

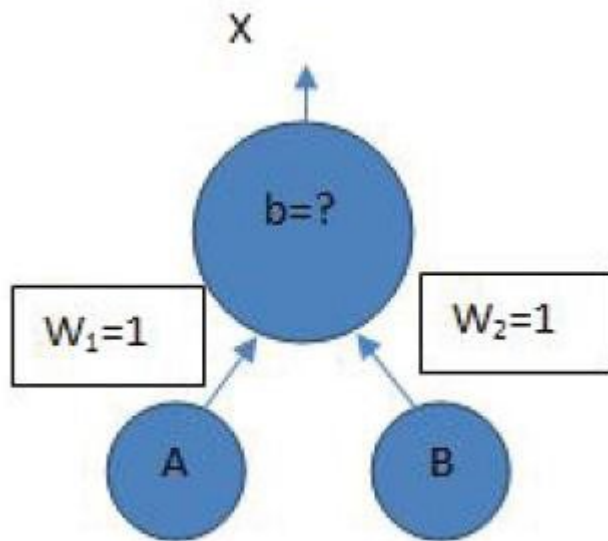
**Roll No. :** 41310

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**Assignment No.:** 5 (SCOA)

### **Problem Statement :**

Write a program to find the Boolean function to implement following single layer perceptron. Assume all activation functions to be the threshold function which is 1 for all input values greater than zero and 0, otherwise.



### **Objective :**

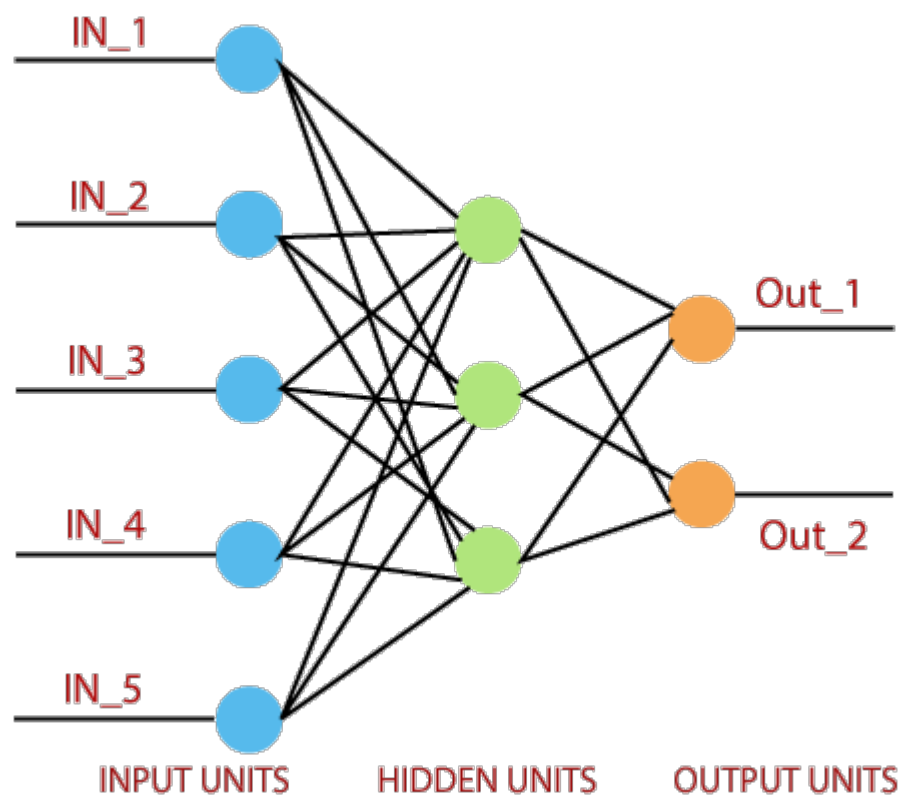
- To learn single layer perceptron.
- To learn Boolean logic implementation using perceptron.

### **Software and Hardware Requirement :**

- 32/64 bit PC
- Ubuntu OS
- Python

### **Theory :**

The perceptron is a single processing unit of any neural network. **Frank Rosenblatt** first proposed in **1958** is a simple neuron which is used to classify its input into one or two categories. Perceptron is a linear classifier, and is used in supervised learning. It helps to organize the given



input data. A

perceptron is a neural network unit that does a precise computation to detect features in the input data. Perceptron is mainly used to classify the data into two parts. Therefore, it is also known as **Linear Binary Classifier**.

The single-layer perceptron was the first neural network model, proposed in 1958 by Frank Rosenbluth. It is one of the earliest models for learning. Our goal is to find a linear decision function measured by the weight vector  $w$  and the bias parameter  $b$ .

To understand the perceptron layer, it is necessary to comprehend artificial neural networks (ANNs).

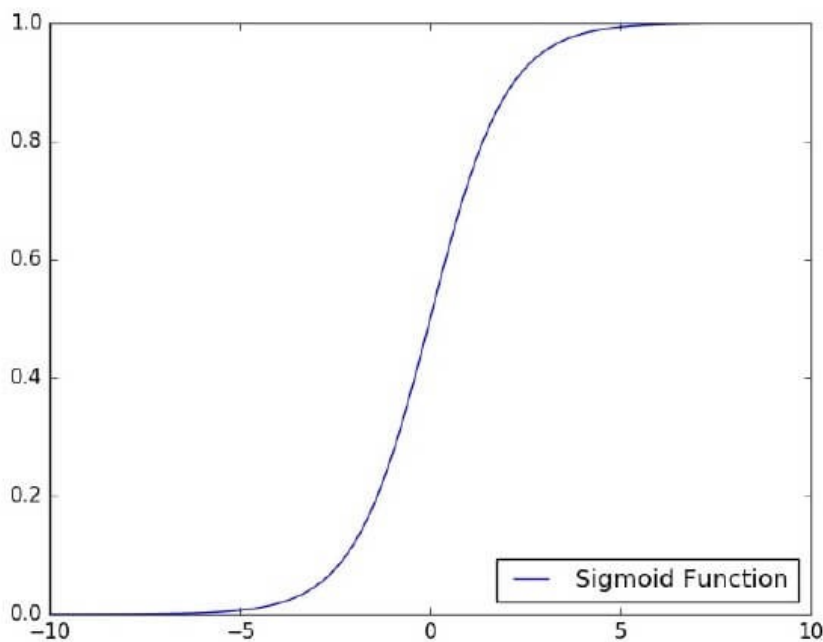
The artificial neural network (ANN) is an information processing system, whose mechanism is inspired by the functionality of biological neural circuits. An artificial neural network consists of several processing units that are interconnected.

This is the first proposal when the neural model is built. The content of the neuron's local memory contains a vector of weight.

The single vector perceptron is calculated by calculating the sum of the input vector multiplied by the corresponding element of the vector, with

each increasing the amount of the corresponding component of the vector by weight. The value that is displayed in the output is the input of an activation function.

Let us focus on the implementation of a single-layer perceptron for an image classification problem using TensorFlow. The best example of drawing a single-layer perceptron is through the representation of "logistic regression."



## Conclusion :

Mc-Culloch pits Model is implemented for XOR function by using the thresholding activation function. Activation of M-P neurons is binary (i.e) at any time step the neuron may fire or may not fire. Threshold plays major role here.