



**Write a prolog program to implement FamilyTree  
and get required queries**

**Lab Assignment-11**

**CSE3002 : Artificial Intelligence**

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**SCOPE**

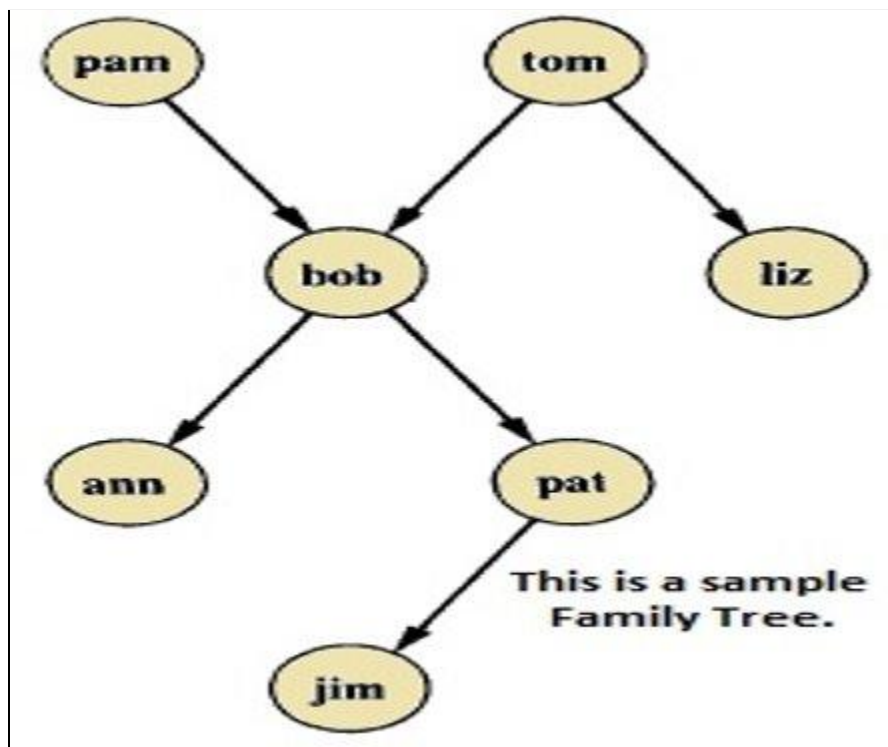
**VIT-AP**

**Task:**

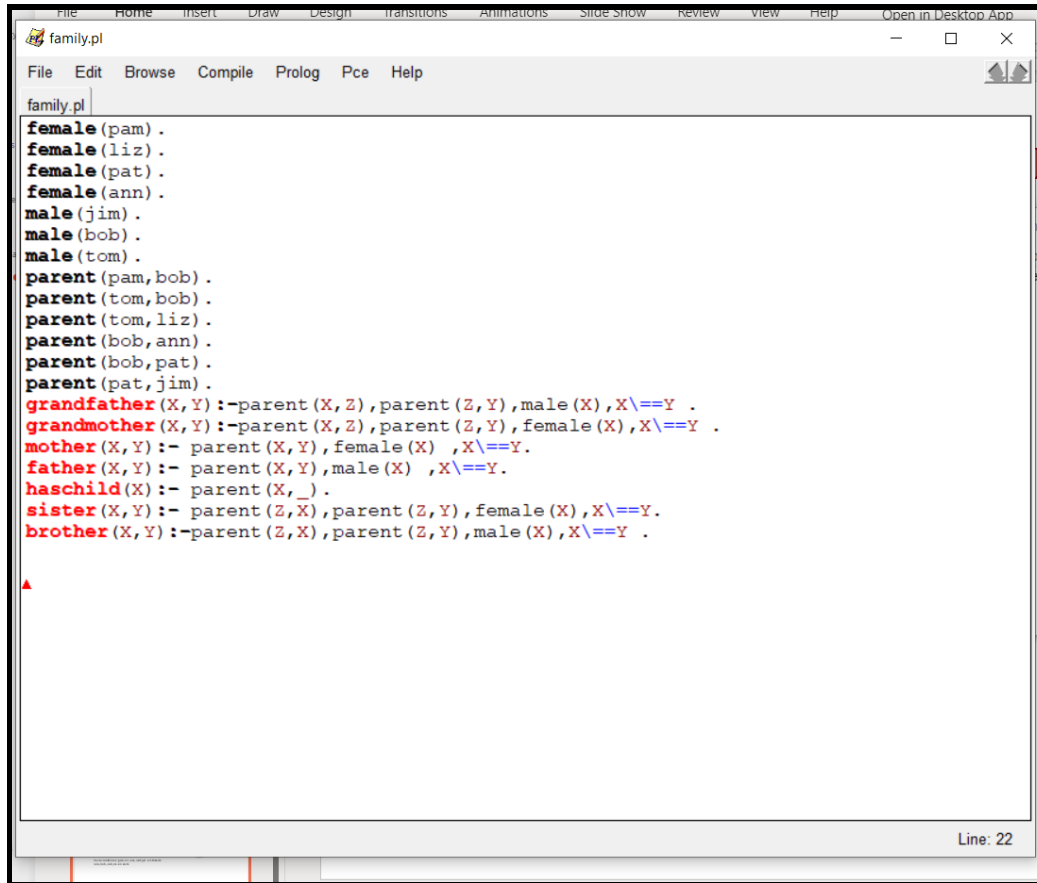
Write a prolog to maintain a family tree. The family tree is shown below. You need the check the following queries :

1. Who is the grandmother of pat?
2. Who is the grandfather of ann?
3. Who is the brother of bob?
4. Who is the sister of pat?
5. Do pat have any child?
6. Who are the parents of bob?

Given conditions: pam, liz, ann, and pat are female. tom, bob, and Jim are male.

**Solution:**

Below is the source code of the same.

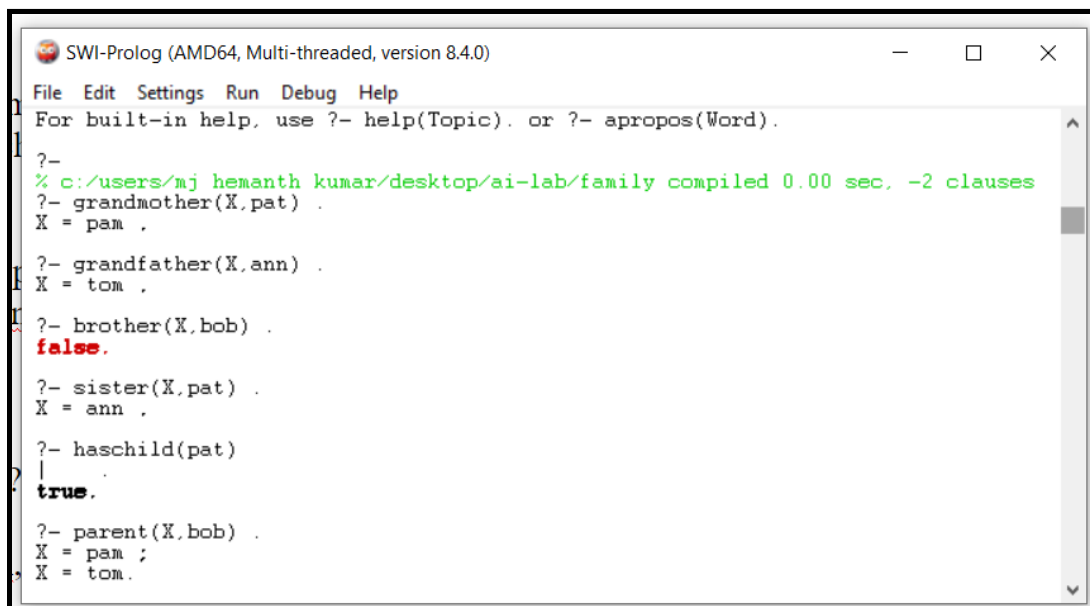


The screenshot shows a Prolog editor window titled 'family.pl'. The code defines a family database with facts and rules. The facts include individuals (pam, liz, pat, ann, jim, bob, tom) and their parents. The rules define grandfathers, grandmothers, mothers, fathers, children, sisters, and brothers based on the parent facts.

```
family.pl
female(pam).
female(liz).
female(pat).
female(ann).
male(jim).
male(bob).
male(tom).
parent(pam,bob).
parent(tom,bob).
parent(tom,liz).
parent(bob,ann).
parent(bob,pat).
parent(pat,jim).
grandfather(X,Y):-parent(X,Z),parent(Z,Y),male(X),X\==Y.
grandmother(X,Y):-parent(X,Z),parent(Z,Y),female(X),X\==Y.
mother(X,Y):-parent(X,Y),female(X),X\==Y.
father(X,Y):-parent(X,Y),male(X),X\==Y.
haschild(X):-parent(X,_).
sister(X,Y):-parent(Z,X),parent(Z,Y),female(X),X\==Y.
brother(X,Y):-parent(Z,X),parent(Z,Y),male(X),X\==Y.
```

Line: 22

Output below :



The screenshot shows the SWI-Prolog console output for the queries. The first query returns 'pam'. The second query returns 'tom'. The third query returns 'false'. The fourth query returns 'ann'. The fifth query returns 'true'. The sixth query returns 'pam' and 'tom'.

```
SWI-Prolog (AMD64, Multi-threaded, version 8.4.0)
File Edit Settings Run Debug Help
For built-in help, use ?- help(Topic). or ?- apropos(Word).

?-
% c:/users/mj hemanth kumar/desktop/ai-lab/family compiled 0.00 sec, -2 clauses
?- grandmother(X,pat) .
X = pam .

?- grandfather(X,ann) .
X = tom .

?- brother(X,bob) .
false.

?- sister(X,pat) .
X = ann .

?- haschild(pat)
true.

?- parent(X,bob) .
X = pam ;
X = tom.
```