



# KING COUNTY REAL ESTATE

Emmi Galfo • February 2023

# Overview

# Business Problem

# Data Understanding

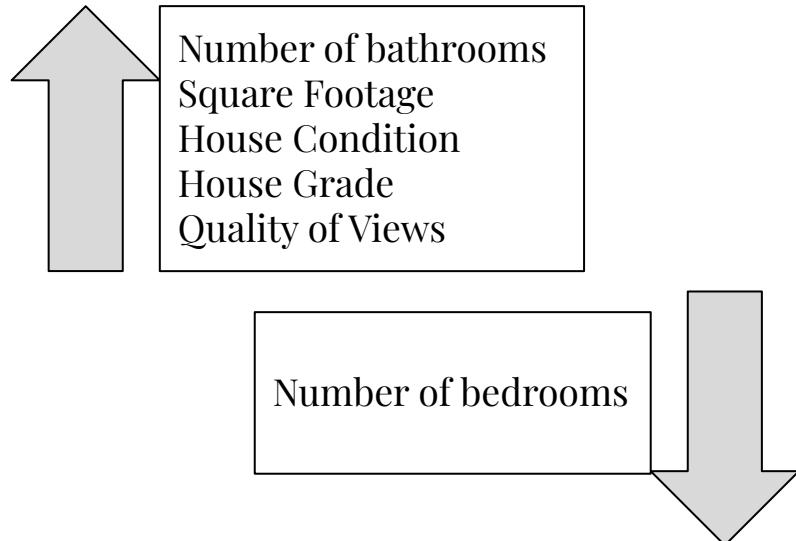
# Results

# Conclusions



# Overview

This project looks at factors that may influence **price** in the King County real estate market.



# Business Problem

- A real estate agent is helping a couple find a house in King County, WA.
- The couple is interested in seeing how different factors affect overall price.





# Data Understanding

A large database of King County home sales was taken from the King County assessor's website and downloaded from Kaggle.com.

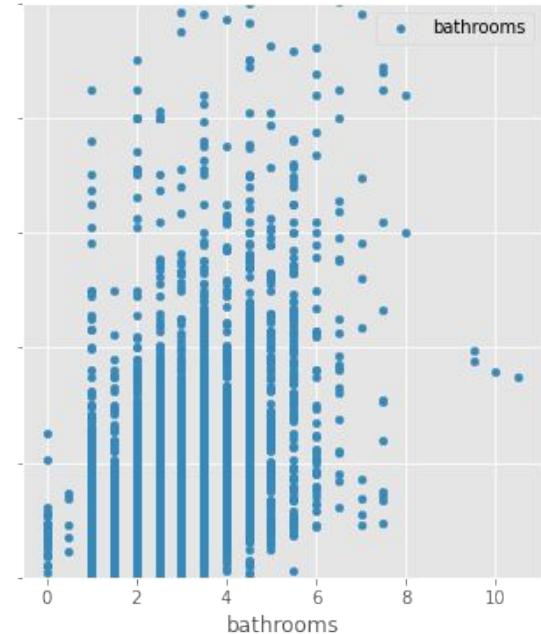
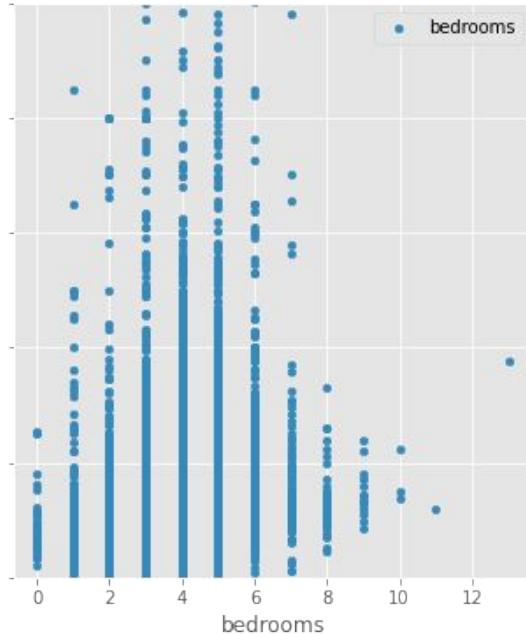
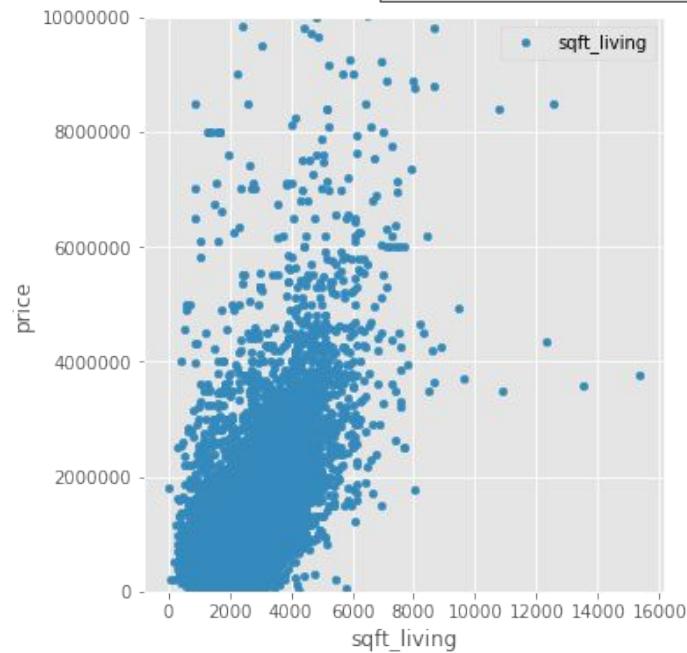
## Data Used:

- Price
- Bedrooms
- Bathrooms
- Square Footage of Living Space
- View
- Condition
- Grade

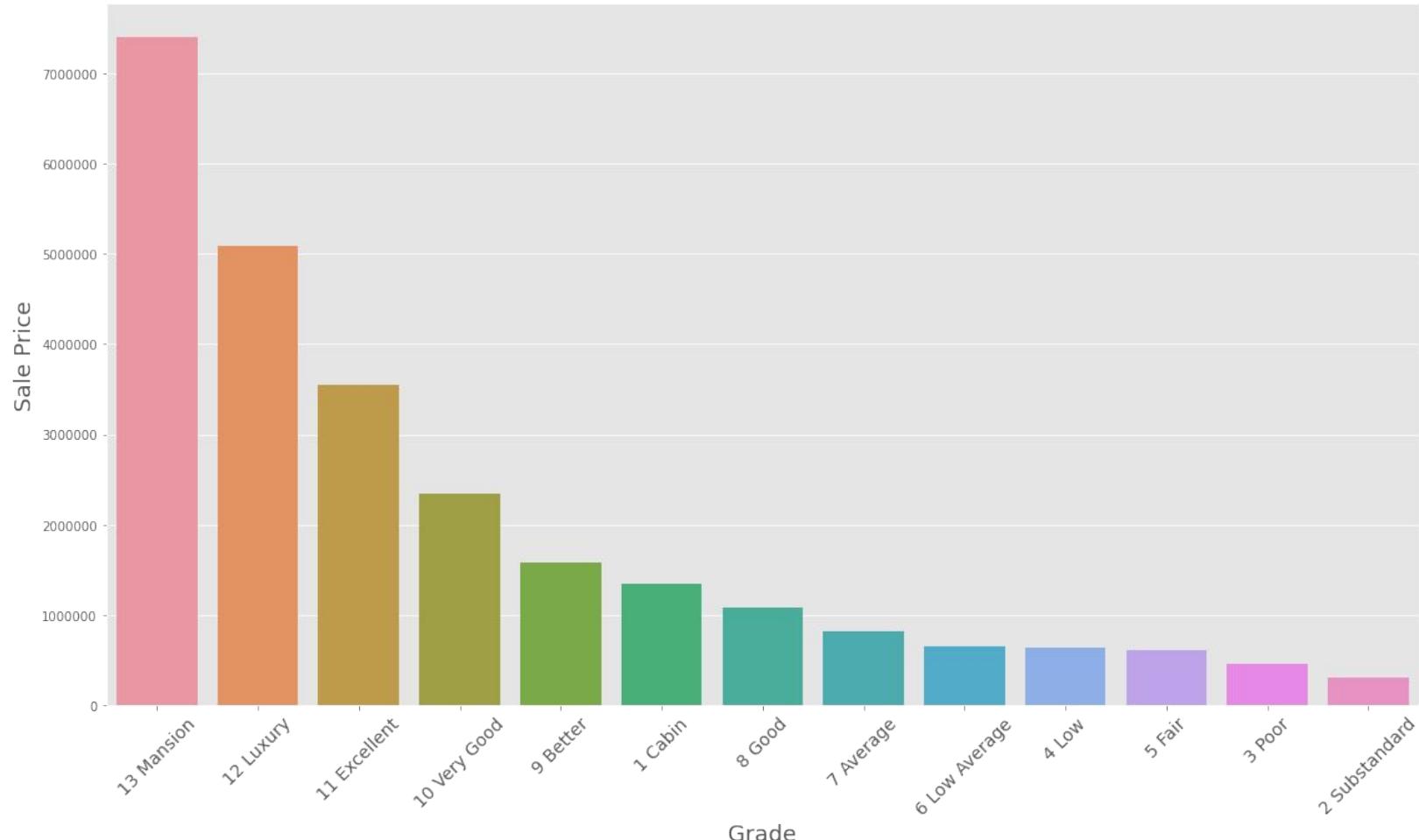
# Initial Findings



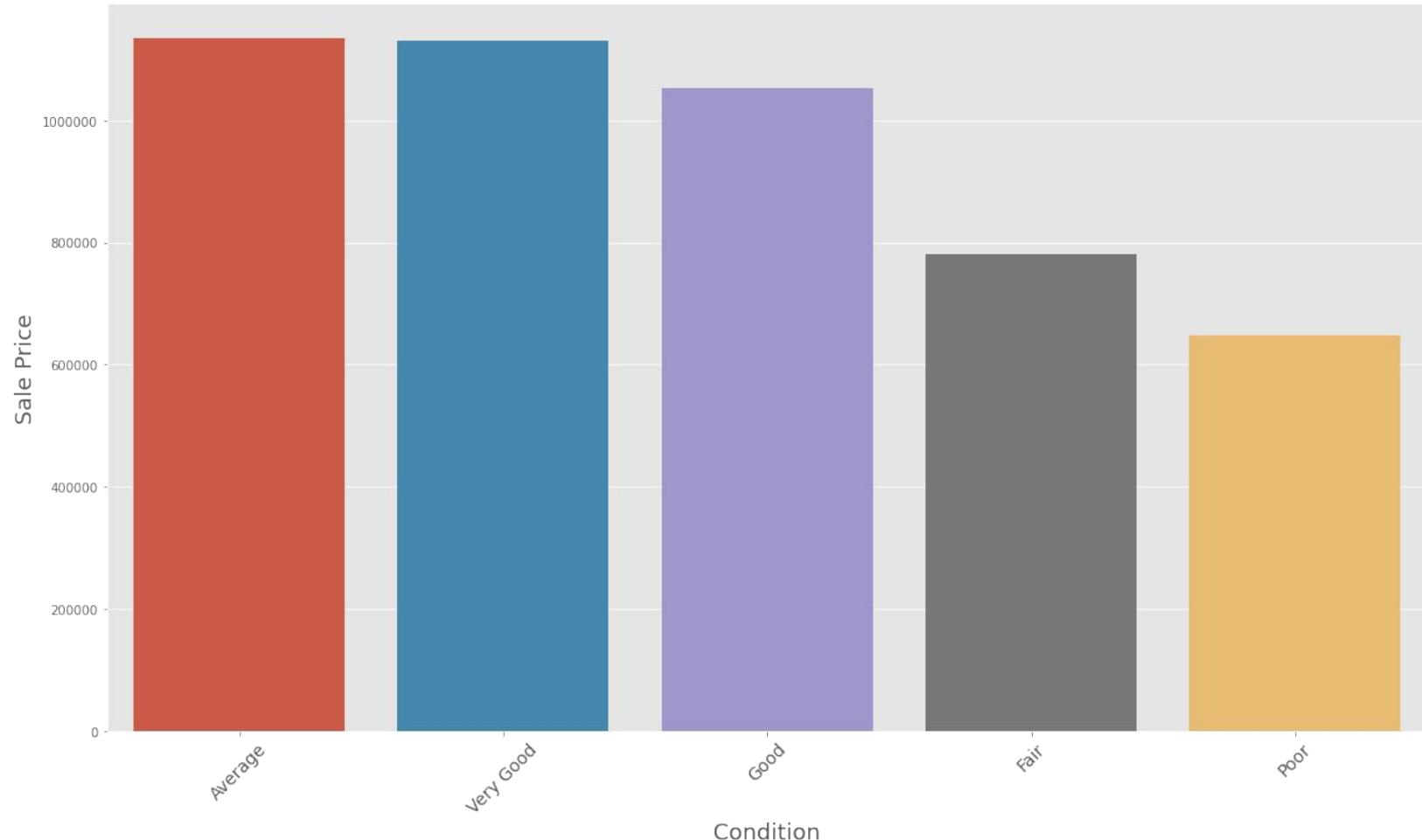
# Square Footage, Bedrooms, and Bathrooms vs Sale Price



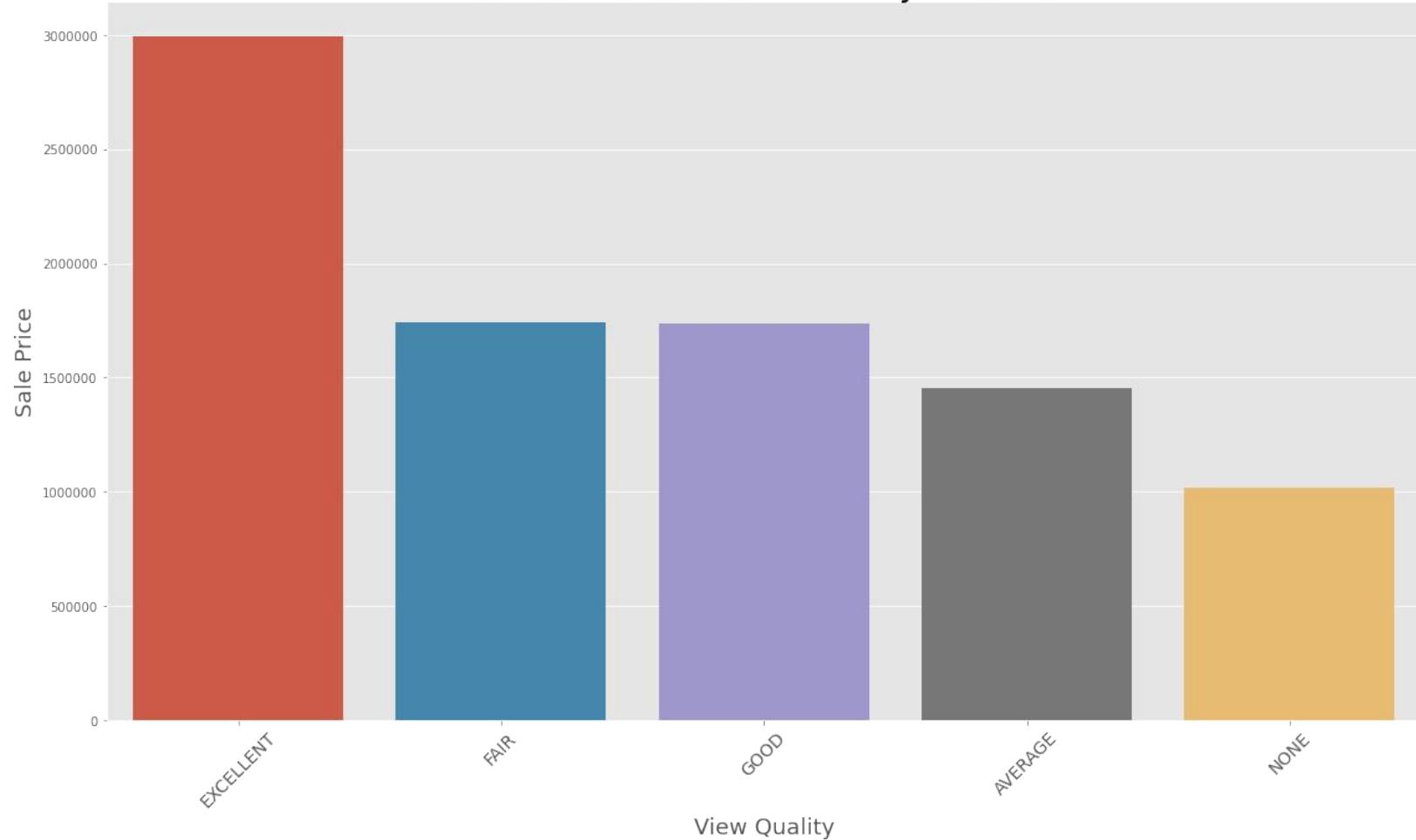
## Mean Sale Price for Home Grade



## Mean Sale Price for Home Condition



## Mean Sale Price for Quality of View



# Results



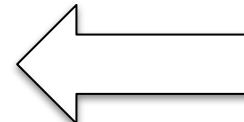
### OLS Regression Results

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Dep. Variable:          price    R-squared:           0.511
Model:                 OLS     Adj. R-squared:        0.510
Method:                Least Squares   F-statistic:         1631.
Date:      Wed, 08 Feb 2023   Prob (F-statistic):    0.00
Time:      14:41:11           Log-Likelihood:       -4.2685e+05
No. Observations:      29718    AIC:                  8.537e+05
Df Residuals:          29698    BIC:                  8.539e+05
Df Model:               19
Covariance Type:       nonrobust
=====
```

	coef	std err	t	P> t	[0.025	0.975]
const	1.392e+06	2.88e+04	48.363	0.000	1.34e+06	1.45e+06
sqft_living	237.5706	5.335	44.533	0.000	227.114	248.027
bedrooms	-1.318e+04	3510.246	-3.755	0.000	-2.01e+04	-6302.247
bathrooms	1.665e+04	4658.384	3.573	0.000	7514.595	2.58e+04
grade_10 Very Good	-2.033e+05	2.58e+04	-7.892	0.000	-2.54e+05	-1.53e+05
grade_2 Substandard	-1.28e+06	2.98e+05	-4.300	0.000	-1.86e+06	-6.96e+05
grade_3 Poor	-1.188e+06	1.19e+05	-9.965	0.000	-1.42e+06	-9.55e+05
grade_4 Low	-1.068e+06	6.52e+04	-16.383	0.000	-1.2e+06	-9.4e+05
grade_5 Fair	-1.085e+06	3.42e+04	-31.695	0.000	-1.15e+06	-1.02e+06
grade_6 Low Average	-1.104e+06	2.76e+04	-39.937	0.000	-1.16e+06	-1.05e+06
grade_7 Average	-1.034e+06	2.59e+04	-39.950	0.000	-1.08e+06	-9.83e+05
grade_8 Good	-9.013e+05	2.5e+04	-36.019	0.000	-9.5e+05	-8.52e+05
grade_9 Better	-5.955e+05	2.47e+04	-24.116	0.000	-6.44e+05	-5.47e+05
condition_Fair	3.6e+04	2.81e+04	1.282	0.200	-1.9e+04	9.1e+04
condition_Good	7.156e+04	5760.490	12.423	0.000	6.03e+04	8.29e+04
condition_Very Good	1.562e+05	8149.125	19.169	0.000	1.4e+05	1.72e+05
view_AVERAGE	1.208e+05	1.02e+04	11.875	0.000	1.01e+05	1.41e+05
view_EXCELLENT	4.793e+05	2.04e+04	23.481	0.000	4.39e+05	5.19e+05
view_FAIR	2.222e+05	2.95e+04	7.540	0.000	1.64e+05	2.8e+05
view_GOOD	1.642e+05	1.5e+04	10.964	0.000	1.35e+05	1.94e+05

```
=====
Omnibus:              6256.380   Durbin-Watson:        1.977
Prob(Omnibus):        0.000    Jarque-Bera (JB):    25671.478
Skew:                  0.993    Prob(JB):            0.00
Kurtosis:              7.097    Cond. No.           2.77e+05
=====
```

Ordinary Linear Regression Modeling  
 was used to factor in multiple  
 predictors.





# Model Findings

The final model explains about 51% of the variance in price.

A scenic view of Mount Rainier, a large snow-capped mountain, with a line of houses and trees in the foreground under a clear blue sky.

# Model Findings

When comparing houses, for every additional square foot of living space, the couple can expect to add 237 USD all else constant.

# Model Findings



For each bedroom the price goes down about 13K USD all else constant.



# Model Findings

For every bathroom the price increases about 17K USD all else constant.

A photograph of a two-story stone villa with a tiled roof and a prominent chimney. The exterior walls are made of large, light-colored stones. The villa features several arched doorways and windows. In the foreground, there is a large, clear swimming pool reflecting the sky and the building's facade.

# Model Findings

**Counterintuitive-** When compared to a grade of 1, increasing the grade to 7-10, decreases the cost of the house.

Going from a good to a better grade house, increases about 306K USD all else constant. Going from a better to a very good grade house, the price increases an additional 329K USD all else constant.



# Model Findings

For a house in good condition, the price will go up 72K USD compared to a house in poor condition all else constant. A house in very good condition will be about 156K USD more than a house in poor condition all else constant.

A photograph of the Seattle skyline at sunset. The Space Needle is prominent on the left, illuminated against a backdrop of other skyscrapers and a warm orange sky. In the distance, the silhouette of mountains is visible.

# Model Findings

For a house with a fair view, the price goes up 222K

For an average view the price will go up about 121K

For a good view the price goes up about 164K,

For an excellent view the price will go up 479K USD compared to no view all else constant

# Conclusions



## Recommendations:

- More bedrooms
- Less bathrooms
- Grade 7 or 8
- Good View



A scenic view of the Seattle skyline at sunset. The Space Needle is visible on the left. In the center, there's a large white geodesic dome, likely the Seattle Center Convention Center. The city buildings are silhouetted against a vibrant orange and yellow sky. In the distance, Mount Rainier stands prominently against a darker blue sky.

# Limitations

- The OLS model is only explaining about 51% of the variation in price.
- The model has a relatively high mean absolute error, 301K
- Next steps should be to look at other variables such as zipcodes and acreage.
- Ideally, an increase in model accuracy is needed before the model can produce solid recommendations.



# Thank You

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