**Lab instructions 4**

In this lab you will start exploring restricted Boltzmann machines. Recall that in an RBM we have visible and hidden nodes. If there are ‘n’ visible and ‘m’ hidden nodes then the total number of nodes is (n+m). Also, each node of one layer is connected to all nodes of the other layer. The energy of the system is written as:

Given the above, the activation probabilities are given as follows:

Where ( ) is the logistic sigmoid function.

In today’s lab you will do the following:

1. Set up an RBM i.e. define the visible and hidden nodes. Use 3 visible and 4 hidden nodes.
2. Initialize the biases and weights randomly
3. Assume some feature vectors (~ 10). Since we have 3 visible nodes, so each feature vector is of length 3.
4. Given a particular feature vector, calculate for all ‘j’
5. In case greater that 0.5, set
6. Using the values of calculate
7. Repeat the above for all the samples