



UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Engineering, Built Environment and IT
Department of Computer Science

COS 314

Assignment 3 - Artificial Neural Networks

Due 03 June 2022

Question (20 Marks)

1. This assignment involves implementing the back-propagation learning algorithm for pattern classification. The neural network must be designed and applied to the Balance Scale dataset, a well known dataset for pattern recognition. The dataset can be accessed via the UCI Machine Learning Repository

<http://archive.ics.uci.edu/ml/datasets/Balance+Scale>

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 should be coded in Java or C++. Both the executable/jar file and the source code must be submitted. Include a readme file. 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:

1. Number of hidden layers.
2. Number of nodes in each hidden layer
3. Activation function.
4. Learning rules used.

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