House Sales in King County

We Push to Master
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Overview

Background

- King County, particularly Seattle, is one of the fastest growing cities in America.

-As a result, housing market in King County is of interest.

-We will be looking at house sales in King County in 2014/2015.

Dataset

-The dataset contains 21,613 houses, and 21 variables.

-The response variable (variable being predicted) is Price (price the house was sold).

-Dataset contains no NA values. However, outliers are present.

Predictors

-Originally there are 20 predictors (such as bedrooms, bathrooms, sqft_living, etc).

-We remove 2 predictors (House ID, date house was sold).

-Added one predictor (city).

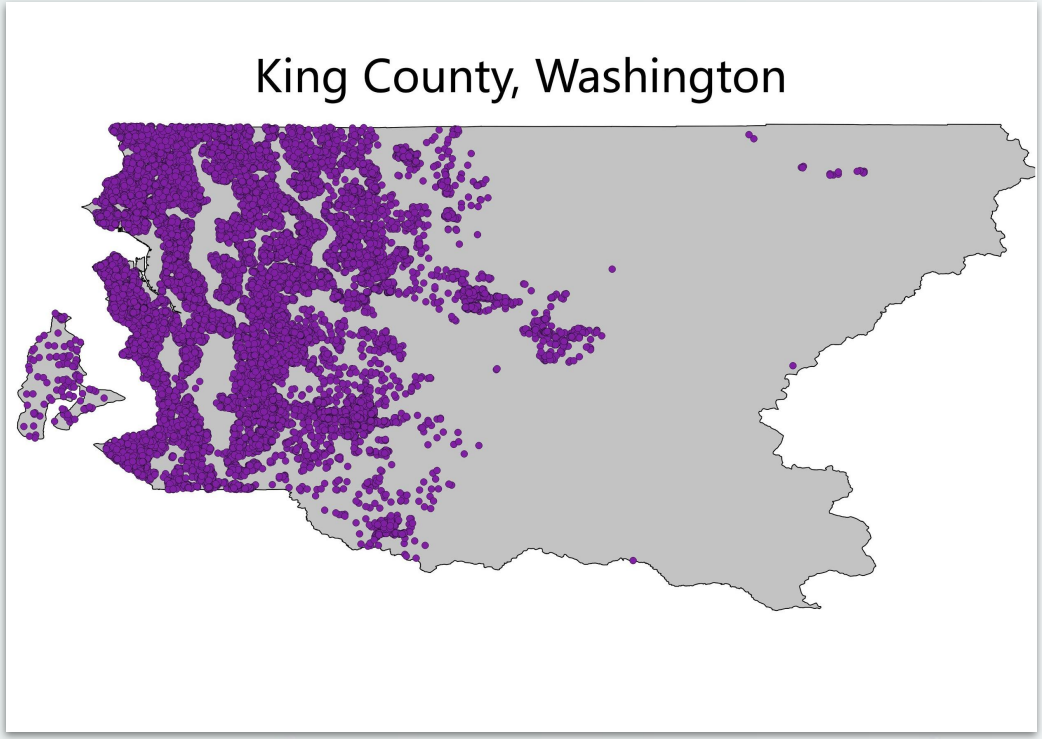
Correlation

-The highest correlation predictors to Price includes: sqft_living, grade, sqft_above, sqft_living15

-Many predictors highly correlated with each other.

-Ex: sqft_living and sqft_living15

Map Visualization



-There are 70 unique zipcodes, and 24 unique cities.

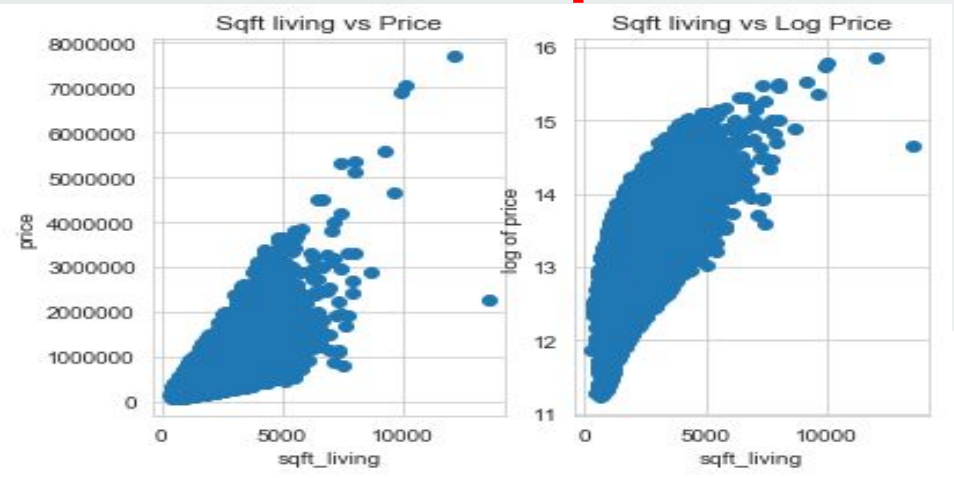
-These cities include: Seattle, Bellevue, Kent, Renton, Federal Way, and more.

-The three cheapest cities were: Federal Way, Auburn, and Enumclaw (median price came around $270,000)

-The three most expensive cities were: Bellevue($749,000), Mercer Island($993,750), and Medina($1.9 million).

-Seattle fell in the middle (median: $453,000)

Exploratory Analysis



Sqft Living vs (Log) Price

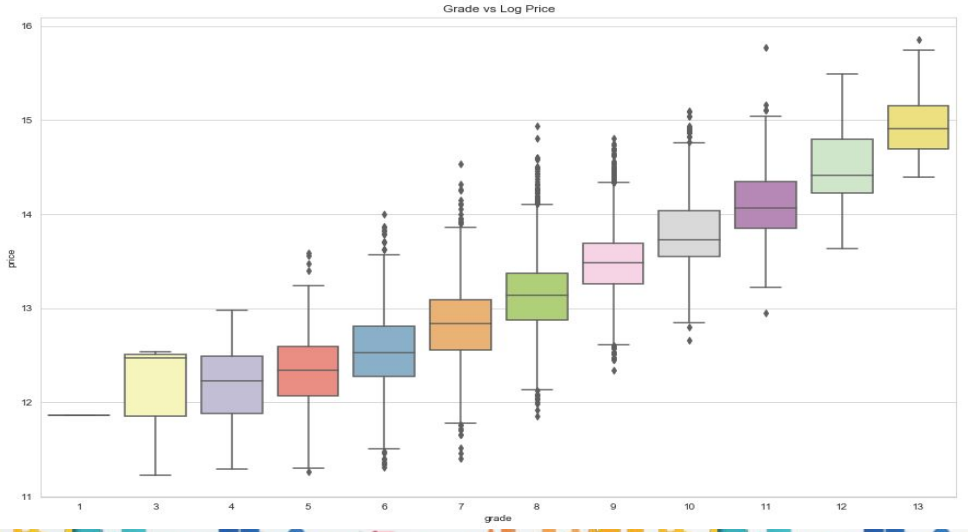
- A positive relationship is shown between House Price and Sqft living.

- Correlation between these two comes out to 0.70.

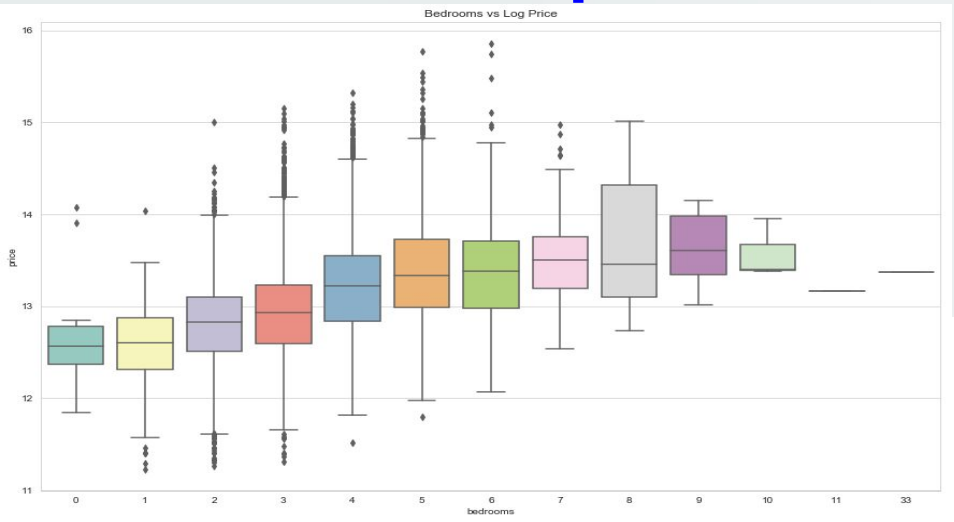
Grade vs Log Price

-With the exception of Grade 3 to Grade 4, as Grade of the House goes up, the House Price goes up.

-Correlation between these two comes out to 0.67.

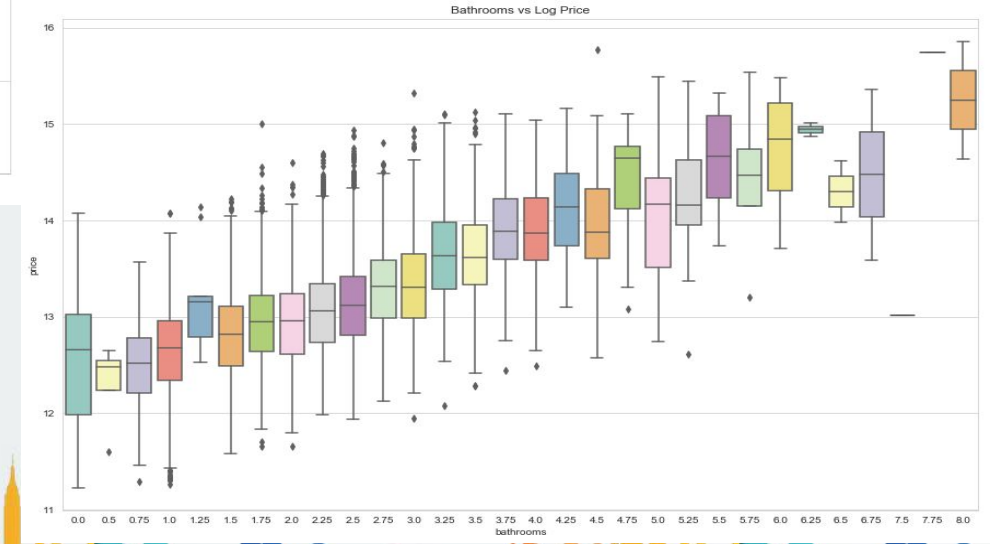


Exploratory Analysis



Bedrooms vs Log Price

- There a slight upward trend in House Prices as Bedrooms go up. Furthermore, the variability in house prices is higher in 2-6 bedrooms is higher than in 0-1 and 7-11 bedroom houses. With the higher variability, more outliers exist
- Correlation between these two comes out to 0.31.

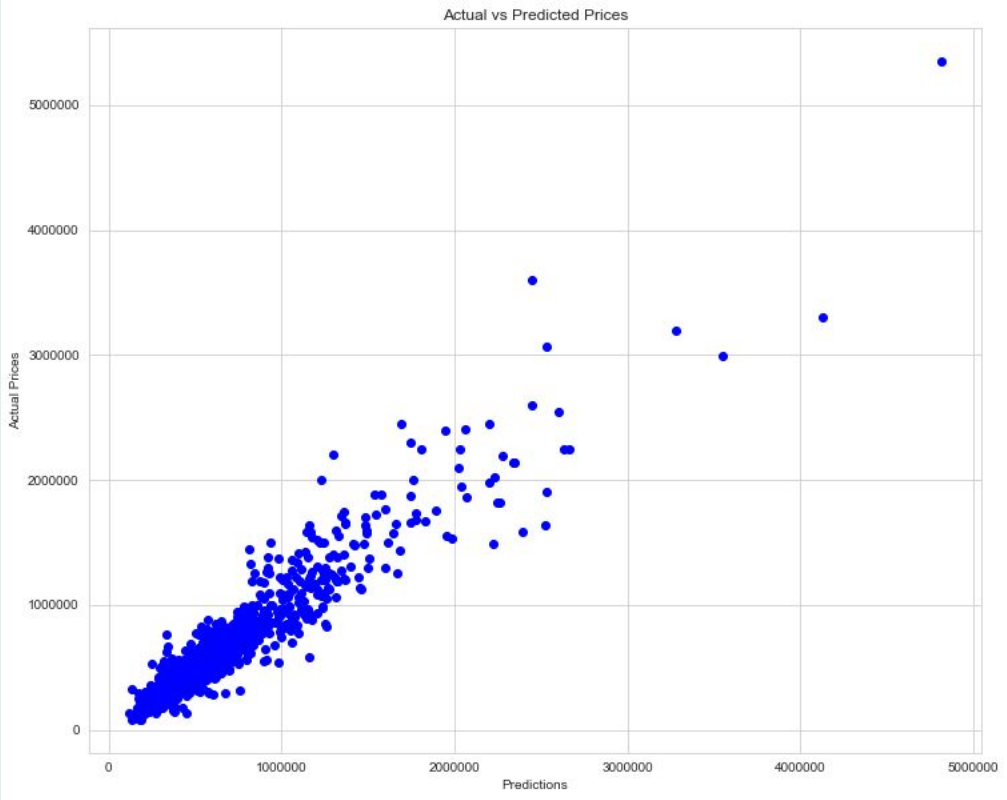


Bathrooms vs Log Price

-Generally, as number of bathrooms increases, House Prices increase.

-Correlation between these two comes out to 0.53.

Modeling the Data



-The Statistical Modeling method used for our final model was Gradient Boosting for regression.

-First split the data into two sets: 90% training, 10% testing. Further performed 20-fold cross-validation to ensure the model was not overfitting.

-Results came out to an average testing R-squared value of around 89%.

-Plot on the left shows a strong linear relationship between our predictions and the observations in our testing set. Therefore, our model does well in predicting House Prices.

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Final Project

Thank you

For listening, and thank you for teaching us Python