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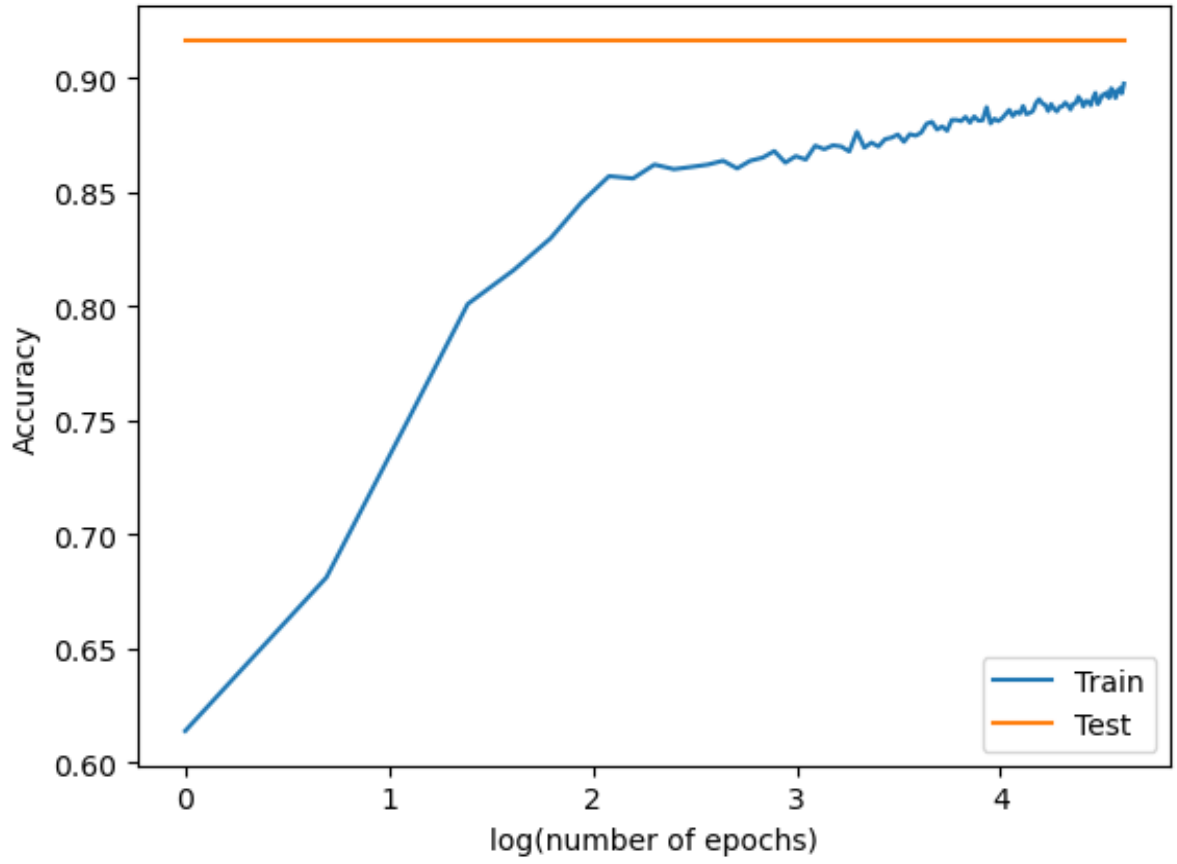
RESULTS HW00

Model Performance Overview

The graph showing model accuracy as a function of log-scaled epoch count tells that the Neural Network performance improved significantly over time for both training and testing datasets.
The accuracy on the training data plateaued, indicating that the model has reached its capacity in capturing the pattern of the training set.
The test accuracy shows a flat line, which indicates of the model's generalization to unseen data.



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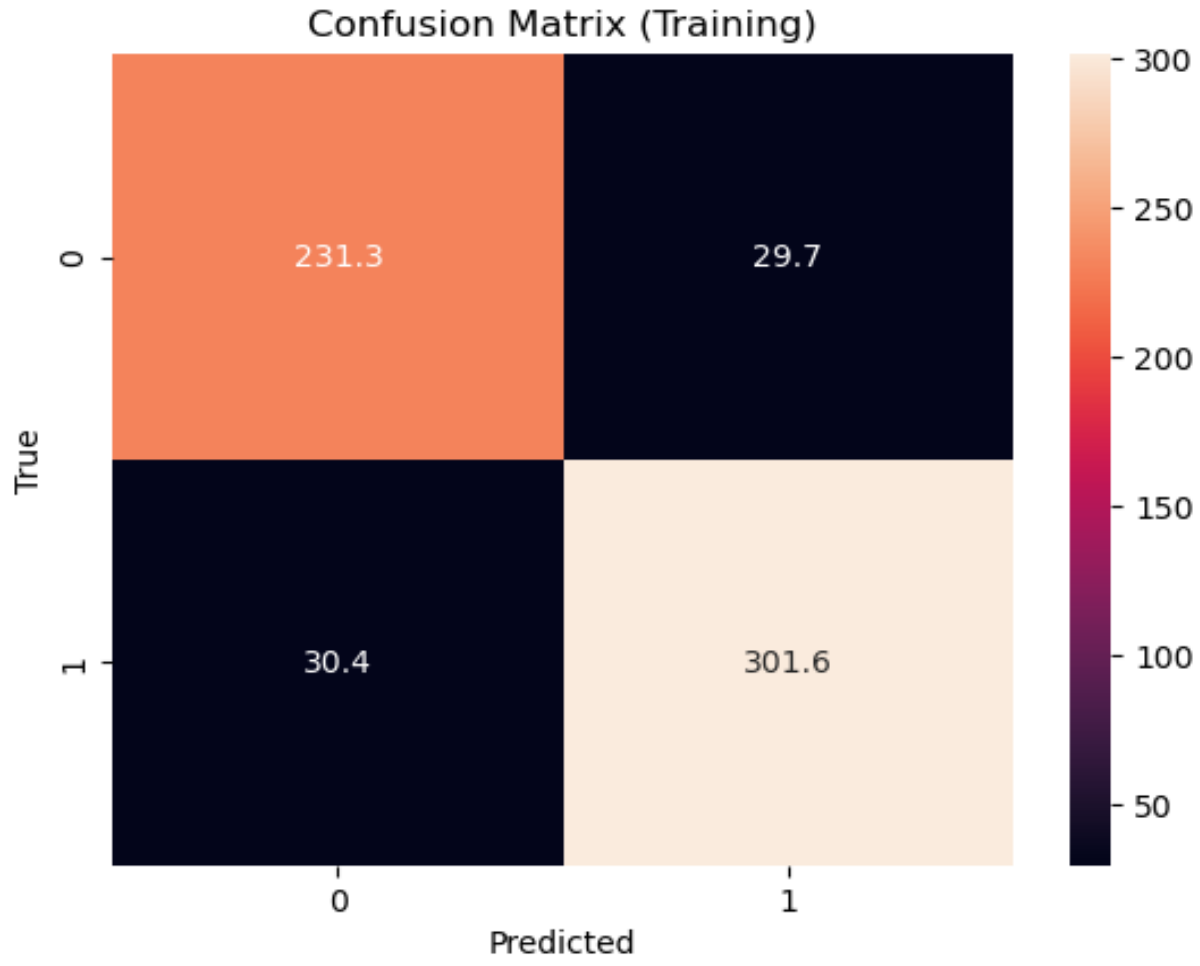
Training Data Confusion Matrix Analysis:

The confusion matrix for the training data indicates that the model predicted class 0 with a slightly higher degree of accuracy than class 1.
The model correctly predicted class 0 [231.3] times while misclassifying it [29.7] times.
For class 1, the model correctly predicted [301.6] instances and misclassified [30.4] instances.
This suggests that while the model is reasonably accurate, there's a balanced misclassification rate between the two classes.



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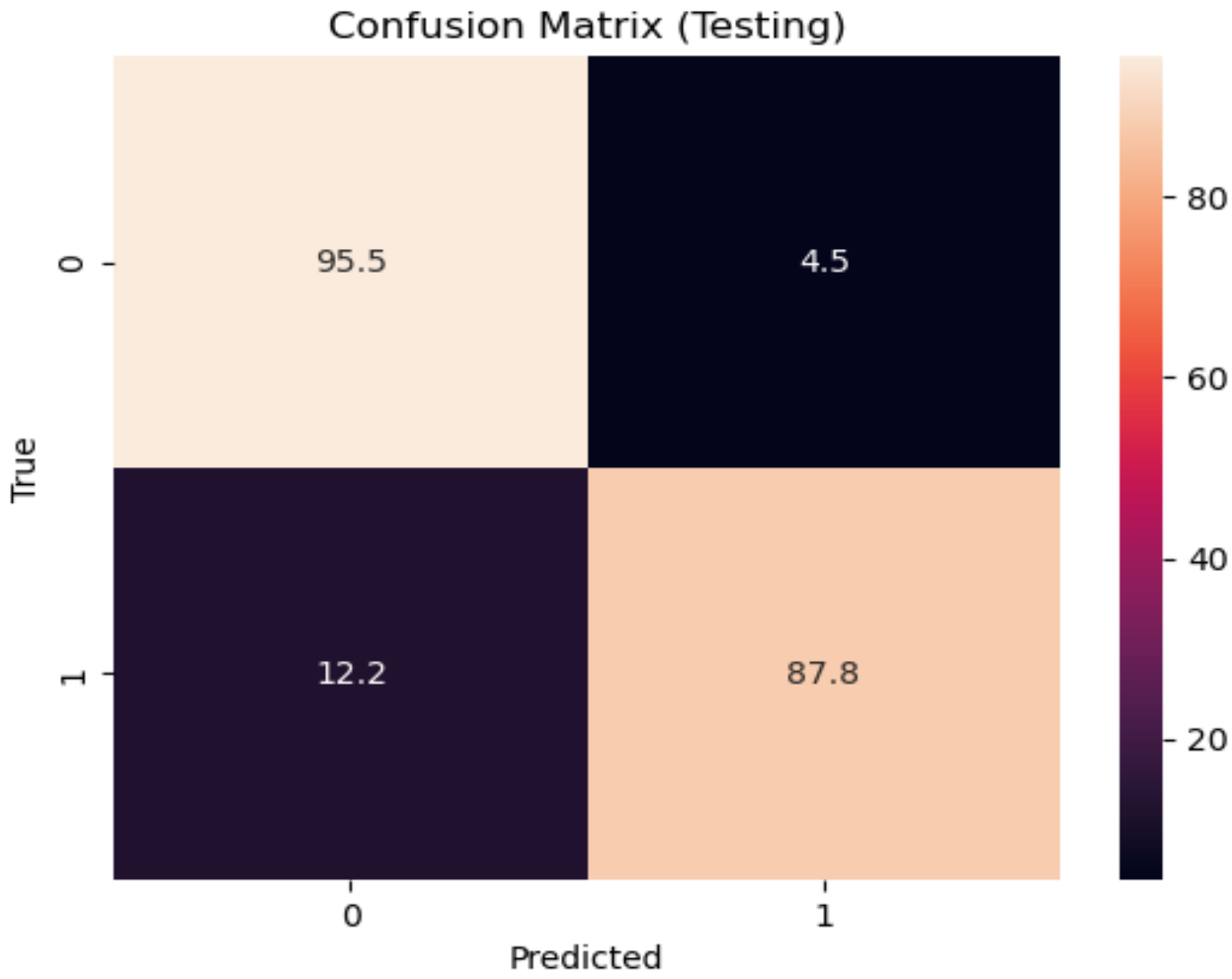
Testing Data Confusion Matrix Analysis:

The testing data confusion matrix shows a similar trend to the training data, with class 0 being predicted with slightly higher accuracy.
The model correctly predicted class 0 [95.5] times and class 1 [87.8] times the accuracy. Misclassifications occurred [4.5] times for class 0 and [12.2] times for class 1, showing a slightly higher misclassification rate for class 1 in the test data compared to the training data.



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Combined Analysis

The performance metrics and confusion matrices suggest that the model has learned to distinguish between the two classes effectively, despite the introduction of label noise and imbalance in the training data.
The slight discrepancy in performance between the two classes may be attributable to the unbalancing and noise introduction.

The consistency in performance between the training and test sets suggests that the model generalizes well, although there is a slight overrepresentation of false negatives for class 1 in the test set.

Conclusion

The shallow neural network demonstrated robust learning capabilities in the face of deliberately introduced data challenges. The performance across multiple initializations was stable, and the model showed good generalization to the test data.