Weekly Homework 10

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CS 1675: Intro to Machine Learning

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Problem 1. Feature/Input ranking

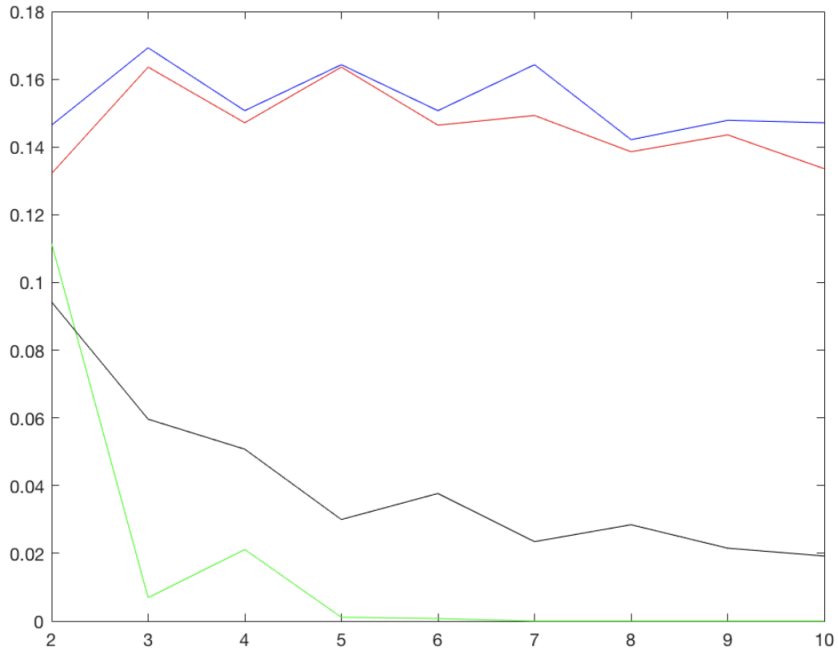
(a) Top 20 Fisher Scores

Dimension	Fisher Score
0.392	48.0000
0.2140	25.0000
0.1910	21.0000
0.1892	70.0000
0.1693	65.0000
0.1673	40.0000
0.1650	29.0000
0.1402	19.0000
0.1255	57.0000
0.1212	20.0000
0.0995	24.0000
0.0950	30.0000
0.0858	12.0000
0.0846	47.0000
0.0607	61.0000
0.0579	10.0000
0.0527	34.0000
0.0462	27.0000
0.0461	39.0000
0.0422	41.0000

(*b*) Top 20 ROC Scores

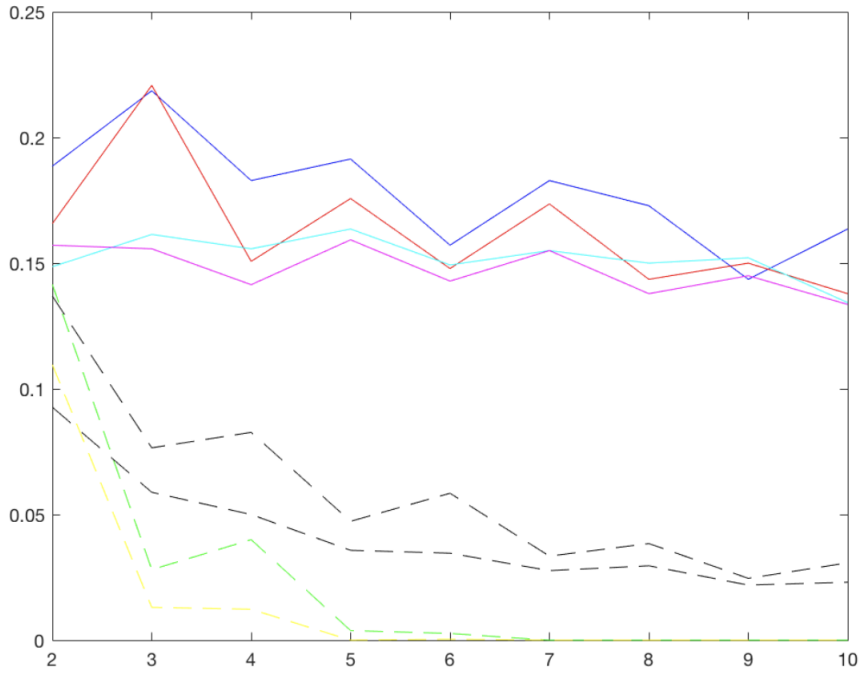
Dimension	Fisher Score
0.7340	25.0000
0.6837	29.0000
0.6695	11.0000
0.6661	47.0000
0.6315	19.0000
0.6174	34.0000
0.6021	32.0000
0.6021	30.0000
0.6000	9.0000
0.5971	56.0000
0.5953	27.0000
0.5929	60.0000
0.5881	51.0000
0.5874	26.0000
0.5845	53.0000
0.5797	7.0000
0.5709	10.0000
0.5686	61.0000
0.5567	43.0000
0.5422	44.0000

Problem 2. Bagging of classifiers
(*a*)



The top two lines are the test boosting and bagging errors, the bottom to lines are the boost and bag training. The X axis represents the T value and the Y value represents the error. We see that the training sets have much lower error in both cases. The test sets in general achieve a lower error as you increase the value of T.

(*b*)



All of the training set errors are dotted lines, and they are considerably lower than any of the test sets hinting that perhaps we have done a little bit of overfitting. The blue line is the boost algorithm run with dtfull, while it follows the same pattern as all the others in this specific example it preformed the worst. It should be noted however that the performance difference seems to be negligible. The red line is the bagging algorithm run with the dtfull, it preforms very comparably to the SVMbase bag and boost runs that we saw in part a.