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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)

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"

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):
```

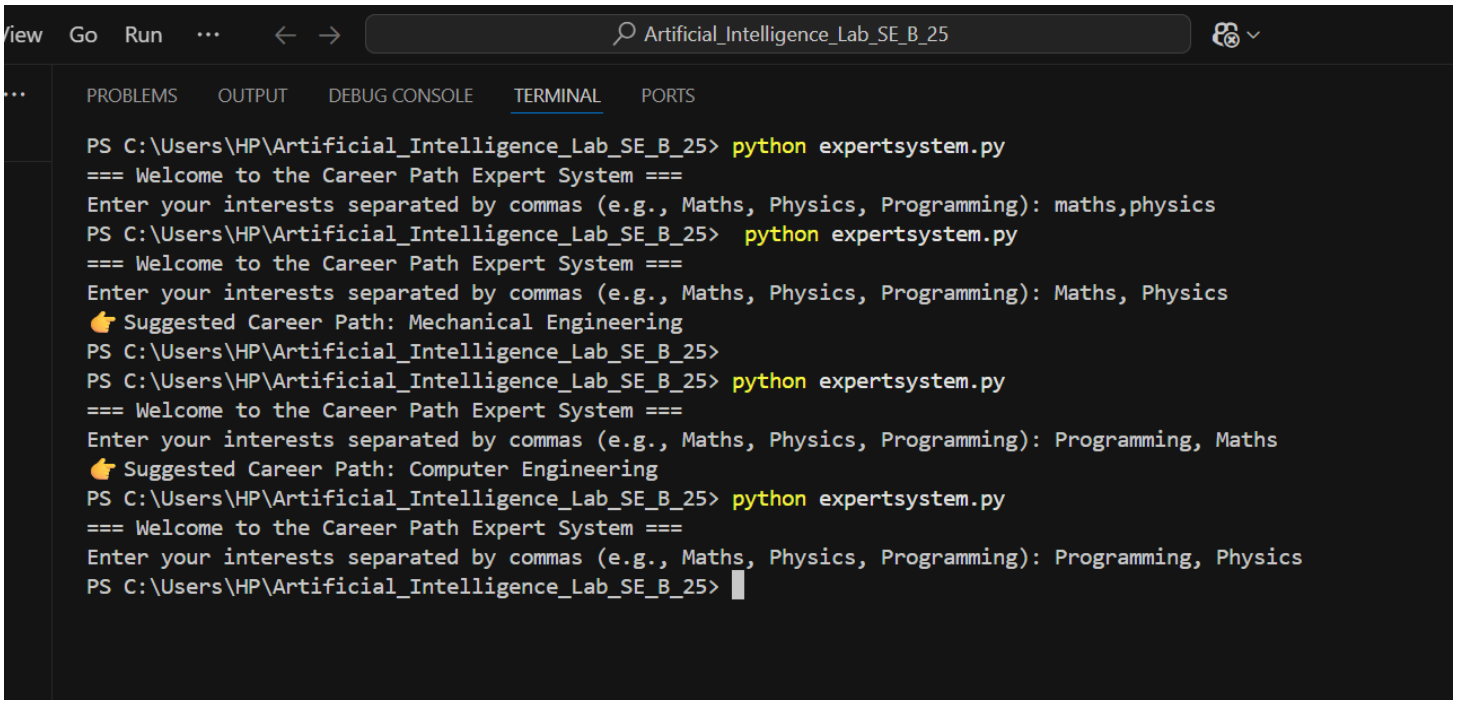
```
 pass
class CareerExpertSystem(KnowledgeEngine):



 @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:


iew 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>