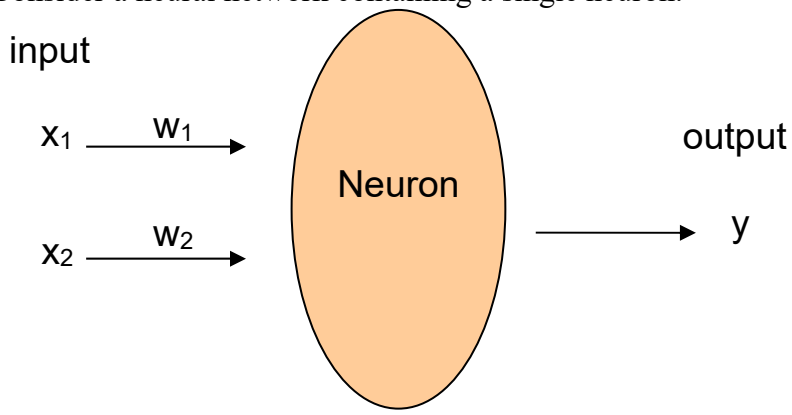
MSBD5002: Data Mining and Knowledge Discovery (MicroMasters)
Exercise 6
Neural Network

Q1 Neural Network

The following shows the AND function where x_1 and x_2 are two inputs and y is the output.

x_1	x_2	y
0	0	0
0	1	0
1	0	0
1	1	1

Consider a neural network containing a single neuron.



Initially, we set the values of w_1, w_2 and b to be 0.1 where b is a bias value in the neuron.

Suppose the learning rate is denoted by α. Let $\alpha = 0.5$.
Suppose we adopt the threshold function as an activation function.
Please try to train the neural network with five instances by the following inputs in the given sequence.

1. $(x_1, x_2) = (0, 0)$
2. $(x_1, x_2) = (0, 1)$
3. $(x_1, x_2) = (1, 0)$
4. $(x_1, x_2) = (1, 1)$
5. $(x_1, x_2) = (0, 0)$

What are the final values of w_1, w_2 and b after these five instances are processed?