UNIVERSITEIT VAN PRETORIA
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YUNIBESITHI YA PRETORIA

COS 314: Artificial Intelligence
Assignment 3: Backpropagation Neural Network for Pattern Classification
Due Date: 12 June 2020

This assignment involves implementing the backpropagation learning algorithm for pattern classification. The neural network must be designed and applied to the Iris dataset, a well known dataset for pattern recognition. The problem involves classifying specimens to be different species of the iris flower, namely, iris setosa, iris versicolour and iris virginica. The Iris dataset can be accessed via the UCI Machine Learning Repository `https://archive.ics.uci.edu/ml/datasets/Iris`. The program must output the following to a text file:

- The weight matrix
- The biases
- The accuracy for the training set
- The accuracy for the test set

You need to use a training and test set. You can also use a validation set in addition to the training and test sets. The file names of the training, validation (if this is used) and test set must be command line parameters to the program. Parameters for the learning algorithm should also be included in a file, the name of which must also be a command line parameter.
The assignment can be coded in Java, C++ or Python. Both the executable/jar file and the source code must be submitted. The program must be executable and be able to run without linking to libraries via the IDE (in the case of C++). Please note the programs will not be run in IDEs but as a piece of commercial software.

In addition to the program please submit a report (in PDF) specifying:

- Number of hidden layers
- Number of nodes in each hidden layer
- Activation function
- Learning rules used (if these differ from the those discussed in class)

Mark breakdown: Algorithm - 15 marks, Report - 5 marks

Total:20