

# VIVEKANAND EDUCATION SOCIETY'S INSTITUTE OF TECHNOLOGY

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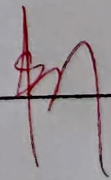


## Department of Artificial Intelligence and Data Science

Subject: ML

Class: D11AD

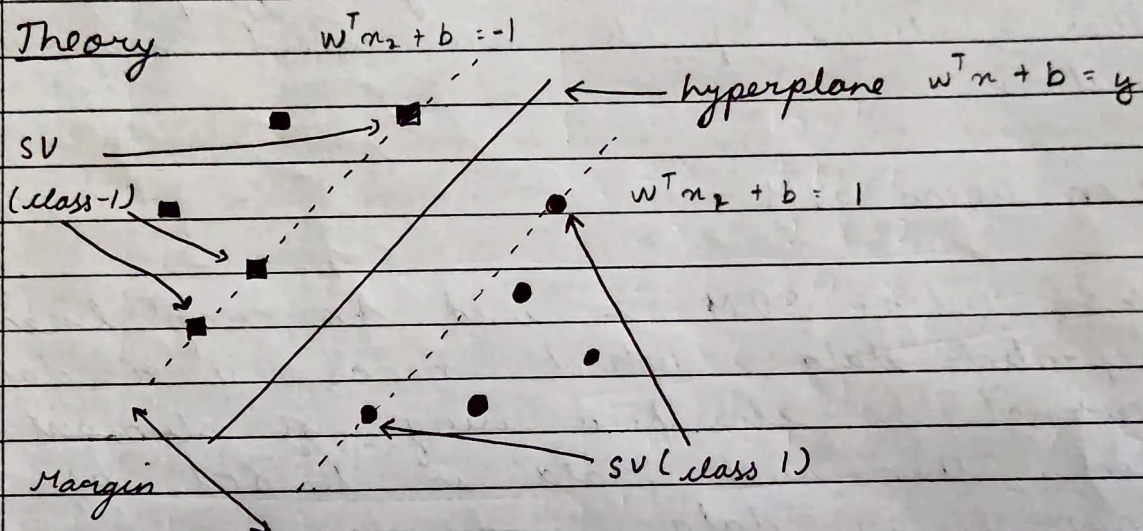
Semester: VI

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Exp No.:	Title:  <u>Support Vector Machine</u>		
DOP:		DOS:	
GRADE		LAB OUTCOME:	SIGNATURE: 

## ML experiment

Aim

Support Vector Machine

Theory

$$\hat{y} = \begin{cases} -1 & , \quad w^T x_i + b \leq -1 \\ 1 & , \quad w^T x_i + b \geq 1 \end{cases}$$

$$L = \max (0, 1 - y_i (w^T x_i + b))$$

↑

Hinge loss function.

The goal of the SVM algorithm is to create a best line or a decision boundary that can segregate  $n$  dimensional space into classes so that we can easily put the new data in the correct category in future.



This best decision boundary is called hyperplane.

SVM chooses the extreme points / vectors that help in the creating hyperplane. These extreme points are called support vectors.

Non linear SVM -

Non linear SVM is used for non-linearly separated data, which means if a dataset cannot be classified using a straight line, then such data is termed as non-linear data. and that

SVM has a technique called the kernel trick.

These are functions that take low dimensional input space and transform it into a higher dimensional space, i.e. it converts not separable problem to separable problem.

eg. Polynomial Kernel, Gaussian RBF

Conclusion -

Thus we have successfully implemented support vector machine.