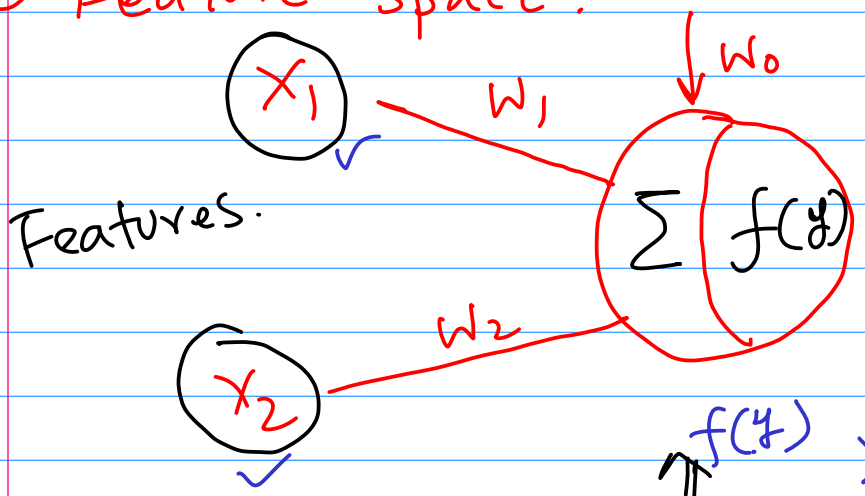
① Activation.

② Squashing functions.

- Binary threshold Logic Neuron
- Linear Neuron.
- Sigmoid Neuron
- Gaussian Neuron.

① Feature Space :

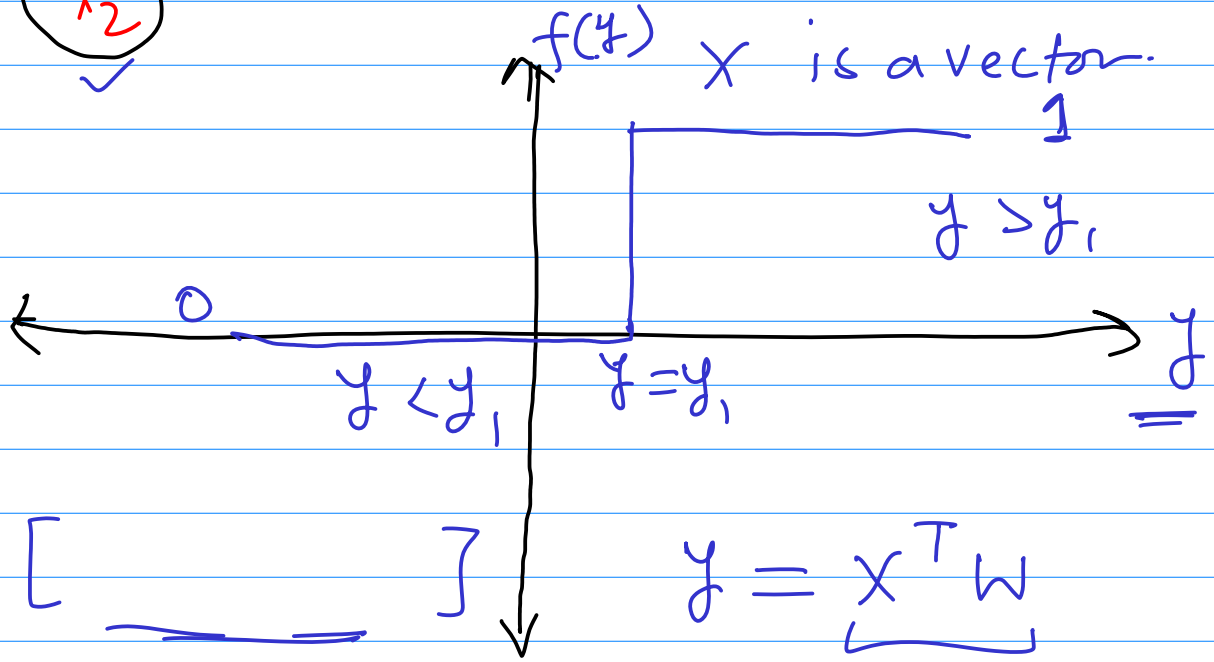


Features.

$y = w_1x_1 + w_2x_2 + w_0$

$X = [x_1\ x_2\ x_3 \cdots x_n]$

X is a vector.

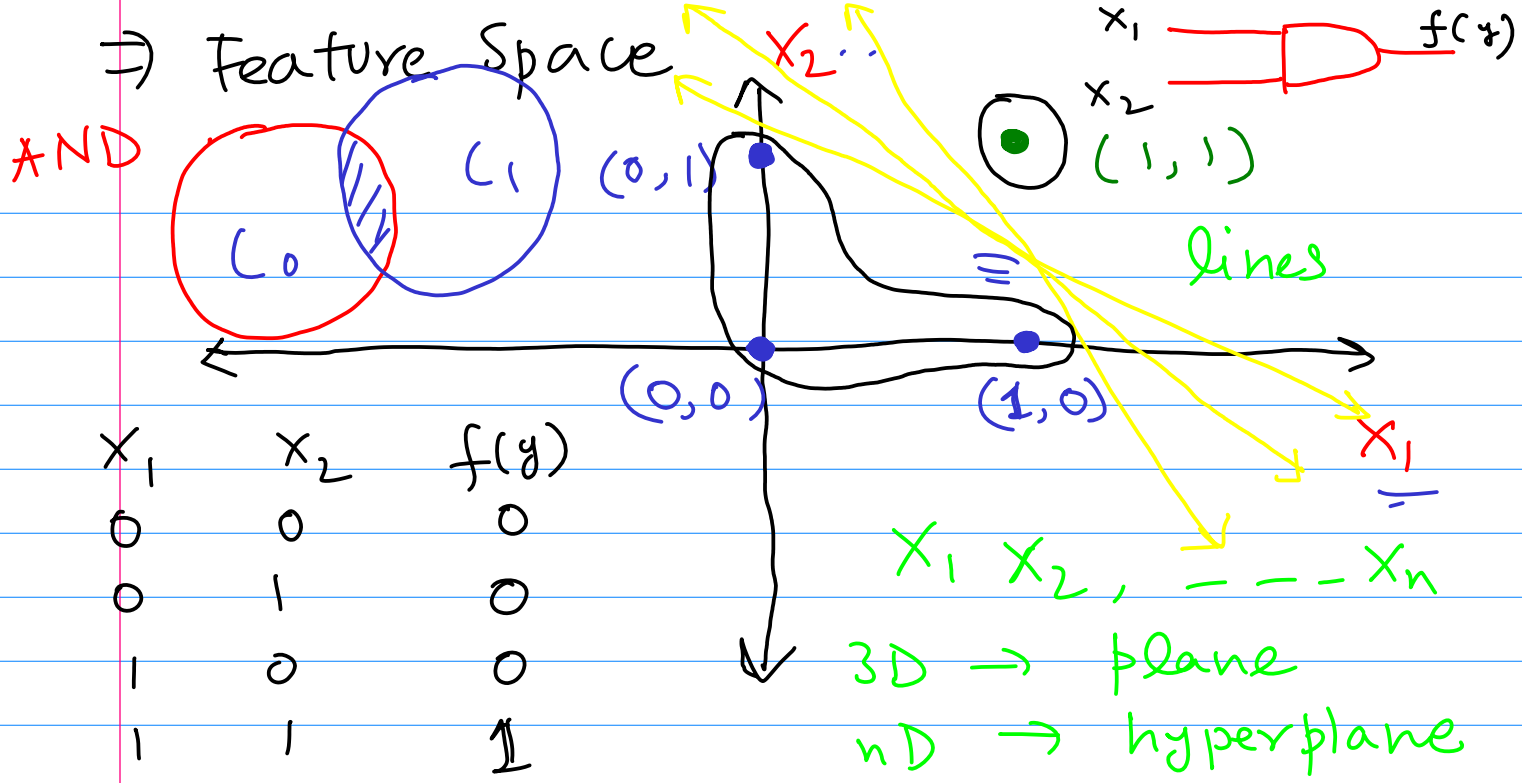


$X = [\quad\quad]$

$y = X^T W$

$W = [\quad\quad]$

⇒ Feature Space



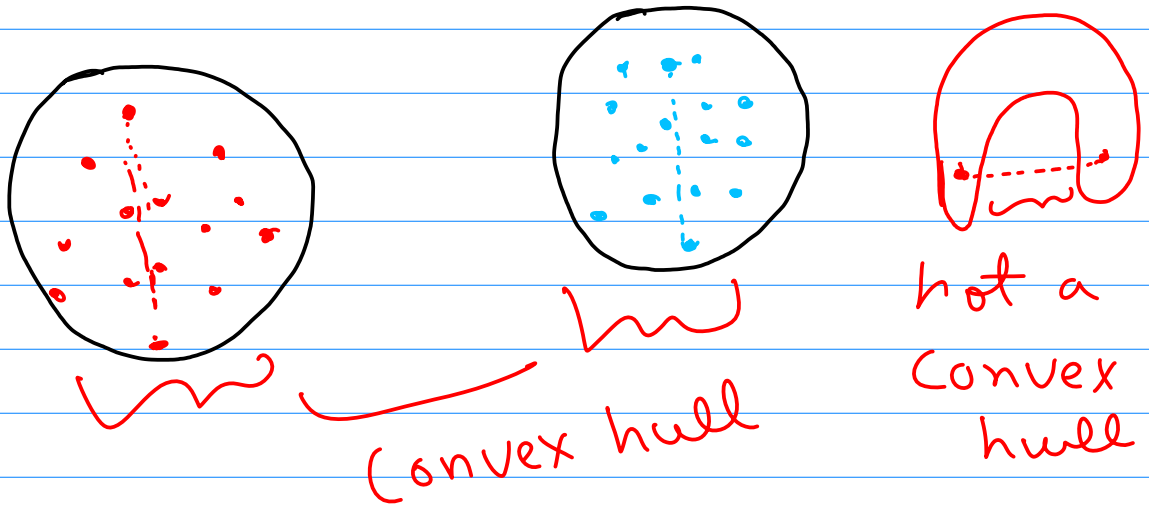
X_1	X_2	f(y)
0	0	0
0	1	0
1	0	0
1	1	1

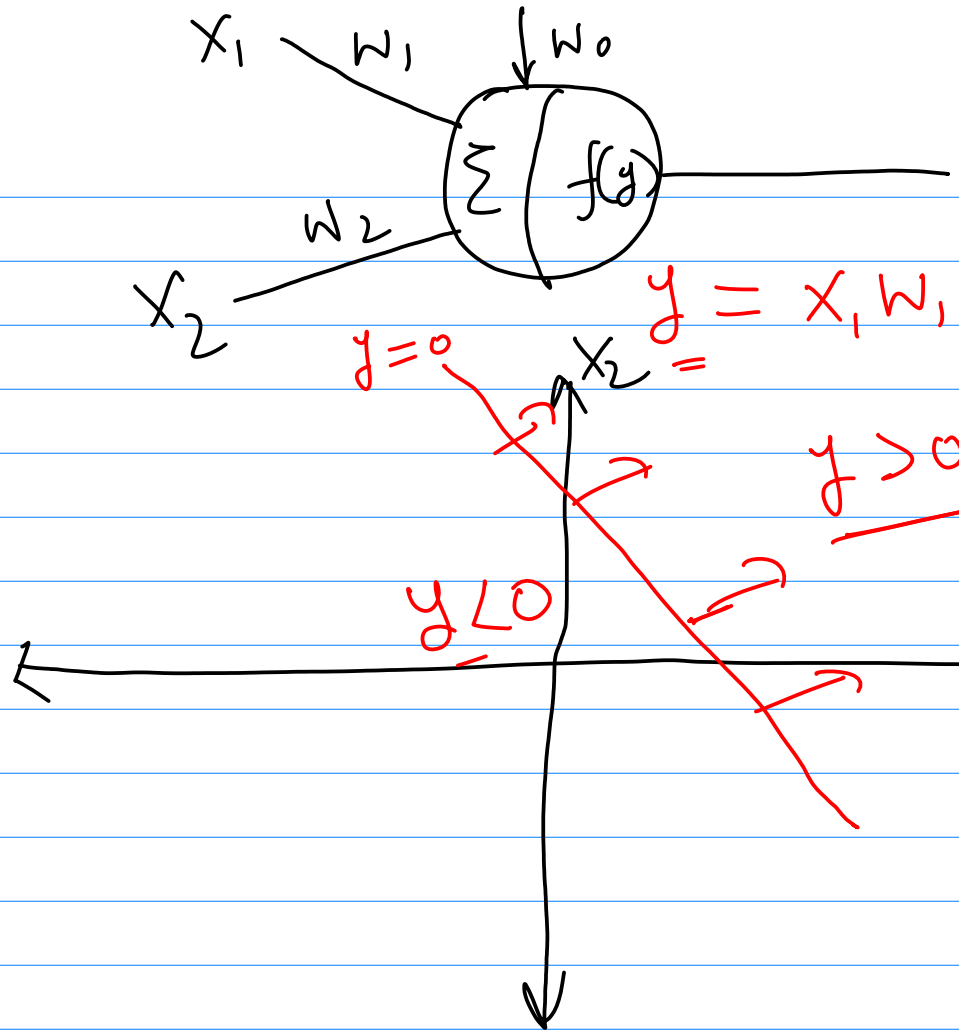
Classification | two class Problem.

$C_1 = 1$ $C_0 = 0$

Linearly Separable Problems which can be classified using a simple line or hyperplane.

Convex hulls :-





$$0 = x_1 w_1 + x_2 w_2 + w_0$$

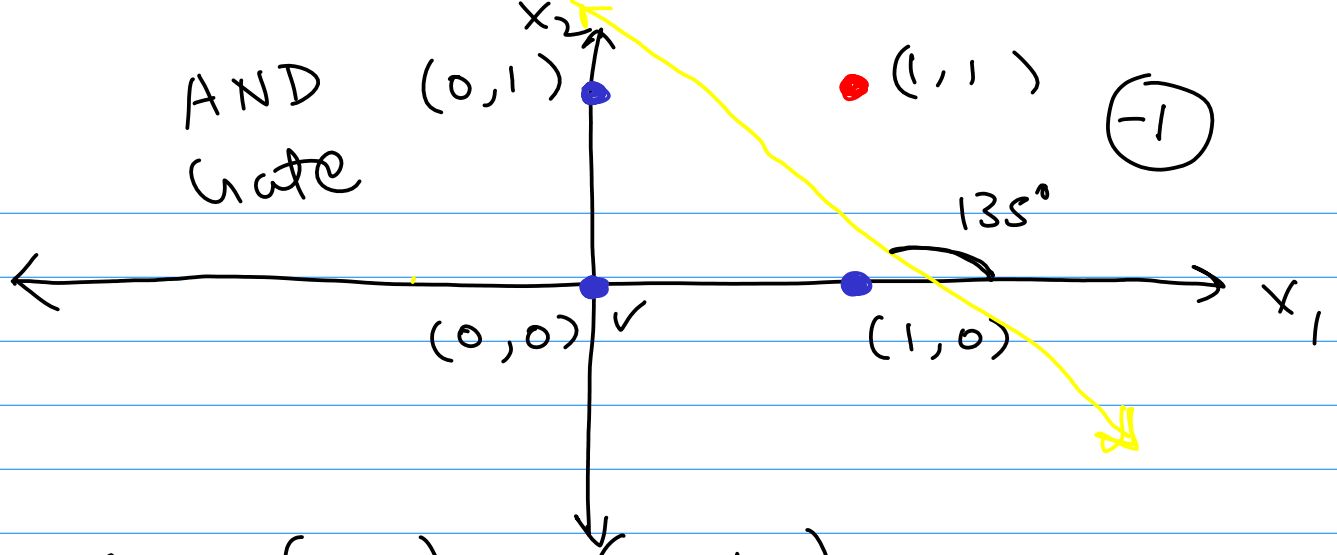
$$\Rightarrow \quad x_2 w_2 = -x_1 w_1 - w_0$$

$$x_2 = \left(\frac{-w_1}{w_2}\right) x_1 - \left(\frac{w_0}{w_2}\right)$$

m $\quad$ c

$$\boxed{x_2 = m x_1 + c}$$

equation of straight line



$$x_2 = \left(-\frac{w_1}{w_2}\right) x_1 \left(-\frac{w_0}{w_2}\right)$$

$$\frac{-w_0}{w_2} = 2 \Rightarrow w_2 = -\frac{w_0}{2}$$

$$\frac{-w_1}{w_2} = -1 \Rightarrow w_1 = w_2$$

$w_1 = 1$

$w_0 = -2$ $\quad w_2 = 1$

$$y = x_1 + x_2 - 2 \rightarrow -1.5$$

BTLN

$y > 0$ (T)

$y < 0$ 0.

$$y = x_1 + x_2 - 1.5$$

DHA : Solve OR Gate with Similar Method. ✓