**Assignment -1**

**Set 1**

1. Discuss briefly Mc-Culloch Pitt’s artificial neuron model. Give its limitations.
2. Explain the taxonomy of artificial neural network architectures.
3. Draw the architecture of MLP network. Derive the Expressions used to update weights in back -propagation algorithm for MLP network.
4. Implement OR function with binary inputs and bipolar targets using perceptron training algorithm upto 3 epochs. Assume initial weights and bias are zero.
5. Implement ANDNOT function using McCulloch-Pitts neuron use binary data representation.

**Set 2**

1. Using Madaline network, implement XOR function with bipolar inputs and targets. Assume the required parameters for training of the network.
2. Explain the working of basic building block of ANN? How are artificial neural networks similar to the brain?
3. Assume a standard 3-2-2 three- layered network with η = 1.2, α = 0.9. Perform hand calculation assuming Back Propagation learning for one iteration on the pattern sets given in table:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Inputs | | | Desired O/P | |
| X1 | X2 | X3 | D1 | D2 |
| 0.2 | 0.4 | 0.7 | 1 | 0 |

and the values of input to hidden weights are -0.5; and hidden to output weights are 0.25.

1. What is the necessity of activation function? Define and plot identity function, step function, binary sigmoid function, bipolar sigmoid function used in neural networks.
2. Define soft computing with example? Also write down the difference between soft computing and hard computing.

**Set 3**

1. What are the basic two types of learning? Explain in details.
2. Define linear seperability? Justify that X-OR is not linearly separable problem.
3. Compare biological and artificial neural networks.
4. What is the activation function used in back propagation. Write a short note on a choice of parameter used in a BPN.
5. Why sigmoid activation are used in BPN? Why it is advantages over step function?

**Set 4**

1. Discuss briefly Mc-Culloch Pitt’s artificial neuron model. Give its limitations.
2. Using Madaline network, implement XOR function with bipolar inputs and targets. Assume the required parameters for training of the network.
3. What are the basic two types of learning? Explain in details.
4. Define soft computing with example? Also write down the difference between soft computing and hard computing.
5. Implement ANDNOT function using McCulloch-Pitts neuron use binary data representation.

**Set 5**

1. Compare biological and artificial neural networks.
2. What is the activation function used in back propagation. Write a short note on a choice of parameter used in a BPN.
3. Explain the working of basic building block of ANN? How are artificial neural networks similar to the brain?
4. Assume a standard 3-2-2 three- layered network with η = 1.2, α = 0.9. Perform hand calculation assuming Back Propagation learning for one iteration on the pattern sets given in table:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Inputs | | | Desired O/P | |
| X1 | X2 | X3 | D1 | D2 |
| 0.2 | 0.4 | 0.7 | 1 | 0 |

and the values of input to hidden weights are -0.5; and hidden to output weights are 0.25.

1. Implement OR function with binary inputs and bipolar targets using perceptron training algorithm upto 3 epochs. Assume initial weights and bias are zero.