"येथे बहुतांचे हित"	Marathwada Mitra Mandal's **Institute of Technology, Lohgaon Pune - 47** **Department of Artificial Intelligence and Data Science**	ACCREDITED WITH GRADE A NAAC

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()
```