University of Asia Pacific

Department of Computer Science & Engineering

Course Title: Artificial Intelligence and Expert System Lab

Course Code : CSE 404

Assignment Report

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Section: B1

Submitted To
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Associate Professor,
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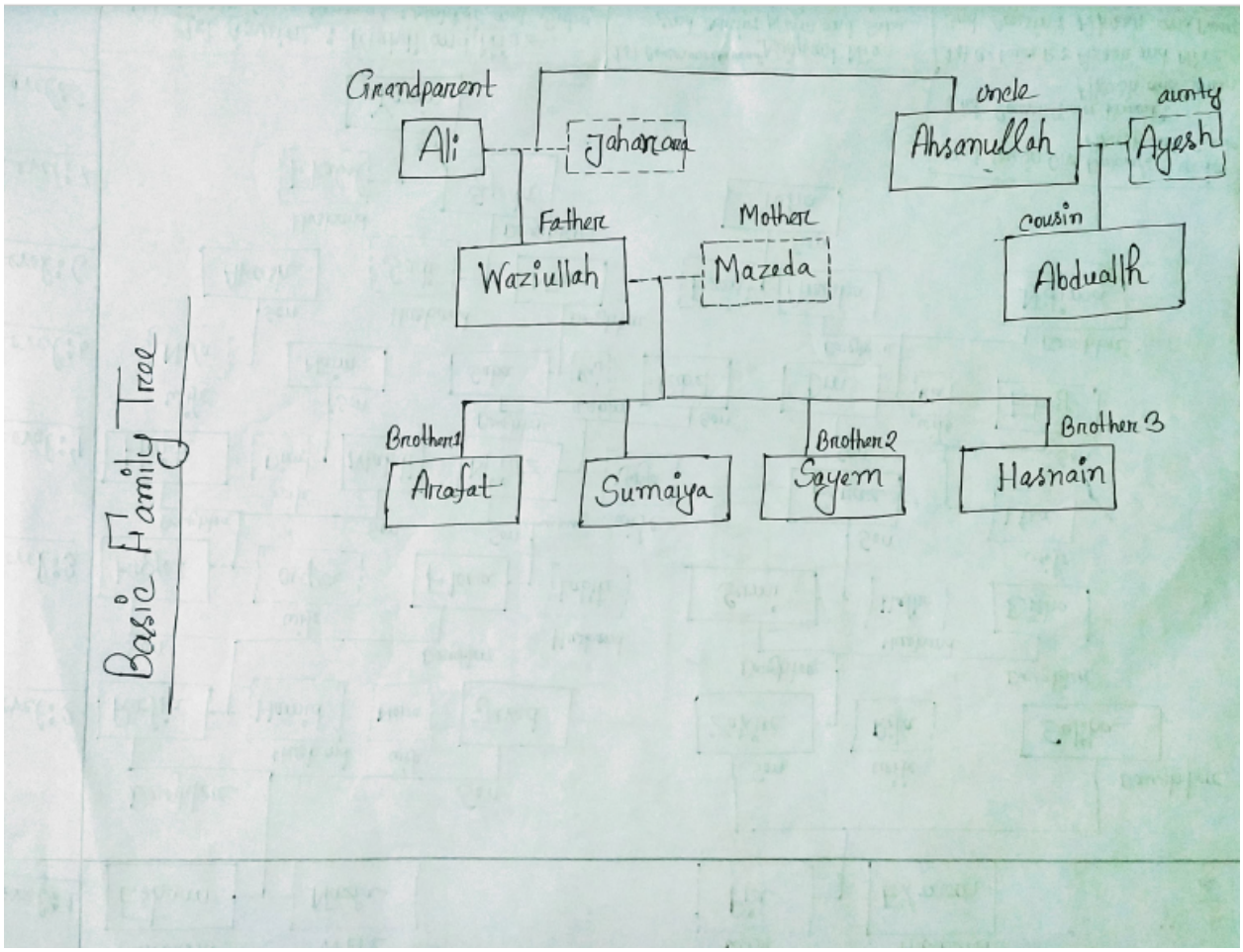
1. Problem Title: Implement a basic family relationship tree structure of your own family using Prolog. Write rules against degree and removal for up to 3rd degree and twice removed situations for cousin relations. You have to use recursion in your rules for different family relations.

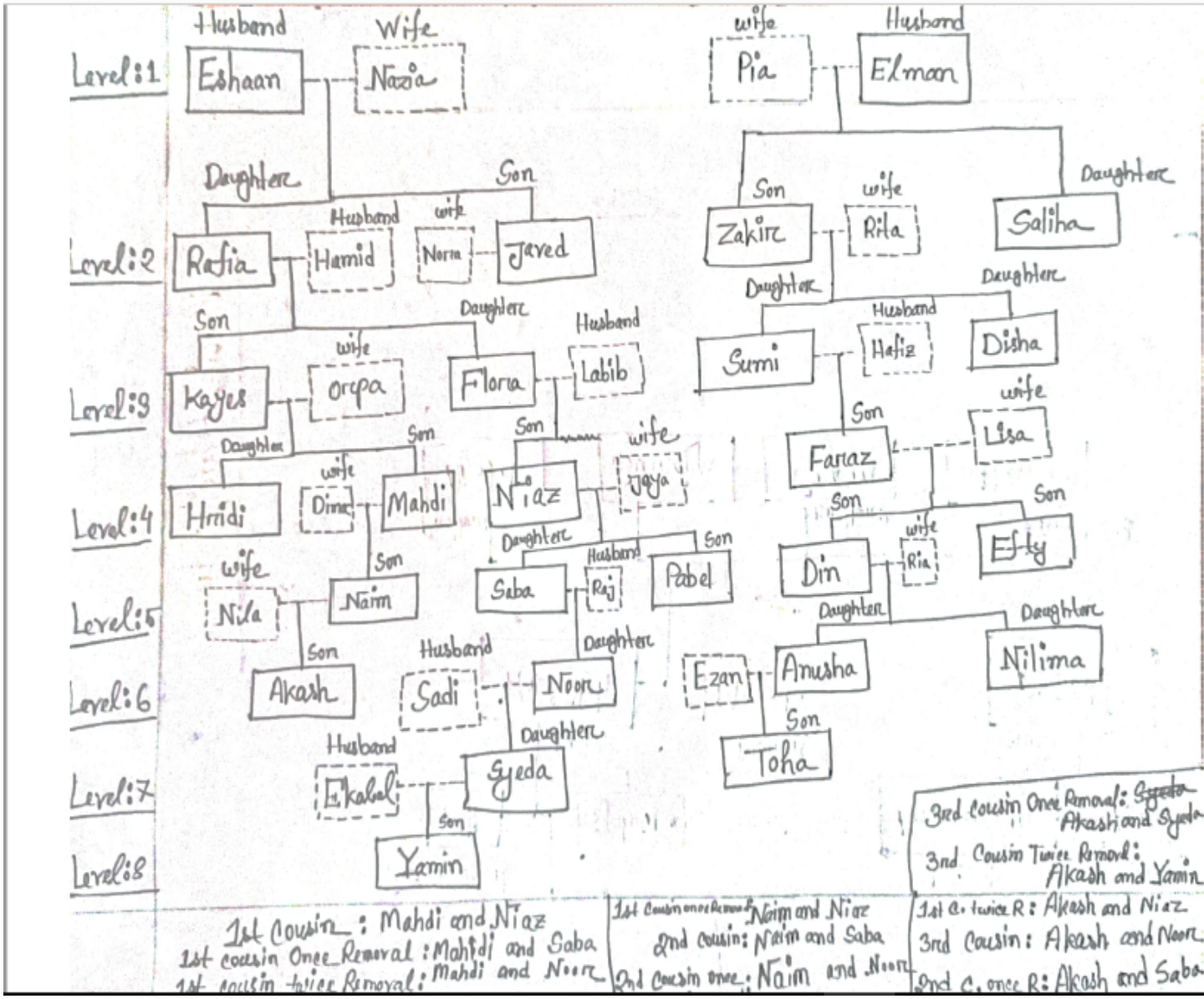
2. Problem Description: I have been told to implement a basic family relationship tree structure of my own family using Prolog and would write rules against degree and removal for up to 3rd degree and twice removed situations for cousin relations. I have to use recursion in my rules for different family relations. So, first I draw my family tree, and then write my knowledge base/facts in a PL file. Then run in prolog. And query every relationship step by step, and I used recursion in my rules for different family relations. I also drew my cousin's tree for showing till 3rd degree twice removed. But finally, I couldn't finish my work.

3. Tools and Languages Used: Swi-Prolog for simulation, Notepad to write knowledge base,

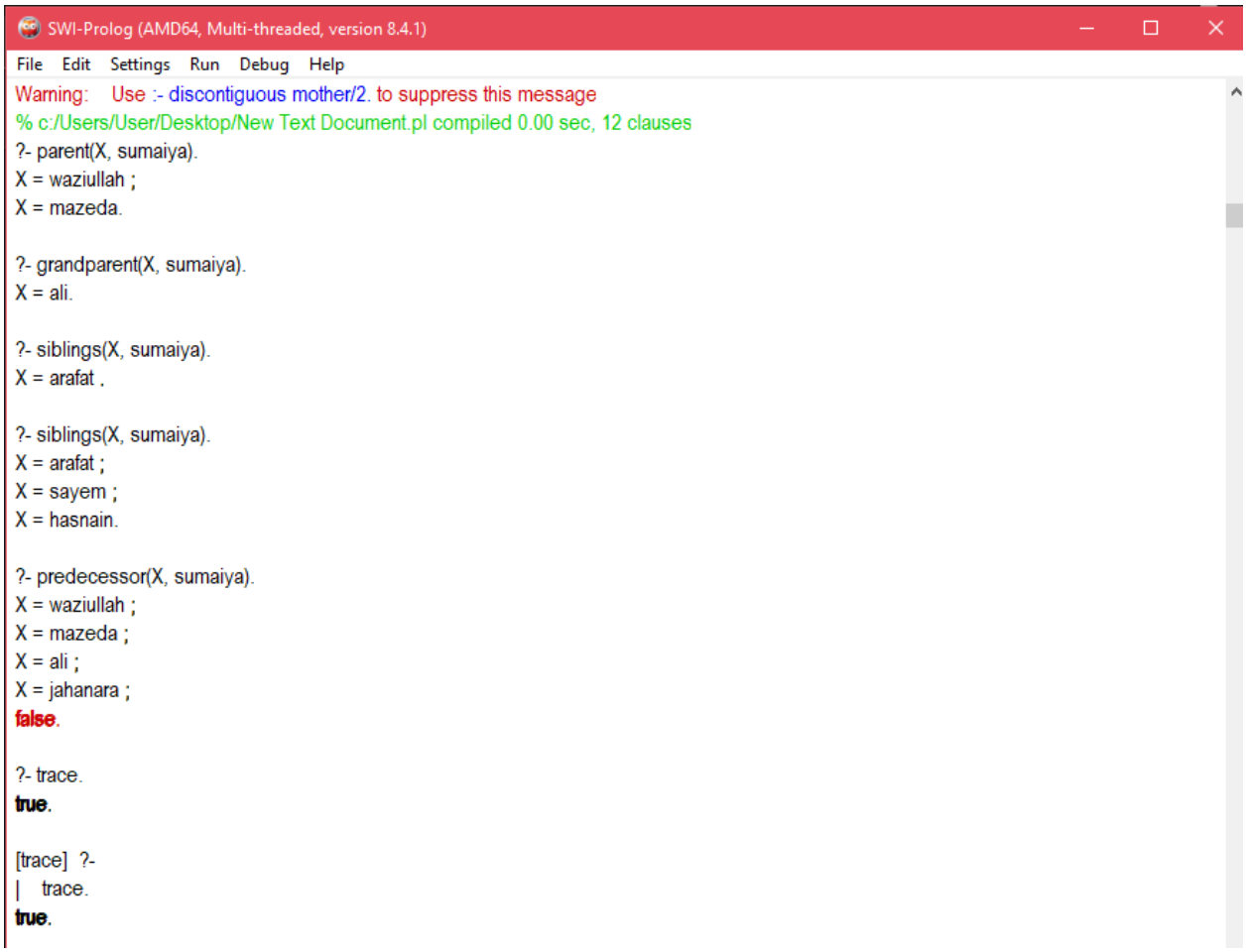
4. Diagram/Figure: For Family Tree:

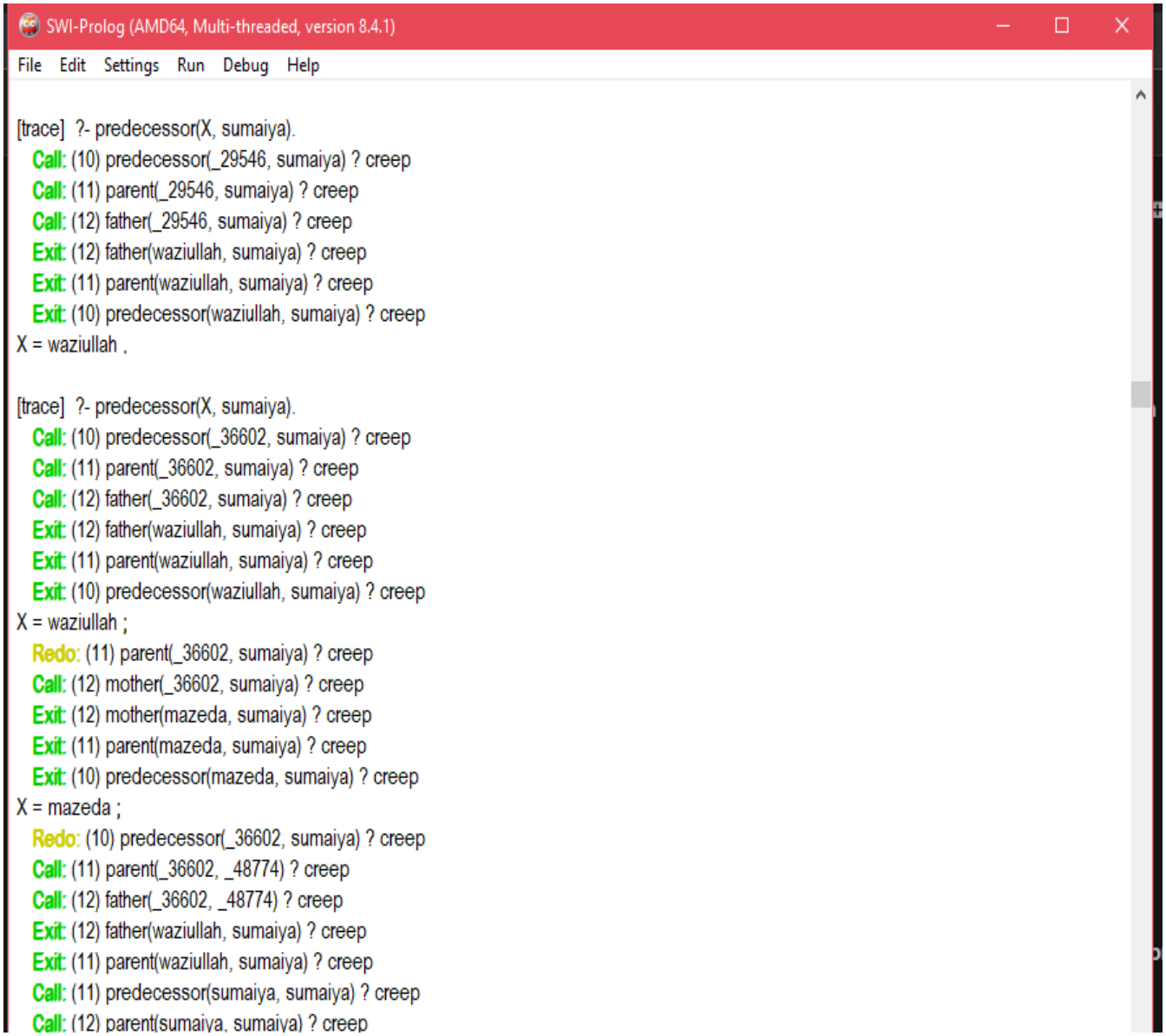


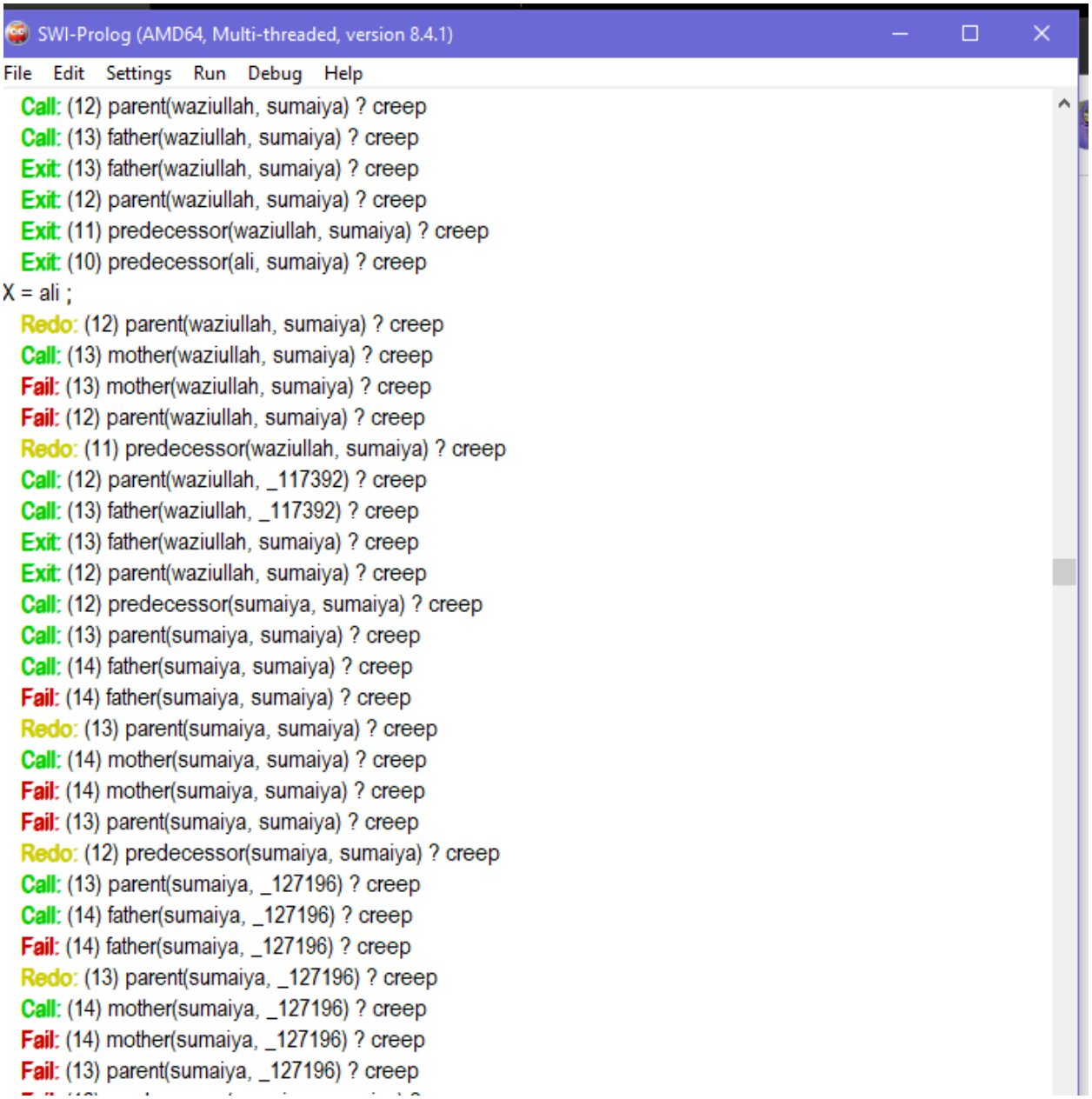
Diagram/Figure: For Cousin Tree:

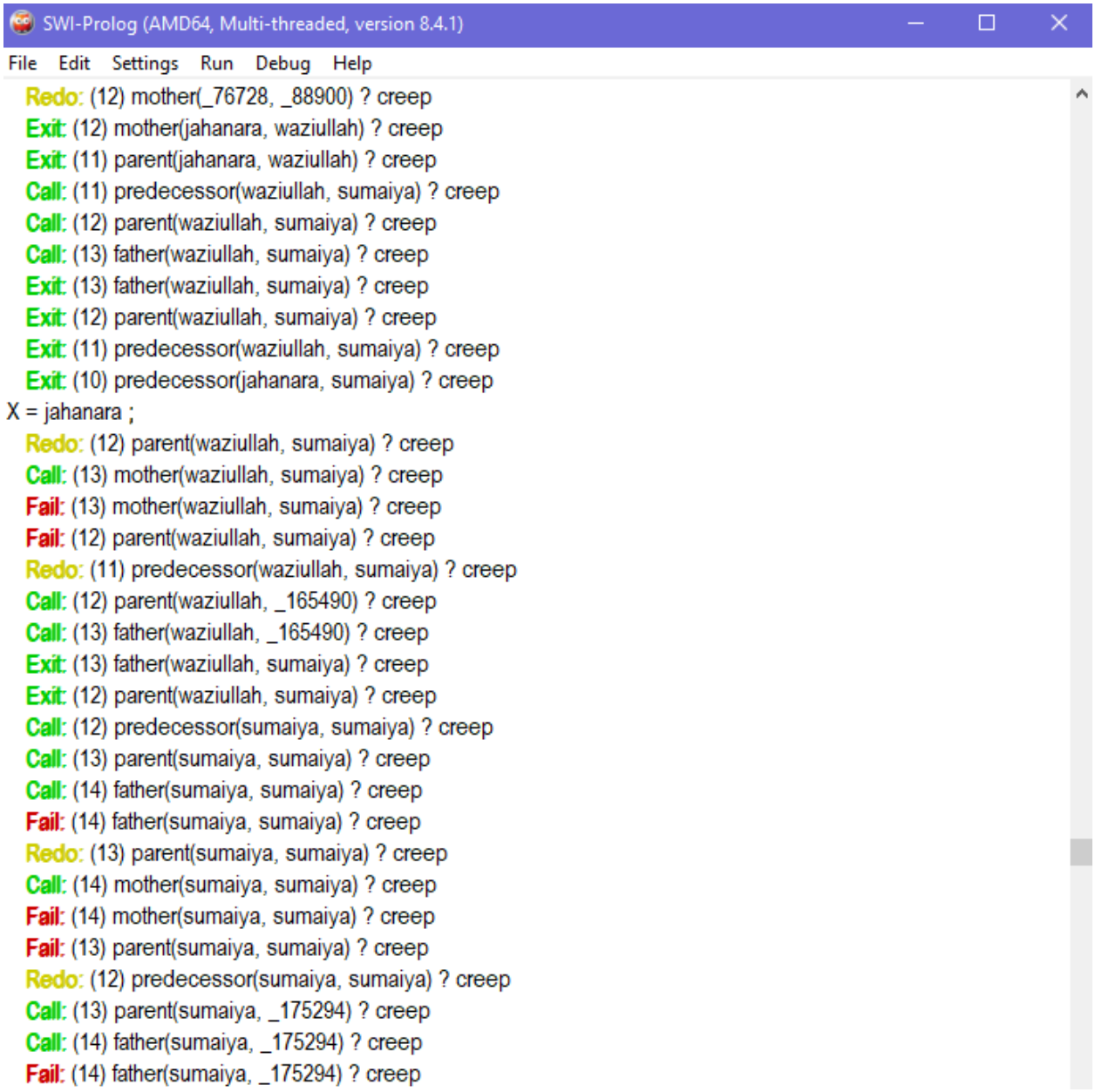


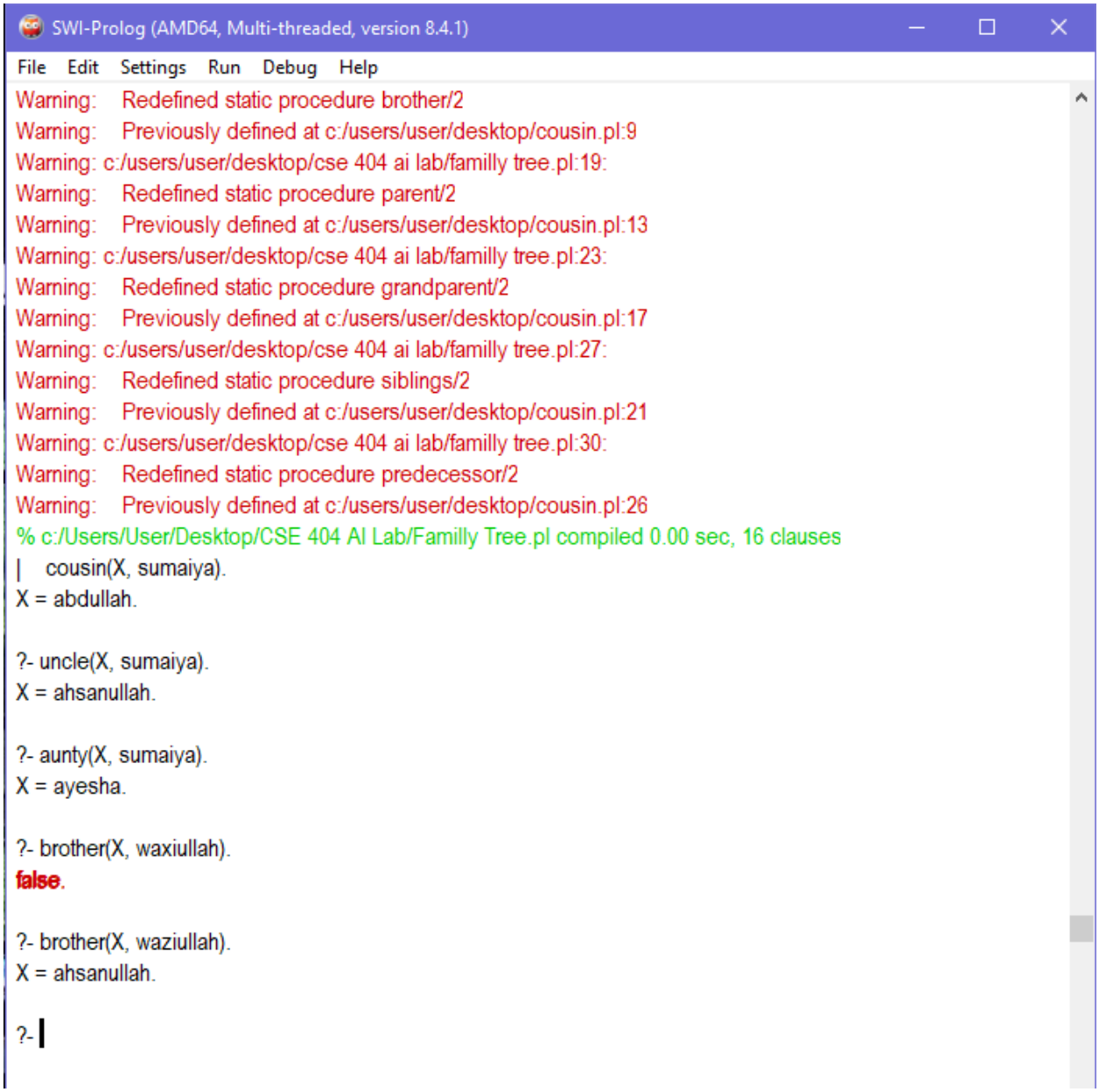
5. Sample Input/Output: For Basic family tree:



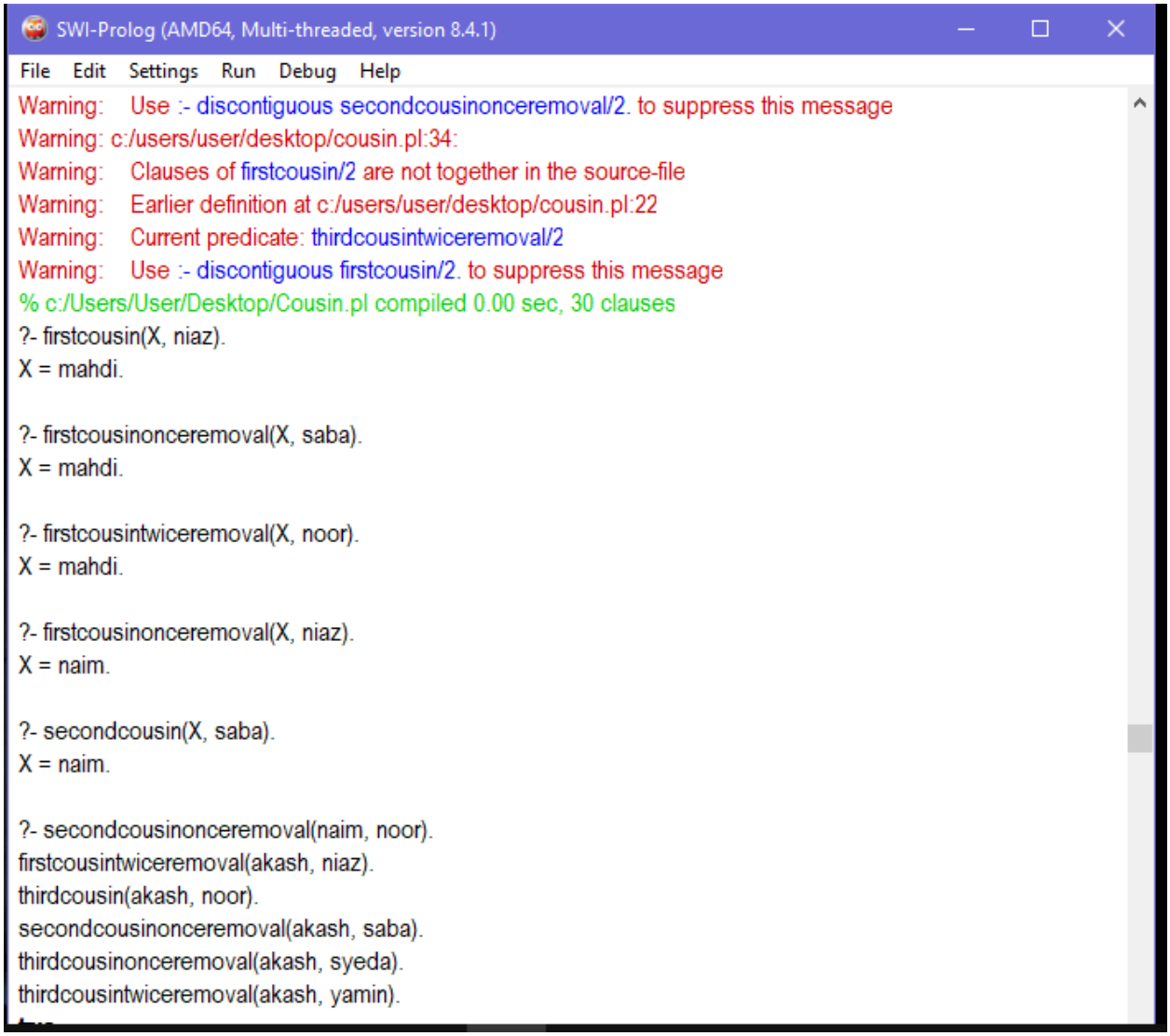

SWI-Prolog (AMD64, Multi-threaded, version 8.4.1)
File Edit Settings Run Debug Help
[trace] ?- predecessor(X, sumaiya).
Call: (10) predecessor(_29546, sumaiya) ? creep
Call: (11) parent(_29546, sumaiya) ? creep
Call: (12) father(_29546, sumaiya) ? creep
Exit: (12) father(waziullah, sumaiya) ? creep
Exit: (11) parent(waziullah, sumaiya) ? creep
Exit: (10) predecessor(waziullah, sumaiya) ? creep
X = waziullah .
[trace] ?- predecessor(X, sumaiya).
Call: (10) predecessor(_36602, sumaiya) ? creep
Call: (11) parent(_36602, sumaiya) ? creep
Call: (12) father(_36602, sumaiya) ? creep
Exit: (12) father(waziullah, sumaiya) ? creep
Exit: (11) parent(waziullah, sumaiya) ? creep
Exit: (10) predecessor(waziullah, sumaiya) ? creep
X = waziullah ;
Redo: (11) parent(_36602, sumaiya) ? creep
Call: (12) mother(_36602, sumaiya) ? creep
Exit: (12) mother(mazeda, sumaiya) ? creep
Exit: (11) parent(mazeda, sumaiya) ? creep
Exit: (10) predecessor(mazeda, sumaiya) ? creep
X = mazeda ;
Redo: (10) predecessor(_36602, sumaiya) ? creep
Call: (11) parent(_36602, _48774) ? creep
Call: (12) father(_36602, _48774) ? creep
Exit: (12) father(waziullah, sumaiya) ? creep
Exit: (11) parent(waziullah, sumaiya) ? creep
Call: (11) predecessor(sumaiya, sumaiya) ? creep
Call: (12) parent(sumaiya, sumaiya) ? creep

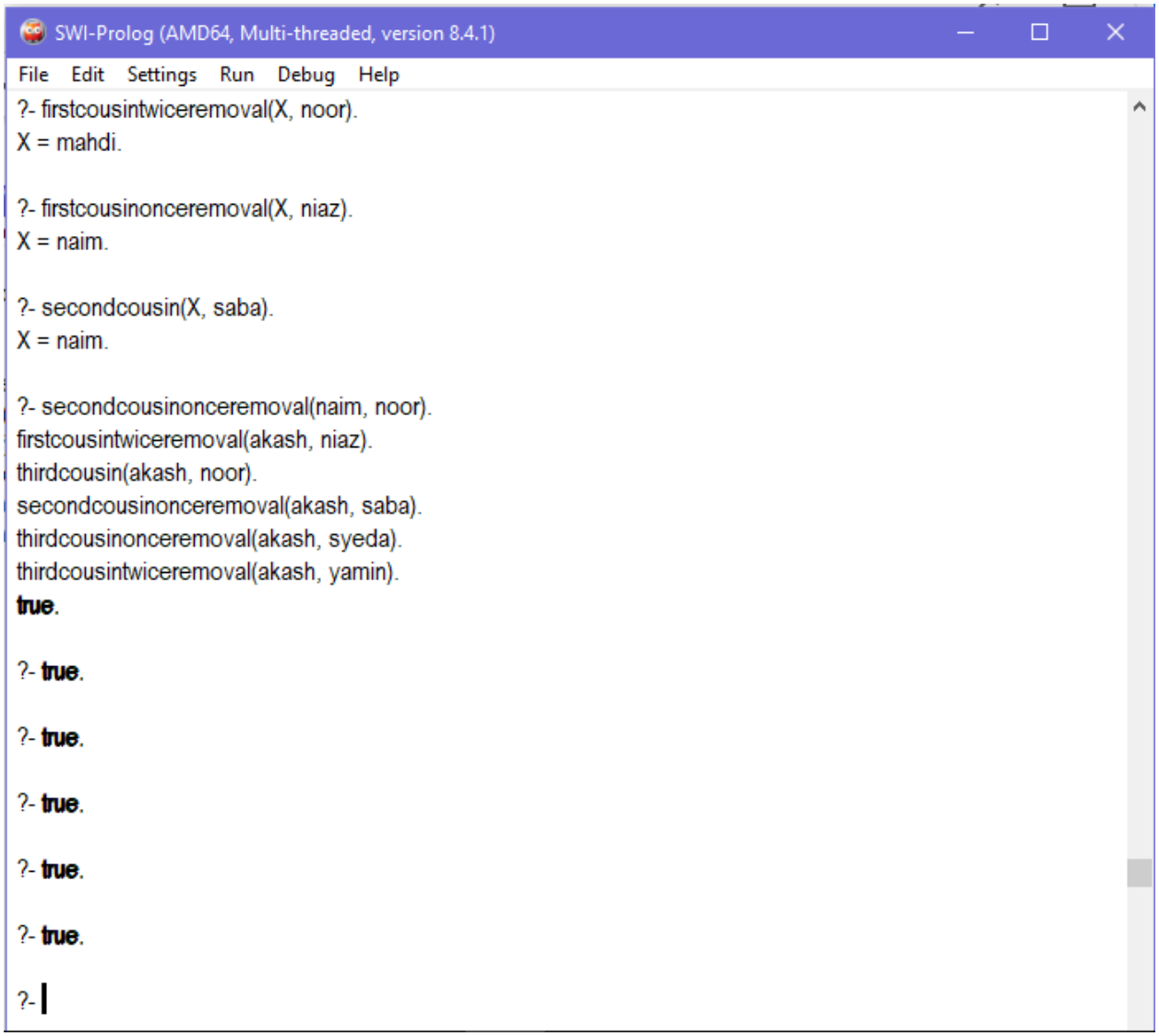

SWI-Prolog (AMD64, Multi-threaded, version 8.4.1)
File Edit Settings Run Debug Help
Call: (12) parent(waziullah, sumaiya) ? creep
Call: (13) father(waziullah, sumaiya) ? creep
Exit: (13) father(waziullah, sumaiya) ? creep
Exit: (12) parent(waziullah, sumaiya) ? creep
Exit: (11) predecessor(waziullah, sumaiya) ? creep
Exit: (10) predecessor(ali, sumaiya) ? creep
X = ali ;
Redo: (12) parent(waziullah, sumaiya) ? creep
Call: (13) mother(waziullah, sumaiya) ? creep
Fail: (13) mother(waziullah, sumaiya) ? creep
Fail: (12) parent(waziullah, sumaiya) ? creep
Redo: (11) predecessor(waziullah, sumaiya) ? creep
Call: (12) parent(waziullah, _117392) ? creep
Call: (13) father(waziullah, _117392) ? creep
Exit: (13) father(waziullah, sumaiya) ? creep
Exit: (12) parent(waziullah, sumaiya) ? creep
Call: (12) predecessor(sumaiya, sumaiya) ? creep
Call: (13) parent(sumaiya, sumaiya) ? creep
Call: (14) father(sumaiya, sumaiya) ? creep
Fail: (14) father(sumaiya, sumaiya) ? creep
Redo: (13) parent(sumaiya, sumaiya) ? creep
Call: (14) mother(sumaiya, sumaiya) ? creep
Fail: (14) mother(sumaiya, sumaiya) ? creep
Fail: (13) parent(sumaiya, sumaiya) ? creep
Redo: (12) predecessor(sumaiya, sumaiya) ? creep
Call: (13) parent(sumaiya, _127196) ? creep
Call: (14) father(sumaiya, _127196) ? creep
Fail: (14) father(sumaiya, _127196) ? creep
Redo: (13) parent(sumaiya, _127196) ? creep
Call: (14) mother(sumaiya, _127196) ? creep
Fail: (14) mother(sumaiya, _127196) ? creep
Fail: (13) parent(sumaiya, _127196) ? creep


SWI-Prolog (AMD64, Multi-threaded, version 8.4.1)
File Edit Settings Run Debug Help
Redo: (12) mother(_76728, _88900) ? creep
Exit: (12) mother(jahanara, waziullah) ? creep
Exit: (11) parent(jahanara, waziullah) ? creep
Call: (11) predecessor(waziullah, sumaiya) ? creep
Call: (12) parent(waziullah, sumaiya) ? creep
Call: (13) father(waziullah, sumaiya) ? creep
Exit: (13) father(waziullah, sumaiya) ? creep
Exit: (12) parent(waziullah, sumaiya) ? creep
Exit: (11) predecessor(waziullah, sumaiya) ? creep
Exit: (10) predecessor(jahanara, sumaiya) ? creep
X = jahanara ;
Redo: (12) parent(waziullah, sumaiya) ? creep
Call: (13) mother(waziullah, sumaiya) ? creep
Fail: (13) mother(waziullah, sumaiya) ? creep
Fail: (12) parent(waziullah, sumaiya) ? creep
Redo: (11) predecessor(waziullah, sumaiya) ? creep
Call: (12) parent(waziullah, _165490) ? creep
Call: (13) father(waziullah, _165490) ? creep
Exit: (13) father(waziullah, sumaiya) ? creep
Exit: (12) parent(waziullah, sumaiya) ? creep
Call: (12) predecessor(sumaiya, sumaiya) ? creep
Call: (13) parent(sumaiya, sumaiya) ? creep
Call: (14) father(sumaiya, sumaiya) ? creep
Fail: (14) father(sumaiya, sumaiya) ? creep
Redo: (13) parent(sumaiya, sumaiya) ? creep
Call: (14) mother(sumaiya, sumaiya) ? creep
Fail: (14) mother(sumaiya, sumaiya) ? creep
Fail: (13) parent(sumaiya, sumaiya) ? creep
Redo: (12) predecessor(sumaiya, sumaiya) ? creep
Call: (13) parent(sumaiya, _175294) ? creep
Call: (14) father(sumaiya, _175294) ? creep
Fail: (14) father(sumaiya, _175294) ? creep



Sample Input/Output for Cousin Tree:


SWI-Prolog (AMD64, Multi-threaded, version 8.4.1)
File Edit Settings Run Debug Help
Warning: Use :- discontiguous secondcousinonceremoval/2. to suppress this message
Warning: c:/users/user/desktop/cousin.pl:34:
Warning: Clauses of firstcousin/2 are not together in the source-file
Warning: Earlier definition at c:/users/user/desktop/cousin.pl:22
Warning: Current predicate: thirdcousintwiceremoval/2
Warning: Use :- discontiguous firstcousin/2. to suppress this message
% c:/Users/User/Desktop/Cousin.pl compiled 0.00 sec, 30 clauses
?- firstcousin(X, niaz).
X = mahdi.
?- firstcousinonceremoval(X, saba).
X = mahdi.
?- firstcousintwiceremoval(X, noor).
X = mahdi.
?- firstcousinonceremoval(X, niaz).
X = naim.
?- secondcousin(X, saba).
X = naim.
?- secondcousinonceremoval(naim, noor).
firstcousintwiceremoval(akash, niaz).
thirdcousin(akash, noor).
secondcousinonceremoval(akash, saba).
thirdcousinonceremoval(akash, syeda).
thirdcousintwiceremoval(akash, yamin).



6. Conclusion and Challenges: It was too difficult to track degrees for removal, I faced many problems. Finding 1st cousin/2nd cousin/ 3rd cousin once/twice removal by prolog code was so difficult for me. So,it was a horrible assignment!