

Bounty from King County

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Purpose of our analysis: New seller price estimation

The purpose of our study is to find a way to help new sellers with an estimate of their property value in King County.

For that we will perform a data study on properties sold between 2014 - 2015

We will try to help our potential new customers (sellers) to understand the conditions of the market and the potential value added of renovations and condition improvement.



Housing overview:

A quick look on our housing population

We are looking at a sample of over 21 thousand houses sold over the course of 2014-15.

What our average house looks like:

- 2,000 sqft
- 3 bedrooms
- 2 bathrooms

What our standard (average) house costs:

- USD 540,000

Is this information enough to help our sellers?



Can we help new sellers to estimate how much they could sell their house for?

Features that determine cost:

- Living space
- Grading
- Presence of a Basement
- Number of Floors
- Living space of the nearest 15 neighbors



Price Estimation Considerations

Our model tells us that these features can explain 60% of the variation in the price of the properties in the dataset.

New instances of these features would be enough to account for 60% of the estimation of a new house price.

The other 40% is difficult to account for, and could be based on tricky variables such as neighborhood, nearby schools or even the amount of light and air a room gets.



Findings and recommendations

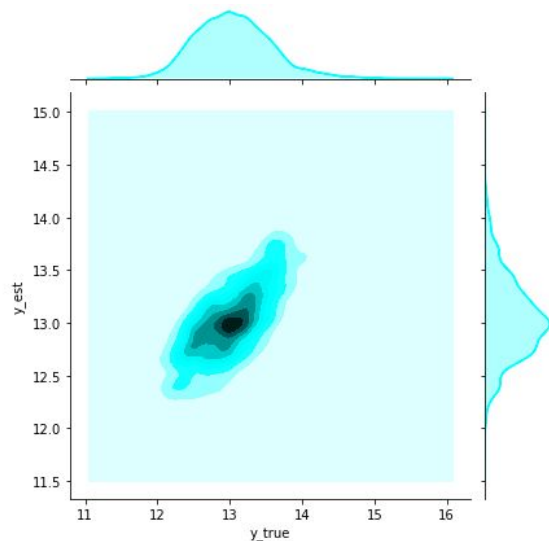
- An increase of 10% in square footage results in a 2.5% increase in price.
- Each extra floor increases the average house price 3%.
- The presence of a basement in a house increases the average house price 15%
- On average an improvement in condition from grades 2 to 3 could result in a price increase of around \$82 per square foot.
- An improvement from condition 3 to 4 does not appear to have any effect on house price, we therefore would not recommend the necessary renovations.

Thank You



Q&A

Our Model



Log interpretation:

For a 10% increase in sqft of living, all other variables remaining equal (or unchanged) we would expect the price to increase by 2.5%
$$(((1.1^{0.25})-1)*100)$$

Our floor variable, implies that one unit increase (i.e one extra floor) will translate in average into a 3% price increase ($\exp(0.0323)$)

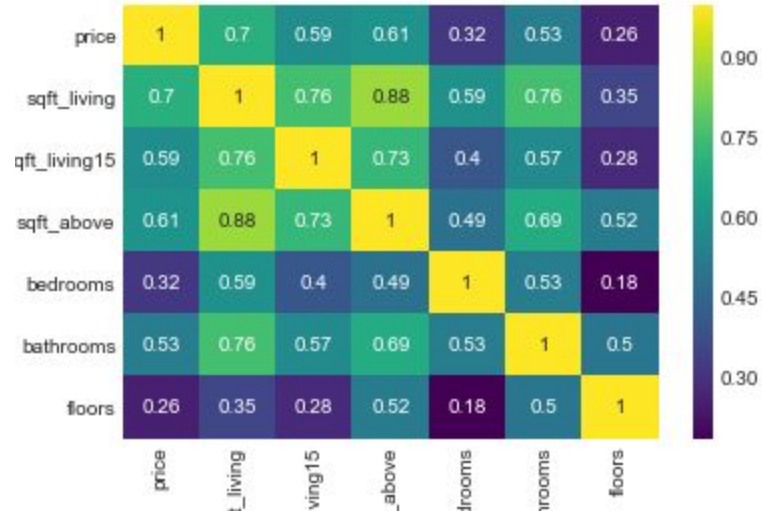
OLS Regression Results

Dep. Variable:	price_log	R-squared:	0.567
Model:	OLS	Adj. R-squared:	0.567
Method:	Least Squares	F-statistic:	5648.
Date:	Tue, 22 Oct 2019	Prob (F-statistic):	0.00
Time:	14:56:15	Log-Likelihood:	-7760.2
No. Observations:	21596	AIC:	1.553e+04
Df Residuals:	21590	BIC:	1.558e+04
Df Model:	5		
Covariance Type:	nonrobust		

	coef	std err	t	P> t	[0.025	0.975]
const	7.8729	0.066	120.192	0.000	7.744	8.001
grade	0.1954	0.003	58.877	0.000	0.189	0.202
sqft_living_log	0.2546	0.010	24.929	0.000	0.235	0.275
sqft_basement_dummy	0.1502	0.005	27.446	0.000	0.139	0.161
sqft_living15_log	0.2189	0.012	18.916	0.000	0.196	0.242
floors	0.0323	0.005	6.102	0.000	0.022	0.043

Omnibus:	72.012	Durbin-Watson:	1.993
Prob(Omnibus):	0.000	Jarque-Bera (JB):	72.676
Skew:	0.141	Prob(JB):	1.65e-16
Kurtosis:	2.966	Cond. No.	372.

Looking for correlations



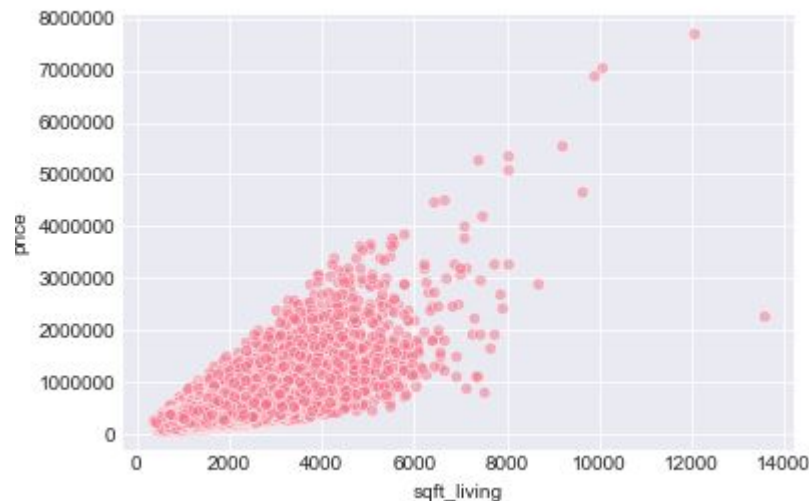


Can living space predict price?

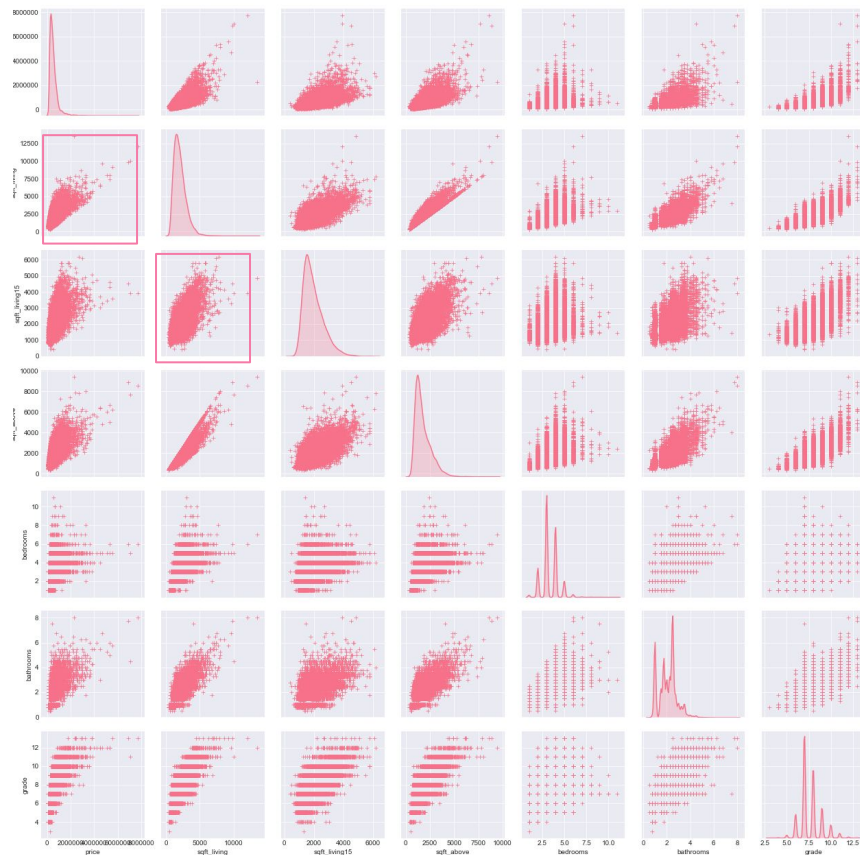
- There is a large standard variation for square footage.

STD = 918.0ft²

- Square footage has a strong correlation with price.



Avoiding Multicollinearity



The condition jump

