

Assignment 2

Summary:

The IMDB dataset

The "IMDB dataset" is a collection of 50,000 reviews from the Internet Movie Database that are highly polarized. These reviews are split into 25,000 for training and 25,000 for testing, with an equal distribution of negative and positive reviews. Keras provides this dataset preprocessed, with the reviews already converted into sequences of integers representing specific words in a dictionary.

I have used 3 hidden layers, 16, 32, 64, and 128 neurons. The optimal epoch was determined by the highest validation accuracy (binary accuracy) and examining the test and validation graphs. The initial results showed an upward trend in accuracy up to epoch 4, followed by a downward trend indicating overfitting. The maximum validation accuracy was achieved at epoch 4, with a test accuracy of 0.8840%. The model used the MSE Loss function, ADAM optimizer, and TanH activation function.

Changing the activation function, optimizer, and loss function had little impact on the test and validation accuracy. When applying 1, 2, or 3 hidden layers, there was no significant variation or trend in accuracy for different numbers of neurons. However, increasing the number of layers and neurons resulted no significant improvement in the validation and test accuracy.

Applying the regularization model with dropout technique did not significantly improve the validation and test accuracy.

Conclusion-

After considering above all the points with different layers with Neurons and changing functions does not give much change in test accuracy

HIDDEN LAYERS	NEURONS	LOSS FUNCTION	OPTIMIZER	ACTIVATION FUNCTION	EPOCH(HIGHEST ACCURACY)	VALIDATION ACCURACY	TEST ACCURACY	VALIDATION ACCURACY WITH DROPOUT	TEST ACCURACY WITH DROPOUTS
1	16	MSE	ADAM	TANH	4	0.9493	0.8840		
1	32	MSE	ADAM	TANH	3	0.9346	0.8845	0.9411	0.8833
1	64	MSE	ADAM	TANH	2	0.9247	0.8851		
1	128	MSE	ADAM	TANH	2	0.9318	0.8803		
2	16	MSE	ADAM	TANH	4	0.9634	0.8751	0.9581	0.8810
2	32	MSE	ADAM	TANH	2	0.9239	0.8832		
2	64	MSE	ADAM	TANH	2	0.9349	0.8758		
2	128	MSE	ADAM	TANH	1	0.8152	0.8776		
3	16	MSE	ADAM	TANH	2	0.9108	0.8835	0.9144	0.8815
3	32	MSE	ADAM	TANH	2	0.9239	0.8784		
3	64	MSE	ADAM	TANH	1	0.8253	0.8803		
3	128	MSE	ADAM	TANH	1	0.8247	0.8785		