HEPro AI/ML Internship

Activity 4 – Mentor Matching & Intervention Recommendations

Project: Dedicated Mentoring System for Students (HEPro AI+)
Submitted By: Subhajit Das

---

1. Overview

The objective of Activity 4 is to transform machine learning insights into actionable mentoring decisions. The system integrates student readiness analysis, clustering insights, and mentor expertise mapping to generate personalized mentoring recommendations and simulated risk alerts.

This activity demonstrates how AI outputs can be operationalized into real-world mentoring workflows.

---

2. System Workflow

The mentoring system follows an end-to-end pipeline:

Step 1 — Student Analysis

Student readiness scores (APS, WWS, PTMS, CRS, SRI) and cluster labels generated in previous activities are used as the foundation for decision-making.

Step 2 — Student Need Identification

Each student is mapped to a mentoring need category based on cluster interpretation:

- At-Risk → Academic Mentoring
- Productivity Risk → Productivity Coaching
- High Performer → Career Mentoring
- Stable → Wellness Mentoring

This step translates ML segmentation into interpretable mentoring needs.

Step 3 — Mentor Matching

A mentor dataset containing domain expertise, availability, and experience level is used to assign mentors.

Matching Logic:

- Student needs are aligned with mentor domain expertise.
- The first available mentor with matching domain is selected.
- If no exact match exists, a fallback mentor is assigned.

This ensures explainable and scalable mentor allocation.

Step 4 — Intervention Recommendation

Rule-based intervention logic generates mentoring actions for each student:

- Academic Intervention
- Productivity Coaching
- Career Acceleration
- Regular Mentoring

These recommendations convert analytics into actionable guidance.

Step 5 — High-Risk Alert Simulation

Students with low SRI values trigger automated alerts:

⚠️ HIGH RISK ALERT

This simulates a real monitoring system that enables mentors to prioritize critical students.

Step 6 — Final Recommendation Table

The system produces a consolidated output containing:

- Student cluster label
- Mentor need category
- Assigned mentor
- Recommended intervention
- Risk alert status

This table represents the final operational output of the HEPro AI+ mentoring system.

---

3. Explainability & Design Considerations

The workflow combines:

- Rule-based scoring (Activity 2)
- Machine learning segmentation (Activity 3)
- Decision logic (Activity 4)

The design prioritizes interpretability, ensuring mentors can understand and trust system recommendations.

---

4. Conclusion

The mentor matching and intervention pipeline successfully bridges the gap between AI insights and real mentoring actions. By integrating clustering outputs with domain-aware mentor matching, the system provides scalable and personalized mentoring recommendations aligned with the HEPro AI+ framework.