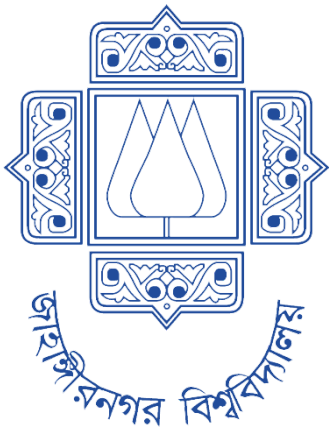
Institute of Information Technology (IIT)

Jahangirnagar University



Lab Report: 01

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Lab Date:23.05.23

Submission Date: 29.05.23

Lab Report # Day 01

Example 1:

Knowledge Base 1.

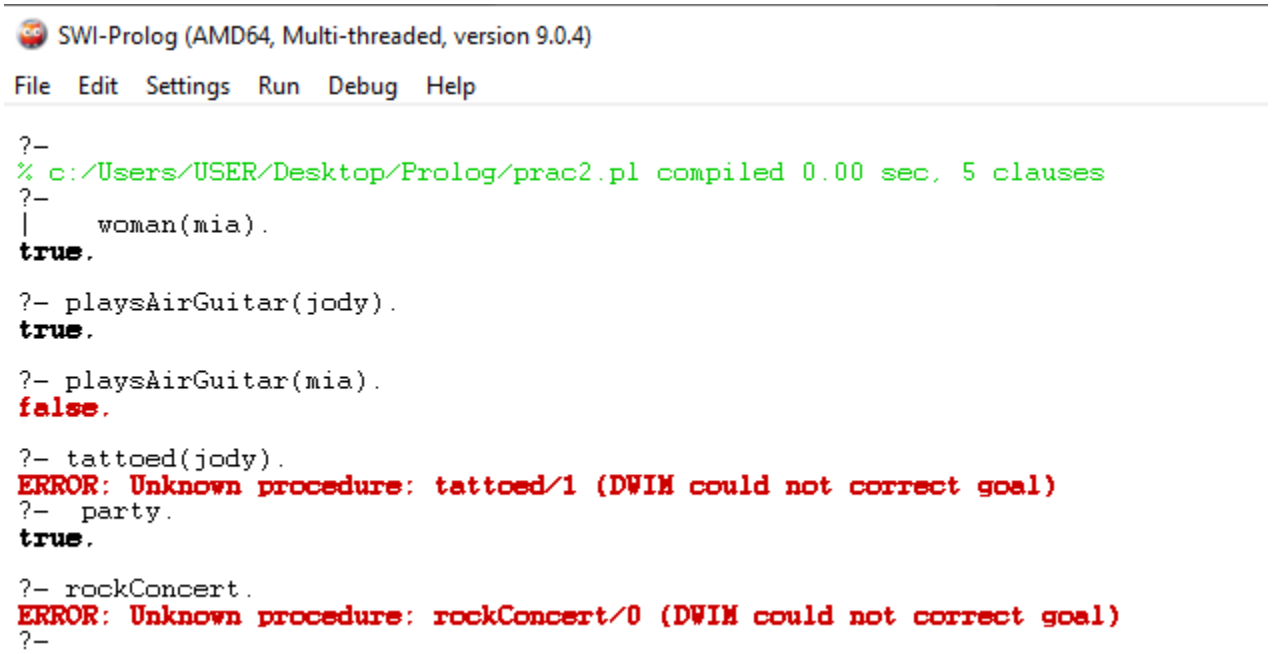
Clause:

woman(mia).
woman(jody).
woman(yolanda).
playsAirGuitar(jody).
party.

Queries:

1. ?- woman(mia).
2. ?- playsAirGuitar(jody).
3. ?- playsAirGuitar(mia).
4. ?- tattoed(jody).
5. ?- party.
6. ?- rockConcert.

Result :



Example 2:

Knowledge Base 2.

Clause:

happy(yolanda).
listens2music(mia).
listens2music(yolanda):- happy(yolanda).
playsAirGuitar(mia):- listens2music(mia).
playsAirGuitar(yolanda):- listens2music(yolanda).

Queries:

1. ?- playsAirGuitar(mia).
2. ?- playsAirGuitar(yolanda).

Result :

```
Warning:    Use :- discontiguous playsAirGuitar/1. to s
% c:/Users/USER/Desktop/Prolog/prac2.pl compiled 0.02 s
?-
|    playsAirGuitar(mia).
true.

?- playsAirGuitar(yolanda).
true.

?-
```

Example 3:

Knowledge Base 3.

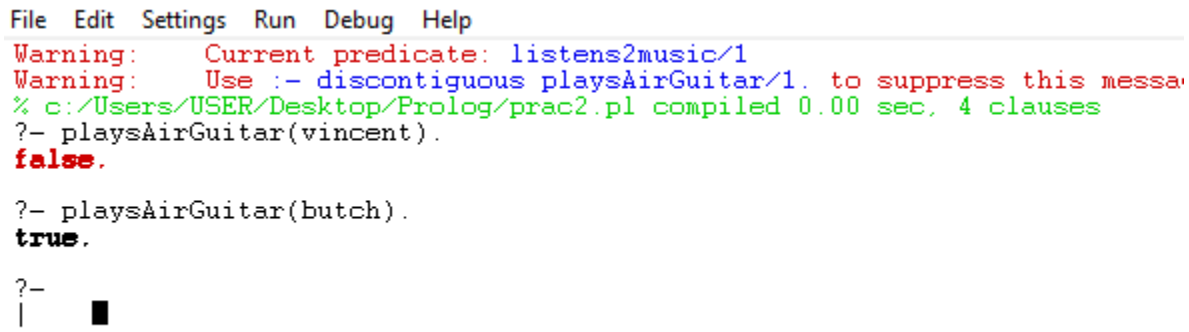
Clause:

happy(vincent).
listens2music(butch).
playsAirGuitar(vincent):- listens2music(vincent), happy(vincent).
playsAirGuitar(butch):- happy(butch).
playsAirGuitar(butch):- listens2music(butch).

Queries:

1. ?- playsAirGuitar(vincent).
2. ?- playsAirGuitar(butch).

Result :



Example 4:

Knowledge Base 4.

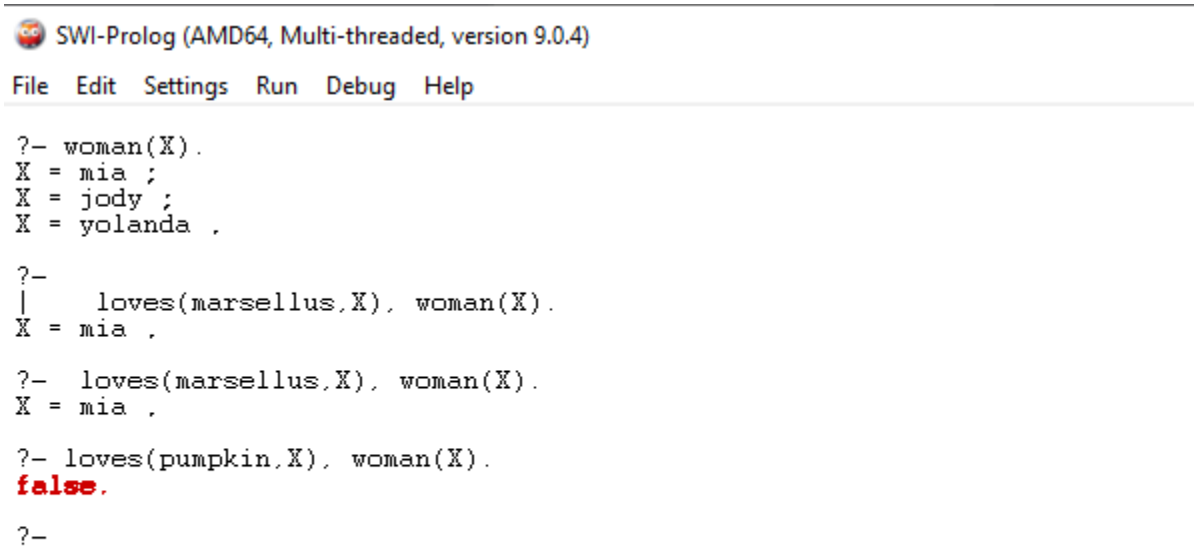
Clause:

```
woman(mia).
woman(jody).
woman(yolanda).
loves(vincent, mia).
loves(marsellus, mia).
loves(pumpkin, honey_bunny).
loves(honey_bunny, pumpkin).
```

Queries:

1. ?- woman(X).
2. ?- loves(marsellus,X), woman(X).
3. ?- loves(pumpkin,X), woman(X).

Result :



Example 5:

Knowledge Base 5.

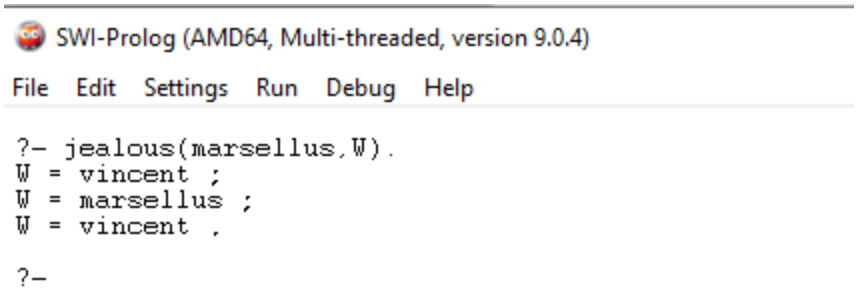
Clause:

loves(vincent,mia).
loves(marsellus,mia).
loves(pumpkin, honey_bunny).
loves(honey_bunny, pumpkin).
jealous(X,Y):- loves(X,Z), loves(Y,Z).

Queries:

1. ?- jealous(marsellus,W).

Result :



Example 6:

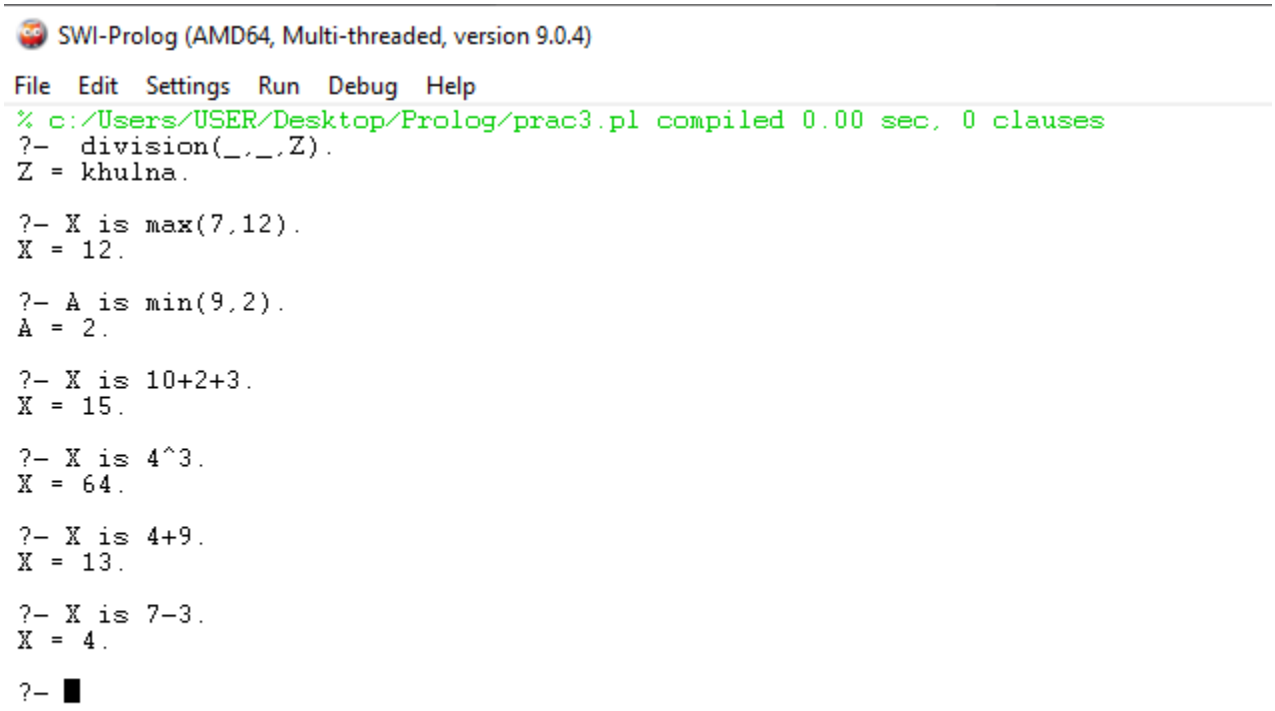
Clause:

division(dhaka,rajshahi,khulna).
?- division(X,Y,Z).
X = dhaka,
Y = rajshahi,
Z = khulna.

Queries:

1. division(_,_,Z).
2. X is max(7,12).
3. A is min(9,2).
4. X is 10+2+3.
5. X is 4^3.
6. X is 4+9.
7. X is 7-3.

Result:



Example 7:

Exercise 1: Read & write two numbers

Clause:

```
start:-
write('enter  first num'),nl,
read(X),nl,
write('enter second num'),nl,
read(Y),nl,
write('here are the numbers'),nl,
write(X),nl,
write(Y).
```

Queries:

1. start.
2. 12.
3. 13.

Result:

```
?-
% c:/Users/USER/Desktop/Prolog/class1par2.pl compiled 0.00 sec, -6 clauses
?-
|    start.
enter first number
|: 12
|: .

enter second number
|: 13.

here are the numbers
12
13
true.

?-
```

Example 8:

Exercise 2: Sum of two numbers

Clause:

```
go:-
write('enter  first num'),nl,
read(X),nl,
write('enter  second num'),nl,
read(Y),nl,
sum(X,Y).
sum(X,Y):-S is X+Y,
write('sum is'),nl,
write(S).
```

Queries:

1. start.
2. 12.
3. 40.

Result:

```
?- start.
enter first num
|: 12.

enter second num
|: 40.

sum is
52
true.

?-
```

Example 9:

Exercise 3:

Clause:

```
string1(Input) :-
write('Enter a string: '),

read_line_to_codes(user_input, Codes),
string_codes(Input, Codes).
process_string(String) :-

string_upper(String, Output),
write('Output: '), write(Output).

main :-
string1(Input),
process_string(Input).
```

Queries:

1. ?- main.

Result:

```
?- main.
Enter a string: Patuakhali, a beautiful town, is my beloved hometown.
Output: PATUAKHALI, A BEAUTIFUL TOWN, IS MY BELOVED HOMETOWN.
true.

?-
```

Example 10:

Task 1: Average of three numbers.

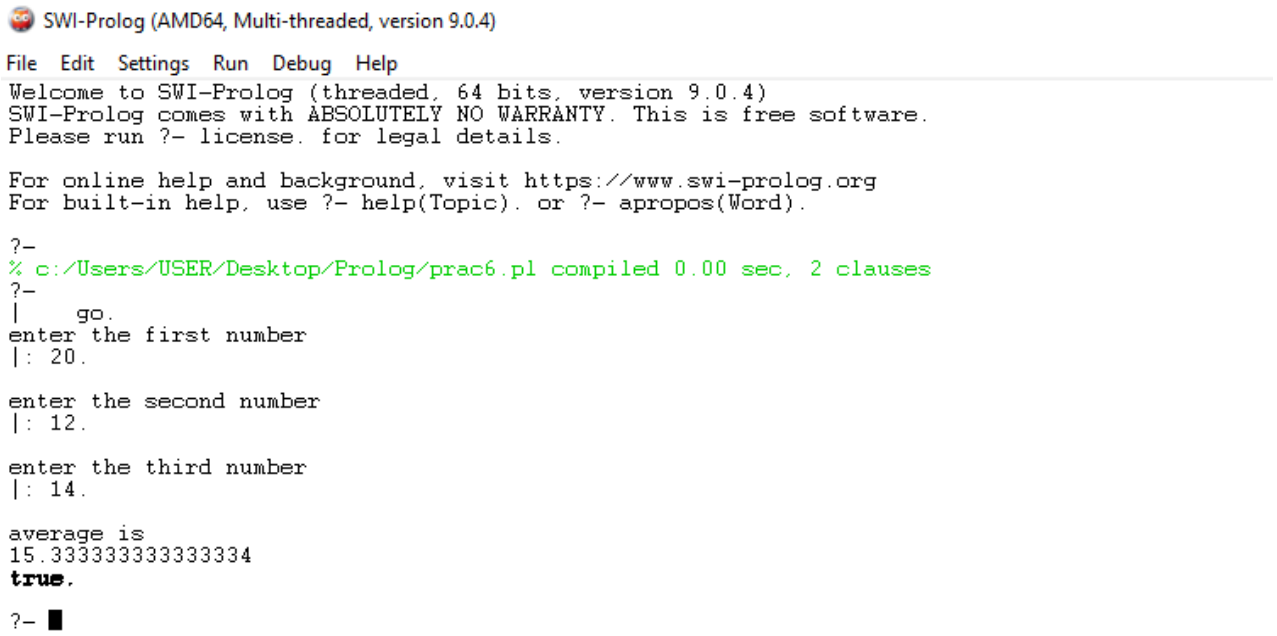
Clause:

```
go:-
write('enter the first number'),nl,
read(X),nl,
write('enter the second number'),nl,
read(Y),nl,
write('enter the third number'),nl,
read(Z),nl,
sum(X,Y,Z).
sum(X,Y,Z):-S is ( X+Y+Z )/3,
write('average is'),nl,
write(S).
```

Queries:

1. go.
2. 20.
3. 12.
4. 14.

Result:



Example 11:

Task 2: Family Tree

Clause:

```
male(rahim).
male(ratul).
male(setu).
female(riya).
female(shila).
parents(rahim,ratul).
parents(rahim,riya).
parents(riya,setu).
parents(riya,shila).
father(X,Y) :- parents(X,Y),male(X).
mother(X,Y) :- parents(X,Y),female(X).
sister(X,Y):-parents(Z,X),parents(Z,Y),X\=Y,female(X).
brother(X,Y):-parents(Z,X),parents(Z,Y),X\=Y,male(X).
sibling(X,Y):-parents(Z,X),parents(Z,Y),X\=Y.
```

grandfather(X,Z):-parents(X,Y),parents(Y,Z),male(X).
grandmother(X,Z):-parents(X,Y),parents(Y,Z),female(X).

Queries:

1. brother(X,riya).
2. brother(X,shila).
3. sister(X,ratul).
4. sister(X,setu).
5. sister(X,rahim)

Result:

```
% c:/Users/USER/Desktop/Prolog/prac5.pl compiled 0.00 sec, 0 clauses
?-
|    brother(X,riya).
X = ratul ;

?-
|    brother(X,shila).
X = setu ;

?-
|    sister(X,ratul).
X = riya ;

?- sister(X,setu).
X = shila.

?- sister(X,rahim
|    ).
false.

?-
```

Example 12:

Family Tree

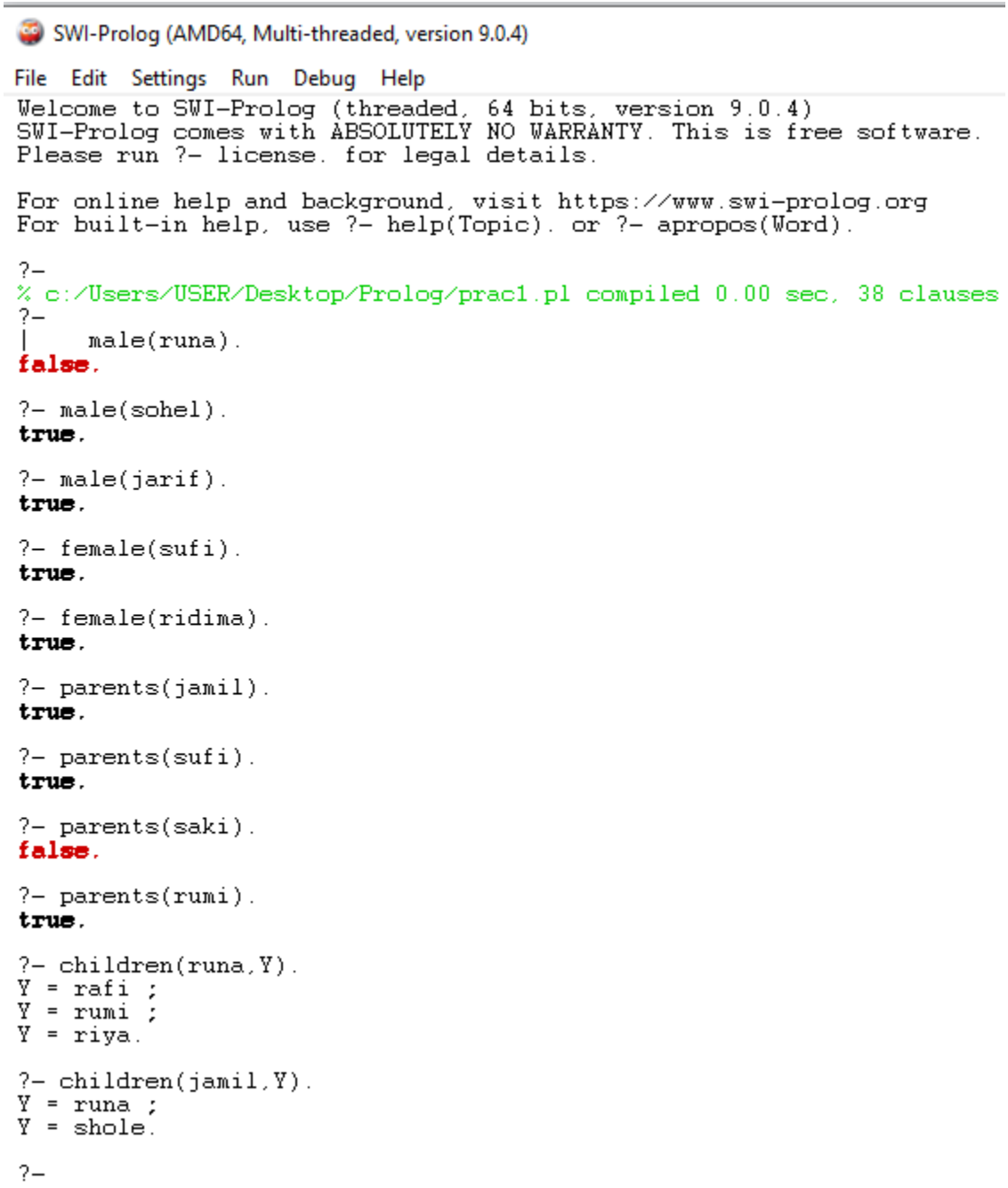
Clause:

```
male(jamil).
male(rafi).
male(sohel).
male(rumi).
male(raj).
male(jarif).
male(orko).
male(ovi).
female(runa).
female(riya).
female(najia).
female(ridima).
female(sufi).
female(saki).
parents(jamil).
parents(runa).
parents(sohel).
parents(rafi).
parents(rumi).
parents(sufi).
parents(najia).
parents(orko).
parents(jamil,runa).
parents(jamil,shole).
parents(runa,rafi).
parents(runa,rumi).
parents(runa,riya).
parents(sohel,najia).
parents(sohel,ridima).
parents(rafi,raj).
parents(rumi,sufi).
parents(sufi,jarif).
parents(najia,saki).
parents(najia,orko).
parents(orko,ovi).
mother(X,Y):-parents(X,Y),female(X).
siblings(X,Y):-parents(Z,X),parents(Z,Y), X \== Y.
children(X,Y):-parents(X,Y).
```

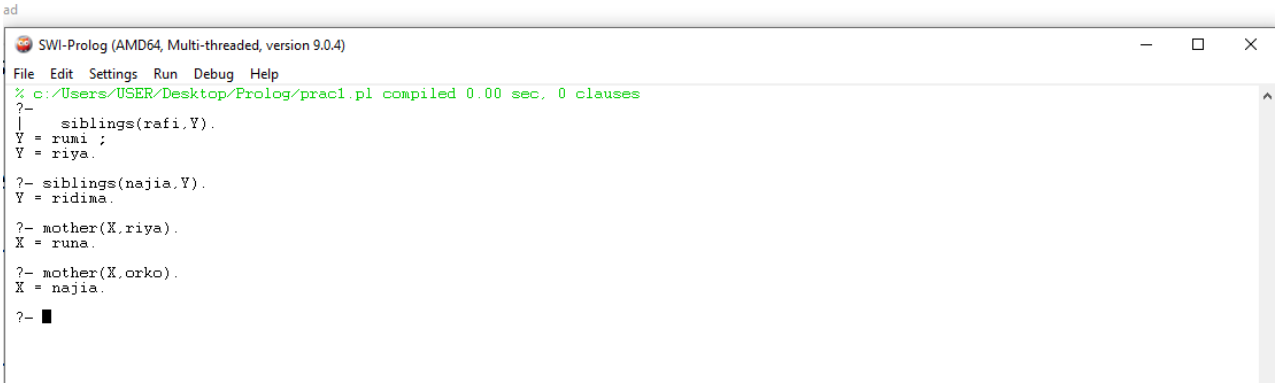
Queries:

1. male(runa).
2. male(sohel).
3. male(jarif).
4. female(sufi).
5. female(ridima).
6. parents(jamil).
7. parents(sufi).
8. parents(saki).
9. parents(rumi).
10. children(runa,Y).
11. children(jamil,Y).
12. siblings(rafi,Y).
13. siblings(najia,Y).
14. mother(X,riya).
15. mother(X,orko).

Result:


SWI-Prolog (AMD64, Multi-threaded, version 9.0.4)
File Edit Settings Run Debug Help
Welcome to SWI-Prolog (threaded, 64 bits, version 9.0.4)
SWI-Prolog comes with ABSOLUTELY NO WARRANTY. This is free software.
Please run ?- license. for legal details.
For online help and background, visit https://www.swi-prolog.org
For built-in help, use ?- help(Topic). or ?- apropos(Word).
?-
% c:/Users/USER/Desktop/Prolog/prac1.pl compiled 0.00 sec, 38 clauses
?-
| male(runa).
false.
?- male(sohel).
true.
?- male(jarif).
true.
?- female(sufi).
true.
?- female(ridima).
true.
?- parents(jamil).
true.
?- parents(sufi).
true.
?- parents(saki).
false.
?- parents(rumi).
true.
?- children(runa,Y).
Y = rafi ;
Y = rumi ;
Y = riya.
?- children(jamil,Y).
Y = runa ;
Y = shole.
?-

ad


SWI-Prolog (AMD64, Multi-threaded, version 9.0.4)
File Edit Settings Run Debug Help
% c:/Users/USER/Desktop/Prolog/prac1.pl compiled 0.00 sec, 0 clauses
?-
| siblings(rafi,Y).
Y = rumi ;
Y = riya.
?- siblings(najia,Y).
Y = ridima.
?- mother(X,riya).
X = runa.
?- mother(X,orko).
X = najia.
?-