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PROLOG – FAMILY TREE

AIM:

To develop a family tree program using PROLOG with all possible facts, rules, and queries.

SOURCE CODE:

KNOWLEDGE BASE:

/*FACTS :: */

male(peter).
male(john).
male(chris).
male(kevin).
female(betty).
female(jeny).
female(lisa).
female(helen).

parentOf(chris,peter).
parentOf(chris,betty).
parentOf(helen,peter).
parentOf(helen,betty).
parentOf(kevin,chris).
parentOf(kevin,lisa).
parentOf(jeny,john).
parentOf(jeny,helen).

/*RULES :: */

/* son,parent

*** son,grandparent*/**

father(X,Y):- male(Y), parentOf(X,Y).
mother(X,Y):- female(Y), parentOf(X,Y).
grandfather(X,Y):- male(Y),parentOf(X,Z),parentOf(Z,Y).
grandmother(X,Y):- female(Y),parentOf(X,Z),parentOf(Z,Y).
brother(X,Y):- male(Y), father(X,Z), father(Y,W),Z==W.
sister(X,Y):- female(Y), father(X,Z),father(Y,W),Z==W.

OUTPUT:

The screenshot shows the SWISH Prolog environment. On the left, the program code is displayed in a text editor. On the right, the execution results are shown in a table format, with each row representing a query and its corresponding bindings for variables Y, X, Z, and W.

Program Code:

```
1 male(peter).
2 male(john).
3 male(chris).
4 male(kevin).
5
6 female(betty).
7 female(jeny).
8 female(lisa).
9 female(helen).
10
11 parentOf(chris,peter).
12 parentOf(chris,betty).
13 parentOf(helen,peter).
14 parentOf(helen,betty).
15 parentOf(kevin,chris).
16 parentOf(kevin,lisa).
17 parentOf(jeny,john).
18 parentOf(jeny,helen).
19
20 father(X,Y):- male(Y), parentOf(X,Y).
21 mother(X,Y):- female(Y), parentOf(X,Y).
22
23 grandfather(X,Y):- male(Y),parentOf(X,Z),parentOf(Z,Y).
24 grandmother(X,Y):- female(Y),parentOf(X,Z),parentOf(Z,Y).
25 brother(X,Y):- male(Y), father(X,Z), father(Y,W),Z==W.
26 sister(X,Y):- female(Y), father(X,Z),father(Y,W),Z==W.
27
```

Execution Results:

Query	Y	X	Z	W
male(Y), parentOf(X,Y).	peter	chris		
female(Y), parentOf(X,Y).	betty	chris		
male(Y),parentOf(X,Z),parentOf(Z,Y).	peter	kevin	chris	
female(Y),parentOf(X,Z),parentOf(Z,Y).	betty	kevin	chris	
male(Y), father(X,Z), father(Y,W),Z==W.	chris	chris	peter	peter
female(Y), father(X,Z),father(Y,W),Z==W.	jeny	jeny	john	john

RESULT:

Thus, the prolog for family tree program has been executed successfully.