**ADVANCED MACHINE LEARNING**

**Assignment 2: Neural Networks**

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| --- | --- | --- | --- | --- | --- |
| Layers | Units | Loss function | Activation function | Validation Accuracy | Testing Accuracy |
| 1 | 32 | Binary crossentropy | relu | 0.8565 | 0.886 |
| 3 | 64 | Binary crossentropy | relu | 0.8902 | 0.869 |
| 3 | 32 | MSE | tanh | 0.8819 | 0.883 |
| 1 | 32 | Binary crossentropy | tanh | 0.887 | 0.889 |
| 3 | 32 | Binary crossentropy | tanh | 0.8908 | 0.885 |
| 3 | 32 | Binary crossentropy | tanh | 0.8904( with dropout method) | 0.887(with dropout method) |

Thiscode uses a Keras-built neural network to do classification on the IMDB movie review dataset. The data collection was obtained in binary format, encoded, and then split into test and train chunks for analysis. In a neural network model, there are hidden layers, activation function, loss function, and optimizer, which are hyperparameters and regularization that can change the model's performance with high validation accuracy. In first train dataset which i used it have consist 2 hidden layer with 16 hidden units, relu activation, binary crossentropy loss function, rmsprop optimizer, 20 epochs with a batch size of 512 , and I use remaining subset as validation data. base on graph plotting result I choose 2 epoch value, at this point I see the training and validation accuracy value is 0.8747 and test accuracy is 0.8745. The performance of first model is overfitting issues. After that I retraining the different data model by changing values of hidden layer, units, loss function, activation function and dropout method to increasing the performance of validation accuracy. So I change the hidden layer value instead of 2 I change it to 3 with 64 units, then it shows validation accuracy is 0.890 and test accuracy is 0.8697. After applying the dropout method to validation data, the result may change so that I use 3 dense, hidden layers, 32 hidden units, the binary crossentropy loss function instead of mse, tanh activation and finally dropout method, the validation accuracy and test accuracy increase. When I change the hidden units, activation function and loss function the validation accuracy is 0.8904 and the test accuracy is 0.8870. After retraining the various model I was able to create a table to display the various findings of the model

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