

We have to trace perceptron's algorithm to solve the problem.

In the first step we have to initialize the weights. We initialize the weights as zeros.

After initializing the weights, we should select a training sample. Consider selecting (x_0, t_0) from the set of training samples, then we have:

$$w \leftarrow w + \eta (t_0 - 0) \cdot x_0 \quad (\text{Cause } \text{Sign}(w \cdot x_0) \neq t_0)$$

$$\downarrow$$
$$0 + \eta (t_0 - 0) \cdot x_0 \Rightarrow w \leftarrow \eta t_0 \cdot x_0$$

$$\Rightarrow \text{Sign}(w_0 \cdot x_0) = \text{Sign}(\eta t_0) = t_0$$

So we can conclude that if we initialize the weights as zeroes, η can not affect the learning.