ANN Classifier Assignment

Following the code we have developed in the lectures, and using Keras for the neural network functions, you will produce a classifier neural network that successfully (not necessarily at 100% accuracy) predicts wine quality.

As we did with the ANN regressor assignment from Assignment 2, you will use the wine quality datasets from the Machine Learning Repository at the University of California-Irvine. ***For this assignment, use the "winequality-white.csv" and the "winequality-red.csv"dataset.***

Please also (re)train your regressor model from Assignment 2 on the ***"winequality-white.csv"*** and the ***"winequality-red.csv"***dataset. Compare the two models, regressor and classifier on both datasets. Which would you use on each dataset? Why?

Here is the link to the web page for the dataset: <https://archive.ics.uci.edu/ml/datasets/Wine+Quality>. Here is a bit of background on Portuguese wines: <https://en.wikipedia.org/wiki/Vinho_Verde>

Please submit ONE MSWord or pdf document containing the following to Blackboard.

1. Your objective should be stated in written form. What are you trying to accomplish? Predicting a number? Classifying? Your objective must reference the context of the problem, specifically. (Hint: this is a classifier NN)
2. Your final ANN model, in code.
3. Your final model and training algorithm, in words.
4. Your experimental plan for arriving at the final model.
5. How long it took to run all the models in your experimental plan.
6. An explanation of the input variables and any preprocessing steps you took.
7. An explanation of your metrics and justification for your choice.
8. An explanation of your method to validate the model.
9. Your results in terms of appropriate metrics for the objective and problem.

Accuracy in your NN prediction rate may be considered in awarding grades.

**You are required to:**

* Please submit the Assignment write-up, in one MSWord document, to our Blackboard classroom.
* Please also submit your python (.py) file for the assignment.
* Use Python and Keras for the assignment.
* Please use our coding template for this assignment. Jupyter notebooks are not acceptable for the code submission.
* The assignment should be submitted in report format. If you are uncertain, please peruse the guidelines at this website: <https://www.examples.com/education/report-writing-format.html>
* Please do not use any screen shots in your writeup, except for charts/graphs.
* Please decorate the code with explanatory comments, as the code may be reused in the future.
* No zip files, please.
* The late policy, as in the syllabus applies.
* Please make your answers to the various parts of the assignment easy to find, preferably in the order specified in the assignment.
* The assignment is W&M Honor Code Category C. The use of discussions, course materials and homework solutions are allowed, but you should write the ﬁnal solutions alone. Books, notes, and Internet resources can be consulted, but not copied from.