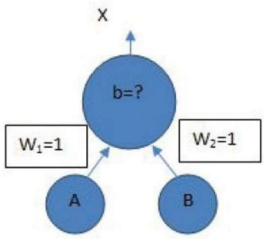
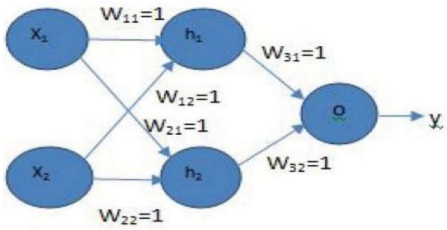
Laboratory Practice IV(410255)

LIST OF LAB EXPERIMENTS

LAB EXP. NO	PROBLEM STATEMENT
GROUP A	**410252 (D) Soft Computing and Optimization Algorithms**
1	Implement Union, Intersection, Complement and Difference operations on fuzzy sets. Also create fuzzy relation by Cartesian product of any two fuzzy sets and perform max-min composition on any two fuzzy relations.
2	Implement genetic algorithm for benchmark function (eg. Square, Rosenbrock function etc) Initialize the population from the Standard Normal Distribution. Evaluate the fitness of all its individuals. Then you will do multiple generation of a genetic algorithm. A generation consists of applying selection, crossover, mutation, and replacement. Use: • Tournament selection without replacement with tournament size s • One point crossover with probability Pc • bit-flip mutation with probability Pm • use full replacement strategy
3	Implement Particle swarm optimization for benchmark function (eg. Square, Rosenbrock function). Initialize the population from the Standard Normal Distribution. Evaluate fitness of all particles. Use : • c1=c2 = 2 • Inertia weight is linearly varied between 0.9 to 0.4. • Global best variation
4	Implement basic logic gates using Mc-Culoch-Pitts or Hebbnet neural networks
5	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.

	
6	The figure shows a single hidden layer neural network. The weights are initialized to 1‟s as shown in the diagram and all biases are initialized to 0‟s. Assume all the neurons have linear activation functions. The neural network is to be trained with stochastic (online) gradient descent. The first training example is [x1=1, x2=0] and the desired output is 1. Design the back-propagation algorithm to find the updated value for W11 after backpropagation. Choose the value that is the closest to the options given below: [learning rate =0.1] 
7	**Mini-Project 1 on Genetic Algorithm:** Apply the Genetic Algorithm for optimization on a dataset obtained from UCI ML repository. For Example: IRIS Dataset or Travelling Salesman Problem or KDD Dataset
8	Apply the Particle swarm optimization for Travelling Salesman Problem
9	**Mini-Project 2 on Fuzzy Logic:** Solve Greg Viot‟s fuzzy cruise controller using MATLAB Fuzzy logic toolbox or Octave or Python.
10	**Mini-Project 3 on Fuzzy Logic:** Solve Air Conditioner Controller using MATLAB Fuzzy logic toolbox or Octave or Python
GROUP B	**410253 (B) Human Computer Interface**
1	Identify specialized users and related facilities for a selected product / system and make necessary suggestions for its improved accessibility design.
2	Design user persona for the users of selected product / system.
3	Conduct a contextual inquiry for selected product / system.

4	Design an interface prototype for selected product / system.
5	Evaluate an interface using usability evaluation technique