

Red Wine Qualification

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Goal of Research

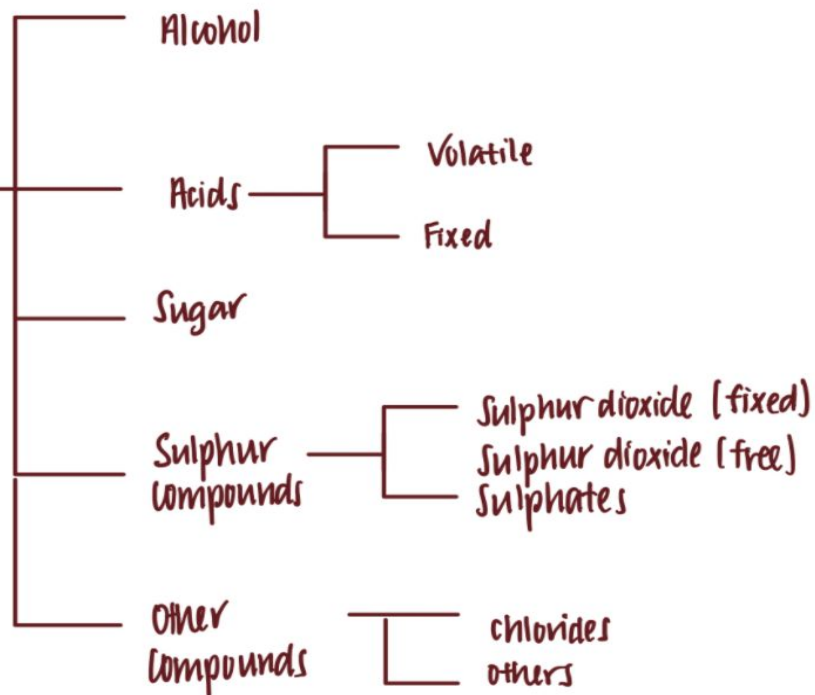
Figure out a proper way to qualify red wine.

In memory of my undergraduate instructor.

Variable Description



What is Wine Made Up of?



Difference Kinds of Acidity

Fix acidity is the most acids involved with wine or fixed or nonvolatile (do not evaporate readily).

Volatile acidity is the amount of acetic acid in wine, which can lead to an unpleasant, vinegar taste.

Citric acid is the most important organic acid produced in tonnage by fermentation.



Acid

pH

Alkaline



Sulfur Compounds

Free sulfur dioxide, Total sulfur dioxide, Sulphates

Sulfur Dioxide: Preventing microbial growth and the oxidation of wine.



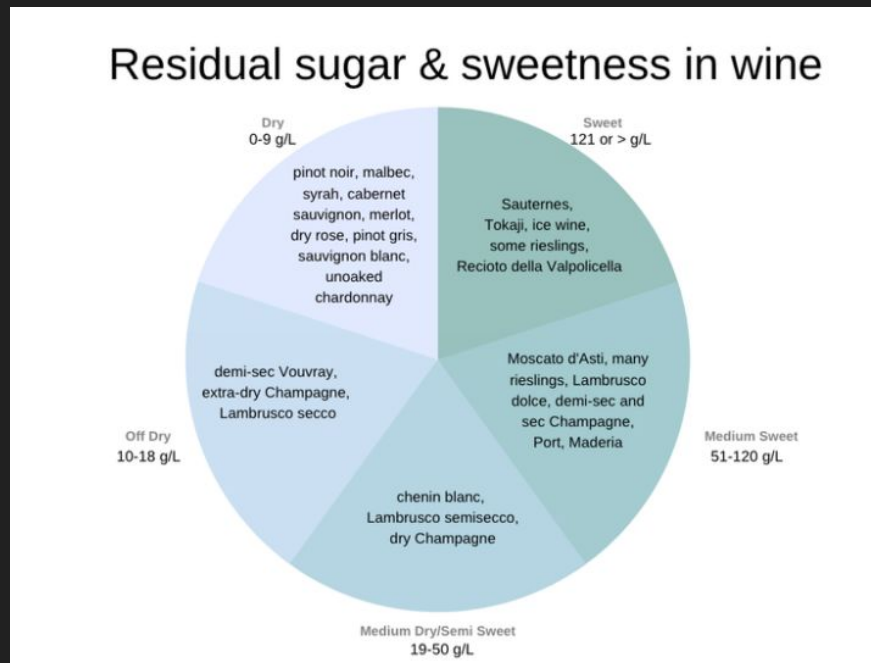
Sulphates: Other kinds of sulfur in red wine

Higher sulfur content causes a duller taste in wine, and that high potency of sulfite ions presents a health risk.



Residual Sugar

Residual sugar is the amount of sugar left in a wine.



Chlorides

Chlorides is a key role in the salty taste of a wine



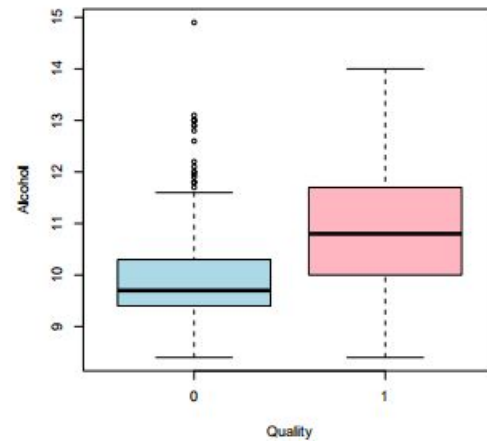
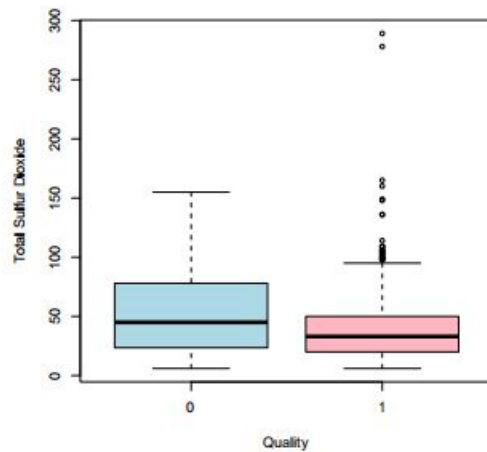
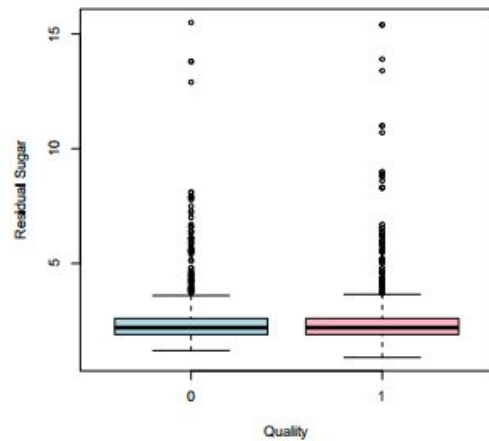
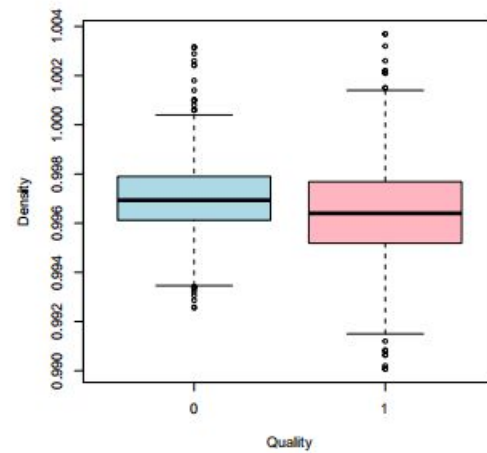
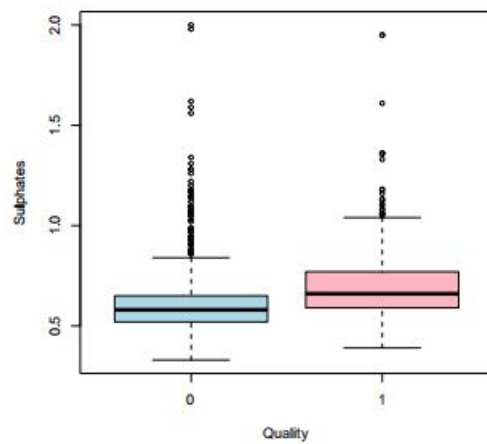
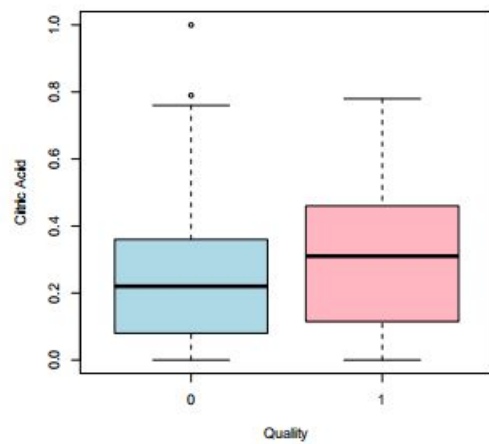
Alcohol & Density

Basic indexes a red wine, measures the alcohol concentration and density.



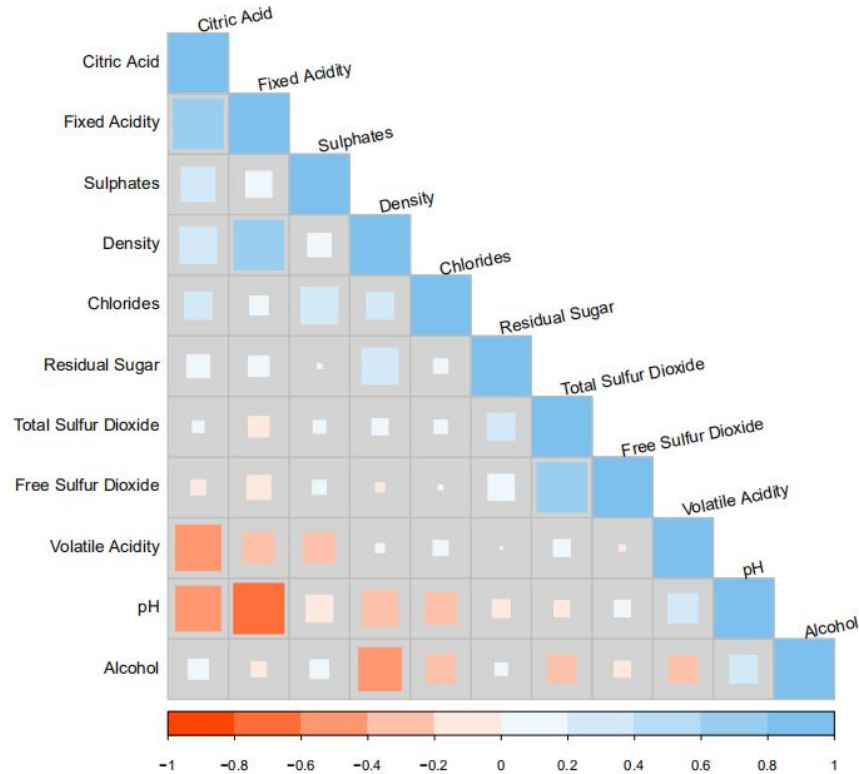
Model & Variable Analysis

- **Response variable is categorical with 11 levels.**
- **Merge to only 2 levels and rename them as 0-1.**
- **Logistic regression.**

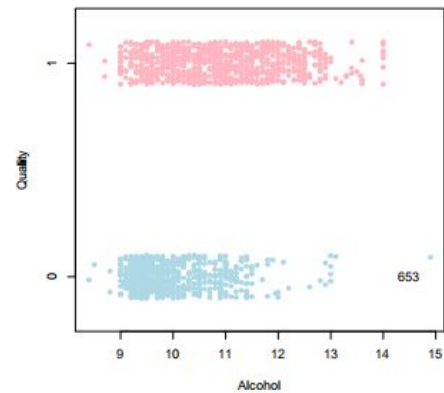
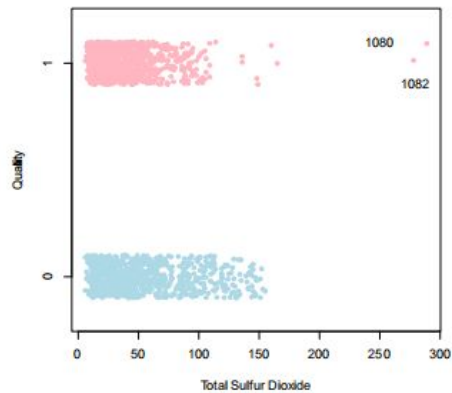
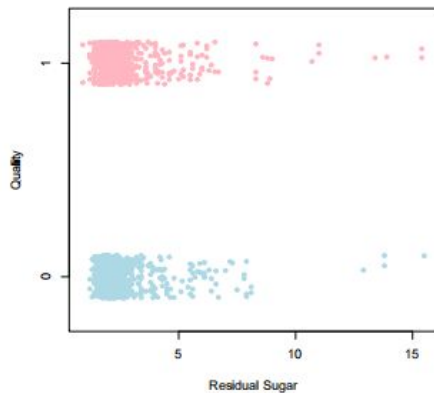
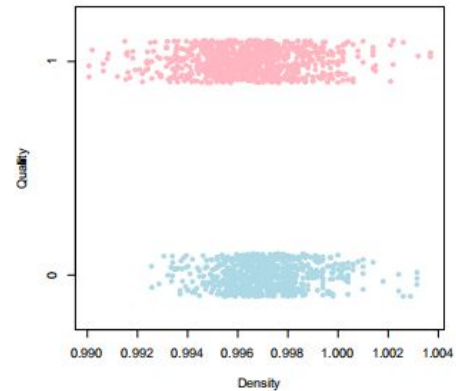
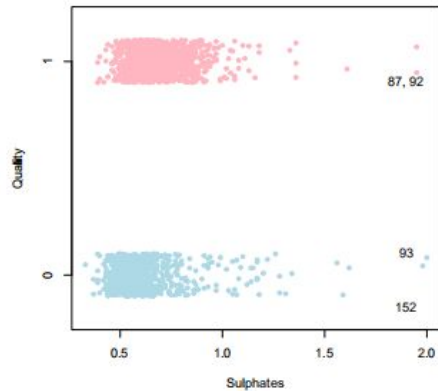
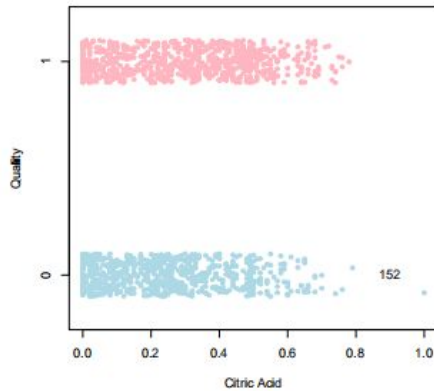


Challenges

Collinearity



Outliers



Model Selection

Choose less correlated variables and then add/delete.

Comparison Criterias: AIC, BIC, DIC (Adjusted R-Squared?)

Residual Analysis

Residuals for logistic regression are not normally distributed (?)

Variance of binomial distribution is $Np(1-p)$