Machine Learning 2017

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Exercise 1

2 situations: $X_2 = 2$ when $X_1 = 0$ and $X_1 = -1$ when $X_2 = 0$

$aX_1 + b = X_2$

$0 + b = 2$

$b = 2$

$aX_1 + b = X_2$

$-a + b = 0$

$-a + 2 = 0$

$a = 2$

So, the weights are both 2.

$2X_1 + 2 = X_2$

↳ w_1 and $w_2 = 2$.

$w_0 = 0$ → because it doesn't affect the linear function ~~$aX_1 + bX_2 = 0$~~

$aX_1 + b = X_2$

- A bias' weight can be zero.

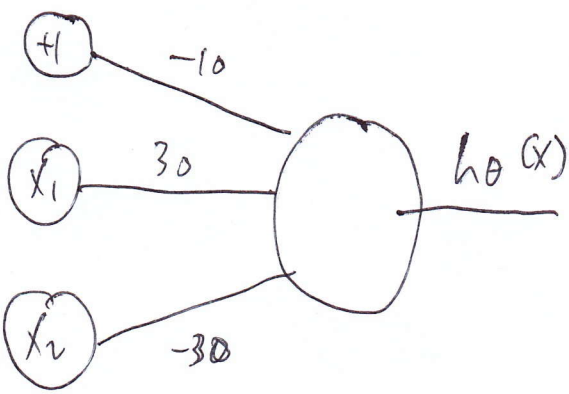
Exercise 2

A AND (NOT B)

A	B	NOT B	A AND ¬B	$h_\theta(x)$
0	0	1	0	$g(-10) \approx 0$
0	1	0	0	$g(-30) \approx 0$
1	0	1	1	$g(10) \approx 1$
1	1	0	0	$g(-10) \approx 0$

$(w_0 + w_1 x_1 + w_2 x_2) = a$

$w_0 = -10$
$w_1 = 30$
$w_2 = -30$



Exercise 3

A XOR B

A	B	A XOR B	(a_1) ¬A AND B	(a_2) A AND ¬B	(¬A AND B) OR (A AND ¬B)
0	0	0	0	0	0
0	1	1	1	0	1
1	0	1	0	1	1
1	1	0	0	0	0