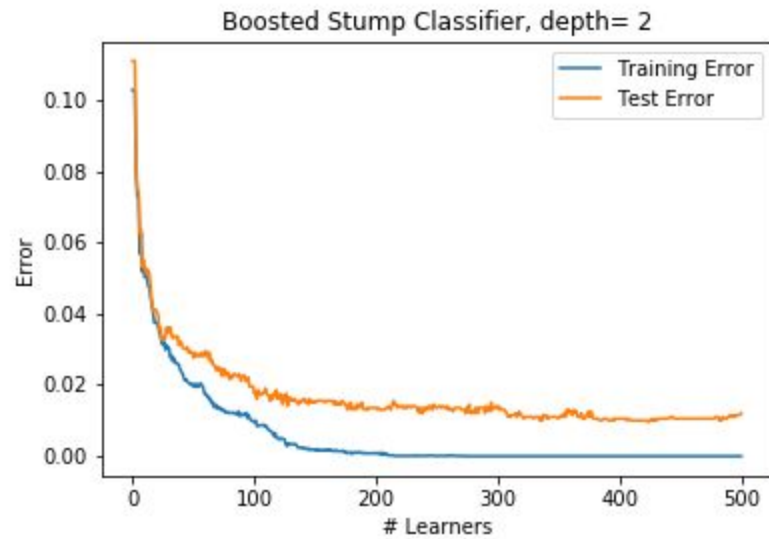
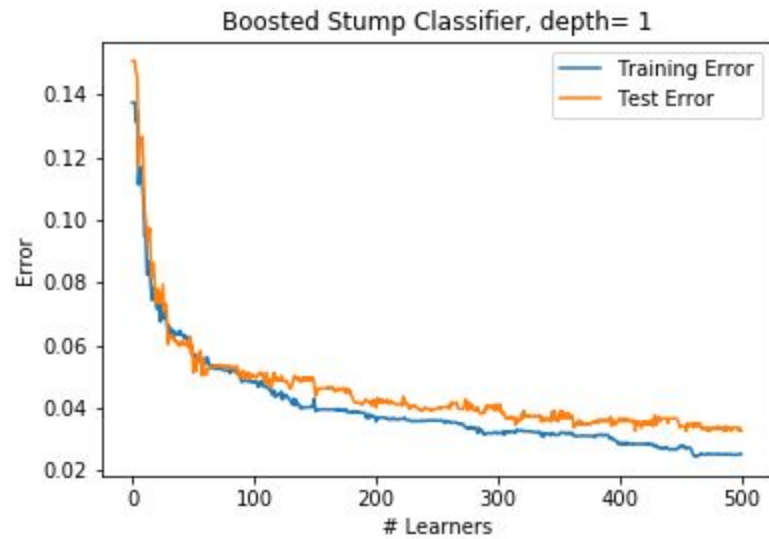
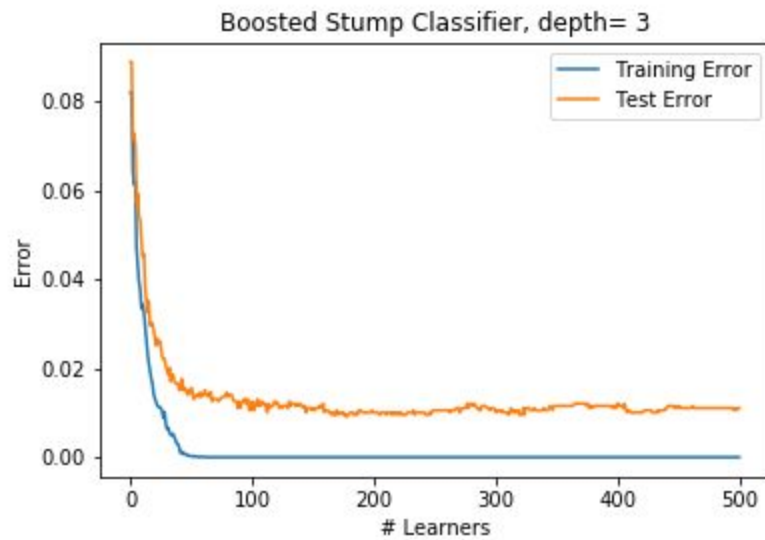


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CSCI 5622
Boosting Writeup

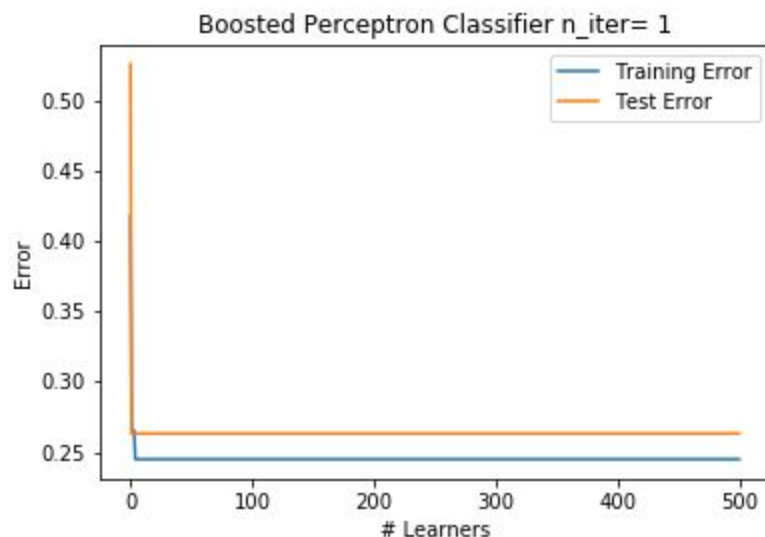
In training a boosting model using decision stumps of depth 1, 2, and 3, I got these error measures for n learners:

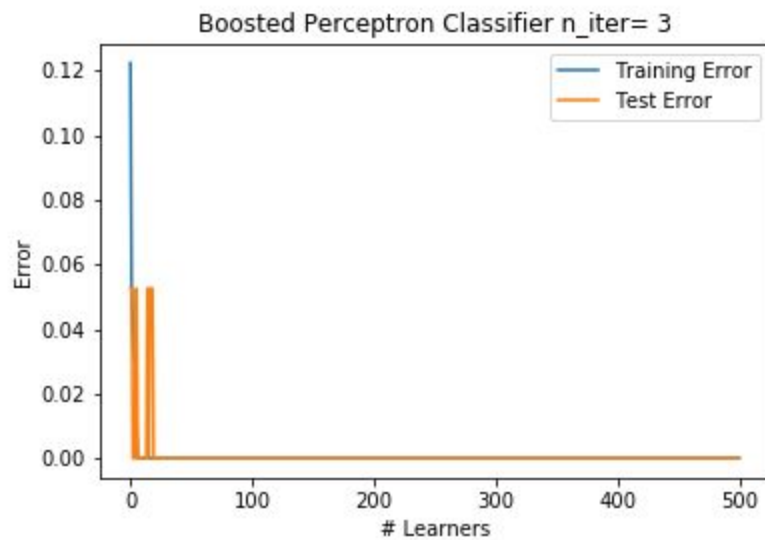
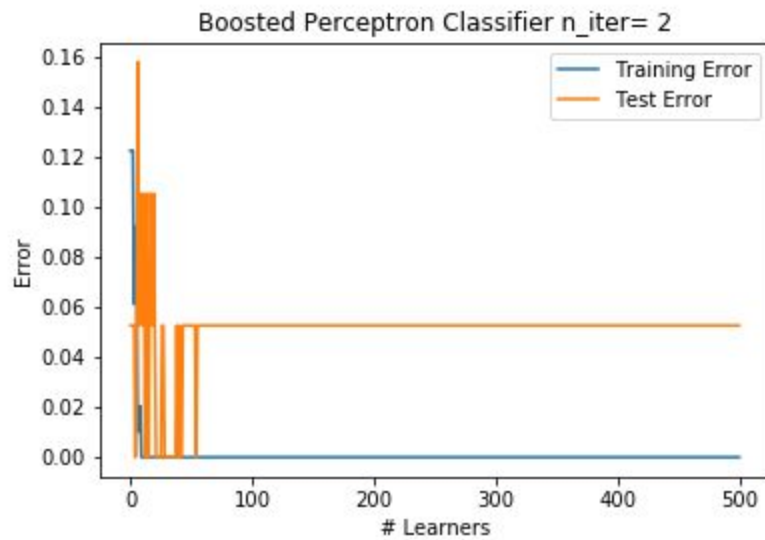




Of these models, it appears that the one with stumps of depth 3 performs the best as it converges to about 0.019 test error after only 50 learners and stays there throughout the rest of the boosting iterations. It also appears that there are no overfitting problems with this number of weak learners. None of these models approach 100% accuracy though they are all more than 99.5% accurate by the end of the boosting process.

I also tested the same datasets on a Boosting model with Perceptron Classifiers as the weak learner. I tested three different models with 1, 2, and 3 passes over the data. Here are the results for these models:





As the figures show, three passes over the data worked the best. There doesn't seem to be much overfitting if any, and the 3 pass model seems to have nearly 100% accuracy. 500 learners for this dataset seems to be a good number in that none of the perceptron based boosting models show signs of overfitting up to that margin, though it appears that 50 or so learners is enough for these models to reach their maximum accuracy.