UNIVERSITY OF ASIA PACIFIC

Department of Computer Science and Engineering

Course Title :
Artificial Intelligence and Expert Systems Lab
Course Code : CSE 404

Assignment No: 01

Submitted By:

Asikur Rahman Sumon

ID: 19201055

Submitted to:

Dr. Nasima Begum

Assistant Professor

Department of CSE,

University Of Asia Pacific.

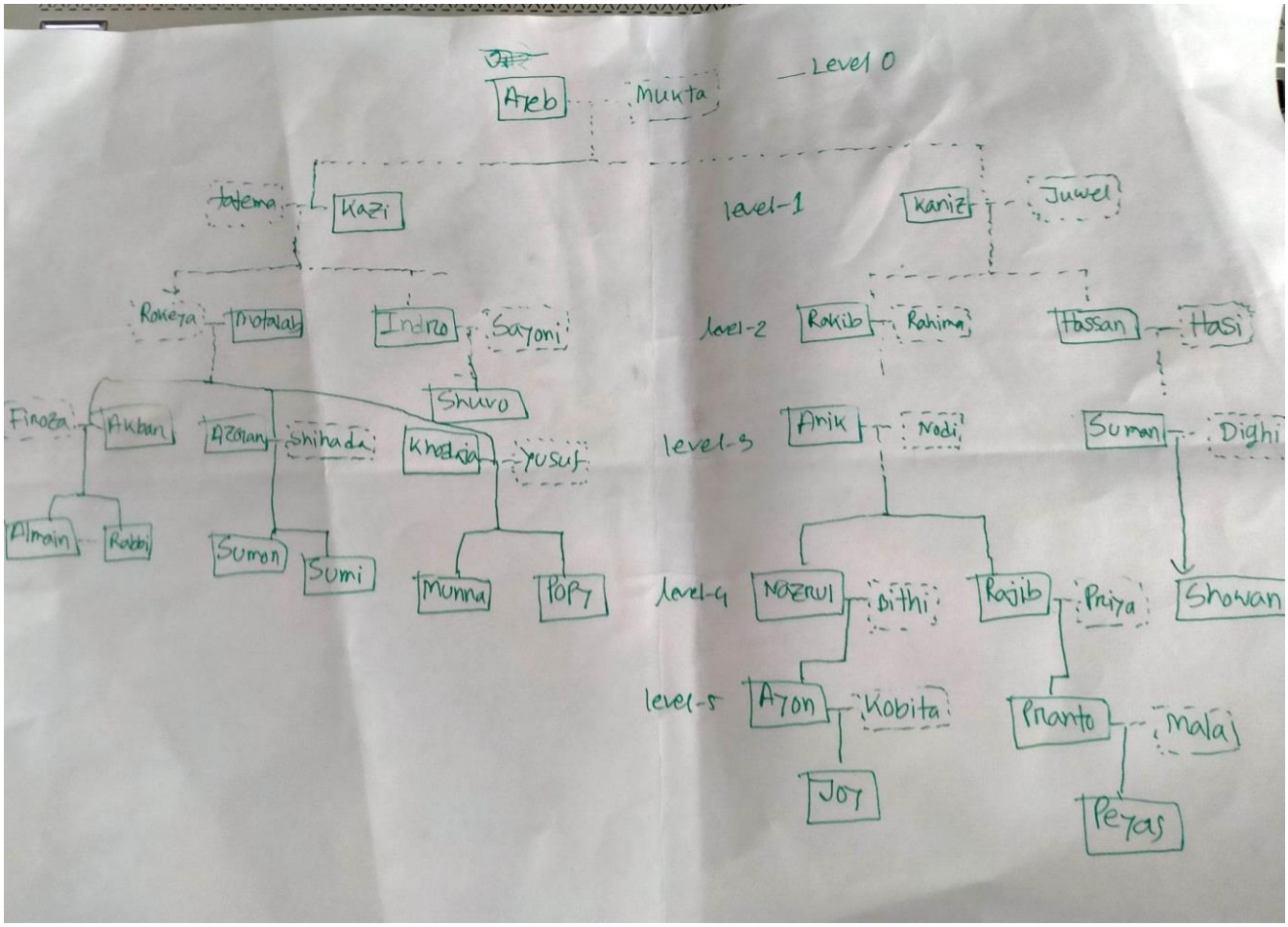
Problem Title:

Implement a basic family relationship tree structure of your own family using Prolog. Write rules against degree and removal for up to 3rd degree and twice removed situation for cousin relationship. You have to use recursion in your rules for different family relations.

Tools And Languages:

1. SWI-Prolog
2. visual studio code

Diagram

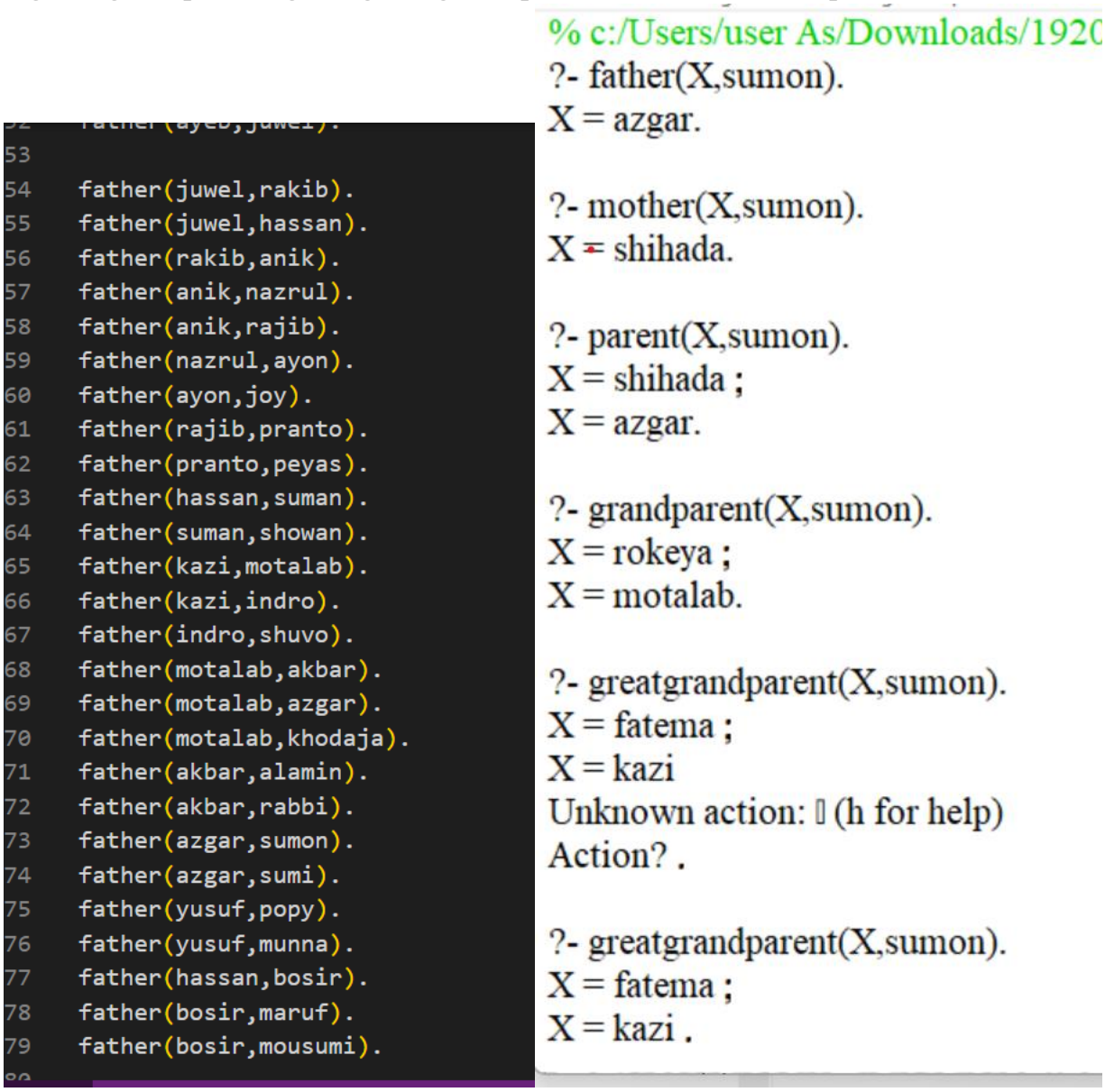


The above diagram is my family relationship tree structure. Now with help of SWI-Prolog I'll remove first, second, third cousin twice times. In the tree, all bold

rectangular box represents males and dotted arrow represents wife.

Sample Output

In the screenshot, here is the sample output for father, mother, parent, grandparent, great-grandparent, great great grand parent for a individual person.



```
53
54   father(juwel,rakib).
55   father(juwel,hassan).
56   father(rakib,anik).
57   father(anik,nazrul).
58   father(anik,rajib).
59   father(nazrul,ayon).
60   father(ayon,joy).
61   father(rajib,pranto).
62   father(pranto,peyas).
63   father(hassan,suman).
64   father(suman,showan).
65   father(kazi,motalab).
66   father(kazi,indro).
67   father(indro,shuvo).
68   father(motalab,akbar).
69   father(motalab,azgar).
70   father(motalab,khodaja).
71   father(akbar,alamin).
72   father(akbar,rabbi).
73   father(azgar,sumon).
74   father(azgar,sumi).
75   father(yusuf,popy).
76   father(yusuf,munna).
77   father(hassan,bosir).
78   father(bosir,maruf).
79   father(bosir,mousumi).
```

```
% c:/Users/user As/Downloads/1920
?- father(X,sumon).
X = azgar.

?- mother(X,sumon).
X = shihada.

?- parent(X,sumon).
X = shihada ;
X = azgar.

?- grandparent(X,sumon).
X = rokeya ;
X = motalab.

?- greatgrandparent(X,sumon).
X = fatema ;
X = kazi
Unknown action: ▯ (h for help)
Action? .

?- greatgrandparent(X,sumon).
X = fatema ;
X = kazi .
```

And here is the sample output by removing first cousin, second cousin and third cousin first cousins, second cousin and third cousin.

```
159 thirdcousin(X,Y):-
160     greatgreatgrandparent(Z,X),
161     greatgreatgrandparent(Z,Y),
162     \+firstcousin(X,Y),
163     \+secondcousin(X,Y),
164     \+sibling(X,Y),
165     X\=Y.
166
167 firstcousin_onceremoved(X,Y):-
168     parent(Z,Y),
169     firstcousin(X,Z).
170 firstcousin_onceremoved(X,Y):-
171     parent(Z,X),
172     firstcousin(Z,Y).
173
174 firstcousin_twiceremoved(X,Y):-
175     firstcousin(X,Z),
176     grandparent(Z,Y).
177 firstcousin_twiceremoved(X,Y):-
178     firstcousin(Z,Y),
179     grandparent(Z,X).
180
181 secondcousin_onceremoved(X,Y):-
182     parent(Z,Y),
183     secondcousin(X,Z).
184 secondcousin_onceremoved(X,Y):-
185     parent(Z,X),
186     secondcousin(Z,Y).
ted Mode  ⊗ 0 ⚠ 0
```

```
?- firstcousin_twiceremoved(X,Y).
X = rakib,
Y = popy ;
X = rakib,
Y = munna .

?- secondcousin_twiceremoved(X,Y).
X = akbar,
Y = ayon ;
X = azgar,
Y = ayon .
```

```
?- thirdcousin_twiceremoved(X,Y).
X = popy,
Y = joy ;
X = munna,
Y = joy ;
X = alamin,
Y = joy .

?-
```

Conclusion

I've faced some minor difficulties during completing this assignment. SWI-Prolog was showing some errors. But after some troubleshooting I was able to fix all the errors of SWI-Prolog. https://swi-prolog.discourse.group/ has some amazing solution which helps me a lot during troubleshooting.