E0 270 Machine Learning *Due:* Feb 28, 2012

Assignment 3 - Report

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1 Solution: Problem 1

Part (1)
Refer to Code

Part (2)

figure for 1a

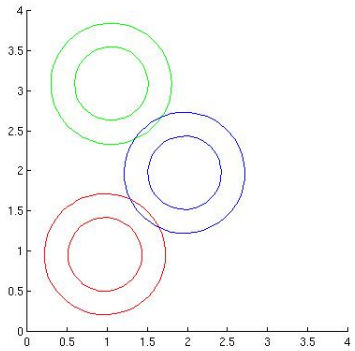


figure for 1b

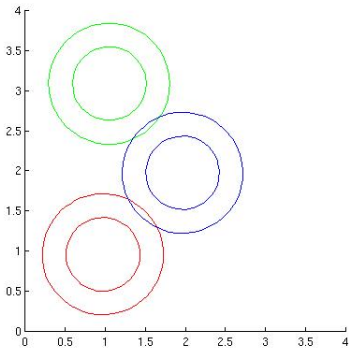


figure for 1c

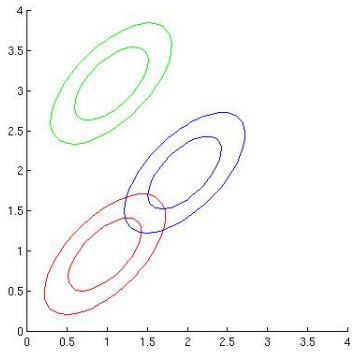


figure for 2a

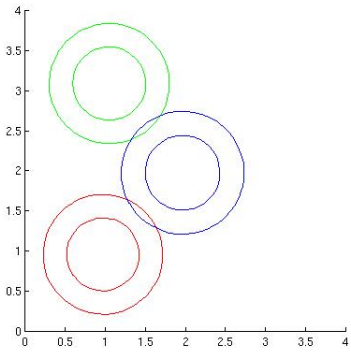


figure for 2b

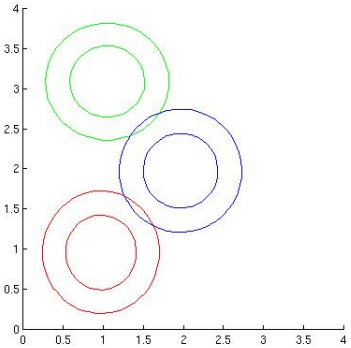
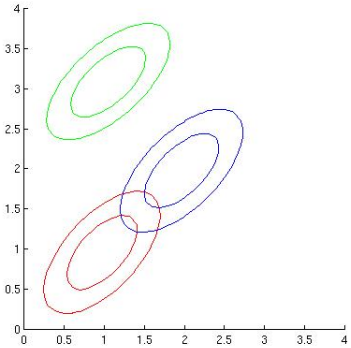


figure for 2c



Part (3)

figure for 1c

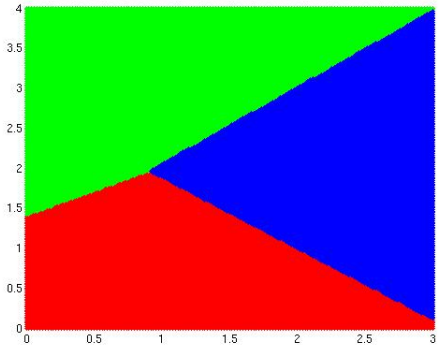
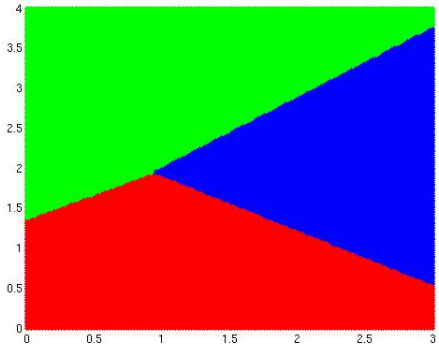
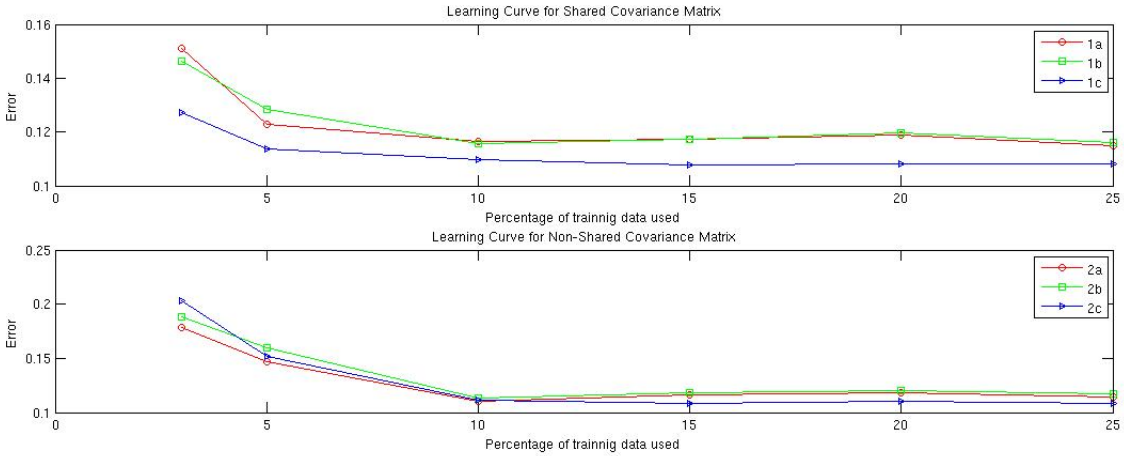


figure for 2c



In case of 1c, that is shared covariance matrix, the decision boundary is linear due to the shared covariance matrix.
Due to the shared covariance matrix, the quadratic term in the classifier cancels out and we get a linear decision boundary.
In case of 2c , where each class have different covariance matrix, this term remains in the classifier making the decision boundary non-linear.

Part (4)



In both the cases , the error reduces as we increase the number of training data.