Indian Institute of Technology Tirupati

Image Processing Lab

Lab sheet. No: 08

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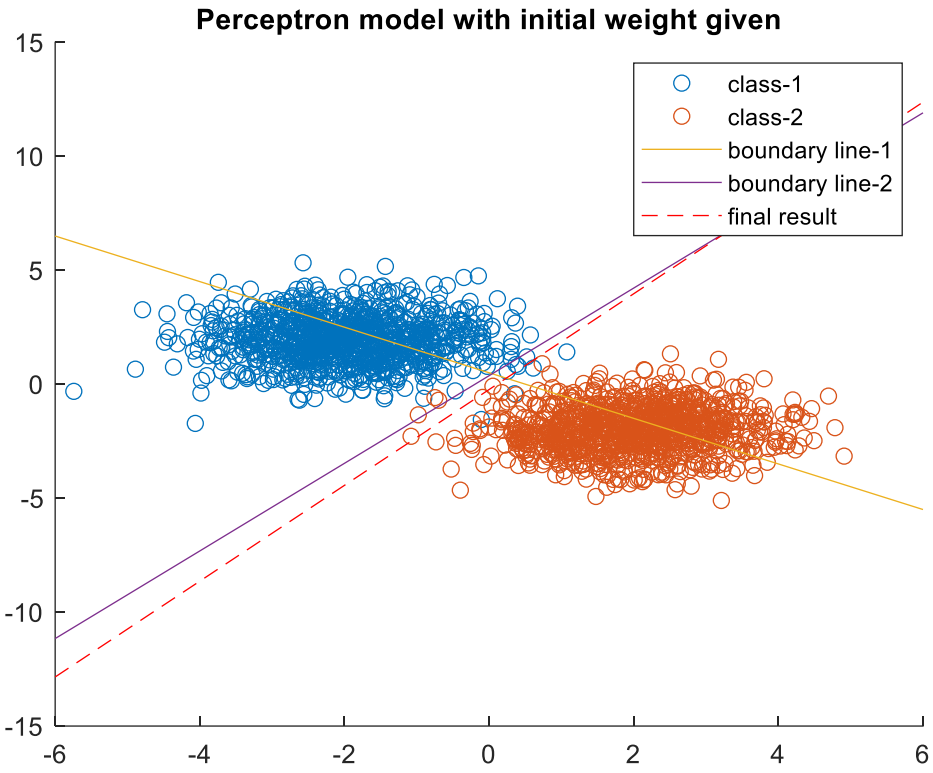
Q1_a.

Aim: To draw decision boundary between two mentioned classes using perceptron algorithm when initial weight vector is given.

Output:



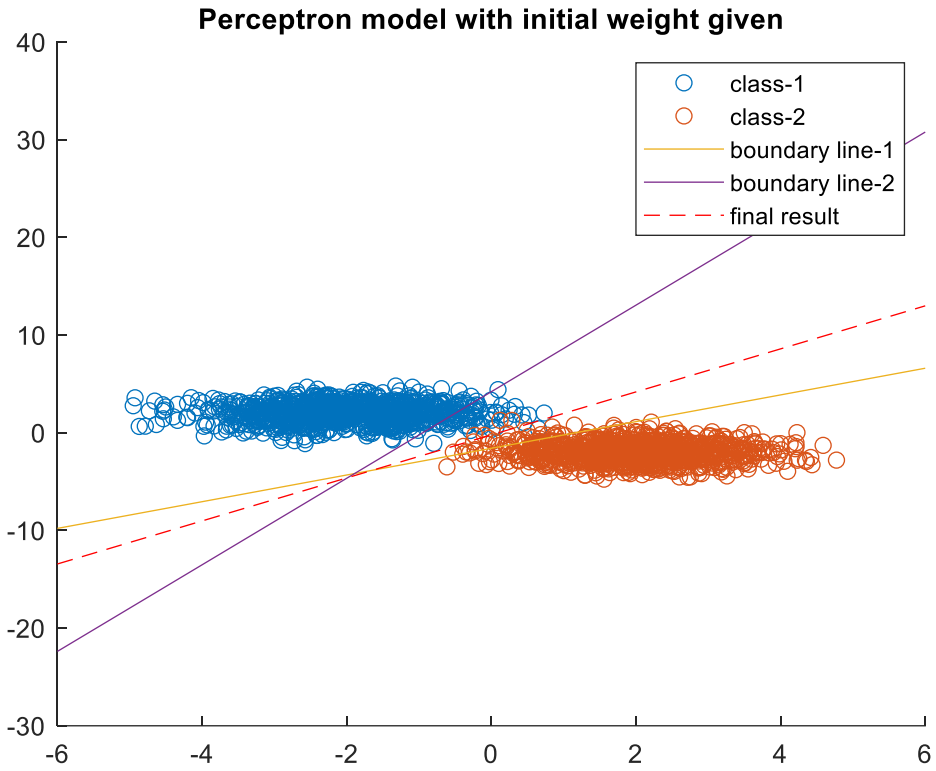
Inferences:

1. Initial weight vector = [1 1 -0.5]
2. Final weight vector obtained = [6.4 -4.5 -0.36]
3. Obtained efficiency = 0.9985
4. When learning rate is high , final decision border is reached quickly but maximum efficiency might not be attained.
5. When learning rate is low , final decision border will be reached slowly but maximum efficiency could be attained.
6. And learning rate should not be too high like around 1. Because chance is there that decision border will never be attained and loop will be running. That is , there might never be convergence.

Q1_b.

Aim: To draw decision boundary between two mentioned classes using perceptron algorithm when initial weight vector is randomly chosen.

Output:



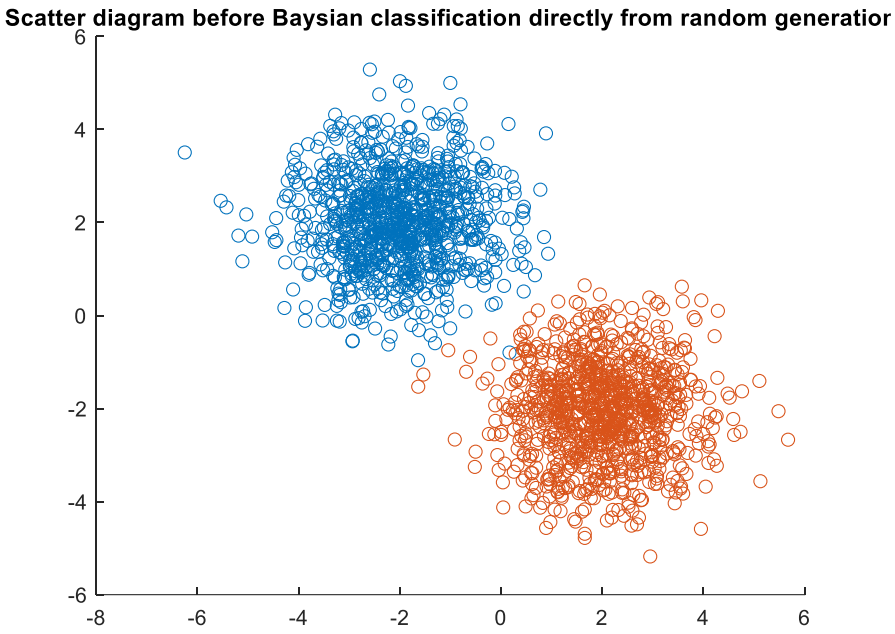
Inferences:

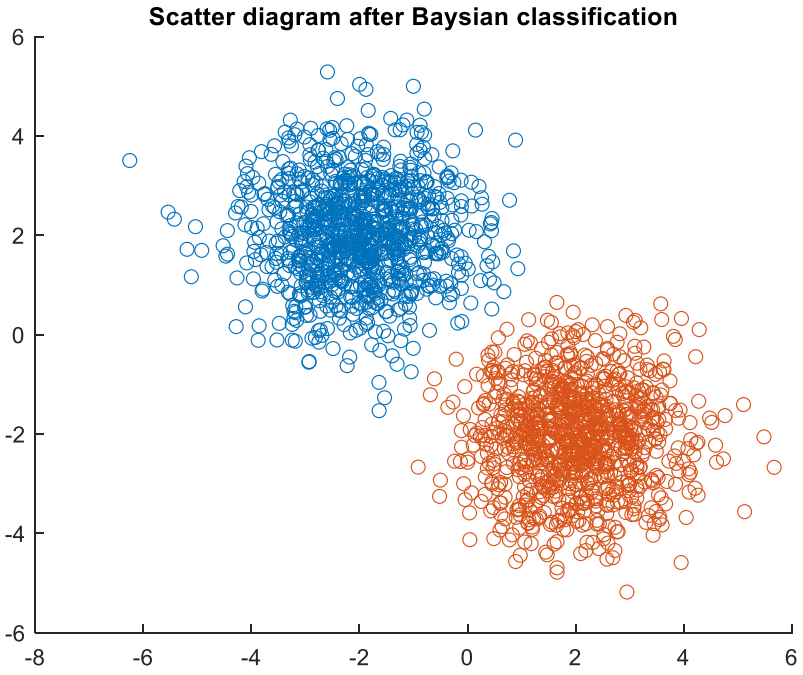
1. Initial weight vector generated randomly = [-1.7 4.23 2.45]
2. Final weight vector obtained = [12.05 -17.43 -8.9]
3. Efficiency = 0.9950.
4. When initial weights are random, number of iterations would vary randomly.
5. Initial efficiency also will be very random.

Q1_c.

Aim: To perform Bayesian classification of data generated in program 1.

Output:





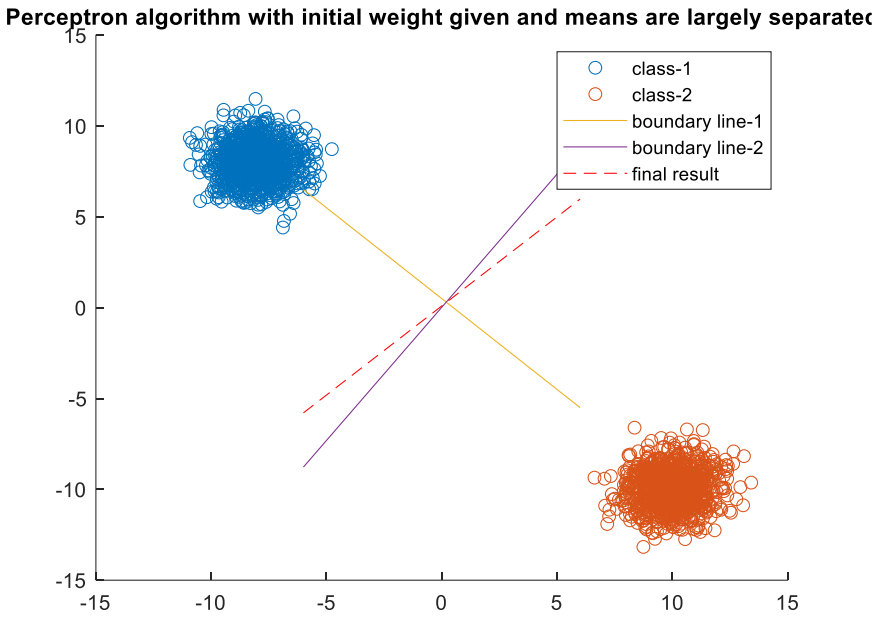
Inferences:

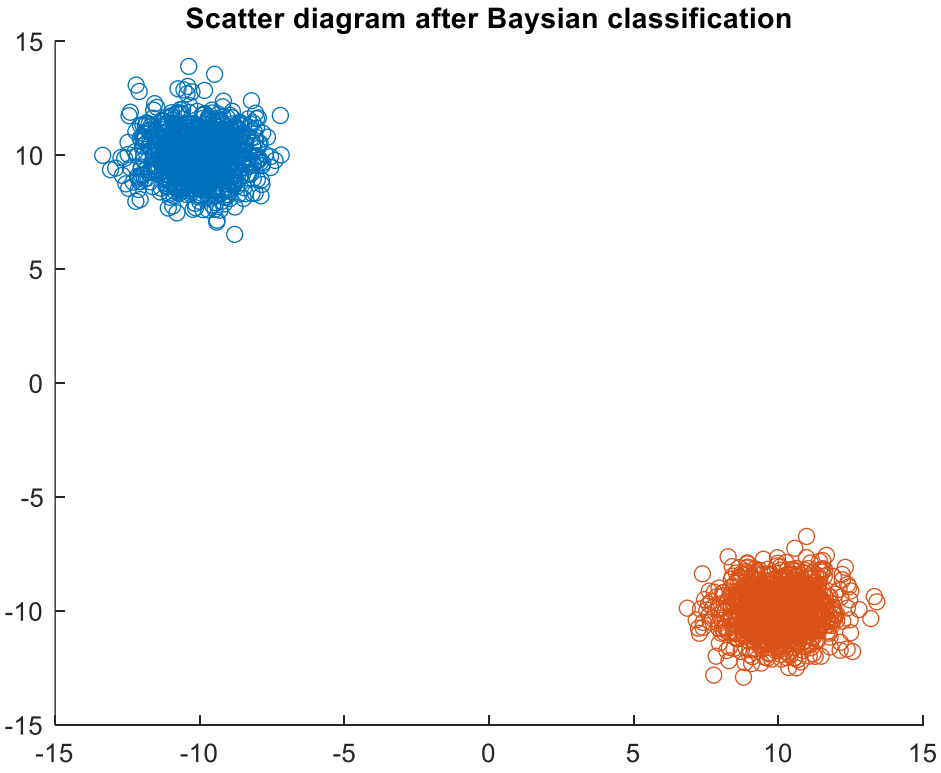
1. Efficiency = 0.9960
2. Efficiency is less in Bayesian classification compared to linear classification.

Q1_d.

Aim: To perform program 1 and 3 with means at large distance.

Output:





Inferences:

1. When means are largely separated, classification becomes easy. Chances are classification are negligible. Efficiency is almost equal to 1.