# Home Renovation Analysis

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# Overview

An analysis of King County House Sales dataset determining how different home improvements affects profitability when selling a home.

# Outline

- Business Problem

- Data and Process Steps

- Results

- Conclusions

# Business Problem

- Homeowners and real estate agents are looking for ways in how different renovations affect their home's price and by how much

- Square footage of living area, square footage of patio, and house condition are the three variables we will focus on

# Data and Process Steps

- Data of over 30,000 homes from the King County House Sales dataset

- Utilizing multiple linear regression to determine best renovations for homes

# Results

```
                     OLS Regression Results
==============================================================================
Dep. Variable:                 price   R-squared:                       0.394
Model:                           OLS   Adj. R-squared:                  0.394
Method:                Least Squares   F-statistic:                     3263.
Date:               Sun, 03 Dec 2023   Prob (F-statistic):               0.00
Time:                       20:46:44   Log-Likelihood:                 -18967.
No. Observations:              30155   AIC:                          3.795e+04
Df Residuals:                  30148   BIC:                          3.801e+04
Df Model:                          6
Covariance Type:           nonrobust
==============================================================================
                        coef     std err         t      P>|t|     [0.025      0.975]
------------------------------------------------------------------------------
const                12.5976       0.056   223.321      0.000     12.487      12.708
sqft_living           0.0004    2.94e-06   120.411      0.000      0.000       0.000
sqft_patio            0.0002    1.16e-05    14.954      0.000      0.000       0.000
condition_Average     0.3414       0.056     6.047      0.000      0.231       0.452
condition_Fair        0.2403       0.064     3.768      0.000      0.115       0.365
condition_Good        0.3516       0.057     6.216      0.000      0.241       0.462
condition_Very Good   0.4154       0.057     7.301      0.000      0.304       0.527
==============================================================================
Omnibus:                    5927.975   Durbin-Watson:                   1.968
Prob(Omnibus):                 0.000   Jarque-Bera (JB):            50502.812
Skew:                         -0.708   Prob(JB):                         0.00
Kurtosis:                      9.180   Cond. No.                     1.13e+05
==============================================================================
```
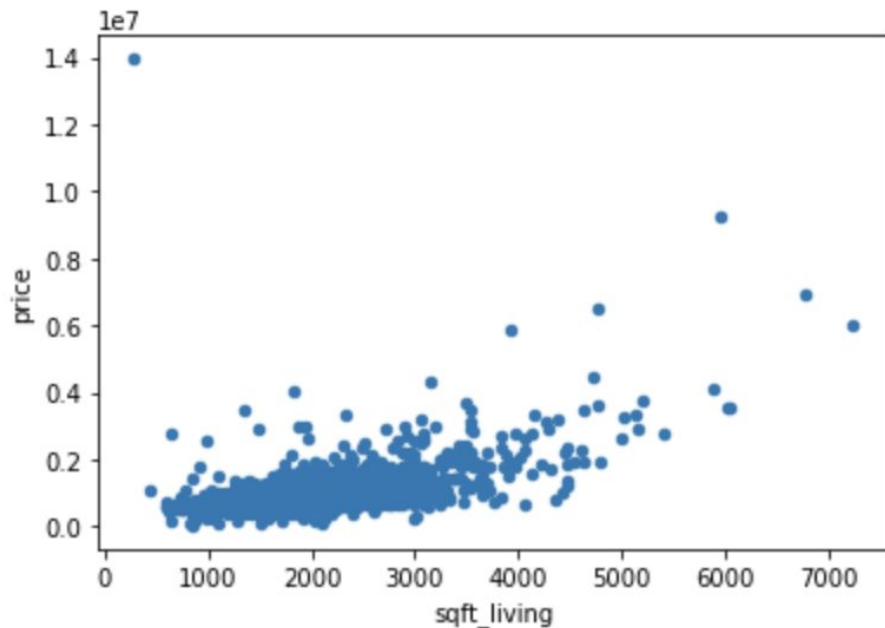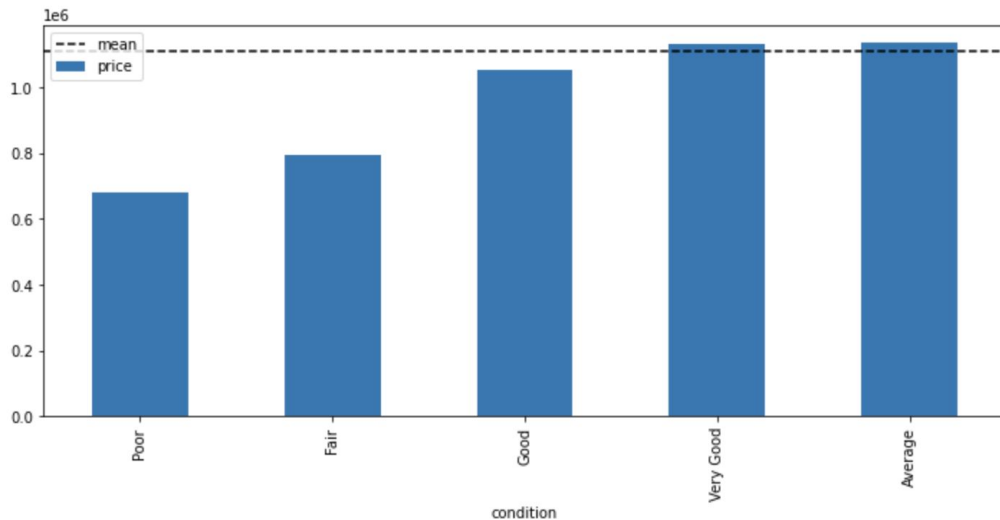
- Model explains about 39% of variance in price

- Overall model is statistically significant, along with all of its coefficients

# Results



- For every 1% increase in square footage of the living area, we would expect an associated increase of 0.0004% in price

- For every 1% increase in square footage of the patio, we would expect an associated increase of 0.0002% in price

# Results



- The Very Good condition will result in the largest increase in price by 42%

# Conclusion

- Improving the overall condition of the house adds the most value when selling a home

- Adding square footage to the patio and living area also helps increase the value of the home

# Thank you!

Questions?

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