

# PPL Assignment 7

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1. For the given family tree, do as directed using PROLOG:

- Write the predicates using the following relations:
  1. parent/2
  2. male/1
  3. female/1
  4. husband/2

**Source Code:**

```
%female
female(mary).
female(sandra).
female(juliet).
female(lisa).

%male
male(peter).
male(paul).
male(dick).
male(bob).
male(harry).

%parent
parent(bob, lisa).
parent(bob, paul).
parent(bob, mary).
parent(juliet, lisa).
parent(juliet, paul).
parent(juliet, mary).
parent(peter, harry).
parent(lisa, harry).
parent(mary, dick).
parent(mary, sandra).

%husband
husband(peter,lisa).
husband(bob,juliet).
```

2. Write the rules using above relations for the following:

1. Child
2. Mother
3. Father
4. Wife
5. Son
6. Daughter
7. Brother
8. Sister
9. Uncle
10. Aunt
11. Nephew
12. Niece

### Source Code:

```
%child
child(X,Y) :- parent(Y,X).

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

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

%wife
wife(X,Y) :- husband(Y,X),!.

%son
son(X,Y) :-
male(X),
child(X,Y).

%daughter
daughter(X,Y) :-
female(X),
child(X,Y).

%brother
brother(X,Y) :-
male(X),
parent(Z,X),
parent(Z,Y),
X \= Y.

%sister
sister(X,Y) :-
female(X),
parent(Z,X),
parent(Z,Y),
X \= Y.

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

%aunt
aunt(X,Y) :-
female(X),
parent(Z,Y),
sister(X,Z).

%nephew
```

```
nephew(X,Y) :-
male(X),
parent(Z,X),
(brother(Y,Z);sister(Y,Z)).

%niece
niece(X,Y) :-
female(X),
parent(Z,X),
(brother(Y,Z);sister(Y,Z)).
```

## Output:

```
himani@Himani:~/Desktop/PPL$ swipl
Welcome to SWI-Prolog (threaded, 64 bits, version 8.4.2)
SWI-Prolog comes with ABSOLUTELY NO WARRANTY. This is free software.
Please run ?- license. for legal details.

For online help and background, visit https://www.swi-prolog.org
For built-in help, use ?- help(Topic). or ?- apropos(Word).

?- consult('assgn7q1.pl').
true.

?- child(mary,X).
X = bob ;
X = juliet.

?- mother(X,mary).
X = juliet.

?- father(X,mary).
X = bob.

?- wife(juliet,X).
X = bob.

?- son(dick,Y).
Y = mary.

?- daughter(sandra,Y).
Y = mary.

?- daughter(mary,Y).
Y = bob ;
Y = juliet.

?- brother(paul,Y).
Y = lisa ;
Y = mary ;
Y = lisa .

?- sister(sandra,Y).
Y = dick .

?-
```