Kyle Angelo D. Mercado

BSCS-3A  
  
**I. Introduction**

This project demonstrates the application of **propositional logic** in real-world scenarios through a **Mini Expert System** implemented in Python. The program applies logical implication (P → Q) to common university processes such as attendance checking, grading, login verification, bonus point eligibility, and enrollment clearance. Results from each test are recorded in a CSV file for reference.

**II. Explanation of Rules Tested**

1. **Attendance Rule**
   * Logic: *If a student is late (P), then they must bring an excuse letter (Q).*
   * Expression: **Late → Excuse Letter**
   * If the student is not late, the rule is still satisfied (vacuous truth).
2. **Grading Rule**
   * Logic: *If a student’s grade is ≥ 75 (P), then the student passes (Q).*
   * Expression: **Grade ≥ 75 → Pass**
   * Students below 75 automatically fail, so the implication still holds.
3. **Login System Rule**
   * Logic: *If the password is correct (P), then access is granted (Q).*
   * Expression: **Password Correct → Access Granted**
   * Prevents unauthorized access.
4. **Bonus Points Rule**
   * Logic: *If the student has regular attendance (P), then the student is eligible for bonus points (Q).*
   * Expression: **Regular Attendance → Bonus Eligible**
   * Encourages consistent attendance.
5. **Enrollment Clearance Rule (Newly Added)**
   * Logic: *If all fees are paid (P), then the student’s enrollment is confirmed (Q).*
   * Expression: **Fees Paid → Enrollment Confirmed**
   * This ensures financial obligations are met before enrollment is finalized.

**III. Screenshots of Program Runs**

* **Attendance Rule Test**  
  [Insert Screenshot Here]
* **Grading Rule Test**  
  [Insert Screenshot Here]
* **Login System Test**  
  [Insert Screenshot Here]
* **Bonus Points Test**  
  [Insert Screenshot Here]
* **Enrollment Clearance Test (New Rule)**  
  [Insert Screenshot Here]

**IV. Description of the New Rule**

The **Enrollment Clearance Rule** was added to extend the expert system. Its purpose is to simulate the real-world process where students must settle their financial accounts before being officially enrolled.

* **Logic Translation:** *If fees are paid → enrollment confirmed.*
* **Implementation in Code:** The program asks whether fees have been paid (T/F). If yes, enrollment is confirmed; otherwise, the implication is violated.
* **Purpose:** This reflects a practical university policy and demonstrates how propositional logic can model administrative requirements.

**V. Conclusion**

This project successfully applied propositional logic to five university-related scenarios. Each rule demonstrates the importance of logical implication in decision-making processes. The results, stored in the CSV file, provide a record of system outcomes for different students. The addition of the **Enrollment Clearance Rule** highlights the flexibility of the expert system in modeling new university policies.