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CSCI 3202
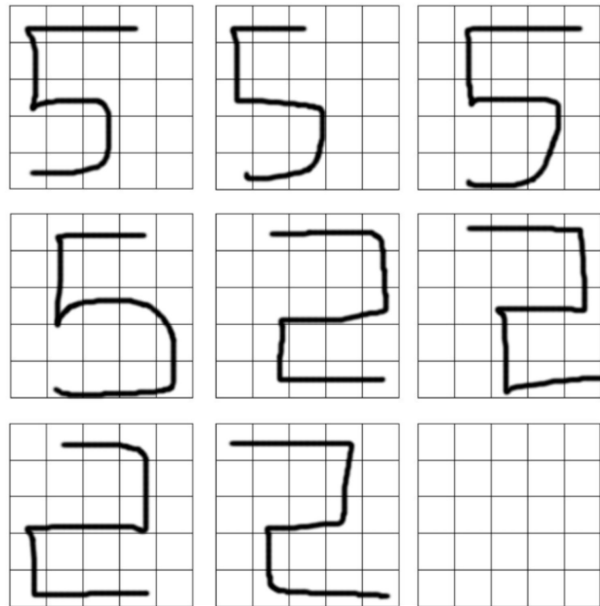
Assignment 4 Write Up

1. Training Data:

2. My hopfield classified the digits with an accuracy of 0.75. In some cases, the classifier would achieve an accuracy of 0.875 and 1 on the test data. The classifier would commonly misclassify data points 0, 1, and 5 when it made mistakes. The binary strings of data point 0 and 1 only differ by 1 bit, so it makes logical sense that they would be misclassified equally. Additionally, the classifier could be misclassifying data point 5 due to the order of node updates (that is selected at random on each run) that causes the network to converge on either the 'two' or 'five' attractor.

3. My MLP classifier classified the digits with an accuracy of 0.75. Again in some cases, the classifier would achieve an accuracy of 0.875 and 1 on the test data. I am seeing the same patterns of misclassifications that I saw in the hopfield network that I would consider to be due to the similarities between the test data examples of different classes.

4.

Accuracy vs. Disortion rate
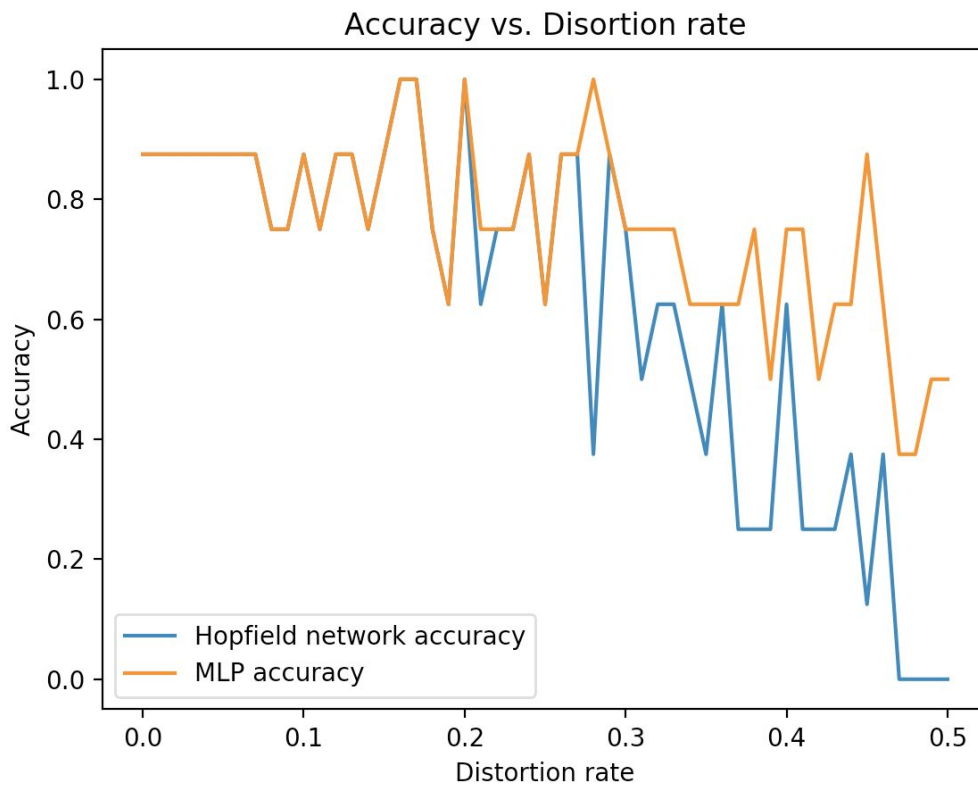
Looking at the plot, we notice that the Hopfield network makes more errors than the MLP network at higher distortion rates. Thus, the MLP is more robust to distortion than the Hopfield network.

5.
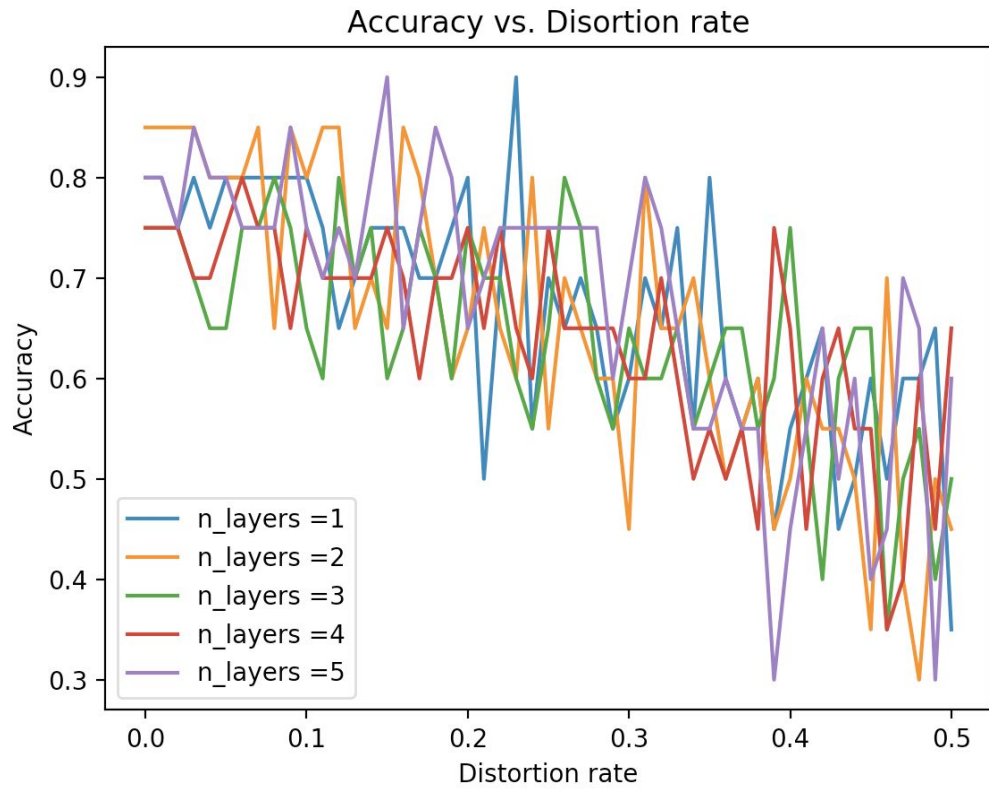
Looking at the graph, there is no clear distinction between the accuracies of the different classifiers across distortion rates. Therefore, we can conclude that adding more layers to our MLP network does not increase the accuracy of the classifier.