Assignment 1-A: Fischer's Linear Discriminant

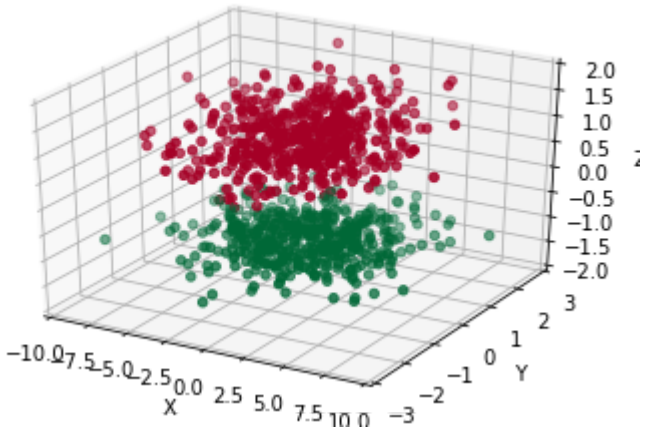
A)

Criteria for Fischer's is primarily, Minimising sum of variances of clusters and Maximising the differences of means.

Implementation of the Algorithm is as follows.

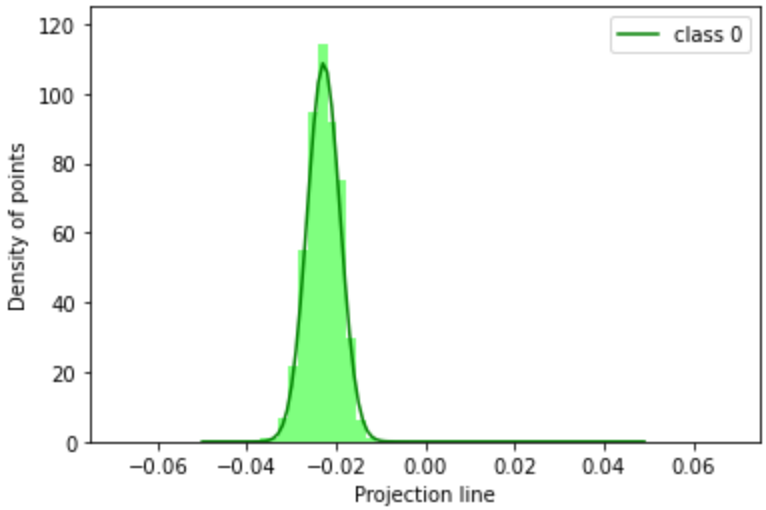
A) We first find out the means and standard deviations of both the clusters(only 2 classes we have), and calculate M1,M2.
B) We calculate the vector Sw.
C) We take projection of Sw(inverse) and M1-M2.
D) We then calculate the point on W, which would divide the points in the best possible way.
E) Then, we project these points(using normal distribution) on the unit vector direction(W) and calculate the intersection graphically.
F) The same can be extended to 3D as well.

B)

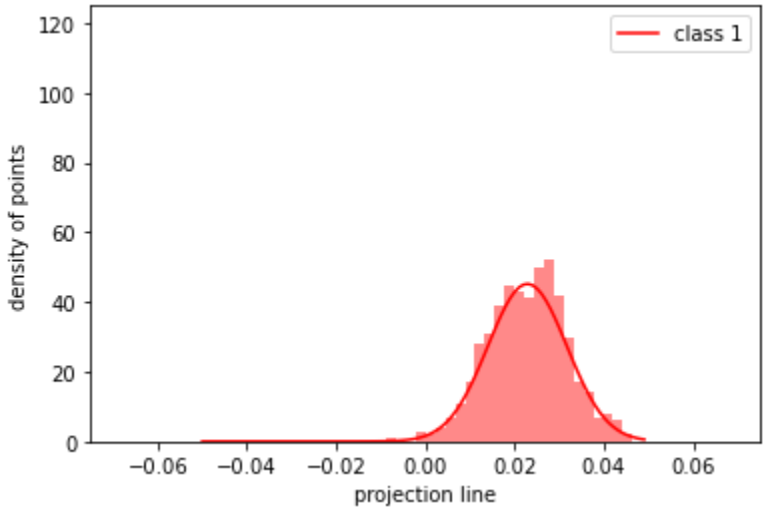


C)

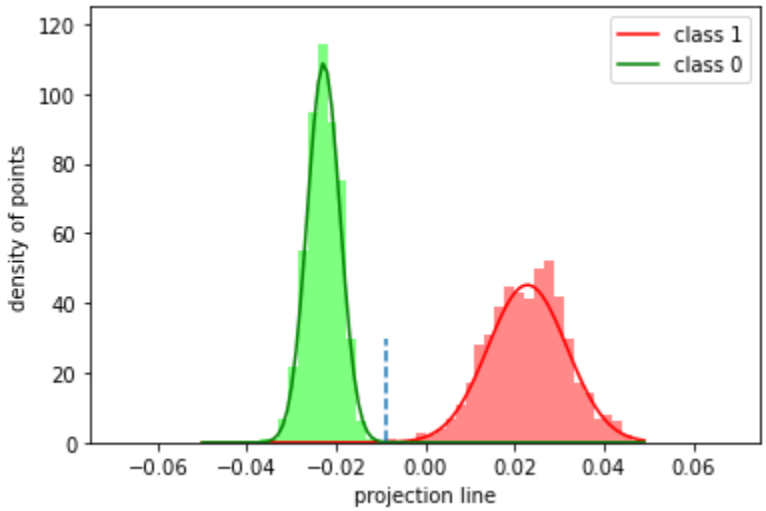
CLASS A:



CLASS B:

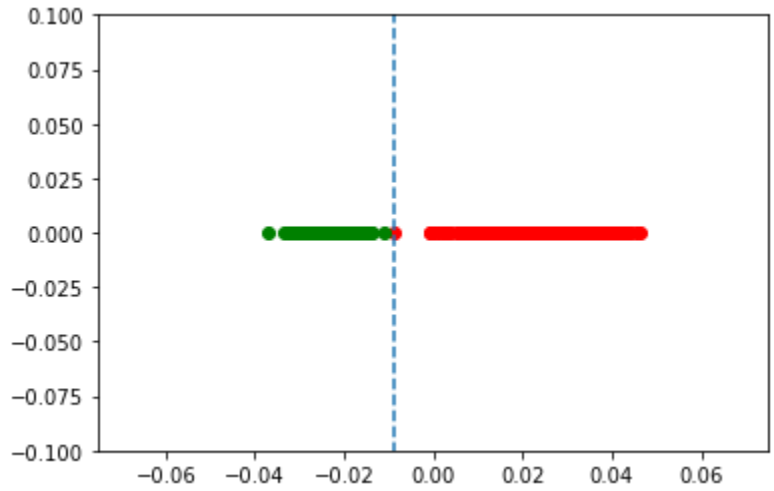


BOTH CLASSES ON SAME PLOT WITH THE INTERSECTION:



D)

1D INTERSECTION**:**



3D INTERSECTION: