

Assignment 2 – Logic Programming (CO2, K3)

1. Given the following statements

Laxman is wherever Ram is.

Ram is at Ayodhya.

Where is Laxman?

Generate answer using logic programming

2. Consider the knowledge base

- 1. ancestor(X,X).
- 2. ancestor(X,Z) :- parent(X,Y), ancestor(Y,Z).
- 3. parent(george,sam).
- 4. parent(george,andy).
- 5. parent(andy,mary).
- 6. male(george).
- 7. male(sam).
- 8. male(andy).
- 9. female(mary).

- i. Apply logic programming to find the female ancestor of george

- ii. Apply logic programming to find the male ancestor of george

3. Apply procedural interpretation for the logic program with program clauses:

$P(x, z) \text{ :- } Q(x, y), P(y, z).$

$P(u, u).$

$Q(a, b).$

and a goal clause:

$G = \{\neg P(v, b)\}$

Draw the in a tree structure.

4. Use procedural semantics for the program:

male(philip).

female(elizabeth).

parent(elizabeth, charles).

parent(elizabeth, anne).

parent(philip, anne).

father(X, Y) :- parent(X, Y), male(X)

with a Query:

?- father(X, anne).

Draw the tree structure.

5. Write the declarative semantics of the above logic program.

6. Write the procedural semantics and model theoretic semantics of the logic program

P(a,a).

P(a,b).

$P(x, y) :- P(y, x)$
with a given goal clause
 $?- P(a, z), P(z, a)$

7. Consider the following logic program
- ```
parent(tukul,budi).
parent(budi,doni).
parent(budi,doni).
parent(doni,harto). parent(harto,tomi).
ancestor(X,Y) :- parent(X,Y).
ancestor(X,Z) :- parent(X,Y),ancestor(Y,Z).
```

Find the first 2 descendants of 'budi' returned using DFS evaluation strategy.