

# Model

$$\ln(\textit{price}) = 10.2082 + 0.3618 \cdot \textit{waterfront} - 0.0160 \cdot \textit{bedrooms} - 0.0153 \cdot \textit{bathrooms} + 0.1400 \cdot \textit{sqft\_living}^{0.3} \\ + 0.0088 \cdot \textit{floors} + 0.1494 \cdot \textit{view}^{0.5} + 0.0105 \cdot \textit{grade}^2 + 0.1187 \cdot \ln(\textit{sqft\_living}^{15})$$

## Check Statistical Hypotheses of the Regression

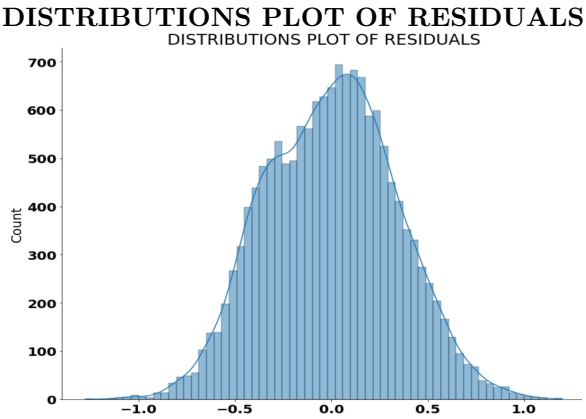
### Linearity:

**The Null Hypothesis:** The model is linearly predicted by the feature,  
**The Alternative Hypothesis:** The model is not linearly predicted by the feature.

Our p-value for this model is  $p = 0.933 > 0.05 = \alpha$ . Thus, we don't have enough evidence to reject **The Null Hypothesis** and we conclude that our model satisfies Linearity Assumption.

### Normality Assumption for Errors

To check Normality, I used the following checks:



I also, used D'Agostino Test for Normality:

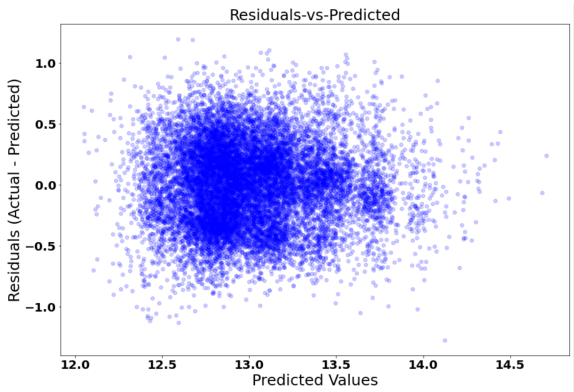
**The Null Hypothesis:** The Residuals are normally distributed,  
**The Alternative Hypothesis:** The Residuals are not normally distributed.

Our p-value for this model is  $p = 0.000 < 0.05 = \alpha$ . Thus, we have enough evidence to reject the Null Hypothesis and conclude that D'Agostino Test tells us, that residuals are not normally distributed.

**Conclusion:** Based on QQ-Plot, Distributions Plot, and D'Agostino Test, I conclude that the Distribution of Errors is not far away from Normal. Also, since we have a lot of observations Normality Assumption doesn't play a critical role, since Central Limit Theorem will apply in this case.

### Constant Error Variance

To if heteroscedasticity is present in the model, I will use Residual-vs-Predicted values plot and Breusch-Pagan test. I look at at the Residual-vs-Predicted values plot first.



I used Breusch-Pagan Test:

**The Null Hypothesis:** Homoscedasticity is present,  
**The Alternative Hypothesis:** Homoscedasticity is not present (i.e. heteroscedasticity exists).

Our p-value for this model is  $p = 0.000 < 05 = \alpha$ . Thus, we have enough evidence to reject the Null Hypothesis and we conclude from Breusch-Pagan Test, that we have don't have heteroscedasticity.

**Conclusion:** From the Residual-vs-Predicted values plot and Breusch-Pagan Test, I conclude that we have some Heteroscedasticity in our model, but it is not very bad.

### Overall Conclusion:

I conclude that our model almost satisfies statistical assumptions for the regression model.