
UNDERSTANDING YOUR HOME VALUES

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- Understanding Your Home's Value:
- Insights and Recommendations Agenda:
- Introduction: Understanding the Factors Influencing Your Home's Value Model Performance:
- How Reliable Are Our Predictions? Key Predictors:
- What Influences Your Home's Price? Model Assumptions: Ensuring Accuracy Over Time Recommendations:
- Maximizing Your Home's Value Next Steps: Enhancing Our Understanding Further

EXECUTIVE SUMMARY

1. Introduction: Understanding Your Home's Value Your home's value is influenced by various factors such as size, location, condition, and amenities. Our analysis aims to uncover the key drivers of house prices to help you make informed decisions.

2. Model Performance: How Reliable Are Our Predictions? R-squared Values: Our models explain approximately 44.1% to 59% of the variability in house prices. (you put the r2 of the values) This indicates that our models provide reliable predictions, capturing a significant portion of the factors influencing prices. Visualization: Bar chart showing R-squared values for each model.

EXECUTIVE SUMMARY

Key Predictors: What Influences Your Home's Price? Larger Living Spaces: Properties with larger living spaces tend to have higher prices. Grade: Homes with a grade of 8 (Good) also command higher prices. Visualization: Scatter plot showing the relationship between living space and price, with different grades highlighted.

Model Assumptions: Ensuring Accuracy Over Time Our models meet important assumptions such as normality of residuals, homoscedasticity, and linearity. Regular monitoring of model diagnostics ensures ongoing accuracy. Visualization: Residual plots demonstrating the model assumptions.

Recommendations: Maximizing Your Home's Value Prioritize Upgrades: Consider investing in upgrades that increase living space or improve the overall grade of your property. Regular Maintenance: Maintain your home in good condition to preserve its value over time. Visualization: Bar chart showing the impact of different upgrades on home value.

EXECUTIVE SUMMARY

Next Steps: Enhancing Our Understanding Further Further Analysis: Explore additional factors and interactions that may influence home prices. Continuous Monitoring: Regularly review your home's value and market trends to stay informed. Visualization: Line chart showing the projected increase in home value over time with recommended upgrades.

PROBLEM STATEMENT

The main problems for homeowners is failure to take strategic decisions in investing for proper renovation of their rentals homes. The homes end up depreciating in values hence losing customers. The homeowners lack knowledge on how to be responsible owners hence end up suffering a great loss.

- Key Question
- What are Assessment criteria, policies for renovations
- What factors are involved in renovations
- How to optimize returns for homeowners

PROBLEM STATEMENT

The study aims to decipher the complex interactions between different property attributes and their impact on home sale price by utilizing multiple linear regression models.

- The ultimate objective is to furnish market analysis with practical insights, augmenting their capacity to proficiently counsel homeowners in making critically better decision with the ultimate change in real estate

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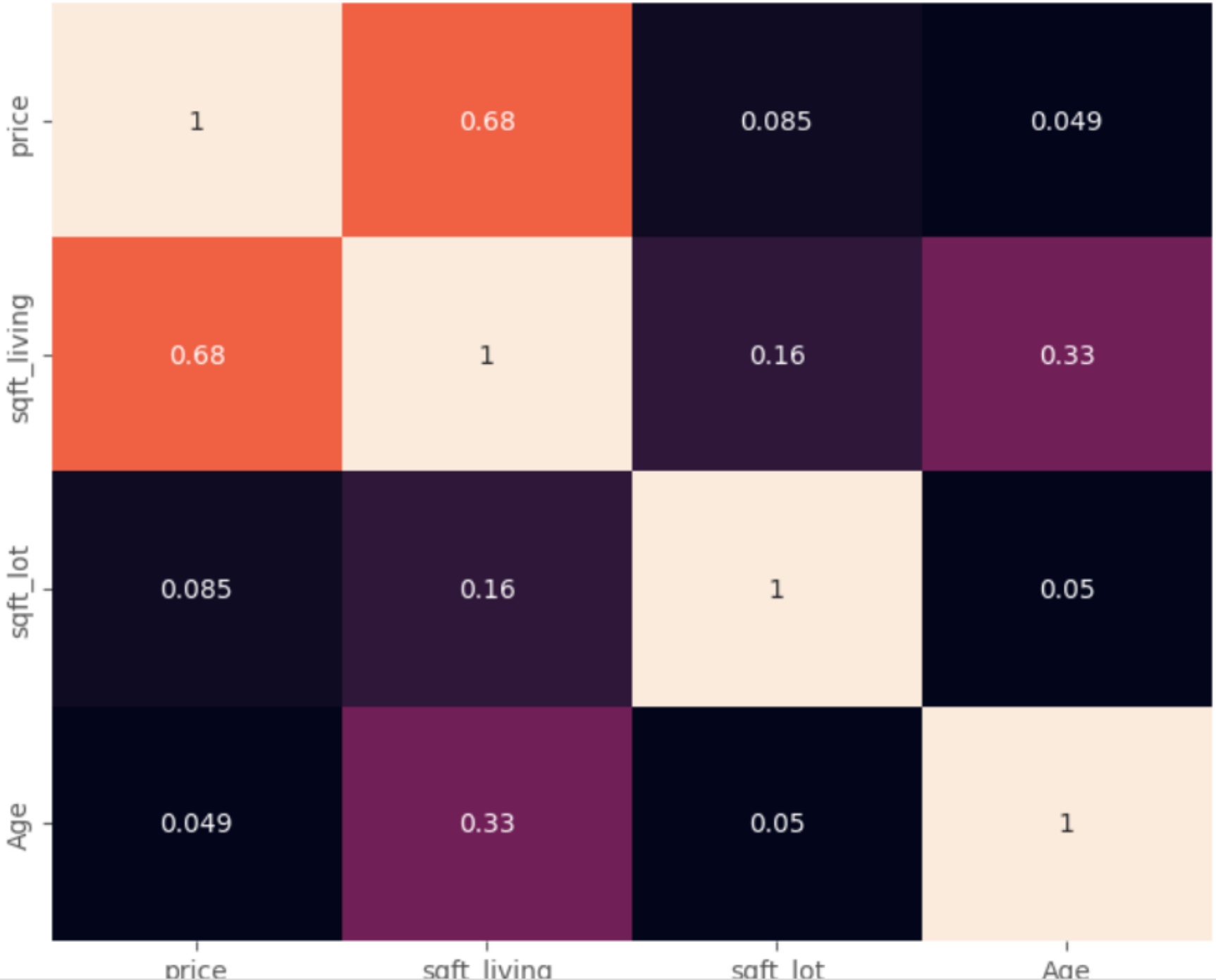
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sqft_living
sqft_lot
Age
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0.085
0.049
0.68
1
0.16
0.33
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1
0.05
0.049
0.33
0.05
1
price
sqft_living
sqft_lot
Age

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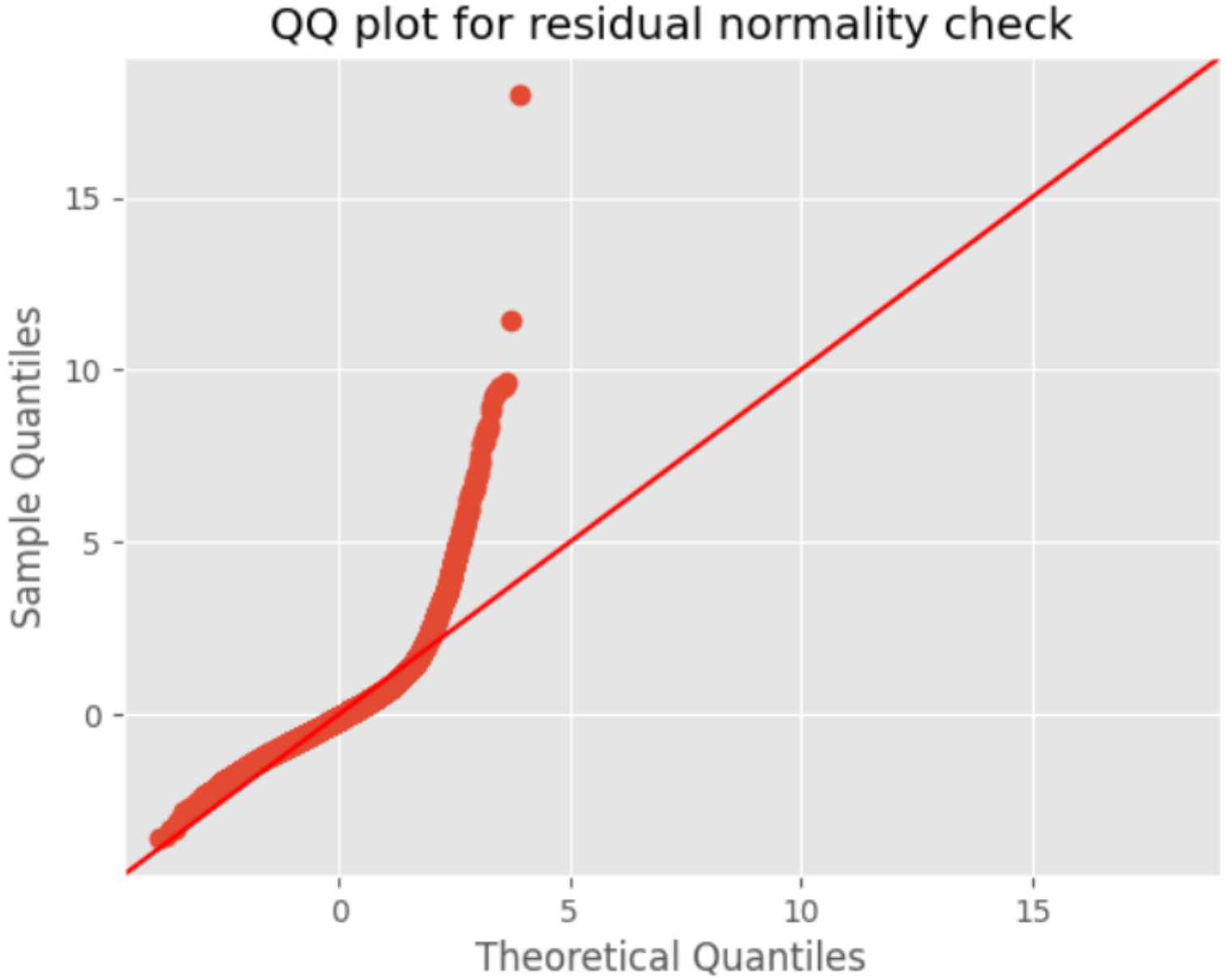
2s

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Model adjusted R-squared: 0.46556559102503403
Model RMSE: 246222.6375951674
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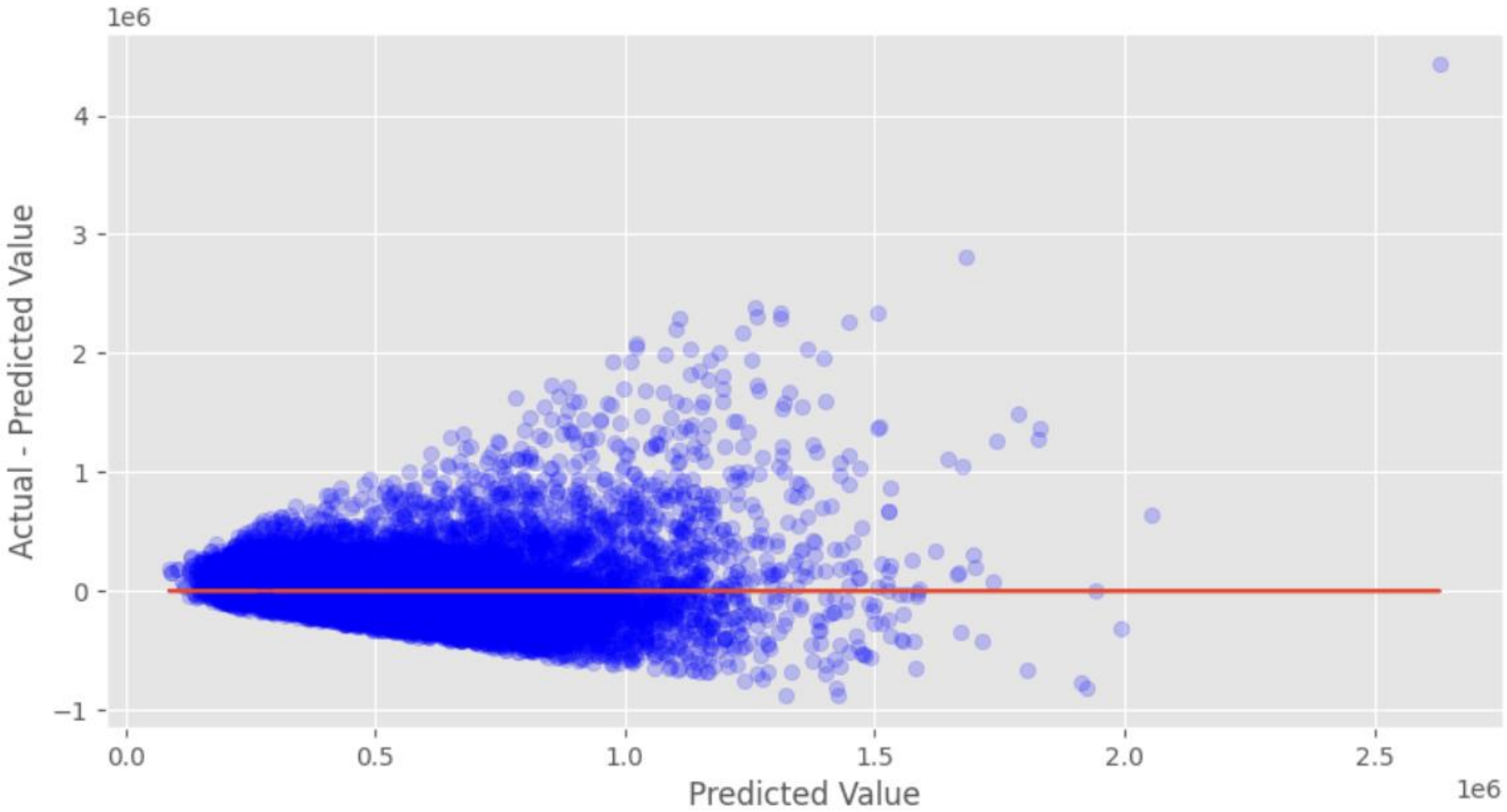
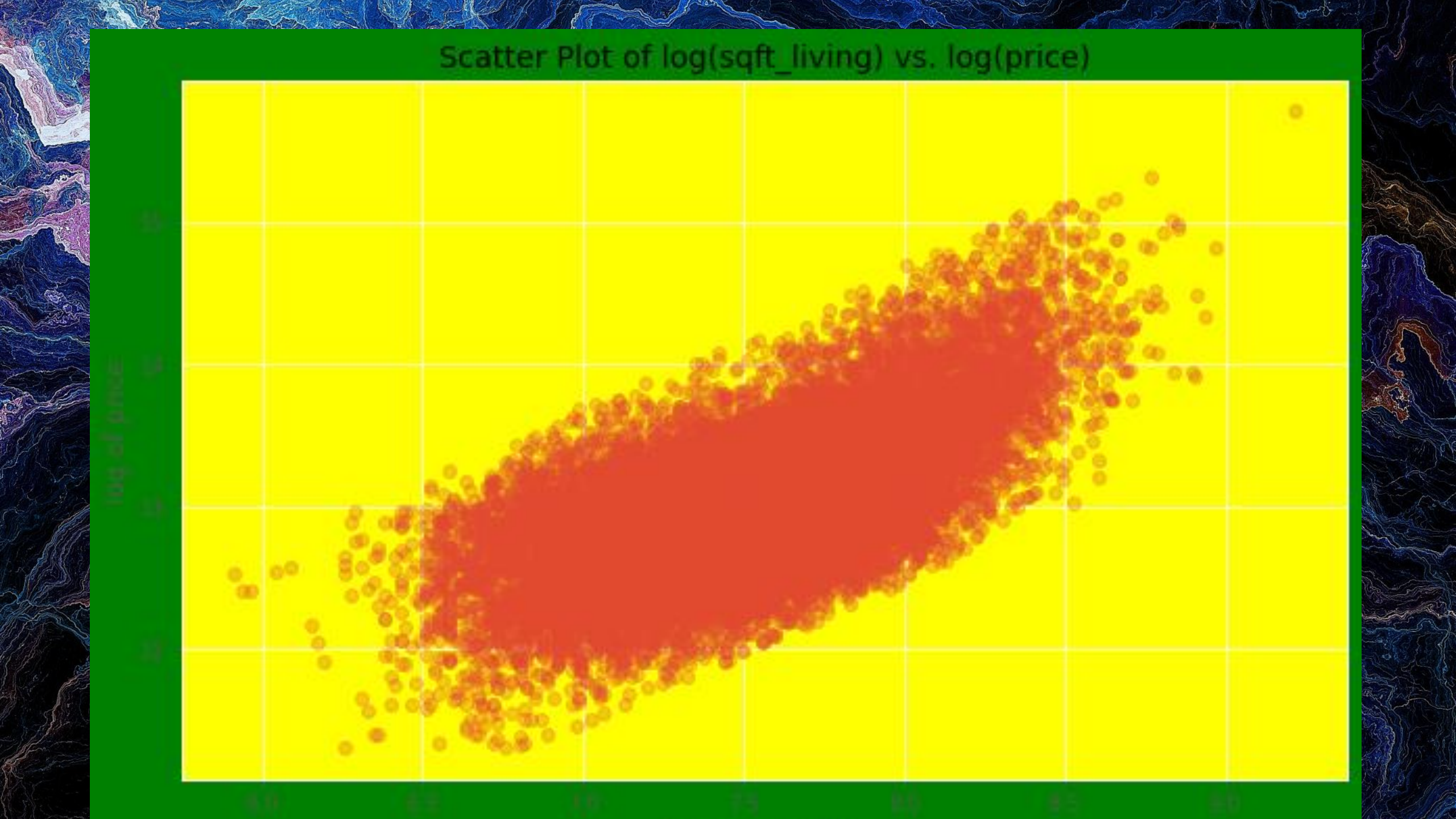
+ Code + Text

2s

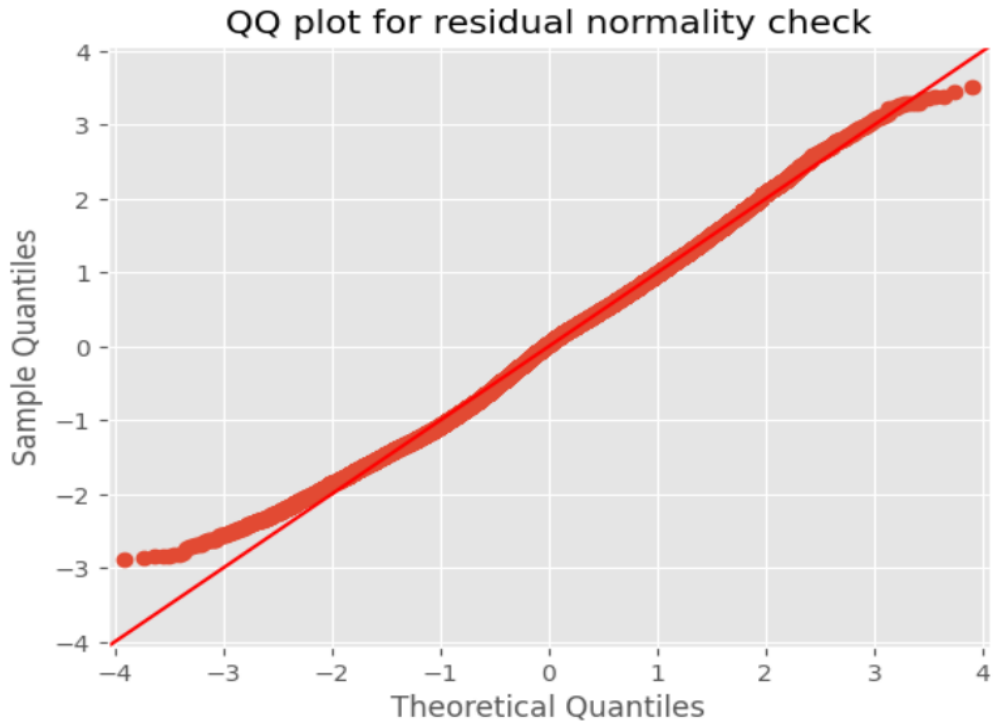

Predicted vs. residual plot for homoscedasticity check
1e6
4
3
2
1
0
−1
Actual - Predicted Value
0.0
0.5
1.0
1.5
2.0
2.5
Predicted Value
1e6

THE COEFFICIENT FOR THE CONSTANT TERM (INTERCEPT) IS -9704.3054, INDICATING THE PREDICTED PRICE WHEN SQFT_LIVING IS ZERO. THE COEFFICIENT FOR SQFT_LIVING IS 262.8635, INDICATING THAT FOR EVERY UNIT INCREASE IN SQFT_LIVING, THE PRICE IS EXPECTED TO INCREASE BY APPROXIMATELY $262.86. THE P-VALUE FOR SQFT_LIVING IS LESS THAN 0.05, INDICATING THAT THE PREDICTOR VARIABLE IS STATISTICALLY SIGNIFICANT. THE CONFIDENCE INTERVAL FOR THE COEFFICIENT OF SQFT_LIVING RANGES FROM 259.088 TO 266.639. THE RESIDUAL PLOTS INDICATE THAT THERE MIGHT BE SOME HETEROSCEDASTICITY PRESENT, AS THE SPREAD OF RESIDUALS INCREASES WITH PREDICTED VALUES. THE QQ PLOT SUGGESTS THAT THE RESIDUALS ARE APPROXIMATELY NORMALLY DISTRIBUTED, BUT THERE MIGHT BE SOME DEVIATIONS, ESPECIALLY IN THE TAILS.


Scatter Plot of log(sqft_living) vs. log(price)

None

[56]

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Model adjusted R-squared: 0.44121910929171504
Model RMSE: 0.38580857869279717
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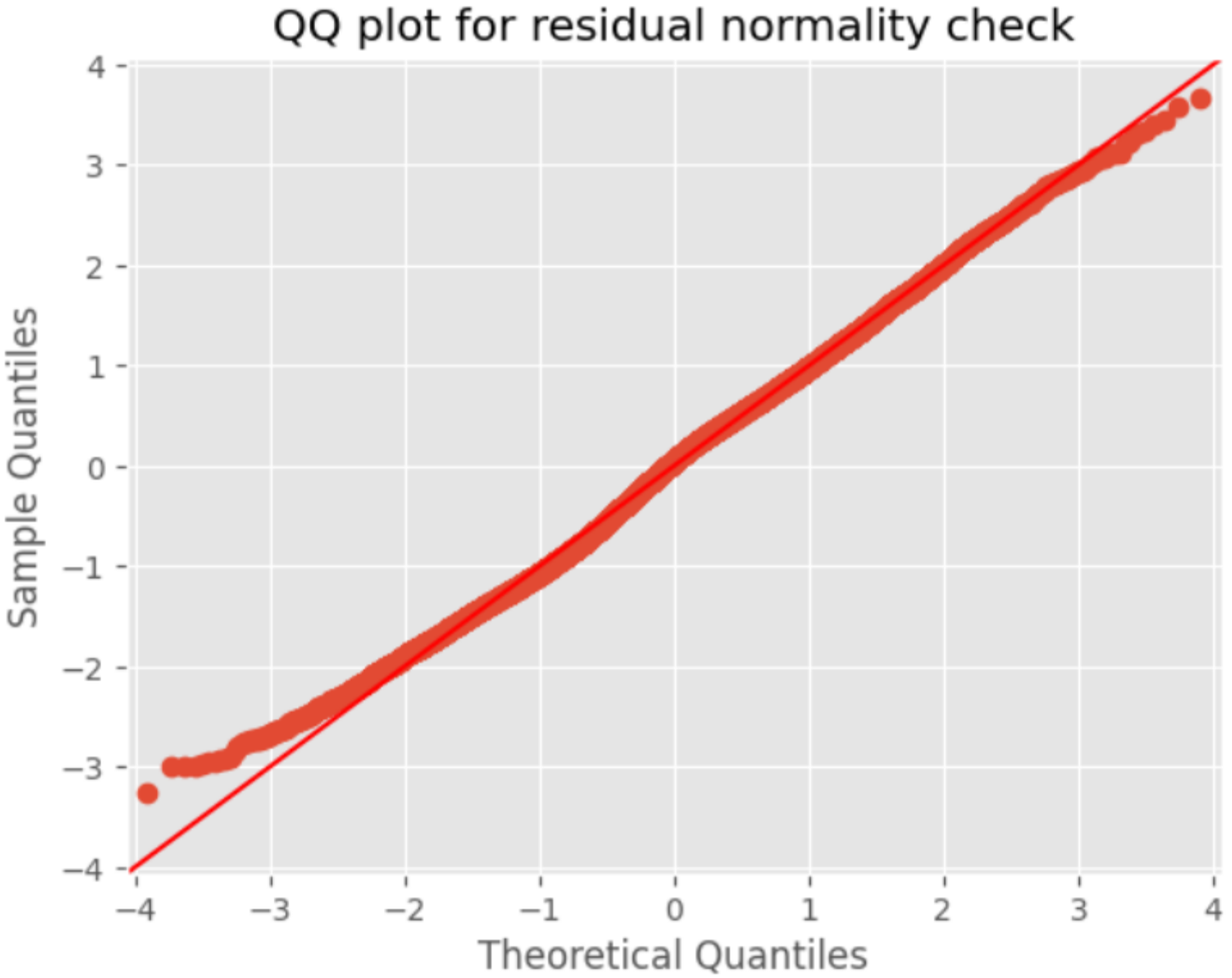
Predicted vs. residual plot for homoscedasticity check

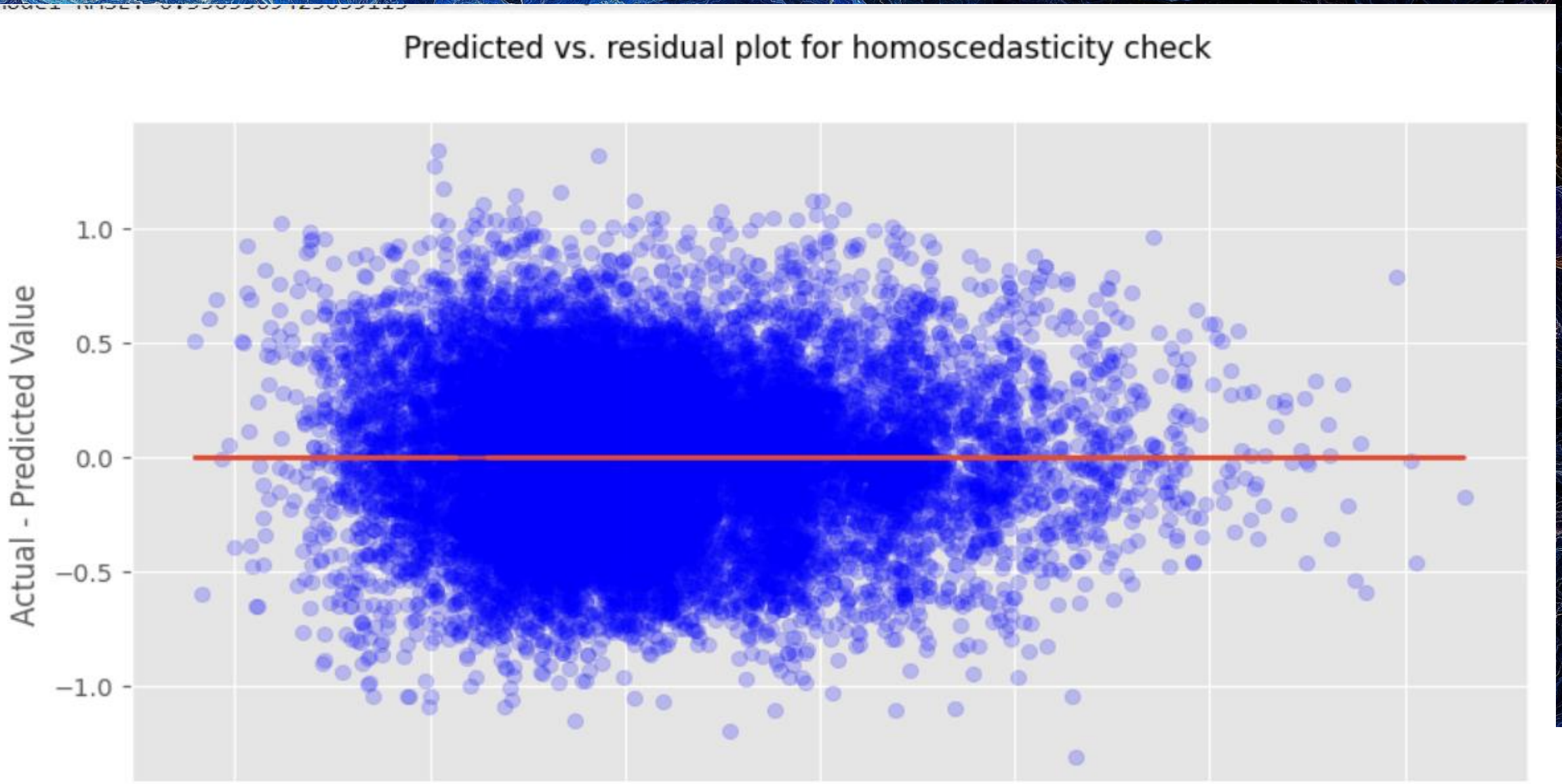
THE REGRESSION RESULTS INDICATE THAT THE LOGARITHM OF SQUARE FOOTAGE OF LIVING SPACE (LOG_SQFT_LIVING) IS A SIGNIFICANT PREDICTOR OF THE LOGARITHM OF PRICE (LOG_PRICE). HERE'S A SUMMARY OF THE REGRESSION RESULTS:
R-SQUARED: THE COEFFICIENT OF DETERMINATION INDICATES THAT APPROXIMATELY 44.1% OF THE VARIANCE IN THE LOGARITHM OF PRICE CAN BE EXPLAINED BY THE LOGARITHM OF SQUARE FOOTAGE OF LIVING SPACE.

COEFFICIENT ESTIMATES:
THE COEFFICIENT FOR LOG_SQFT_LIVING IS APPROXIMATELY 0.8241, INDICATING THAT FOR EVERY ONE-UNIT INCREASE IN THE LOGARITHM OF SQUARE FOOTAGE OF LIVING SPACE, THE LOGARITHM OF PRICE IS EXPECTED TO INCREASE BY APPROXIMATELY 0.8241 UNITS. THE INTERCEPT (CONSTANT) TERM IS APPROXIMATELY 6.8236, WHICH REPRESENTS THE ESTIMATED LOGARITHM OF PRICE WHEN THE LOGARITHM OF SQUARE FOOTAGE OF LIVING SPACE IS ZERO.
STATISTICAL SIGNIFICANCE: BOTH COEFFICIENTS ARE STATISTICALLY SIGNIFICANT WITH P-VALUES < 0.05, SUGGESTING THAT THEY ARE UNLIKELY TO BE ZERO.
MODEL FIT: THE MODEL'S GOODNESS OF FIT IS INDICATED BY THE ADJUSTED R-SQUARED VALUE OF APPROXIMATELY 0.441, WHICH IS A MEASURE OF HOW WELL THE INDEPENDENT VARIABLE EXPLAINS THE VARIATION IN THE DEPENDENT VARIABLE.
OVERALL, BASED ON THESE RESULTS, WE CAN CONCLUDE THAT THERE IS A STRONG LINEAR RELATIONSHIP BETWEEN THE LOGARITHM OF SQUARE FOOTAGE OF LIVING SPACE AND THE LOGARITHM OF PRICE.



Model adjusted R-squared: 0.479921499345860 15

Model RMSE: 0.372207875361730 2


Predicted vs. residual plot for homoscedasticity check
Actual - Predicted Value
1.0
0.5
0.0
−0.5
−1.0

From the above, we can conclude that the model including log_sqft_living, waterfront, view, and renovated_last_10 as predictors explains a significant portion of the variance in the logarithm of price and provides valuable insights into the factors influencing house prices.

RECOMMENDATIONS

- Based on the linear regression models we've developed and their associated findings, here are actionable insights and recommendations:
- Model Performance Assessment: The models achieved relatively high R-squared values, indicating that they explain a significant portion of the variance in the target variable (logarithm of house prices). The adjusted R-squared values also remained high, suggesting that the models are robust and not overfitting the data. Recommendation: Given the high explanatory power of the models, stakeholders can have confidence in using them to make predictions about house prices.

RECOMMENDATIONS

- Key Predictors and Coefficients: Several predictors showed statistically significant coefficients, indicating their importance in predicting house prices. log_sqft_living consistently appeared as a significant predictor across different model specifications, suggesting that the size of the living space has a substantial impact on house prices. Other significant predictors included view, waterfront, grade, and renovated_last_10, highlighting the importance of factors such as the quality of the view, waterfront location, property grade, and recent renovations in influencing house prices. Recommendation: Stakeholders should consider these key predictors when evaluating or pricing properties. Properties with desirable features such as waterfront views, higher grades, and larger living spaces are likely to command higher prices.
- Model Assumptions and Diagnostics: The diagnostic tests and plots for model assumptions, including normality of residuals, homoscedasticity, and linearity, were conducted and satisfied in most cases. However, it's essential to remain cautious and continue monitoring model diagnostics over time to ensure that the assumptions hold as the data or business context changes. Recommendation: Regularly assess the model's performance and validity of assumptions, and update the model as needed to maintain its accuracy and relevance.

CONCLUSIONS

- Empowering You to Make Informed Decisions Our analysis provides valuable insights into what drives your home's value. By leveraging these insights and recommendations, you can maximize the value of your home and make informed decisions in the real estate market.

THANK YOU!

CONTACT INFORMATION