KING COUNTY
REAL ESTATE DEVELOPMENT PLAN

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We represent a real estate development company based in King County, WA. For our purposes, we are interested in:
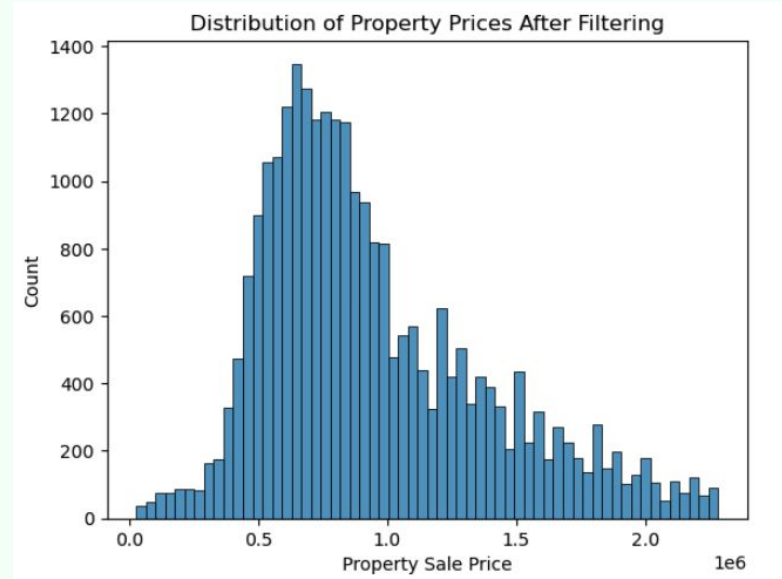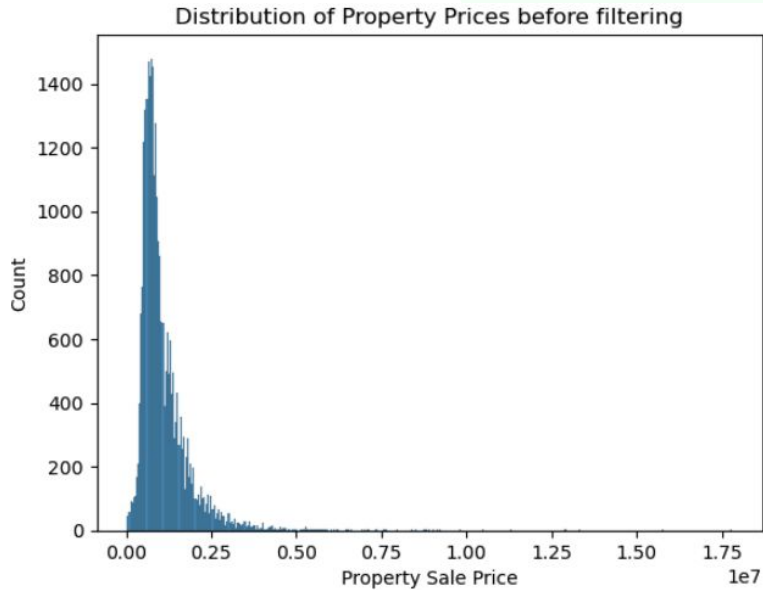
Q: How can we use our model to identify undervalued properties?

**Q: How can we increase the selling price of these properties by highlighting specific features?**

- Remove outliers: drop data outside IQR, plus group with few observations (~8%)
- Price < ~$2.3 M USD

Distribution of Property Prices before filtering

Distribution of Property Prices After Filtering

- Our **baseline model** uses '**living space (sqft)**' as a predictor variable for our target variable, '**price**'

- Only explains **~ 32 %** of the **variance** in price

- Has an **MAE** of **~ $281K** when predicting **price**

Living Space (sqft) & Property Sale Price
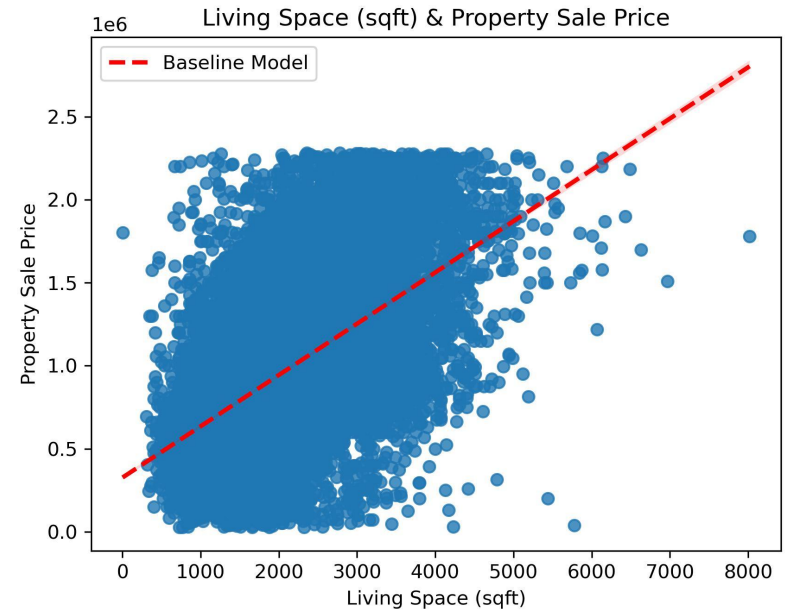
MULTILINEAR REGRESSION MODEL

- **Our best model** considers several features in addition to **living space** such as:
  - **Bathrooms**
  - **Property age**
  - **Patio size (sqft)**
  - **Grade**
  - **Property location (zipcode)**
  - **Property condition**

- Explained **~ 70%** of the **variance** in **'price'**

- Has an **MAE** of **~ $170,000** when predicting price
- Has a **normal** distribution of **residuals**

Histogram of Residuals with Normal Distribution Line
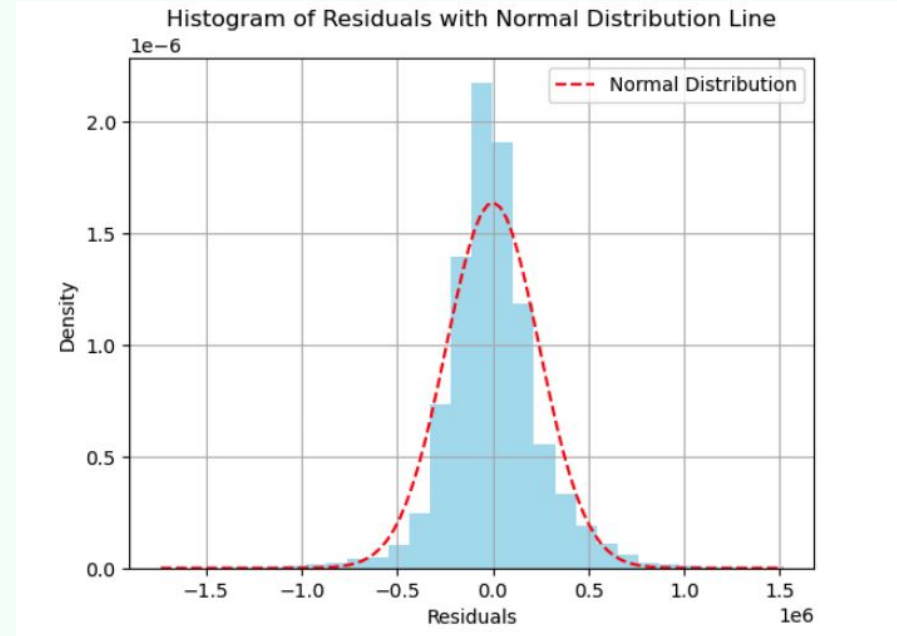
Q: How does our model perform at different price ranges?

**Our model performs best when predicting property sale price between $500,000 - $1 M USD.**
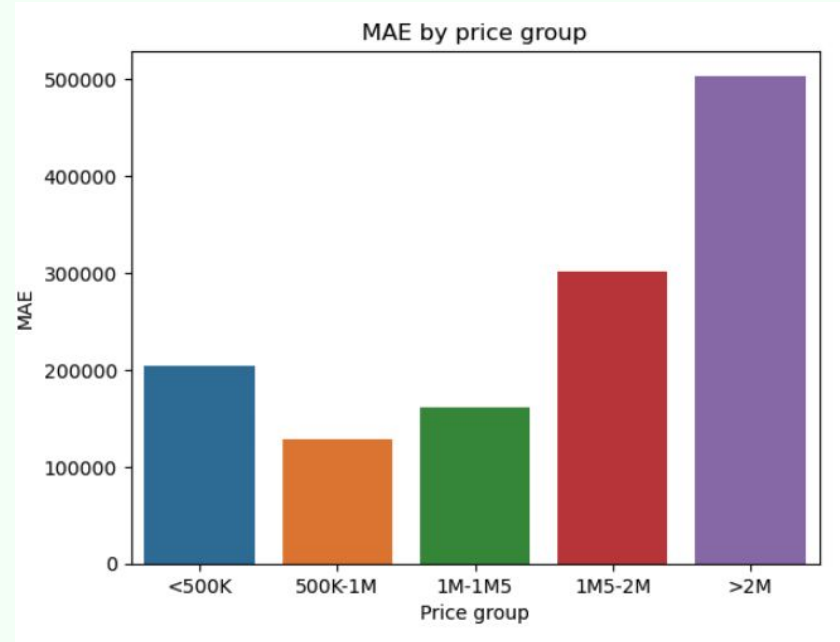

MAE by price group

Q: Based on our model's predictions, what is the distribution of undervalued properties across different price groups?

A property is considered **undervalued** when our model's **predicted price > actual price**

Properties **sold < $1 M USD** comprise the majority of undervalued assets.
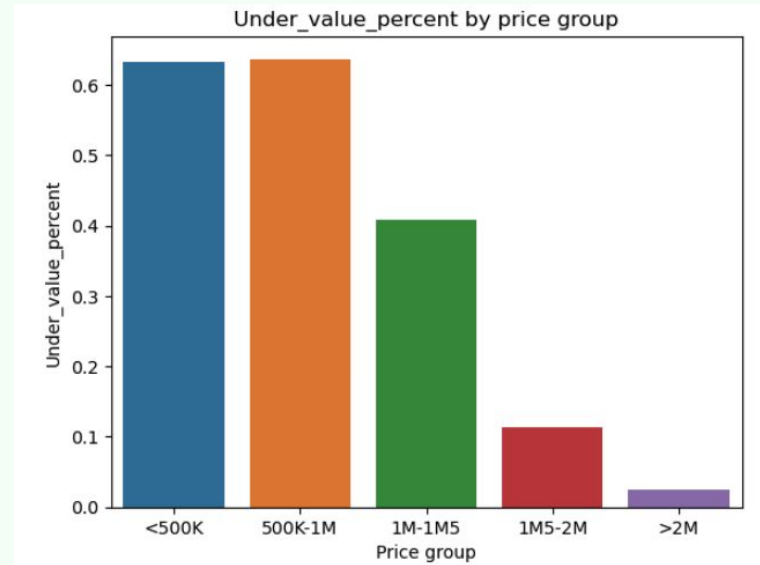
"Based on our model, what features/renovations are worth investing resources in for properties considered undervalued between $500,000 and $1 M USD"
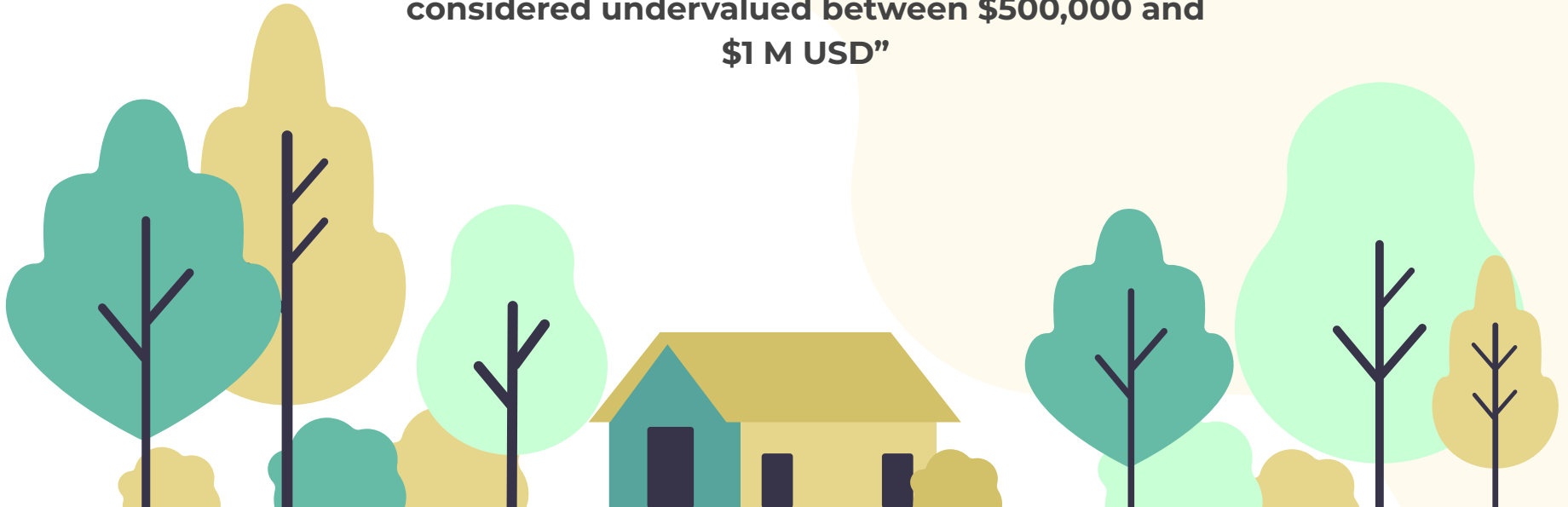
The grade (construction quality and design of a property) matters !

Improving the **grade** by 1 point showed an increase in sale price of **~ $98,592 USD**.

500k to 1M Valued Properties & Building Grade
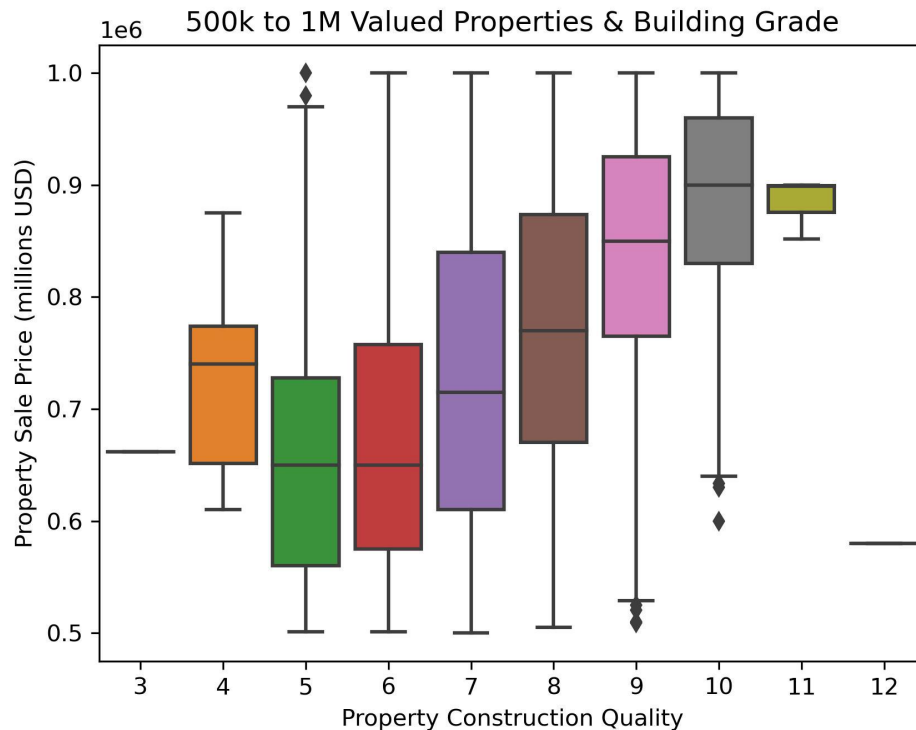
The number of bathrooms a property has affects its sale price.

Constructing a **full** bathroom contributed to an increase in sale price of ~**$7,300**

500k to 1M Valued Properties & # of Bathrooms
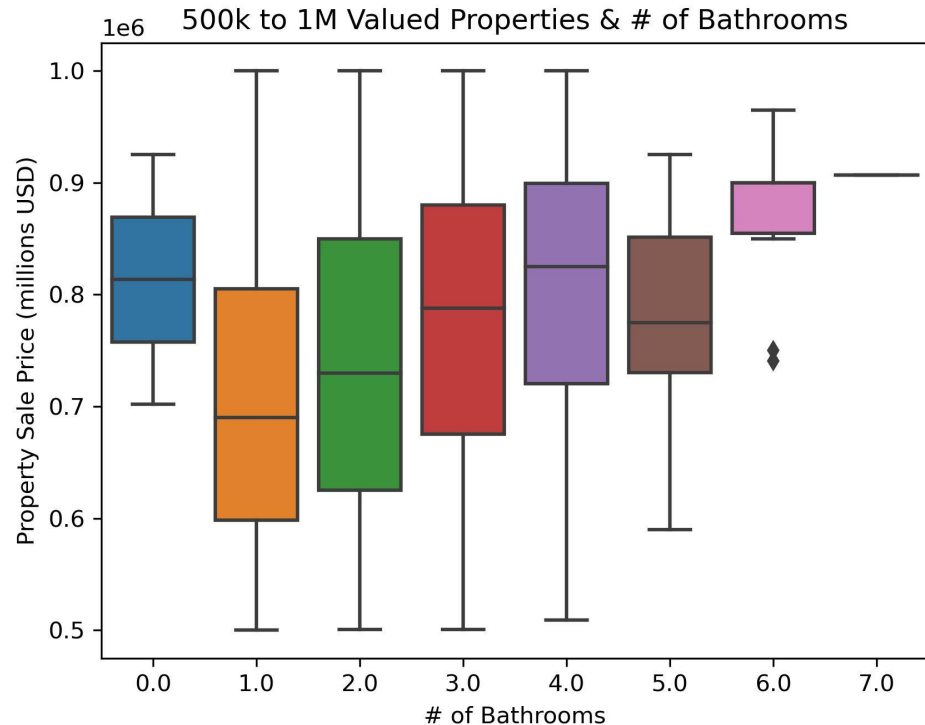
Improving the condition (wear of a property through repairs and maintenance) can affect its sale price

Improving the **condition** of a property by 1 point showed an increase in sale price of **~ $44,051 USD**.

500k to 1M Valued Properties & Building Condition
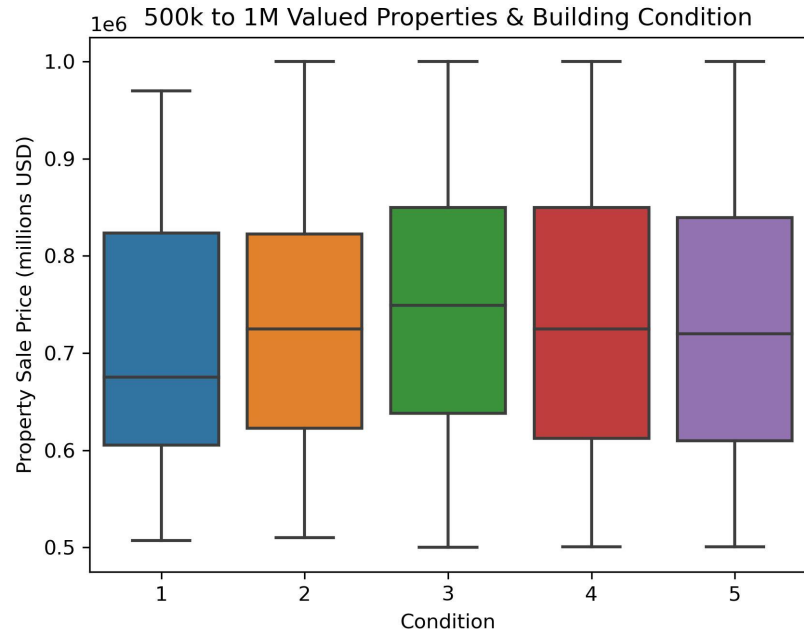
RECOMMENDATIONS FOR PROPERTIES SOLD BTWN $500K - $1M USD

RECOMMENDATIONS	SUMMARY
BUILDING GRADE	Improving the overall quality and design of a property can increase its price (+$98,592) when sold. This can look like the addition of amenities or using better materials in both exterior or interior finish work.
# OF BATHROOMS	Constructing an additional bathroom in a property can increase its price when sold(+$7,300).
BUILDING CONDITION	Improving the condition of a property can increase its price when sold(+$44,051). This can look like general repairs or maintenance which not only extend the lifespan of the property but its value.

LIMITATIONS & FUTURE CONSIDERATIONS	SUMMARY
INTERACTION BTWN. PREDICTOR VARIABLES	The interaction between predictor variables (e.g., bedrooms and bathrooms) could be useful to understand its weight when predicting the price of a property when sold.
NEIGHBORHOOD FEATURES	Understanding characteristics of a property's neighborhood such as schooling, food stores, distance to public transportation, etc. could be helpful in predicting the property price when sold.
PRICE WHEN BOUGHT	Future iterations could consider the price when bought of the property to better understand the effect size of different features.

QUESTIONS ?

Thao's Linkedin

Stepan's Linkedin

Kevin's Linkedin

Github