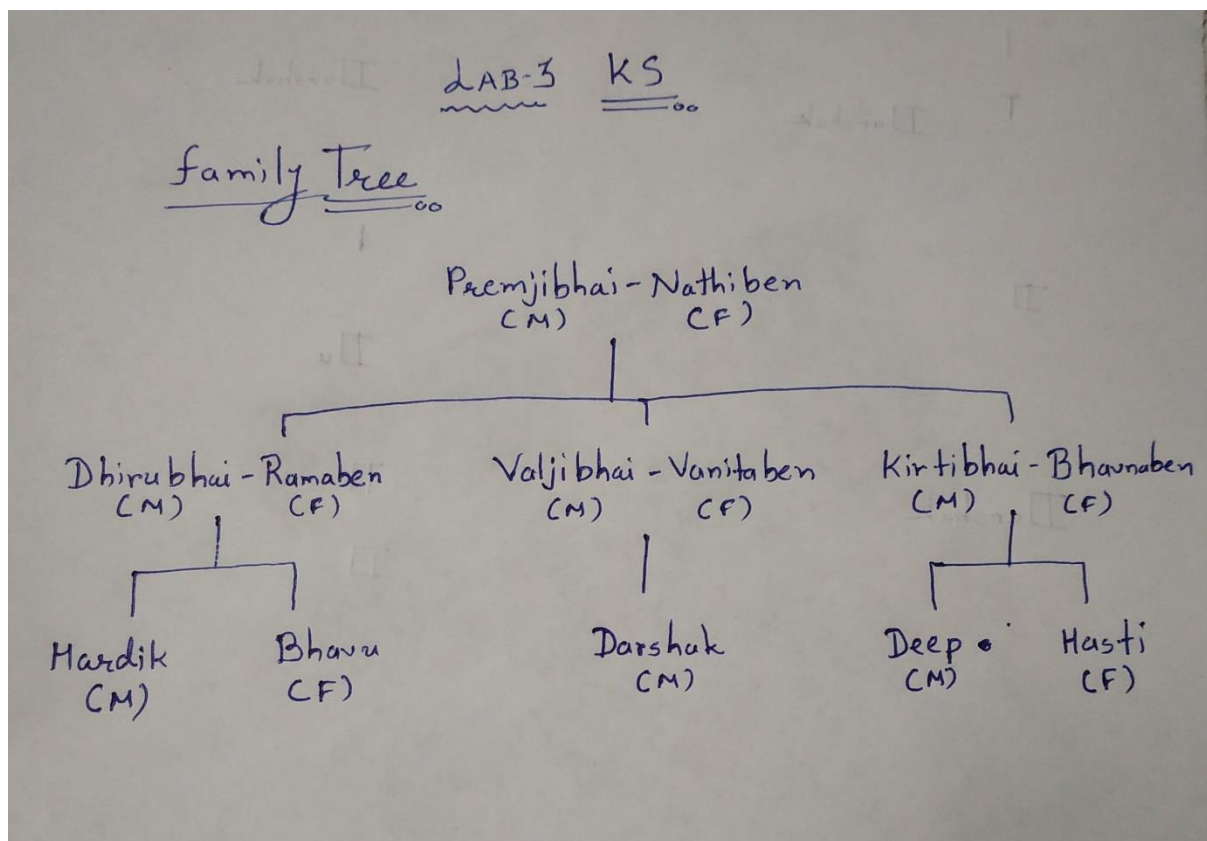# Lab3- WAP for Usage of rules in Prolog.

Procedure:- Create a family tree program

- M is the mother of P if she is a parent of P and is female
- F is the father of P if he is a parent of P and is male
- X is a sibling of Y if they both have the same parent.
- Then add rules for grandparents, uncle-aunt, sister and brother .

Based on the facts, define goals to answer questions related to family tree.

Family Tree:

Code:

```
domains
S_
predicates
        male(symbol)
        female(symbol)
        parent(symbol,symbol)
        couple(symbol,symbol)
        father(symbol,symbol)
        mother(symbol,symbol)
        sibling(symbol,symbol)
        grandfather(symbol,symbol)
        grandmother(symbol,symbol)
        brother(symbol,symbol)
        sister(symbol,symbol)
        uncle(symbol,symbol)
        aunt(symbol,symbol)


clauses
        male(premjibhai).
        male(dhirubhai).
        male(valjibhai).
```
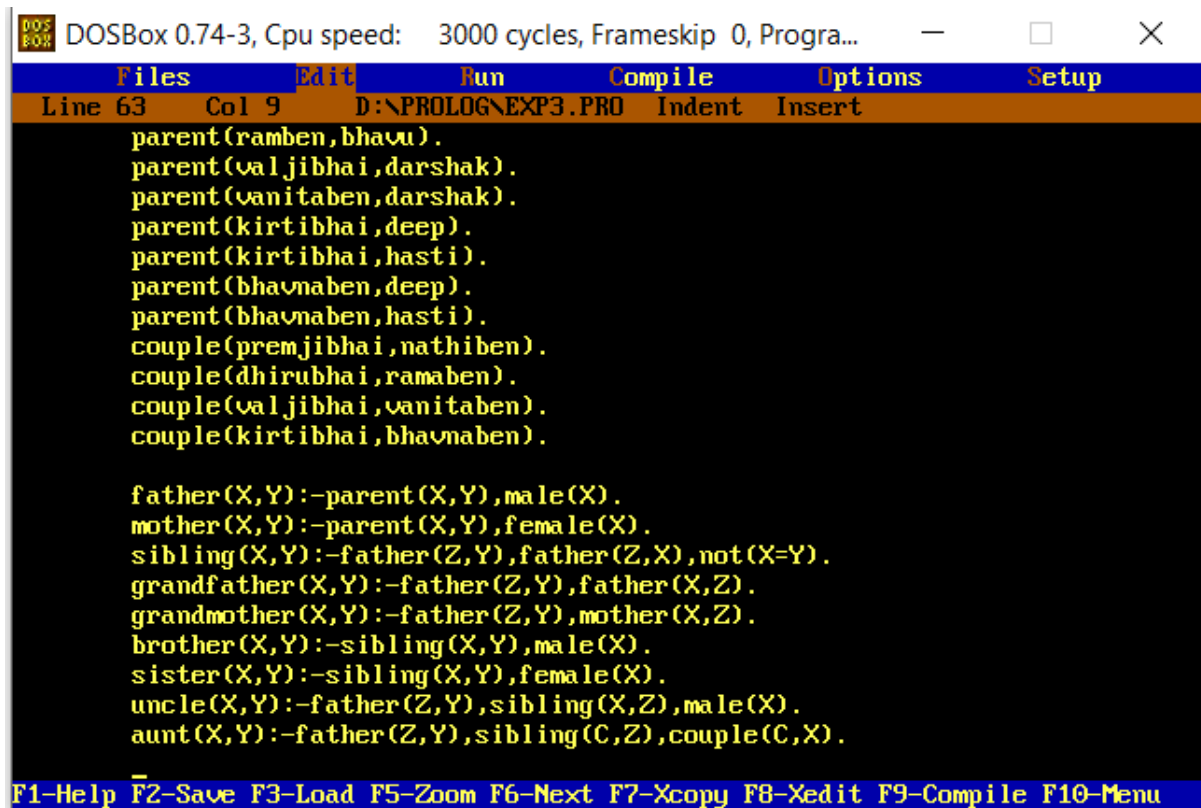
```
        male(kirtibhai).
        male(hardik).
        male(darshak).
        male(deep).
        female(nathiben).
        female(ramaben).
        female(vanitaben).
        female(bhavnaben).
        female(bhavu).
        female(hasti).
        parent(premjibhai,dhirubhai).
        parent(premjibhai,valjibhai).
        parent(premjibhai,kirtibhai).
        parent(nathiben,dhirubhai).
        parent(nathiben,valjibhai).
        parent(nathiben,kirtibhai).
        parent(dhirubhai,hardik).
        parent(dhirubhai,bhavu).
        parent(ramaben,hardik).
        parent(ramben,bhavu).
        parent(valjibhai,darshak).
        parent(vanitaben,darshak).
```

```
DOSBox 0.74-3, Cpu speed:    3000 cycles, Frameskip  0, Progra...    —    □    ×

   Files      Edit       Run        Compile      Options       Setup
 Line 63    Col 9      D:\PROLOG\EXP3.PRO   Indent   Insert
        parent(ramben,bhavu).
        parent(valjibhai,darshak).
        parent(vanitaben,darshak).
        parent(kirtibhai,deep).
        parent(kirtibhai,hasti).
        parent(bhavnaben,deep).
        parent(bhavnaben,hasti).
        couple(premjibhai,nathiben).
        couple(dhirubhai,ramaben).
        couple(valjibhai,vanitaben).
        couple(kirtibhai,bhavnaben).

        father(X,Y):-parent(X,Y),male(X).
        mother(X,Y):-parent(X,Y),female(X).
        sibling(X,Y):-father(Z,Y),father(Z,X),not(X=Y).
        grandfather(X,Y):-father(Z,Y),father(X,Z).
        grandmother(X,Y):-father(Z,Y),mother(X,Z).
        brother(X,Y):-sibling(X,Y),male(X).
        sister(X,Y):-sibling(X,Y),female(X).
        uncle(X,Y):-father(Z,Y),sibling(X,Z),male(X).
        aunt(X,Y):-father(Z,Y),sibling(C,Z),couple(C,X).
        _
F1-Help F2-Save F3-Load F5-Zoom F6-Next F7-Xcopy F8-Xedit F9-Compile F10-Menu
```
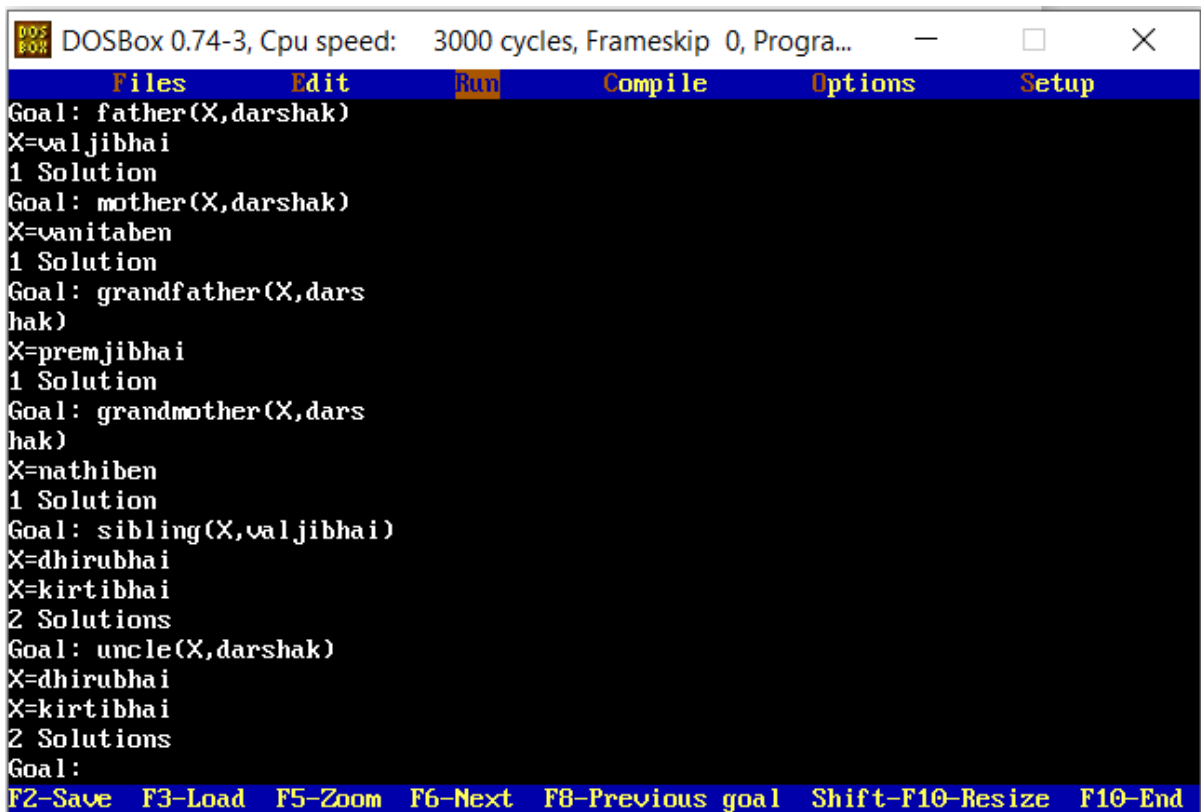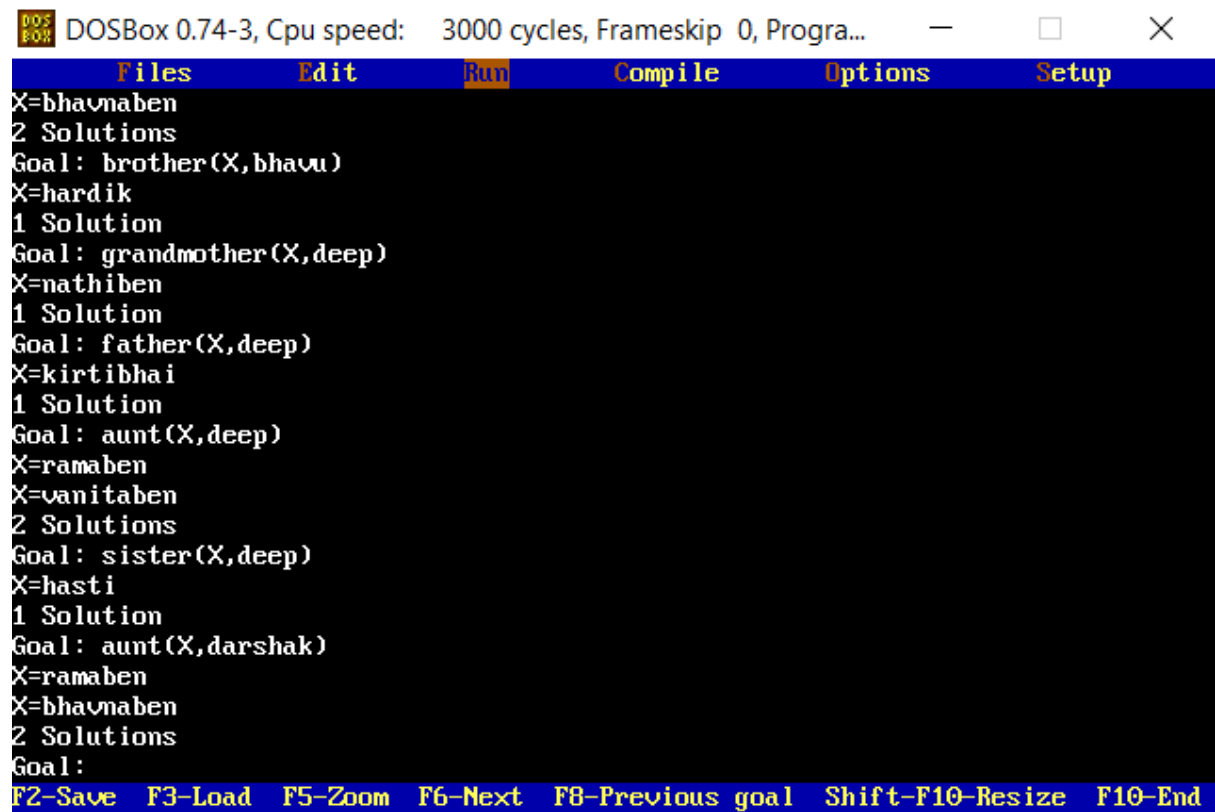
Output:

```
DOSBox 0.74-3, Cpu speed:    3000 cycles, Frameskip  0, Progra...    —    □    ×
   Files      Edit       Run        Compile      Options       Setup
Goal: father(X,darshak)
X=valjibhai
1 Solution
Goal: mother(X,darshak)
X=vanitaben
1 Solution
Goal: grandfather(X,dars
hak)
X=premjibhai
1 Solution
Goal: grandmother(X,dars
hak)
X=nathiben
1 Solution
Goal: sibling(X,valjibhai)
X=dhirubhai
X=kirtibhai
2 Solutions
Goal: uncle(X,darshak)
X=dhirubhai
X=kirtibhai
2 Solutions
Goal:
F2-Save   F3-Load   F5-Zoom   F6-Next   F8-Previous goal   Shift-F10-Resize   F10-End
```

```
 DOSBox 0.74-3, Cpu speed:    3000 cycles, Frameskip  0, Progra...      —      □      ✕
    Files        Edit      Run        Compile      Options        Setup
X=bhavnaben
2 Solutions
Goal: brother(X,bhavu)
X=hardik
1 Solution
Goal: grandmother(X,deep)
X=nathiben
1 Solution
Goal: father(X,deep)
X=kirtibhai
1 Solution
Goal: aunt(X,deep)
X=ramaben
X=vanitaben
2 Solutions
Goal: sister(X,deep)
X=hasti
1 Solution
Goal: aunt(X,darshak)
X=ramaben
X=bhavnaben
2 Solutions
Goal:
F2-Save  F3-Load  F5-Zoom  F6-Next  F8-Previous goal  Shift-F10-Resize  F10-End
```

Code:

domains

predicates

male(symbol)

female(symbol)

parent(symbol,symbol)

couple(symbol,symbol)

father(symbol,symbol)

mother(symbol,symbol)

sibling(symbol,symbol)

grandfather(symbol,symbol)

grandmother(symbol,symbol)

brother(symbol,symbol)

sister(symbol,symbol)

uncle(symbol,symbol)

aunt(symbol,symbol)

clauses

male(premjibhai).

male(dhirubhai).

male(valjibhai).

male(kirtibhai).

male(hardik).

male(darshak).

male(deep).

female(nathiben).

female(ramaben).

female(vanitaben).

female(bhavnaben).

female(bhavu).

female(hasti).

parent(premjibhai,dhirubhai).

parent(premjibhai,valjibhai).

parent(premjibhai,kirtibhai).

parent(nathiben,dhirubhai).

parent(nathiben,valjibhai).

parent(nathiben,kirtibhai).

parent(dhirubhai,hardik).

parent(dhirubhai,bhavu).

parent(ramaben,hardik).

parent(ramben,bhavu).

parent(valjibhai,darshak).

parent(vanitaben,darshak).

parent(kirtibhai,deep).

parent(kirtibhai,hasti).

parent(bhavnaben,deep).

parent(bhavnaben,hasti).

couple(premjibhai,nathiben).

couple(dhirubhai,ramaben).

couple(valjibhai,vanitaben).

couple(kirtibhai,bhavnaben).

father(X,Y):-parent(X,Y),male(X).

mother(X,Y):-parent(X,Y),female(X).

sibling(X,Y):-father(Z,Y),father(Z,X),not(X=Y).

grandfather(X,Y):-father(Z,Y),father(X,Z).

grandmother(X,Y):-father(Z,Y),mother(X,Z).

brother(X,Y):-sibling(X,Y),male(X).

sister(X,Y):-sibling(X,Y),female(X).

uncle(X,Y):-father(Z,Y),sibling(X,Z),male(X).

aunt(X,Y):-father(Z,Y),sibling(C,Z),couple(C,X).