

AIML Lab 1

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Problem

Load the following facts into familytree.pl , consult the prolog file and answer the given questions

```
% Program: family.pl
% Source: ProLog
%
% Purpose: This is the sample program for the Prolog Lab in AIML
% It is a simple ProLog program to demonstrate how prolog works.
%
% History: Original code by Barry Drake
% parent(Parent, Child)
%
parent(albert, jim).
parent(albert, peter).
parent(jim, brian).
parent(john, darren).
parent(peter, lee).
parent(peter, sandra).
parent(peter, james).
parent(peter, kate).
parent(peter, kyle).
parent(brian, jenny).
parent(irene, jim).
parent(irene, peter).
parent(pat, brian).
parent(pat, darren).
parent(amanda, jenny).
% female(Person)
%
female(irene).
female(pat).
female(lee).
female(sandra).
female(jenny).
female(amanda).
female(kate).
% male(Person)
%
```

```
male(albert).
male(jim).
male(peter).
male(brian).
male(john).
male(darren).
male(james).
male(kyle).
% yearOfBirth(Person, Year).
%
yearOfBirth(irene, 1923).
yearOfBirth(pat, 1954).
yearOfBirth(lee, 1970).
yearOfBirth(sandra, 1973).
yearOfBirth(jenny, 2004).
yearOfBirth(amanda, 1979).
yearOfBirth(albert, 1926).
yearOfBirth(jim, 1949).
yearOfBirth(peter, 1945).
yearOfBirth(brian, 1974).
yearOfBirth(john, 1955).
yearOfBirth(darren, 1976).
yearOfBirth(james, 1969).
yearOfBirth(kate, 1975).
yearOfBirth(kyle, 1976).
```

Use SWI – Prolog for answering the following questions (load the rules in the file familytree.pl):

Solution

1. Is Albert a parent of Peter?

```
?- parent(albert, peter).
true .
```

2. Who is the child of Jim?

```
?- parent(jim, Who).
Who = brian.
```

3. Who are the parents of Brian?

```
?- parent(Who, brian).  
Who = jim ;  
Who = pat.
```

4. Is Irene a grandparent of Brian?

```
% grandparent(Gparent, Child).  
grandparent(G, C):-  
    parent(G, X),  
    parent(X, C).
```

```
?- grandparent(irene, brian).  
true .
```

5. Find all the grandchildren of Irene

```
?- grandparent(irene, Who).  
Who = brian ;  
Who = lee ;  
Who = sandra ;  
Who = james ;  
Who = kate ;  
Who = kyle.
```

6. Now add the following rule to familytree.pl and re-consult:

older(Person1, Person2) :-

yearOfBirth(Person1, Year1),

yearOfBirth(Person2, Year2),

Year2 > Year1.

7. Who is older than Pat?

```
?- older(Who, pat).  
Who = irene ;  
Who = albert ;  
Who = jim ;  
Who = peter ;  
false.
```

8. Who is younger than Darren?

```
?- older(darren, Who).  
Who = jenny ;  
Who = amanda ;  
false.
```

9. List the siblings of Sandra

```
%  
sibling(X, Y) :-  
    parent(Z, X),  
    parent(Z, Y),  
    X \= Y.
```

```
?- sibling(sandra, Who).  
Who = lee ;  
Who = james ;  
Who = kate ;  
Who = kyle.
```

10. Who is the older brother of Sandra?

```
%
% olderbrother(Brother, Sister)
olderbrother(X, Y):-
    male(X),
    parent(Z,X),
    parent(Z,Y),
    X \= Y,
    older(X, Y).|
```

```
?- olderbrother(Who, sandra).
Who = james ;
false.
```

11. Find the predecessors of Kyle.

```
%
predecessor(X,Y):-
    parent(X,Z),
    predecessor(Z,Y).
predecessor(X,Y):-
    parent(X,Y).|
```

```
?- predecessor(Who, kyle).
Who = albert ;
Who = irene ;
Who = peter.
```

12. Does Kate have a sister?

```

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

```

```

?- sister(Who, kate).
Who = lee ;
Who = sandra ;
false.

```

13. How many females and males are there in the knowledge base?

```

%
person(X):-
    female(X).
person(Y):-
    male(Y).

```

```

?- aggregate_all(count, person(Who), Total).
Total = 15.

```