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Machine Learning
Problem Set 12

Problem 1: Review Questions
Write a summary of the previous lecture on multiple classifier system. Write down all formulas we discussed in the lectures and explain in detail each step of derivations.

Problem 2: Scatter matrices
Prove mixture scatter matrix is equal to the summation of within-class and between-class scatter matrices, $S_m = S_w + S_b$.

Problem 3: Programming: Liquid Biopsy for Cancer Diagnosis-revisited
Extend/improve your implementation for HW6, problem 4. In particular, your task is to

(a) explore the data more.

(b) repeat the classification tasks using random forests and boosted trees with and without feature selection.

(c) use cross validation for performance assessment and provide a confidence interval for the accuracy of each method.

(d) use McNemar's test for comparing top three classifiers for two-class classification problem.

Submit your solutions (using Easyclass) by Azar 30.