COMP3411/9814

23T1

QUIZ 3

Question 1

Consider the following training examples for a perceptron.

Training Example	x_1	x_2	Class
a	0	1	−1
b	2	0	−1

Suppose the initial weights are $w_0 = -0.5$, $w_1 = 0$ and $w_2 = 1$, and the learning rate is 0.5. What are the weights after training using the perceptron learning algorithm on instance (a)?

- w0 =−1.5,w1=0, w2 =0.5
- *$w_0 = -1.5, w_1 = 0, w_2 = 0$*
- *$w_0 = -2, w_1 = 0, w_2 = -0.5$*
- *$w_0 = -1.5, w_1 = -0.5, w_2 = 0.5$*

Question 2

Consider the following training examples for a perceptron.

Training Example	x_1	x_2	Class
a	0	1	−1
b	2	0	−1

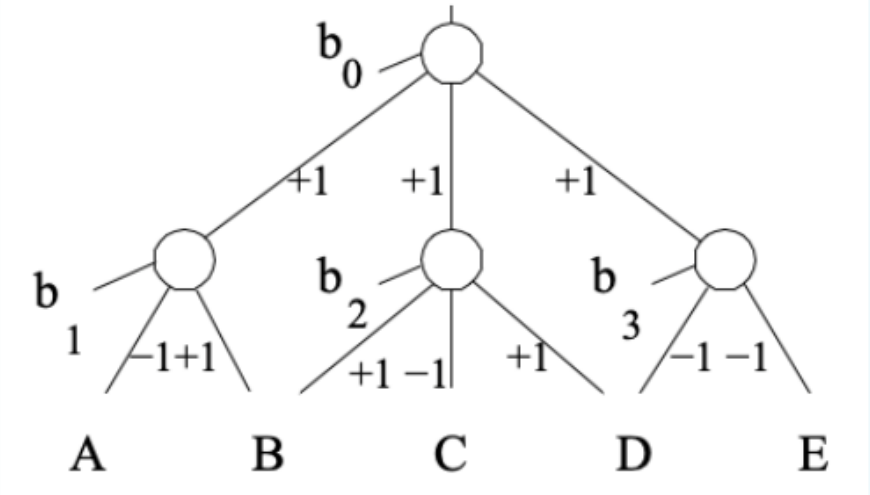
Suppose the initial weights are $w_0 = -0.5$, $w_1 = 0$ and $w_2 = 1$, and the learning rate is 0.5. What are the weights after training using the perceptron learning algorithm on instances (a) then (b)?

NOTE: This question follows from the previous question which finds the weight after the first training instance (a).

- (●) $w_0 = -1.5, w_1 = 0, w2 = 0$
- ( ) $w_0 = -1, w_1 = 0, w2 = 0.5$
- ( ) $w_0 = -2, w_1 = 0, w_2 = -0.5$
- ( ) $w_0 = -1.5, w_1 = -0.5, w_2 = 0$

Question 3

Consider the following multi-layer perceptron, with threshold activation function, and assume that TRUE is represented by 1; FALSE by 0.

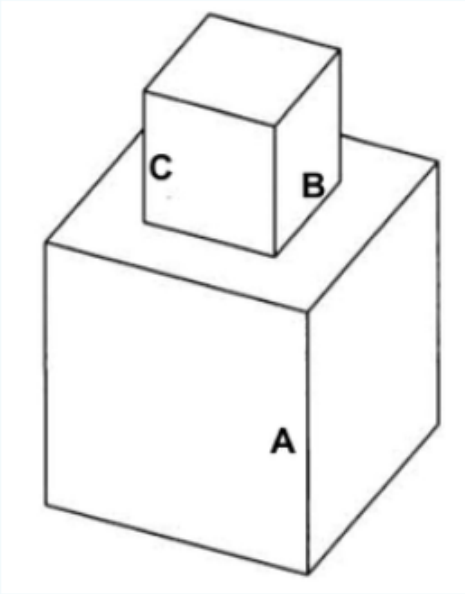


For which values of the biases b_0, b_1, b_2 and b_3 would this network compute the logical function (¬A ∨ B) ∧ (B ∨ ¬C ∨ D) ∧ (¬D ∨ ¬E)

- $b_0 = -2.5, \quad b_1 = -0.5, \quad b_2 = +0.5, \quad b_3 = +1.5$
- $b_0 = -2.5, \quad b_1 = +0.5, \quad b_2 = +0.5, \quad b_3 = +1.5$
- $b_0 = -0.5, \quad b_1 = -0.5, \quad b_2 = -1.5, \quad b_3 = +0.5$
- $b_0 = -2.5, \quad b_1 = -0.5, \quad b_2 = -1.5, \quad b3 = +0.5$

Question 4

Consider the following scene in which points A, B, and C are intersections of planar surfaces creating occlude, blade, or fold edges.

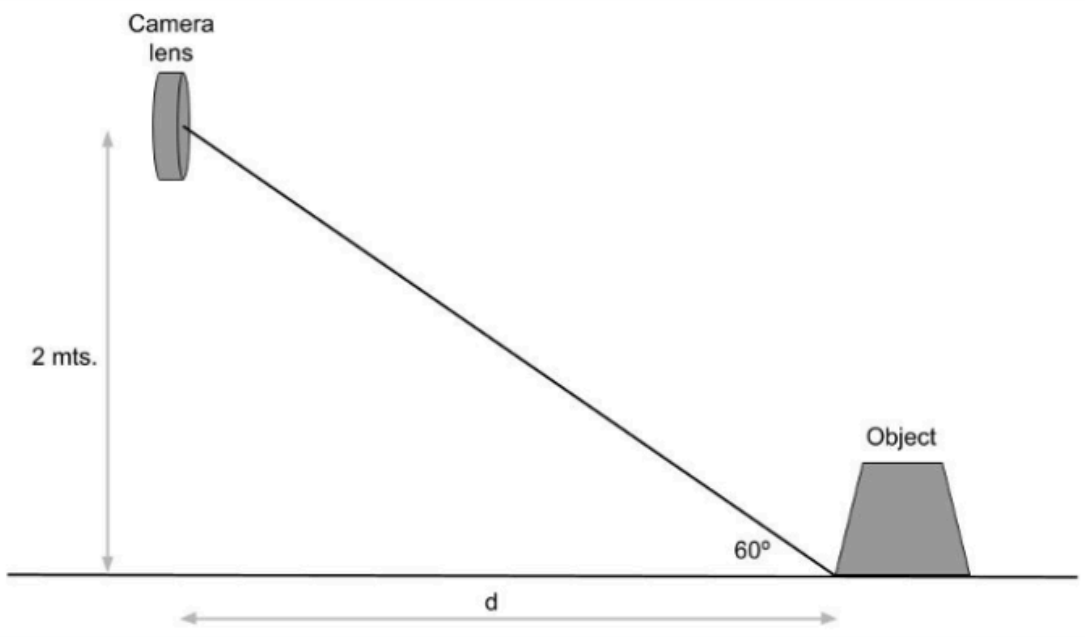


Which one of the following statements is true.

- A = fold, B = occlude, C = fold
- A = blade, B = occlude, C = blade
- **A = blade, B = fold, C = occlude**
- A = fold, B = blade, C = occlude

Question 5

Consider the following scene in which a known object is on the floor. The camera lens is at a height = 2 mts. and the object is perceived at an angle of 60 degrees, as follows:



What would be the computed distance d from the camera to the object?

- d = 3.4641 mts.
- d = 1.7320 mts.
- d = 0.8660 mts.
- d = 1.1547 mts.