Machine Learning HW 6

This homework is a practice for students to get familiar with Neural Network usage. It does not require students to separate data into training and test sets.

(1) 編寫一個 Python 程序以讀取 HW6 數據文件 (”hw6_haberman.csv”)。整體共計 306 數據集 + header. 除了header, HW6 數據文件每行是1個數據集(dataset). 每個數據集(每行)包含 3個 features and 1個 classification (0 是 5年內死亡, 1 是活5年以上). 每個數據都用逗號分隔. Write a Python program to read HW6 data file (”hw6_haberman.csv”). There are 306 datasets and a header in the data file. Every dataset contains 3 features and 1 class (1 as living 5+ years, 0 not). Every data is separated by a comma.

(2) Use the whole 306 datasets as training data.

(3) Use Scikit-learn Neural Network method **MLPClassifier**, and train your model using 3 hidden layers, with the given training data.

(4) You are to find the model which makes the training set score above 0.85. It takes me several trials to reach 0.92. I think 0.85 could be *overfitting*, but this homework is just for practice only.

(5) You can import the MLP classifier as shown below. Sample Python codes using *MLPClassifier* is given below.

```
from sklearn.neural_network import MLPClassifier

# default setting
#mlp = MLPClassifier(random_state=0)

# my parameter
mlp = MLPClassifier(hidden_layer_sizes=[10, 10, 10], \
                    solver='lbfgs', \
                    activation='tanh', \
                    random_state=0, \
                    max_iter=100000)

# train
mlp.fit(X_train, y_train)

# score & print
tr1 = mlp.score(X_train, y_train)

print("MLP training set score: {:.3f}".format(tr1))
```

(6). 估計所需時間：1-3小時

(7). 截止時間:2020年12月17日上課之前提交 zipped 的 python 程序 (“ yourID_name_MLP_HW6.py”) 和 print-screen 圖 (“ yourID_name_MLP_result.jpg”) of the training score output and the parameters which makes your score above 0.85. Zip Python and jpg files in file “ yourID_name_HW6.zip”.

(8). 截止時間:If you cannot train the model to bear the training set score above 0.85, then just submit as many of your (failed) trained model results as possible in a jpg file that shows that you have tried.