

# PRINCIPLES OF ARTIFICIAL INTELLIGENCE

## LABORATORY PROGRAMS

### PROLOG PROGRAM:

#### SOURCE CODE:

```
/*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,grandparents*/  
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:

```

001.pl
File Edit Browse Compile Prolog Pce Help

/*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,grandparents*/
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),

```

```

SWI-Prolog (AMD64, Multi-threaded, version 9.2.2)
File Edit Settings Run Debug Help

Welcome to SWI-Prolog (threaded, 64 bits, version 9.2.2)
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).

?-
% c:/users/ur mom/documents/prolog/001 compiled 0.00 sec. -3 clauses
% c:/users/ur mom/documents/prolog/001 compiled 0.00 sec. 0 clauses
?- parentOf(chris,peter).
true.
?- male(john).
true.
?- male(betty).
false.
?-

```

```

001.pl
File Edit Browse Compile Prolog Pce Help

/*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,grandparents*/
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),

```

```

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?-
% c:/users/ur mom/documents/prolog/001 compiled 0.00 sec. -3 clauses
% c:/users/ur mom/documents/prolog/001 compiled 0.00 sec. 0 clauses
?- parentOf(chris,peter).
true.
?- male(john).
true.
?- male(betty).
false.
?- grandfather(X,Y).
X = kevin,
Y = peter.
?- grandmother(X,Y).
X = kevin,
Y = betty.
?- father(X,Y).
X = chris,
Y = peter.
?-

```

c:/users/ur mom/documents/prolog/001.pl compiled