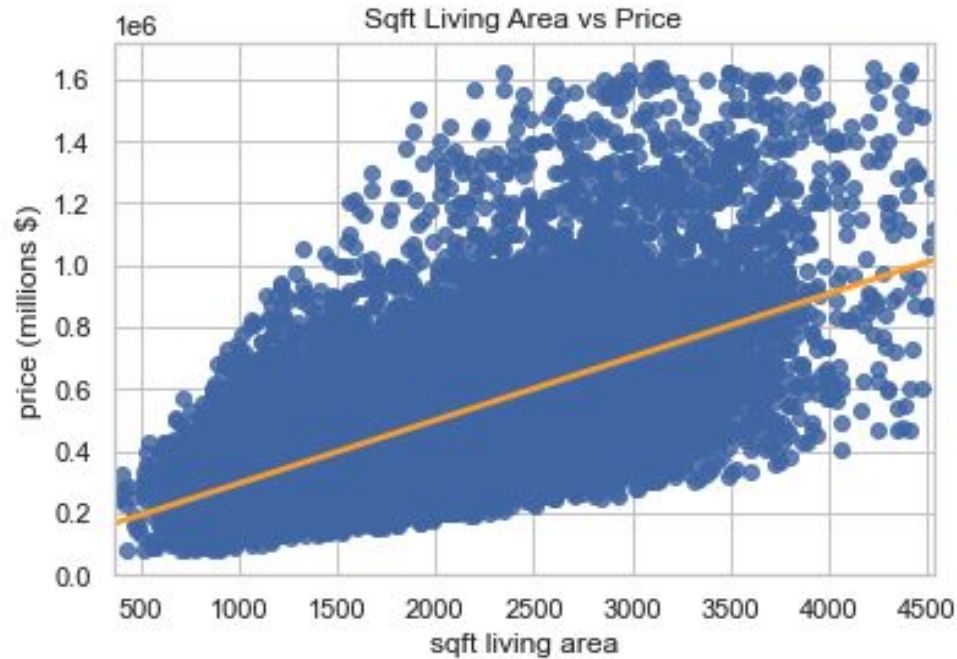


Waterfront



Recommendation:
Target homes with a waterfront

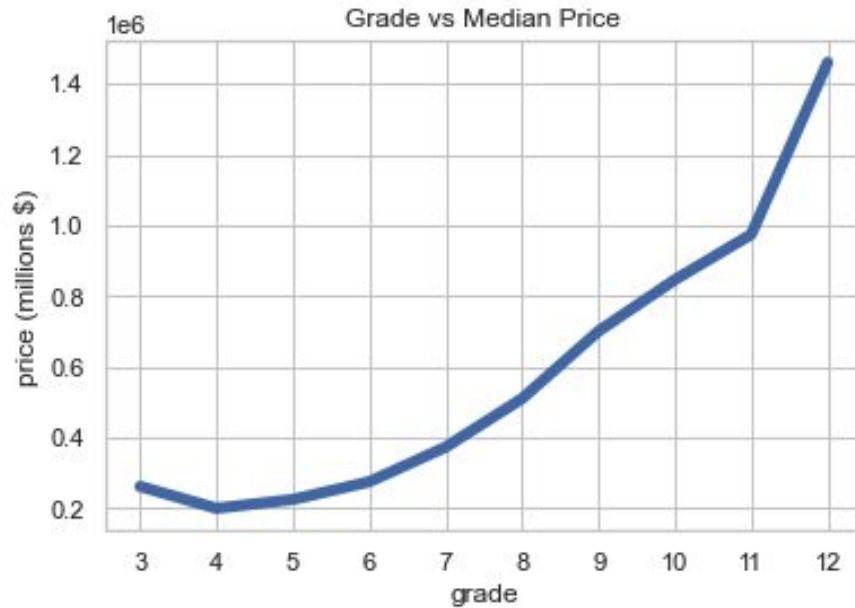
Sqft_living



Recommendation:

Be aware that larger living area does not always equal higher price

Exploratory Data Analysis



Recommendation:

Focus on houses with a grade 9 or higher

Model





Model Summary

	Final Model
Features	19
Adj. R-squared	0.800
RMSE	0.4460626998391177

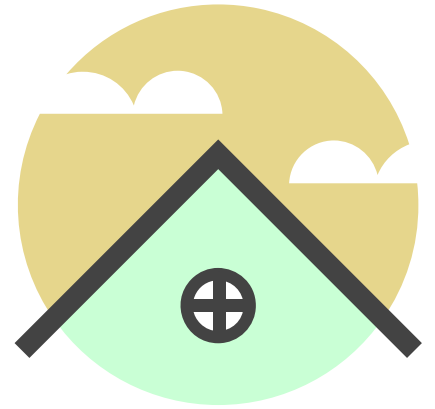
Model Findings

- Presence of a **waterfront**, **living area square footage**, **grade 9 or higher**, **condition of 5 or higher**, and **renovation** have a **positive impact** on house sale price.
- Number of **bedrooms**, surprisingly has a **negative impact** on house sale price.
- While **zip code groupings by median house price sales** resulted in a **negative impact** overall, higher priced groupings have much less impact on house sales price.



Incorporate added features:

- Central air conditioning: **69%** of buyers willing to pay more
- New kitchen appliances: **69%** of buyers willing to pay more
- Walk-in closet in master bedroom: **60%** of buyers willing to pay more





THANK YOU

Does anyone have any questions?

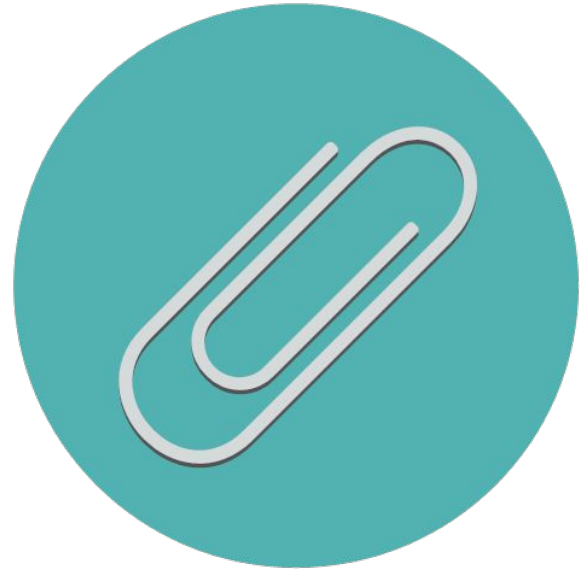
quillaodaniel@gmail.com

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- Baseline Model Summary
- Final Model Summary
- Final Model Insights



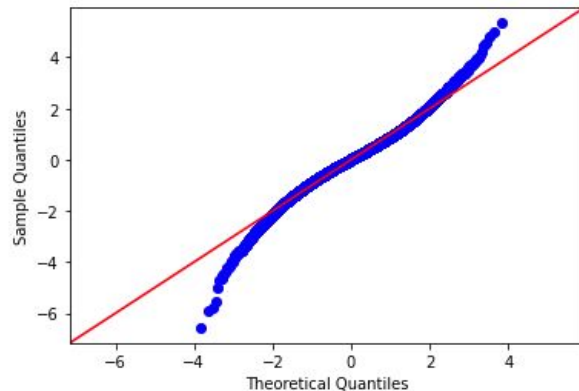
Baseline Model Summary

Total features: 84

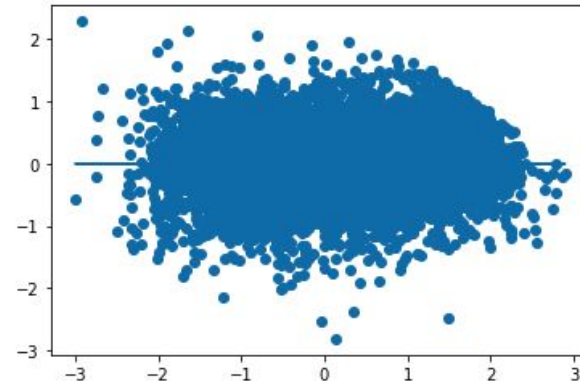
Adj. R-squared: 0.816

RMSE: 0.43210986407830576

Normality Assumption (QQ Plot)



Residuals Plot for Homoscedasticity



Final Model Summary

Total features: 19

Train:

Adj. R-squared: 0.803

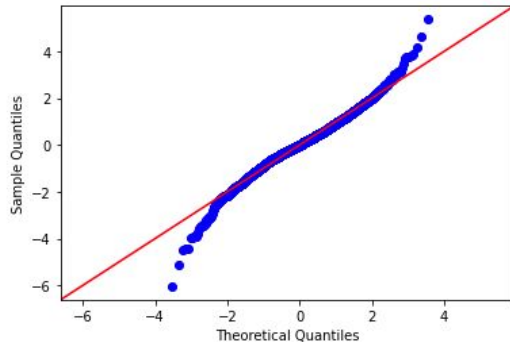
RMSE: 0.445487007351384

Test:

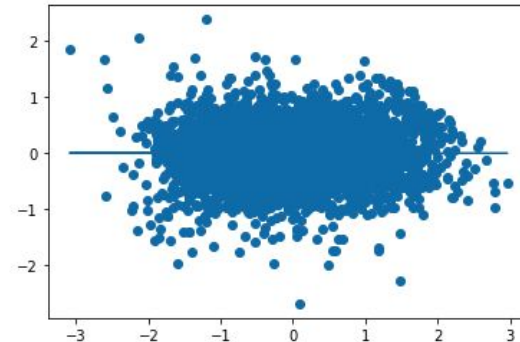
Adj. R-squared: 0.800

RMSE: 0.4460626998391177

Normality Assumption (QQ Plot)



Residuals Plot for Homoscedasticity



Final Model Insights

Positive affect:

- sqft_living
- waterfront_1
- view_1
- condition_5
- renovated_1
- grade_9 and 11

	coef	std err	t	P> t	[0.025	0.975]
Intercept	0.9074	0.026	35.366	0.000	0.857	0.958
— bedrooms	-0.0405	0.009	-4.737	0.000	-0.057	-0.024
+ sqft_living	0.4723	0.010	49.106	0.000	0.453	0.491
+ waterfront_1	1.2518	0.115	10.910	0.000	1.027	1.477
+ view_1	0.4092	0.025	16.374	0.000	0.360	0.458
— condition_2	-0.4163	0.077	-5.413	0.000	-0.567	-0.266
+ condition_5	0.1656	0.025	6.719	0.000	0.117	0.214
+ renovated_1	0.0957	0.037	2.581	0.010	0.023	0.168
+ grade_11	0.6197	0.120	5.154	0.000	0.384	0.855
— grade_5	-0.2964	0.066	-4.504	0.000	-0.425	-0.167
+ grade_9	0.2355	0.022	10.895	0.000	0.193	0.278
— rank_10	-1.9603	0.034	-57.475	0.000	-2.027	-1.893
— rank_2	-0.2250	0.035	-6.473	0.000	-0.293	-0.157
— rank_3	-0.5273	0.030	-17.486	0.000	-0.586	-0.468
— rank_4	-0.3926	0.031	-12.662	0.000	-0.453	-0.332
— rank_5	-0.8455	0.035	-24.357	0.000	-0.914	-0.777
— rank_6	-1.0732	0.032	-33.689	0.000	-1.136	-1.011
— rank_7	-1.1378	0.031	-36.472	0.000	-1.199	-1.077
— rank_8	-1.6115	0.031	-51.737	0.000	-1.673	-1.550
— rank_9	-1.8855	0.032	-59.077	0.000	-1.948	-1.823

Negative affect:

- bedrooms
- condition_2
- grade_5
- rank_2-10