

WINE QUALITY PREDICTION ANALYSIS



Purpose

- Predicting the quality of wine.

We will predict the quality of wine on the basis of giving features. We are using the wine quality dataset from Kaggle and UCI . These datasets has the fundamental features which are responsible for affecting the quality of the wine. By the use of several Machine learning models, we will predict the quality of the wine.

Data Overview

We are using the wine quality datasets that have multiple features for different kinds of wines.

Data Sources:

- [Wine Quality | Kaggle](#)
- [Index of /ml/machine-learning-databases/wine-quality](#)

Dataset Description: Wine Features

Input Variables

- Fixed acidity : The predominant fixed acids in wine, such as tartaric, succinic, citric, and malic acids.
- Volatile acidity : The high acetic acid present in wine, which causes an unpleasant vinegar taste.
- Citric acid : A weak organic acid used to increase the freshness and flavor of wine.
- Residual sugar : The amount of sugar left after fermentation.
- Chlorides : The amount of salt in wine. The lower chloride rate creates better quality wines.
- Free sulfur dioxide : SO₂ is used for preventing wine from oxidation and microbial spoilage.
- Total sulfur dioxide : The amount of free and bound forms of SO₂.
- Density : Depends on the alcohol and sugar content. Better wines usually have lower densities.
- pH : Used to check the level of acidity or alkalinity of wine.
- Sulphates : An antibacterial and antioxidant agent added to wine.
- Alcohol : The percentage of alcohol in wine. A higher concentration leads to better quality.

Output Variable

- Quality score : The quality rating of wine that is based on sensory data and scores from 0 to 10.

Machine Learning Model

- Supervised Machine Learning with Linear Regression Model.

According to experts, the wine is differentiated according to its smell, flavor, and color, but we are not a wine expert to say that wine is good or bad. What will we do then? By the use of Machine learning models, we will predict the quality of the wine.

Database

- PostgreSQL.

Dashboard

Tools used to create the final Dashboard:

- JavaScript, HTML/CSS
- Tableau

Dashboard

JavaScript, HTML/CSS

These are used to create an interactive webpage, where user put in the values for the various wine features and then on the click of the button ('Predict'), the quality of the wine is displayed in the form of a text message.



Wine Quality Prediction

Use the features below to predict the quality of your wine.

[Dashboard](#)

WINE FEATURES

Fixed Acidity (g/L) <input type="text"/>	Fixed acidity : The predominant fixed acids in wine, such as tartaric, succinic, citric, and malic acids.
Volatile Acidity (g/L) <input type="text"/>	Volatile acidity : The high acetic acid present in wine, which causes an unpleasant vinegar taste.
Citric Acid (g/L) <input type="text"/>	Citric acid : A weak organic acid used to increase the freshness and flavor of wine.
Residual Sugar (g/L) <input type="text"/>	Residual sugar : The amount of sugar left after fermentation.
Chlorides (g/L) <input type="text"/>	Chlorides : The amount of salt in wine. The lower chloride rate creates better quality wines.
Free Sulfur Dioxide (g/L) <input type="text"/>	Free sulfur dioxide : SO ₂ is used for preventing wine from oxidation and microbial spoilage.
Total Sulfur Dioxide (g/L) <input type="text"/>	Total sulfur dioxide : The amount of free and bound forms of SO ₂ .
Density (g/mL) <input type="text"/>	Density : Depends on the alcohol and sugar content. Better wines usually have lower densities.
pH <input type="text"/>	pH : Used to check the level of acidity or alkalinity of wine.
Sulphates (g/L) <input type="text"/>	Sulphates : An antibacterial and antioxidant agent added to wine.
Alcohol (% by volume) <input type="text"/>	Alcohol : The percentage of alcohol in wine. A higher concentration leads to better quality.

Predict

Dashboard

Tableau

Tableau is used to create different visualizations showing correlations between wine features vs the quality of wine.

On the webpage, there's a tab 'Dashboard' which upon clicking navigate to another page where the Wine Dashboard is presented with two different tableau dashboards for Red Wine and White Wine Quality Analysis.

Wine Quality Dashboard



Tableau Dashboards

- Red Wine Quality Analysis

https://public.tableau.com/app/profile/surbhi.bawaria/viz/RedWineQualityAnalysis_16527286095740/RedWineQualityAnalysis

- White Wine Quality Analysis

<https://public.tableau.com/app/profile/surbhi.bawaria/viz/WhiteWineQualityAnalysis/WhiteWineQualityAnalysis>