SAI ROHAN PARITALA-811236693

AML ASSIGNMENT -1

Results:

One Hidden Layer:

Using a single hidden layer with 16 units, the validation accuracy is around 0.88 and the test accuracy is around 0.87.

Three Hidden Layers:

Using three hidden layers with 16 units in each layer, the validation accuracy is around 0.89 and the test accuracy is around 0.88.

Number of Hidden Units:

Using 32 units in the hidden layer, the validation accuracy is around 0.88 and the test accuracy is around 0.87.

Using 64 units in the hidden layer, the validation accuracy is around 0.88 and the test accuracy is around 0.87.

Loss Function:

Using mean squared error (mse) as the loss function, the validation accuracy is around 0.89 and the test accuracy is around 0.88.

Activation Function:

Using the tanh activation function instead of relu, the validation accuracy is around 0.87 and the test accuracy is around 0.86.

Regularization and Dropout:

Adding L2 regularization to the model and using a dropout rate of 0.5, the validation accuracy is around 0.88 and the test accuracy is around 0.87.

Adding early stopping to the training process, where the training stops when there is no improvement in validation accuracy for a specified number of epochs, the validation accuracy is around 0.89 and the test accuracy is around 0.88.

Summary Report:

Based on the experiments performed, here is a summary of the results obtained:

Hidden Layers:

Using one or three hidden layers did not significantly improve the accuracy of the model, compared to using two hidden layers. The test accuracy remained around 0.87-0.88 in all cases.

Number of Hidden Units:

Increasing the number of hidden units did not have a significant effect on the accuracy of the model, and the test accuracy remained around 0.87-0.88 in all cases.

Loss Function:

Using mean squared error (mse) as the loss function improved the accuracy of the model slightly, with a test accuracy of around 0.88.

Activation Function:

Using tanh activation function instead of Relu did not improve the accuracy of the model, and the test accuracy remained around 0.86-0.87.

Regularization and Dropout:

Adding L2 regularization and dropout regularization to the model improved the accuracy of the model slightly, with a test accuracy of around 0.87-0.88.

Adding early stopping to the training process improved the accuracy of the model slightly, with a test accuracy of around 0.88.

Overall, the best performance was achieved by using two hidden layers with 16 units in each layer, binary cross-entropy loss function, Relu activation function, and adding L2 regularization and dropout regularization with a dropout rate of 0.5 to the model. The test accuracy of this model was around 0.87-0.88. However, it should be noted that these results may vary depending on the specific dataset and problem being solved.