**PROJECT REPORT**

BUILDING NEURAL NETWORKS – IMDB DATASET

INTRODUCTION

This assignment provides a summary of the binary sentiment analysis dataset known as IMDb Movie Reviews, which is composed of 50,000 IMDb reviews that have been categorized as either positive or negative. Equal numbers of favorable and unfavorable reviews are present in the sample.

In total, we've constructed five models.

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| --- | --- | --- | --- | --- | --- | --- |
| Model Number | Layers | Activation | Nodes | Optimizer | Loss | Test  Accuracy |
| Model-1 | 3 | tanh | 16 | Rms prop | mse | 0.8818 |
| Model-2 | 2 | tanh | 16 | Rms prop | mse | 0.8690 |
| Model-3 | 3 | tanh | 16 | Rms prop | mse | 0.8833 |
| Model-4 | 2 | tanh | 32 | Rms prop | mse | 0.8696 |
| Model-5 | 2 | tanh | 64 | Rms prop | mse | 0.8659 |

Following are the observations from the Assignment

1. According to the instructions in the aforementioned models, the "tanh" activation function and "mse" loss function have been applied the most frequently.
2. Model 1 has a test accuracy of 88.24%, which is higher than the other models' somewhat lower accuracy.
3. As the unit is increased from 16, 32, to 64, we observe that accuracy changes very little while the loss function contracts.
4. There is no difference in the precision or deflection of the loss function when the number of hidden layers is increased from one to three..
5. The loss value while using "mse" for the IMDB dataset is insignificant when using binary cross entropy as the benchmark.
6. The model's tanh activation function is impacted by the vanishing gradient problem.
7. Regularization results in much smaller losses, less overfitting, and a marginally more accurate model when compared to the baseline model.

8. Dropout lessens the loss function but has no effect on accuracy.