

cs760 - HW3

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Part 3 Plots and Discussion

The F1 score versus the number of epochs for both logistic regression and a single layer neural net are shown in Figures 1 and 2 respectively. Each model was trained with a training set and was then used to predict classes of both the training set and testing sets (labeled on each graph). The maximum number of epochs was 20, the learning rate was 0.01, the number of hidden units was 10, and the data set used was the training and testing sets for magic. The aforementioned information is provided on each figure.

There are several things to note for each figure. For Figure 1, the F1 score for the training set increases, for the most part, with increasing number of training epochs. This is not true for the testing set. The testing set increases after a certain number of epochs and then decreases. This can be explained by over-fitting. Basically, the weights are tuned for better performance with the training set which makes them less versatile for new data.

For Figure 2, the F1 score is better for the training set as compared to the testing set. The improvement rate is much faster than that for the logistic regression. Furthermore, the single layer neural net is less prone to over-fitting as evidenced by no decreases in the F1 score for either the training or testing sets. Hence, it would be safe to state that the neural net outperforms logistic regression in this scenario.

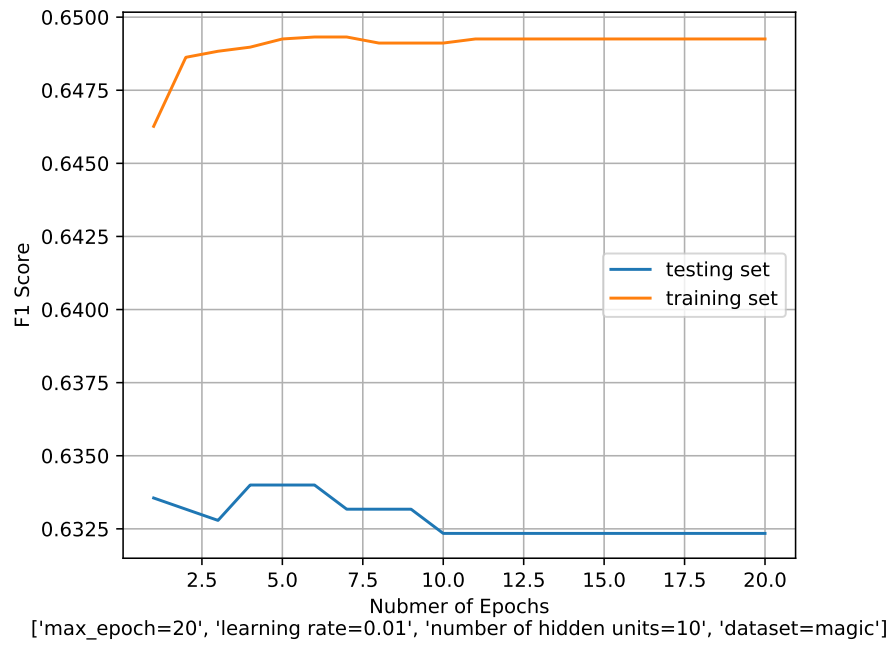


Figure 1: Logistic Regression Plot

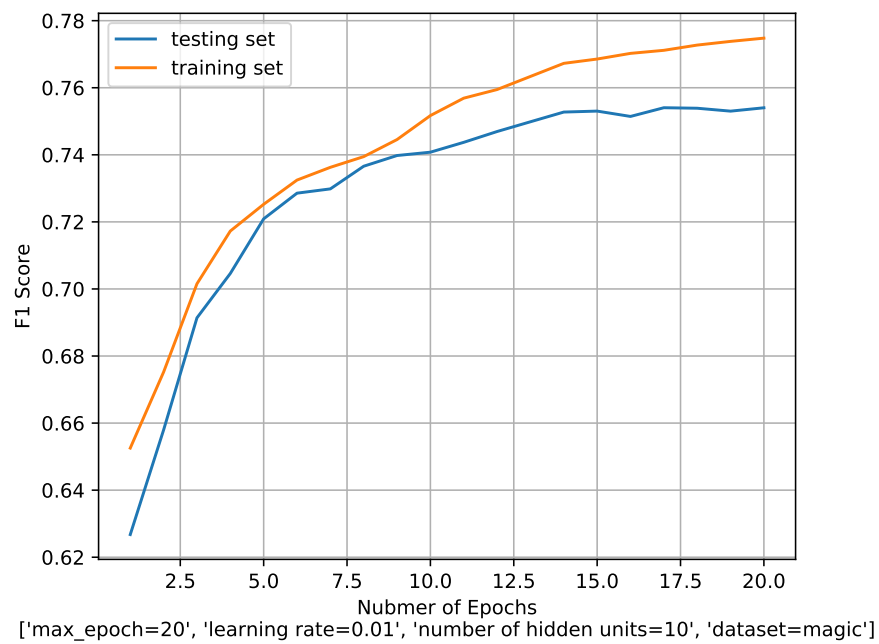


Figure 2: Neural Net Plot