Check Statistical Hypotheses of the Regression

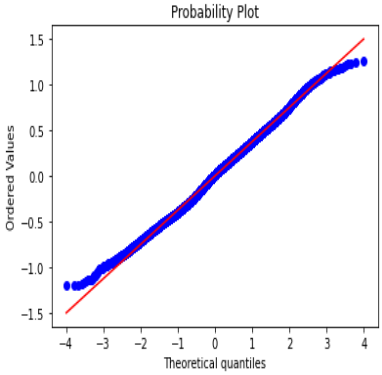
Linearity:

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 $p = 0.877 > 0.05 = \alpha$. Thus, we don't have enough evidence to reject **The Null Hypothesis** and we conclude that our model satisfies Linearity Assumption.

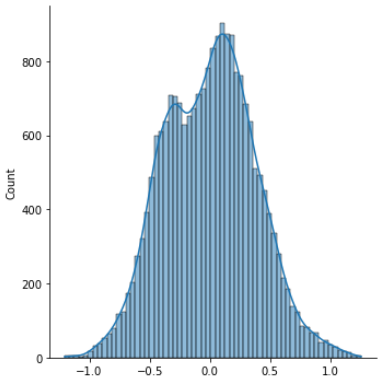
Normality Assumption for Errors

To check Normality, I used the following checks:

QQ-Plot



DISTRIBUTIONS PLOT OF RESIDUALS

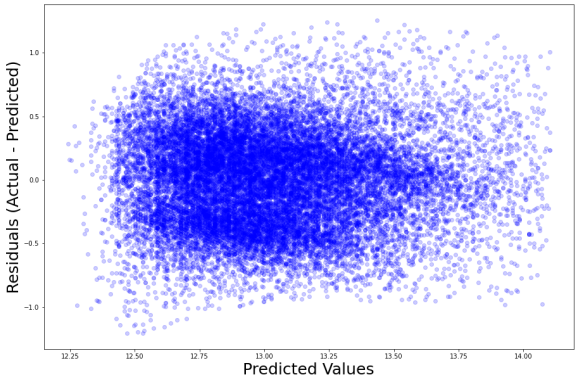


I will, also, use D'Agostino Test for Normality:
The Null Hypothesis: The Residuals are normally distributed,
The Alternative Hypothesis: The Residuals are not normally distributed.
Our p-value for this model is $p = 0.000 < 0.05 = \alpha$. Thus, we have enough evidence to reject the Null Hypothesis 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.



Now, I will use 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 $p = 0.05 \geq 0.05 = \alpha$. Thus, we don't have enough evidence to reject the Null Hypothesis and we conclude that Breusch-Pagan Test tells us, that we have don't have heteroscedasticity.
Conclusion: From the Residual-vs-Predicted values plot and Breusch-Pagan Test, I conclude that we don't have Heteroscedasticity in our model.

Overall Conclusion:

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