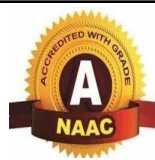
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Semester -I

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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"

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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()

```