STUDENT PERFORMANCE PREDICTION

SUBMITTED TO : MR. DEBASISH SAHOO

DATE : 10/02/2026

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Decoding Student Success: A Predictive Analytics Approach

- Using student data to understand learning behaviour and take action at the right time.
- This project explains simple methods to help teachers improve results and reduce dropouts.

The Challenge: Why Predicting Student Performance Matters

Retention & Completion

Finding students who may drop out early helps save their future and improves college results.

Resource Prioritisation

Target limited tutoring, counselling and scholarship resources where they'll have most impact.

Personalised Learning

Each student learns differently. Predictions help teachers support students based on their pace and needs.

Our Methodology: Data Sources and Predictive Models

Data Used:

- Student details, attendance, online learning activity, assignment marks, class participation, and background information.

Data Processing:

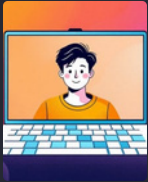- We study trends over time, student involvement level, and learning patterns.

Models Used:

- Logistic Regression (easy to understand results)
- Random Forest (stable and reliable)
- Gradient Boosting (better accuracy)
- Combined model for final prediction

Validation:

- Model performance is checked using accuracy scores and fairness across students.

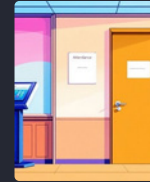# Key Factors Influencing Student Outcomes

Engagement Patterns

Students who regularly attend classes and take part in discussions perform better.

Submission Timeliness

Submitting assignments on time strongly improves final marks.

Attendance & Punctuali ty

Low attendance is an early sign that a student may struggle later.

Peer & Mentor Support

Support from classmates and teachers helps students stay motivated.

Data Collection

Feature
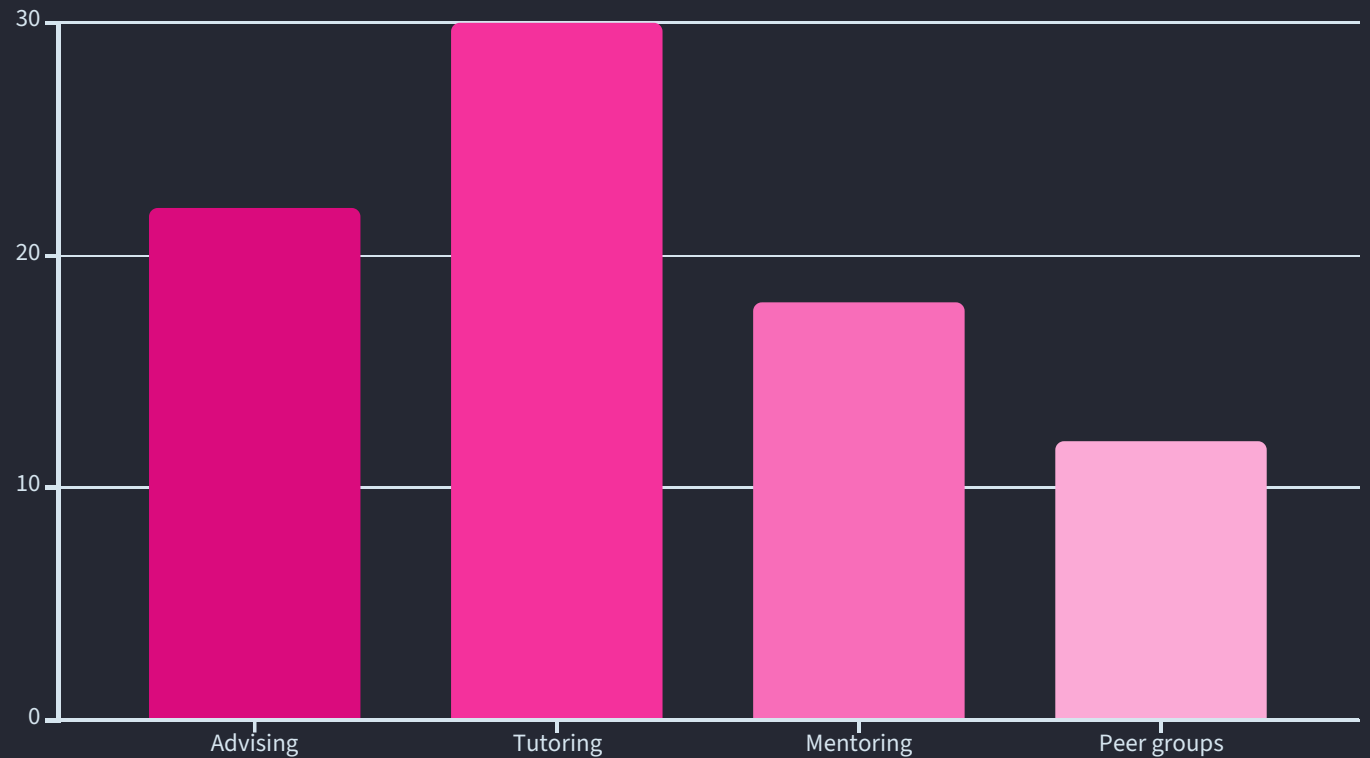Processing

Risk
Analysis

Alert & Action

The system creates alerts showing:
Student risk level
Main reasons for risk
Suggested actions for teachers or advisors
This helps in taking quick and correct action.

Impact Assessment: How Predictions Improve Interventions

Early support reduces failure chances by 20–35%
Personal guidance increases confidence and pass rates
Teachers focus time on students who need help the most

Future Scope: Enhancing Predictive Accuracy and Personalisation

1

1.Better Learning Signals

Use video watching time and question activity for deeper understanding.

2

2.Adaptive Support

Automatically suggest learning paths based on student needs.

3

3.Ethics & Fairness

Ensure no bias, clear explanations, and human decision support.

Q&A and Key Takeaways: Empowering Educators with Data

- Early prediction means early support

- Data + teacher judgement works best

- Start small , measure results, and improve step by step

THANK YOU