Project 2 Report

CSCI 602 – Advanced Artificial Intelligence

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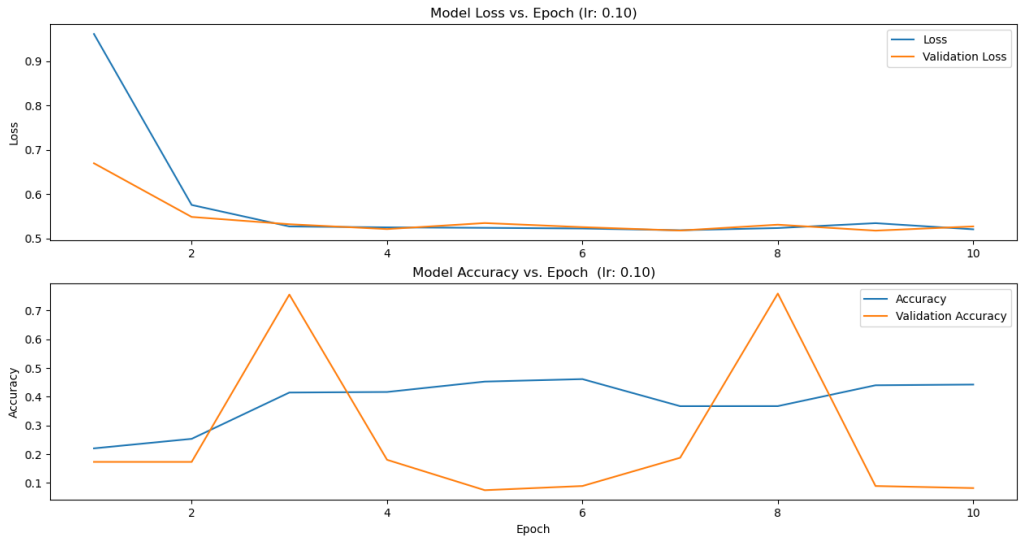
Learning Rate 0.10:

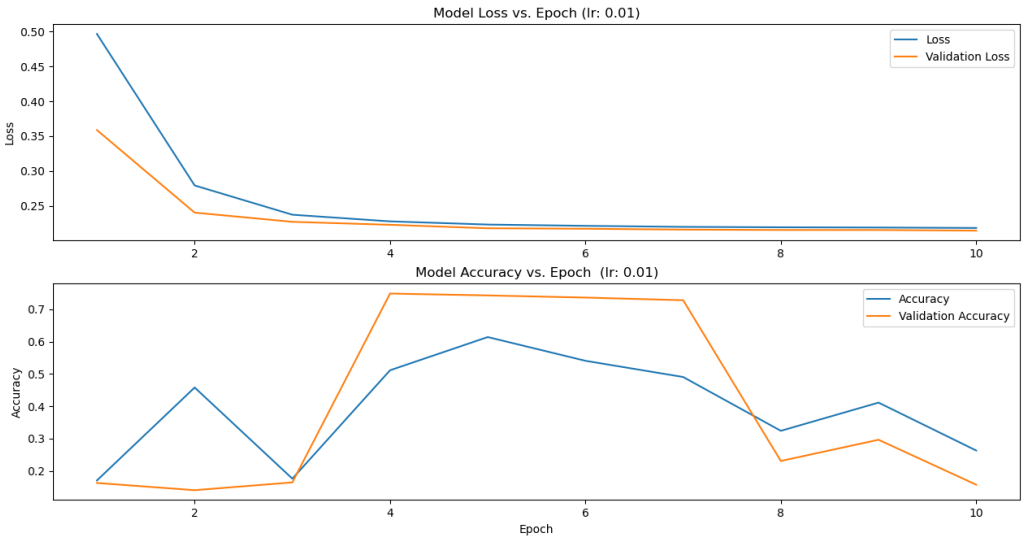
Loss and Accuracy vs Epoch:



This figure shows the loss and accuracy across 10 epochs for a learning rate of 0.10. Notable features are the loss leveling out at just above .5 after the second epoch and the accuracy generally increasing from about .2 to about .45 from the first epoch to the last epoch.

Learning Rate 0.01:

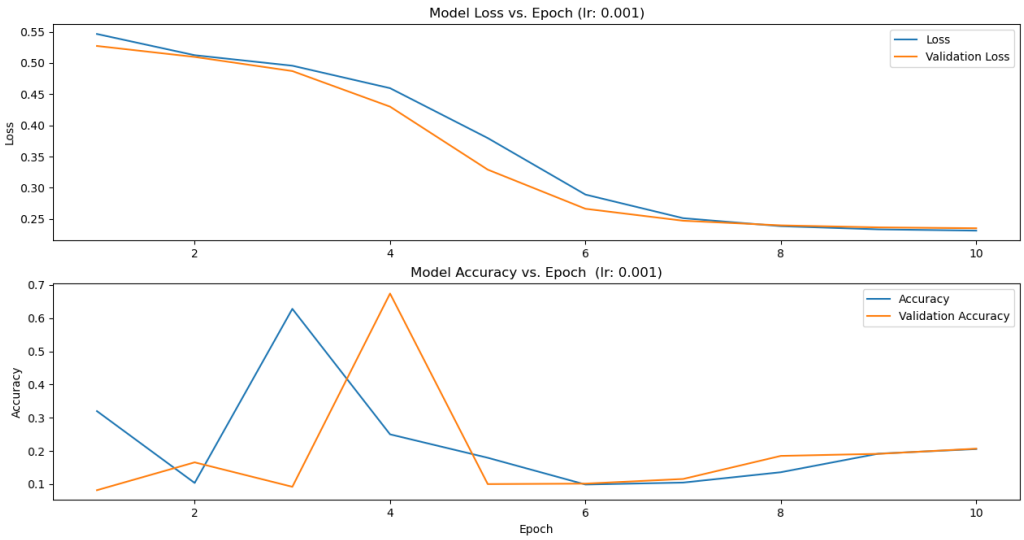
Loss and Accuracy vs Epoch:



This figure shows the loss and accuracy across 10 epochs for a learning rate of 0.01. Notable features are the loss leveling out at about .23 after the fifth epoch and the accuracy generally increasing from about .2 to about .3 from the first epoch to the last epoch but with its best performance from epoch 4 to 7.

Learning Rate 0.001:

Loss and Accuracy vs Epoch:



This figure shows the loss and accuracy across 10 epochs for a learning rate of 0.001. Notable features are the loss leveling out at about .23 after the eighth epoch and the accuracy stays around .2 after epoch 6 but with its best performance at epoch 3.

Overall, in terms of loss, the largest learning rate, .10, had the worst performance, ending around .5 by the end of training. The final losses for the other learning rates were nearly identical at about .23. However, the learning rate of .01 arrived at that level at epoch 4 as opposed to epoch 7 for learning rate .001. In terms of accuracy, as the learning rates decreased, the accuracies at the last epoch also decreased. The learning rates and their final accuracies are as follows (LR – Acc): 0.10 - .45, 0.01 - .3, 0.001 - .2. Another feature of accuracy is that it was not linear across epochs. For each learning rate, the accuracy could increase or decrease from epoch to epoch at an unpredictable rate. This is in contrast to the loss vs epoch graphs that seem to maintain a negative exponentially relationship across learning rates.

The code to run the model, log the epoch history, and create the final plots can be found attached to the submission.