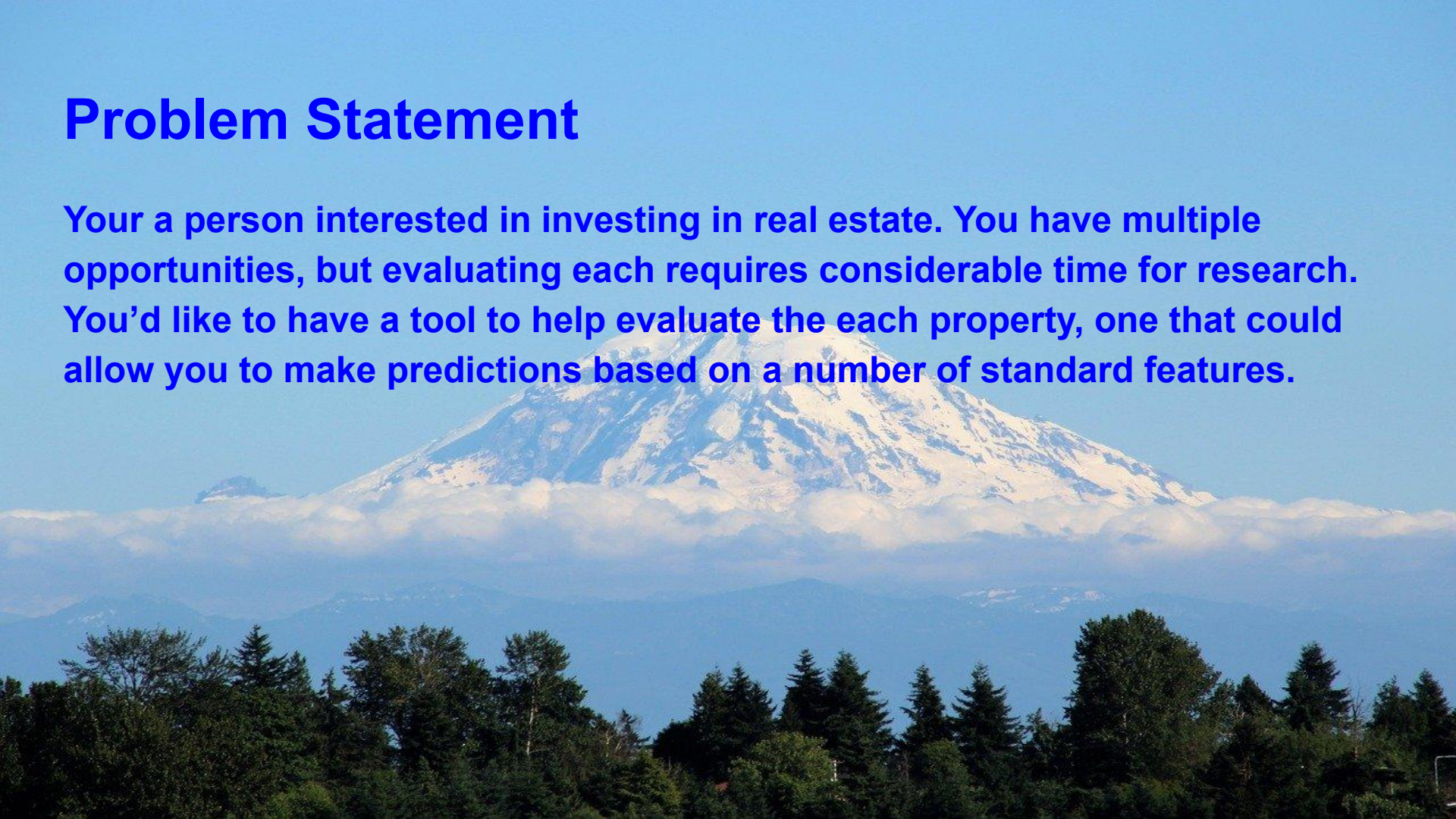
Predicting House Prices in Kings County, Washington

Problem Statement

Your a person interested in investing in real estate. You have multiple opportunities, but evaluating each requires considerable time for research. You'd like to have a tool to help evaluate the each property, one that could allow you to make predictions based on a number of standard features.



Problem Statement - cont.

Consider that you want to invest in real estate but do not have all of the necessary knowledge to confidently select the best possible properties. What do you do? Is there a way to make up for your gap in knowledge?

Business Value

- Comparing predicted values to actual prices can help identify profitable opportunities.
- Try out various improvement scenarios to see which provide the largest increases in price
- Identify the best locations to invest.

Methodology

- Use a housing dataset containing relevant information regarding the real estate market in the targeted area.
- Study the data to understand how it can be used for house price prediction.
- Identify those features that contribute in a significant way, and remove those that do not.
- Model the data using statistical tools.
- Study the results to understand the model.

The Data

This data was compiled by the county assessor for Kings County in the state of Washington. It includes 21 different features related to housing prices in the county, including the price.

We will build our model using all or a subset of 20 features to predict the price.

id	date	bedrooms	bathrooms	Sqft living
Sqft lot	floors	waterfront	view	condition
grade	Sqft above	Sqft basement	Yr built	Yr renovated
zipcode	lat	long	Sqft living15	Sqft lot15

Scaling

It should be noted the the data has be rescaled for square foot area and for price.

All features that are represented in square foot have been rescaled so that a single unit is now 100 square feet.

The housing prices have been rescaled so that a single unit is represented as $1000.00 instead of a single dollar.

The model

In the end we went with a model that uses 15 of the original features. We will go over the most important of them.

Grade

This is a Kings County grading system that ranges from 1 to 13. The higher the grade the better.

This model suggests that increasing the grade by one will increase the price of the house by $1000 x 70.27.

Square foot living

This is the total living space of the house. It include the basement, if any.

This model suggests that increasing the living area by one unit (100 sqft) the price of the house increases $1000 x 18.57

Waterfront

Is this a waterfront property?

The model suggests that waterfront properties are priced at $1000 x 252.11 higher than those that are not. These are mostly located in some of Seattle's most exclusive zip codes.

Number of bedrooms

Oddly enough the model suggests that as you increase the number of bedrooms, the contribution to the price is negative - $1000 x -29.45. We will need to look at this closer. Perhaps a tweeking of the model in the future.

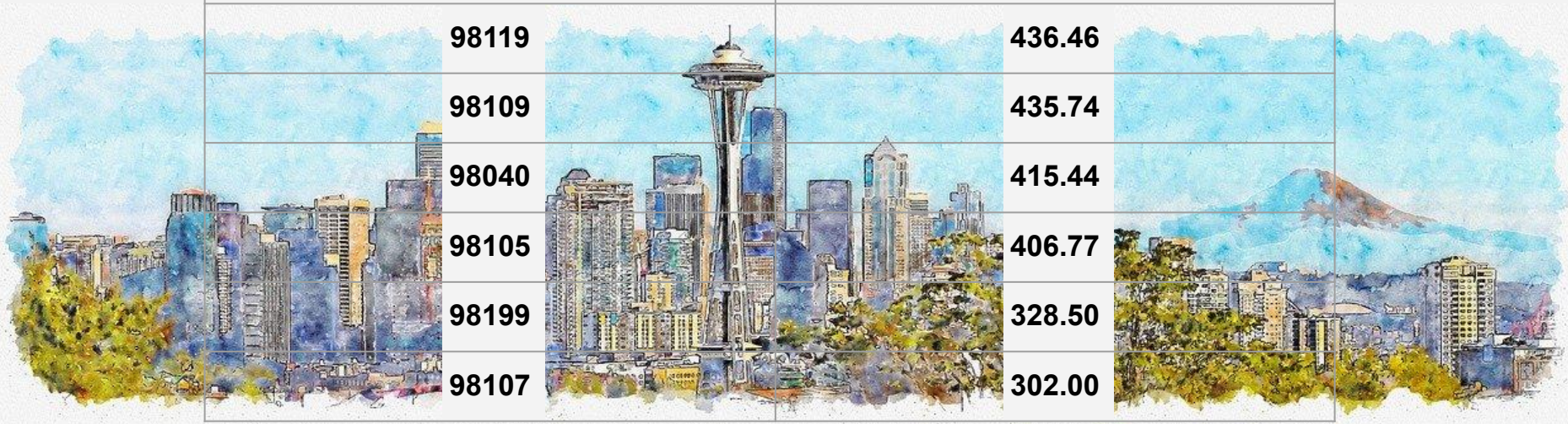
Zip Code

Real estate is all about location, and the model supports this. Real estate prices by zip code can be predicted by taking $1000 and multiplying it by the specific zip code multiplier - $1000 x zipcode_multiplier.

We'll look at the top contributing zip codes in the next slide

Top contributing zip codes

Zip code	Multiplier
98039	1119.64
98004	677.20
98112	528.67
98102	453.02
98119	436.46
98109	435.74
98040	415.44
98105	406.77
98199	328.50
98107	302.00



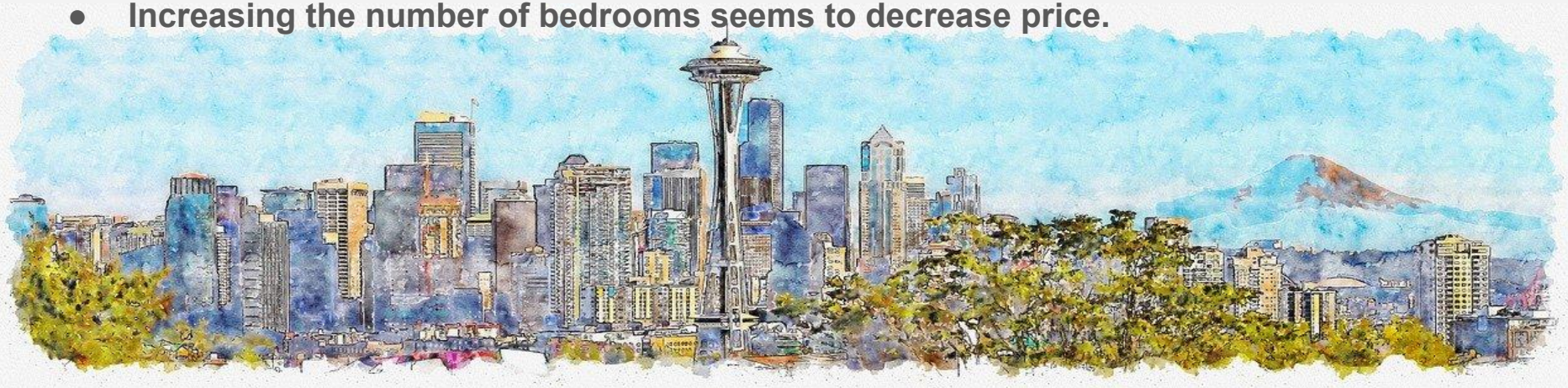
Renovated

Houses that had a designation of having been renovated had a price increase of $1000 x 68.42

Summary

We have seen the top contributors to house prices based on our data.

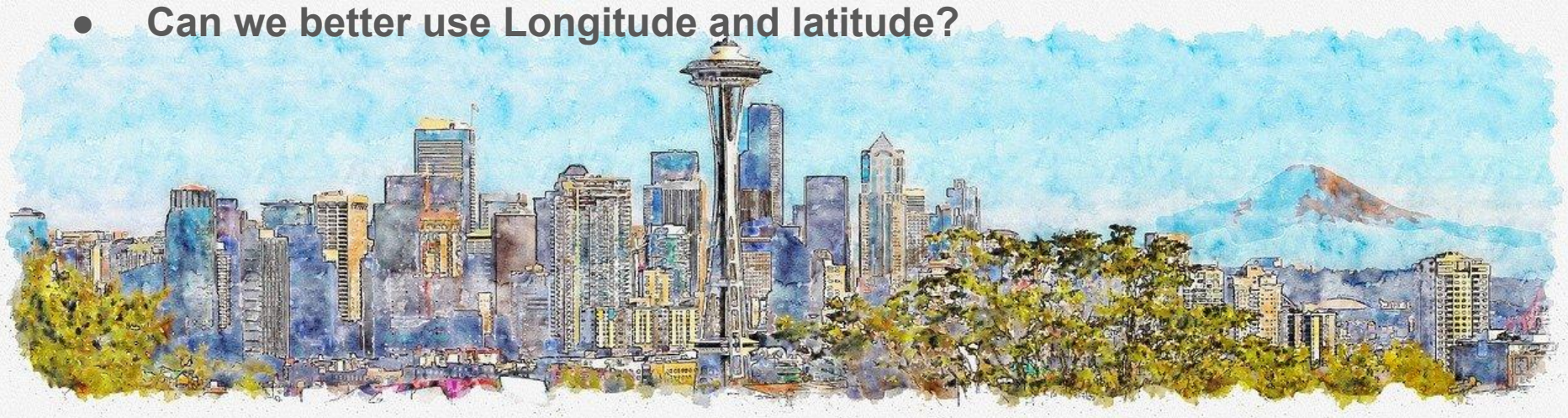
- Location, location. The zip code is a strong predictor. Opportunities can be found by finding homes in these zip codes that are below the predicted price.
- Improving on the grade given to the house will give a significant increase in price.
- Properties located on waterfronts suggest much higher prices.
- Increasing the square foot living area will contribute to increase in price
- Increasing the number of bedrooms seems to decrease price.



Future work

These are points to explore in the future.

- **Explore interactions - the cumulative effect of multiple features together.**
- **Try to understand the effect of bedrooms and identify if there is another approach**
- **Can we better use Longitude and latitude?**




Thank You
I hope