

Report: Enhanced Mini Expert System with Logic Rules

Explanation of Rules Tested

The Enhanced Mini Expert System was designed to test several logic rules commonly encountered in a university setting. The **Attendance Rule** checks if a student who arrives late has an excuse letter. If the student is late without a letter, the rule is violated; otherwise, it is satisfied. The **Grading Rule** verifies that a student who has a grade of 75 or above is considered to have passed. The **Login Rule** ensures that access to the system is only granted if the correct password is entered. The **Bonus Rule** determines if students with regular attendance are eligible to receive bonus points. Each of these rules demonstrates how logical implication can be applied in everyday school-related scenarios.

Demonstration of Program Runs

Screenshots of the program runs show the interaction between the system and the user. In each case, the program asks for the required inputs such as grade, attendance status, or password. The results are displayed on screen, showing whether the rule was satisfied or violated. All outputs are also recorded in the CSV file *logic_results.csv* for reference.

The image displays two screenshots of a Jupyter Notebook interface, titled "AquinoIII-MP1.ipynb".

Screenshot 1: The notebook shows the execution of the "Grading Rule Checker". The output indicates that the result is "Satisfied". Below the code cell, a "Main Menu" is displayed with options 1 through 6, and the user has chosen option 3 ("Login Rule Checker"). A password input field shows "user123".

```
... Grading Rule Checker ...
... enter Student Grade: 87
... p = F (grade >= 75), Q = F (student Passes)
Results Satisfied

Main Menu
1) Attendance Rule Checker
2) Grading Rule Checker
3) Login System Rule Checker
4) Bonus Points Checker
5) Scholarship Eligibility Checker
6) Exit/Logout Eligibility Checker
Choose an option: 3

... Login Rule Checker ...
Enter Password: user123
```

Screenshot 2: The notebook shows the execution of the "University logic Rule System". The user has entered "Jose" as the student name. The "Main Menu" is displayed again, and the user has chosen option 2 ("Grading Rule Checker"). A grade input field shows "87".

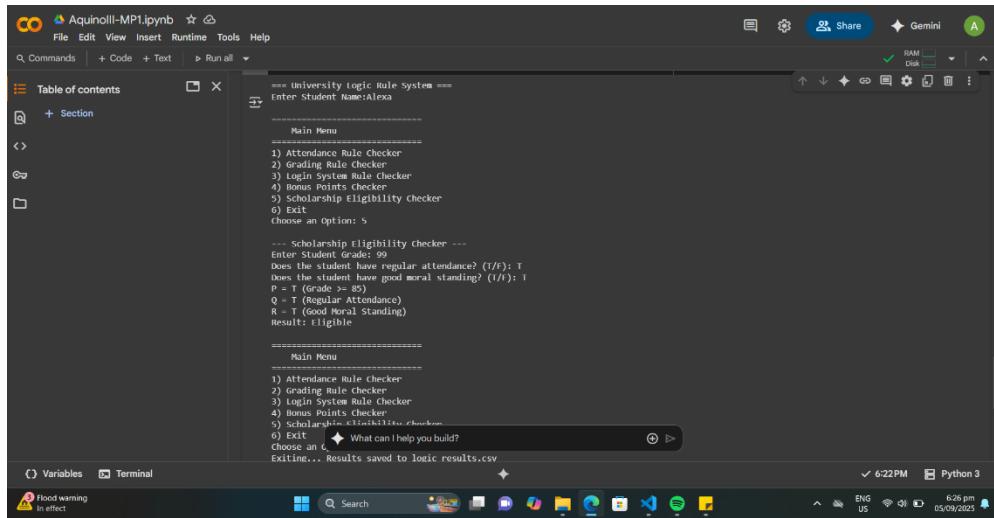
```
... University logic Rule System ...
Enter Student Name:Jose

Main Menu
1) Attendance Rule Checker
2) Grading Rule Checker
3) Login System Rule Checker
4) Bonus Points Checker
5) Scholarship Eligibility Checker
6) Exit/Logout Eligibility Checker
Choose an option: 2

... Grading Rule Checker ...
Enter Student Grade: 87
```

Description of the New Rule Added

A new rule, the **Scholarship Eligibility Rule**, was added to extend the system's functionality. Unlike the previous rules that rely mainly on implication, this rule uses logical AND because multiple conditions must be satisfied together. A student must achieve a grade of at least 85, maintain regular attendance, and demonstrate good moral standing. If all three are true, the student is declared eligible for a scholarship; otherwise, they are not eligible. This rule makes the system more realistic since scholarship criteria in universities often consider both academic performance and personal conduct.



```
Aquinolli-MP1.ipynb  Share  Gemini  A
File Edit View Insert Runtime Tools Help
Commands + Code + Text Run all
Table of contents  Enter Student Name:Alexa
----- Main Menu -----
1) Attendance Rule Checker
2) Grading Rule Checker
3) Login System Rule Checker
4) Scholar Points Checker
5) Scholarship Eligibility Checker
6) Exit
Choose an Option: 5
---- Scholarship Eligibility checker ---
Enter Student Grade: 99
Does the student have regular attendance? (T/F): T
Does the student have good moral standing? (T/F): T
P = T (Grade >= 85)
Q = T (Regular Attendance)
R = T (Good Moral Standing)
Result: Eligible
----- Main Menu -----
1) Attendance Rule Checker
2) Grading Rule Checker
3) Login System Rule Checker
4) Scholar Points Checker
5) Scholarship Eligibility Checker
6) Exit  ♦ What can I help you build?
Choose an Option: 6
Exiting... Results saved to logic results.csv
Variables Terminal
6:22PM Python 3
good warning In effect
Search 6:26 PM 05/09/2024
```