

Student Performance Evaluation System

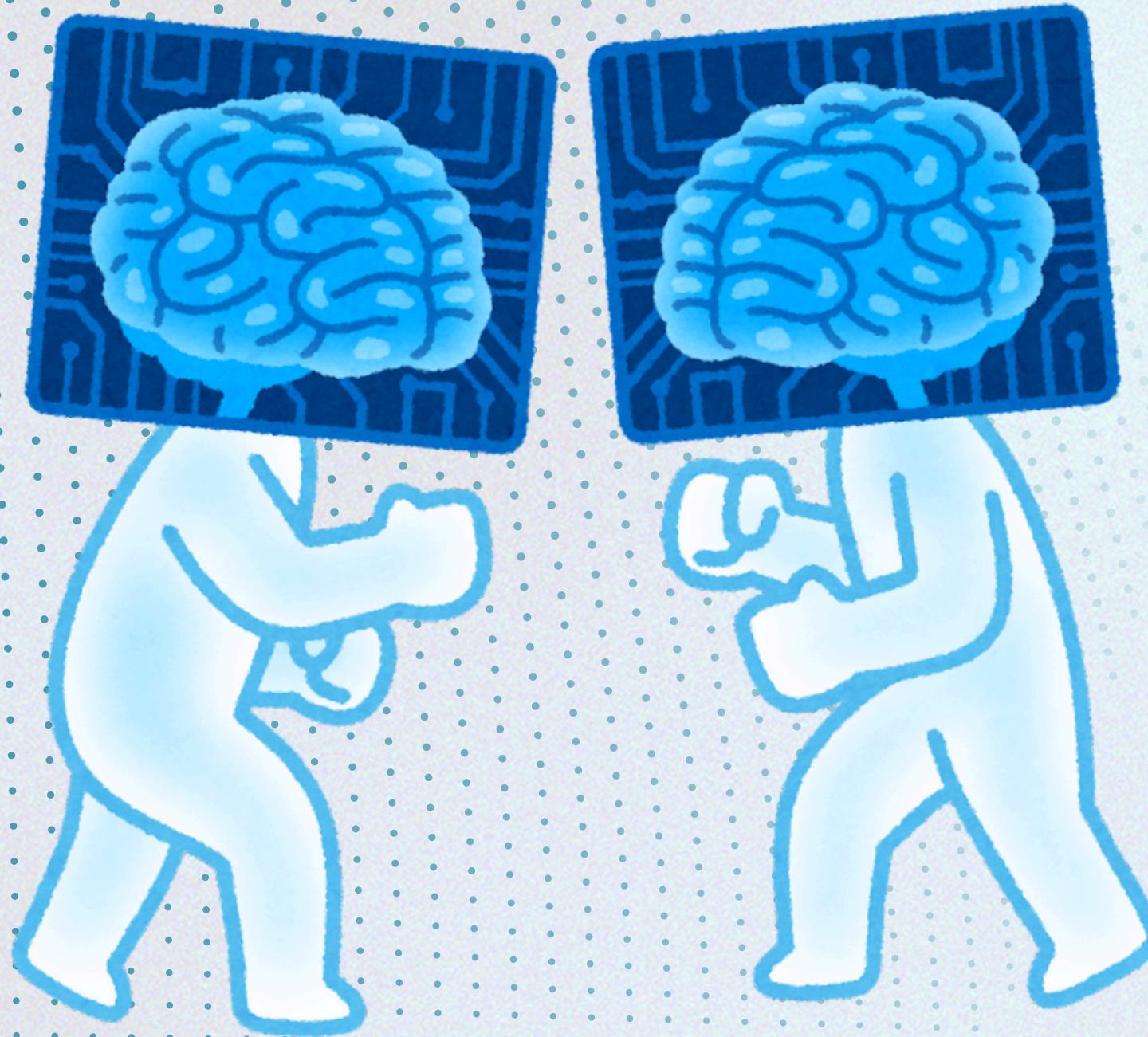
**Course: Artificial Intelligence & Expert
System Lab (CSE 404)**

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Problem Statement

Key Issues Addressed:

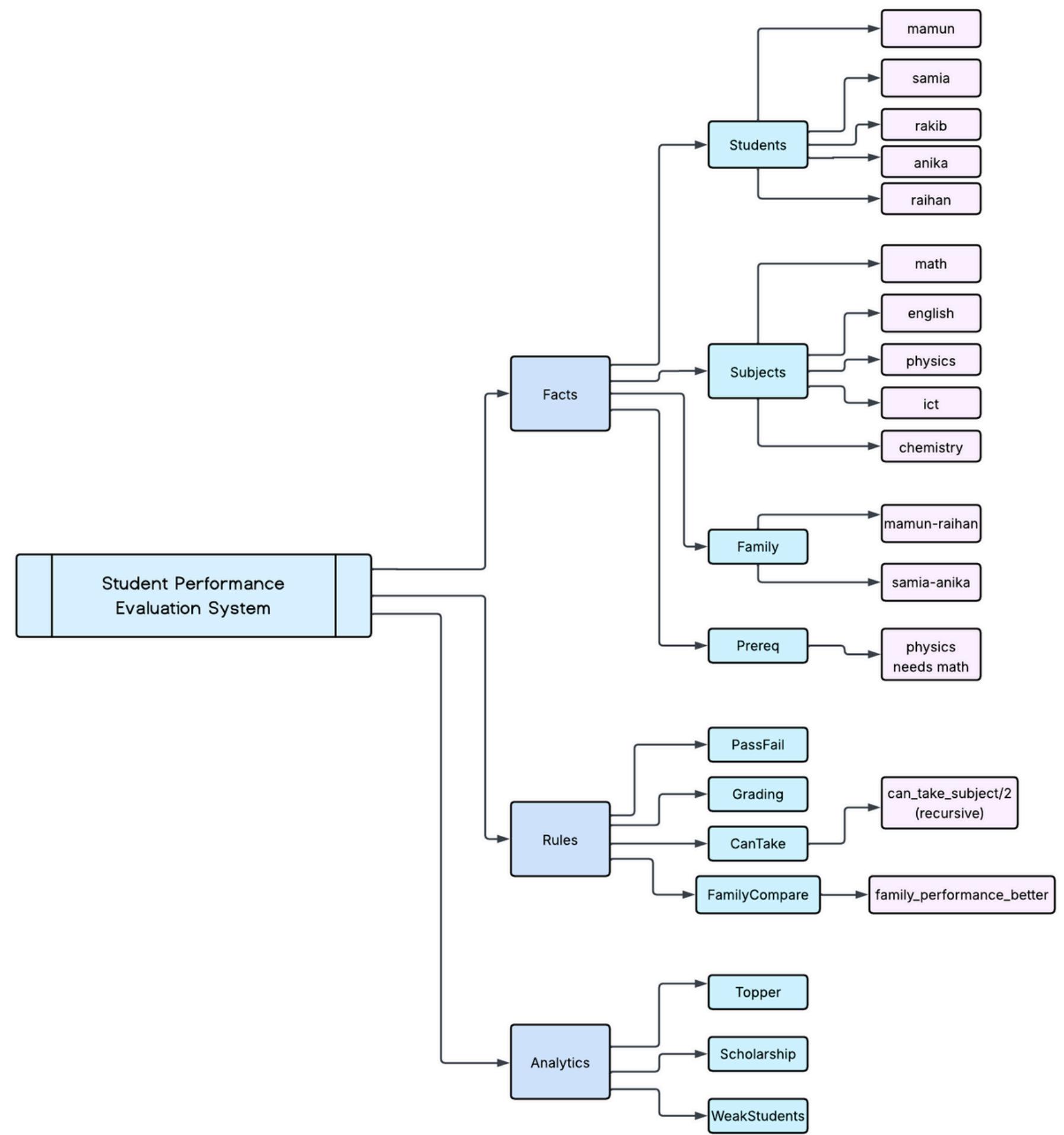
- Manual student performance analysis is time-consuming
- Lack of automated prerequisite checks (e.g., Math → Physics)
- No systematic family performance benchmarking
- Difficulty in identifying weak/exceptional students

Solution:

Prolog-based expert system with:

- ✓ Rule-based grading
- ✓ Backtracking for multi-criteria analysis
- ✓ Family performance comparisons

Diagram



Technical Report

The detailed technical report for this project is available [here](#). This report provides an in-depth overview of the student performance evaluation knowledgebase implemented in Prolog. It covers the problem statement, methodology, facts and rules used, and key insights derived from the knowledgebase. The document serves as a comprehensive reference for understanding the system design, logic, and results.

Source Code

```
1 % Students & Subjects
2 student(mamun). student(samia). student(rakib). student(anika). student(raihan).
3 subject(math). subject(english). subject(physics). subject(ict). subject(chemistry).
4
5 % Marks
6 marks(mamun, math, 85). marks(mamun, english, 72). marks(mamun, physics, 65).
7 marks(mamun, ict, 88). marks(mamun, chemistry, 75).
8
9 marks(samia, math, 40). marks(samia, english, 60). marks(samia, physics, 55).
10 marks(samia, ict, 58). marks(samia, chemistry, 62).
11
12 marks(rakib, math, 30). marks(rakib, english, 25). marks(rakib, physics, 45).
13 marks(rakib, ict, 35). marks(rakib, chemistry, 40).
14
15 marks(anika, math, 95). marks(anika, english, 90). marks(anika, physics, 92).
16 marks(anika, ict, 94). marks(anika, chemistry, 96).
17
18 marks(raihan, math, 55). marks(raihan, english, 50). marks(raihan, physics, 48).
19 marks(raihan, ict, 60). marks(raihan, chemistry, 57).
20
21 % Attendance & Assignments
22 attendance(mamun, 28). attendance(samia, 25). attendance(rakib, 18).
23 attendance(anika, 30). attendance(raihan, 22).
24
25 assignments_completed(mamun, 5). assignments_completed(samia, 4).
26 assignments_completed(rakib, 2). assignments_completed(anika, 5).
27 assignments_completed(raihan, 3).
28
```

```
1 % -----
2 % Rules
3 %
4 pass(S, Sub) :- marks(S, Sub, M), M >= 40.
5 fail(S, Sub) :- marks(S, Sub, M), M < 40.
6
7 grade(S, Sub, 'A') :- marks(S, Sub, M), M >= 80.
8 grade(S, Sub, 'B') :- marks(S, Sub, M), M >= 70, M < 80.
9 grade(S, Sub, 'C') :- marks(S, Sub, M), M >= 60, M < 70.
10 grade(S, Sub, 'D') :- marks(S, Sub, M), M >= 40, M < 60.
11 grade(S, Sub, 'F') :- marks(S, Sub, M), M < 40.
12
```

The complete Prolog source code for the Student Performance Evaluation system is available here: [Click Here](#).

Query

```
● ○ ●  
1 1. Check if a student passed a subject  
2 ?- pass(mamun, math).  
3 true.  
4  
5 2. Get grade for a student in a subject  
6 ?- grade(anika, physics, Grade).  
7 Grade = 'A'.  
8  
9 3. Find total marks of a student  
10 ?- total_marks(samia, Total).  
11 Total = 275.  
12  
13 4. Find average marks  
14 ?- average_marks(raihan, Avg).  
15 Avg = 54.0.  
16  
17 5. Find the topper  
18 ?- topper(Student).  
19 Student = anika.  
20
```

```
● ○ ●  
1 6. Check scholarship eligibility  
2 ?- eligible_for_scholarship(mamun).  
3 false.  
4  
5 7. Identify weak students  
6 ?- weak_student(rakib).  
7 true.  
8  
9 8. Check if a student can take physics (prerequisite: pass in math)  
10 ?- can_take_subject(rakib, physics).  
11 false.  
12 ?- can_take_subject(samia, physics).  
13 true.  
14  
15 9. Compare family members' performance  
16 ?- family_performance_better(mamun, raihan).  
17 true.  
18 ?- family_performance_better(samia, anika).  
19 false.  
20  
21 10. Rank family performance recursively  
22 ?- family_performance_ranking([mamun, raihan]).  
23 true.  
24 ?- family_performance_ranking([anika, samia]).  
25 false.  
26
```

Conclusion

Achievements:

- ✓ Automated performance evaluation
- ✓ Dynamic prerequisite validation
- ✓ Family benchmarking feature

Future Scope:

- Integrate with LMS (Moodle/Blackboard)
- Add natural language query support
- Predictive analytics for performance trends



THANK YOU