

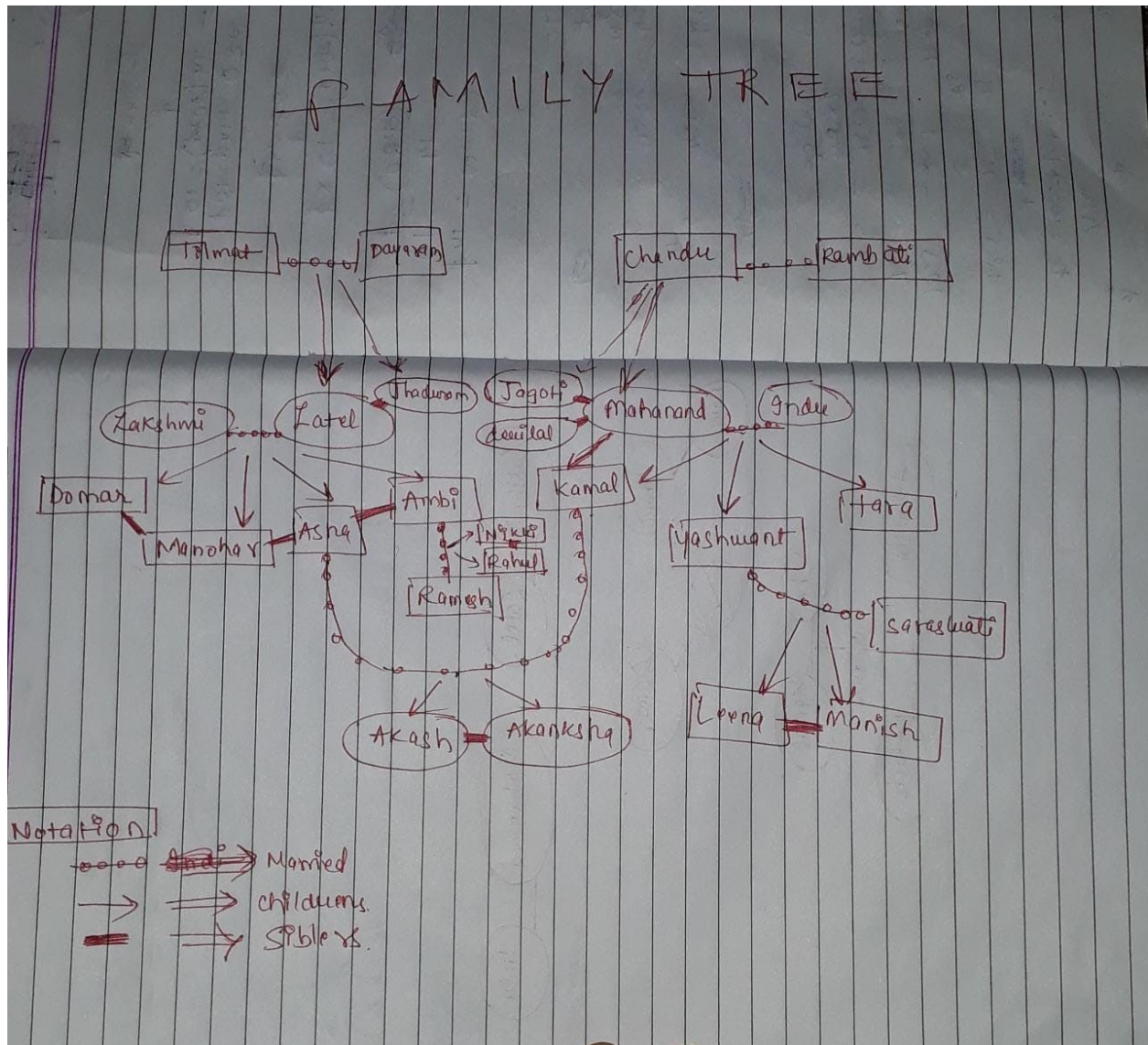
PRACTICE ASSIGNMENT -1

NAME :- Akanksha Dewangan

ROLL NO :- MT19049

Truth of facts and rules is below picture of family tree of asha and kamal who are married couple and akanksha and akash are their kids.

(NOTE:- TEST(X,Y) read as X TEST of Y).



PREDICATES USED:-

1. parent(X,Y). Means X is the parent of Y.
2. child(X,Y). means X is child of Y.
3. spouse(X,Y). Means X is the spouse or husband of Y.
4. male(X). Means X is male.

5.female(X).means X is female.

FAMILY-RELATION USED AS A CLAUSES ARE-

1.husband(X,Y)- x is husband of y.

2.wife(X,Y)-x is wife of y

3.son(X,Y)- x is son of y

4.daughter(X,Y)- x is daughter of y.

5.siblings(X,Y)- x and y are sblers

6.brothers(X,Y)- x and y are brothers

7.sisters(X,Y)- a and y are sisters

8.brothers_in_law(X,Y)- x is brother in law of y

9.sisters_in_law(X,Y)- x is sister in law of y

10.uncle(X,Y)- x is uncle of y

11.aunt(X,Y)- x is aunt of y

12.granduncle(X,Y)- x is grand uncle of y

13.grandaunt(X,Y)-x is grand aunt of y

14.first_cousine(X,Y)- x is the first cousin of y which is here if x is the child of parents, brothers or sisters.

15.reations1(X) to relations11(X):- print every above relations of X.

16.grandfather(X,Y)- x is grand father of y

17.grandmother(X,Y)- x is grandmother of y.

FACTS:-

parent(asha, akanksha).

parent(kamal, akanksha).

parent(asha, akash).

parent(kamal, akash).

parent(latel, asha).

parent(lakshmi, asha).

parent(mahanand, kamal).

parent(indu, kamal).

parent(latel, ambi).

parent(latel, domar).

parent(latel, manohar).

parent(lakshmi, ambi).

parent(lakshmi, domar).

parent(lakshmi, manohar).

parent(mahanand, tara).

parent(mahanand, yashwant).

parent(indu, tara).

parent(indu, yashwant).

parent(ambi, rahul).

parent(ambi, nikki).
parent(ramesh, rahul).
parent(ramesh, nikki).
parent(yashwant, leena).
parent(yashwant, manish).
parent(saraswati, leena).
parent(saraswati, manish).

parent(dayaram, latel).
parent(tilmat, latel).

parent(dayaram, jhaduram).
parent(tilmat, jhaduram).
parent(chandu, mahanand).
parent(raambati, mahanand).
parent(chandu, jagoti).
parent(raambati, jagoti).

child(akanksha, asha).
child(akanksha, kamal).
child(akash, asha).
child(akash, kamal).
child(asha, latel).
child(asha, lakshmi).
child(kamal, mahanand).
child(kamal, indu).
child(ambi, latel).
child(domar, latel).
child(manohar, latel).
child(ambi, lakshmi).
child(domar, lakshmi).
child(manohar, lakshmi).
child(tara, mahanand).
child(yashwant, mahanand).
child(tara, indu).
child(yashwant, indu).
child(nikki, ambi).
child(rahul, ambi).
child(rahul, ramesh).
child(nikki, ramesh).
child(leena, yashwant).
child(manish, yashwant).
child(leena, saraswati).

child(manish, saraswati).
child(latel, dayaram).
child(latel, tilmat).
child(jhaduram, dayaram).
child(jhaduram, tilmat).
child(mahanand, chandu).
child(mahanand, raambati).
child(jagoti, chandu).
child(jagoti, raambati).

male(kamal).
male(akash).
male(latel).
male(mahanand).
male(yashwant).
male(domar).
male(manohar).
male(lakshman).
male(jhaduram).
male(devilal).
male(dev).
male(ramesh).
male(nikki).
male(rahul).
male(manish).
male(leena).
male(dayaram).
male(chandu).

female(asha).
female(akanksha).
female(lakshmi).
female(indu).
female(ambi).
female(tara).
female(jagoti).
female(geerja).
female(asho).
female(rani).
female(leena).
female(tilmat).
female(raambati).

spouse(kamal, asha).
spouse(latel, lakshmi).
spouse(mahanand, indu).
spouse(ramesh, ambi).
spouse(yashwant, saraswati).
spouse(dayaram, tilmat).
spouse(chandu, raambati).

CLAUSES OR RULES:-

husband(X,Y):-spouse(X, Y), female(Y),male(X).
wife(X, Y):-husband(Y, X).

sons(X, Y):-child(X, Y),parent(Y, X),male(X).
daughter(X, Y):-child(X, Y),parent(Y, X),female(X).

siblings(X, Y):-parent(Z, Y),parent(Z, X),child(X, Z),child(Y, Z).

brother(X, Y):-parent(Z, X),parent(Z, Y),child(X, Z),child(Y, Z),male(X),male(Y).
sisters(X, Y):-parent(Z, X),parent(Z, Y),child(X, Z),child(Y, Z),female(X),female(Y).

brother_in_law(X, Y):-wife(Y, Z),brother(Z, X),male(X),female(Y),male(Z).
brother_in_law(X, Y):-husband(Y, Z),siblings(Z, X),male(X),male(Y),female(Z).

sister_in_law(X, Y):-wife(Y, Z),siblings(X, Z),male(Z),female(Y),female(X).
sister_in_law(X, Y):-husband(Y, Z),siblings(X, Z),male(Y),female(Z),female(X).

uncle(X, Y):-parent(Z, Y),siblings(Z, X),male(X).
uncle(X, Y):-parent(Z, Y),brother_in_law(X, Z),male(X).
aunts(X, Y):-parent(Z, Y),siblings(Z, X),female(X).
aunts(X, Y):-parent(Z, Y),sister_in_law(X, Z),female(X).

first_cousins(X, Y):-parent(Z, X),aunts(Z, Y),child(X, Z),female(Z).
first_cousins(X, Y):-parent(Z, X),uncle(Z, Y),child(X, Z),male(Z).

grandfathers(X, Y):-male(X),parent(X, Z),parent(Z, Y),child(Y, Z),child(Z, X).

grandmothers(X, Y):-female(X),parent(X, Z),parent(Z, Y),child(Y, Z),child(Z, X).

grandUncle(X, Y):-male(X),grandfathers(Z, Y),parent(W, Y),child(Y, W),uncle(X, W),not(grandfathers(X, Y)),not(Z=X).

grandAunt(X, Y):-female(X),grandmothers(Z, Y),parent(W, Y),child(Y, W),aunts(X, W),not(grandfathers(X, Y)),not(Z=X).

Following clauses to print the relations-

relation1(X):-father(Y, X),write(Y),write(' is father of '),write(X).

relation2(X):-mother(Y, X),write(Y),write(' is mother of '),write(X).

relation3(X):-uncle(Y, X),write(Y),write(' is uncle of '),write(X).

relation4(X):-aunts(Y, X),write(Y),write(' is aunt of '),write(X).

relation5(X):-grandfathers(Y, X),write(Y),write(' is grandfather of '),write(X).

relation6(X):-grandmothers(Y, X),write(Y),write(' is grandmother of '),write(X).

relation7(X):-grandUncle(Y, X),write(Y),write(' is granduncle of '),write(X).

relation8(X):-grandAunt(Y, X),write(Y),write(' is grandaunt of '),write(X).

relation9(X):-siblings(Y, X),write(Y),write(' is sibling of '),write(X).

relation10(X):-brother_in_law(Y, X),write(Y),write(' is brother in law of '),write(X).

relation11(X):-sister_in_law(Y, X),write(Y),write(' is sister in law of '),write(X).

RESULTS:-

1.

```
?- ['C:/Users/akanksha/Desktop/AI_assignment1.pl'].
true.

?- female(akanksha).
true.

?- female(asha).
true.

?- male(kamal).
true.

?- spouse(kamal,asha).
true.

?- wife(asha,kamal).
true.

?- wife(ambi, ramesh).
true.

?- husband(ramesh, ambi).
true.

?- son(akash, kamal).
Correct to: "sons(akash,kamal)"? yes
true.

?- son(kamal, mahanand).
Correct to: "sons(kamal,mahanand)"? yes
true
Unknown action: e (h for help)
Action?
Unknown action: s (h for help)
Action? .

?- daughter(akanksha, kamal).
true.

?- daughter(akanksha, asha).
true.

?- daughter(akanksha, ambi).
false.

?- siblings(akanksha, akash).
true.

?- siblings(akanksha, nikki).
false.

?- brothers(domar, manohar).
Correct to: "brother(domar,manohar)"? yes
true
Unknown action: e (h for help)
```

2.

```
?- sisters(asha, ambi).
true .

?- brother_in_law(yashwant, asha).
true .

?- sister_in_law(tara, asha).
true .

?- sister_in_law(tara, ambi).
false.

?- uncle(domar, akash).
true .

?- uncle(kamal, akash).
true .

?- ['C:/Users/akanksha/Desktop/AI_assignment1.pl'].
true.

?- uncle(kamal, akash).
false.

?- uncle(domar, akash).
true .

?- aunt(tara, akash).
Correct to: "aunts(tara,akash)"? yes
true .

?- aunt(asha, akash).
Correct to: "aunts(asha,akash)"? yes
false.

?- aunt(indu, akash).
Correct to: "aunts(indu,akash)"? yes
false.

?- aunt(jagoti, akash).
Correct to: "aunts(jagoti,akash)"? yes
false.

?- first_cousins(nikki, akash).
true .

?- first_cousins(manish, akash).
true .

?- first_cousins(manish, akanksha).
true .

?- grandfather(latel, akanksha).
Correct to: "grandfathers(latel,akanksha)"? yes
true .

?- grandfather(jhaduram, akanksha).
Correct to: "grandfathers(jhaduram,akanksha)"? yes
```

3.


```
?- aunt(jagoti, akash).
Correct to: "aunts(jagoti,akash)"? yes
false.

?- first_cousins(nikki, akash).
true .

?- first_cousins(manish, akash).
true .

?- first_cousins(manish, akanksha).
true .

?- grandfather(latel, akanksha).
Correct to: "grandfathers(latel,akanksha)"? yes
true .

?- grandfather(jhaduram, akanksha).
Correct to: "grandfathers(jhaduram,akanksha)"? yes
false.

?- grandUncle(jhaduram, akanksha).
true .

?- grandAunt(jagoti, akanksha).
true .

?- grandAunt(indu, akanksha).
false.

?- ■
```

following are relations of akanksha and some of kamal.

```
?- ['C:/Users/akanksha/Desktop/AI_assignment1.pl'],  
true.
```

```
?- relation1(akanksha).  
kamal is father of akanksha  
true.
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```
?- relation2(akanksha).  
asha is mother of akanksha  
true.
```

```
?- relation3(akanksha).  
yashwant is uncle of akanksha  
true.
```

```
?- relation4(akanksha).  
ambi is aunt of akanksha  
true.
```

```
?- relation5(akanksha).  
latel is grandfather of akanksha  
true.
```

```
?- relation6(akanksha).  
lakshmi is grandmother of akanksha  
true.
```

```
?- relation7(akanksha).  
jhaduram is granduncle of akanksha  
true.
```

```
?- relation8(akanksha).  
jagoti is grandaunt of akanksha  
true.
```

```
?- relation9(akanksha).  
akanksha is sibling of akanksha  
true.
```

```
?- relation10(kamal).  
domar is brother in law of kamal  
true .
```

```
?- relation11(kamal).  
asha is sister in law of kamal  
true  
Unknown action: [] (h for help)  
Action? ,
```

```
?- relation11(asha).  
tara is sister in law of asha  
true ■
```