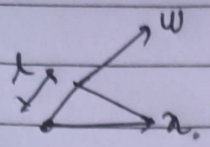
Support Vector Machine

DS - 05/04/2024

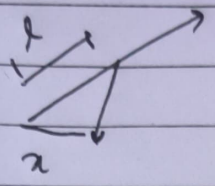
AM23MA022

$w^T x = l\|w\|$

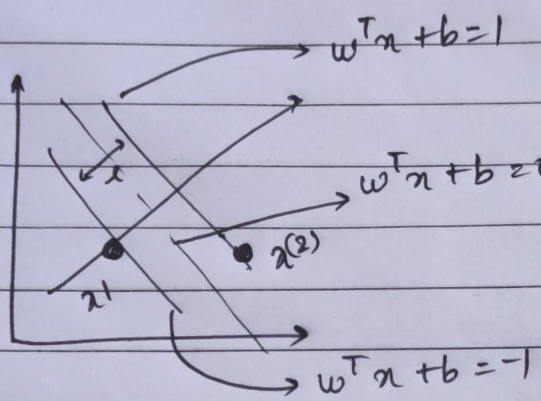
2 Problem
- hard margin
- soft margin



$w^T x > 0$



$w^T x \leq 0$



$w^T(x^1 - x^2) = l\|w\|$

$(1-b) - (-1-b) = l\|w\|$

$l\|w\| = 2$

$l = \frac{2}{\|w\|}$

$y^i(w^T x + b) + 1 \geq 0$

Squaring both sides →

$l = \frac{2}{\|w\|^2}$

$\max l = \max \frac{2}{\|w\|^2}$

for min,

$\min \frac{\|w\|}{2}$