Mesias, Ian Patrick Z. CSST 101

BSCS – 3A

Short Report: Enhanced Mini Expert System

Introduction

This mini expert system was developed to simulate logical rules applied in a university setting. The program uses Python with CSV logging to record results for each rule tested. The implication operator (P → Q) serves as the foundation for all rules, ensuring that if a given condition (P) holds, then its logical consequence (Q) must also hold true.

Explanation of Rules Tested

- Attendance Rule

If a student is late (P), then they must provide an excuse letter (Q). Interpretation: Students who arrive late must justify their tardiness. If late without a letter, the rule is violated.

- Grading Rule

If a student's grade ≥ 75 (P), then the student passes (Q). Interpretation: Passing grades confirm student promotion. If a student achieves 75 or more, they should be marked as passed.

- Login Rule

If the password is correct (P), then access is granted (Q). Interpretation: Secure login validation ensures access is only given when the correct password is entered.

- Bonus Points Rule

If the student has regular attendance (P), then they are eligible for bonus points (Q). Interpretation: Regular class participation rewards students with extra credit.

- Enrollment Clearance Rule (Newly Added)

If the fees are paid (P), then enrollment is confirmed (Q). Interpretation: Students who settle their fees gain clearance to be officially enrolled.

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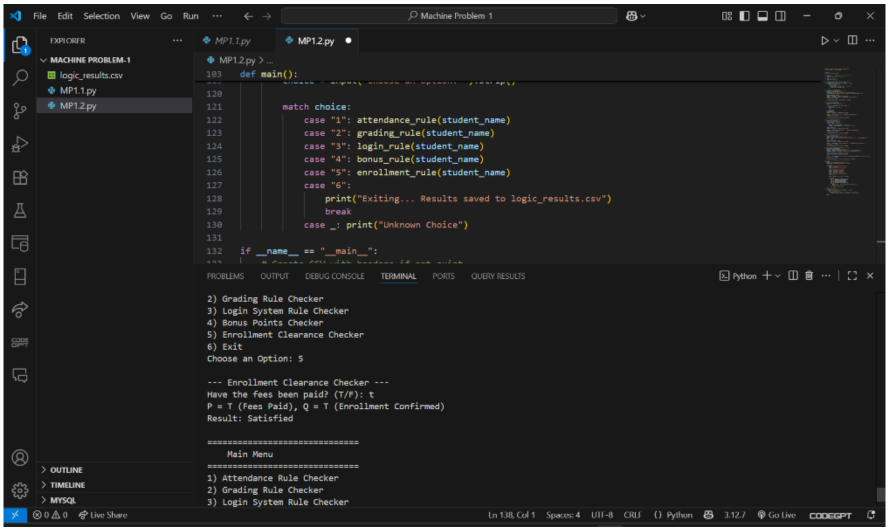
Screenshot of Program Runs

During the test run, each rule was executed interactively using sample student inputs. For the Attendance Rule, the program correctly identified that a student arriving late but presenting an excuse letter satisfied the rule. The Grading Rule was tested with a passing grade (≥ 75), and the system confirmed the student's passing status. The Login Rule accepted the correct password and granted access, while rejecting incorrect attempts. In the Bonus Points Rule, a student with regular attendance was shown to be eligible for additional credit. Finally, the Enrollment Clearance Rule (newly added) was tested by marking fees as paid, and the system confirmed enrollment successfully.

All test runs were logged automatically into the CSV file, showing a timestamp, student name, rule tested, and the outcome.



```python
def main():

        match choice:
            case "1": attendance_rule(student_name)
            case "2": grading_rule(student_name)
            case "3": login_rule(student_name)
            case "4": bonus_rule(student_name)
            case "5": enrollment_rule(student_name)
            case "6":
                print("Exiting... Results saved to logic_results.csv")
                break
            case _: print("Unknown Choice")

if __name__ == "__main__":
```

```
2) Grading Rule Checker
3) Login System Rule Checker
4) Bonus Points Checker
5) Enrollment Clearance Checker
6) Exit
Choose an Option: 5

--- Enrollment Clearance Checker ---
Have the fees been paid? (T/F): t
P = T (Fees Paid), Q = T (Enrollment Confirmed)
Result: Satisfied

==============================
   Main Menu
==============================
1) Attendance Rule Checker
2) Grading Rule Checker
3) Login System Rule Checker
```

Description of the New Rule Added

The Enrollment Clearance Rule was added to strengthen the system's logic framework. In real academic institutions, financial clearance is essential before a student can be officially considered enrolled. - Condition (P): Fees are paid. - Consequence (Q): Enrollment is confirmed. - Implication (P → Q): If a student has paid their fees, the system automatically confirms their enrollment. If the fees are unpaid, no enrollment confirmation is granted. This ensures that financial responsibilities are logically tied to the enrollment process, providing a practical and realistic application of logical reasoning in the university context.

Conclusion

The enhanced mini expert system successfully models real-world university policies using logic rules. Each rule was tested and logged into a CSV file for record keeping. The newly added Enrollment Clearance Rule further improves the program's realism by integrating financial considerations into the enrollment process.