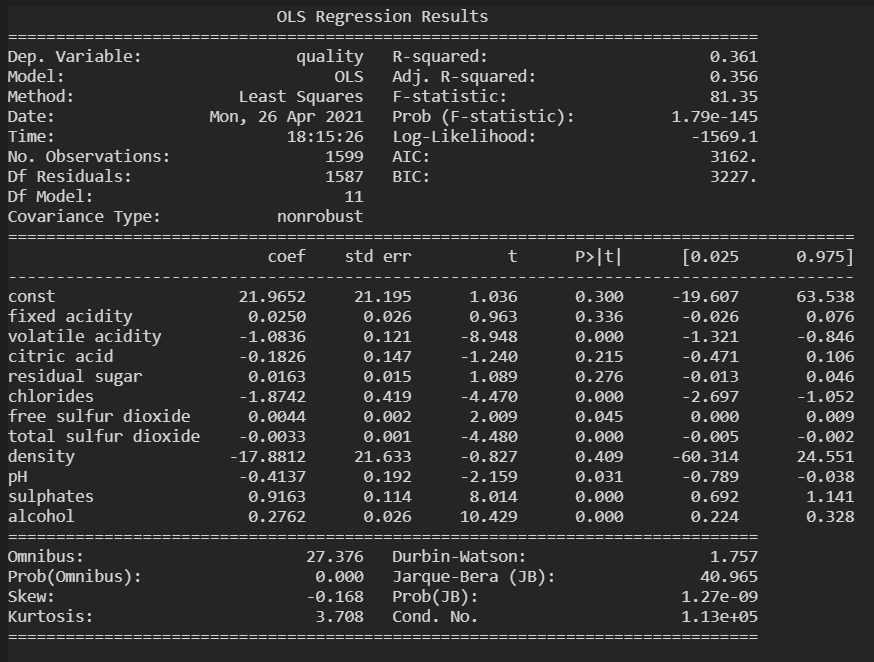
**RED WINE ANALYSIS**

wineRed correlation matrix:

Text

Description automatically generated

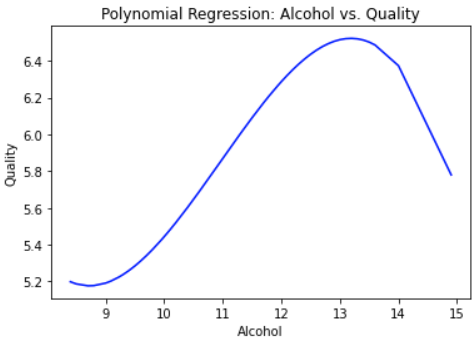
OLS Regression on wineRed to see which p values are significant:





The MSE is still fairly high, so we can try using a different regression model.

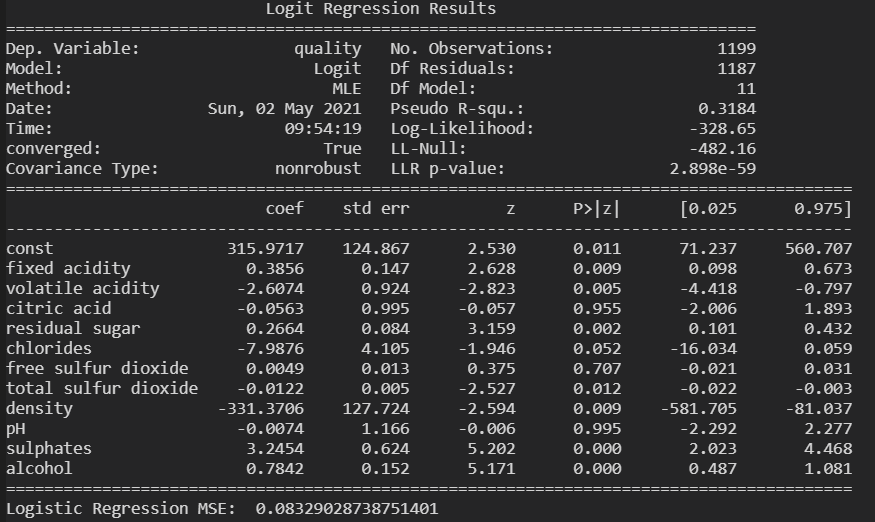
Polynomial regression using alcohol as the predictor for quality:





Although the curve shows a clear relationship, The MSE is fairly high, so this model may not work the best. We can try using classification instead.

Logistic Regression on wineRed to see which p values are significant – to do logistic regression the response variable should be a dummy variable. So we change the ‘quality’ column so that each datapoint is 1 if greater than or equal to 7, and 0 if less than:

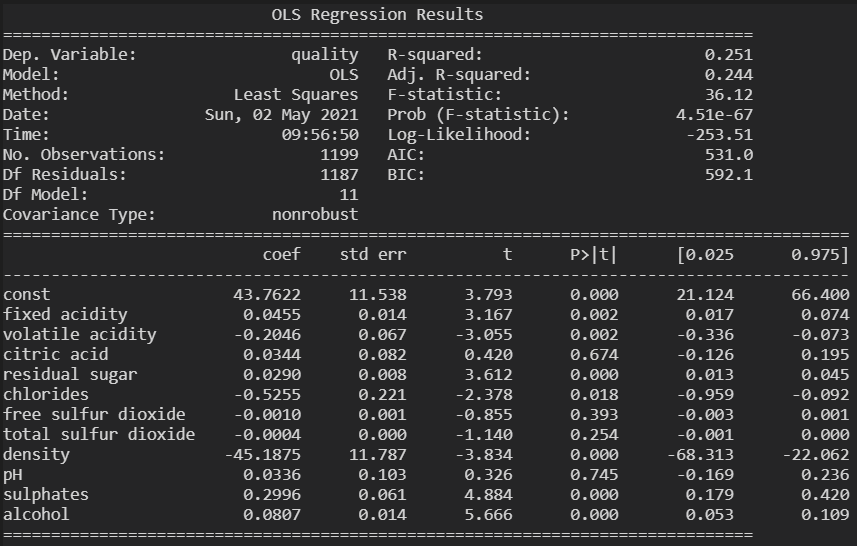




QDA Accuracy score and Test MSE:



OLS with classification:





It seems overall with classification we yield much smaller MSEs and higher accuracy scores as well. So we can try some more classification models to see how they fare:

Random forest classification:



Decision tree classifiers:

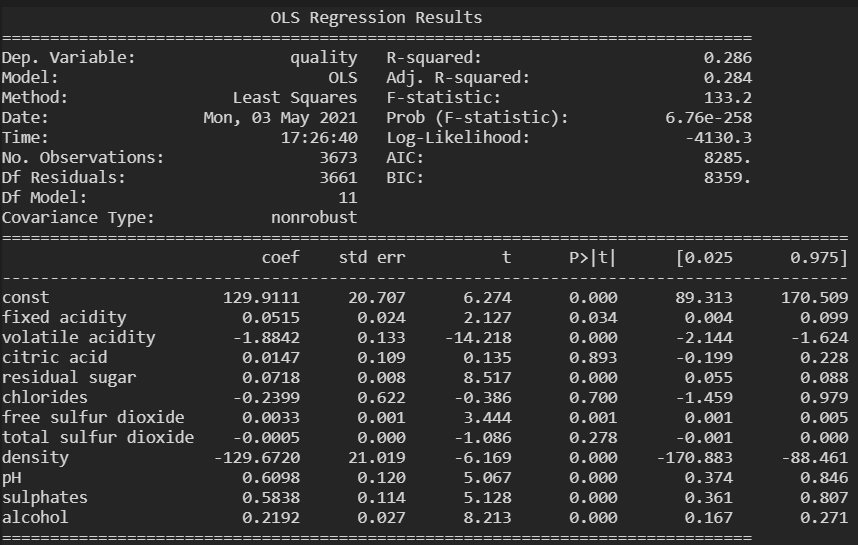
**WHITE WINE ANALYSIS**

wineWhite correlation matrix:

Text

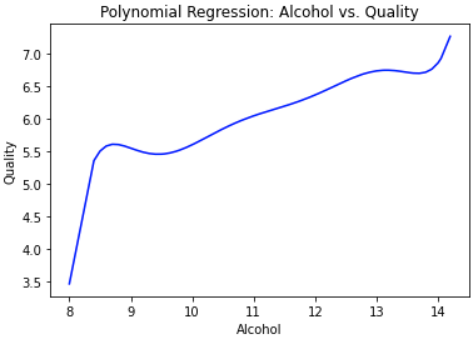
Description automatically generated

OLS Regression on wineWhite to see which p values are significant:





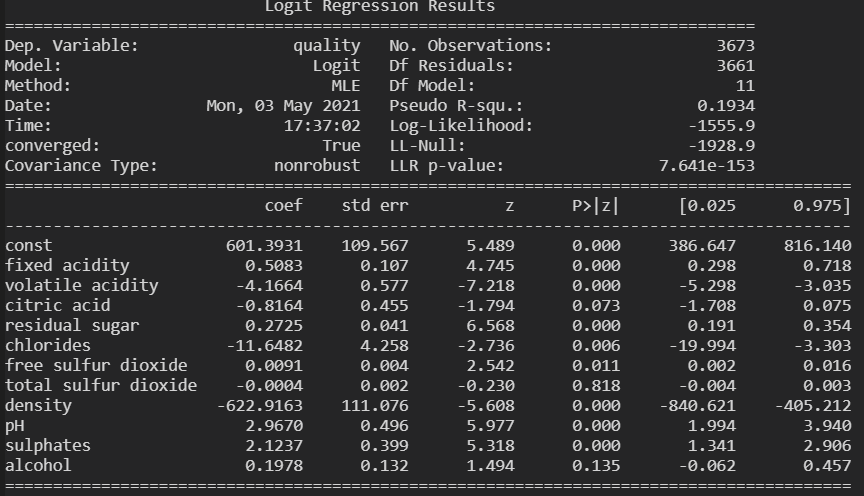
MSE is pretty high, so we can try polynomial regression.





Although the curve shows a clear relationship, The MSE is fairly high, so this model may not work the best. We can try using classification instead.

Logistic Regression on wineRed to see which p values are significant – to do logistic regression the response variable should be a dummy variable. So we change the ‘quality’ column so that each datapoint is 1 if greater than or equal to 7, and 0 if less than:

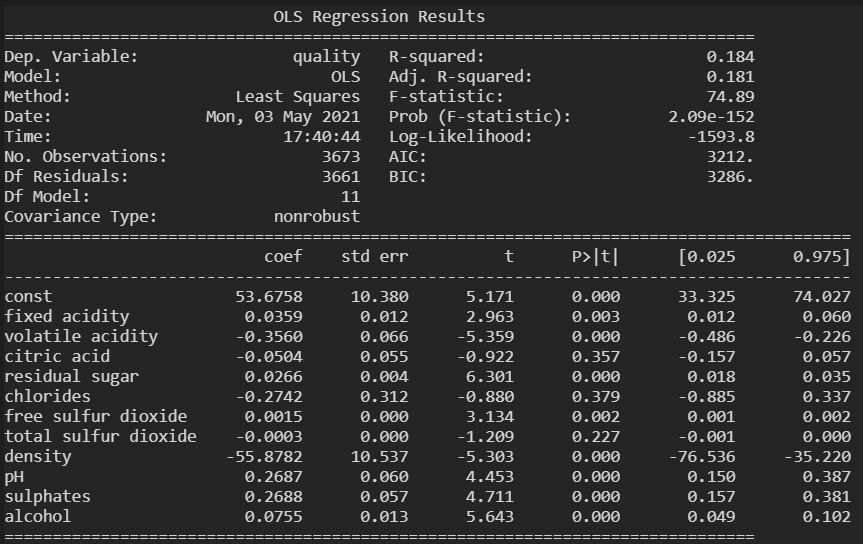




QDA Accuracy score and Test MSE:



OLS with classification:





It seems overall with classification we yield much smaller MSEs and higher accuracy scores as well. So we can try some more classification models to see how they fare:



Decision tree classifiers: