

Group Activity

Figure 1 below illustrates a multilayer Neural Network that has the input patterns of (0 1 1).

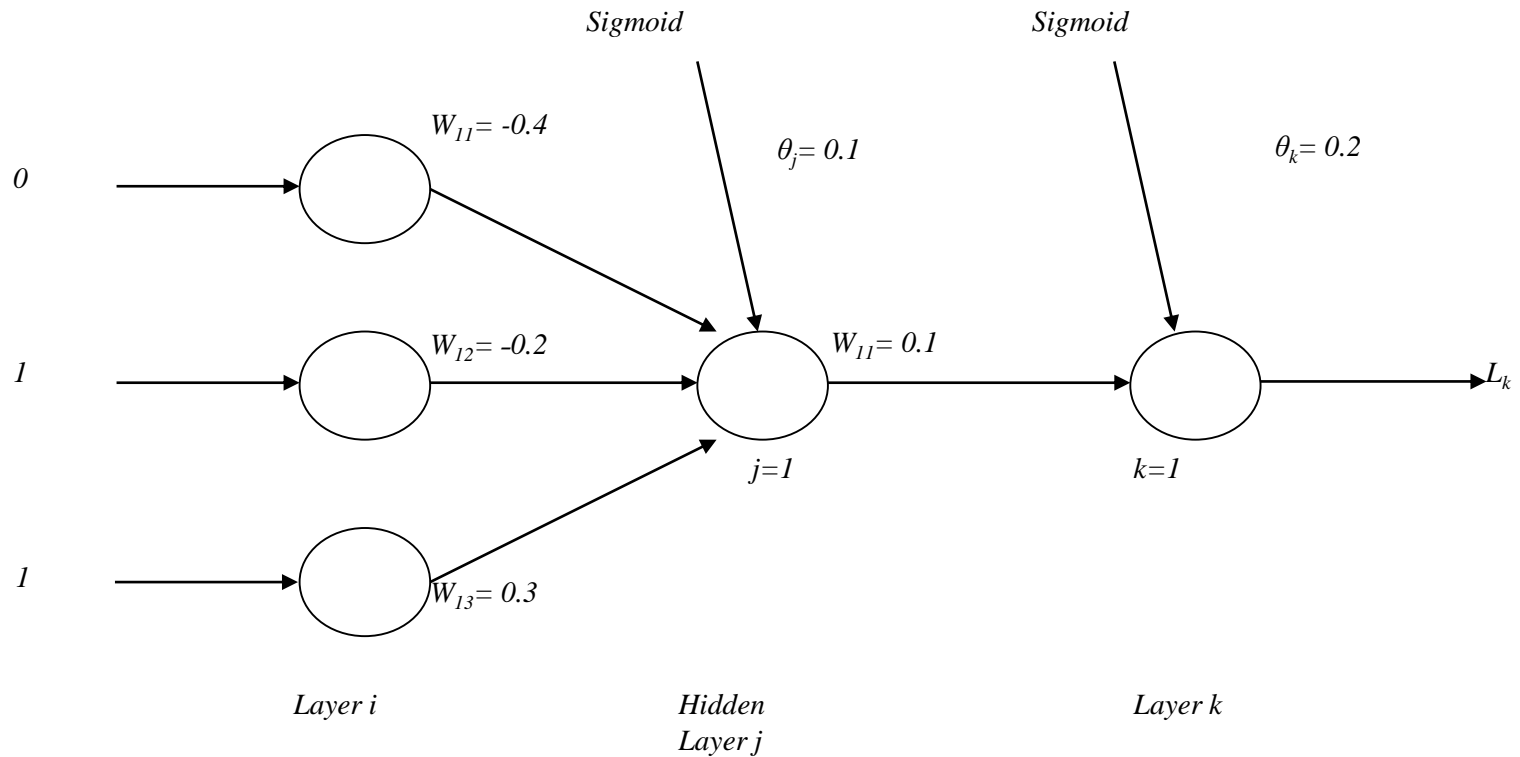


Figure 1: A Multilayer Neural Network



Introduction to Artificial
Intelligent by N.M.A Ghani

- i) Calculate the output value of L_k .
- ii) Given $t_k = 0$. From the value of L_k , calculate the following values at the first iteration by using Back Propagation algorithm.
 - Δw_{11} and w_{11} (new) between output and hidden layer
 - Δw_{11} , Δw_{12} , Δw_{13} , and w_{11} (new), w_{12} (new), w_{13} (new) between hidden layer and input layer.
 - Illustrate the new Neural Network.



The information for the Neural Networks configurations are as follows.

Given $\eta = 0.4$ and $\alpha = 0.1$.

Back propagation is not required to be derived.

Sigmoid function; $f(x) = (1+e^{-x})^{-1}$

$f(x) = x$

The error signals are as follows.

$$\delta_k = L_k (1 - L_k) (t_k - L_k)$$

$$\delta_j = L_j (1 - L_j) \sum_k \delta_k w_{kj}$$

- Adaptions of weights are defined as below.

$$\Delta w_{kj}(t + 1) = \eta \delta_k L_j + \alpha \Delta w_{kj}(t)$$

$$\Delta w_{ji}(t + 1) = \eta \delta_j L_i + \alpha \Delta w_{ji}(t)$$

[16 Marks]

- [CO2, P10, C4]

