## Input variables (based on physicochemical tests):

1 - fixed acidity

most acids involved with wine or fixed or nonvolatile (do not evaporate readily)

2 - volatile acidity

the amount of acetic acid in wine, which at too high of levels can lead to an unpleasant, vinegar taste

3 - citric acid

found in small quantities, citric acid can add 'freshness' and flavor to wines

4 - residual sugar

the amount of sugar remaining after fermentation stops, it's rare to find wines with less than 1 gram/liter and wines with greater than 45 grams/liter are considered sweet

5 - chlorides

the amount of salt in the wine

6 - free sulfur dioxide

the free form of SO2 exists in equilibrium between molecular SO2 (as a dissolved gas) and bisulfite ion; it prevents microbial growth and the oxidation of wine

7 - total sulfur dioxide

amount of free and bound forms of S02; in low concentrations, SO2 is mostly undetectable in wine, but at free SO2 concentrations over 50 ppm, SO2 becomes evident in the nose and taste of wine

8 - density

the density of water is close to that of water depending on the percent alcohol and sugar content

9 - pH

describes how acidic or basic a wine is on a scale from 0 (very acidic) to 14 (very basic); most wines are between 3-4 on the pH scale

10 - sulphates

a wine additive which can contribute to sulfur dioxide gas (S02) levels, which acts as an antimicrobial and antioxidant

11 - alcohol

the percent alcohol content of the wine

## Output variable (based on sensory data):

12 - quality (score between 0 and 10)

output variable (based on sensory data, score between 0 and 10)