Machine Learning Assignment Two

1. Instruction:

Dear all:

In this assignment, **you're asked to design a White Wine classification machine learning web APP.** You should use python for this homework and you may use any related packages such as sklearn, NumPy, pandas, streamlit, TensorFlow, PyTorch, etc. Please complete all the following requirements as indicated and upload the source code to the course website before the due date.

2. Problem Definition:

Suppose you're a data scientist and you're assigned a job to build a multi-class classifier machine learning model to automatically predict different types of white wine. Your model should have good performance with high predicting accuracy, precision, high F1 score.

Figure 1: White Wines

3. Dataset Description:

Please download the dataset: **winequality-white.csv** from the course Moodle website and train your machine learning model with this dataset. The attributes of the dataset are described as follows:

Attributes Name & Description
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)

4. Designing requirements

[1]. Please put your student ID and your name in the first two lines of your source code.

[2]. Please add the comments on each line of code in your program.

[3]. Your classification machine learning web app should contain at least three classification machine learning models. Your web app should also have some essential components, such as widgets, figures, tables, classification results, model evaluation results, etc.

[4]. **Bonus Parts:** If students can deploy their machine learning apps on the website, such as GitHub, AWS, Heroku, Google GCP, Azure. They will get extra 10 points as a bonus. Students should also include a document to describe their steps to deploy the app in detail.

[5]. **Streamlit reference:** https://www.streamlit.io/

5. Submission Requirements:

[1]. You should submit your program source code with .py extension on the course Moodle website before the due date.

[2]. You should also submit your program developing environment dependencies file: **requirements.txt along with your program source code** to the course Moodle website.

[3]. Avoid plagiarism: students should take care to avoid plagiarism. Do not copy and directly use other people's works. **For that plagiarized homework, the**

student's homework score is zero.

[4]. Please upload your assignment to the course Moodle website before the due date. **Late submission will not be accepted.**