**Problem Statement:**

## To build a methodology to Prediction for Wine Quality.

**Data Description:**

**Input variables (based on physicochemical tests):**  
  
1 - fixed acidity  
  
2 - volatile acidity  
  
3 - citric acid  
  
4 - residual sugar  
  
5 - chlorides  
  
6 - free sulfur dioxide  
  
7 - total sulfur dioxide  
  
8 - density  
  
9 - pH  
  
10 - sulphates  
  
11 - alcohol  
  
**Output variable (based on sensory data):**  
  
12 - quality (score between 0 and 10)

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**Data Analysis:**

Find EDA

Scaling data.

**Model Training**

1. **KNN**

## Decision tree

(Find best parameter using GridSearchC)

## XGBClassifier

### **Use Class Imbalancement Technique:**

**Model Training**

### **DecisionTreeClassifier**

## RandomForestClassifier

1. **XGBClassifier**

**Result:**

Predict value ≤ 3 →→ Result = 'Bad'

Predict value = 4 →→ Result = 'Below Average'

Predict value = 5 →→ Result = 'Average'

Predict value = 6 →→ Result = 'Good'

Predict value = 7 →→ Result = ‘'Very Good'

Predict value ≥ 8 →→ Result = 'Excellent'

**Deployment**

We will be deploying the model to the Heroku Cloud platform.

Deployment Link: https://wine-quality-prediction-vj.herokuapp.com/