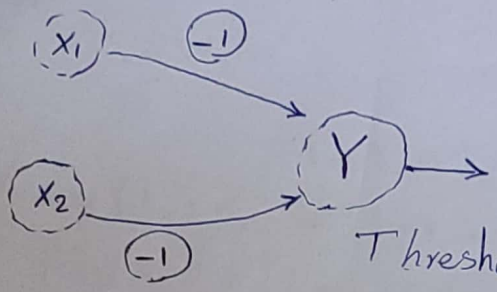
هوم ورک اول درس شبکه عصبی

مهدی فقیر ← ۴۰۱۷۲۲۱۳۶

مسئله ۱

الف) گیت NOR:

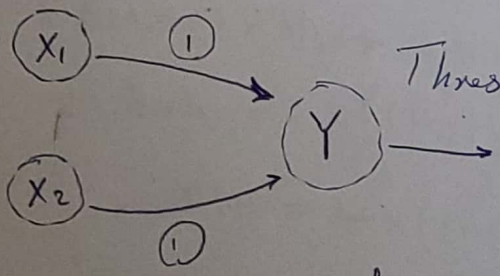
X_1	X_2	Y
0	0	1
0	1	0
1	0	0
1	1	0



$$\Rightarrow H(-X_1 - X_2 - (-0.5)) = \begin{cases} 1 & >0 \\ 0 & otherwise \end{cases}$$

ب) گیت OR:

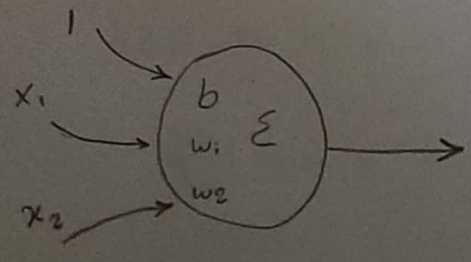
X_1	X_2	Y
0	0	0
0	1	1
1	0	1
1	1	1



$$H(X_1 + X_2 - 0.5) = \begin{cases} 1 & >0 \\ 0 & otherwise \end{cases}$$

مسئله ۲

X_1	X_2	Y
0	0	1
0	1	0
1	0	0
1	1	0



X_1	X_2	bias	target
1	1	1	-1
1	-1	1	-1
-1	1	1	-1
-1	-1	1	+1

اولین مرحله:

input (-1, -1) out put = 1

$y = 1 \times (0.1) + (0.2 \times -1) + (0.3 \times -1) = -0.14$

$b = 0.1 + 0.1 (1 - (-14)) \times 1 = 0.124$

$w_1 = 0.2 + 0.1 (+1 - (-14)) \times -1 = 0.106$

$w_2 = 0.3 + 0.1 (+1 - (-14)) \times -1 = 0.116$

دومین مرحله:

input (-1, 1) out put = -1

$y = 1 \times (0.124) - 1 \times 0.106 + 0.116 \times 1 = 0.134$

$b = 0.124 + 0.1 (-1 - (0.134)) \times 1 = 0.106$

$w_1 = 0.106 + 0.1 (-1 - (0.134)) \times -1 = 0.194$

$w_2 = 0.116 + 0.1 (-1 - (0.116)) \times 1 = 1.044$

سومین مرحله:

input (1, -1) output = -1

$y = 1 \times 0.106 + 1 \times 0.194 - 1 \times 1.044 = 0.256$

$b = 0.106 + 0.1 (-1 - (0.256)) \times 1 = -0.196$

$w_1 = 0.194 + 0.1 (-1 - (0.256)) \times 1 = 0.684$

$w_2 = 1.044 + 0.1 (-1 - (0.256)) \times -1 = 1.096$

input (1,1) output = -1

$y = -1.0196 + 1.0684 + 1.1696 = 1.2184$

$b = -1.0196 + 0.1(-1 - (1.2184)) = -1.14144$

$w_1 = 1.0684 + 0.1(-1 - (1.2184)) = -1.05344$

$w_2 = 1.1696 + 0.1(-1 - (1.2184)) = 1.04776$