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CS1675

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Homework 8 – Report

AdaBoost accuracies per number of iterations:

* 10 iterations: 0.7500
* 20 iterations 0.7434
* 50 iterations: 0.7513

A screenshot of a cell phone

Description automatically generated

Extra Credit:

AdaBoost\_Extra accuracies per number of iterations:

* 10 iterations: 0.7434
* 20 iterations: 0.7421
* 50 iterations: 0.7382

A screenshot of a cell phone

Description automatically generated

I produced very similar accuracies for both the standard implementation and the extra credit implementations. I believe this occurs because the extra credit has you utilize the inverse of the predictions of classifiers that produce alpha values below 0. Alpha is only negative when epsilon has a value above 1/2 i.e. when the current classifier mislabels over half the training samples (this is why we use the inverse of the predictions – if the classifier correctly labels only 30% of the samples, then the inverse of its predictions will correctly classify 70% of the samples, assuming it is a binary classification problem). However, a classifier misclassifying over half of the samples contradicts the assumption of Boosting algorithms that the weak classifiers must perform better than chance, that is, better than a coin toss or 50% (as given in lecture slides 8-9). Therefore, it is not unexpected that neither the standard nor the extra credit implementations have produced alpha values below 0 in my <100 trial runs.