

① Perceptron-based multi-layer nets Boolean Functions

$X_1 \text{ AND } X_2 \rightarrow 2 \text{ variable} \rightarrow X_1 \wedge X_2$

X_1	X_2	result
0	0	0
0	1	0
1	0	1
1	1	0

$$\rightarrow w = \begin{bmatrix} w_0 \\ w_1 \\ w_2 \end{bmatrix} \quad X = \begin{bmatrix} X_0 \\ X_1 \\ X_2 \end{bmatrix}$$

$\begin{cases} w_0 = -0.5 \\ w_1 = 1 \\ w_2 = -1 \end{cases}$
 $X_0 = 1$

$X_1 \text{ XOR } X_2 \rightarrow 2 \text{ variable} \rightarrow X_1 \oplus X_2$

X_1	X_2	result
0	0	0
0	1	1
1	0	1
1	1	0

$$w = \begin{bmatrix} -30 \\ 20 \\ 20 \end{bmatrix} \quad X = \begin{bmatrix} 1 \\ X_1 \\ X_2 \end{bmatrix}$$