



PROJECT 2: LINEAR REGRESSION

KING COUNTY HOUSING DATA

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BACKGROUND

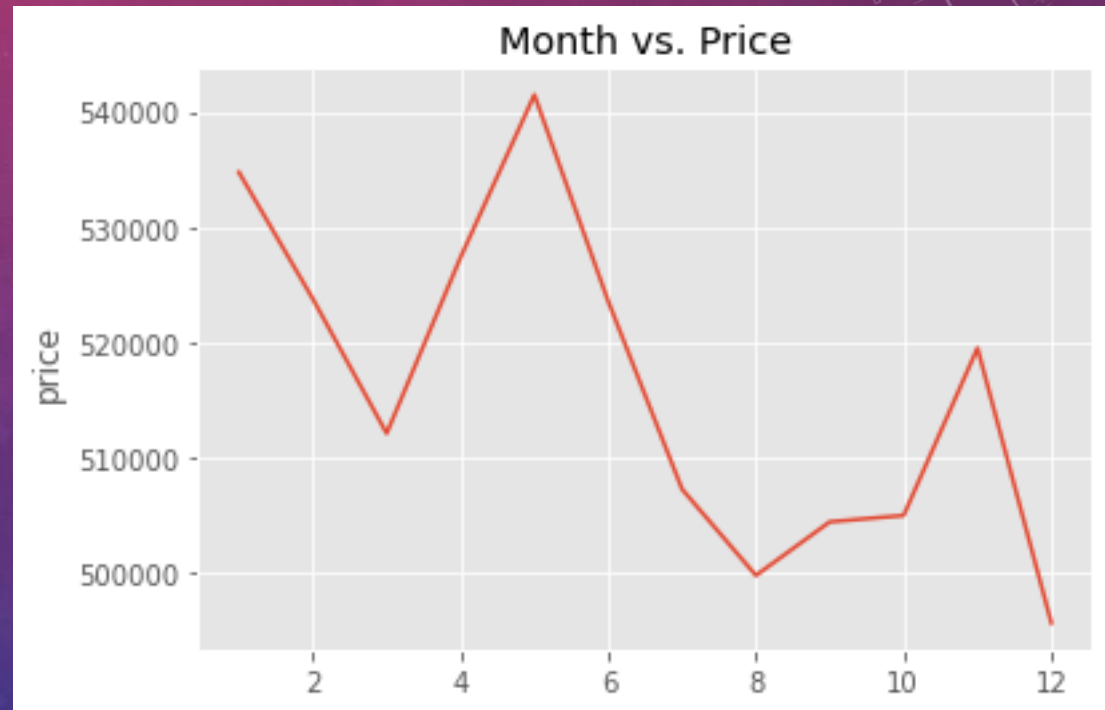
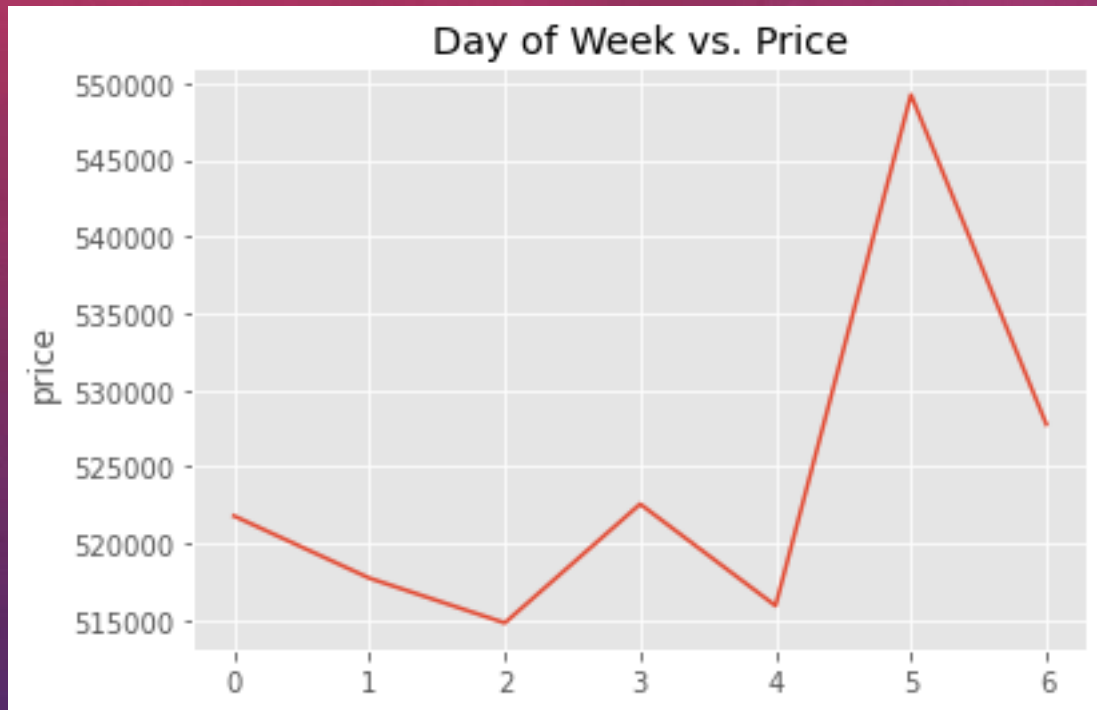
- Problem – Provide insight into most influential factors when buying/selling a home
- Stakeholder – family selling and potentially buying home in Seattle area
- Data – Kings County, WA Home Sale data; 2014-2015
- Model – Multiple Regression
- Goals
 - Identify areas for improvement of current home/ areas of savings for future home
 - Identify strategic timing for sale/purchase



METHODOLOGY

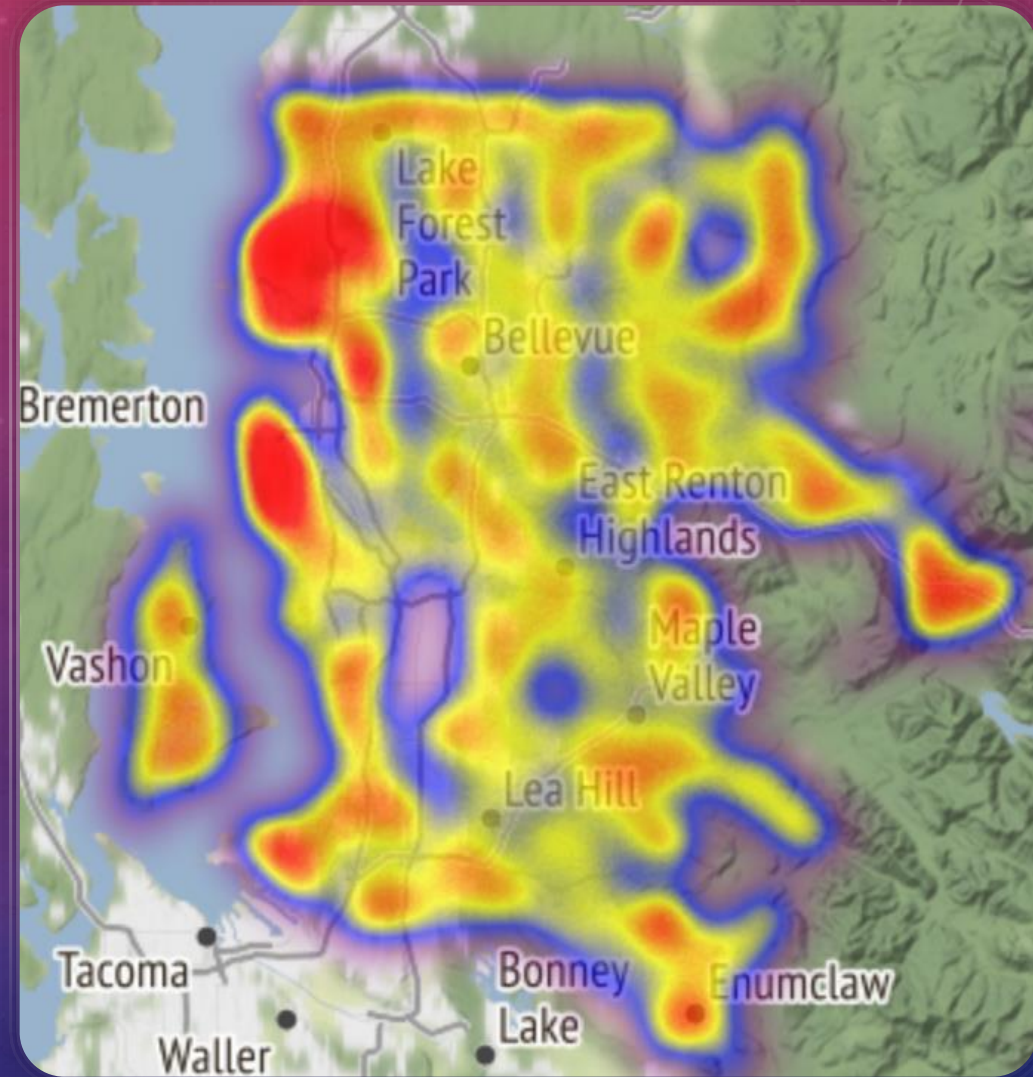
- 1) I performed Exploratory Data Analysis to identify characteristics of the data
- 2) I created several new features including grade squared, day of the week, month.
- 3) I performed multiple linear regression (with one polynomial regression term) under several different permutations (e.g. logging numerals, scaling numerals, and different ways of classifying categoricals/numeric values)
- 4) I identified a model that had a good Score as well as minimal multicollinearity.
- 5) I examined the necessary conditions of linear regression
- 6) The business takeaways: sqft_living, grade_squared, zipcode_avg, waterfront, View, day of week (namely Saturday vs Sunday) all have a (normalized) significant impact on price. The top 6 coefficients in descending order are: zipcode_avg, view_3.0, view_4.0, waterfront_1.0, sqft_living, and grade_squared.
- Furthermore, the model is ready to accept any new home predictors for comparison to current prices, in order to establish if a home is over- or under-valued.

RESULTS 1 – AVERAGE PRICE VS TIME



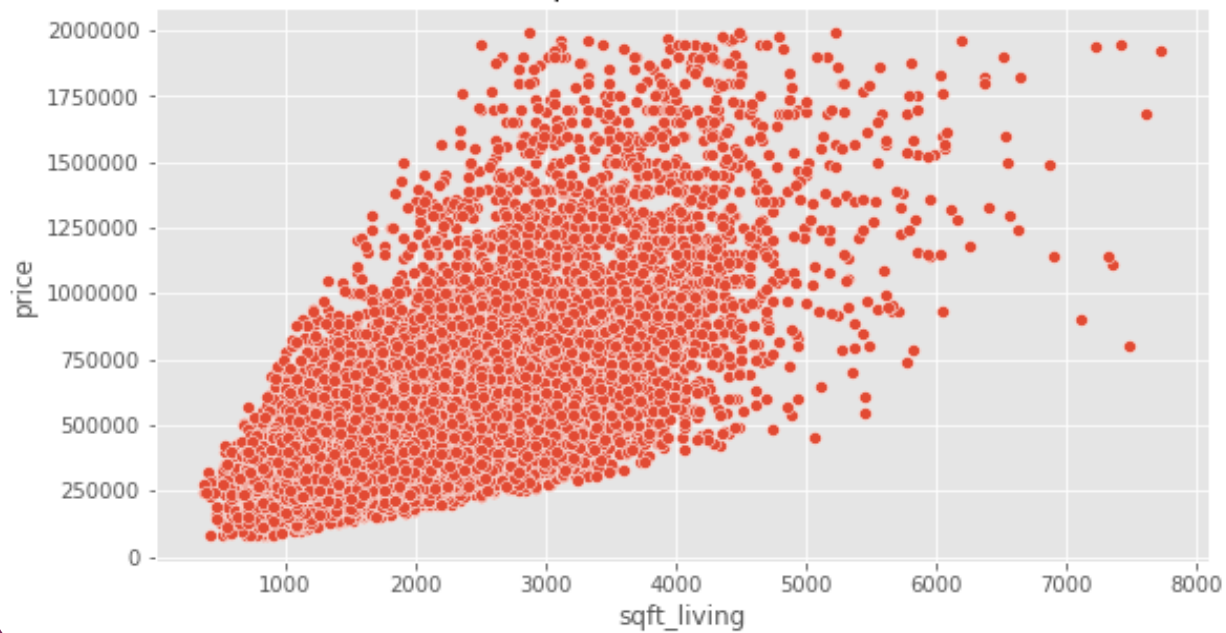
RESULTS 2

- This map illustrates the price differentials by location. Zipcode_avg_price served as a representation of this in the model.
- Future work could include looking at pricing trends since 2015 to identify what neighborhoods have upwardly trending prices.

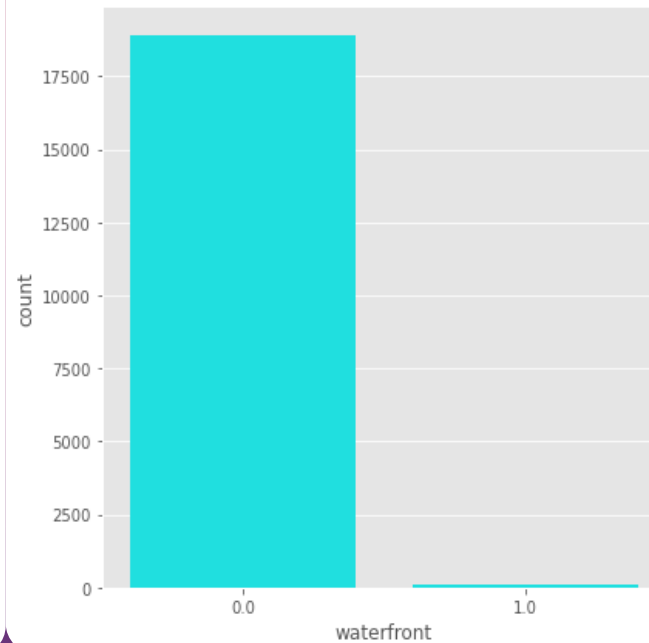


RESULTS 3

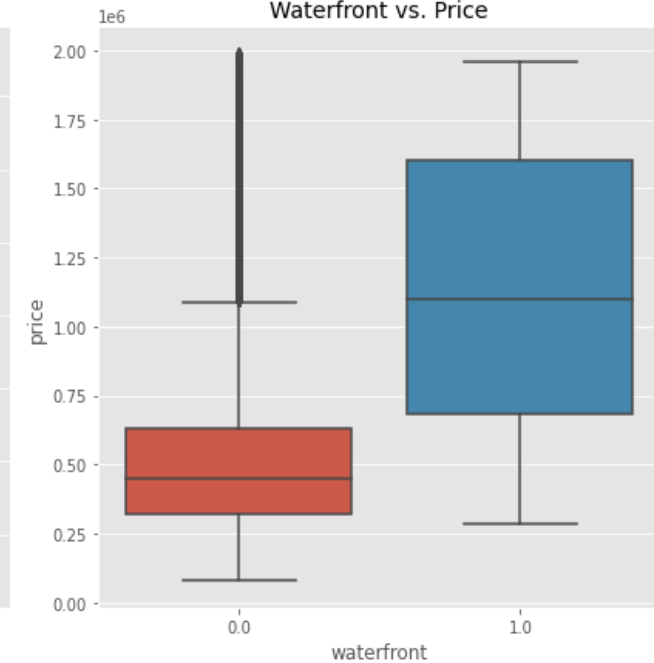
Square Feet vs. Price



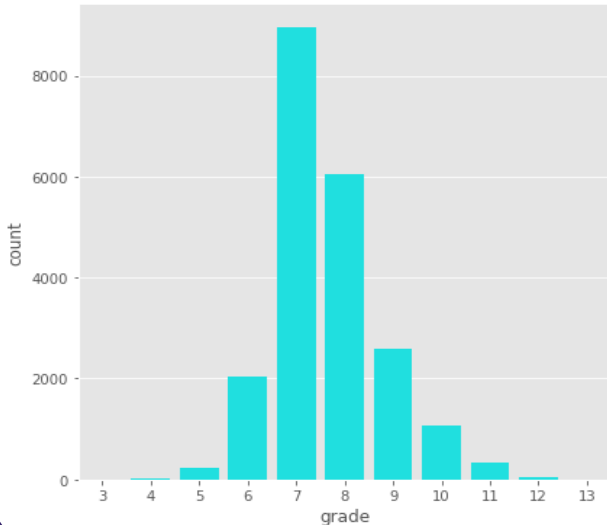
Waterfront Counts



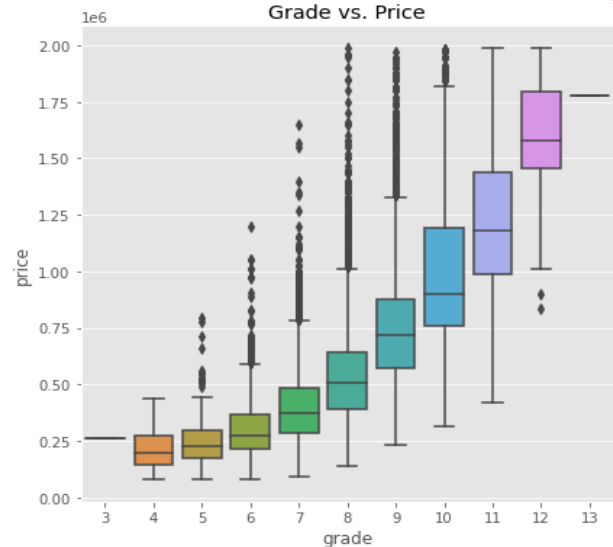
Waterfront vs. Price



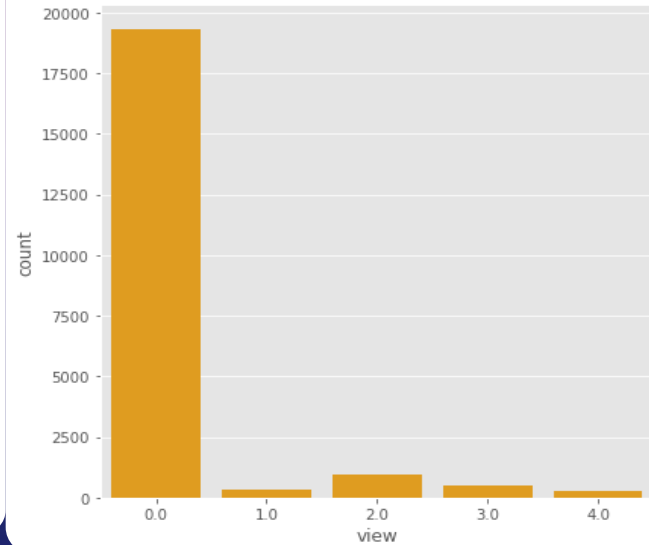
Grade Counts



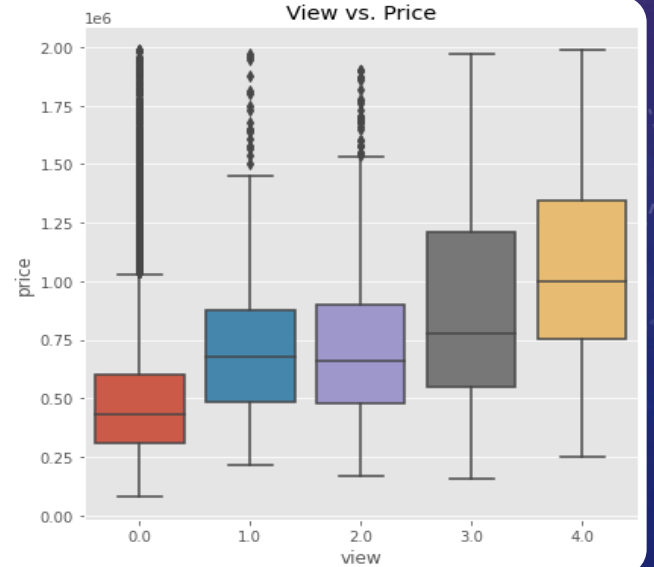
Grade vs. Price



View Counts



View vs. Price



CONCLUSIONS/QUESTIONS

- Linear regression model has identified some characteristics to dial in on.
 - As stated earlier, the top 6 coefficients of linear regression, in descending order, are: zipcode_avg, view_3.0, view_4.0, waterfront_1.0, sqft_living, and grade_squared.
 - This model had an R^2 value of 0.8241. Compared to a ceiling of 1.0, and maintaining good interpretability of predictors, this is a strong result.
- Actionable items:
 - Strategically time home sale/purchase during the year and even within the week
 - Examine locations/zipcodes carefully. In the future, could project zipcodes with desirable growth
 - Improve grade/square footage of current home to increase its value
 - Identify future homes for purchase where grade/square footage are not yet maximized
 - Use linear regression or other model to investigate current / prospective home price points.
- Questions?