AI ASSIGNMENT-3

Submission:

The following files have been submitted in the attached zip:
- 'AI Assignment-3 Report.pdf': Consists of the explanation of the code, Demonstration of forward chaining, Ingenuity, steps to run the code.
- 'Program.py': The main python code that needs to be run.

How to run the code:
- Ensure that the durable-rules library of python is installed. Run the command **python program.py** and enter the acronyms of the electives you have done in IIITD.
- Enter 'end' when you wish to stop entering your electives.
- Then the AI system would ask for CGPA of each course you have done.
- Then the system would ask for your fields of interest, choose from the list.
- Based on the inputs, it determines the feasibility of the fields of interest and prints it.
- It also prints the recommended career options.
  (Ensure that the inputs are entered quickly)

Explanation of code:
- First the input of the courses done by the student is taken. It is put in as a fact. Then under the rule 'courses', these are stored along with their CGPA.
- Under the 'field' rule, these courses are stored depending on the tech field they would be beneficial for.
- Then the interests are taken as inputs and stored as facts.
- The interests of a student are processed under the rule 'interest' in which, it is checked whether the student is familiar with the courses of the field in which he/she is interested. Based on that, feasibility is determined.
- Then the student's average CGPA for courses of different fields is calculated to determine the fields, where the student would be willing to put in more effort as compared to others.
- The 2 highest CGPA fields along with feasible interests are displayed by the recommendation system by the rule 'career'.

Forward Chaining:

- The courses done by a student of IIITD are taken as input, along with the CGPA obtained in the course.
- We also input the interests of the student in the tech field.
- The interests and courses and corresponding grades are taken as **facts**.

- These facts are used to add **new assertions** such as the field the person should take based upon the courses done. These assertions are obtained by using the **rules** on facts.
  - For this purpose, the *ruleset('course')* and *ruleset('field')* are used.
  - *ruleset('interest')* is also used for handling of the facts related to the interests of the student
- The above facts are combined in a comprehensive manner using appropriate rules which are based on the interest of the student and the grade one obtains in the courses of various fields. The courses are divided into different fields for the purpose of defining rules and then using them for prediction.
- The top 2 fields based on CGPA are suggested as career advice along with consideration of interests.

Following is the diagram for explaining Forward Chaining:
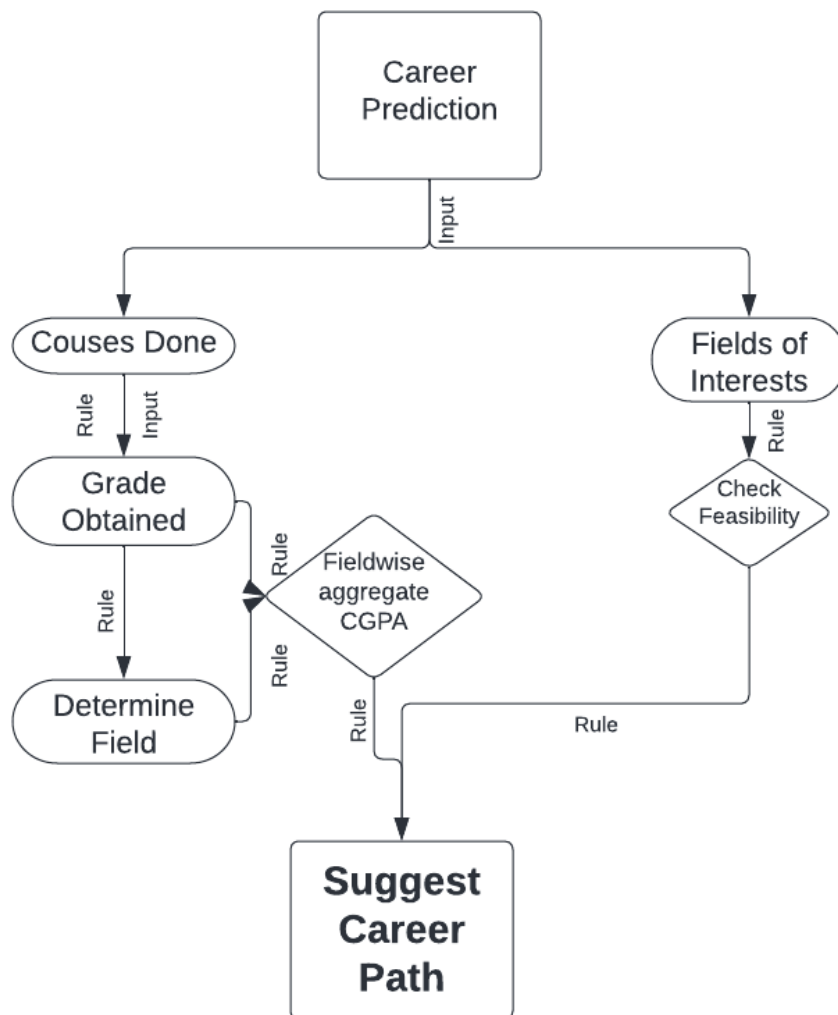
Ingenuity Shown:

- A student can enter multiple fields of interest, whether he/she has done the course for that field or not, the AI system would, based upon his knowledge, evaluate whether pursuing his interest is feasible or not.
- The AI system recommends multiple career options keeping in view, student's interest, the courses done and the grade obtained.
- The grade interests and his knowledge is used in a comprehensive way to suggest career paths which he has interest in and/or has performed well in.
- The courses are linked to a particular field a student might take up.
- Interest, not just in certain fields is considered but also in other things, such as CP, that one may do as a hobby.
- The system gives suitable importance to the average grade of courses a student has done in a particular field for recommendation of career in that field. This way, the AI system tries to understand the field where the student would be willing to put in extra effort, which is good for his career growth.

Screenshots of sample program run:

a.

```
visheshrangwani@Visheshs-MacBook-Air Assignment 3 % python program.py

Welcome To CAREER ADVISORY System

Enter all the courses related to Computer Science, Computational Biology, Hardware Electronics and Design that
 you have done:
Enter the acronyms of the courses and enter 'end' to stop entering the courses

Enter course ('end' to stop): fpp
Enter course ('end' to stop): ml
Enter course ('end' to stop): ai
Enter course ('end' to stop): aag
Enter course ('end' to stop): iqb
Enter course ('end' to stop): pb
Enter course ('end' to stop): bda
Enter course ('end' to stop): end

Enter the Grade Point obtained in FPP: 9
Enter the Grade Point obtained in ML: 9
Enter the Grade Point obtained in AI: 8
Enter the Grade Point obtained in AAG: 7
Enter the Grade Point obtained in IQB: 6
Enter the Grade Point obtained in PB: 7
Enter the Grade Point obtained in BDA: 10
```

```
Enter your interests from the following list as a student of IIITD:
        -> Cyber Security
        -> AI/ML
        -> Data Science
        -> Software Development
        -> System Design
        -> Computational Biology
        -> Data Science (Biology)
        -> UI/UX Design
        -> Animation/Motion Graphics
        -> Hardware
        -> Data Structures and Algorithms
        -> Competitive Programming

Enter your interests. Input 'end' to stop entering your choices.

Enter interest: Cyber Security
Enter interest: Competitive Programming
Enter interest: end

FACT: Interest Cyber Security not feasible
FACT: Career in Software Development (CP)
FACT: Career in Data Science
FACT: Career in AI/ML
```

b.

```
● visheshrangwani@Visheshs-MacBook-Air Assignment 3 % python program.py

 Welcome To CAREER ADVISORY System

 Enter all the courses related to Computer Science, Computational Biology, Hardware Electronics and Design that
  you have done:
 Enter the acronyms of the courses and enter 'end' to stop entering the courses

 Enter course ('end' to stop): nssii
 Enter course ('end' to stop): os
 Enter course ('end' to stop): fcs
 Enter course ('end' to stop): mlba
 Enter course ('end' to stop): bstats
 Enter course ('end' to stop): cn
 Enter course ('end' to stop): sw
 Enter course ('end' to stop): mad
 Enter course ('end' to stop): dmg
 Enter course ('end' to stop): bda
 Enter course ('end' to stop): end

 Enter the Grade Point obtained in NSSII: 7
 Enter the Grade Point obtained in OS: 10
 Enter the Grade Point obtained in FCS: 9
 Enter the Grade Point obtained in MLBA: 8
 Enter the Grade Point obtained in BStats: 9
 Enter the Grade Point obtained in CN: 10
 Enter the Grade Point obtained in SW: 7
 Enter the Grade Point obtained in MAD: 8
 Enter the Grade Point obtained in DMG: 9
 Enter the Grade Point obtained in BDA: 6
```

```
Enter your interests from the following list as a student of IIITD:
        -> Cyber Security
        -> AI/ML
        -> Data Science
        -> Software Development
        -> System Design
        -> Computational Biology
        -> Data Science (Biology)
        -> UI/UX Design
        -> Animation/Motion Graphics
        -> Hardware
        -> Data Structures and Algorithms
        -> Competitive Programming

Enter your interests. Input 'end' to stop entering your choices.

Enter interest: Data Science
Enter interest: AI/ML
Enter interest: end

FACT: Career in Data Science
FACT: Interest AI/ML not feasible
FACT: Career in System Design
FACT: Career in Data Science (Biology)
```