Smart Student Performance Analytics & Guidance Portal using AI

ABSTRACT:

Academic performance evaluation plays a crucial role in identifying students' strengths, weaknesses, and areas that require improvement. Traditional evaluation systems primarily focus on marks and grades, which often fail to provide predictive insights, personalized guidance, and meaningful analysis. To address these limitations, this project presents a Smart Student Performance Analytics and Guidance Portal powered by Artificial Intelligence and Machine Learning.

The proposed system is a secure, web-based application that allows students to log in and access personalized academic analytics. The system uses a machine learning classification model trained on historical student data to predict academic outcomes such as Pass or Fail, along with performance levels. The trained model is integrated into a Flask-based web application to provide real-time predictions.

In addition to prediction, the portal offers data visualization and analytics through graphical representations such as attendance versus marks, study patterns, and overall performance distribution, enabling explainable and interpretable AI decisions. The system further enhances usability by generating personalized education plans and improvement suggestions based on individual student performance metrics, acting as an intelligent academic guidance tool. A downloadable PDF performance report is also provided for documentation and review purposes.

Overall, the proposed portal transforms raw academic data into actionable insights, combining prediction, analytics, visualization, and guidance within a secure and user-friendly platform. This system can assist students and educators in making informed academic decisions and can be extended further for institutional-level performance monitoring.

KEY WORDS:

Random Forest Classifier , Academic Analytics , Flask Web Application , Education Data Mining

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