**Artificial Intelligence I - Lab 5**

**Task 1: Predicates for various family relationships.**

male(ragavan).

male(surendran).

male(rajan).

male(shyam).

male(hari).

male(raman).

male(krishnan).

female(janaki).

female(sarojini).

female(omana).

female(mini).

female(remya).

parent(ragavan,omana).

parent(ragavan,mini).

parent(ragavan,raman).

parent(janaki,omana).

parent(janaki,mini).

parent(janaki,raman).

parent(krishnan,surendran).

parent(krishnan,rajan).

parent(sarojini,surendran).

parent(sarojini,rajan).

parent(surendran,shyam).

parent(surendran,hari).

parent(omana,shyam).

parent(omana,hari).

married(ragavan,janaki).

married(krishnan,sarojini).

married(raman,remya).

married(surendran,omana).

mother(X) :- parent(X, \_), female(X).

father(X) :- parent(X, \_), male(X).

grandparent(X) :- parent(X, Y), parent(Y, \_).

not\_a\_father(X) :- \+father(X).

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

mother(X,Y):- female(X),parent(X,Y).

grandfather(X,Y):- male(X),parent(X,Z),parent(Z,Y).

grandmother(X,Y):- female(X),parent(X,Z),parent(Z,Y).

sister(X,Y):- female(X),father(P, Y), father(P,X),X\=Y.

brother(X,Y):- male(X),father(P, Y), father(P,X),X\=Y.

sibling(X,Y):- (sister(X,Y);brother(X,Y)),(X\=Y).

aunt(X,Y):- female(X),(parent(Z,Y), sibling(Z,X));(uncle(U,Y),married(U,X)).

uncle(X,Y):- parent(Z,Y), sibling(Z,X),male(X).

spouse(X,Y):- (parent(X,C),parent(Y,C));(married(X,Y)).

husband(X,Y):- spouse(X,Y),male(X).

wife(X,Y):- spouse(X,Y),female(X).

son(X,Y):- parent(Y,X),male(X).

daughter(X,Y):- parent(Y,X),female(X).

nephew(X,Y):- ((parent(P,X),sibling(P,Y));(uncle(U,X),husband(U,Y))),male(X).

**Task 2: Prolog queries**

?- female(mini).

?- parent(omana, hari).

?- parent(X, raman).

?- parent(P, C).

?- parent(P, \_).

?- parent(P, \_), female(P).

?- parent(X, Y), parent(Y, \_).

?- grandparent(krishnan).

?- sister(mini, omana).

?- sister(X, Y).

?- sister(mini, mini).

?- married(X,Y).

?- married(raman,remya).

?- not\_a\_father(hari).

?- father(X, shyam).

?- mother(X, \_).

?- grandfather(X, Y)

?- grandmother(janaki, shyam).

?- brother(hari,shyam).

?- sibling(surendran,rajan).

?- sibling(X,shyam).

?- aunt(X,\_).

?- uncle(raman,shyam).

?- spouse(ragavan,janaki).

?- husband(X,sarojini).

?- wife(remya,raman).

?- son(X,surendran).

?- nephew(hari,remya).