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Implementation of Perceptron Training Algorithm

Perceptrons are the simplest kind of neural network: they take in an input, weight each input, take the sum of weighted inputs, and apply an activation function. Since they were modelled from biological neurons by Frank Rosenblatt, they take and produce only binary values. In other words, we can perform binary classification using perceptrons.
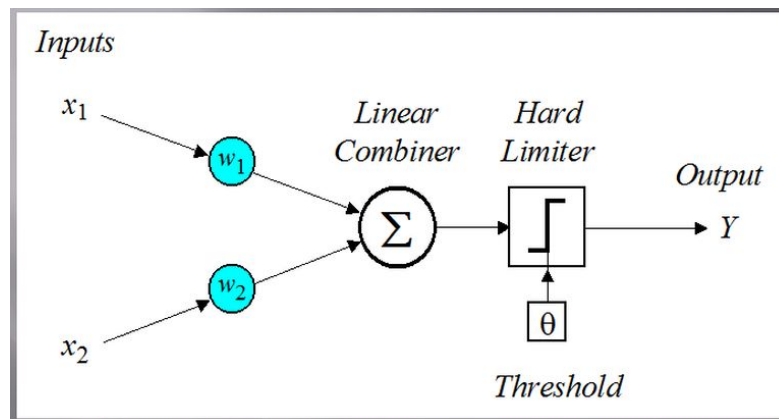

Figure 1. Single-layer two-input perceptron

Steps for training the Perceptron are given here The Perceptron Training Algorithm

Analysis:

AND, OR, NAND and NOR gates are trained using the Perceptron Training Algorithm. The output we got is the bias and weights of respective gates.

To verify this weight vector is correct, let take an example.

Pre- activation (z) = bias + $w_0 * x_0 + w_1 * x_1$

For AND gate, let bias = -0.3, w_0 = 0.2, w_1 = 0.1, x_1 = 0, x_2 = 0 then

If both inputs are 0, then the pre-activation(z) will be -0.3 + 0 * 0.2 + 0 * 0.1 = -0.3. When applying our activation function, i.e. -0.3 < 0 it returns 0, which is exactly 0 AND 0.

Similarly, we can try this for other gates as well.