Name: Nidhi Verma

Roll no: MT22044

Subject: Artificial Intelligence

[Assignment-3]

REPORT

Project Name: Career Advisory System for IIITD students.

Objective: Career Advisory system is all based upon the interest, grades and the courses they already done in their graduation and it gives the advice that what career they can persue after their graduation.

This Career advisory System asks a set of questions to the students. Students need to answer few questions. Depending upon the answers a student give, it advices the career.

Introduction: The Career Advisory System is built using Forward Chaining Rule Engine.

Description:

- **Input :** It takes input from the user from the given list of Interest, Grades, and Courses that what are their interest , what grade they have scored in their graduation and what courses they have done.
- **Output of program**: Advices the career.
- **More Details:** In this assignment, I applied forward chaining rules using a durable rule engine in python. There are 4 ruleset in the program:
  a) career
  b) interest
  c) grade
  d) course.
  First triggering career fact with attributes: interest, grade and course. Then based on the user's choice career will further trigger 'interest' fact, 'grade' fact and 'course' fact and use Forward chaining concept.

Working of System: Below steps shows the process to run the program.

1. **Ask for user's interest from the given choices.**

2. **Ask for user's grade in Graduation.**

```
*****Welcome to IIITD Career Advisory System*****
In which of the following you are interested: 1) coding  2) hacking 3) AI-ML 4) cloud ?
1
What is your grade in Graduation (CSE)? Select one option
1) 8-10    2) 6-7
2
```

3. **Ask for the course which user has already done during their graduation.**

```
*****Welcome to IIITD Career Advisory System*****
In which of the following you are interested: 1) coding  2) hacking 3) AI-ML 4) cloud ?
1
What is your grade in Graduation (CSE)? Select one option
1) 8-10    2) 6-7
2
Which of the course you already done during your Graduation?
1) DS     2)  FCS   3) Machine Learning & AI  4) Cloud Computing
1
```

4. **Advices career to the user as per user's choice using forward chaining rules.**

```
*****Welcome to IIITD Career Advisory System*****
In which of the following you are interested: 1) coding  2) hacking 3) AI-ML 4) cloud ?
1
What is your grade in Graduation (CSE)? Select one option
1) 8-10    2) 6-7
2
Which of the course you already done during your Graduation?
1) DS     2)  FCS   3) Machine Learning & AI  4) Cloud Computing
1
Fact: ***** CAREER SUGGESTION : As you have scored avearge Grades*****
Fact: And You are interested in coding
Fact: As well as you have done DS course.
Fact: ***** CAREER SUGGESTION : You can choose your career as Software Engineer*****
```

SOME MORE OUTPUT:

- **When user have interest in hacking, having grade 7-8 and have done FCS course, the system suggests them to persue Network Administrator.**

```
*****Welcome to IIITD Career Advisory System*****
In which of the following you are interested: 1) coding  2) hacking 3) AI-ML 4) cloud ?
2
What is your grade in Graduation (CSE)? Select one option
1) 8-10    2) 6-7
2
Which of the course you already done during your Graduation?
1) DS     2)  FCS   3) Machine Learning & AI  4) Cloud Computing
2
Fact: ***** CAREER SUGGESTION : As you have scored avearge Grades*****
Fact: And You are interested in hacking
Fact: As well as you have done FCS course.
Fact: ***** CAREER SUGGESTION : You can choose your career as Network Administrator*****
```

- **When the user didn't done the relevant courses according to interests,The system suggests to take break and explore more.**

```
*****Welcome to IIITD Career Advisory System*****
In which of the following you are interested: 1) coding  2) hacking 3) AI-ML 4) cloud ?
2
What is your grade in Graduation (CSE)? Select one option
1) 8-10    2) 6-7
2
Which of the course you already done during your Graduation?
1) DS     2)  FCS   3) Machine Learning & AI  4) Cloud Computing
3
Fact: Sorry, No career in the system. We suggest you to take a break and explore the interests more.!
{'sid': '0', 'id': 'sid-0', '$s': 1}
```

CODE:

```
!pip install durable_rules
from durable.lang import *

#welcome to IIITD Career Advisory System.
# Start of the Program
print('*****Welcome to IIITD Career Advisory System*****')
print('In which of the following you are interested: 1) coding  2) hack
ing 3) AI-ML 4) cloud ?')
interest = input()    # input User's interest
print('What is your grade in Graduation (CSE)? Select one option')
print('1) 8-10    2) 6-7' )        #input User's grade
grade = input()
print('Which of the course you already done during your Graduation?')
print('1) DS     2)  FCS   3) Machine Learning & AI  4) Cloud Computing
 ' )
course = input()      # input User's course


# 'career' facts to suggest the career as per by User interest.
with ruleset('career'):
    #when user have interest in coding, and having grade 9-
10 and already did the course DS-Data Structure
    @when_all((m.interest == '1') & (m.grade == '1') & (m.course == '1'
))
    def career_suggest(c):
      # triggering grades
      c.assert_fact('grade' , {'grade':'8-10'})
      c.assert_fact('interest' , {'interest':'coding'})
      c.assert_fact('course' , {'course':'DS'})
```

```
      c.assert_fact({ 'suggestion': '***** CAREER SUGGESTION : You can
choose your career as Full-Stack Developer*****'})

    #when user have interest in coding, and having grade 7-
8 and already did the course DS-Data Structure.
    @when_all((m.interest == '1') & (m.grade == '2') & (m.course == '1'
))
    def career_suggest(c):
      # triggering grades
      c.assert_fact('grade' , {'grade':'6-7'})
      c.assert_fact('interest' , {'interest':'coding'})
      c.assert_fact('course' , {'course':'DS'})
      c.assert_fact({ 'suggestion': '***** CAREER SUGGESTION : You can
choose your career as Software Engineer*****'})


    @when_all((m.interest == '1') & (m.grade == '1') & (m.course == '2'
))
    def career_suggest(c):
      # triggering grades
      c.assert_fact('grade' , {'grade':'8-10'})
      c.assert_fact('interest' , {'interest':'coding'})
      c.assert_fact('course' , {'course':'FCS'})
      c.assert_fact({ 'suggestion': '***** CAREER SUGGESTION : You can
choose your career as Cyber Security Engineer*****'})

    @when_all((m.interest == '1') & (m.grade == '1') & (m.course == '3'
))
    def career_suggest(c):
      # triggering grades
      c.assert_fact('grade' , {'grade':'8-10'})
      c.assert_fact('interest' , {'interest':'coding'})
      c.assert_fact('course' , {'course':'ai_ml'})
      c.assert_fact({ 'suggestion': '***** CAREER SUGGESTION : You can
choose your career as AI-ML Engineer*****'})

    @when_all((m.interest == '1') & (m.grade == '1') & (m.course == '4'
))
    def career_suggest(c):
      # triggering grades
      c.assert_fact('grade' , {'grade':'8-10'})
      c.assert_fact('interest' , {'interest':'coding'})
      c.assert_fact('course' , {'course':'Cloud Computing'})
      c.assert_fact({ 'suggestion': '***** CAREER SUGGESTION : You can
choose your career as Cloud Developer*****'})
```

```
    @when_all((m.interest == '1') & (m.grade == '2') & (m.course == '2'
))
    def career_suggest(c):
      # triggering grades
      c.assert_fact('grade' , {'grade':'6-7'})
      c.assert_fact('interest' , {'interest':'coding'})
      c.assert_fact('course' , {'course':'FCS'})
      c.assert_fact({ 'suggestion': '***** CAREER SUGGESTION : You can
choose your career as Ethical Hacker*****'})

    @when_all((m.interest == '1') & (m.grade == '2') & (m.course == '3'
))
    def career_suggest(c):
      # triggering grades
      c.assert_fact('grade' , {'grade':'6-7'})
      c.assert_fact('interest' , {'interest':'coding'})
      c.assert_fact('course' , {'course':'ai_ml'})
      c.assert_fact({ 'suggestion': '***** CAREER SUGGESTION : You can
choose your career as AI-ML Engineer*****'})


    @when_all((m.interest == '1') & (m.grade == '2') & (m.course == '4'
))
    def career_suggest(c):
      # triggering grades
      c.assert_fact('grade' , {'grade':'6-7'})
      c.assert_fact('interest' , {'interest':'coding'})
      c.assert_fact('course' , {'course':'Cloud Computing'})
      c.assert_fact({ 'suggestion': '***** CAREER SUGGESTION : You can
choose your career as Cloud Data Engineeer*****'})



    #when user have interest in security, and having grade 9-
10 and already did the course FCS-Fundamental of Computer Security.
    @when_all((m.interest == '2') & (m.grade == '1') & (m.course == '2'
))
    def career_suggest(c):
      # triggering grades
      c.assert_fact('grade' , {'grade':'8-10'})
      c.assert_fact('interest' , {'interest':'hacking'})
      c.assert_fact('course' , {'course':'FCS'})
      c.assert_fact({ 'suggestion': '***** CAREER SUGGESTION : You can
choose your career as Cyber Security Expert*****'})

    @when_all((m.interest == '2') & (m.grade == '2') & (m.course == '2'
))
    def career_suggest(c):
```

```
      # triggering grades
      c.assert_fact('grade' , {'grade':'6-7'})
      c.assert_fact('interest' , {'interest':'hacking'})
      c.assert_fact('course' , {'course':'FCS'})
      c.assert_fact({ 'suggestion': '***** CAREER SUGGESTION : You can
choose your career as Network Administrator*****'})

    # default starts
    @when_all((m.interest == '2') & (m.grade == '1') & (m.course == '1'
))
    def career_suggest(c):
      # default
      c.assert_fact({ 'suggestion': 'Sorry, No career in the system. We
 suggest you to take a break and explore the interests more.! '})

    @when_all((m.interest == '2') & (m.grade == '1') & (m.course == '3'
))
    def career_suggest(c):

      c.assert_fact({ 'suggestion': 'Sorry, No career in the system. We
 suggest you to take a break and explore the interests more.! '})

    @when_all((m.interest == '2') & (m.grade == '1') & (m.course == '4'
))
    def career_suggest(c):
      # default
      c.assert_fact({ 'suggestion': 'Sorry, No career in the system. We
 suggest you to take a break and explore the interests more.! '})

    @when_all((m.interest == '2') & (m.grade == '2') & (m.course == '1'
))
    def career_suggest(c):
      # default
      c.assert_fact({ 'suggestion': 'Sorry, No career in the system. We
 suggest you to take a break and explore the interests more.! '})

    @when_all((m.interest == '2') & (m.grade == '2') & (m.course == '3'
))
    def career_suggest(c):
      # default
      c.assert_fact({ 'suggestion': 'Sorry, No career in the system. We
 suggest you to take a break and explore the interests more.! '})


    @when_all((m.interest == '2') & (m.grade == '2') & (m.course == '4'
))
    def career_suggest(c):
      # default
```

```
      c.assert_fact({ 'suggestion': 'Sorry, No career in the system. We
 suggest you to take a break and explore the interests more.! '})

    #default ends

    #when user have interest in AI-ML, and having grade 9-
10 and already did the course AI-ML.
    @when_all((m.interest == '3') & (m.grade == '1') & (m.course == '3'
))
    def career_suggest(c):
      # triggering grades
      c.assert_fact('grade' , {'grade':'8-10'})
      c.assert_fact('interest' , {'interest':'ai_ml'})
      c.assert_fact('course' , {'course':'ai_ml'})
      c.assert_fact({ 'suggestion': '***** CAREER SUGGESTION : You can
choose your career as Data Scientist*****'})
    @when_all((m.interest == '3') & (m.grade == '2') & (m.course == '3'
))
    def career_suggest(c):
      # triggering grades
      c.assert_fact('grade' , {'grade':'6-7'})
      c.assert_fact('interest' , {'interest':'ai_ml'})
      c.assert_fact('course' , {'course':'ai_ml'})
      c.assert_fact({ 'suggestion': '***** CAREER SUGGESTION : You can
choose your career as Data Analyst*****'})

   # default starts
    @when_all((m.interest == '3') & (m.grade == '1') & (m.course == '1'
))
    def career_suggest(c):
      # default
      c.assert_fact({ 'suggestion': 'Sorry, No career in the system. We
 suggest you to take a break and explore the interests more.! '})

    @when_all((m.interest == '3') & (m.grade == '1') & (m.course == '2'
))
    def career_suggest(c):

      c.assert_fact({ 'suggestion': 'Sorry, No career in the system. We
 suggest you to take a break and explore the interests more.! '})

    @when_all((m.interest == '3') & (m.grade == '1') & (m.course == '4'
))
    def career_suggest(c):
      # default
      c.assert_fact({ 'suggestion': 'Sorry, No career in the system. We
 suggest you to take a break and explore the interests more.! '})
```

```
    @when_all((m.interest == '3') & (m.grade == '2') & (m.course == '1'
))
    def career_suggest(c):
      # default
      c.assert_fact({ 'suggestion': 'Sorry, No career in the system. We
 suggest you to take a break and explore the interests more.! '})

    @when_all((m.interest == '3') & (m.grade == '2') & (m.course == '2'
))
    def career_suggest(c):
      # default
      c.assert_fact({ 'suggestion': 'Sorry, No career in the system. We
 suggest you to take a break and explore the interests more.! '})


    @when_all((m.interest == '3') & (m.grade == '2') & (m.course == '4'
))
    def career_suggest(c):
      # default
      c.assert_fact({ 'suggestion': 'Sorry, No career in the system. We
 suggest you to take a break and explore the interests more.! '})

    #default ends



    #when user have interest in cloud, and having grade 9-
10 and already did the course Cloud Computing.
    @when_all((m.interest == '4') & (m.grade == '1') & (m.course == '4'
))
    def career_suggest(c):
      # triggering grades
      c.assert_fact('grade' , {'grade':'8-10'})
      c.assert_fact('interest' , {'interest':'cloud'})
      c.assert_fact('course' , {'course':'Cloud Computing'})
      c.assert_fact({ 'suggestion': '***** CAREER SUGGESTION : You can
choose your career as Big Data Analyst*****'})
    @when_all((m.interest == '4') & (m.grade == '2') & (m.course == '4'
))
    def career_suggest(c):
      # triggering grades
      c.assert_fact('grade' , {'grade':'6-7'})
      c.assert_fact('interest' , {'interest':'cloud'})
      c.assert_fact('course' , {'course':'Cloud Computing'})
      c.assert_fact({ 'suggestion': '***** CAREER SUGGESTION : You can
choose your career as Cloud Visulization Expert*****'})

    # default starts
```

```
    @when_all((m.interest == '4') & (m.grade == '1') & (m.course == '1'
))
    def career_suggest(c):
      # default
      c.assert_fact({ 'suggestion': 'Sorry, No career in the system. We
 suggest you to take a break and explore the interests more.! '})

    @when_all((m.interest == '4') & (m.grade == '1') & (m.course == '2'
))
    def career_suggest(c):

      c.assert_fact({ 'suggestion': 'Sorry, No career in the system. We
 suggest you to take a break and explore the interests more.! '})

    @when_all((m.interest == '4') & (m.grade == '1') & (m.course == '3'
))
    def career_suggest(c):
      # default
      c.assert_fact({ 'suggestion': 'Sorry, No career in the system. We
 suggest you to take a break and explore the interests more.! '})

    @when_all((m.interest == '4') & (m.grade == '2') & (m.course == '1'
))
    def career_suggest(c):
      # default
      c.assert_fact({ 'suggestion': 'Sorry, No career in the system. We
 suggest you to take a break and explore the interests more.! '})

    @when_all((m.interest == '4') & (m.grade == '2') & (m.course == '2'
))
    def career_suggest(c):
      # default
      c.assert_fact({ 'suggestion': 'Sorry, No career in the system. We
 suggest you to take a break and explore the interests more.! '})


    @when_all((m.interest == '4') & (m.grade == '2') & (m.course == '3'
))
    def career_suggest(c):
      # default
      c.assert_fact({ 'suggestion': 'Sorry, No career in the system. We
 suggest you to take a break and explore the interests more.! '})

    #default ends



    @when_all(+m.suggestion)
    def output(d):
```

```
        print('Fact: {0}'.format(d.m.suggestion))

# 'grades' facts to suggest the career based on the grades selected by
user.
with ruleset('grade'):
    @when_all((m.grade == '8-10'))
    def high_grade(m):
        m.assert_fact({ 'suggestion': '***** CAREER SUGGESTION : As you
 have score good Grades*****'})

    @when_all((m.grade == '6-7'))
    def avg_grade(m):
        m.assert_fact({ 'suggestion': '***** CAREER SUGGESTION : As you
 have scored avearge Grades*****'})
    #output the suggestion
    @when_all(+m.suggestion)
    def output(d):
        print('Fact: {0}'.format(d.m.suggestion))

# 'interest' facts to suggest the career based on the interest selected
 by user.
with ruleset('interest'):
    @when_all((m.interest == 'coding'))
    def coding(e):
        e.assert_fact({ 'suggestion': 'And You are interested in coding
'})
    @when_all((m.interest == 'hacking'))
    def hacking(e):
        e.assert_fact({ 'suggestion': 'And You are interested in hackin
g'})
    @when_all((m.interest == 'ai_ml'))
    def ai_ml(e):
        e.assert_fact({ 'suggestion': 'And You are interested in AI-
ML'})
    @when_all((m.interest == 'cloud'))
    def cloud(e):
        e.assert_fact({ 'suggestion': 'And You are interested in cloud'
})
     #output the suggestion
    @when_all(+m.suggestion)
    def output(d):
        print('Fact: {0}'.format(d.m.suggestion))



with ruleset('course'):
    @when_all((m.course == 'DS'))
    def DS(e):
```

```
        e.assert_fact({ 'suggestion': 'As well as you have done DS cour
se.'})
    @when_all((m.course == 'FCS'))
    def FCS(e):
        e.assert_fact({ 'suggestion': 'As well as you have done FCS cou
rse.'})
    @when_all((m.course == 'ai_ml'))
    def ML(e):
        e.assert_fact({ 'suggestion': 'As well as you have done ML cour
se.'})
    @when_all((m.course == 'Cloud Computing'))
    def ML(e):
        e.assert_fact({ 'suggestion': 'As well as you have done Cloud C
omputing course.'})

     #output the suggestion
    @when_all(+m.suggestion)
    def output(d):
        print('Fact: {0}'.format(d.m.suggestion))
assert_fact('career', { 'interest': interest,'grade': grade, 'course':
course})
```