

Machine Learning

Assignment Report (1A)

Team members:

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Fischer's LDA

Data pre-processing:

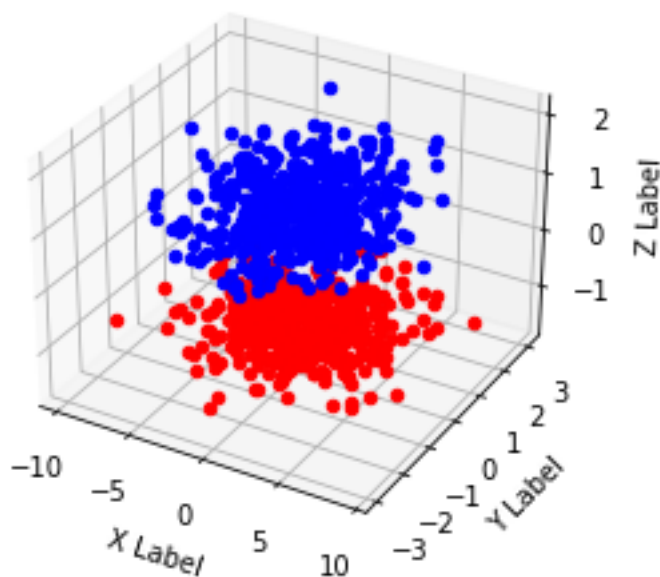
Reading the data as a pandas data frame was followed by separating the rows based on the target variable and storing those indices in a NumPy array.

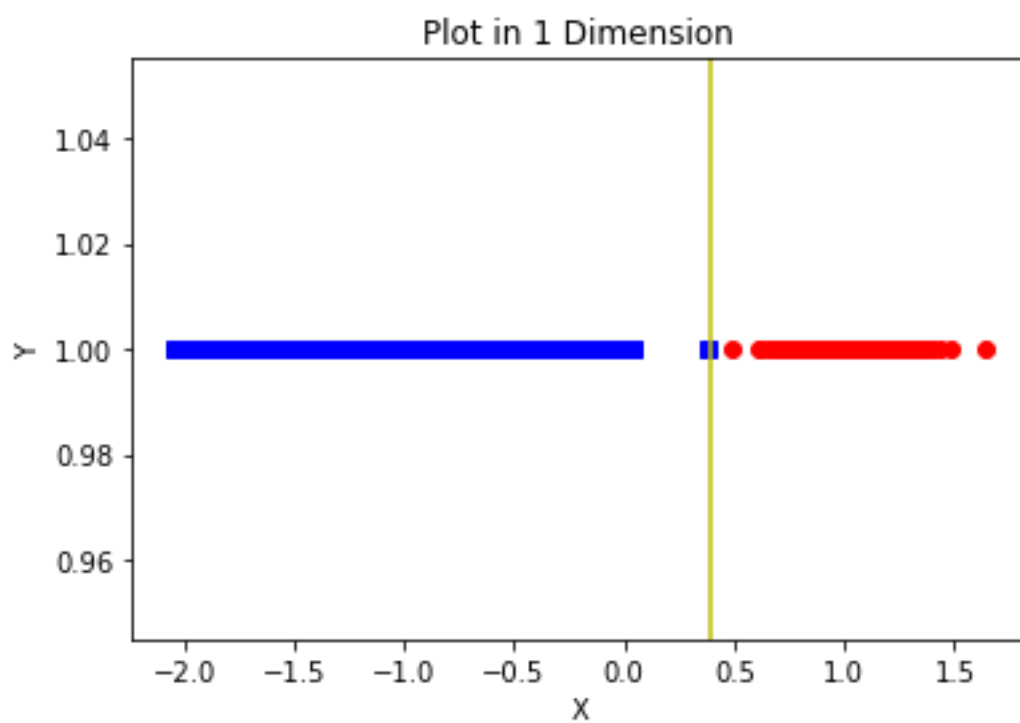
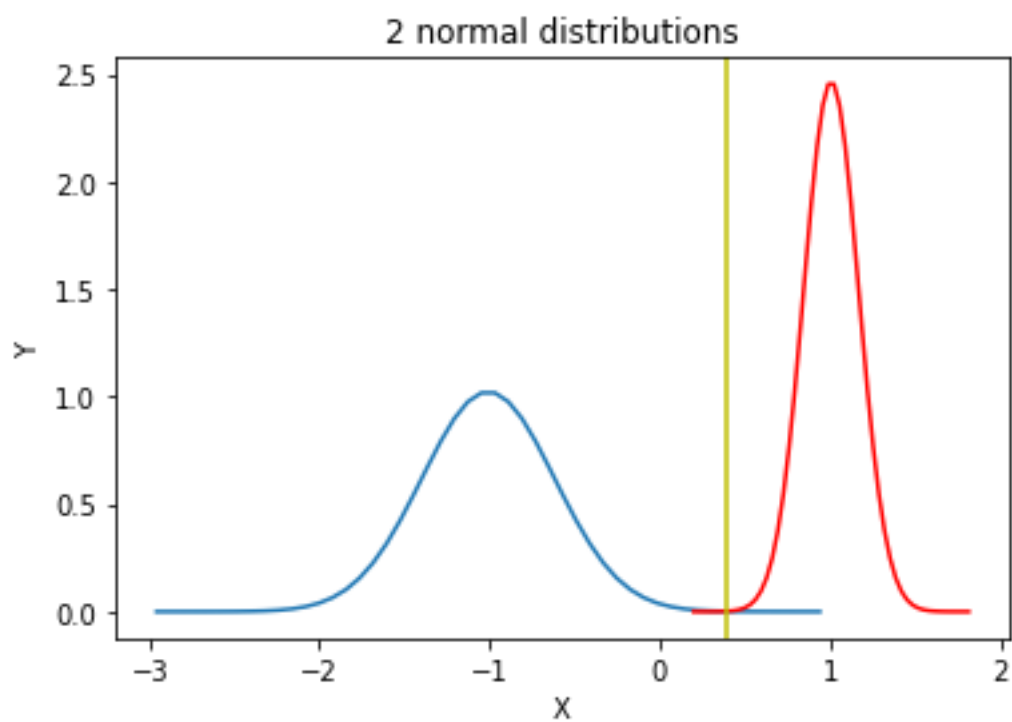
Model and Implementation details:

First, we found the means of the two classes of data and then used it to calculate the covariance matrix S_w by summing up the two covariances matrices of the corresponding classes.

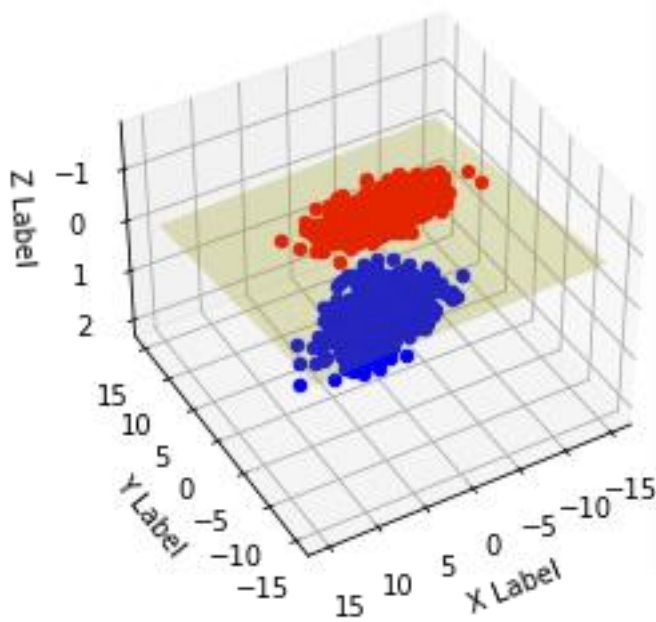
The vector w was found using the equation $w = S_w^{-1} \cdot (M_1 - M_0)$

3-D plot of the dataset





Hyper plane in 3-D



Results:

Intersection point in 1-D = 0.389

$W = \begin{bmatrix} 0.00655686 \\ 0.01823739 \\ -0.99981218 \end{bmatrix}$

The equation of plane in 3-D is given by:

$0.0065x + 0.0182y - 0.999z = 0.389$ where x, y and z are the three features in the given dataset

The accuracy of Fischer's Linear Discriminant is 100% i.e. no points are misclassified.