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	Department of Artificial Intelligence and Data Science	

Semester -I A.Y.2025-26 Sub.: - Artificial Intelligence Lab

Class: SE

## Assignment 02: Building an Expert System Using Rule-Based Systems

**Objective:** Develop an Expert System that provides simple decision-making.

**Problem Statement:** Creating a simple Expert System that can be demonstrated to introduce Artificial Intelligence, decision-making algorithms, and rule-based systems.

### "Expert System for Career Path Suggestion Based on Student

#### Interests" What is an Expert System?

An **Expert System** mimics the decision-making ability of a human expert. It uses a set of rules and a knowledge base to make decisions or solve problems in a specific domain.

#### Tools and Technologies:

- **Language:** Python
- **Interface:** CLI
- **Logic Engine:** PyKnow (Python library for Expert Systems)

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Knowledge Base (Sample Rules):

IF student\_likes == "Maths" AND student\_likes == "Physics" THEN suggest  
"Mechanical Engineering"

IF student\_likes == "Programming" AND student\_likes == "Maths" THEN  
suggest "Computer Engineering"

IF student\_likes == "Biology" AND student\_likes == "Chemistry" THEN  
suggest "Biotechnology"

IF student\_likes == "Circuits" AND student\_likes == "Maths" THEN suggest  
"Electronics Engineering"

IF student\_likes == "Programming" AND student\_likes == "Statistics" THEN  
suggest "Artificial Intelligence and Data Science"

IF student\_likes == "Programming" AND student\_likes == "AI Concepts" THEN  
suggest "Artificial Intelligence and Machine Learning Engineering"

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Students will develop the expert system/decision making using if else in python and then can go for the following implementation using “**experta**” library.

**NOTE:** For following code execution, your system needs an “**experta**” python library installed. -----Following is implementation using “experta” python library----- **Code:**

```
from experta import *  
class StudentFacts(Fact):
```

```

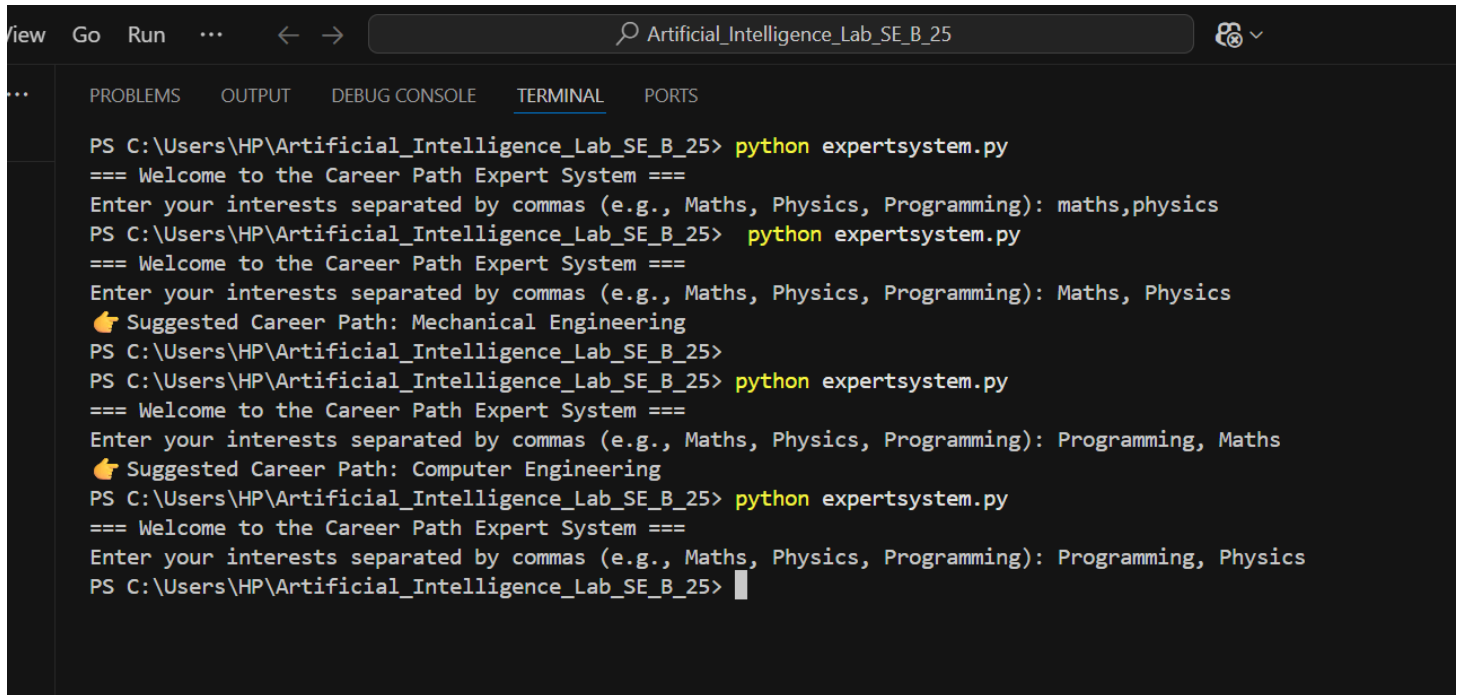
pass
class CareerExpertSystem(KnowledgeEngine):

    @Rule(StudentFacts(likes='Maths'), StudentFacts(likes='Physics'))
    def mechanical(self):
        print("Suggested Career Path: Mechanical Engineering")
    @Rule(StudentFacts(likes='Programming'),
StudentFacts(likes='Maths')) def computer(self):
        print("Suggested Career Path: Computer Engineering")
    @Rule(StudentFacts(likes='Biology'),
StudentFacts(likes='Chemistry')) def biotech(self):
        print("Suggested Career Path: Biotechnology")
    @Rule(StudentFacts(likes='Circuits'), StudentFacts(likes='Maths'))
    def electronics(self):
        print("Suggested Career Path: Electronics Engineering")

def main():
    engine = CareerExpertSystem()
    engine.reset()
    print("Welcome to the Career Path Expert System!")
    interests = input("Enter your interests separated by commas (e.g., Maths,
Physics, Programming): ").split(',')
    for interest in interests:
        engine.declare(StudentFacts(likes=interest.strip()))
    engine.run()
if __name__ == "__main__":
    main()

```

## output:



```
View Go Run ... < > Artificial_Intelligence_Lab_SE_B_25
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

PS C:\Users\HP\Artificial_Intelligence_Lab_SE_B_25> python expertsystem.py
=== Welcome to the Career Path Expert System ===
Enter your interests separated by commas (e.g., Maths, Physics, Programming): maths,physics
PS C:\Users\HP\Artificial_Intelligence_Lab_SE_B_25> python expertsystem.py
=== Welcome to the Career Path Expert System ===
Enter your interests separated by commas (e.g., Maths, Physics, Programming): Maths, Physics
👉 Suggested Career Path: Mechanical Engineering
PS C:\Users\HP\Artificial_Intelligence_Lab_SE_B_25>
PS C:\Users\HP\Artificial_Intelligence_Lab_SE_B_25> python expertsystem.py
=== Welcome to the Career Path Expert System ===
Enter your interests separated by commas (e.g., Maths, Physics, Programming): Programming, Maths
👉 Suggested Career Path: Computer Engineering
PS C:\Users\HP\Artificial_Intelligence_Lab_SE_B_25> python expertsystem.py
=== Welcome to the Career Path Expert System ===
Enter your interests separated by commas (e.g., Maths, Physics, Programming): Programming, Physics
PS C:\Users\HP\Artificial_Intelligence_Lab_SE_B_25> 
```