Artificial Intelligence & Its Applications

Laboratory 03

Submission Due: 9-June-2023

Submission Procedure:

1. Use Pickle to save all variables into a file named "Lab03_XX_YY.pkl"
2. Compress the programs of each question and "Lab03_XX_YY.pkl" into a file named "Lab03_XX_YY.zip"
3. Send "Lab03_XX_YY.zip" to your monitor.

XX is your student ID.
YY is your first name + last name in small letter without spacing.

For example:
Chen Tao and ID 20190123456789
The file names should be
"Lab03_20190123456789_chentao.pkl" and
"Lab03_20190123456789_chentao.zip"

Scikit-learn in Python is used in this laboratory. For detail, please refer to

Lab03 - Scikit-learn.pdf

“lab3_data.zip” contains a training set (lab3_train.csv, with labels) and a test set (lab3_ test.csv, without labels) of a 2-class problem.

1. For each classifier (i.e. k-nn, DT, SVM, kNN, and MLP), build the model with the best-selected parameters and evaluate it by the training set.
2. Build ensemble using the trained model in (1) by continued-value fusions (mean and max).
3. Select the best from the trained models in (1) and (2) to predict the test set.

Answer Requirement:

- Store the type, parameters and training accuracy of classifier into a list containing **`tuples`**, as a list in **`Q1`**

```
"Q1": [
      (“svm”, {“kernel”: “rbf”, …}, 0.95),
      (“decision tree”, {“depth”: 4, …}, 0.86),
      …
],
```

- Store the criteria and training accuracy into a list containing tuples, as a list to **`Q2`**

```
"Q2": [
      (“mean”, 0.9),
      (“max”, 0.9)
],
```

- Store the labels as a list to key **`Q3`**, the labels should be sorted according to “test id” in an ascending order

```
"Q3": [1, 0, …, 1]
```