

# Perceptron Learning Example XOR

X<sub>0</sub>

1  
1  
1  
1

Perceptron Learning Example XOR											
		Bias Input X <sub>0</sub> = +1				Alpha => 0.5					
Input	Input	1.0*W <sub>0</sub>	X <sub>1</sub> *W <sub>1</sub>	X <sub>2</sub> *W <sub>2</sub>	Net Sum	Target	Actual	Alpha*	Weight Values		
X <sub>1</sub>	X <sub>2</sub>				Input	Output	Output	Error	W <sub>0</sub>	W <sub>1</sub>	W <sub>2</sub>
						t	o	a(t-o)	0.5	0.5	0.5
0	0	1 × 0.5 = 0.5	0 × 0.5 = 0	0 × 0.5 = 0	= 0.5	0	1	0.5(0-1) = -0.5	0.5 + (-0.5 × 1) = 0	0.5 + (-0.5 × 0) = 0.5	0.5 + (-0.5 × 0) = 0.5
0	1	1 × 0 = 0	0 × 0.5 = 0	1 × 0.5 = 0.5	= 0.5	0	1	0.5(0-1) = -0.5	0 + (-0.5 × 1) = -0.5	0.5 + (-0.5 × 0) = 0.5	0.5 + (-0.5 × 1) = 0
1	0	1 × -0.5 = -0.5	1 × 0.5 = 0.5	0 × 0 = 0	= 0	0	1	0.5(0-1) = -0.5	-0.5 + (-0.5 × 1) = -1	0.5 + (-0.5 × 0) = 0	0.5 + (-0.5 × 1) = 0
1	1	1 × -1 = -1	1 × 0 = 0	1 × 0 = 0	= -1	1	0	...	...	...	...

$$F(\text{netsum}) = \begin{cases} 1; & \text{netsum} \geq 0 \\ 0; & \text{netsum} < 0 \end{cases}$$

$$W_{i(\text{new})} = W_{i(\text{old})} + [(\alpha(t-o)) X_i]$$

$$W_{i(\text{new})} = W_{i(\text{old})} + [\alpha(t-o) X_i]$$

ทำแบบนี้ไปเรื่อยๆ ให้ครบ 6 Epoch

Perceptron Learning Example XOR

		Bias Input X0 = +1					Alpha =>	0.5			
Input	Input				Net Sum	Target	Actual	Alpha*	Weight Values		
X1	X2	1.0*W0	X1*W1	X2*W2	Input	Output	Output	Error	W0	W1	W2
						t	o	a(t-0)	0.5	0.5	0.5
0	0	0.5	0	0	0.5	0	1	-0.5	0	0.5	0.5
0	1	0	0	0.5	0.5	0	1	-0.5	-0.5	0.5	0
1	0	-0.5	0.5	0	0	0	1	-0.5	-1	0	0
1	1	-1	0	0	-1	1	0	0.5	-0.5	0.5	0.5
0	0	-0.5	0	0	-0.5	0	0	0	-0.5	0.5	0.5
0	1	-0.5	0	0.5	0	0	1	-0.5	-1	0.5	0
1	0	-1	0.5	0	-0.5	0	0	0	-1	0.5	0
1	1	-1	0.5	0	-0.5	1	0	0.5	-0.5	1	0.5
0	0	-0.5	0	0	-0.5	0	0	0	-0.5	1	0.5
0	1	-0.5	0	0.5	0	0	1	-0.5	-1	1	0
1	0	-1	1	0	0	0	1	-0.5	-1.5	0.5	0
1	1	-1.5	0.5	0	-1	1	0	0.5	-1	1	0.5
0	0	-1	0	0	-1	0	0	0	-1	1	0.5
0	1	-1	0	0.5	-0.5	0	0	0	-1	1	0.5
1	0	-1	1	0	0	0	1	-0.5	-1.5	0.5	0.5
1	1	-1.5	0.5	0.5	-0.5	1	0	0.5	-1	1	1
0	0	-1	0	0	-1	0	0	0	-1	1	1
0	1	-1	0	1	0	0	1	-0.5	-1.5	1	0.5
1	0	-1.5	1	0	-0.5	0	0	0	-1.5	1	0.5
1	1	-1.5	1	0.5	0	1	1	0	-1.5	1	0.5
0	0	-1.5	0	0	-1.5	0	0	0	-1.5	1	0.5
0	1	-1.5	0	0.5	-1	0	0	0	-1.5	1	0.5
1	0	-1.5	1	0	-0.5	0	0	0	-1.5	1	0.5
1	1	-1.5	1	0.5	0	1	1	0	-1.5	1	0.5

คำนวณ Accurate : Ac =  $\frac{TP + TN}{\text{all}}$

$$= \frac{4 + 0}{4} \times 100\%$$

$$= 100\%$$

หมายความว่าโมเดลนี้มีความแม่นยำ 100% ตอบ \*

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