Pandit Deendayal Petroleum University
School of Technology
Artificial Intelligence
B.Tech ICT/CE Semester VI, Winter Semester 2020
Lab 3: Classification using built-in ANN Tool

Preamble
ATOMS[1] (AuTomatic mOdules Management for Scilab) is the repository for packaged extension modules ("Toolboxes"). ANN provides a framework for designing and implementing neural networks with different algorithms. This assignment is carried out to perform classification on Iris dataset and pima-indians-diabetes dataset using built-in **ANN Tool**.
(To install : atomsInstall("ANN_Toolbox")

Dataset: Iris dataset and pima-indians-diabetes .

The Iris dataset includes three iris species with 50 samples each as well as some properties about each flower. One flower species is linearly separable from the other two, but the other two are not linearly separable from each other.

The columns in this dataset are:

1. Id
2. SepalLengthCm
3. SepalWidthCm
4. PetalLengthCm
5. PetalWidthCm
6. Species

Pima-indians-diabetes dataset is originally from the National Institute of Diabetes and Digestive and Kidney Diseases. The objective of the dataset is to diagnostically predict whether or not a patient has diabetes, based on certain diagnostic measurements included in the dataset. Several constraints were placed on the selection of these instances from a larger database. In particular, all patients here are females at least 21 years old of Pima Indian heritage.

The column in this dataset are:

1. Number of times pregnant.
2. Plasma glucose concentration 2 hours in an oral glucose tolerance test.
3. Diastolic blood pressure (mm Hg).
4. Triceps skin fold thickness (mm).
5. 2-Hour serum insulin (mu U/ml).
6. Body mass index.
7. Diabetes pedigree function.
8. Age (years).
9. Class, onset of diabetes within five years.

Exercise 1: Download and Study both (PIMA-INDIAN-DIABETES, IRIS) dataset files from the LMS

- Observe and comment about the features/values of dataset.

Exercise 2: Implement an ANN feed-forward network and evaluate its Accuracy for Pima-Indian-Diabetes dataset.

- Tweak parameters to improve accuracy (like learning rate and training cycles). Report the output accuracy.

Exercise 3: Implement an ANN feed-forward backpropagation network and evaluate its Accuracy for Iris Dataset.

- Tweak parameters to improve accuracy (like learning rate , minimum Error and training cycles). Calculate and print the mean accuracy.

Exercise 4: Visit http://playground.tensorflow.org and create your own ANN for classifying Non-linear pattern.

- Change the parameters and observe their impact on execution.

References

[1] http://atoms.scilab.org/toolboxes/ANN_Toolbox/

[2] https://atoms.scilab.org/toolboxes/ANN_Toolbox/0.5/files/ANN_Toolbox_0.5.pdf

[3] https://www.kaggle.com/uciml/pima-indians-diabetes-database

[4] https://www.kaggle.com/arshid/iris-flower-dataset