**Problem:**

Clauses-

parent(tom,bob)

parent(pam,bob)

parent(tom,liz)

parent(bob,ann)

parent(bob,pat)

parent(pat,jim)

male(tom)

male(bob)

male(jim)

male(ann)

male(liz)

male(pat)

with reference to the above clauses answer the following questions.

**Methodology:**

1. Who is the grandparent of ann?

* grandparent(X,Y):-parent(X,Z),parent(Z,Y).

?-grandparent(X,ann),female(X).

1. Who are the grandchildren of bob?

* grandchildren(X,Y):- grandparent(Y,X) .

?-grandchildren(X,bob).

1. Who is jim’s aunt?

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

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

?-aunt(X,jim).

1. Who is the brother of liz?

* brother(X,Y):-parent(Z,Y),parent(Z,X),male(X),not(X==Y).

?-brother(X,liz).

1. Name the parents of the family except ann’s parent.

* ?- parent(X,Y),not(Y=ann).

1. Who is jim’s great grandparent?

* ?- grandparent(X,jim),parent(Y,X),male(Y).

1. Define relation twochildren and find the parent with two children.

* twochildren(X):-parent(X,Z),parent(X,Y),not(Z==Y).

?- twochildren(X).

1. Define the relation uncle and find the name of the parents with uncle.

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

?- uncle(X,Y).

1. Define a recursive predecessor relation.

* predecessor(X,Y):- parent(X,Y).

predecessor(X,Y):- parent(X,Z),predecessor(Z,Y).

1. Find predecessor of jim.

* ?- predecessor(X,jim).

**Output:**

1. pam; 2. jim. 3. ann. 4. bob.

tom.

5. tom, 6. tom. 7. tom, 8. false

pam; tom,

bob, bob,

pat. bob,

pam,

pat.

1. pat,

tom,

pam,

bob.