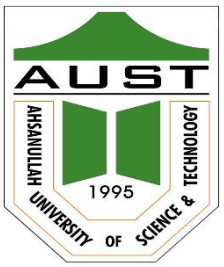

Ahsanullah University of Science and Technology (AUST)

Department of Computer Science and Engineering

Assignment 1

Course No : CSE4108

Course Title: Artificial Intelligence Lab

Date of Submission-
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Submitted To-

Submitted To- Dr. S.M.A. Al-Mamun & Mr. Raihan Tanvir.

Submitted By-

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

Question: 2. Enrich the KB demonstrated above with ‘brother’, ‘sister’, ‘uncle’ and ‘aunt’ rules in Python and Prolog.

Answer:

Python Code:

```
while True:
   print("MD Fardin Jaman Aranayak")
   print("ID:190204093/B2")
   print("Aust CSE")
   print()
   newTupleList = [('parent', 'adam', 'eve'),
            ('parent', 'adam', 'cain'),
            ('parent', 'eve', 'abel'),
            ('parent', 'eve', 'seth'),
            ('parent', 'cain', 'enoch'),
            ('parent', 'cain', 'irad'),
            ('parent', 'seth', 'noah'),
            ('parent', 'seth', 'shem'),
            ('parent', 'seth', 'ham')]

   for i in range(len(newTupleList)):
      print(newTupleList[i])
   print()

   newGenderList = [('male', 'adam'),
```

```
            ('female', 'eve'),
            ('male', 'cain'),
            ('male', 'abel'),
            ('male', 'seth'),
            ('male', 'enoch'),
            ('male', 'irad'),
            ('male', 'noah'),
            ('male', 'shem'),
            ('male', 'ham')]

    for i in range(len(newGenderList)):
        print(newGenderList[i])
    print()
    #Brother or Sister
    ch = int(input("Enter your choice to find relation of
\nBrother[1]\nSister[2]\nUncle[3]\nAunt[4]\nGrandparents[5]\nChoice: "))

    if ch == 1 or ch == 2:
        X = str(input("Enter the name to find the siblings: "))
        if ch == 1:
            print("Brother: ", end=' ')
        else:
            print("Sister: ", end=' ')
        for i in range(len(newTupleList)):
            if newTupleList[i][0] == 'parent' and newTupleList[i][2] == X:
                for j in range(len(newTupleList)):
                    if (
                        newTupleList[j][0] == 'parent'
                        and newTupleList[i][1] == newTupleList[j][1]
```

```
                and newTupleList[j][2] != X
            ):
                for k in range(len(newGenderList)):
                    if ch == 1:
                        if (
                            newGenderList[k][0] == 'male'
                            and newGenderList[k][1] == newTupleList[j][2]
                        ):
                            print(newTupleList[j][2], end=' ')
                    else:
                        if (
                            newGenderList[k][0] == 'female'
                            and newGenderList[k][1] == newTupleList[j][2]
                        ):
                            print(newTupleList[j][2], end=' ')
#Uncle or Aunt
elif ch == 3 or ch == 4:
    X = str(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(newTupleList)):
        if newTupleList[l][0] == 'parent' and newTupleList[l][2] == X:
            for i in range(len(newTupleList)):
                if newTupleList[i][0] == 'parent' and newTupleList[i][2] == newTupleList[l][1]:
                    for j in range(len(newTupleList)):
                        if (
                            newTupleList[j][0] == 'parent'
```

```
                    and newTupleList[i][1] == newTupleList[j][1]
                    and newTupleList[j][2] != newTupleList[l][1]
                ):
                    for k in range(len(newGenderList)):
                        if ch == 3:
                            if (
                                newGenderList[k][0] == 'male'
                                and newGenderList[k][1] == newTupleList[j][2]
                            ):
                                print(newTupleList[j][2], end=' ')
                        else:
                            if (
                                newGenderList[k][0] == 'female'
                                and newGenderList[k][1] == newTupleList[j][2]
                            ):
                                print(newTupleList[j][2], end=' ')
elif ch == 5:
    # Procedure to find the grandparents of someone
    X = str(input("Enter the name to find someone's grandparent: "))
    print('Grandparent: ', end=' ')
    for i in range(len(newTupleList)):
        if newTupleList[i][0] == 'parent' and newTupleList[i][2] == X:
            for j in range(len(newTupleList)):
                if (
                    newTupleList[j][0] == 'parent'
                    and newTupleList[i][1] == newTupleList[j][2]
                ):
                    print(newTupleList[j][1], end=' ')
print("\n::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::");
```

Prolog:

```
parent(adam, eve).
parent(adam, cain).
parent(eve, abel).
parent(eve, seth).
parent(cain, enoch).
parent(cain, irad).
parent(seth, noah).
parent(seth, shem).
parent(seth, ham).

male(adam).
male(cain).
male(abel).
male(seth).
male(enoch).
male(irad).
male(noah).
male(shem).
male(ham).

female(eve).
female(seth).
```

```
% 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(X, Z) :- parent(X, Y), parent(Y, Z).

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