Assignment 2

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Title : AI Lab Assignment Report: Career Selector using Rule-Based System

Aim of the Practical : To design and implement a career selector expert system using rule-based logic first through basic if-else conditions, and later using the experta module in Python for a more structured and scalable approach.

Objective :

1.
2. To understand the working of rule-based systems.
3. To create a career selection system based on user input.
4. To implement the system using both basic conditional logic and the experta module.
5. To explore the basics of expert system frameworks in AI.

Explanation of Tasks Performed :

1. Career Selector using If-Else Statements:

- Created a Python program that asks the user several questions related to interests, skills, and preferences.
- Based on the responses, used if-else logic to suggest a suitable career (e.g., Data Scientist, Doctor, Engineer, Artist).
- Successfully executed and tested the program with different inputs.

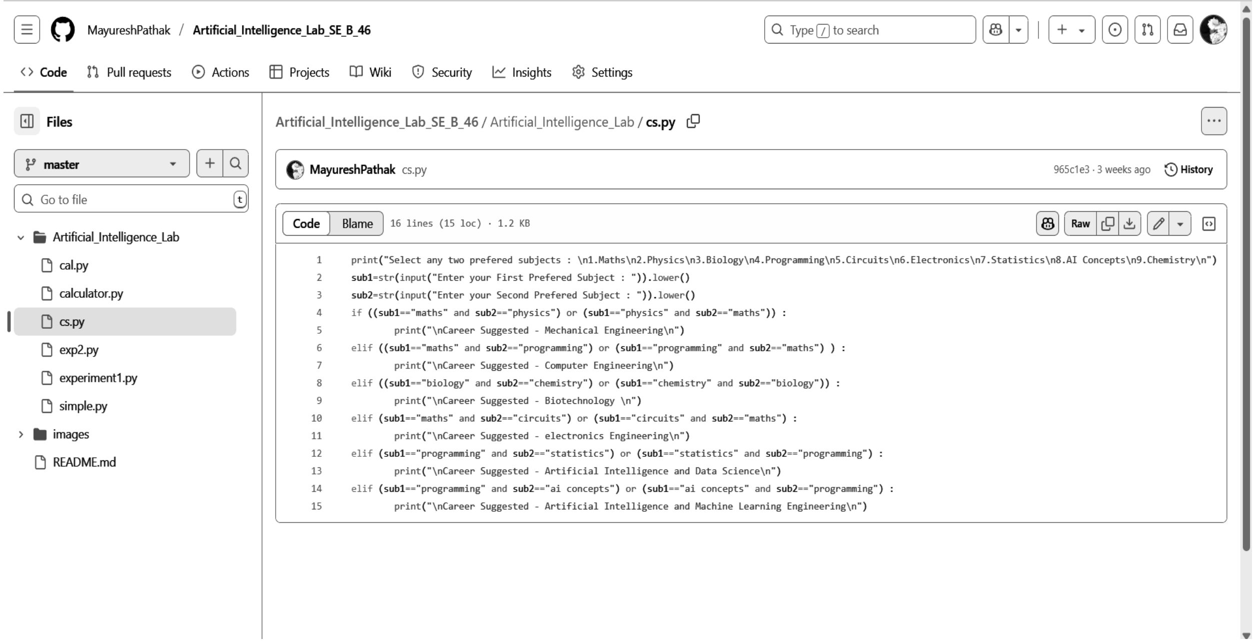
2. Career Selector using experta Module:

- Installed the experta module using pip: pip install experta
- Created a rule-based expert system using experta.Fact, KnowledgeEngine, and @Rule decorators.
- Defined rules for various career paths.
- Created a user interface to input preferences and trigger the engine.
- Ran and validated the output for multiple user profiles.

Output Screenshots :

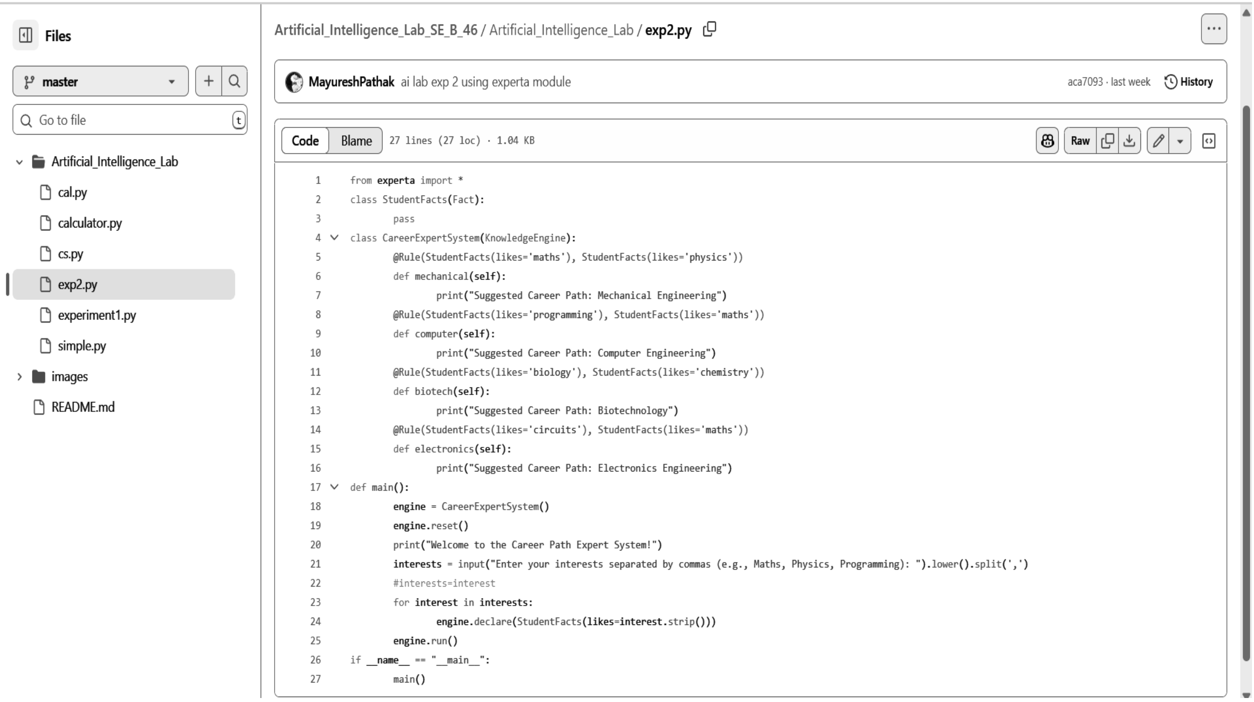
Note: Attach the following screenshots below this section in your document:

1. Screenshot of the if-else version code and output.



```
print("Select any two prefered subjects : \n1.Maths\n2.Physics\n3.Biology\n4.Programming\n5.Circuits\n6.Electronics\n7.Statistics\n8.AI Concepts\n9.Chemistry\n")
sub1=str(input("Enter your First Prefered Subject : ")).lower()
sub2=str(input("Enter your Second Prefered Subject : ")).lower()
if ((sub1=="maths" and sub2=="physics") or (sub1=="physics" and sub2=="maths")) :
        print("\nCareer Suggested - Mechanical Engineering\n")
elif ((sub1=="maths" and sub2=="programming") or (sub1=="programming" and sub2=="maths") ) :
        print("\nCareer Suggested - Computer Engineering\n")
elif ((sub1=="biology" and sub2=="chemistry") or (sub1=="chemistry" and sub2=="biology")) :
        print("\nCareer Suggested - Biotechnology \n")
elif (sub1=="maths" and sub2=="circuits") or (sub1=="circuits" and sub2=="maths") :
        print("\nCareer Suggested - electronics Engineering\n")
elif (sub1=="programming" and sub2=="statistics") or (sub1=="statistics" and sub2=="programming") :
        print("\nCareer Suggested - Artificial Intelligence and Data Science\n")
elif (sub1=="programming" and sub2=="ai concepts") or (sub1=="ai concepts" and sub2=="programming") :
        print("\nCareer Suggested - Artificial Intelligence and Machine Learning Engineering\n")
```

2. Screenshot of the experta version code.

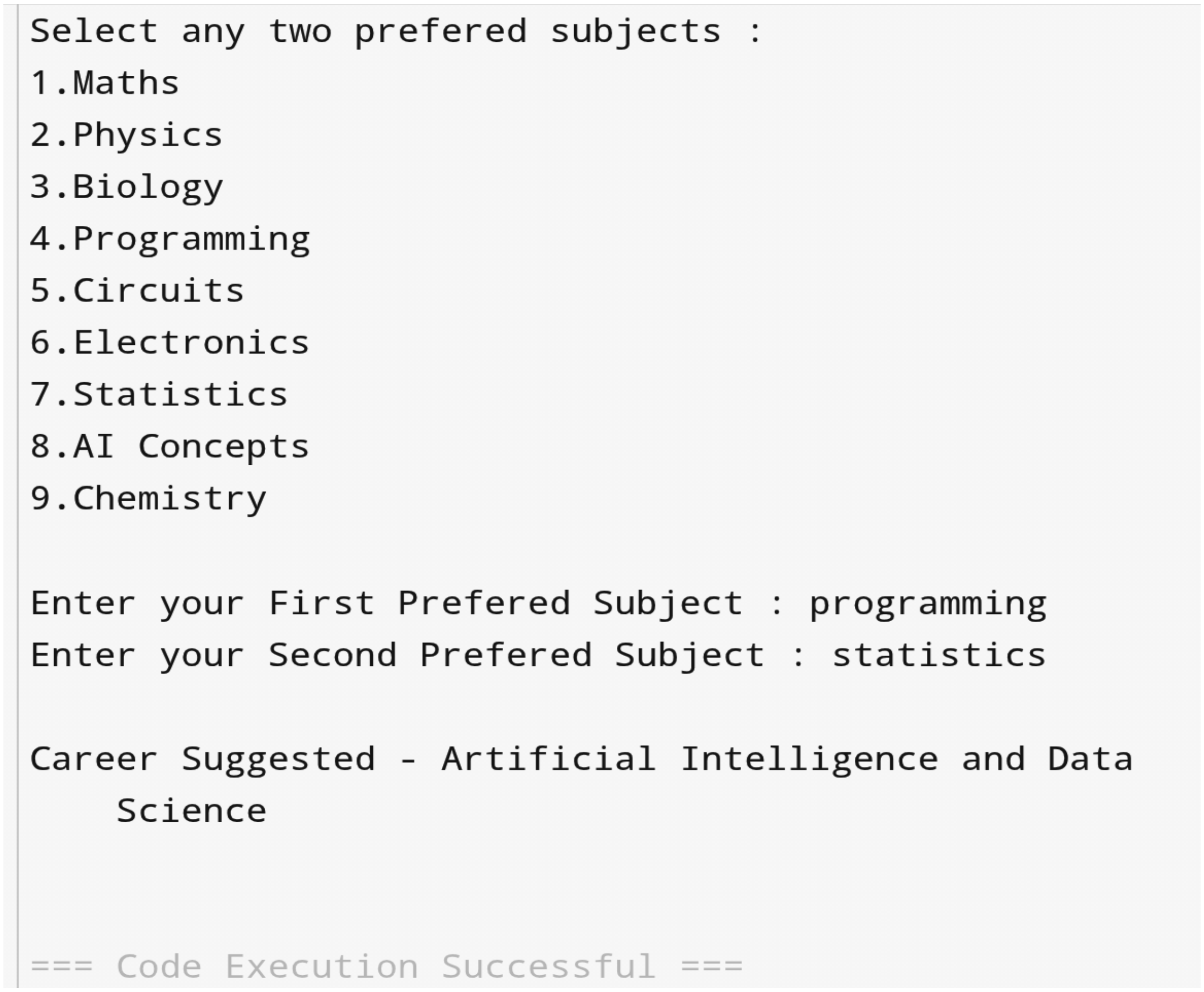


ai lab exp 2 using experta module

27 lines (27 loc) · 1.04 KB

```python
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): ").lower().split(',')
        #interests=interest
        for interest in interests:
                engine.declare(StudentFacts(likes=interest.strip()))
        engine.run()
if __name__ == "__main__":
        main()
```

3. Screenshot of program output for sample inputs.



```
Select any two prefered subjects :
1.Maths
2.Physics
3.Biology
4.Programming
5.Circuits
6.Electronics
7.Statistics
8.AI Concepts
9.Chemistry

Enter your First Prefered Subject : programming
Enter your Second Prefered Subject : statistics

Career Suggested - Artificial Intelligence and Data
    Science



=== Code Execution Successful ===
```

Conclusion : This practical enhanced my understanding of how rule-based systems operate and how they can be used to simulate expert decision-making. Implementing the same logic using both if-else and experta helped me appreciate the importance of modular and scalable