

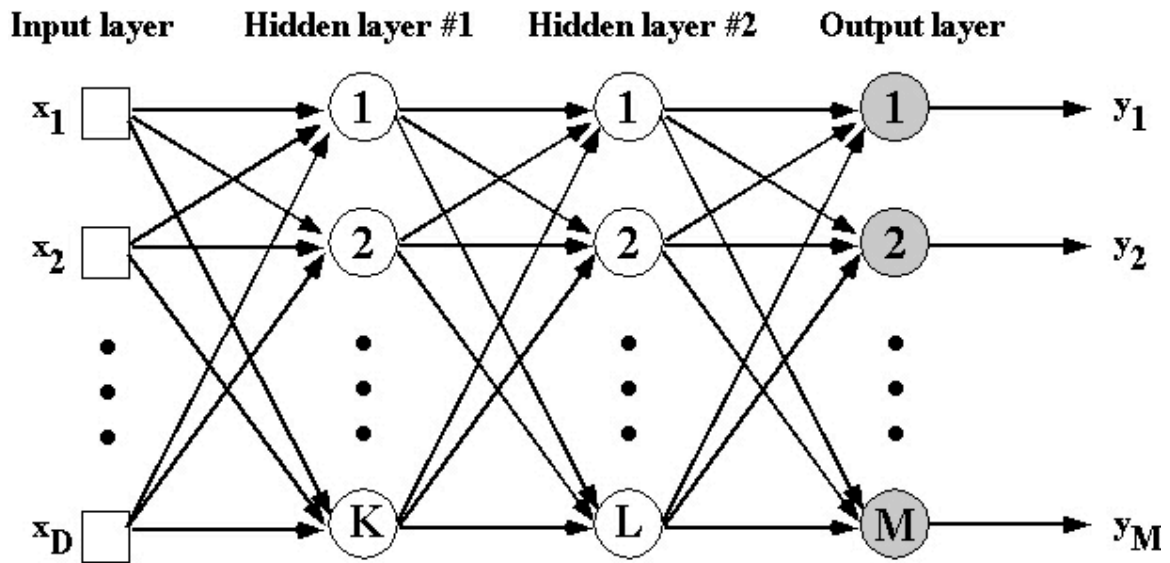
**Addis Ababa University**  
**Addis Ababa Institute of Technology**  
**School of Electrical and Computer Engineering**

**ECEG-6518 Parallel Computing**  
**Assignment 2: Design of Parallel Algorithm**

**Objective:** to get familiarized with parallel algorithm design

**Problem:** Artificial Neural Networks (ANN) can be used to infer a function from observations. This is particularly useful in applications where the complexity of the data or task makes the design of such a function by hand impractical. One of ANN models is the multilayer perceptron (MLP). Design a parallel algorithm that can train an arbitrary MLP using the back-propagation training algorithm. What is meant by arbitrary in this case is that the user is allowed to choose the number of input/output neuron, the number of hidden layers and the number of neurons in each hidden layer. In addition, the trained MLP should execute in parallel as well.

The model for the MLP and the algorithm for the back-propagation training can be found in any book that describes Artificial Neural Networks.



**b**

Figure -1 Multilayer Perceptron Model

Use the Parallel Algorithm Design method we have seen in class.

For the agglomeration and mapping stages, you have the following choices

1. A single Computer with 2 or more individual compute cores
2. A single computer with a GPU with 192 cores
3. A cluster of computers (7 compute nodes currently, each node with 4 individual cores)

**Assignment Due Date:**