



# House sales in King County

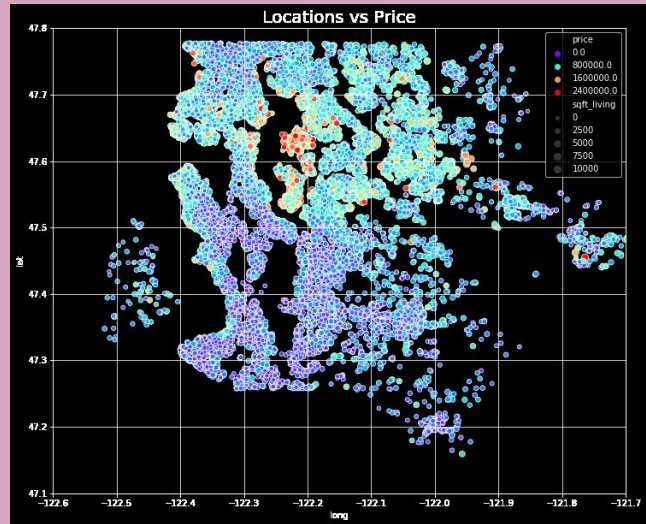
What data science can teach us



Hi, my name is Nate Cibik and I'll be presenting the insights my team found by looking at house sales in King County.

## Questions:

1. What affects price?
  - a. Model: Linear
2. Opportunities
  - a. Buyers/Sellers
  - b. Third Party

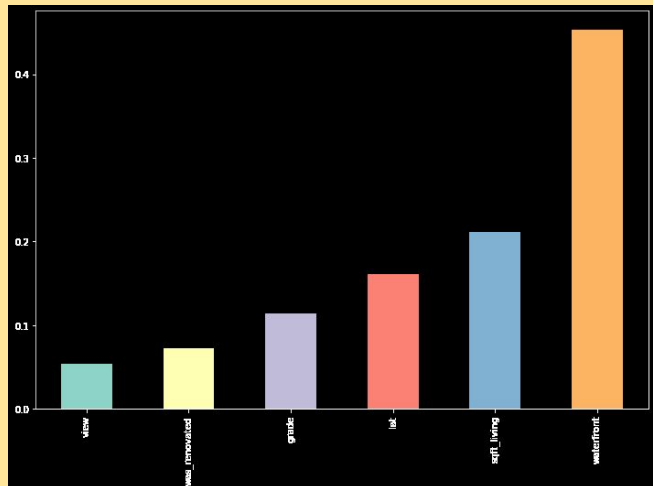


Our team investigated a dataset of the sales prices of King County collected from May 2014 to May 2015 to find out what affected price, and identify marketable insights that information might provide us.

You can see here a map of location vs. price. Clearly location plays a very large role in the value of a house. To see how the other features affected price, we created multiple linear models using different combinations of features, the most complex of which were able to account for 86% of the variation in the prices of homes.

## The Answers:

1. Location
2. Size
3. Quality



The most powerful predictors of price were waterfront property, square footage, latitude, grade, and whether or not the house was renovated

The very strongest features had to do with location, which is faithful to the famous expression “location, location, location” We also found that the zipcode a house was located in to be a very strong predictor of sales price.

The next most powerful predictor was the square footage. Simple linear models using square footage showed that the value of a house would change by between 250 and 280 dollars with each additional square foot, with a predictive accuracy of about 63%

After the square footage you’ll notice grade, which is an evaluation done by King County to describe the quality of a house, then next is whether the house was renovated or not, then how many times it’s been viewed.



## Insights:

- Relocation not possible
- Home Improvement:
  - Size
  - Grade
  - Renovations



The issue with a home's location is that you can't change it, so it doesn't really offer an opportunity for a seller to increase their home value.

The good news is that you CAN improve the grade and square footage of your house. This can be done through renovations, and remember that simply renovating a house has a positive impact on price. Simple linear models showed that just the fact a house had been renovated would add an average of \$100,000 to the sale value of a house. Square footage was correlated with grade, so increasing the size of a house would have a chance of improving its grade as well.

The data showed that more bathrooms had a larger impact on price than having more bedrooms, so that might be something to consider in additions, but any gain in square footage would be beneficial.



## Investigation:

How are houses  
graded?



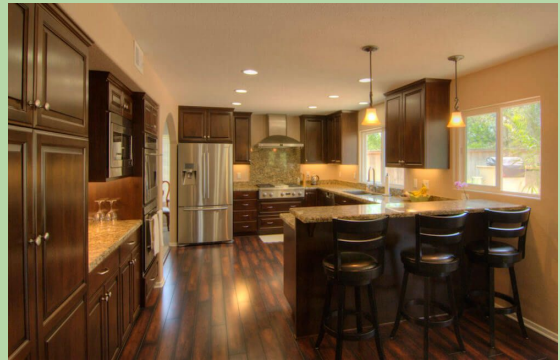
According to a publication released by King County concerning their appraisals of properties, the grade assigned to a house is based off of a few factors, including: size, architecture, building materials, and workmanship.

The vast majority of houses are Grade 7, and this really only means that they are up to code and considered of average building quality. This can be boosted through high quality renovation work.

An important feature of houses which receive high grades, as described in the publication, is the quality of the finish work, of the bathroom/kitchen fixtures, and the building materials, such as having solid wood construction. Custom finishing work is associated with higher grade houses.

## What to offer:

- Additions
- Bathroom upgrades
- Kitchen upgrades
- Custom Molding
- Flooring



Our team concluded that the most obvious market insight from the data was that homeowners could be incentivized to buy renovations for their home with the assurance that they would see a return on investment when they go to sell their home, and enjoy a nicer house in the meantime.

Since the square footage of a home can be increased through renovations, and with there being a potential to raise the grade of a house with them as well, the findings from the data provide a strong business argument for improving a home to raise its value.

## Future work:

### House flipping successful, how?



One interesting trend that the data revealed was found in the differences in sales price of houses in the dataset which sold more than once. On average, these houses which sold twice saw a 39% increase in value from the first sale to the second sale, though there was nothing in the dataset which gave any insight as to why this was occurring. We checked to see if renovations had been done in the interim period, however, none of the houses on the list had been renovated more recently than 1990. Clearly, something was at play in increasing the values of these houses in a short period of time, and it may well be that improvements were made but not reported as renovations to the dataset. Also, there may be other factors at play such as home buyers who allow the sellers to leave the house uncleaned and without any freshening of paint/carpets when they depart, which would give them an edge in negotiating a lower price, allowing them profit after they put some work into the property. Whatever the means, there is successful house “flipping” happening in King County, and further data investigations could be useful in determining what makes it most effective.



**Thank you!**



Thank you!