

### Questions:

1. Modify the demonstrated Python and Prolog codes to find the grandparents of somebody.
2. Enrich the demonstrated knowledge base with 'brother', 'sister', 'uncle' and 'aunt' rules in Python and Prolog.

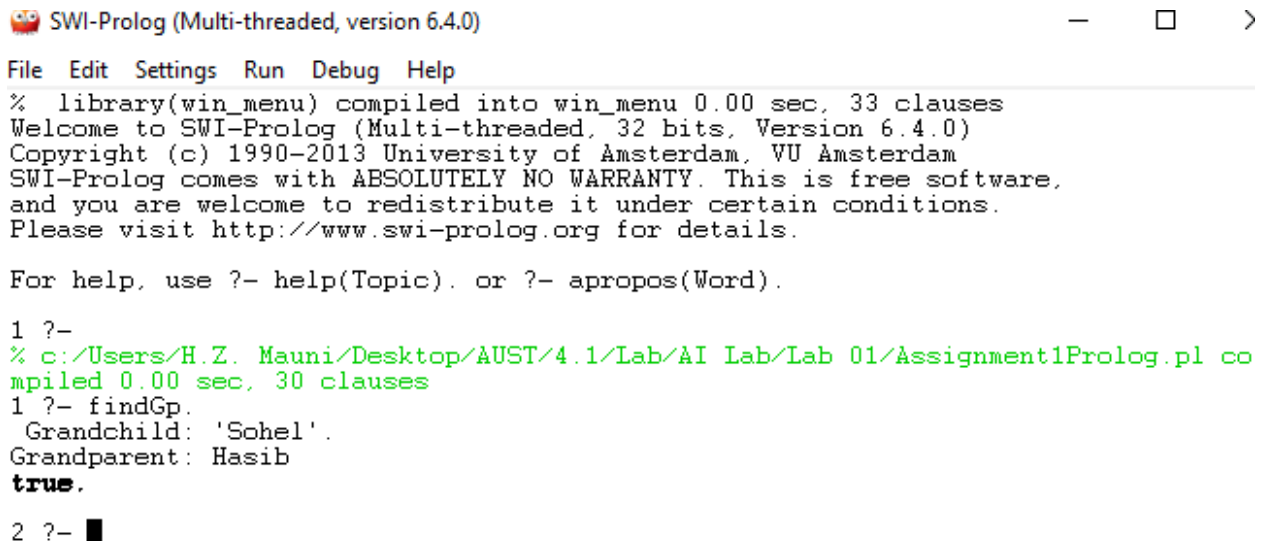
### Solution to the question no 1

Prolog code to find grandparents of someone:

```
parent('Hasib' , 'Rakib').
parent('Rakib' , 'Sohel').
parent('Rakib' , 'Sara').
parent('Rakib' , 'Jamal').
parent('Rakib' , 'Rebeka').
grandparent(X, Z) :- parent(X, Y), parent(Y, Z).

findGp :- write(' Grandchild: '), read(X), write('Grandparent: '),
grandparent(Gp, X), write(Gp), tab(5), fail.
findGp.
```

A sample of input and output:



```
SWI-Prolog (Multi-threaded, version 6.4.0)
File Edit Settings Run Debug Help
% library(win_menu) compiled into win_menu 0.00 sec, 33 clauses
Welcome to SWI-Prolog (Multi-threaded, 32 bits, Version 6.4.0)
Copyright (c) 1990-2013 University of Amsterdam, VU Amsterdam
SWI-Prolog comes with ABSOLUTELY NO WARRANTY. This is free software,
and you are welcome to redistribute it under certain conditions.
Please visit http://www.swi-prolog.org for details.

For help, use ?- help(Topic). or ?- apropos(Word).

1 ?-
% c:/Users/H.Z. Mauni/Desktop/AUST/4.1/Lab/AI Lab/Lab 01/Assignment1Prolog.pl co
mpiled 0.00 sec, 30 clauses
1 ?- findGp.
Grandchild: 'Sohel'.
Grandparent: Hasib
true.

2 ?- █
```

Python code to find grandparents of someone:

```
tupleList1=[('parent', 'Amina', 'Rakib'),('parent', 'Hasib',
'Rakib'),('parent', 'Rakib', 'Sohel'),('parent', 'Rakib',
'Rebeka'),('parent', 'Rebeka', 'Mina')]

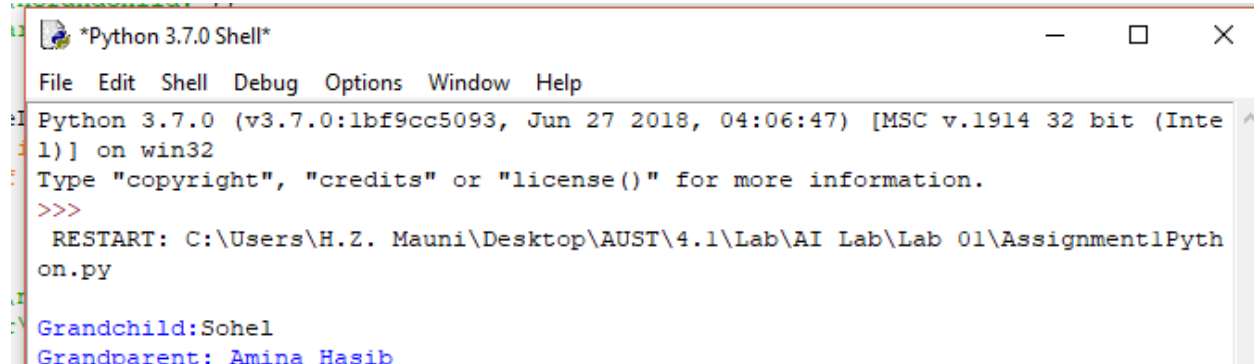
X=str(input("\nGrandchild:"))
print('Grandparent:', end=' ')
```

```

i=0
while(i<=3):
    if ((tupleList1[i][0] == 'parent') & ( tupleList1[i][2] == X)):
        for j in range(4):
            if ((tupleList1[j][0] == 'parent') & ( tupleList1[i][1] ==
tupleList1[j][2])):
                print(tupleList1[j][1], end=' ')
        i=i+1

```

A sample of input and output:



```

Python 3.7.0 (v3.7.0:1bf9cc5093, Jun 27 2018, 04:06:47) [MSC v.1914 32 bit (Intel)] on win32
Type "copyright", "credits" or "license()" for more information.
>>>
RESTART: C:\Users\H.Z. Mauni\Desktop\AUST\4.1\Lab\AI Lab\Lab 01\Assignment1Python.py
Grandchild: Sohel
Grandparent: Amina Hasib

```

## Solution to the question no 2

Prolog code to find the 'brother', 'sister', 'aunt', and 'uncle' of someone:

```

parent('Hasib' , 'Rakib'). parent('Rakib' , 'Sohel'). parent('Rakib' , 'Sara').
parent('Rakib' , 'Jamal'). parent('Rakib' , 'Rebeka').
parent('Rashid' , 'Hasib'). parent('Sara' , 'Mina').
male('Rakib'). male('Hasib'). male('Rashid'). male('Sohel').
male('Jamal').

```

```

brother(X,Y):-parent(Z,X), parent(Z,Y), male(Y), not(X=Y).
sister(X,Y):-parent(Z,X), parent(Z,Y),not( male(Y)), not(X=Y).
aunt(X,Y):- parent(Z,X), sister(Y, Z),not( male(Y)).
uncle(X,Y):- parent(Z,X), brother(Z,Y), male(Y).

```

```

findBr :- write(' Name: '), read(X), write('Brother: '),
          brother(X, Br), write(Br), tab(5), fail.

```

```

findBr.

```

```

findSr :- write(' Name: '), read(X), write('Sister: '),
          sister(X, Sr), write(Sr), tab(5), fail.

```

```

findSr.

```

```

findAn :- write(' Name: '), read(X), write('Aunt: '),
          aunt(X, An), write(An), tab(5), fail.

```

```

findAn.


```

```

findUn :- write(' Name: '), read(X), write('Uncle: '),
         uncle(X, Un), write(Un), tab(5), fail.
findUn.

```

A sample of input and output:

 SWI-Prolog (Multi-threaded, version 6.4.0)

File Edit Settings Run Debug Help

```

2 ?- findBr.
   Name: 'Sara'.
  Brother: Sohel      Jamal
true.

3 ?- findSr.
   Name: 'Jamal'.
  Sister: Sara       Rebeka
true.

4 ?- findUn.
   Name: 'Mina'.
  Uncle: Sohel      Jamal
true.

5 ?- findAn.
   Name: 'Mina'.
  Aunt: Rebeka
true.

6 ?-

```

Python code to find the 'brother', 'sister', 'aunt', and 'uncle' of someone:

```

tupleList1=[('parent', 'Amina', 'Rakib', 'female', 'male'),
             ('parent', 'Hasib', 'Rakib', 'male', 'male'),
             ('parent', 'Rakib', 'Sohel', 'male', 'male'),
             ('parent', 'Rakib', 'Rebeka', 'male', 'female'),
             ('parent', 'Rakib', 'Priya', 'male', 'female'),
             ('parent', 'Rebeka', 'Jamal', 'female', 'male'),
             ('parent', 'Rebeka', 'Mina', 'female', 'female')]

X=str(input("\nChild:"))

print('Sister:', end=' ')
i=0
while(i<=6):
    if ((tupleList1[i][0] == 'parent') & ( tupleList1[i][2] == X)):
        for j in range(7):
            if ((tupleList1[j][0] == 'parent') & ( tupleList1[i][1] ==
tupleList1[j][1]) & (i!=j) & (tupleList1[j][4]=='female')):
                print(tupleList1[j][2], end=' \n')
            i=i+1

print('Brother:', end=' ')

```

```

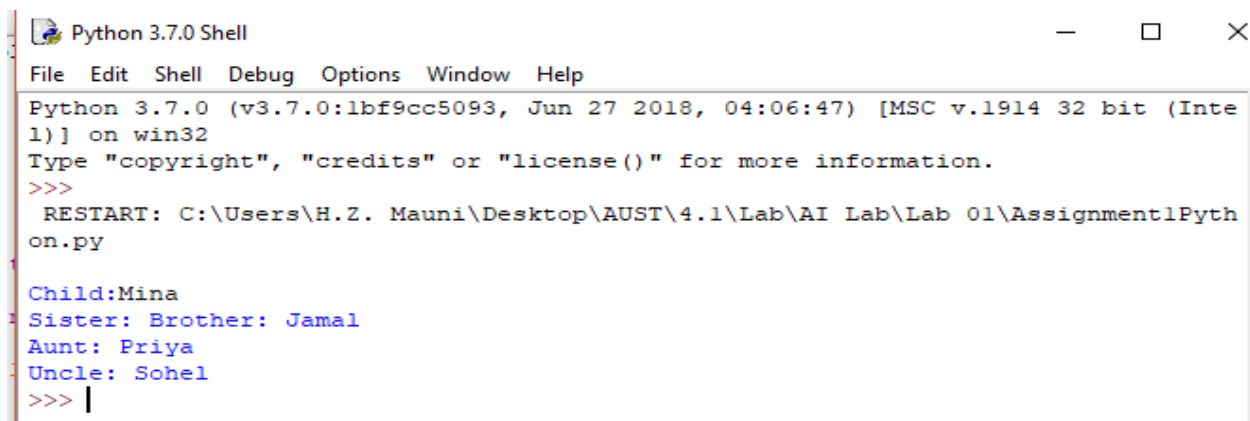
i=0
while(i<=6):
    if ((tupleList1[i][0] == 'parent') & ( tupleList1[i][2] == X)):
        for j in range(7):
            if ((tupleList1[j][0] == 'parent') & ( tupleList1[i][1] ==
tupleList1[j][1]) & (i!=j) & (tupleList1[j][4]=='male')):
                print(tupleList1[j][2], end=' \n')
        i=i+1

print('Aunt:', end=' ')
i=0
while(i<=6):
    if ((tupleList1[i][0] == 'parent') & ( tupleList1[i][2] == X)):
        for j in range(7):
            if ((tupleList1[j][0] == 'parent') & ( tupleList1[j][2] ==
tupleList1[i][1])):
                for k in range(7):
                    if((tupleList1[k][0] == 'parent') &
(tupleList1[j][1] == tupleList1[k][1]) & (j!=k) & (tupleList1[k][4] ==
'female') ):
                        print(tupleList1[k][2], end=' \n')
                i=i+1

print('Uncle:', end=' ')
i=0
while(i<=6):
    if ((tupleList1[i][0] == 'parent') & ( tupleList1[i][2] == X)):
        for j in range(7):
            if ((tupleList1[j][0] == 'parent') & ( tupleList1[j][2] ==
tupleList1[i][1])):
                for k in range(7):
                    if((tupleList1[k][0] == 'parent') &
(tupleList1[j][1] == tupleList1[k][1]) & (j!=k) & (tupleList1[k][4] ==
'male') ):
                        print(tupleList1[k][2], end=' \n')
                i=i+1

```

A sample of input and output:



```

Python 3.7.0 Shell
File Edit Shell Debug Options Window Help
Python 3.7.0 (v3.7.0:1bf9cc5093, Jun 27 2018, 04:06:47) [MSC v.1914 32 bit (Intel)] on win32
Type "copyright", "credits" or "license()" for more information.
>>>
RESTART: C:\Users\H.Z. Mauni\Desktop\AUST\4.1\Lab\AI Lab\Lab 01\Assignment1Python.py
Child:Mina
Sister: Brother: Jamal
Aunt: Priya
Uncle: Sohel
>>> |

```