

**Ahsanullah University of Science and Technology (AUST)**

Department of Computer Science and Engineering

**Assignment 1**

Course No.: CSE4108

Course Title: Artificial Intelligence Lab

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1. **Question: 1.** Modify the Python and Prolog codes demonstrated above to find the grandparents of somebody.
2. **Question: 1.** Enrich the KB demonstrated above with ‘brother’, ‘sister’, ‘uncle’ and ‘aunt’ rules in Python and Prolog.

**Answer:**

Python Code:

while True:

# Assignment01

tupleList1 = [('parent', 'john', 'mary'),

('parent', 'john', 'peter'),

('parent', 'sue', 'mary'),

('parent', 'sue', 'peter'),

('parent', 'mary', 'tom'),

('parent', 'peter', 'lisa'),

('parent', 'peter', 'bob'),

('parent', 'john', 'tyler'),

('parent', 'sue', 'tyler')]

genderList = [('male', 'john'),

('male', 'peter'),

('male', 'tom'),

('male', 'bob'),

('male', 'tyler'),

('female', 'sue'),

('female', 'mary'),

('female', 'lisa')]

ch = int(input("Enter your choice to find the relation of:\n1. Brother\n2. Sister\n3. Uncle\n4. Aunt\n5. Grandparents\nChoice: "))

if ch == 1 or ch == 2:

X = input("Enter the name to find the siblings: ")

if ch == 1:

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

else:

print("Sister: ", end=' ')

for i in range(len(tupleList1)):

if tupleList1[i][0] == 'parent' and tupleList1[i][2] == X:

for j in range(len(tupleList1)):

if tupleList1[j][0] == 'parent' and tupleList1[i][1] == tupleList1[j][1] and tupleList1[j][2] != X:

for k in range(len(genderList)):

if ch == 1:

if genderList[k][0] == 'male' and genderList[k][1] == tupleList1[j][2]:

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

else:

if genderList[k][0] == 'female' and genderList[k][1] == tupleList1[j][2]:

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

print()

elif ch == 3 or ch == 4:

X = input("Enter the name to find someone's uncle/aunt: ")

if ch == 3:

print("Uncle: ", end=' ')

else:

print("Aunt: ", end=' ')

for l in range(len(tupleList1)):

if tupleList1[l][0] == 'parent' and tupleList1[l][2] == X:

for i in range(len(tupleList1)):

if tupleList1[i][0] == 'parent' and tupleList1[i][2] == tupleList1[l][1]:

for j in range(len(tupleList1)):

if tupleList1[j][0] == 'parent' and tupleList1[i][1] == tupleList1[j][1] and tupleList1[j][2] != tupleList1[l][1]:

for k in range(len(genderList)):

if ch == 3:

if genderList[k][0] == 'male' and genderList[k][1] == tupleList1[j][2]:

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

else:

if genderList[k][0] == 'female' and genderList[k][1] == tupleList1[j][2]:

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

print()

elif ch == 5:

X = input("Enter the name to find someone's grandparent: ")

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

for i in range(len(tupleList1)):

if tupleList1[i][0] == 'parent' and tupleList1[i][2] == X:

for j in range(len(tupleList1)):

if tupleList1[j][0] == 'parent' and tupleList1[i][1] == tupleList1[j][2]:

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

print()

else:

print("Invalid choice. Please try again.")

Prolog Code:

% Facts about family relationships

parent('john', 'mary').

parent('john', 'peter').

parent('sue', 'mary').

parent('sue', 'peter').

parent('mary', 'tom').

parent('peter', 'lisa').

parent('peter', 'bob').

parent('john', 'tyler').

parent('sue', 'tyler').

male('john').

male('peter').

male('tom').

male('bob').

male('tyler').

female('sue').

female('mary').

female('lisa').

% Rules to define family relationships

sibling(X, Y) :-

parent(Z, X),

parent(Z, Y),

X \= Y.

brother(X, Y) :-

sibling(X, Y),

male(X).

sister(X, Y) :-

sibling(X, Y),

female(X).

uncle(X, Y) :-

parent(Z, Y),

brother(X, Z).

aunt(X, Y) :-

parent(Z, Y),

sister(X, Z).

grandparent(Z, X) :-

parent(Y, X),

parent(Z, Y).

findGrandparent :- write('Enter a name to find their grandparents: '),

read(X),

grandparent(Gp, X),

write('Grandparent is: '), write(Gp), tab(5),

fail.