Exploration of King County House Sales

Asset Management Business Case

An asset management firm invests in real estate on their clients behalf. The company is planning to enter a foreign real estate market.

BUSINESS CASE

They chose King County for their initial expansion attempt. The company's goal is to maintain and upgrade assets in a cost efficient manner.

BUSINESS CASE

KING COUNTY HOUSE SALES

01

Overview of the King County real estate market

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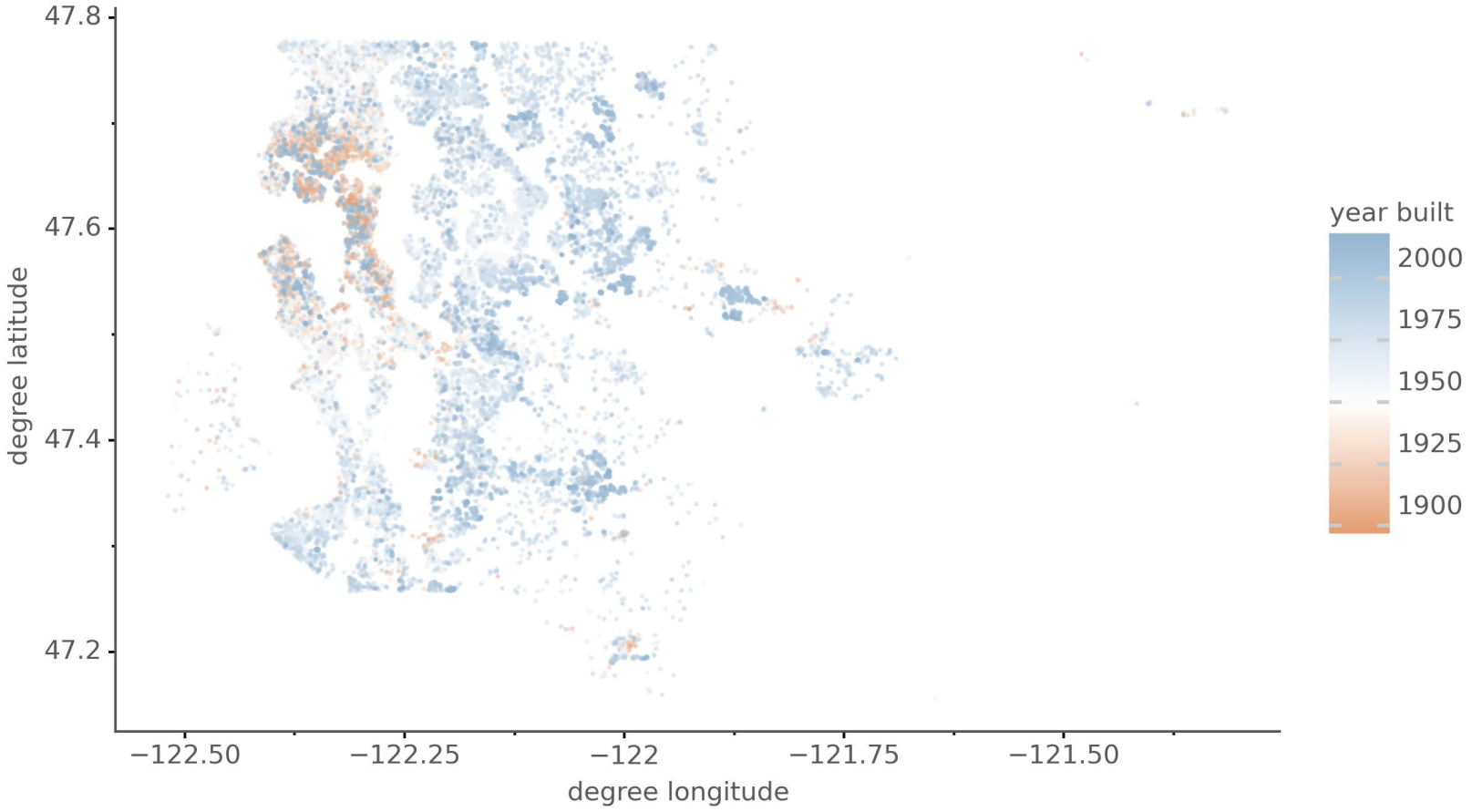
How to increase asset value

03

Modeling of house prices

Overview of the King County real estate market

Sales of old and new houses in King County

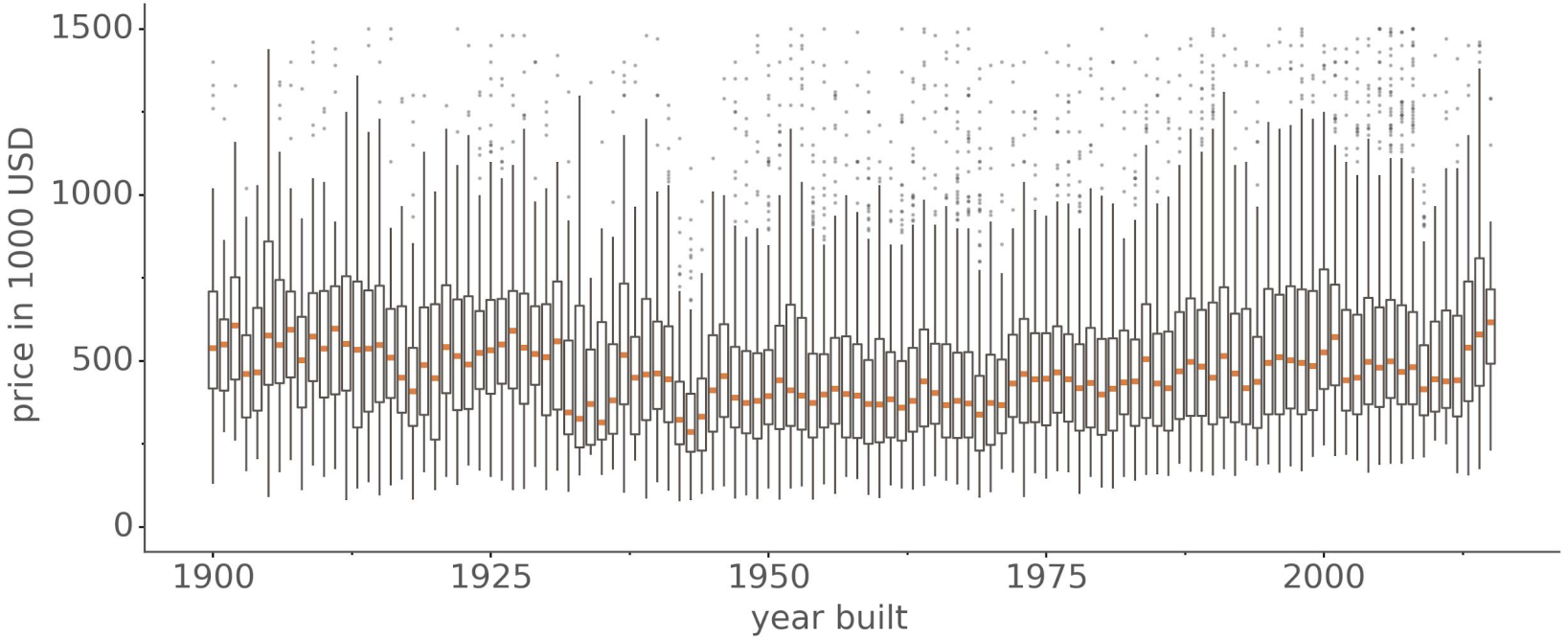


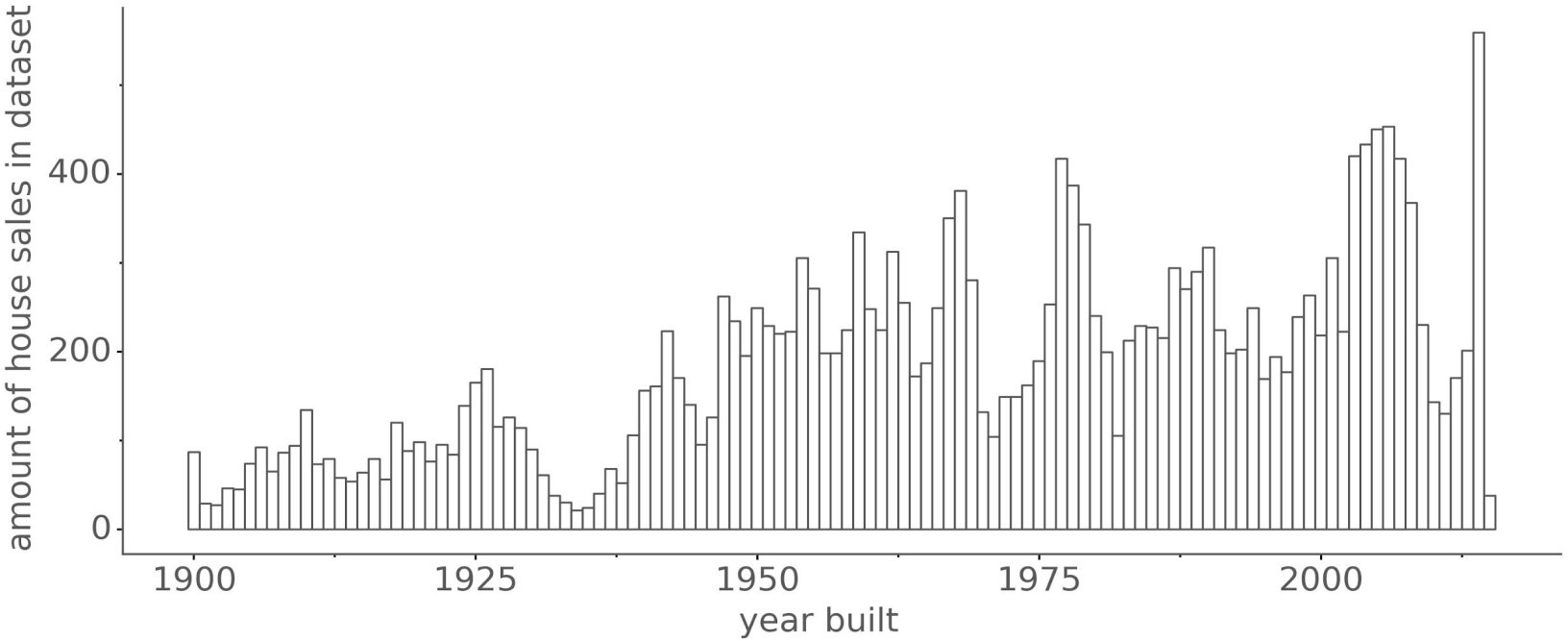
market overview

This map shows the King County real estate market.

It contains House Sales from 05/2014 to 05/2015.

The oldest houses are located in the Seattle area.



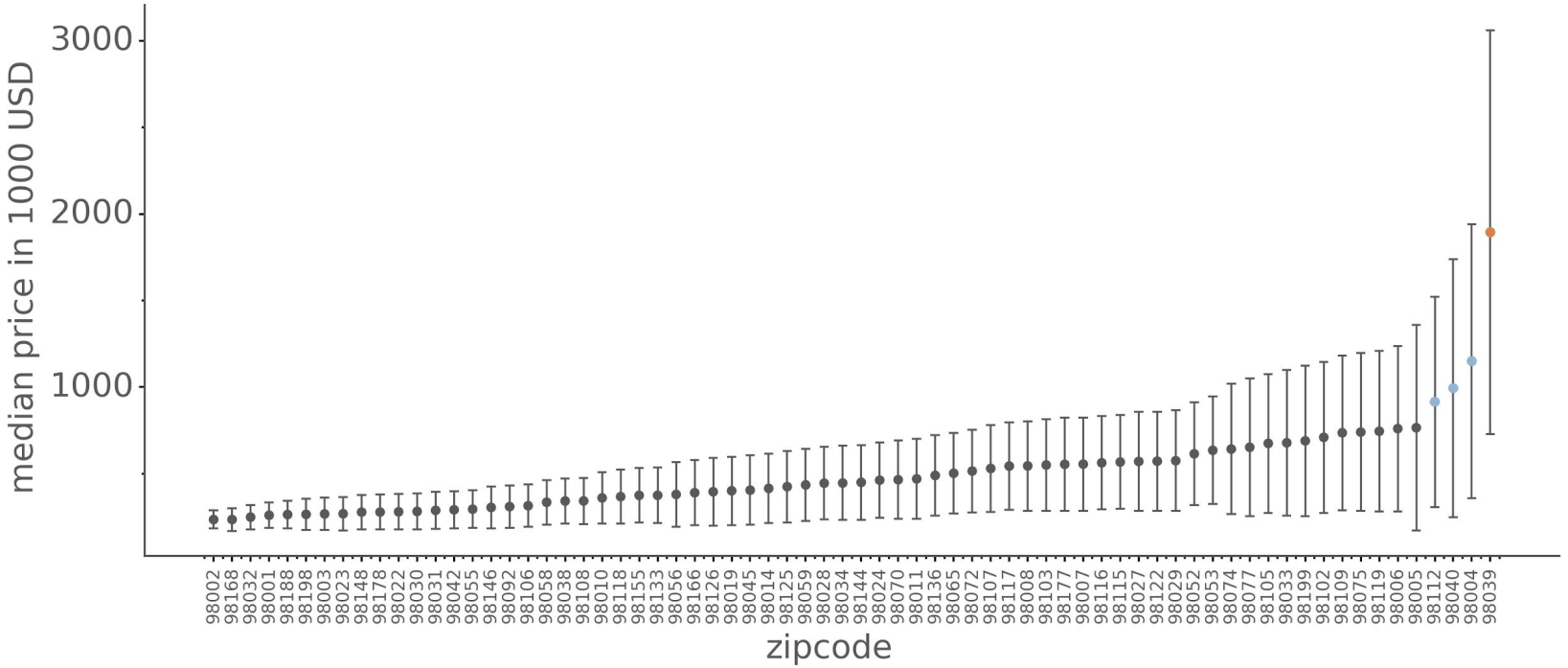


building age

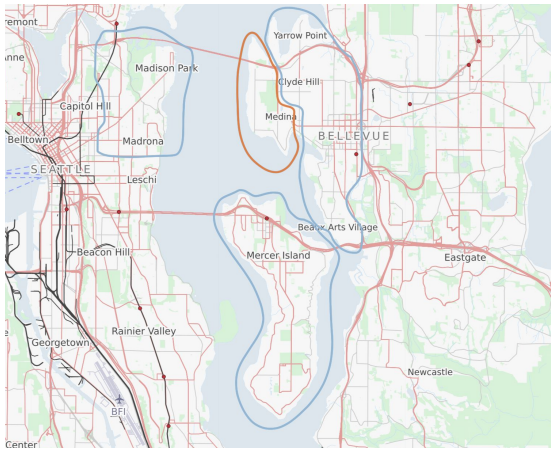
The age of a house does not correlate with price in a meaningful way.

Less houses from certain periods were sold during the data acquisition time frame.

Major US recessions are clearly visible in the data.



		Adjusted Gross Income	Median Household Income
98039	Medina	$691,840	$17,429
98040	Mercer Island	$303,920	$120,300
98004	Bellevue	$256,280	$82,698
98112	Seattle	$246,440	$89,205



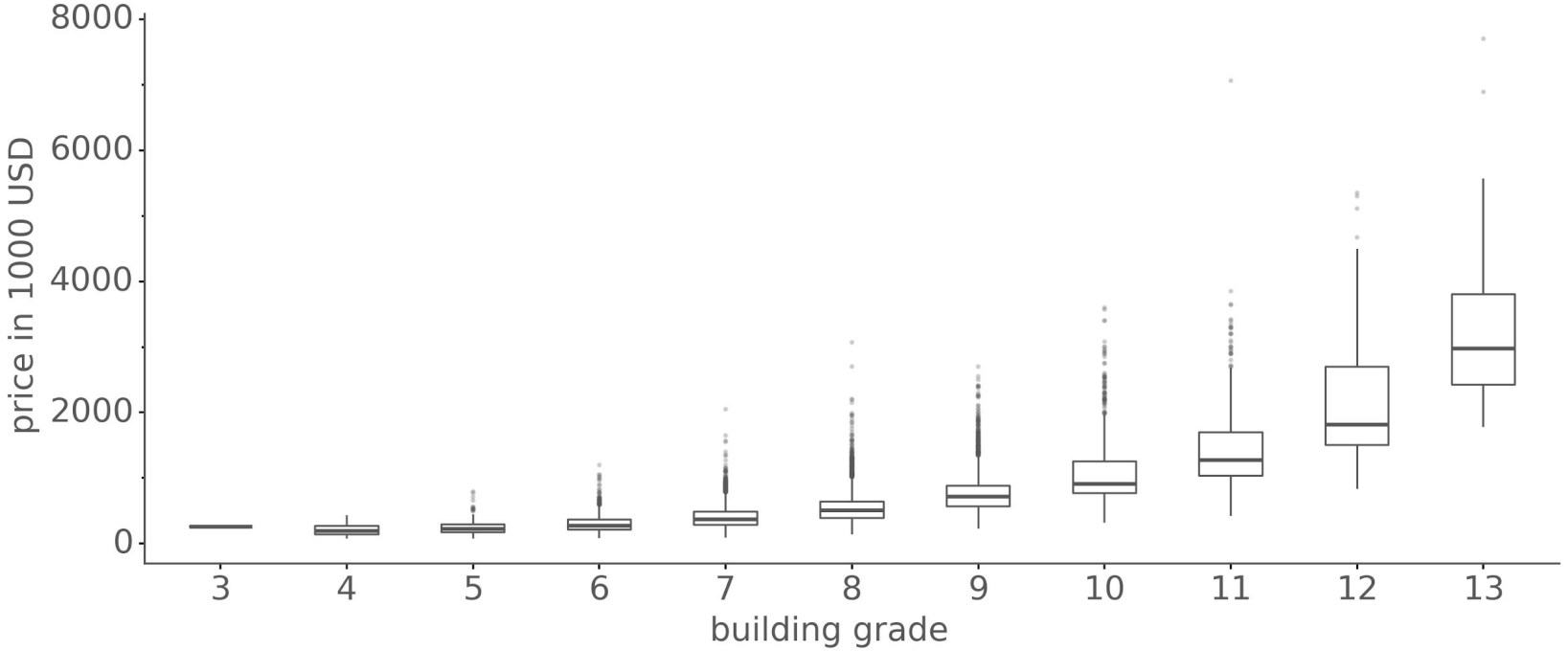
source: https://www.zipdatamaps.com/economics/income/agi/state/wealthiest-zipcodes-in-washington

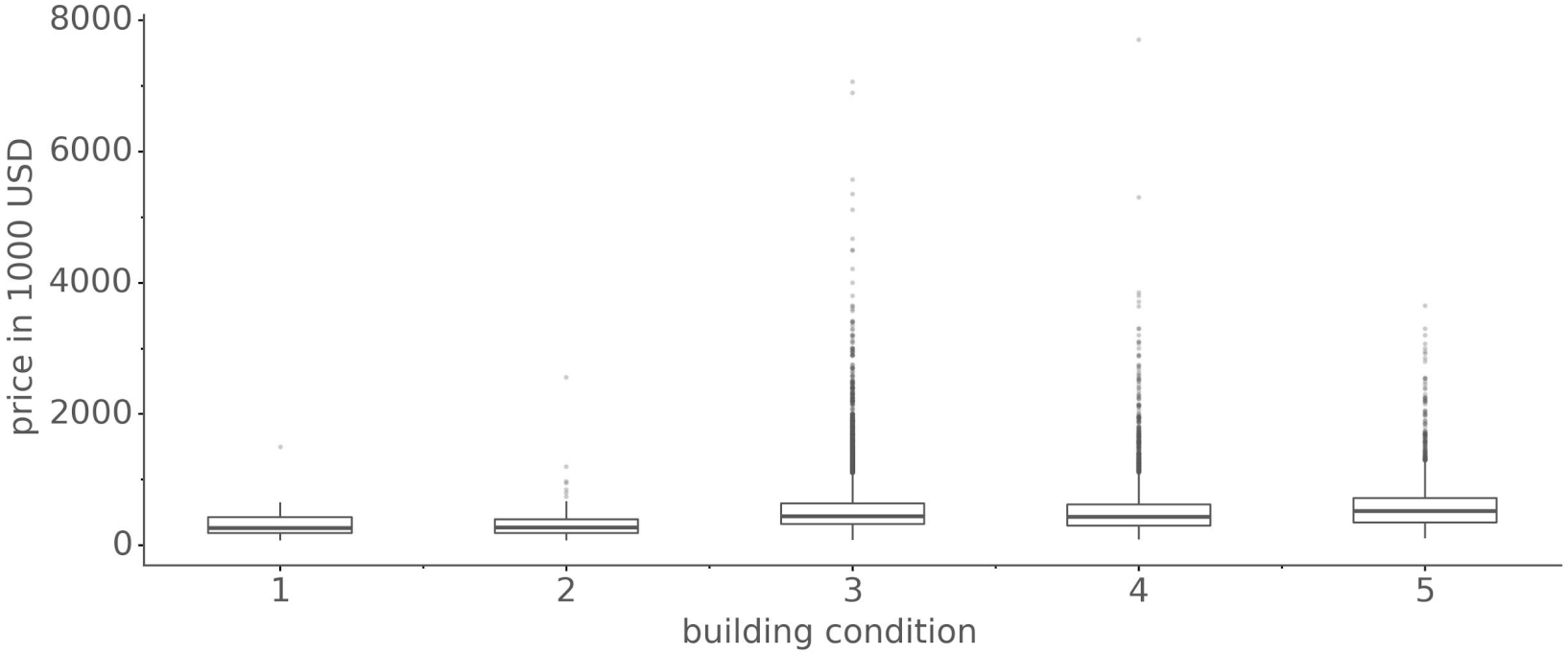
zipcode anomalies

The four zipcodes with the most expensive houses all border Lake Washington.

They are also the four wealthiest zipcodes in the state of Washington.

How to increase asset value



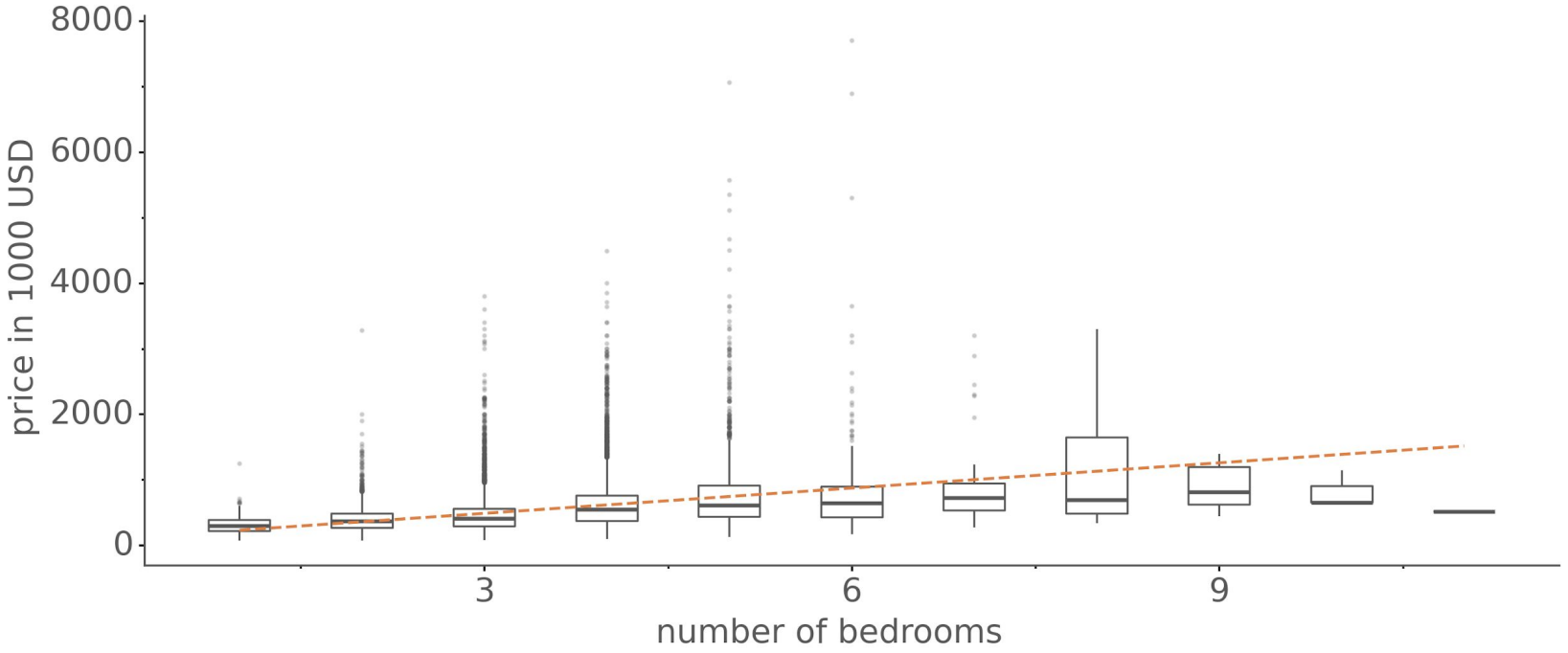


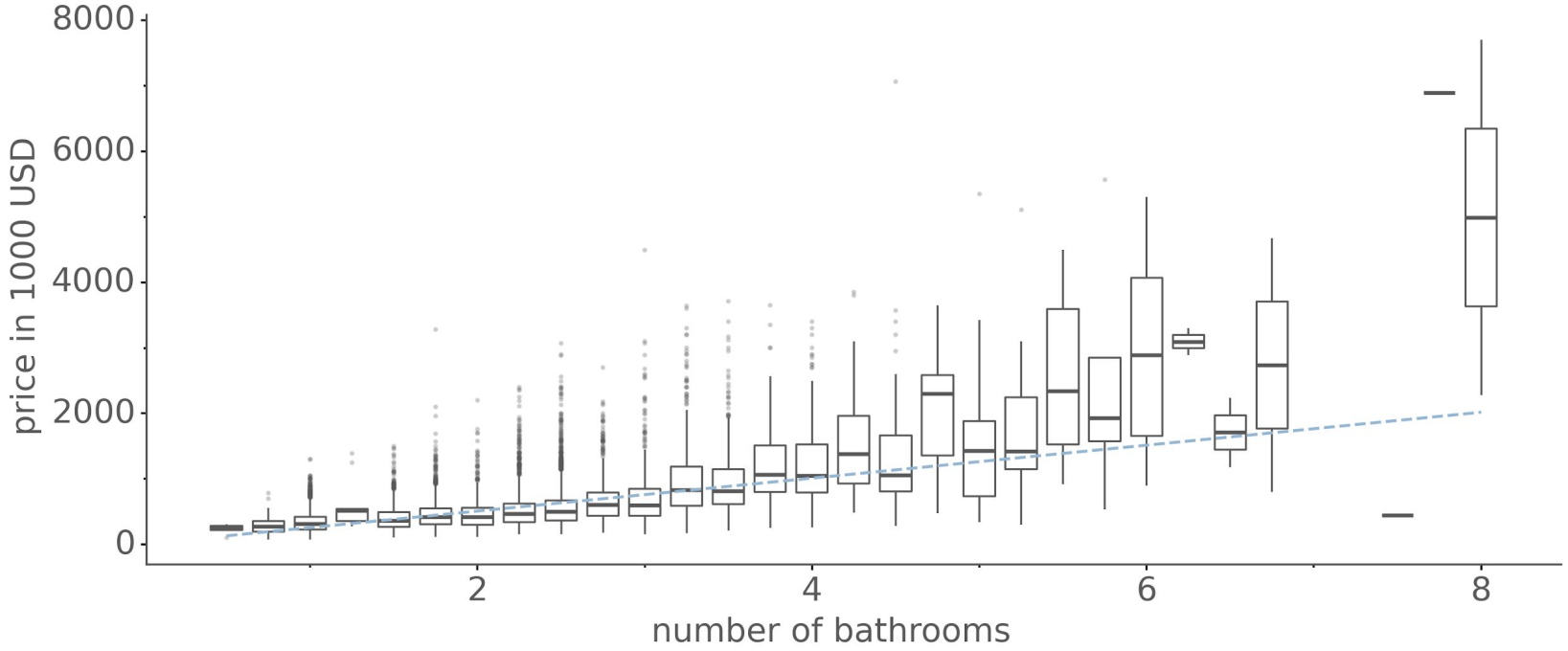
grade versus condition

Identifying houses whose grade can be improved is of the utmost importance.

Condition is relative to grade and age, but not relevant for price.

Buying the highest possible condition is advisable, actively improving the condition is not.





bathrooms versus bedrooms

The addition of a singular bathroom is preferable to the addition of a singular bedroom.

Bedrooms underperform in bigger houses with the most rooms, while bathrooms overperform.

This trend does not necessarily imply causation.

Modeling of House prices

price per square feet

as a function of 18 explanatory variables.

Dep. Variable:	price_sqft	**R-squared:**	0.729
Model:	OLS	**Adj. R-squared:**	0.726
Method:	Least Squares	**F-statistic:**	188.3
Date:	Fri, 18 Sep 2020	**Prob (F-statistic):**	0.00
Time:	06:58:04	**Log-Likelihood:**	-92586.
No. Observations:	16935	**AIC:**	1.857e+05
Df Residuals:	16695	**BIC:**	1.875e+05
Df Model:	239		
Covariance Type:	nonrobust		

MAPE of 15.23 % for independent test set.

model 1
the best MAPE

A model to predict the price/sqft of houses was formulated.

It can serve as a guideline for evaluating offers and getting used to the new market environment.

The model predicts house prices with a mean absolute percentage error (MAPE) of 15.23 %.

price per square feet

- ~ number of bathrooms
- + house grade
- + zipcode
- + waterfront view
- + ratio of own living space and living space of 15 nearest neighbors

Only five explanatory variables.

MAPE of 16.41 % for independent test set.

model 2
a more sensible approach

Adding more predictors may lead to shortcomings of the model when faced with new data.

A more robust model was proposed, choosing only the five most important predictors while still maintaining an acceptable MAPE of 16.41 %.

Thank you for your attention!