Experiment No. 8

Aim : - Implementing Family tree using prolog.

Prolog Code:

```
male(jack).
male(oliver).
male(ali).
male(james).
male(simon).
male(harry).
female(helen).
female(sophie).
female(jess).
female(lily).
spouse(jack, helen).
spouse(helen, jack).
spouse(oliver, sophie).
spouse(sophie, oliver).
spouse(ali, jess).
spouse(jess, ali).
spouse(james, lily).
spouse(lily, james).
father(jack, jess).
```

```
father(jack, lily).
father(oliver, james).
father(simon, james).
father(jess, simon).
father(ali, simon).
father(lily, harry).
father(james, harry).
mother(helen, jess).
mother(helen, lily).
mother(sophie, james).
mother(jess, simon).
mother(lily, harry).
/* Rules */
grandfather(X,Y) :- father(X,Z), father(Z,Y).
grandfather(X,Y) :- father(X,Z), mother(Z,Y).
grandmother(X,Y) :- mother(X,Z), father(Z,Y).
grandmother(X,Y) :- mother(X,Z), mother(Z,Y).
brother(X,Y) :- male(Y), not(X=Y), not(spouse(X,Y)), father(X,Z),
father(Y,Z), mother(X,W), mother(Y,W).
sister(X,Y) :- female(Y), not(X=Y), not(spouse(X,Y)), father(X,Z),
father(Y,Z), mother(X,W), mother(Y,W).
uncle(X,Y) :- male(Y), father(X,Z), brother(Z,Y).
uncle(X,Y) :- male(Y), mother(X,Z), brother(Z,Y).
aunt(X,Y) :- female(Y), father(X,Z), sister(Z,Y).
aunt(X,Y) :- female(Y), mother(X,Z), sister(Z,Y).
```

```
aunt(X,Y) :- uncle(X,Z), spouse(Z,Y).
sibling(X, Y) :-
father(F, X), father(F, Y), mother(M, X), mother(M, Y), X \= Y.
calculate(X, '+', Y, Result) :-
Result is X + Y.
calculate(X, '-', Y, Result) :-
Result is X - Y.
calculate(X, '*', Y, Result) :-
Result is X * Y.
calculate(X, '/', Y, Result) :-
Y =\= 0,
Result is X / Y.
calculate(_, '/', 0, 'Cannot divide by zero').
calculate(_, Operator, _, 'Invalid operator'):-
\+ member(Operator, ['+', '-', '*', '/']).
```

OUTPUT QUERIES : -

***male*(jack)**

1

True

***grandmother*(helen,simon)**

1

True

***grandmother*(sophie,_)**

1

True

***grandmother*(sophie,_var)**

_var = harry

***sibling*(jess, _x)**

_x = lily

***sibling*(jack, _x)**

False

***grandfather*(oliver,harry)**

1

True

***grandfather*(ali,harry)**

False

_x is 5 + 3.

_x = 8

***calculate*(5, '+', 3, Result).**

Result = 8

***calculate*(5, '*', 3, Result).**

Result = 15

***calculate*(5, '/', 3, Result).**

Result = 1.6666666666666667

Family Tree : -