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SUDHA DEVI

Q

4 Subjective Question [2 marks]

Suppose you train a logistic regression classifier and your hypothesis function h is

$$h_\theta(x) = g(\theta_0 + \theta_1 x_1 + \theta_2 x_2)$$

where,

$$\theta_0 = 6, \ \theta_1 = 0, \ \theta_2 = -1$$

Draw the decision boundary for the given classifier (a rough sketch is sufficient). What would happen to the decision boundary if you replace the coefficient of x_1 and x_2? Draw the decision boundary for the second case as well.
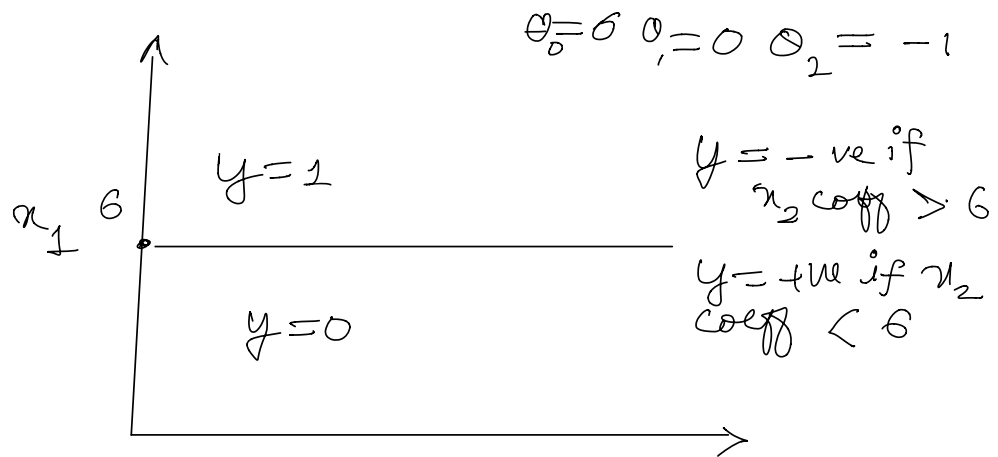
Sol:- Given $h_\theta(x) = g(\theta_0 + \theta_1 x_1 + \theta_2 x_2)$

and $\theta_0 = 6, \ \theta_1 = 0, \ \theta_2 = -1$

$$h_\theta(x) = g(6 + 0 \cdot x_1 + (-1) x_2)$$
$$= g(6 - x_2)$$
$$h_\theta(x) = g(6 - x_2)$$

Input	Coefficient	Value 1	Value 2
	θ_0	6	6
x_1	θ_1	0	0
x_2	θ_2	-1	-1

$\theta_{\overline{0}} = 6 \quad \theta_1 = 0 \quad \theta_2 = -1$

x_1 6

$y = 1$

$y = 0$

$y = -ve$ if x_2 coeff > 6

$y = +ve$ if x_2 coeff < 6

x_2

After swapping the coefficient.

$\theta_0 = 6 \quad \theta_1 = -1 \quad \theta_2 = 0$

x_2

$y = 1$
1

$y = 0$

x_1
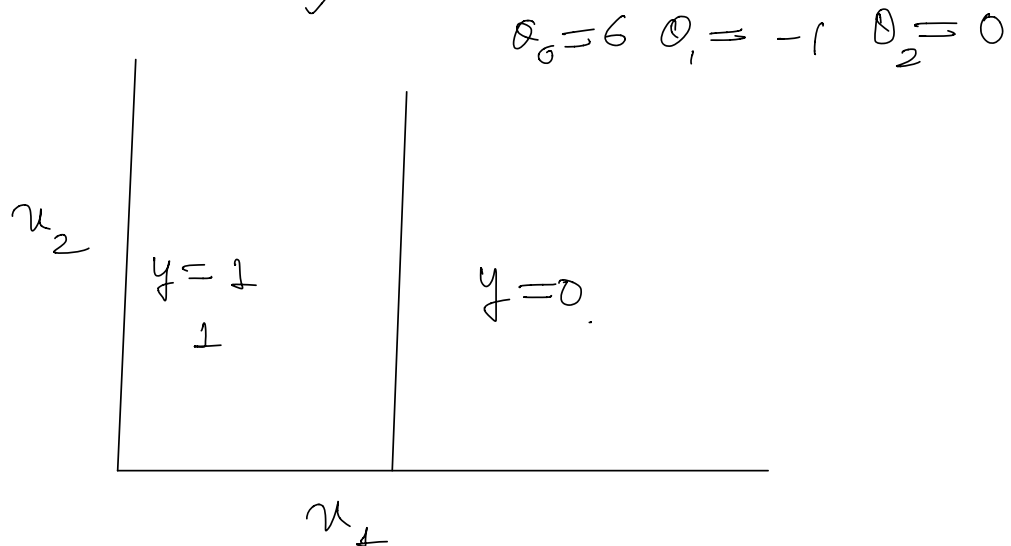
$y = 6 - \theta_1$, if $y = 0 \quad x_1 = 6$

x_1 coeff $= 6$

$y = -1$ if $x_1 > 6$

$y = +1$ if $x_1 < 6$