Experiment No. __6_

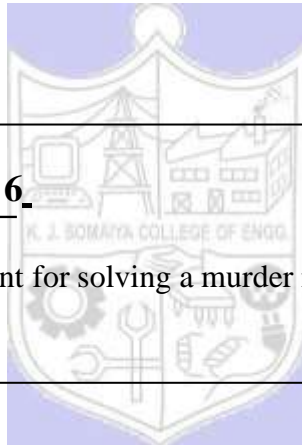**Title:** Goal based agent for solving a murder mystery

Batch: A1(honours)   **Roll No.:16010421059**   **Experiment No.: 6**

Aim: Write a program for implementation of solution of based a Murder Mystery using knowledge agent architecture.

Resources needed: PROLOG Suite

Theory

Knowledge is vast, uncertain and continuously changing. These properties of knowledge make it difficult to arrive at a result. A murder mystery is a kind of situation which depicts the uncertain nature of knowledge and also emphasizes the need of choosing right clauses from entire knowledgebase to make a decision. The goal based agent architecture and some knowledge engineering can help in solution of such problems.

The logical agents are complex but they can reason and learn from the actions and new precepts. They are less like acting and think like humans but more like acting and thinking rational agents. Knowledge and reasoning play a crucial role in dealing with partially observable environments. A knowledge based agent can combine the general knowledge with current percept to infer the hidden aspects of the current state prior to selecting actions. The knowledge engineering process can be broadly described as:

1. Identify the task

2. Assemble the relevant knowledge

3. Decide on vocabulary of predicates, functions and constants

4. Encode general knowledge about the domain

5. Encode description of specific problem instance

6. Pose queries to the inference procedure and get answers

7. Debug the knowledgebase

Procedure:

Define the contents of three sections of prolog program as follows-

1. Define Domain section :- Define various variables and symbols needed for problem.
   (Similar to definition part of conventional programming)

2. Define Predicates:- Different relation between symbols and variables are to be declared .
   (similar to defining function prototype in conventional programming)

3. Define Clauses:- Various facts and rules supporting the predicates declared are to be defined.

Predicates used in Program:

feud(person,person)

affair(person,person)

killedwith(object,person)

negativity(vice,person)

spouse(person,person)

killed(person)

objectsfound(object)

workswith(occupation,person)

occupationrelated(object,occupation)

killer(person,person)

objectsuspect(person,object)

revenge(person,person)

suspect(person,person)

.

Results: (Softcopy submission of Summary Document)

---

feud(rahul,arya).
feud(rahul,aaron).

affair(aaron,nidhi).
killedwith(brush,nidhi).
negativity(jealousy,arya).
negativity(rage,rahul).
spouse(rahul,nidhi).
killed(nidhi).
objectsfound(brush).
workswith(artist,nidhi).
workswith(ai,rahul).
workswith(model,aaron).
occupationrelated(brush,artist).
killer(rahul).
objectsuspect(aaron,brush).
objectsuspect(aaron,banana).
objectsuspect(rahul,brush).
revenge(rahul,nidhi).
revenge(arya,rahul).
revenge(rahul, aaron).
suspect(rahul).
suspect(aaron).
suspect(arya).
    killer(X) :- feud(X, Y), killed(Z), spouse(X, Z).
objectsuspect(X, Y) :- suspect(X), occupationrelated(Y, artist).
revenge(X, Y) :- feud(X, Y), killed(Z), killer(X).

```
5 ?- suspect(arya).
true.

6 ?- suspect(nidhi).
false.

7 ?- killer(nidhi).
false.

8 ?- killer(arya).
false.

9 ?- killer(rahul).
true .

10 ?- objectfound(airpods).
Correct to: "objectsfound(airpods)"?
Please answer 'y' or 'n'? yes
false.

11 ?-
|    objectfound(brush).
Correct to: "objectsfound(brush)"? yes
true.

12 ?-
|    feud(rahul,arya).
true .

13 ?- feud(rahul,siddharth).
false.
```

```
14 ?- objectsuspect(rahul,brush).
true.

15 ?- objectsuspect(rahul,airpods).
false.
```

Outcomes: **Ability to formally state the problem and develop the appropriate proof for given a logical deduction problem.**

Conclusion: **Code on murder mystery story was implemented successfully on prolog.**

Grade: AA / AB / BB / BC / CC / CD /DD

Signature of faculty in-charge with date

_____

References:

1. Stuart Russell and Peter Norvig, Artificial Intelligence: A Modern

   Approach, Second Edition, Pearson Publication

2. Luger, George F. Artificial Intelligence : Structures and strategies for

   complex problem solving , 2009 ,6th Edition, Pearson Education

3. https://www.101computing.net/solving-a-murder-mystery-using-prolog/