Prolog Lab Assignments Set-2

Course: Artificial Intelligence (IAIN532C)

Instructor: Prof. Anupam Date: 30.09.19

Date of Evaluation: 25.10.19 Time: **In the Lab Duration**

Instruction for Submission and Evaluation: Each Group have to upload soft copy of the all solution strategy (word or pdf), programs (.pl files), and screenshot of outputs (zip) by 20.10.19, 3pm or at the time of evaluation. Submission link will be uploaded soon in your AI Part-B Course page in my website (http://gcjana.in/). Evaluation will be taken place in the Lab Duration on Friday (25.10.19). *Evaluation strategy:* Viva/program explanation/ running code etc.

Instruction for preparing Solutions: Before programming, first brief the solution strategy in terms of initial state and different types of permissible moves, final states and if possible draw the derivation diagram showing execution trace for the following problems. After defining the Solution Strategy write the prolog program for the following problems.

Although the give problems in this assignment set may seem open ended, all of them have been implemented in Prolog by various programmers around the world. Some of them are straightforward and some of them are completely new, and depend on knowledge of the artificial intelligence literature or computer science.

1) Given a map that describes roads that connect towns, write a program that plans a route between two towns, giving a timetable of expected travel. The map data should include mileage, road conditions, estimated amount of other traffic, gradients, availability of fuel along various roads.

2) Devise a representation for complex board games such as Chess or Go, and understand how the pattern matching capabilities of Prolog might be used to implement strategies for these games.

3) Write a program, using Grammar Rules, to parse sentences of the form:
Fred saw John.
Mary was seen by John.
Fred told Mary to see John.
John was believed to have been seen by Fred.
Was John believed to have told Mary to see Fred?

4) Write a natural language interface to the filing system of your computer to answer questions such as:

How many files does David own?
Does Chris share PROG.MAC with David?
When did Bill change the file VIDEO.C?

The program must be able to interrogate various parts of the filing system such as ownership and dates.

5) Consider a two-person game (for example, some non-trivial version of tic-tac-toe). Write game-definition relations (legal moves and terminal game positions) and propose a static evaluation function to be used for playing the game with the alpha-beta procedure.

6) Implement assigned Expert System project using Prolog.