INTRODUCTION

- **About wine:**
  - Wine is a beverage made from fermented grape and other fruit juices with lower amount of alcohol content.
  - Quality of wine is graded based on the taste of wine and vintage. This process is time taking, costly and not efficient.
  - A wine itself includes different parameters like fixed acidity, volatile acidity, citric acid, residual sugar, chlorides, free sulphur dioxide, total sulphur dioxide, density, pH, sulphates, alcohol and quality.
- **Problem statement:**
  - In industries, understanding the demands of wine safety testing can be a complex task for the laboratory with numerous analytes and residues to monitor.
  - But, our application's prediction, provide ideal solutions for the analysis of wine, which will make this whole process efficient and cheaper with less human interaction.

OBJECTIVE

- Our main objective is to predict the wine quality using machine learning through Python programming language
- A large dataset is considered and wine quality is modelled to analyse the quality of wine through different parameters like fixed acidity, volatile acidity etc.
- All these parameters will be analysed through Machine Learning algorithms like random forest classifier algorithm which will helps to rate the wine on scale 1 - 10 or bad - good.
- Output obtained would further be checked for correctness and model will be optimized accordingly.
- It can support the wine expert evaluations and ultimately improve the production.

DATA DESCRIPTION

Attributes	Description
pH	To measure ripeness
Density	Density in gram per cm3
Alcohol	Volume of alcohol in %
Fixed Acidity	Impart sourness and resist microbial infection, measured in no. of grams of tartaric acid per dm3
Volatile Acidity	no. of grams of acetic acid per dm3 of wine
Citric Acid	no. of grams of citric acid per dm3 of wine
Residual Sugar	Remaining sugar after fermentation stops
Chlorides	no. of grams of sodium chloride per dm3 of wine
Free Sulfur dioxide	no. of grams of free sulphites per dm3 of wine
Total Sulfur dioxide	no. of grams of total sulfite (free sulphite+ bound)
Sulphates	no. of grams of potassium sulphate per dm3 of wine
Quality	Target variable, 1-10 value