

AI in Data Analytics



Project Topic:

Developed an AI-driven analytics dashboard for predicting student academic performance based on internal assessments, attendance, and past academic records

USE OF DATA ANALYTICS



Uncovers Hidden Patterns: Identifies trends in attendance, assessments, and past performance that affect student outcomes.



Enables Early Intervention: Detects at-risk students before they fail, allowing timely support.



Improves Accuracy: Uses statistical and machine learning models for more reliable predictions than guesswork.



Supports Personalized Learning: Provides customized feedback and recommendations for each student.

UPLOAD CSV FILE

System architecture

A structured framework that defines:-

The components, interactions, and design principles of a software or hardware system. It outlines how different modules work together to achieve overall functionality, scalability, and performance.

PREDICT

EXPLAIN

RECOMMENDED

Research on Student Performance Prediction Based on Random FOREST

Due to the shift to online learning during COVID-19, student performance patterns changed significantly. This paper proposes a CGPA Predicting Model (CPM) that estimates a student's final CGPA based on their 2nd and 3rd-year progress. The model helps academic advisors identify and support students at risk of academic failure.

Parameters Used:

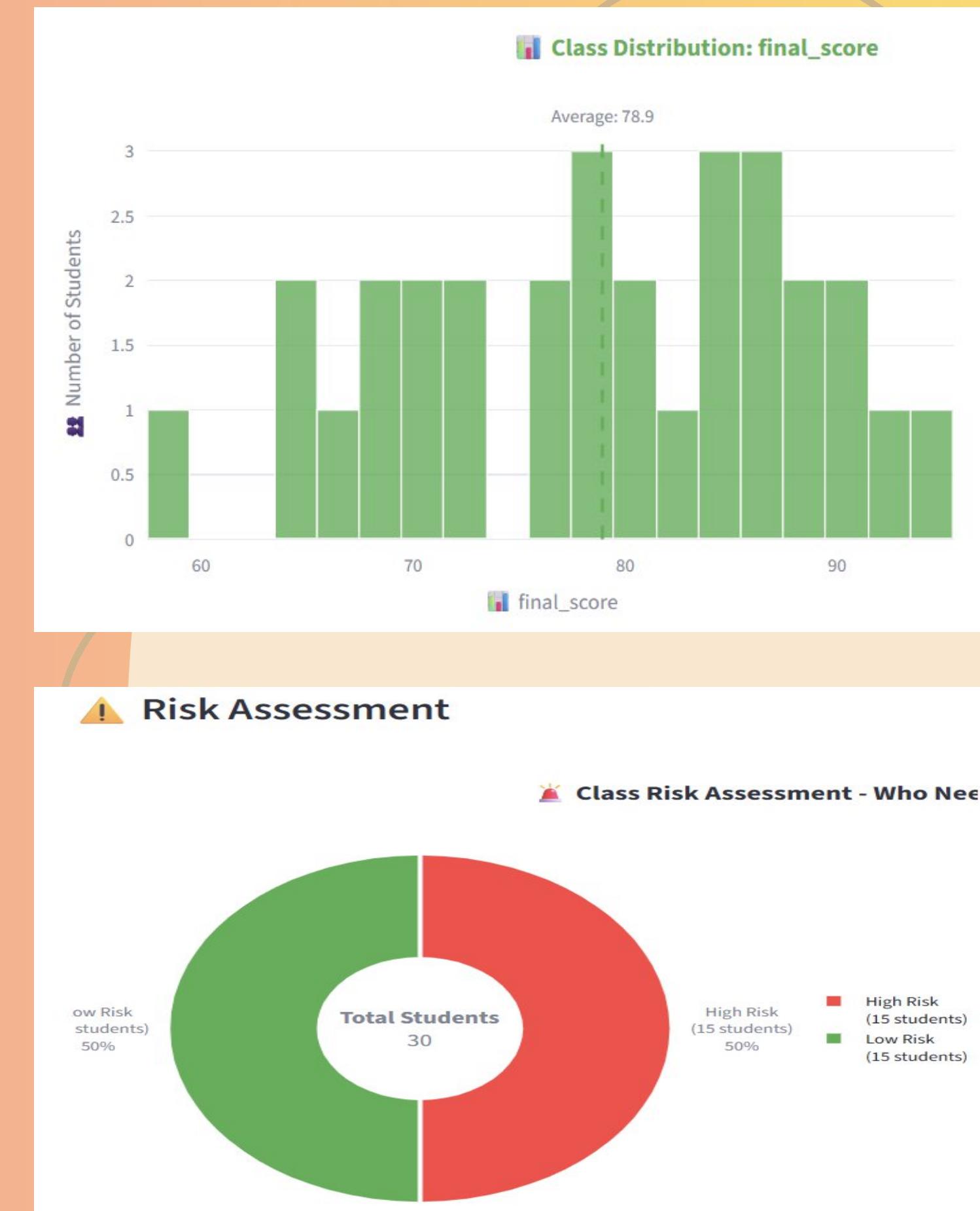
- Second-year course grades
- Third-year course grades
- Cumulative GPA from previous semesters
- Course credit hours
- Student progression status

KEY REASONS:

- High Prediction Accuracy
- Handles Complex & Nonlinear Relationships
- Works Well with Mixed Data Types

MODEL OVERVIEW

Our model uses the **Random Forest algorithm** to predict student performance and classify them into **risk categories** (High, Medium, Low). It takes in academic and demographic data, then outputs a **predicted score** and **risk level**. The model also provides **feature importance** and **SHAP-based explainability**, helping educators understand the reasons behind each prediction.



RANDOM FOREST IN ACTION :

─ Dual-Task Pipeline:

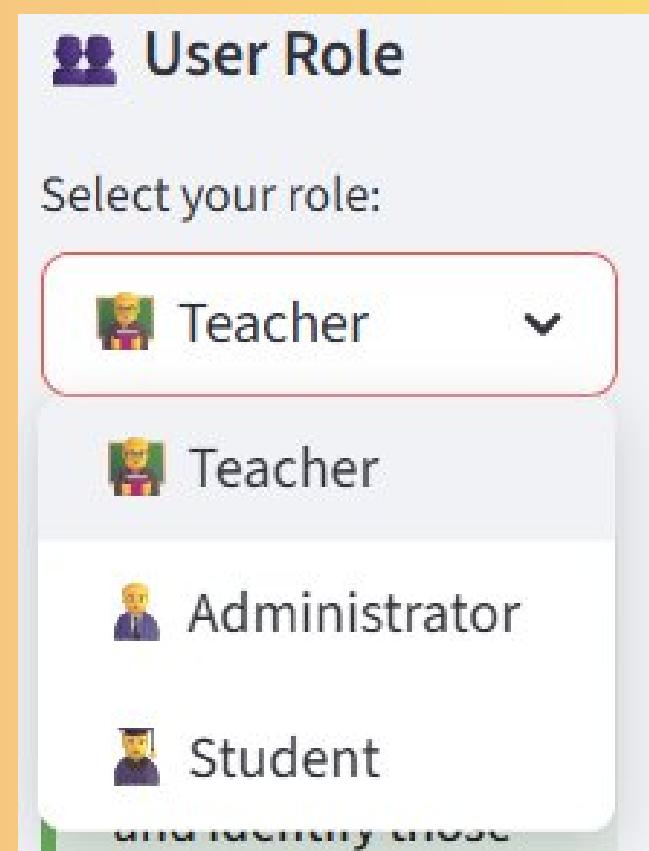
─ Regression → Predicts exact performance scores

─ Classification → Categorizes students into:

Algorithm Used: Random Forest

Ensemble-based method combining multiple decision trees

- Handles non-linear relationships well
- Robust to overfitting due to averaging



TAILORED DASHBOARD VIEW

Dashboard

Navigate through sections

Choose a section:

Data Uplo... ▾

Upload and preprocess student data

User Role

Select your role:

Teacher ▾

Welcome back! Monitor your students' progress and identify those who need extra support.

Deploy ⋮

🎓 Student Performance Prediction Dashboard

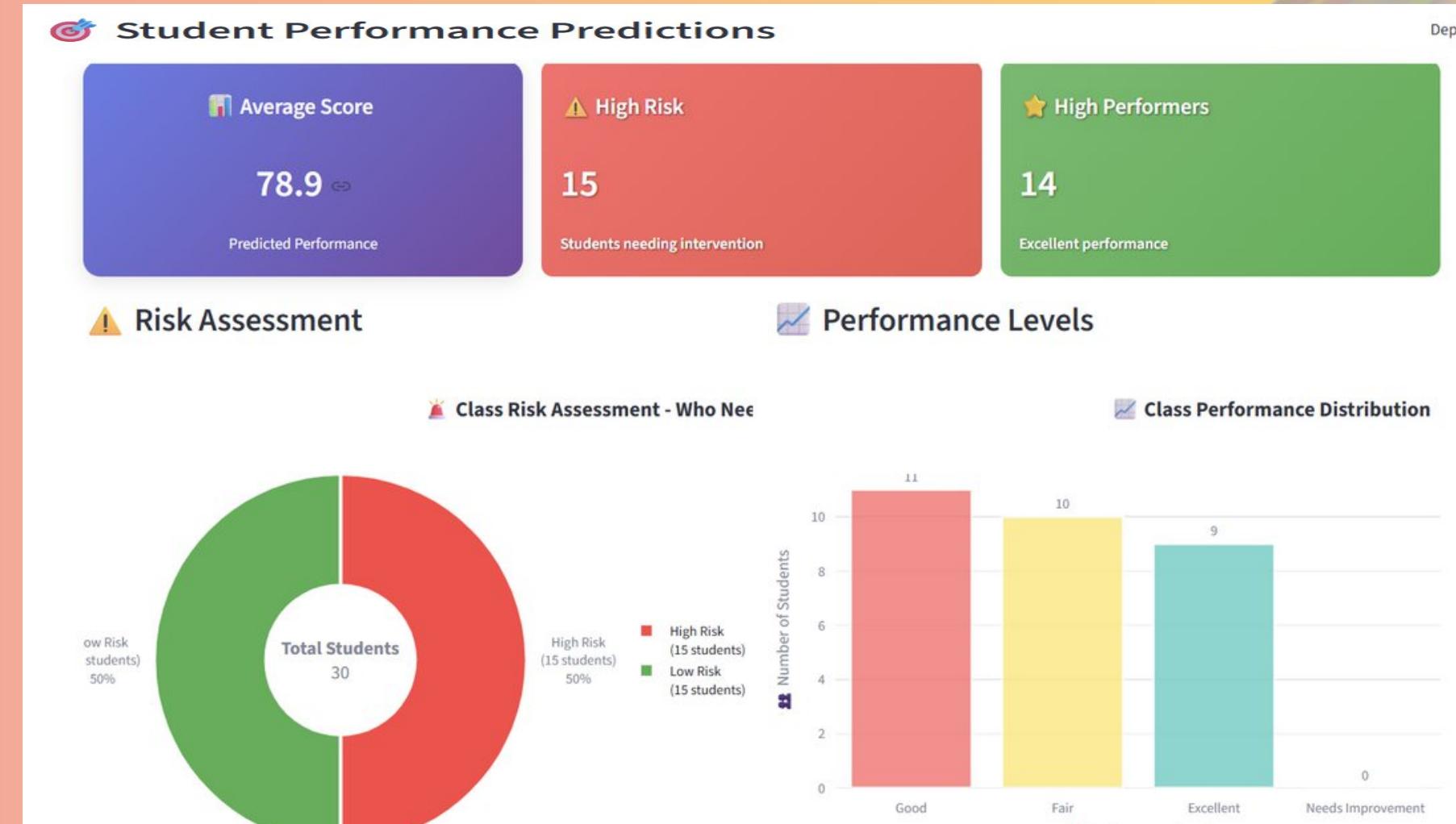
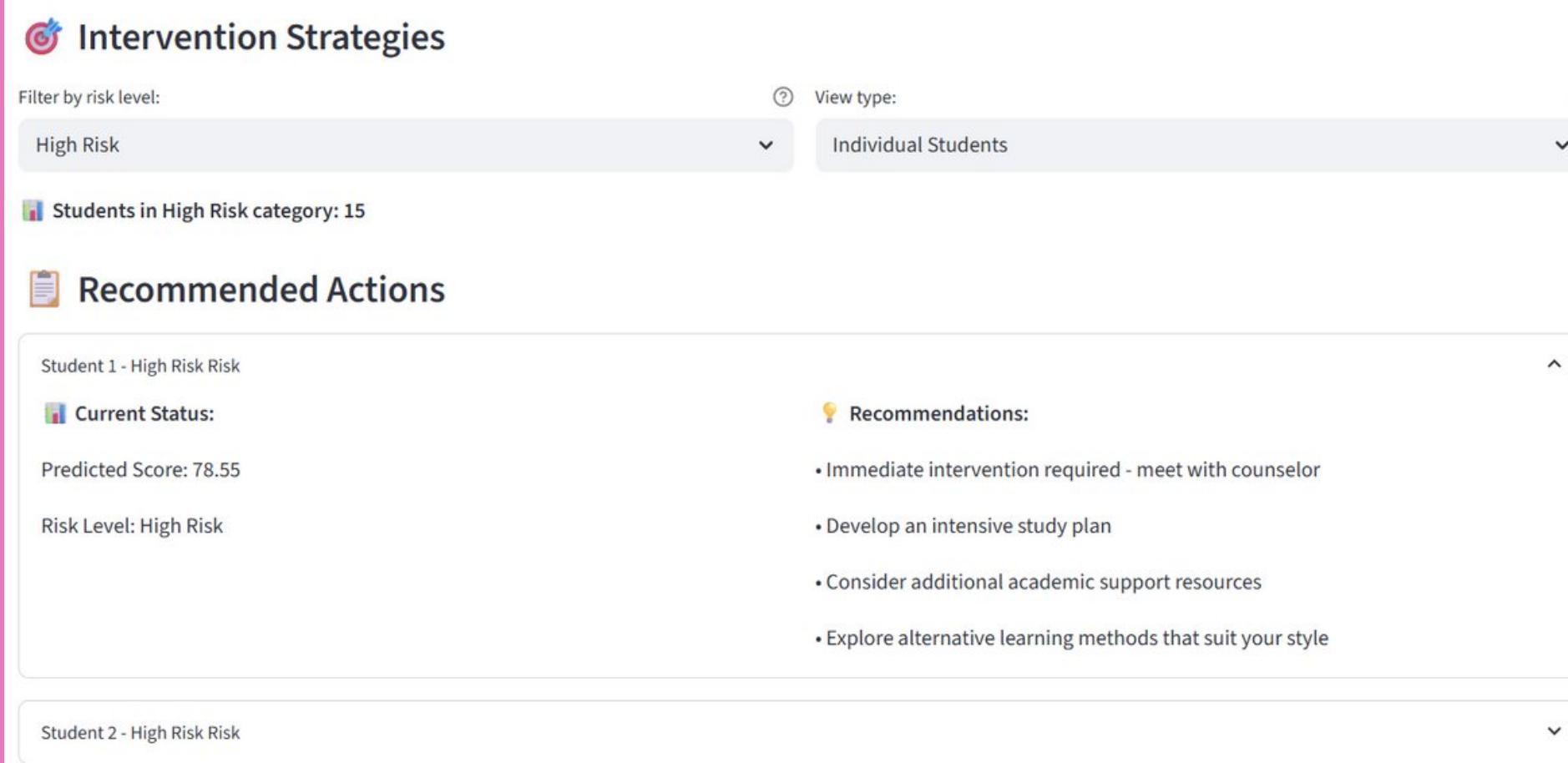
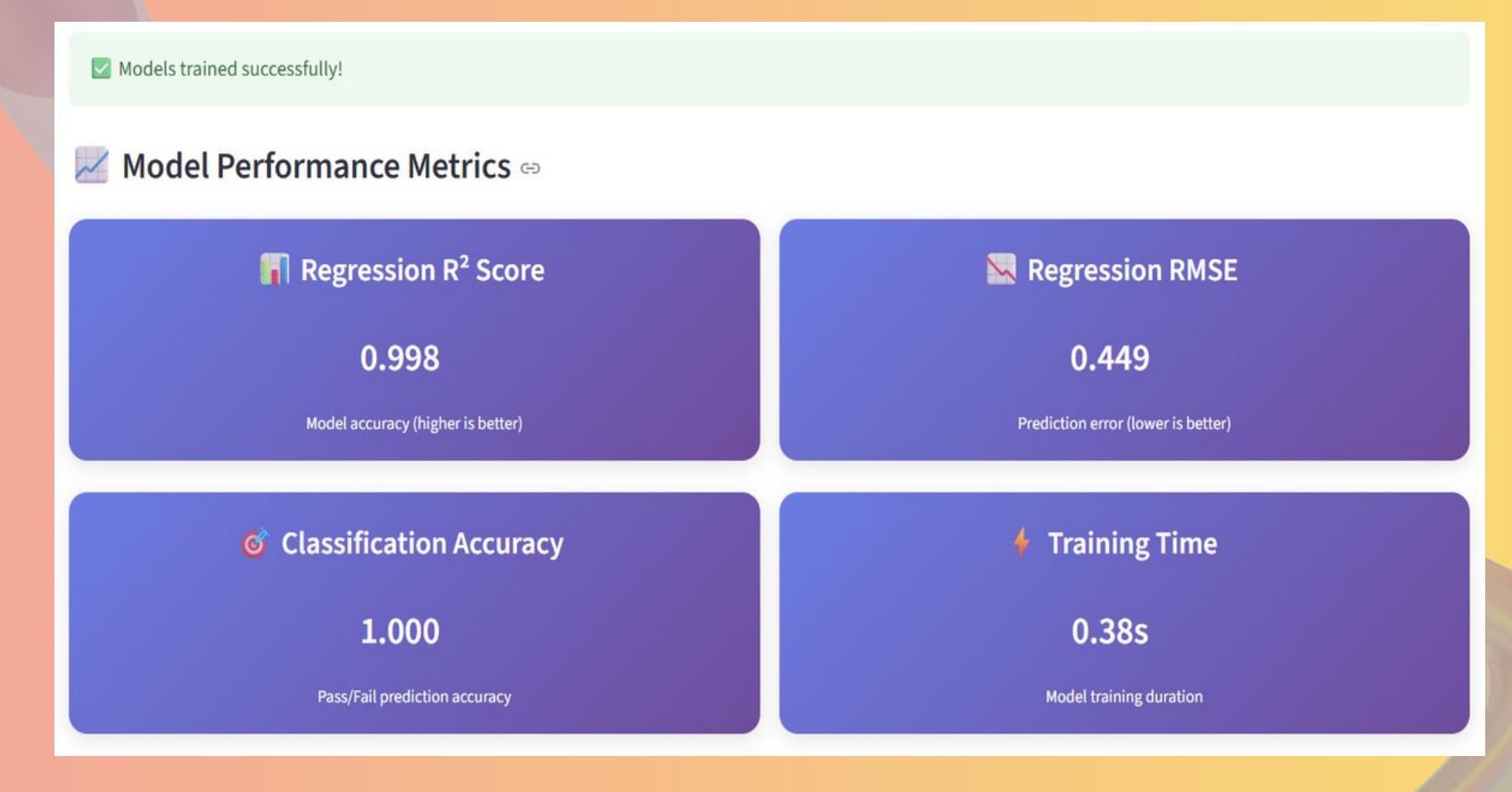
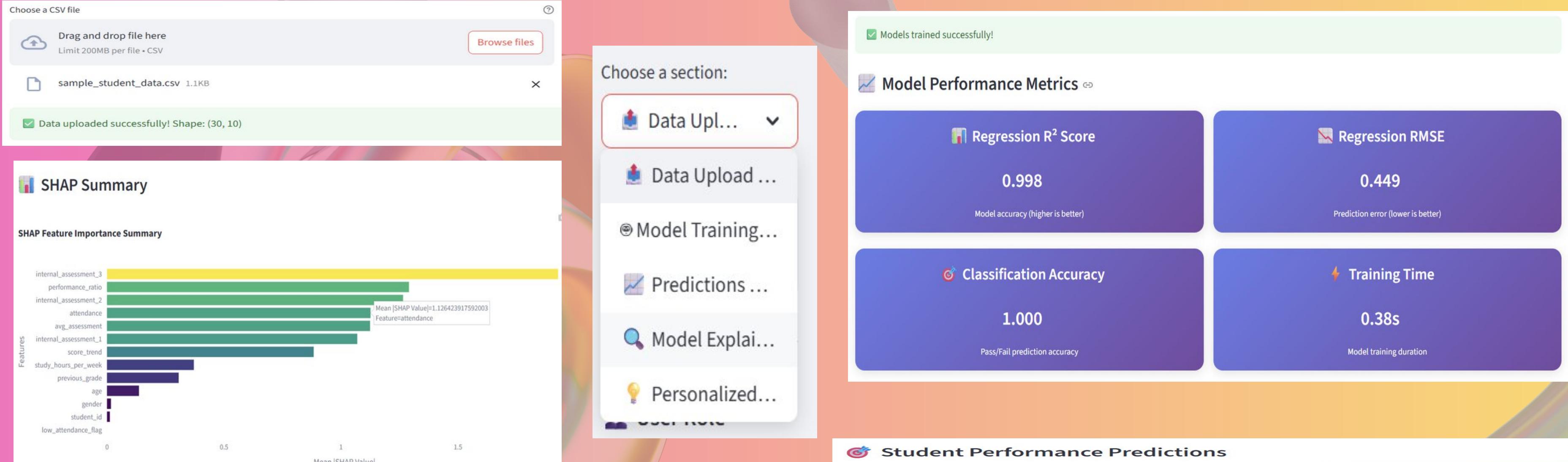
AI-Powered Analytics for Educational Excellence

🚀 Quick Start Guide

Ready to explore? Click 'Load Sample Data' to instantly see charts, analysis, and risk assessments!

📤 Data Upload & Processing

Upload Student Performance Dataset



Future Possibility

Integrate real-time data from school management systems for live predictions

Incorporate emotional/behavioral data for more holistic analysis

Add multilingual support to improve accessibility across regions

Deploy on mobile devices for teacher-friendly, on-the-go insights

Enable parent dashboards for collaborative interventions and tracking

VISUALIZING STUDENT RISK AND PERFORMANCE

Deploy ⋮

Dashboard

Navigate through sections

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Data Up... ▾

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Supported format: CSV files

Expected columns:

- Student demographic data (age, gender, etc.)
- Academic indicators (internal assessments, attendance)
- Final grades or performance metrics

Choose a CSV file

Drag and drop file here
Limit 200MB per file + CSV

Browse files

Load Sample Data

sample_student_data.csv 1.1KB

✓ Data uploaded successfully! Shape: (30, 10)

Data Preview

	student_id	age	gender	attendance	internal_assessment_1	internal_assessment_2	internal_assessment_3	study_hours_per_week	previous_grade	final_score
0	1	18	Male	85	75	80	78	15	B	79
1	2	19	Female	92	88	85	90	20	A	87
2	3	17	Male	78	65	70	68	12	C	69