PUNE INSTITUTE OF COMPUTER TECHNOLOGY

DHANKAWADI, PUNE –43

LIST OF LAB EXPERIMENTS

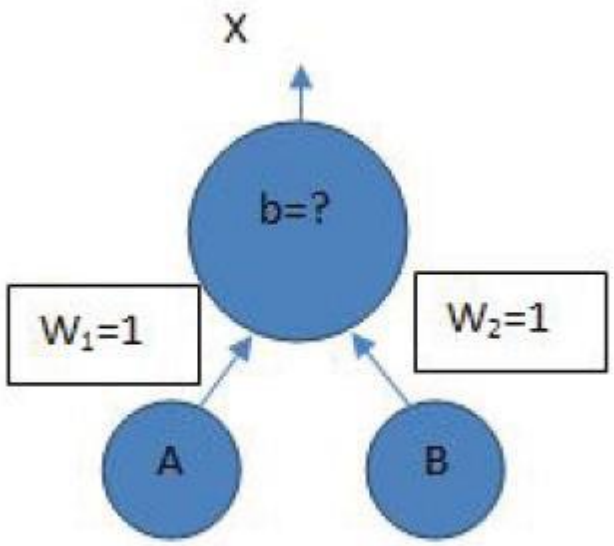
ACADEMIC YEAR: 2020- 2021

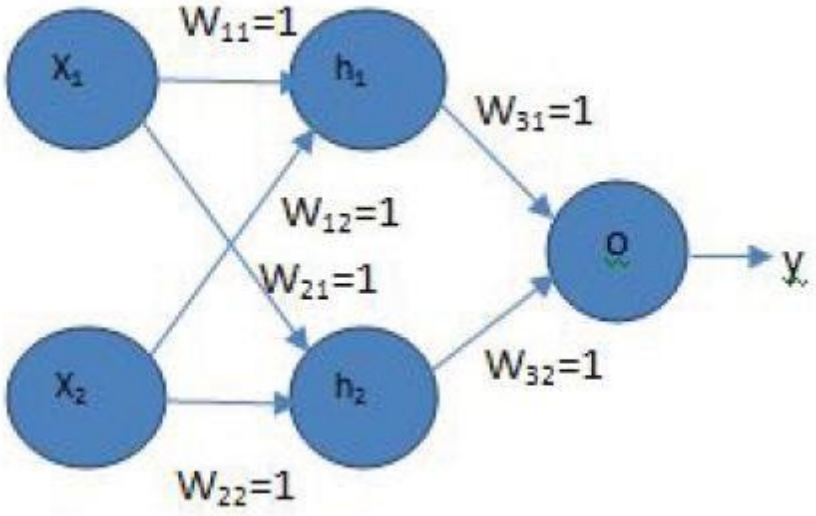
DEPARTMENT: **COMPUTER ENGG** DATE: **18/01/2021**

CLASS: **B.E** SEMESTER: **II**

SUBJECT: **Laboratory Practice IV(410255)**

EXP. NO	PROBLEM STATEMENTS
	Elective - III
Course	**410252 (B) Compiler Construction 410252 (B)**
1	Implement a Lexical Analyzer using LEX for a subset of C. Cross check your output with Stanford LEX.
2	Implement a parser for an expression grammar using YACC and LEX for the subset of C. Cross check your output with Stanford LEX and YACC.
3	Generate and populate appropriate Symbol Table.
4	Implementation of Semantic Analysis Operations (like type checking, verification of function parameters, variable declarations and coercions) possibly using an Attributed Translation Grammar.
5	Implement the front end of a compiler that generates the three address code for a simple language.
6	A Register Allocation algorithm that translates the given code into one with a fixed number of registers.
7	Implementation of Instruction Scheduling Algorithm.
8	Implement Local and Global Code Optimizations such as Common Sub-expression Elimination, Copy Propagation, Dead-Code Elimination, Loop and Basic-Block Optimizations. (Optional)
9	**Mini-Project 1:** Implement POS tagging for simple sentences written Hindi or any Indian Language
Course	**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.

	
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.
ELECTIVE -IV	
Course	**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.

Subject Coordinator
(Prof.S.S.Suradkar)

Head of Department
(Department of Computer Engg.)