

Lab Assignment 2

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1. Implementation of Family tree with using these following facts like male, female, parent, brother, sister.

```
male(shankar).
male(ulhas).
male(satish).
male(saurabh).
male(prashant).
female(umabai).
female(mrunal).
female(sadhana).
female(swati).
parent(shankar,umabai,ulhas).
parent(shankar,umabai,satish).
parent(ulhas,mrunal,prashant).
parent(satish,sadhana,saurabh).
parent(satish,sadhana,swati).
brother(ulhas,satish).
brother(satish,ulhas).
brother(prashant,saurabh).
brother(saurabh,prashant).
sister(swati,saurabh).
sister(swati,prashant).
```

1. Use the following predicates like:

father, mother, son, daughter, grandfather, aunt, uncle, cousin, ancestor.

2. Generate rules of following relations in considering the given knowledge base:

- a. grandparent/2.
- b. brother/2.
- c. sister/2.
- d. mother/2.
- e. father/2.
- f. child/2.
- g. son/2.
- h. daughter/2.

```
% assign2.pl
```

```
male(shankar).
male(ulhas).
male(satish).
male(saurabh).
male(prashant).
female(umabai).
female(mrunal).
female(sadhana).
female(swati).
parent(shankar,umabai,ulhas).
parent(shankar,umabai,satish).
parent(ulhas,mrunal,prashant).
parent(satish,sadhana,saurabh).
```

```
parent(satish,sadhana,swati).
brother(ulhas,satish).
brother(satish,ulhas).
brother(prashant,saurabh).
brother(saurabh,prashant).
sister(swati,saurabh).
sister(swati,prashant).
```

```
son(X):- parent(_,_,X), male(X).
daughter(Y):- parent(_,_,Y), female(Y).
child(X):- parent(_,_,X).
father(X):- parent(X,_,_), male(X).
mother(X):- parent(_,X,_), female(X).
grandparent(X,Y):- parent(X,Y,M), parent(M,_,_);parent(_,M,_).
```

3. Answer the following queries:

a. Find all females in the given tree.

```
?- findall(Female, (female(Female), \+ var(Female)), Females).
Females = [umabai, mrunal, sadhana, swati].
```

b. Find all males in the given tree.

```
?- findall(male, (male(Male), \+ var(Male)), Males).
Males = [male, male, male, male, male].
```

b. How many grandchildren do Shankar has?

```
?- findall(Grandchild, grandparent(Shankar, Grandchild), Grandchildren).
Grandchildren = [umabai, umabai, umabai, _, _, _, _].
```

c. Who is/are sister of Prashant?

```
?- findall(Sister, (sister(Sister, prashant), \+ var(Sister)), Sisters).
Sisters = [swati].
```

d. Who are parents of Swati?

```
?- findall((X,Y), parent(X, Y, swati), ParentsofSwati).
ParentsofSwati = [(satish, sadhana)].
```