Artificial Intelligence Assignments

Instructions: You will need to do one assignment out of these four assignments. Please discuss with the faculty member for the assignment number assigned to you.

Code Documentation and General Requirements

Codes for all programming assignments should be well documented. A working program with no comments will receive only partial credit. Documentation entails writing a description of each predicate and rule as well as comments throughout the code to explain the program logic. Comments in Prolog begin with a /* and end with */. It is understood that some of the exercises in this programming assignment require extremely little code and will not require extensive comments. Nevertheless, comments describing recursions and helper predicates are required.

While few programming assignments pretend to mimic the "real" world, they may, nevertheless, contain some of the ambiguity that exists outside the classroom. If, for example, an assignment is amenable to differing interpretations, such that more than one algorithm may implement a correct solution to the assignment, it is incumbent upon the programmer to document not only the functionality of the algorithm (and more broadly his/her interpretation of the program requirements), but to articulate clearly the reasoning behind a particular choice of solution.

Less than 10 pages report has to be submitted along with the documented code.

Extra marks will be given for design, creativity and interactivity. You are free to work only using Prolog or using multiplatform to achieve the goal of your assignment. Multiplatforms may be Java+Prolog/C+Prolog/ or any other platform of your choice. The core logic should be implemented in Prolog. The project should be executable by the examiner. You may submit a video recording of your assignment sample execution (you may use screen capture/recording app), if it helps in conveying your assignment.

Assignment 1: Ten questions

In the two-people game of ten questions, one person is answerer and the other person is questioner. They decide one topic to confine the scope, say Olympics games. The answerer decides an Olympic game in his/her mind and does not reveal the game to the questioner. Questioner is supposed to ask a maximum of ten questions to guess the answer.

Design a prolog script that plays the role of an answerer. For example, queries can be related to:

- Team size (2 for badminton doubles, 1 for swimming)
- Number of teams in a game (2 for badminton doubles, many for swimming)
- Arena type (court for badminton doubles, pool for swimming)

- Play device (shuttle cock or racket for badminton doubles, water for swimming, ball or racket for tennis, javelin for javelin throw, etc.)
- Game mode (knock out, timed)
- Performance type (score, win)

There should be only one form of query, for example: has(ball), has(pool), has(team), has(teamsize,2), has (teams_per_game, 2), etc. And one form of decision: is(badminton).

Prolog script should be able to play the game 5 times, choosing a different game each time.

Assignment 2: Kid's day at school

Assume that the prolog script is a parent, trying to know about a kid's day at school. The prolog script should converse intelligently with the kid as follows. The prolog script should ask a question to the kid that kid can answer in yes or no. Depending on whether the answer is yes or no, prolog script should ask a related question or another random question. For example, if the kid says yes to whether it ate or not, the query can be a food item, or whether the kid used fork or spoon, or whether the kid washed hand. Similarly, related to games.

Assignment 3: Subway sandwich interactor

The prolog script offers different meal options, sandwich options, meat options, salad options, sauce options, top-up options, sides options etc. to create a customized list of person's choice. The options should be intelligently selected based on previous choices. For example, if the person chose a veggie meal, meat options should not be offered. If a person chose healthy meal, fatty sauces should not be offered. If a person chose vegan meal, cheese top-up should not be offered. If a person chose value meal, no top-up should be offered.

Assignment 4: Patient with a sympathetic doctor

Assume that the prolog script is a sympathetic doctor, conversing with a patient who can answer only yes or no. The doctor should be able to diagnose the patient's condition while asking question sensitively depending upon patient's pain level and mood level. You can choose 5 or more different mood considerations (calm, angry, etc.) and 5 or more levels of pain. Five or more diseases should be diagnosable, each disease characterized by 5 or more symptoms.