ASSIGNMENT - 3

KUSHAGRA'S CAREER ADVISORY SYSTEM.

SUBMITTED BY-
KUSHAGRA MITTAL
M.Tech CSE (MT22108)

This is a career advisory system for a graduating M.Tech CSE student at IIIT Delhi, which uses durable rules library and forward-chaining rules.

The advisory system not only advises the career options related to the course and degree but also suggests alternative career options based on the interests of the students.

FILE INFORMATION:

There is a single python file named- Kushagra_assignment3.py

FLOW OF PROGRAM:

Firstly, the user is welcomed and enquired about his name.

The user is further asked about the specialization he is pursuing.

These are the 4 specializations that the user can choose from-
    Non-specialization (ns)
    Artificial Intelligence (ai)
    Data Engineering (de)
    Information Security (is)

After the user enters his field of specialization in M.Tech CSE, he is questioned about the electives that he studied during his M.Tech course along with his grade point average (GPA).

The system suggests the most likable career options for the user based on the given inputs.

The system does not end here. The user is further asked about his interests in extracurricular activities and hobbies.

An alternative career is suggested to him based on the given inputs.
Here, the user also has an option not to choose any hobby or activity and stick to the technological field. In that case, an alternative tech career is advised to the user.

SNIPPETS OF THE PROGRAM:

Welcome message and the course-related queries.

```python
# importing libraries
from durable.lang import *

# simple print messages as welcome note
def printmsg():
    print("\n\n\n=====================================================================")
    print("\n\nKUSHAGRA'S CAREER AVISORY SYSTEM")
    print("---------------------------------------------------------------------")
    nameoftheuser = input("Hi, Please enter your name: ")
    print("\nHi {0}, I'll help you with choosing career options after graduating from IIIT Delhi ".format(nameoftheuser))
    print("\n\nPlease answer few questions about your academics\n")
    print("\n---------------------------------------------------------------------")
    print("\nAre you purusing any of the below mentioned specialisations?")
    print('\tNon Specialisation ( Type ns)')
    print('\tArtificial Intelligence ( Type ai)')
    print('\tData Engineering (Type de) ')
    print('\tInformation Security ( Type is)')
    special = input("\nPlease enter your answer: ")
    print("\nHave you taken the following elective courses ?")
    print("\nPlease enter course initials or no")
    ansml=input("MACHINE LEARNING CSE 543 (ml):")
    ansdmg=input("DATA MINING CSE 506 (dm) :")
    ansoopd=input("OBJECT ORIENTED PROGRAMMING AND DESIGN CSE 600 (oopd)")
    ansga=input("GRADUATE ALGORITHMS CSE 525 (ga)")
    ansnlp=input("NATURAL LANGUAGE PROCESSING CSE 556 (nlp)")
    ansdw=input("DATA WAREHOUSING CSE 606 (dw)")
    print("\nOne last information!")
    gpa = input("Enter your GRADE POINT AVERAGE (gpa): ")
    return special, ansml, ansdmg, ansoopd, ansga, ansnlp, ansdw, gpa
```

Main function

```python
if __name__ == '__main__':
    speciala, ansmla, ansdmga, ansoopda, ansgaa, ansnlpa, ansdwa, gpaa = printmsg()
    print("\n-------------------------------HERE ARE YOUR RESULTS-----------------------------")
    print("FOLLOWING ARE THE CAREERS RECOMMENDED FOR YOU:\n\n")
    if(speciala == 'ns'):
        if(ansmla == 'ml'):
            assert_fact('checkcourses',{'area':speciala, 'subjectcode':ansmla, 'grading':gpaa})
        if(ansdmga == 'dmg'):
            assert_fact('checkcourses',{'area':speciala, 'subjectcode':ansdmga, 'grading':gpaa})
        if(ansoopda == 'oopd'):
            assert_fact('checkcourses',{'area':speciala, 'subjectcode':ansoopda, 'grading':gpaa})
        if(ansgaa == 'ga'):
            assert_fact('checkcourses',{'area':speciala, 'subjectcode':ansgaa, 'grading':gpaa})
        if(ansnlpa == 'nlp'):
            assert_fact('checkcourses',{'area':speciala, 'subjectcode':ansnlpa, 'grading':gpaa})
        if(ansdwa == 'dw'):
            assert_fact('checkcourses',{'area':speciala, 'subjectcode':ansdwa, 'grading':gpaa})
    elif(speciala == 'ai'):
        if(ansmla == 'ml'):
            assert_fact('checkcourses',{'area':speciala, 'subjectcode':ansmla, 'grading':gpaa})
        if(ansdmga == 'dmg'):
            assert_fact('checkcourses',{'area':speciala, 'subjectcode':ansdmga, 'grading':gpaa})
        if(ansoopda == 'oopd'):
            assert_fact('checkcourses',{'area':speciala, 'subjectcode':ansoopda, 'grading':gpaa})
        if(ansgaa == 'ga'):

        if(ansdmga == 'dmg'):
            assert_fact('checkcourses',{'area':speciala, 'subjectcode':ansdmga, 'grading':gpaa})
        if(ansoopda == 'oopd'):
            assert_fact('checkcourses',{'area':speciala, 'subjectcode':ansoopda, 'grading':gpaa})
        if(ansgaa == 'ga'):
            assert_fact('checkcourses',{'area':speciala, 'subjectcode':ansgaa, 'grading':gpaa})
        if(ansnlpa == 'nlp'):
            assert_fact('checkcourses',{'area':speciala, 'subjectcode':ansnlpa, 'grading':gpaa})
        if(ansdwa == 'dw'):
            assert_fact('checkcourses',{'area':speciala, 'subjectcode':ansdwa, 'grading':gpaa})

    print("\n-------------------------------------------------------------------------------")
    ch = printmsg2()
    print("\n-------------------------------------------------------------------------------")
    if ch == 'tech':
        cht = tech()
    else:
        cht = nontech()
    assert_fact('career_option',{'domain':ch,'domtype':cht})
    print("\n-------------------------------------------------------------------------------")
    print("\n\tI HOPE THAT I COULD HELP YOU WITH CAREER ADVICE. HAVE A GREAT DAY!")
    print("\n-------------------------------------------------------------------------------")
```

Assertion rules for the given inputs

```python
with ruleset('checkcourses'):

    @when_all((m.area == 'ns') & (m.subjectcode == 'ml') & (m.grading >= 6))
    def func(c):
        c.assert_fact({'subject': 'MACHINE LEARNING ENGINEER'})

    @when_all((m.area == 'ns') & (m.subjectcode == 'dmg') & (m.grading >=7))
    def func(c):
        c.assert_fact({'subject': 'DATA ENGINEER'})

    @when_all((m.area == 'ns') & (m.subjectcode == 'oopd') & (m.grading >=6))
    def func(c):
        c.assert_fact({'subject': 'SOFTWARE DEVELOPMENT ENGINEER'})

    @when_all((m.area == 'ns') & (m.subjectcode == 'ga') & (m.grading >=6))
    def func(c):
        c.assert_fact({'subject': 'SOFTWARE ENGINEER or RESEARCHER'})

    @when_all((m.area == 'ns') & (m.subjectcode == 'nlp') & (m.grading >=8))
    def func(c):
        c.assert_fact({'subject': 'AI ENGINEER'})

    @when_all((m.area == 'ns') & (m.subjectcode == 'dw') & (m.grading >=7))
    def func(c):
        c.assert_fact({'subject': 'DATA ENGINEER'})
```

Alternate career options queries-

```python
def printmsg2():
    print("\nENROLLING IN IIIT DELHI WILL OBVIOUSLY MAKE YOU AN ENGINEER.\n")
    print("LET'S SEE WHAT OTHER CAREER OPTIONS DO YOU HAVE.\n\n ")
    print("IF YOU HAVE INTEREST IN PUBLIC ADMINISTRATION, TYPE = publicadmin")
    print("IF YOU HAVE INTEREST IN PAINTING AND SKETCHING, TYPE = art")
    print("IF YOU HAVE INTEREST IN MUSIC, TYPE = music")
    print("IF YOU HAVE NO OTHER INTEREST AND WANT TO COMPLETE YOUR ENGINEERING COURSE, TYPE = tech")
    ch = input("Enter here: ")
    return ch

def tech():

    print("WE SEE THAT YOU HAVE INTEREST ONLY IN TECH FIELD\n")
    print("ITS PRETTY GOOD!")
    print("\nPLEASE BEAR WITH A FEW MORE QUESTIONS")
    print("What is your GPA:")
    gpa=input(":")
    gpa=int(gpa)
    if gpa == 10 :
        cht='machinel'
    elif gpa > 7 and gpa < 10:
        cht='software'
    elif gpa == 7 and gpa < 7:
        cht='testing'
    return cht
```

Assertion rules for alternate careers-

```python
with ruleset('career_option'):
    @when_all((m.domain == 'publicadmin') & (m.domtype == 'travel'))
    def club(e):
        e.assert_fact({'subject': 'YOU MIGHT WANT TO CONSIDER INDIAN ADMINISTRATION SERVICES AS A CAREER OPTION'})

    @when_all((m.domain == 'publicadmin') & (m.domtype == 'bird'))
    def club(e):
        e.assert_fact({'subject': 'YOU CAN CONSIDER UPSC SERVICES OR BE A BIRD WATCHER'})

    @when_all((m.domain == 'publicadmin') & (m.domtype == 'vlog'))
    def club(e):
        e.assert_fact({'subject': 'YOU CAN CONSIDER UPSC SERVICES OR ALSO BE A YOUTUBER'})

    @when_all((m.domain == 'art') & (m.domtype == 'travel'))
    def club(e):
        e.assert_fact({'subject': 'YOU CAN TRAVEL PLACES AND PAINT LANDSCAPES'})

    @when_all((m.domain == 'art') & (m.domtype == 'bird'))
    def club(e):
        e.assert_fact({'subject': 'INSTEAD OF CAPTURING BIRDS WITH YOUR CAMERA, PAINT THEN INSTEAD'})
```

OUTPUT OF THE PROGRAM:

Scenario 1-

```
==================================================================

KUSHAGRA'S CAREER AVISORY SYSTEM
------------------------------------------------------------------
Hi, Please enter your name:  KUSHAGRA MITTAL

Hi KUSHAGRA MITTAL , I'll help you with choosing career options after graduating from IIIT Delhi

Please answer few questions about your academics


------------------------------------------------------------------

Are you purusing any of the below mentioned specialisations?
        Non Specialisation ( Type ns)
        Artificial Intelligence ( Type ai)
        Data Engineering (Type de)
        Information Security ( Type is)

Please enter your answer: |
```

```
Are you purusing any of the below mentioned specialisations?
        Non Specialisation ( Type ns)
        Artificial Intelligence ( Type ai)
        Data Engineering (Type de)
        Information Security ( Type is)

Please enter your answer:  ns

Have you taken the following elective courses ?

Please enter course initials or no
MACHINE LEARNING CSE 543 (ml): ml
DATA MINING CSE 506 (dm) : dm
OBJECT ORIENTED PROGRAMMING AND DESIGN CSE 600 (oopd) oopd
GRADUATE ALGORITHMS CSE 525 (ga) ga
NATURAL LANGUAGE PROCESSING CSE 556 (nlp) no
DATA WAREHOUSING CSE 606 (dw) no

One last information!
Enter your GRADE POINT AVERAGE (gpa):  9




--------------------------------HERE ARE YOUR RESULTS--------------------------------
FOLLOWING ARE THE CAREERS RECOMMENDED FOR YOU:



MACHINE LEARNING ENGINEER

SOFTWARE DEVELOPMENT ENGINEER

SOFTWARE ENGINEER or RESEARCHER

--------------------------------------------------------------------------------


 ENROLLING IN IIIT DELHI WILL OBVIOUSLY MAKE YOU AN ENGINEER.

 LET'S SEE WHAT OTHER CAREER OPTIONS DO YOU HAVE.


 IF YOU HAVE INTEREST IN PUBLIC ADMINISTRATION, TYPE = publicadmin
 IF YOU HAVE INTEREST IN PAINTING AND SKETCHING, TYPE = art
 IF YOU HAVE INTEREST IN MUSIC, TYPE = music
 IF YOU HAVE NO OTHER INTEREST AND WANT TO COMPLETE YOUR ENGINEERING COURSE, TYPE = tech
 Enter here:  publicadmin

 --------------------------------------------------------------------------------

 WE SEE THAT YOU HAVE OTHER INTERESTS THAN ENGINEERING


 DON'T WORRY IT'S ABSOLUTELY FINE TO DROP OFF THE UNIVERSITY AND FOLLOW YOUR HEART

 IF YOU HAVE INTEREST IN BIRD WATCHING, TYPE = bird
 IF YOU WANT TO TRAVEL THE WORLD, TYPE = travel
 IF YOU WANT TO DO VLOGGING, TYPE = vlog
 Enter here:  travel
```

```
---------------------------HERE ARE SOME ADDITIONAL ADVICES FOR YOU-------------------------------

HERE ARE SOME OTHER CAREER OPTIONS FOR YOU: YOU MIGHT WANT TO CONSIDER INDIAN ADMINISTRATION SERVICES AS A CAREER OPTION

--------------------------------------------------------------------------------

        I HOPE THAT I COULD HELP YOU WITH CAREER ADVICE. HAVE A GREAT DAY!

--------------------------------------------------------------------------------
```

SCENARIO 2 -

```
==================================================================

KUSHAGRA'S CAREER AVISORY SYSTEM
-----------------------------------------------------------------------
Hi, Please enter your name:  KRISHNA MITTAL

Hi KRISHNA MITTAL , I'll help you with choosing career options after graduating from IIIT Delhi


Please answer few questions about your academics


-----------------------------------------------------------------------

Are you purusing any of the below mentioned specialisations?
        Non Specialisation ( Type ns)
        Artificial Intelligence ( Type ai)
        Data Engineering (Type de)
        Information Security ( Type is)

 Please enter your answer: |
```

```
Are you purusing any of the below mentioned specialisations?
        Non Specialisation ( Type ns)
        Artificial Intelligence ( Type ai)
        Data Engineering (Type de)
        Information Security ( Type is)

Please enter your answer:  de

Have you taken the following elective courses ?

Please enter course initials or no
MACHINE LEARNING CSE 543 (ml): no
DATA MINING CSE 506 (dm) : dm
OBJECT ORIENTED PROGRAMMING AND DESIGN CSE 600 (oopd) no
GRADUATE ALGORITHMS CSE 525 (ga) no
NATURAL LANGUAGE PROCESSING CSE 556 (nlp) no
DATA WAREHOUSING CSE 606 (dw) dw
```

```
One last information!
Enter your GRADE POINT AVERAGE (gpa):  9

--------------------------------HERE ARE YOUR RESULTS--------------------------------
FOLLOWING ARE THE CAREERS RECOMMENDED FOR YOU:



DATA ENGINEER OR BIG DATA ANALYTICS ENGINEER

--------------------------------------------------------------------------------



--------------------------------------------------------------------------------

 ENROLLING IN IIIT DELHI WILL OBVIOUSLY MAKE YOU AN ENGINEER.

 LET'S SEE WHAT OTHER CAREER OPTIONS DO YOU HAVE.


 IF YOU HAVE INTEREST IN PUBLIC ADMINISTRATION, TYPE = publicadmin
 IF YOU HAVE INTEREST IN PAINTING AND SKETCHING, TYPE = art
 IF YOU HAVE INTEREST IN MUSIC, TYPE = music
 IF YOU HAVE NO OTHER INTEREST AND WANT TO COMPLETE YOUR ENGINEERING COURSE, TYPE = tech
 Enter here: |                                                          |



ENROLLING IN IIIT DELHI WILL OBVIOUSLY MAKE YOU AN ENGINEER.

LET'S SEE WHAT OTHER CAREER OPTIONS DO YOU HAVE.


IF YOU HAVE INTEREST IN PUBLIC ADMINISTRATION, TYPE = publicadmin
IF YOU HAVE INTEREST IN PAINTING AND SKETCHING, TYPE = art
IF YOU HAVE INTEREST IN MUSIC, TYPE = music
IF YOU HAVE NO OTHER INTEREST AND WANT TO COMPLETE YOUR ENGINEERING COURSE, TYPE = tech
Enter here:  tech

--------------------------------------------------------------------------------
WE SEE THAT YOU HAVE INTEREST ONLY IN TECH FIELD

ITS PRETTY GOOD!

PLEASE BEAR WITH A FEW MORE QUESTIONS
What is your GPA:
: 8


-----------------------------HERE ARE SOME ADDITIONAL ADVICES FOR YOU-----------------------------


HERE ARE SOME OTHER CAREER OPTIONS FOR YOU: PURSUE CAREER AS A SOFTWARE DEVELOPMENT ENGINEER

--------------------------------------------------------------------------------

       I HOPE THAT I COULD HELP YOU WITH CAREER ADVICE. HAVE A GREAT DAY!

--------------------------------------------------------------------------------
```