Department of Computer Engineering

Academic Term II : 22-23

Class: B.E (Comp A), SemVI **Subject Name: Artificial Intelligence**

Student Name: Vailantan Fernandes **Roll No: 9197**

Practical No:	**3**
Title:	**Missionaries and Cannibals problem solving using production system approach**
Date of Performance:	
Date of Submission:	

Rubrics for Evaluation:

Sr. No	Performance Indicator	Excellent	Good	Below Average	Marks
1	On time Completion & Submission (01)	01 (On Time)	NA	00 (Not on Time)	
2	Logic/Algorithm Complexity analysis(03)	03(Correct)	02(Partial)	01 (Tried)	
3	Coding Standards (03): Comments/indention/Naming conventions Test Cases /Output	03(All used)	02 (Partial)	01 (rarely followed)	
4	Post Lab Assignment (03)	03(done well)	2 (Partially Correct)	1(submitted)	
Total					

Signature of the Teacher :

Experiment No: 3

Title: Missionaries and Cannibals problem solving using production system approach

Objective: To write a program to solve Missionaries and Cannibals puzzle using depth-first search and breadth-first search

Theory: There are three missionaries, cannibals and a boat on the left bank of a river (initial state). You must transport all six persons to the right bank using the boat (goal state). The boat only carries two persons at a time, and at least one person must bring the boat back. If the cannibals outnumber the missionaries on either bank, then they will naturally devour them

Algorithm:

1. Choose a representation for states of river banks.
2. Find legal moves.
    a. C one cannibal moves from left to right. CC two cannibals move from left to right.
    b. MC one cannibal and one missionary move from left to right.
    c. MM two missionaries move from left to right. M one missionary moves from left to right.
    d. Plus the inverse moves from right to left.
3. Find search space using depth-first search and breadth-first search
    a. Form a one-element queue consisting of a zero-length path that contains only the root node.
    b. Until the first path in the queue terminates at the goal node or the queue is empty.
    c. Remove the first path from the queue;
    d. Create new paths by extending the first paths to all the neighbors of the terminal node.
    e. Reject all new paths with loops.
    f. Add new paths, if any, to the front of the queue.
    g. If the goal node is found, announce success; otherwise, announce failure.

Output:

Post Lab Assignment:

1. Describe a search space in which iterative deepening search performs much better than depth-first search.
2. Explain why problem formulation must follow goal formulation