DALHOUSIE UNIVERSITY

Assignment 5

Topics: Artificial Neural Networks using Bank_Note Dataset

CSCI 4155

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Objective

In this assignment we had to implement our choice of Neural Network on the Bank Note dataset. The goal for our model was to be able to classify image parameters of a cheque into 0 or 1 i.e. counterfeit cheque or real.

Detailed Process

I implemented the ANN algorithm on this dataset following the hints given in the Assignment instructions. Upon observing the graph which shows model test accuracy we can see that the accuracy increases significantly for the first 5 epochs and then begins to flatten out at a plateau of 99 percent accuracy. Analyzing the loss graph we can see that the loss decreases by an exponential decay after the first epoch, by the time it reaches the 20^{th} epoch the line flattens out to approximately 0.2 loss. Then data was tested by scaling with MinMaxScaler and StandardScaler. Using the former an accuracy of 94-97 was achieved but the StandardScaler gave better results. StandardScaler is generally good for most types of data. The model has 2 hidden layers and 1 output layer. Since it is binary classification, I have implemented binary_crossentropy as the loss function. The dataset is relatively small so a batch size of 32 is chosen and epochs were initially set at 100 however the since the desired accuracy was reached by 50 epochs, it was set as the new parameter to optimize resource usage.