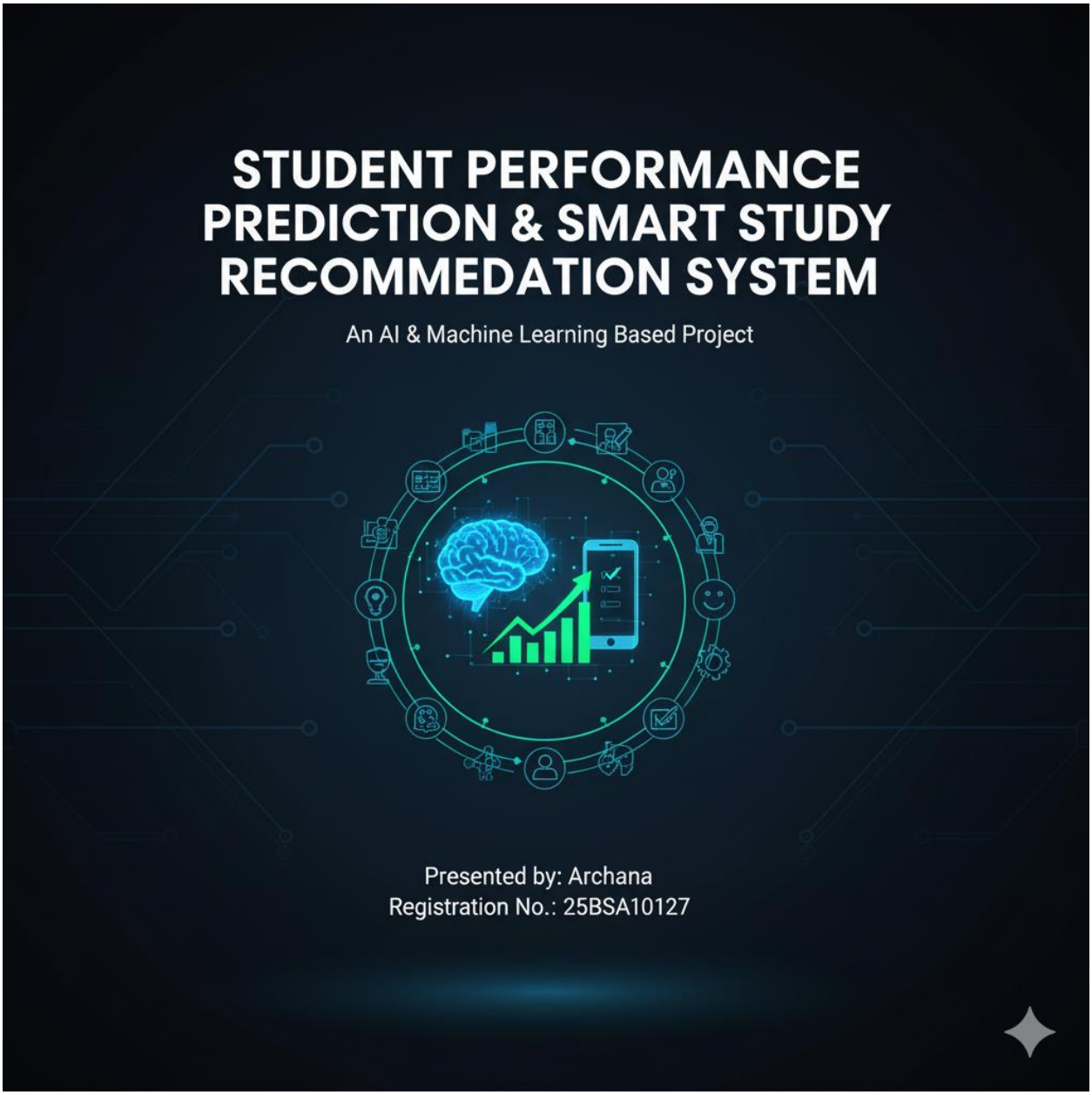
Title


STUDENT PERFORMANCE PREDICTION & SMART STUDY RECOMMEDATION SYSTEM
An AI & Machine Learning Based Project
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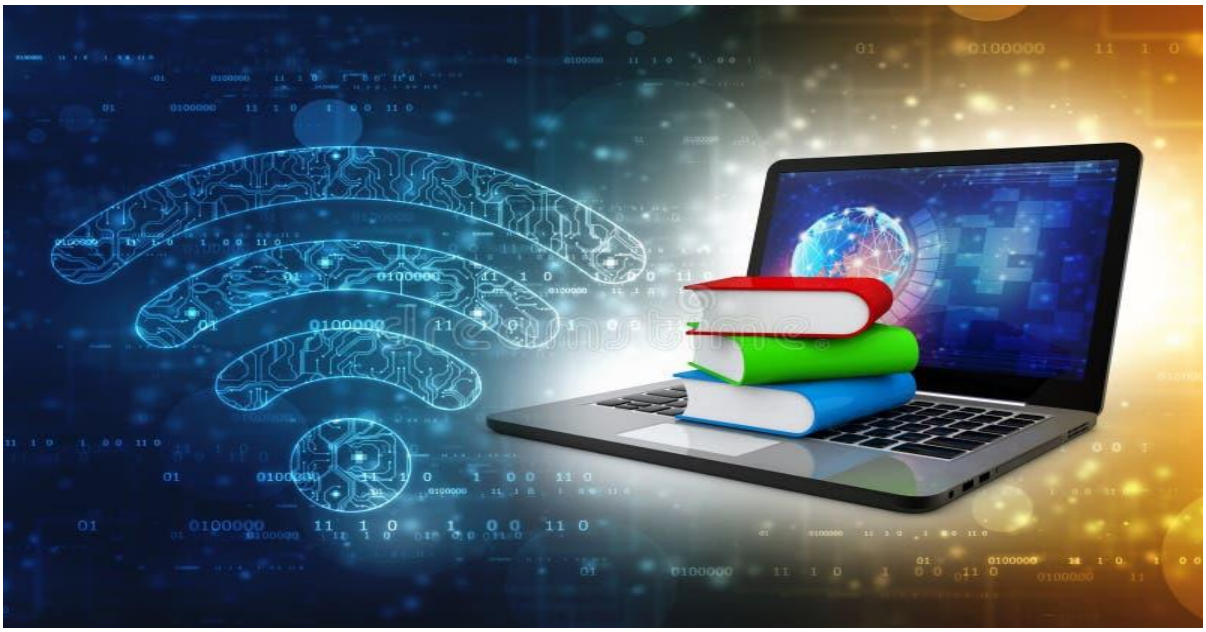
Introduction

Many students struggle to track their academic performance early.

Lack of awareness leads to last-minute preparation and low grades.

This project uses Machine Learning to predict student performance in advance.

The system also provides personalized study recommendations.



AI vs ML vs Data Science

AI : Machines that simulate human intelligence

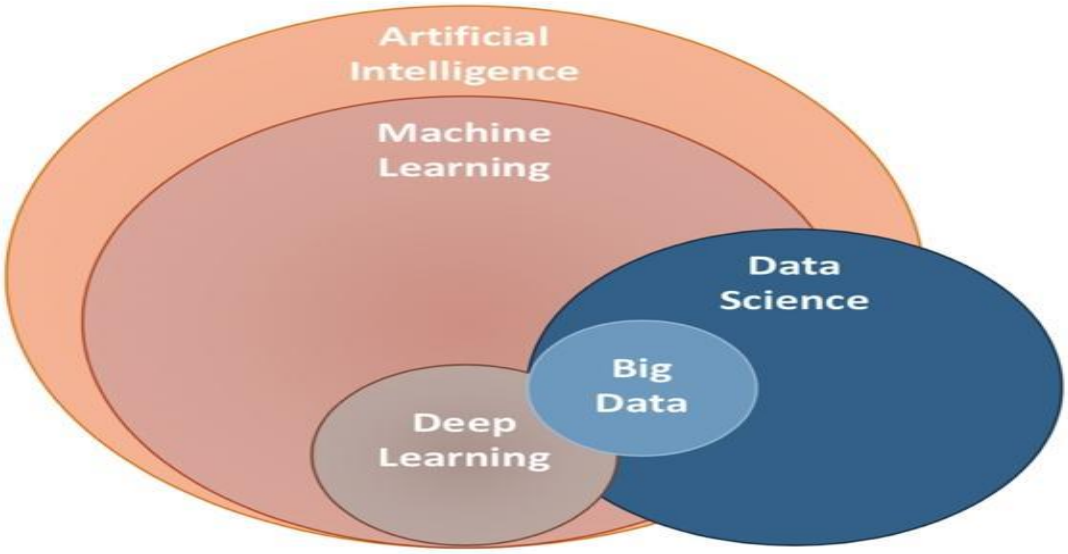
ML : Subset of AI that learns from data

Data science : Uses ML + statistics to extract insights from data

AI → Think

ML → Learn

DS → Analyse & Predict

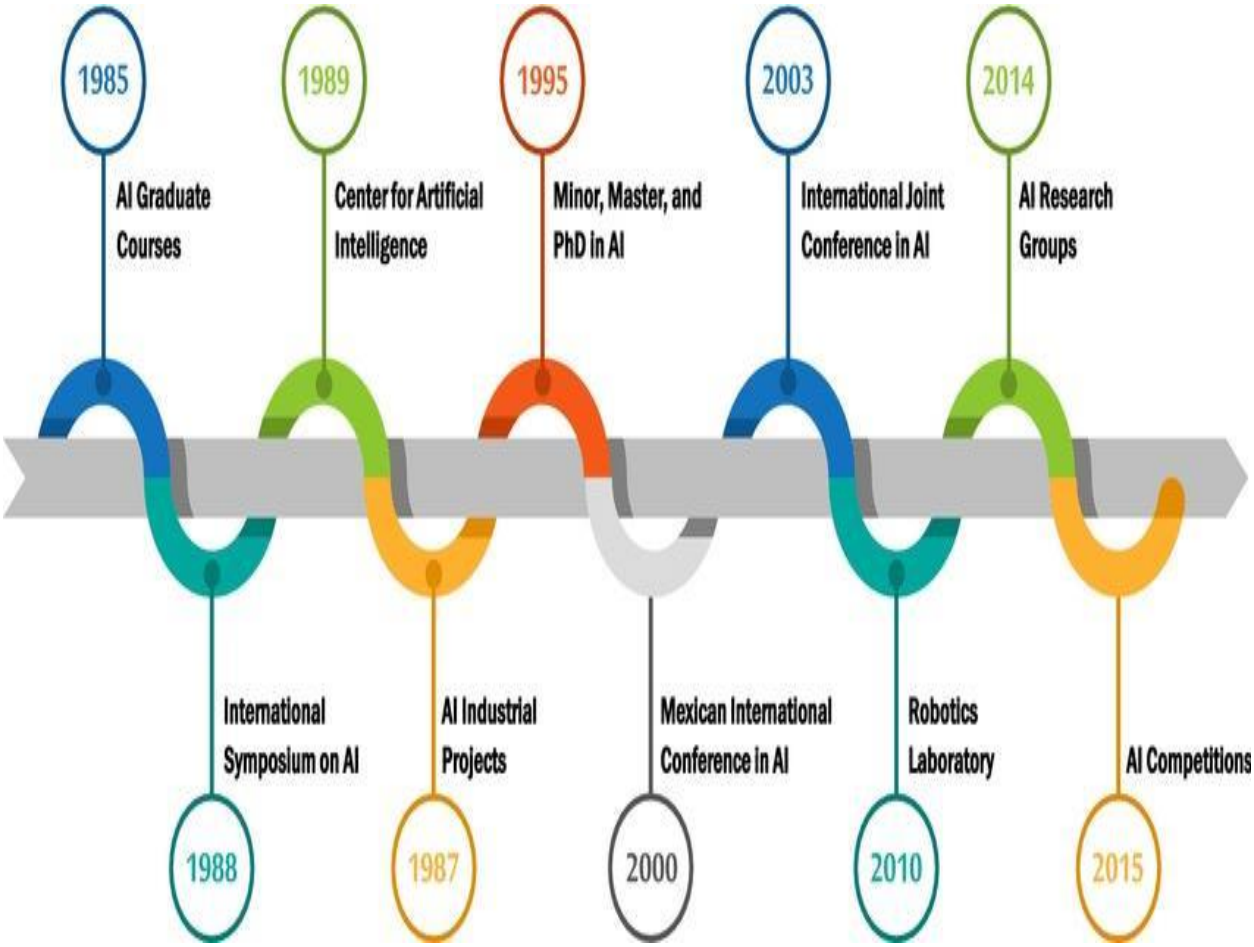


Background & Motivation

Rapid growth of AI in the education sector.

Data-driven academic guidance helps students improve.

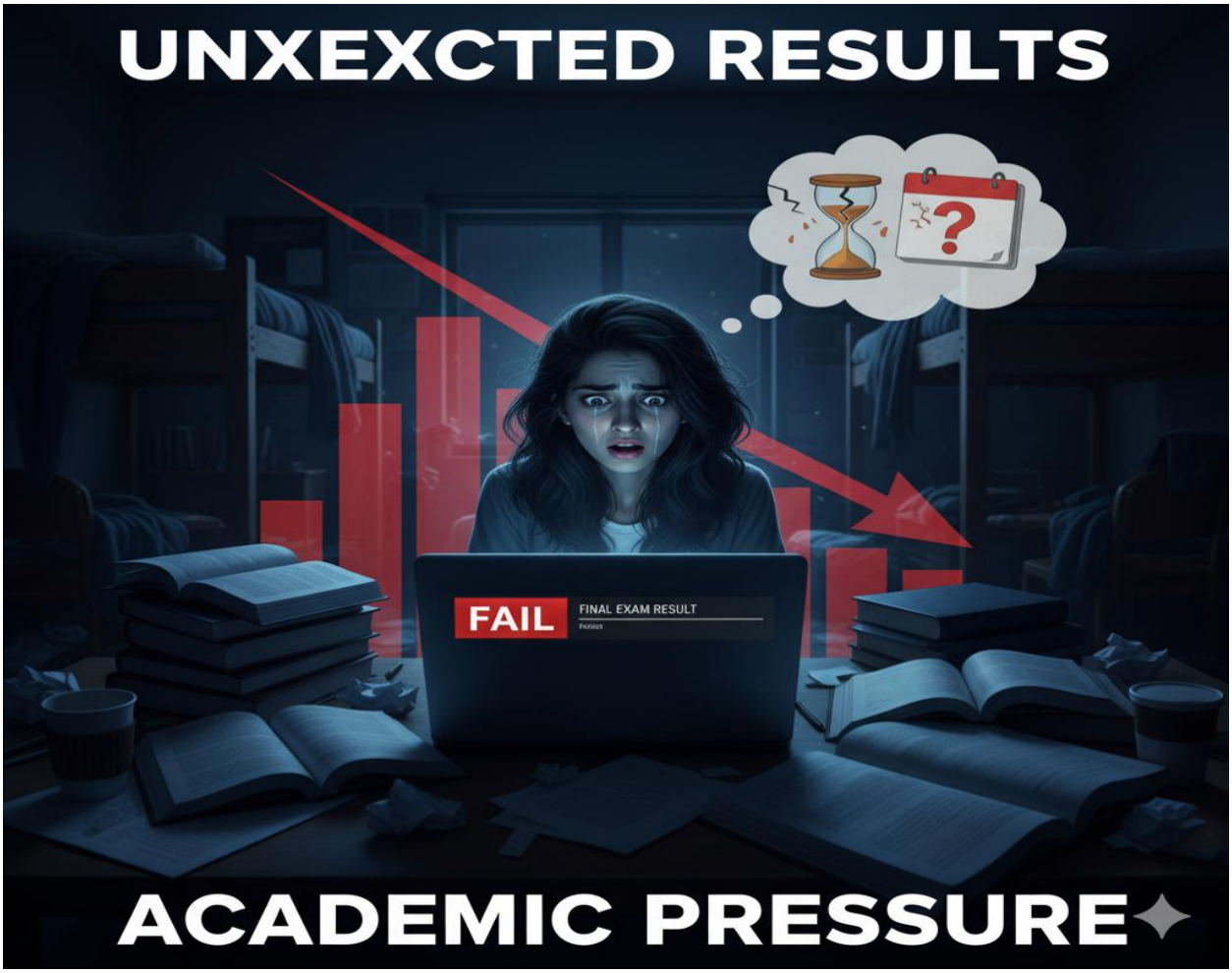
Predictive systems assist teachers, counselling centres & e-learning platforms.



Problem Statement

Students often fail to evaluate their performance early, resulting in unexpected results and academic pressure.

This project aims to predict student performance in advance and recommend suitable learning strategies.



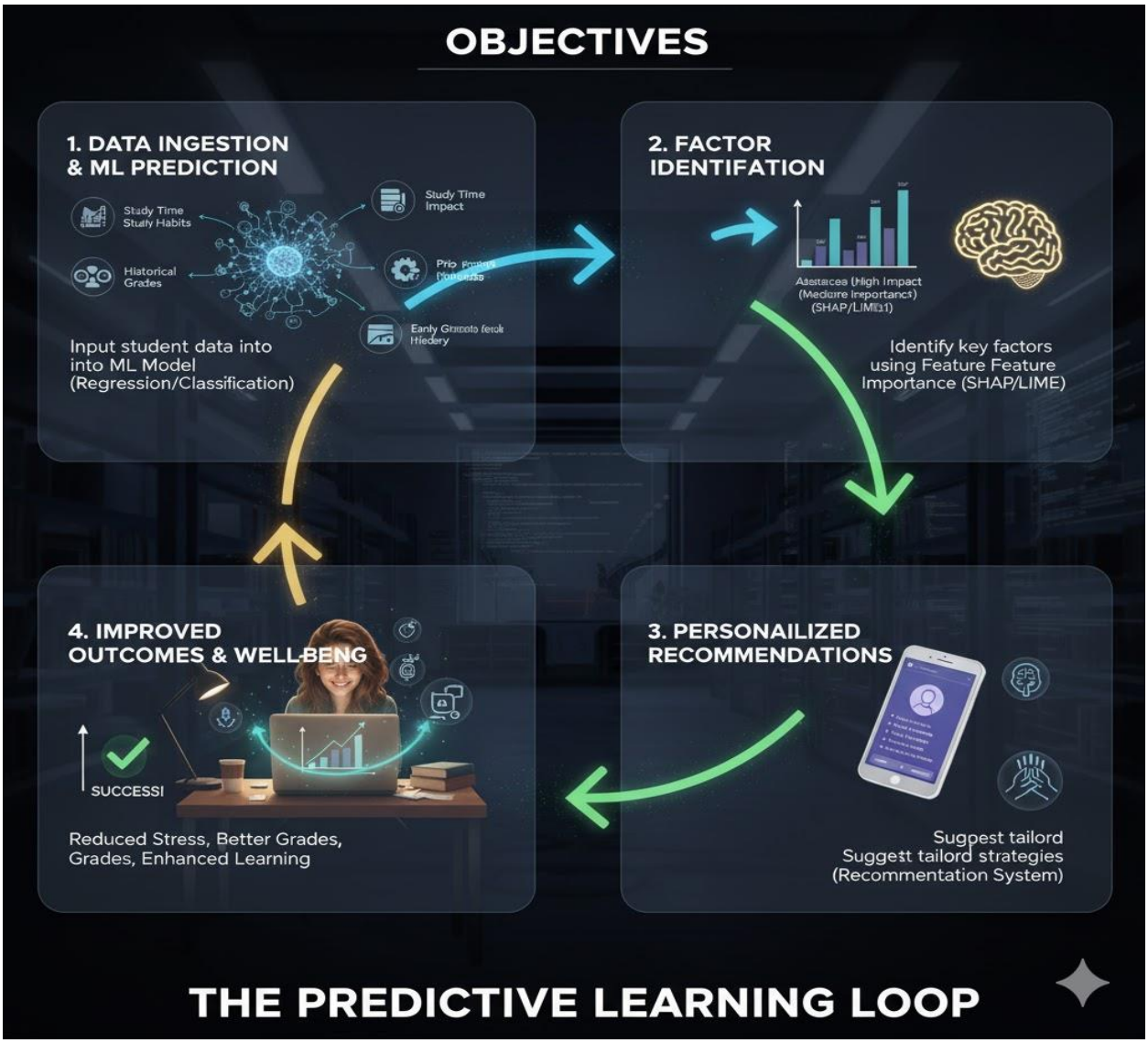
Objectives

Predict student performance using ML.

Identify important factors affecting academic results.

Recommend personalized study patterns.

Reduce academic stress and improve learning outcomes.



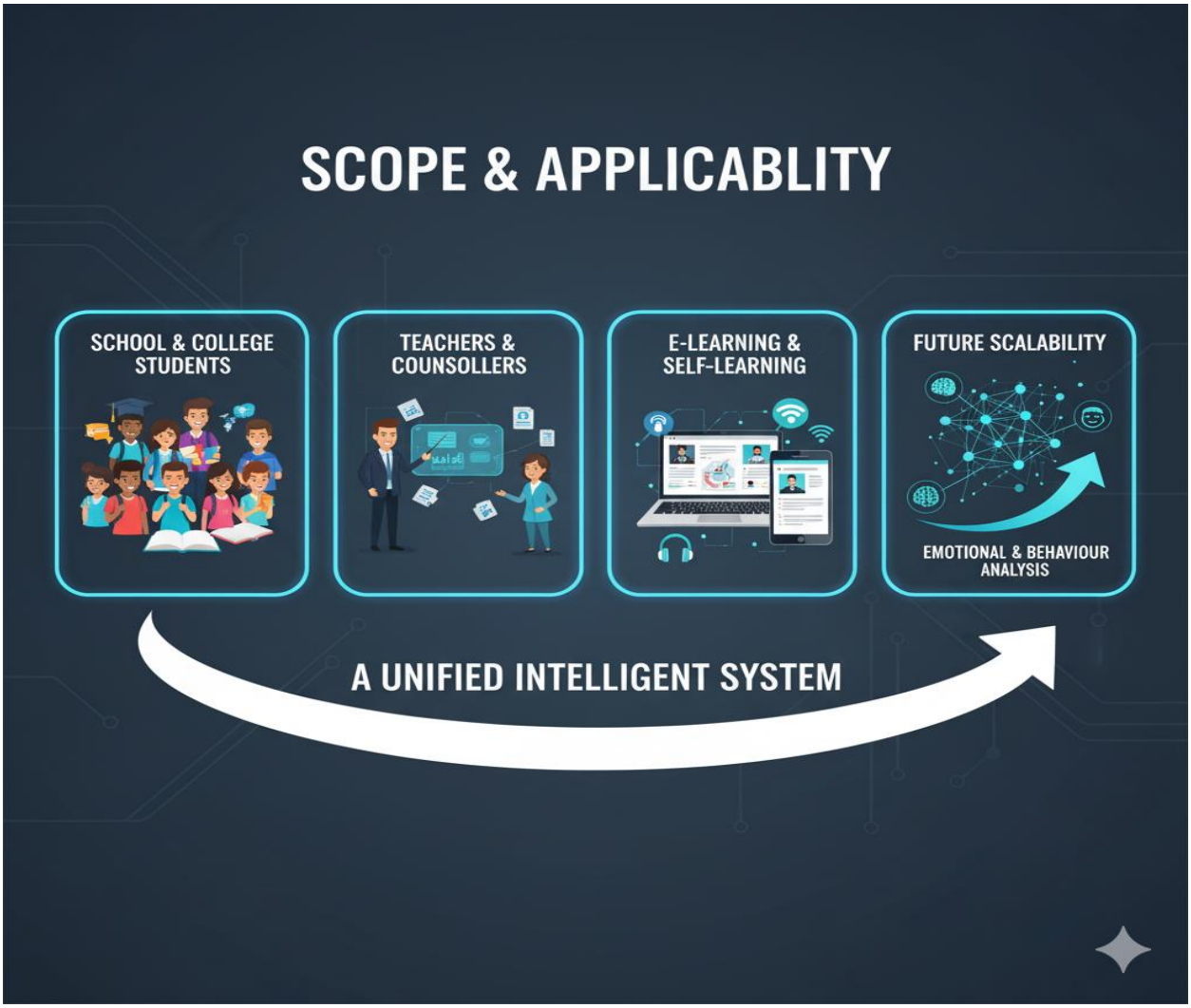
Scope of the Project

Works for school & college students.

Can be used by teachers & academic counsellors.

Supports e-learning and self-learning platforms.

Scalable to include emotional & behaviour analysis in the future.



Dataset Description

The dataset includes attributes such as:

Study hours

Attendance

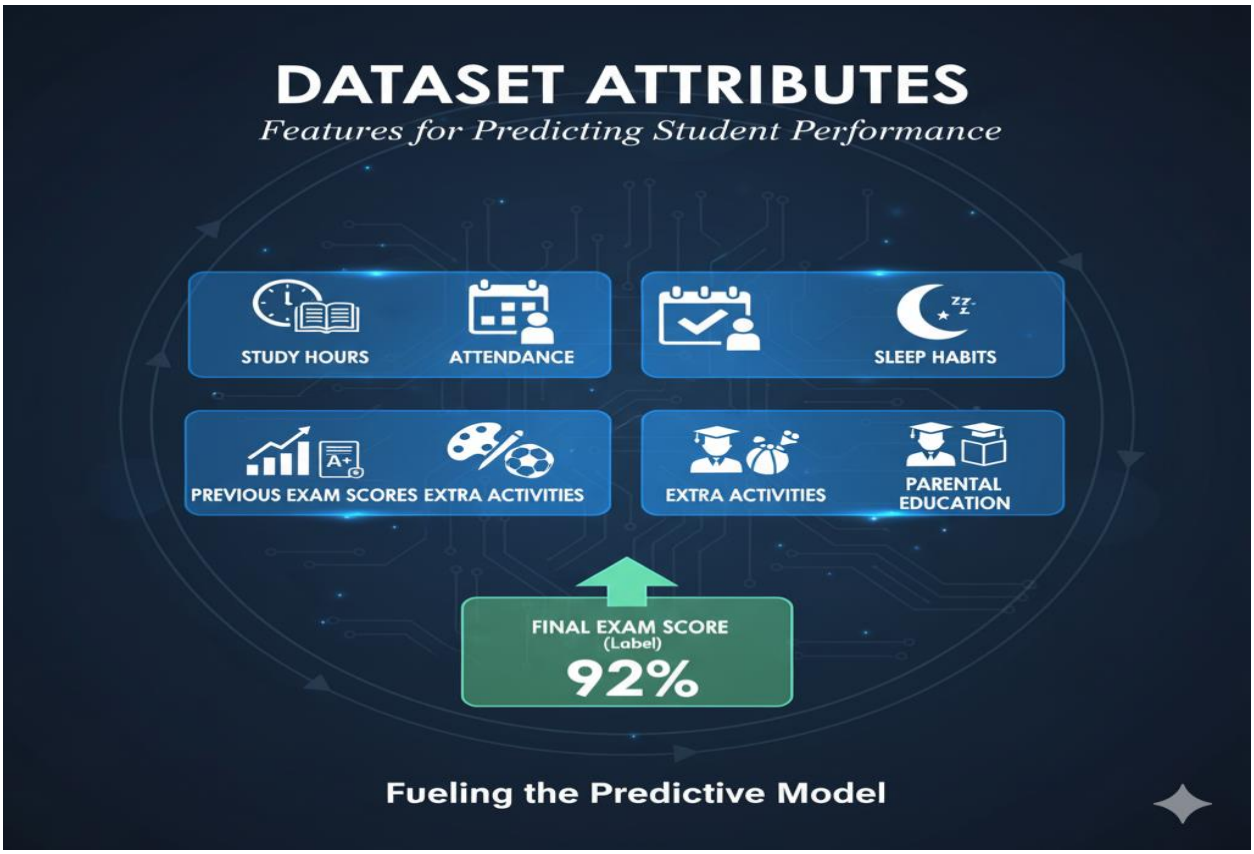
Sleep habits

Previous exam scores

Extra activities

Parental education

Final exam score (label)



Methodology

Data Preprocessing

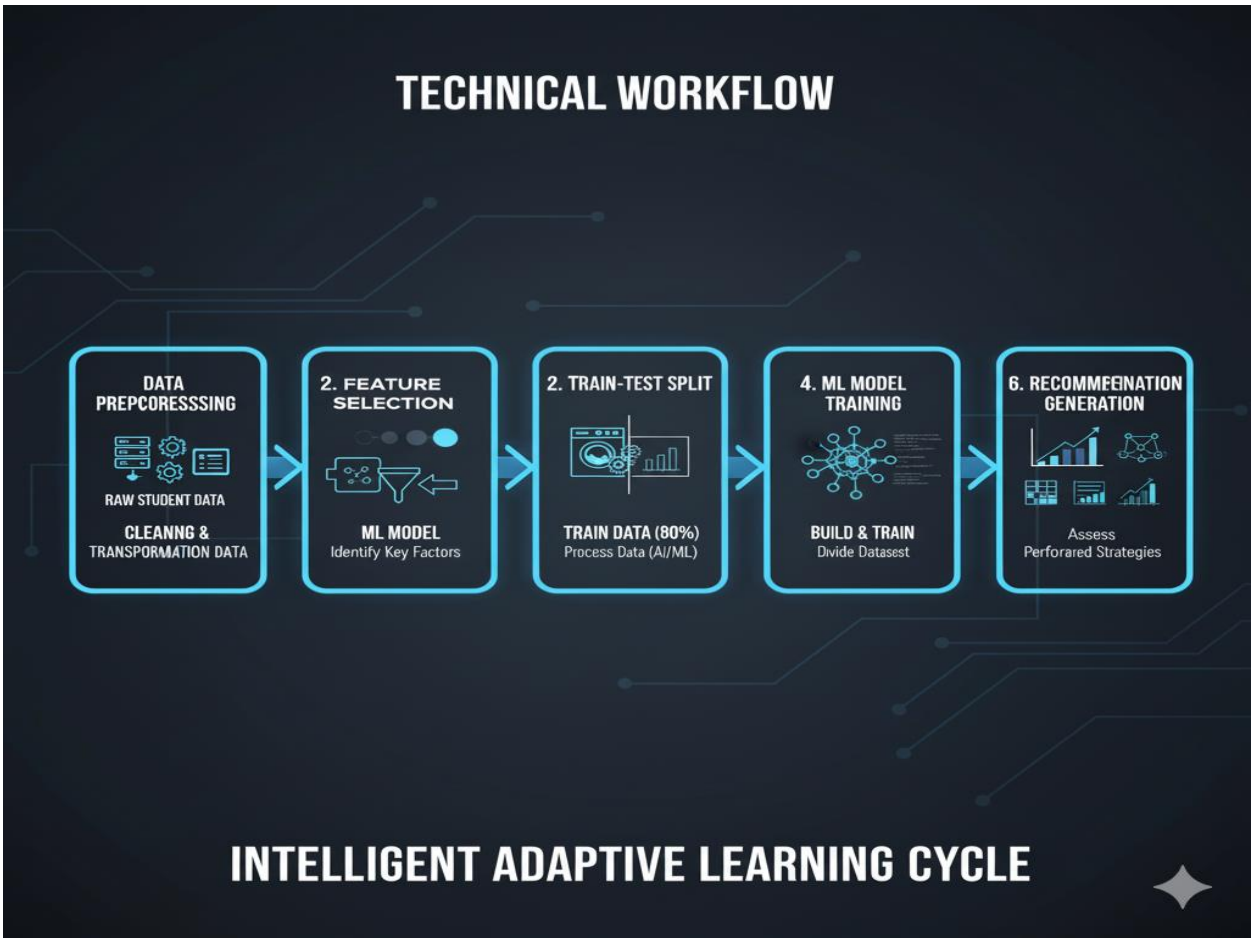
Feature Selection

Train-Test Split

ML Model Training

Model Evaluation

Recommendation Generation



Machine Learning Algorithms Used

Linear Regression / Logistic Regression

Random Forest Classifier

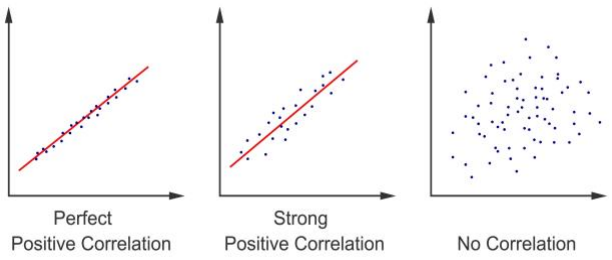
Hyperparameter Tuning (GridSearchCV)

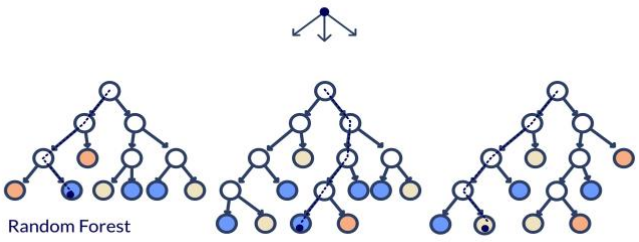
Evaluation metrics:

MSE / RMSE / MAE

Accuracy

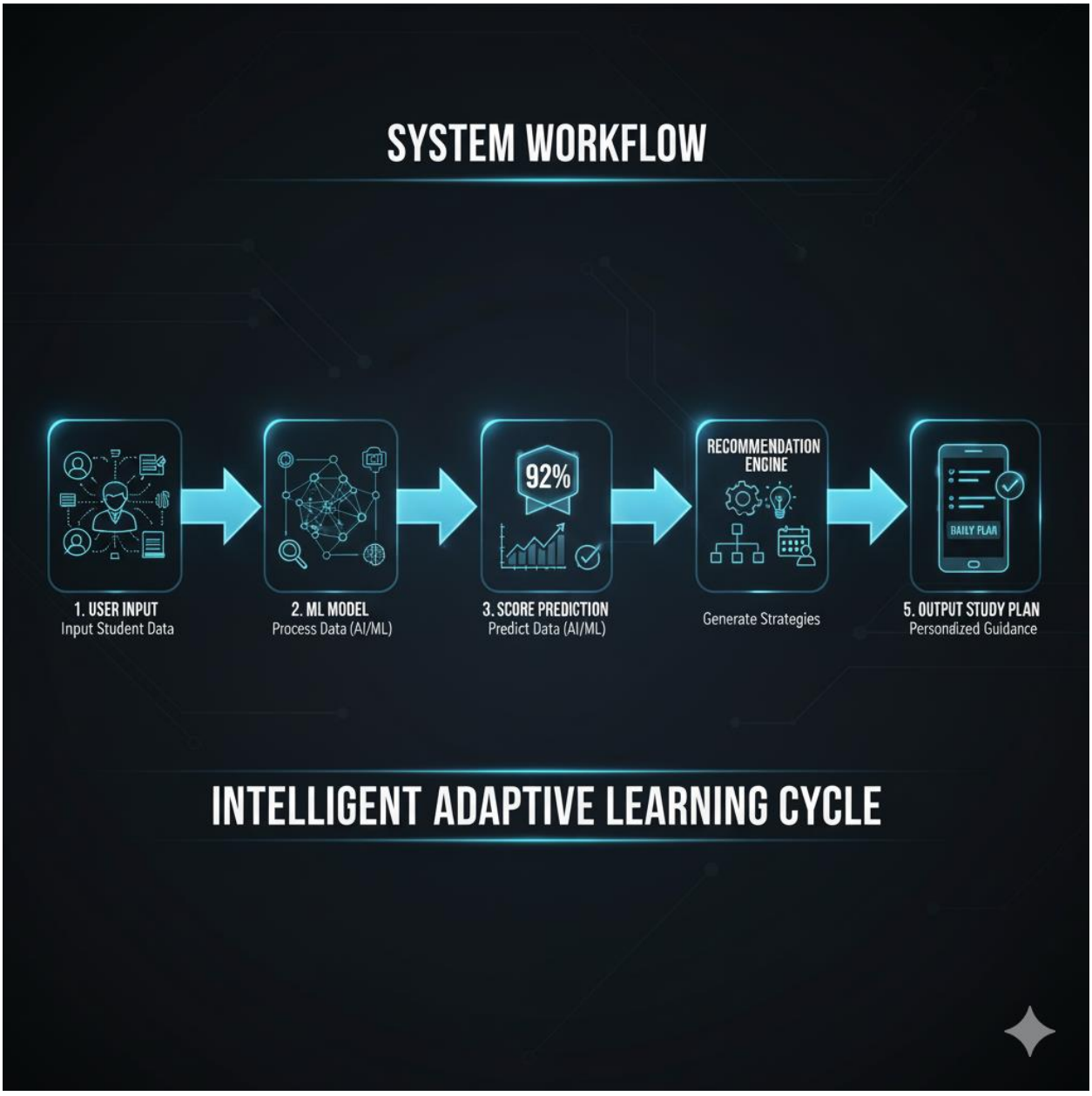
Confusion Matrix





System Architecture

User → Input Student Data → ML Model → Score Prediction → Recommendation Engine → Output Study Plan



Functional Requirements

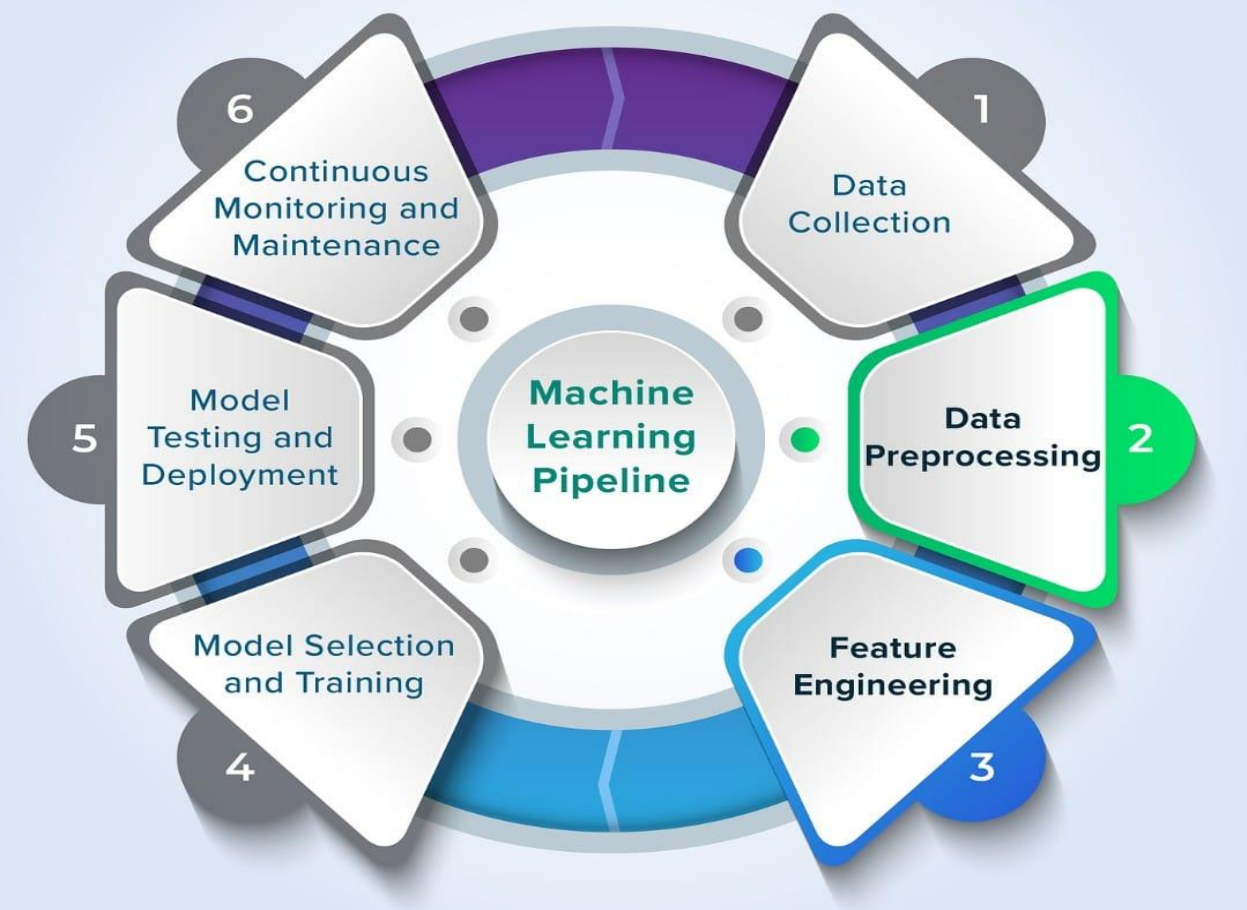
Student data input

Data preprocessing & analysis

Performance prediction

Study recommendation generation

Result dashboard / output report



Non-Functional Requirements

High accuracy

Security of student data

Low system response time

User-friendly design

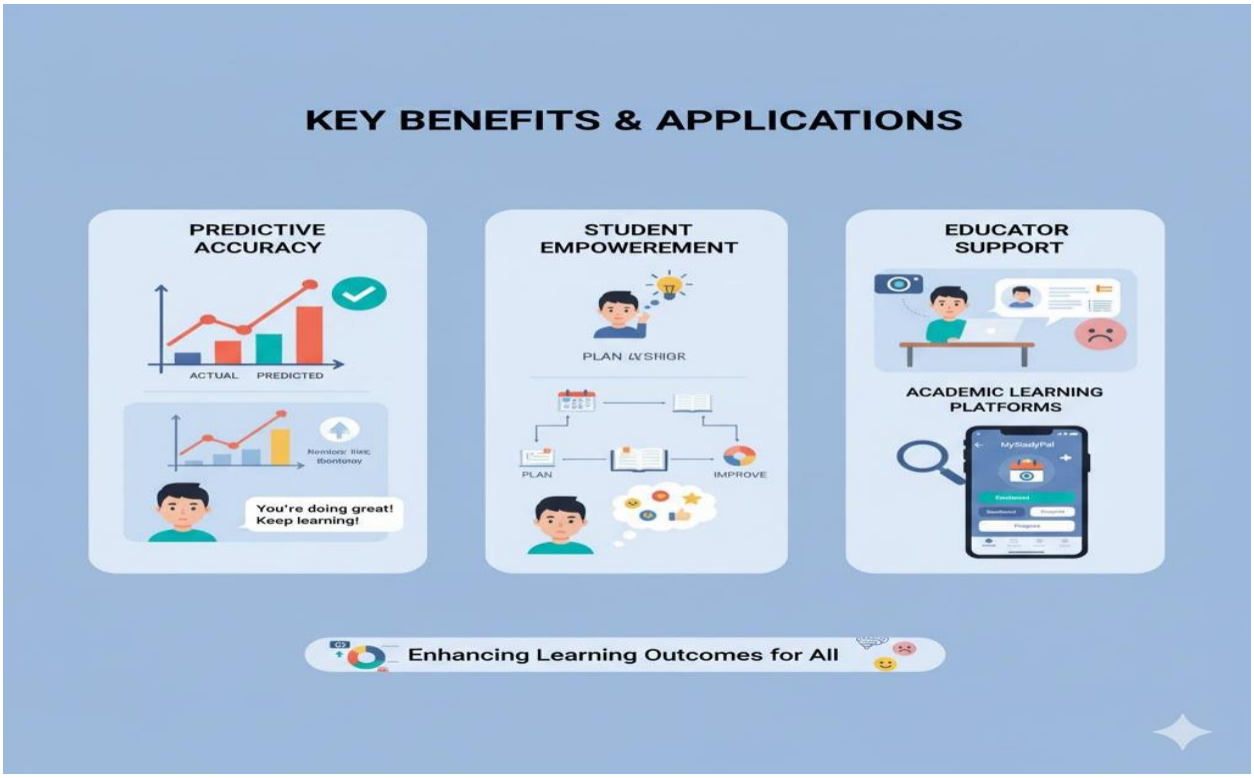
Scalability for future features

Results

Model successfully predicts performance with high accuracy.

Helps students plan and improve learning strategies.

Supports teachers in academic monitoring and guidance.



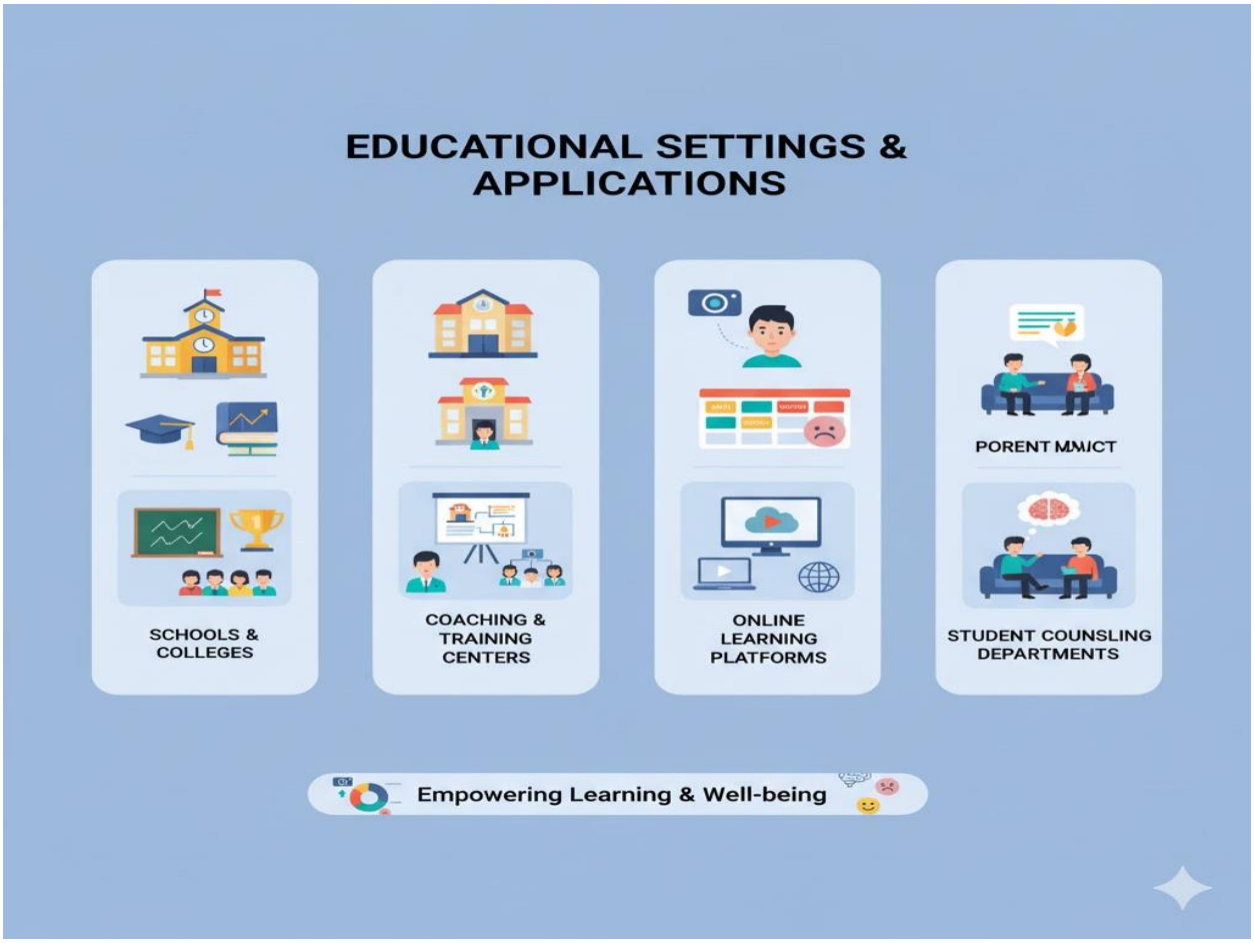
Applications

Schools and colleges

Coaching and training centres

Online learning platforms

Student counselling departments



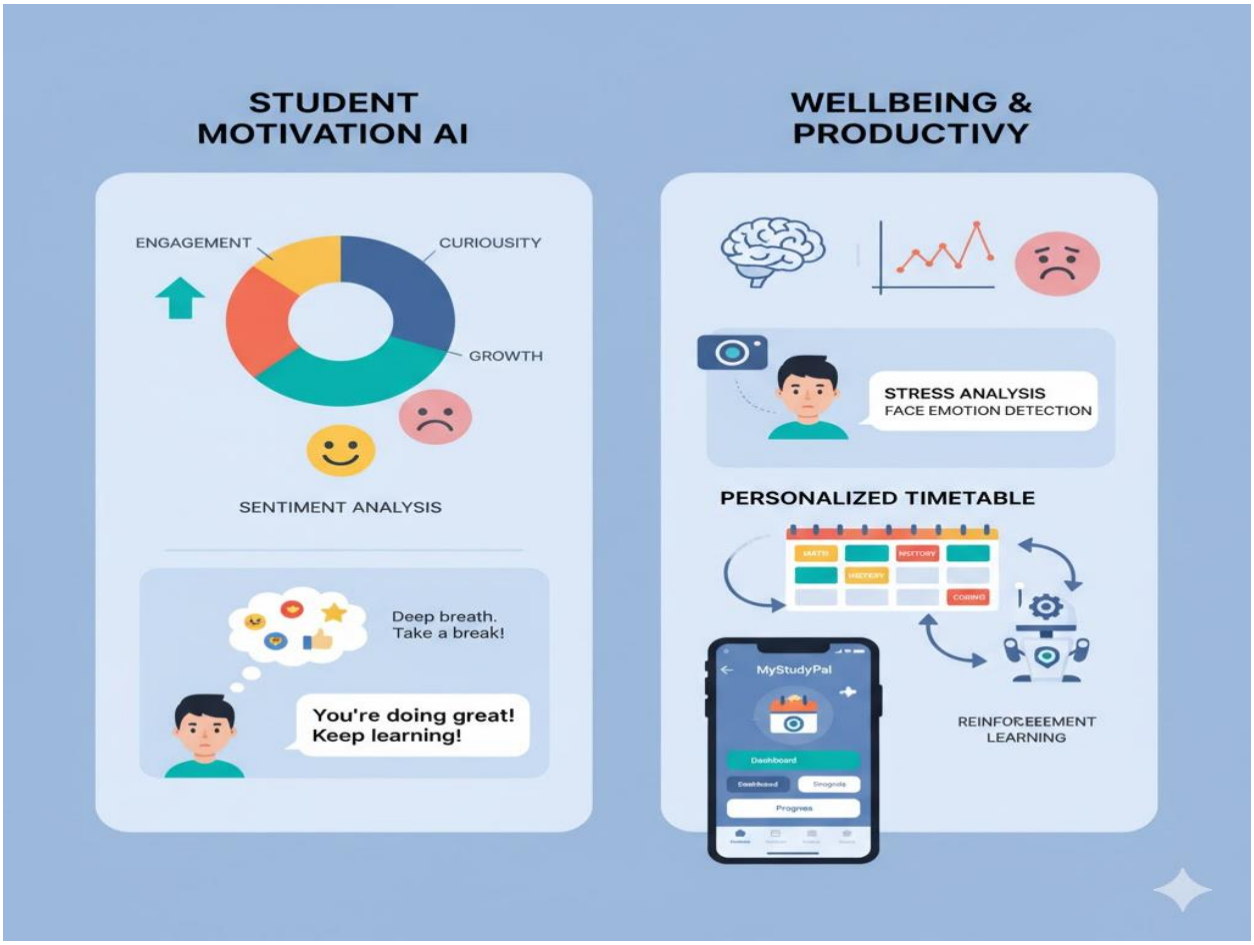
Future Enhancements

Sentiment analysis for student motivation

Face emotion detection for stress analysis

Reinforcement learning-based personalized timetable

Mobile application support



Conclusion

AI-based prediction helps students know their strengths and weaknesses early.

Study recommendation system improves performance and reduces stress.

This project demonstrates the positive role of ML in the education system.

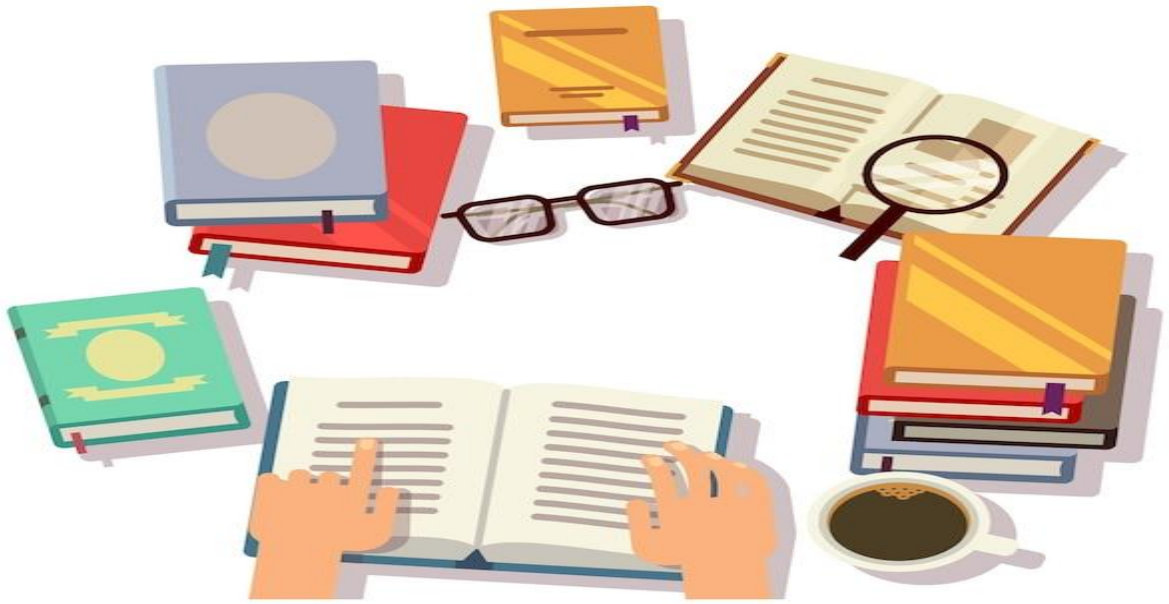
References

Kaggle Dataset — Student Performance

Machine Learning Research Papers

Python Scikit-Learn Documentation

Google Scholar & Educational AI articles




THANK YOU