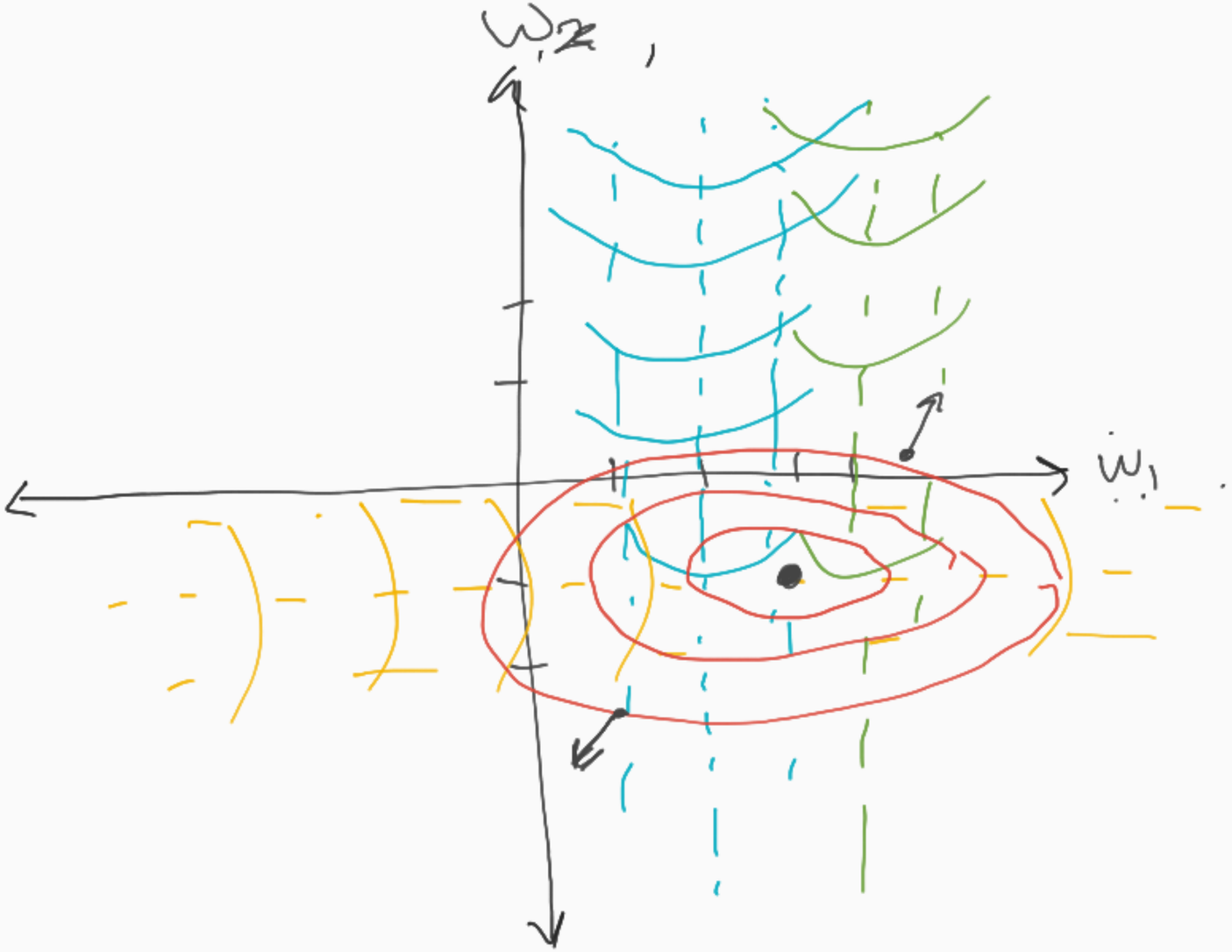
C221: Lecture 3

Loss(x, y, w)



$\rightarrow (w_1 - 2)^2$

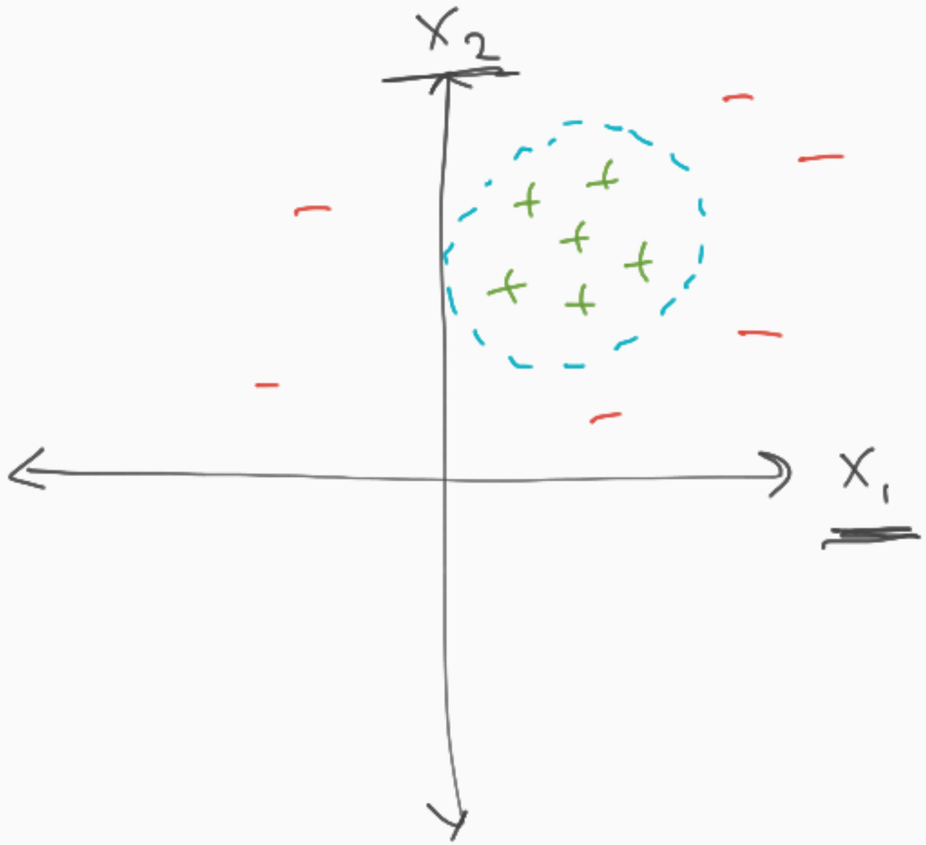
$\rightarrow (w_1 - 4)^2$

$\rightarrow (w_2 - (-1))^2$

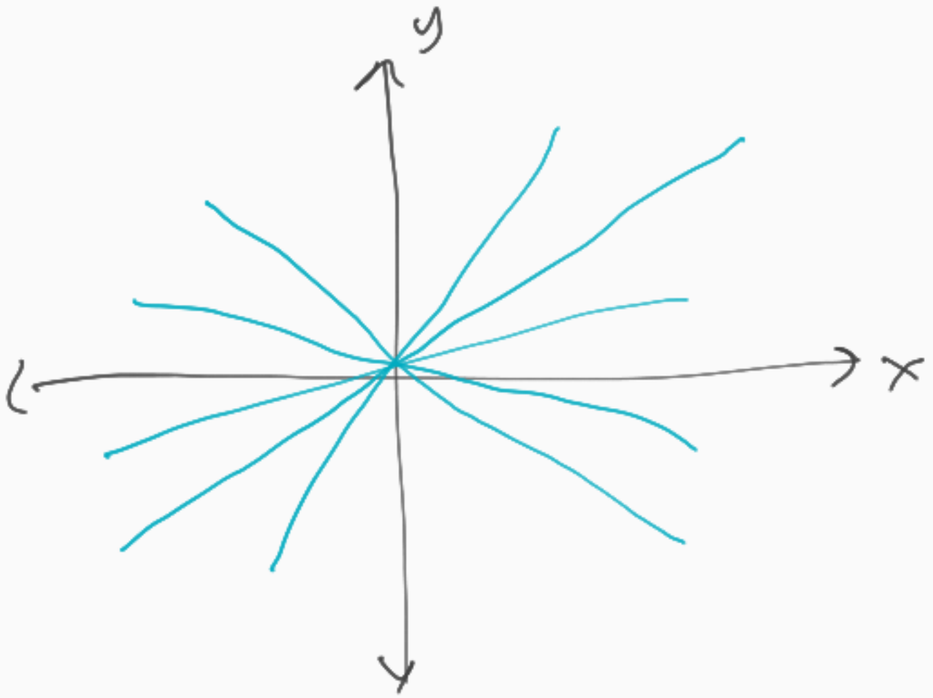
$$\text{Train Loss} = \frac{1}{|D|} \sum_i \text{Loss}$$

$$w \cdot \phi(x) = w_1 \phi_1(x) + w_2 \phi_2(x)$$

$$w = \begin{bmatrix} w_1 \\ w_2 \end{bmatrix}$$

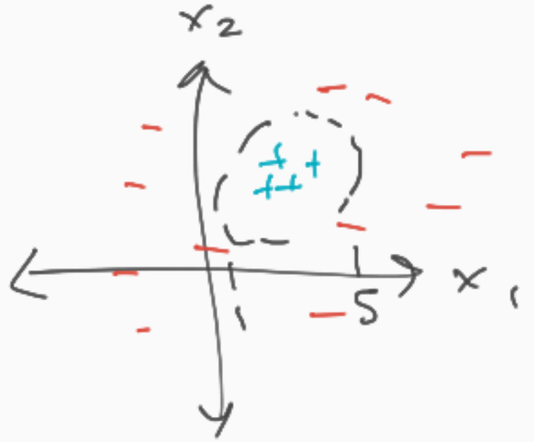


$\phi(x)$



$\phi(x) = x$

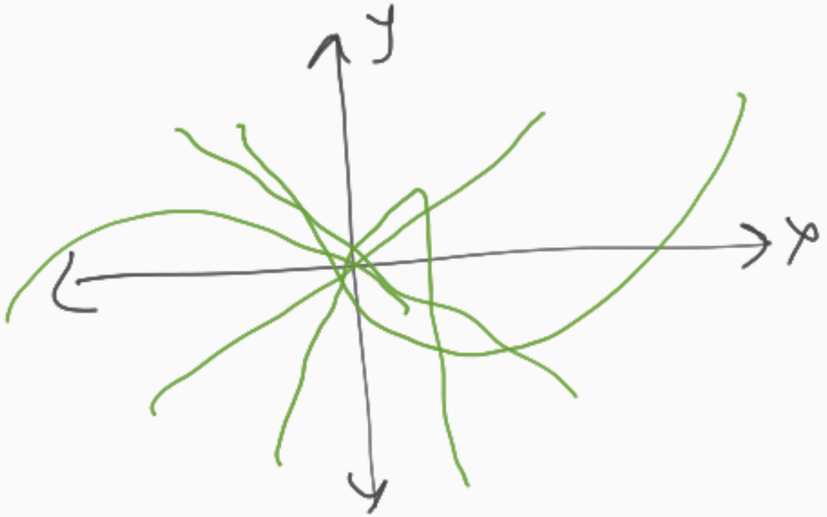
$f_w(x) = w \cdot \phi(x)$



$\phi_1(x) : x_1 < 5$

$\phi_2(x) : x_1 > 1$

$\vdots$

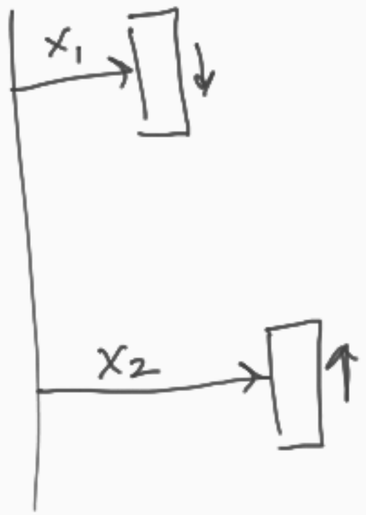


$\phi(x) = [x, x^2]$

$f_w(x) = w \cdot \phi(x) = w_1 x + w_2 x^2$

$w_2 = 0$

$\phi(x) = [x, 1]$ $\phi(x) = [x^2, 1]$ $\phi(x) = [x, x^2, 1]$



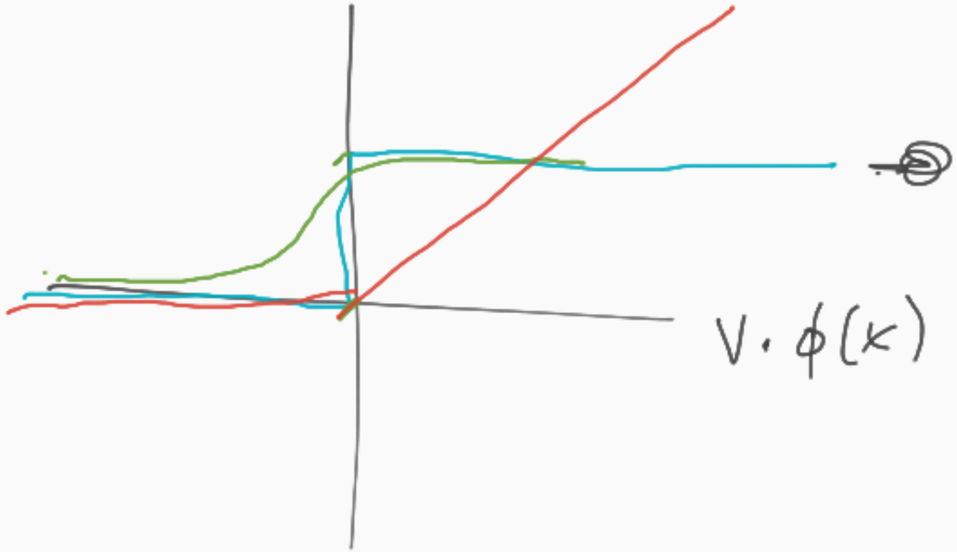
$$h_1 = \mathbb{1}(v \cdot \phi(x) \geq 0)$$

$$-1 + x_1 - x_2 \geq 0$$

$$\mathbb{1}\ (x_1 - x_2 \geq 1)$$

$$v = (-1, +1, -1)$$

$$\phi(x) = [1, x_1, x_2]$$



$$\max(a, b)$$

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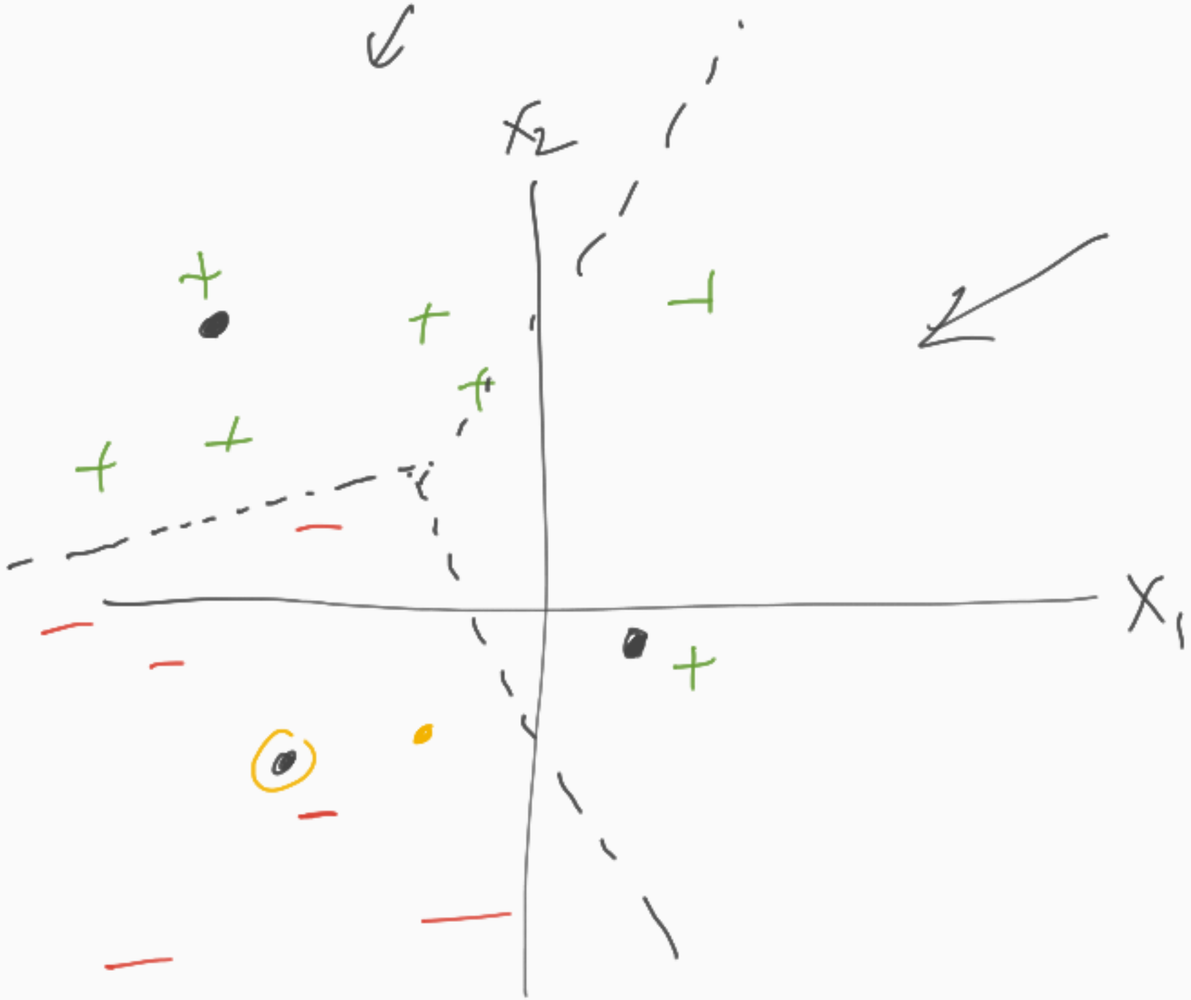
$$a \geq b \rightarrow \frac{\partial}{\partial a} = 1$$

$$\frac{\partial}{\partial b} = 0$$

$$a \leq b$$


x_2
x_1