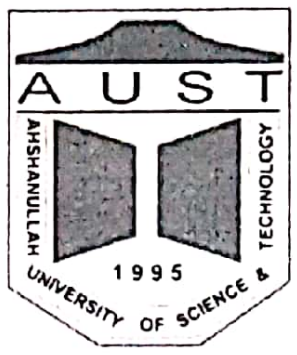
Ahsanullah University of Science And Technology



Department of Computer Science And Engineering

CSE4108: Artificial Intelligence Lab

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Assignment # **01**

Date of Submission: 26/02/2020

1) Modify the Python and Prolog codes demonstrated above to find the grandparents of somebody.

Python:

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


X=str(input("GrandChildren:"))
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
```

Prolog:

```
parent('Hasib' , 'Rakib'). parent('Rakib' , 'Sohel'). parent('Rakib' , 'Rebeka') .
parent('Rashid' , 'Hasib'). parent('Hasib' , 'Argha'). parent('Rashid' , 'Niloy').
parent('Hasib' , 'Fariha'). grandchild(X, Z) :- parent(Y, X), parent(Z, Y).

findGp :- write(' Grandchildren: '), read(X), write('Grandparent: '),
                grandchild(X, Gp), write(Gp), tab(5), fail.

findGp.
```

2) Enrich the KB demonstrated above with 'brother', 'sister', 'uncle' and 'aunt' rules in Python and Prolog.

Prolog:

```
male('Hasib'). male('Rakib'). male('Sohel'). male('Rashid'). male('Argha').

male('Niloy'). female('Rebeka'). female('Fariha').

parent('Hasib' , 'Rakib'). parent('Rakib' , 'Sohel'). parent('Rakib' , 'Rebeka') .

parent('Rashid' , 'Hasib'). parent('Hasib' , 'Argha'). parent('Rashid' , 'Niloy').

parent('Hasib' , 'Fariha').

brother(X, Z) :- male(X), parent(Y, X) , parent(Y, Z), X\=Z.

sister(X, Z) :- female(X), parent(Y, X) , parent(Y, Z), X\=Z.

uncle(X, Z) :- male(X),parent(Y, Z), brother(Y, X).
```

```
aunt(X, Z) :- female(X),parent(Y, Z), sister(X, Y).


findB :- write(' Brother of: '),read(X), write('Brother: '),
        brother(Gc, X), write(Gc), tab(5), fail.
findB.


findS :- write(' Sister of: '),read(X), write('Sister: '),
        sister(Gc, X), write(Gc), tab(5), fail.
findS.


findU :- write('Uncle of: '),read(X), write('Uncle: '),
        uncle(Gc, X), write(Gc), tab(5), fail.
findU.


findA:- write('Aunt of: '),read(X), write('Aunt: '),
        aunt(Gc, X), write(Gc), tab(5), fail.
findA.
```

Python:

```
tupleList1=[('parent', 'Hasib', 'Rakib'),('parent', 'Rakib', 'Sohel'),('parent', 'Rakib', 'Rebeka'),('parent',
'Hasib', 'Rahim'),('parent', 'Rashid', 'Hasib'),('parent', 'Hasib','Argha'),('parent',
'Rashid','Niloy'),('parent', 'Hasib','Fariha')]


tupleList2=[('male', 'Hasib'),('male', 'Rakib'),
('male', 'Sohel'),('male', 'Rashid'),('male','Argha'),('male', 'Niloy'),('female', 'Rebeka'),('female',
'Fariha')]
```

 # Procedure to find the brother of X

```
X=str(input("Brother of:"))
print('Brother:', end=' ')
i = 0
k = 0
while(i<=7):
    if ((tupleList1[i][0] == 'parent')&( tupleList1[i][2] == X)):
        #print(tupleList1[i][1], end=' ')
        for j in range(7):
            if ((tupleList1[j][0] == 'parent') & ( tupleList1[i][1] == tupleList1[j][1]) & (tupleList1[j][2] != X)):
                #print(tupleList1[j][2], end=' ')
                while(k <= 7):
                    if ((tupleList2[k][0] == 'male') & ( tupleList2[k][1] == tupleList1[j][2])):
                        print(tupleList1[j][2], end=' ')
                    k = k+1
    i=i+1
```

 # Procedure to find the sister of X

```
X=str(input("Sister of:"))
print('Sister:', end=' ')
i = 0
k = 0
while(i<=7):
    if ((tupleList1[i][0] == 'parent')&( tupleList1[i][2] == X)):
        #print(tupleList1[i][1], end=' ')
        for j in range(7):
```

```
        if ((tupleList1[j][0] == 'parent') & ( tupleList1[i][1] == tupleList1[j][1]) & (tupleList1[j][2] !=
X)):

            #print(tupleList1[j][2], end=' ')

            while(k <= 7):

                if ((tupleList2[k][0] == 'female') & ( tupleList2[k][1] == tupleList1[j][2])):

                    print(tupleList1[j][2], end=' ')

                k = k+1

    i=i+1
```

#procedure to find uncle of X

```
def brother( X ):

    i = 0

    k = 0

    while(i<=7):

        if ((tupleList1[i][0] == 'parent')&( tupleList1[i][2] == X)):

            #print(tupleList1[i][1], end=' ')

            for j in range(7):

                #print(tupleList1[j][1], end=' ')

                if ((tupleList1[j][0] == 'parent') & ( tupleList1[i][1] == tupleList1[j][1]) & (tupleList1[j][2]
!= X)):

                    #print(tupleList1[j][2], end=' ')

                    while(k <= 7):

                        #print(tupleList1[k][1], end=' ')

                        if ((tupleList2[k][0] == 'male') & ( tupleList2[k][1] == tupleList1[j][2])):

                            #print(tupleList1[j][2], end=' ')

                            Y = tupleList1[j][2]

                    k = k+1
```

```
        i=i+1
    return Y;

X=str(input("Uncle of:"))
print('Uncle:', end=' ')
i = 0
k = 0
while(i<=7):
    if ((tupleList1[i][0] == 'parent')&( tupleList1[i][2] == X)):
        #print(tupleList1[i][1], end=' ')
        Y = brother(tupleList1[i][1])
        print(Y, end=' ')
    i=i+1
```

#procedure to find aunt of X

```
def sister( X ):
    i = 0
    k = 0
    while(i<=7):
        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]) & (tupleList1[j][2]
!= X)):
                    #print(tupleList1[j][2], end=' ')
                    while(k <= 7):
                        #print(tupleList2[k][0], end=' ')
                        #print(tupleList2[k][1], end=' ')
```

```
                if ((tupleList2[k][0] == 'female') & ( tupleList2[k][1] == tupleList1[j][2])):
                    #print(tupleList1[j][2], end=' ')
                    S = tupleList1[j][2]
                k = k+1
    i=i+1
  return S;

X=str(input("Aunt of:"))
print('Aunt:', end=' ')
i = 0
k = 0
 while(i<=7):
    if ((tupleList1[i][0] == 'parent')&( tupleList1[i][2] == X)):
        #print(tupleList1[i][1], end=' ')
        Z = sister(tupleList1[i][1])
        print(Z, end=' ')

    i=i+1
```