

PUNE INSTITUTE OF COMPUTER TECHNOLOGY

DHANKAWADI, PUNE -43

LIST OF LAB EXPERIMENTS

ACADEMIC YEAR: 2018- 2019

DEPARTMENT: COMPUTER ENGG.

DATE: 14/12/2018

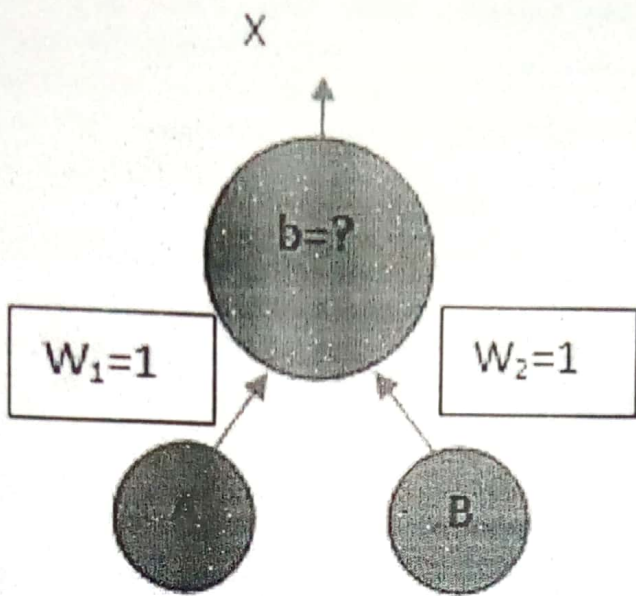
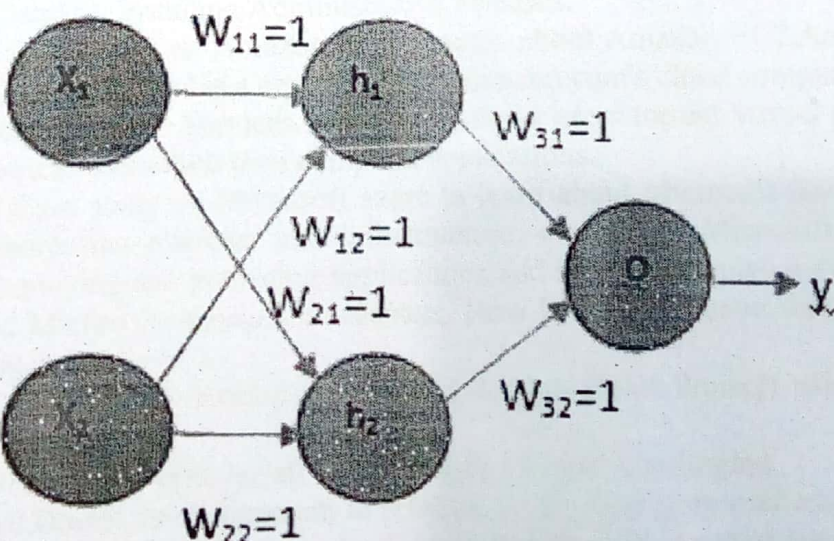
CLASS: B.E

SEMESTER: II

SUBJECT: Laboratory Practice IV (410255)

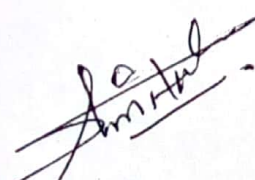
EXP. NO	PROBLEM STATEMENTS
Elective - III	
Course	410252 (B) Compiler Construction 410252 (B)
1	Implement a Lexical Analyzer using LEX for a subset of C. Cross check your output with Stanford LEX.
2	Implement a parser for an expression grammar using YACC and LEX for the subset of C. Cross check your 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 (C) Embedded and Real Time Operating System
1	Simulation/ Design, planning and modeling of a Real-Time / Embedded System for- (any one) <input type="checkbox"/> Alarm system for elderly people (Fall detection, Heart attack) <input type="checkbox"/> Medication machine for patients in ICU <input type="checkbox"/> Smart traffic control <input type="checkbox"/> Autonomous car <input type="checkbox"/> Smart home (sound system, temperature, light)

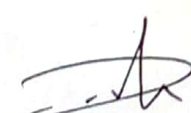
	<input type="checkbox"/> Control of an autonomous quadcopter (e.g. for surveillance tasks) <input type="checkbox"/> Control of a rail station <input type="checkbox"/> Video conference system Washing machine
Course	410252 (D) Soft Computing and Optimization Algorithms
1	Implement Union, Intersection, 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: <ul style="list-style-type: none"> • Tournament selection without replacement with tournament size s • One point crossover with probability P_c • bit-flip mutation with probability P_m • 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 : <input type="checkbox"/> $c_1=c_2 = 2$ <input type="checkbox"/> Inertia weight is linearly varied between 0.9 to 0.4. <input type="checkbox"/> Global best variation
4	Implement basic logic gates using Mc-Culloch-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	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.
7	<p>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 $[x_1=1, x_2=0]$ and the desired output is 1. Design the back-propagation algorithm to find the updated value for W_{11} after backpropagation.</p> 
8	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
9	Apply the Particle swarm optimization for Travelling Salesman Problem

10	Mini-Project 2 on Fuzzy Logic: Solve Greg Viot's fuzzy cruise controller using MATLAB Fuzzy logic toolbox or Octave or Python.
11	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.
Course	410253 (C) Cloud Computing
1	<p>1. Installation and configuration of own Cloud</p> <p>2. Implementation of Virtualization in Cloud Computing to Learn Virtualization Basics, Benefits of Virtualization in Cloud using Open Source Operating System.</p> <p>3. Study and implementation of infrastructure as Service using Open Stack.</p> <p>4. Write a program for Web feed using PHP and HTML.</p> <p>5. Write a Program to Create, Manage and groups User accounts in own Cloud by Installing Administrative Features.</p> <p>6. Case study on Amazon EC2 to learn about Amazon EC2, Amazon Elastic Compute Cloud is a central part of Amazon.com's cloud computing platform, Amazon Web Services. How EC2 allows users to rent virtual computers on which to run their own computer applications.</p> <p>7. Case study on Microsoft Azure to learn about Microsoft Azure is a cloud computing platform and infrastructure, created by Microsoft, for building, deploying and managing applications and services through a global network of Microsoft-managed datacenters. How it works, different services provided by it.</p> <p>8. Design and develop custom Application (Mini Project) using Salesforce Cloud.</p> <p>9. Assignment to install and configure Google App Engine.</p> <p>10. Design an Assignment to retrieve, verify, and store user credentials using Firebase Authentication, the Google App Engine standard environment, and Google Cloud Data store.</p> <p>11. Creating an Application in Salesforce.com using Apex programming Language.</p> <p>12. Design an Assignment based on Working with Mangrasoft Aneka Software.</p>

2	Mini-Project 1: Setup your own cloud for Software as a Service (SaaS) over the existing LAN in your laboratory. In this assignment you have to write your own code for cloud controller using open source technologies without HDFS . Implement the basic operations may be like to upload and download file on/from cloud in encrypted form.
3	Mini-Project 2: Setup your own cloud for Software as a Service (SaaS) over the existing LAN in your laboratory. In this assignment you have to write your own code for cloud controller using open source technologies to implement with HDFS . Implement the basic operations may be like to divide the file in segments/blocks and upload/ download file on/from cloud in encrypted form.


 Subject Coordinator
 (Prof. Kale Sunil D.)


 Head of Department
 (Department of Computer Engg.)