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Academic Result Management System Using Django

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Abstract - The Academic Result Management System is a web-based software application developed to efficiently manage and track student academic performance, including courses, grades, and other related information. This system is designed to streamline the administrative tasks associated with academic result management, making it easier for teachers and administrators to enter, organize, and retrieve student performance data from a centralized platform. The system consists of several integrated modules, including Student Profile Management, Course Management, Result Management, and Report Management, all of which contribute to providing a comprehensive solution for managing student records. Through this system, teachers and administrators can efficiently monitor and track academic progress, making it easier to generate reports and analyze student performance over time.

Additionally, the system allows students to access their results securely by logging in with their personal credentials, providing them with a user-friendly interface to view their grades and academic progress. Designed specifically for educational institutions, the system enhances the management of student records and academic data, leading to more informed decision-making.

Key Words: Academic Result Management System, Web-based application, Student academic performance, Course management, Grade tracking, Student records, Centralized platform, Student Profile Management, Result Management.

1.INTRODUCTION

In today's educational environment, managing academic records manually can lead to errors, delays, and inefficiencies. With the growing number of students in schools and colleges, it becomes increasingly difficult for administrators and teachers to track student progress accurately. This is where a centralized Academic Result Management System proves to be essential. This web-based application aims to simplify the process of managing student academic data, including courses, grades, and performance records, through a secure and user-friendly platform. The need for a structured and reliable system arises from the challenges faced in organizing student information, especially in institutions with a large number of students. The manual handling of data is prone to mistakes and consumes significant time and resources. By digitalizing the result management process, institutions can reduce human error, improve efficiency, and ensure transparency.

2. LITERATURE SURVEY

1. *Early Detection of Students at Risk – Predicting Student Dropouts Using Administrative Student Data and Machine Learning Models*, J. Berens et al. (2022), This study developed an Early Detection System (EDS) using data from a state and a private university. It applied regression, neural networks, decision trees, and AdaBoost to identify students at risk of dropping out. The system achieved prediction accuracies of 79% and 85% at the end of the first semester.
2. *Predicting At-Risk Students at Different Percentages of Course Length for Early Intervention Using Machine Learning Models*, M. Adnan et al. (2021), This research focuses on predicting dropouts in online learning platforms (MOOCs, LMS, VLEs). It addresses challenges like low engagement and self-regulation among students and highlights the need for early intervention through machine learning.
3. *A Survey of Machine Learning-Based Solutions for Phishing Website Detection*

L. Tang and Q. H. Mahmoud (2021), This paper surveys machine learning techniques used to detect phishing websites, emphasizing the evolving nature of cyber threats and the importance of continuous updates to detection systems.

4. *Hybrid Model for Twitter Data Sentiment Analysis Using Ensemble of Dictionary-Based and Machine Learning Classifiers*, S. Rani and N. S. Gil (2020), The study proposes a hybrid sentiment analysis model combining dictionary-based classifiers with SVM, KNN, and C5.0. The aim is to improve sentiment classification accuracy on Twitter data, aiding in policy and public opinion monitoring.

3. PROBLEM STATEMENT

Managing academic records manually is time-consuming and error-prone. This project proposes an Academic Result Management System using Django to digitize and automate result management. Admins can manage classes, students, subjects, and results, while students can view their results using roll numbers. The system emphasizes ease of use, data security, and quick access.

3.1 Existing System

Efforts like extra assignments help low-performing students, but early identification of at-risk students remains a challenge. Researchers are exploring Machine Learning to address this, aiming to predict and support students early.

3.2 Existing System Disadvantages

- Low sensitivity
- Struggles with varying data patterns
- Model instability and reduced reliability

3.3 Proposed System

The proposed system combines Machine Learning and feature-rich models to better detect at-risk students. By integrating academic and demographic data, it enables timely interventions and improved outcomes.

3.4 Proposed System Advantages

- Saves time for students and staff
- Fast and accurate result access
- Reliable student record management
- Supports informed decision-making
- Scalable and secure for future growth

4. METHODOLOGY

4.1 Module Names

a) Admin Authentication Module
b) Student Management Module
c) Class & Subject Management Module
d) Result Entry Module
e) Student Result View Module
f) Data Visualization Module
g) Result Management & Validation Module
h) Web Interface & User Experience Module
i) Database Integration Module

4.2 Module Explanations

1) **Admin Authentication:** Ensures secure login for administrators using Django's superuser feature to manage backend operations.
2) **Student Management:** Allows admin to add, edit, and delete student profiles including personal and academic details.
3) **Class & Subject Management:** Enables the admin to create classes/subjects and assign students accordingly.
4) **Result Entry:** Facilitates entry and updating of student marks and pass/fail status.
5) **Student Result View:** Allows students to check their results using roll numbers once uploaded by the admin.
6) **Data Visualization:** Displays academic data using charts and graphs for easy performance analysis.
7) **Result Management & Validation:** Validates entered results for accuracy, completeness, and proper formatting before saving.
8) **Web Interface & UX:** Builds a user-friendly front end with HTML, CSS, and JS for easy interaction by admins and students.
9) **Database Integration:** Handles secure storage and retrieval of all data using Django's ORM for efficient database interaction.

5. TECHNIQUES OR ALGORITHMS

Existing Technique:

At-risk students often face academic challenges. Machine learning, particularly the Naive Bayes algorithm, is used to predict and identify such students early, aiding in timely intervention.

Proposed Technique:

A Django-based Web Application is developed for academic result management. Key features include:

- Admin Authentication for secure access
- Student & Result Management for efficient data handling
- Student Result View via a user-friendly web interface

Django's built-in ORM, admin panel, and authentication system enable a secure, scalable, and user-friendly solution. The system ensures data integrity, transparency, and ease of access for all stakeholders.

6. ALGORITHM

Step-1: Data Preparation & Feature Extraction

Step-2: Calculate Prior Probabilities

Step-3: Calculate Conditional Probabilities

Step-4: Apply Bayes' Theorem

Bayes' Theorem: $P(C|F) = (P(F|C) * P(C)) / P(F)$

Where:

- $P(C|F)$ is the posterior probability of class C given features F.
- $P(F|C)$ is the likelihood of features F given class C.
- $P(C)$ is the prior probability of class C.
- $P(F)$ is the probability of features F.

Step-5: Prediction

Step-6: Model Evaluation

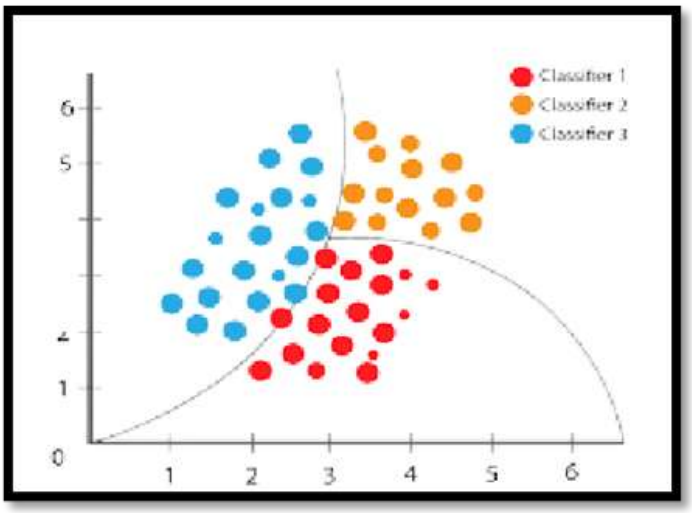
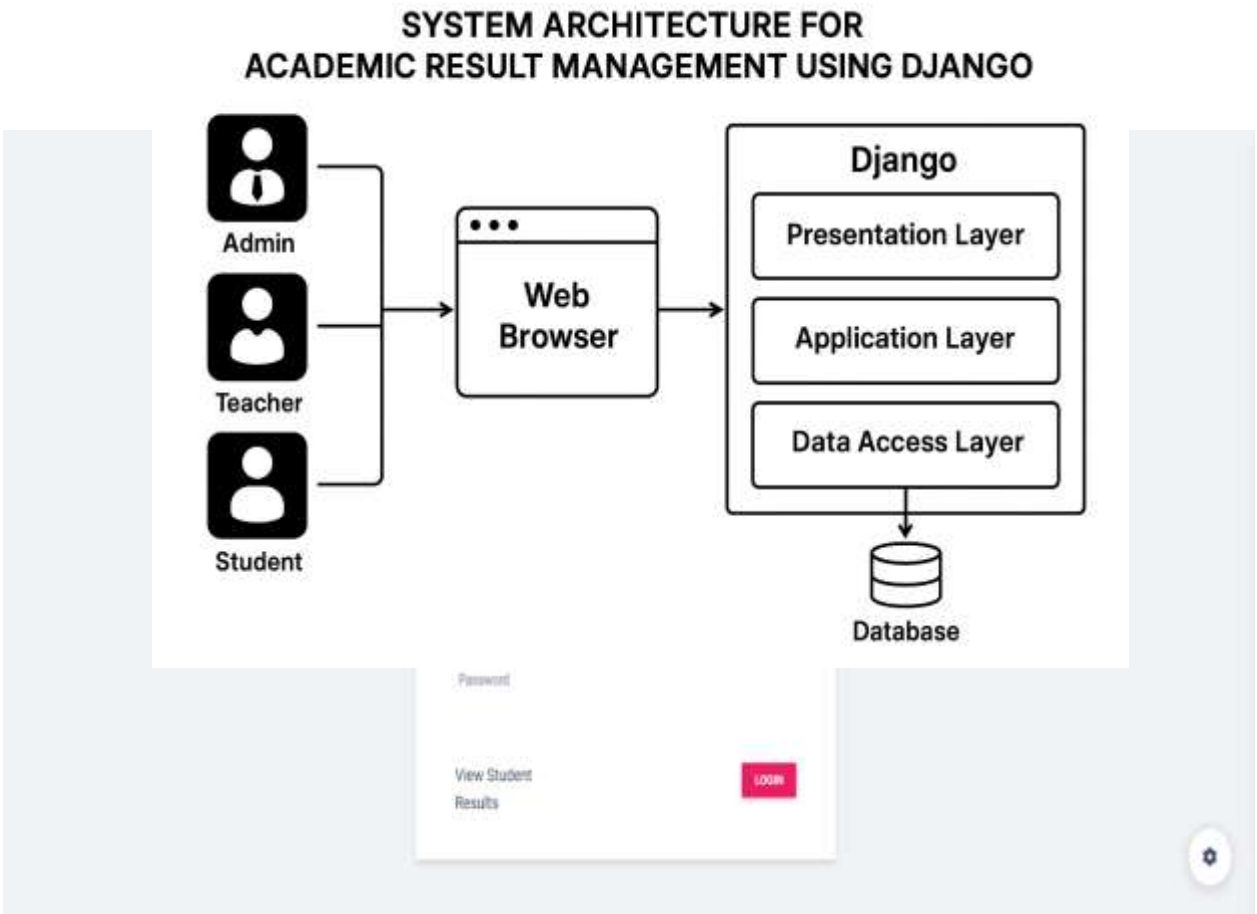


Figure:1 Navie Bayes Classifier

7. DESIGN AND DEVELOPMENT

Figure-2: System Architecture



8. RESULTS AND DISCUSSIONS

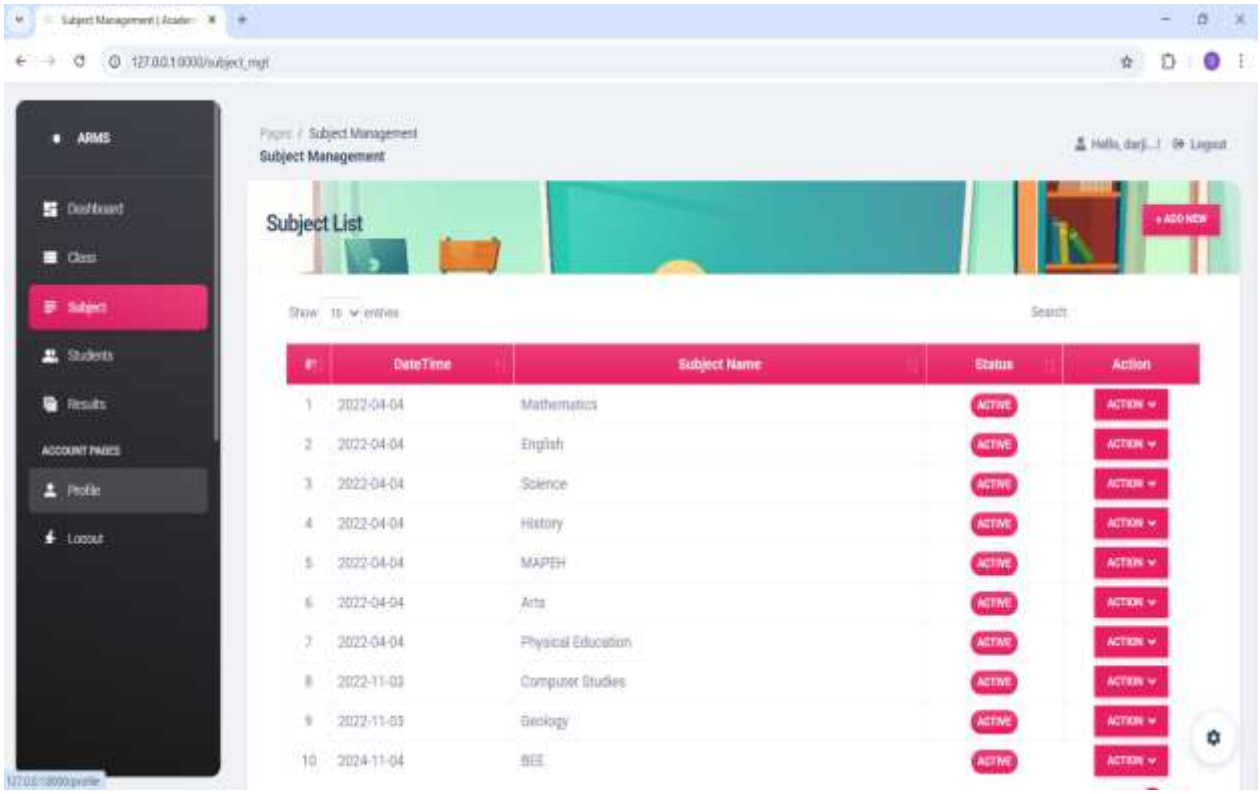


Figure-3: Login Page

Figure-4: Dash Board

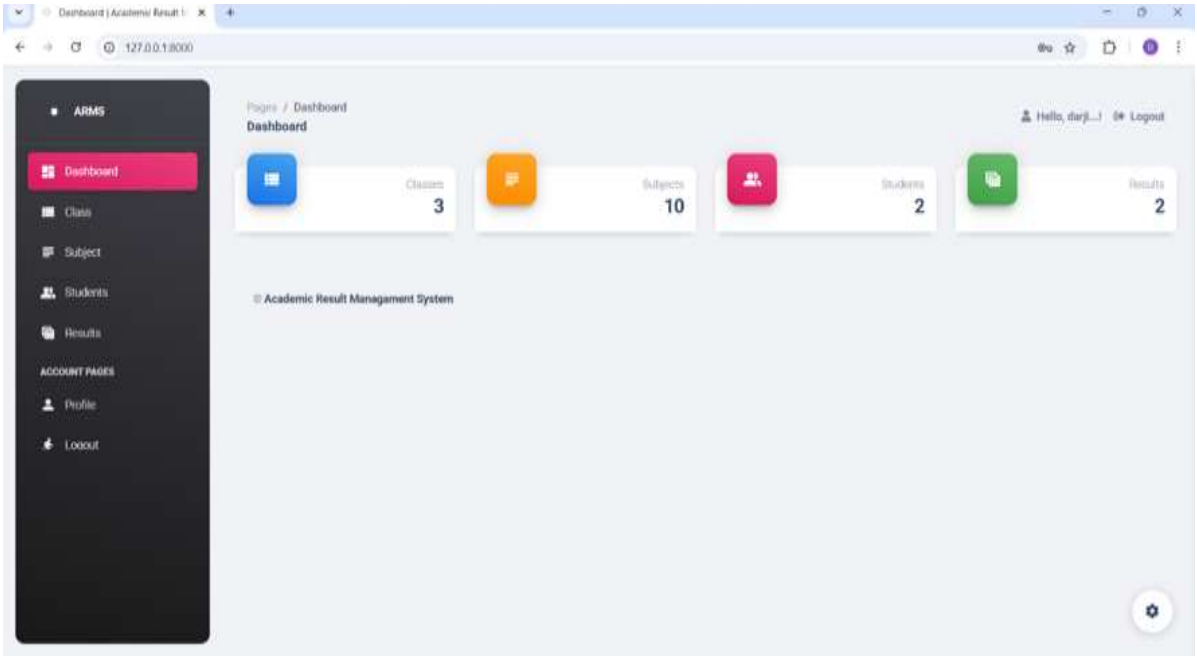


Figure-5: Subject List

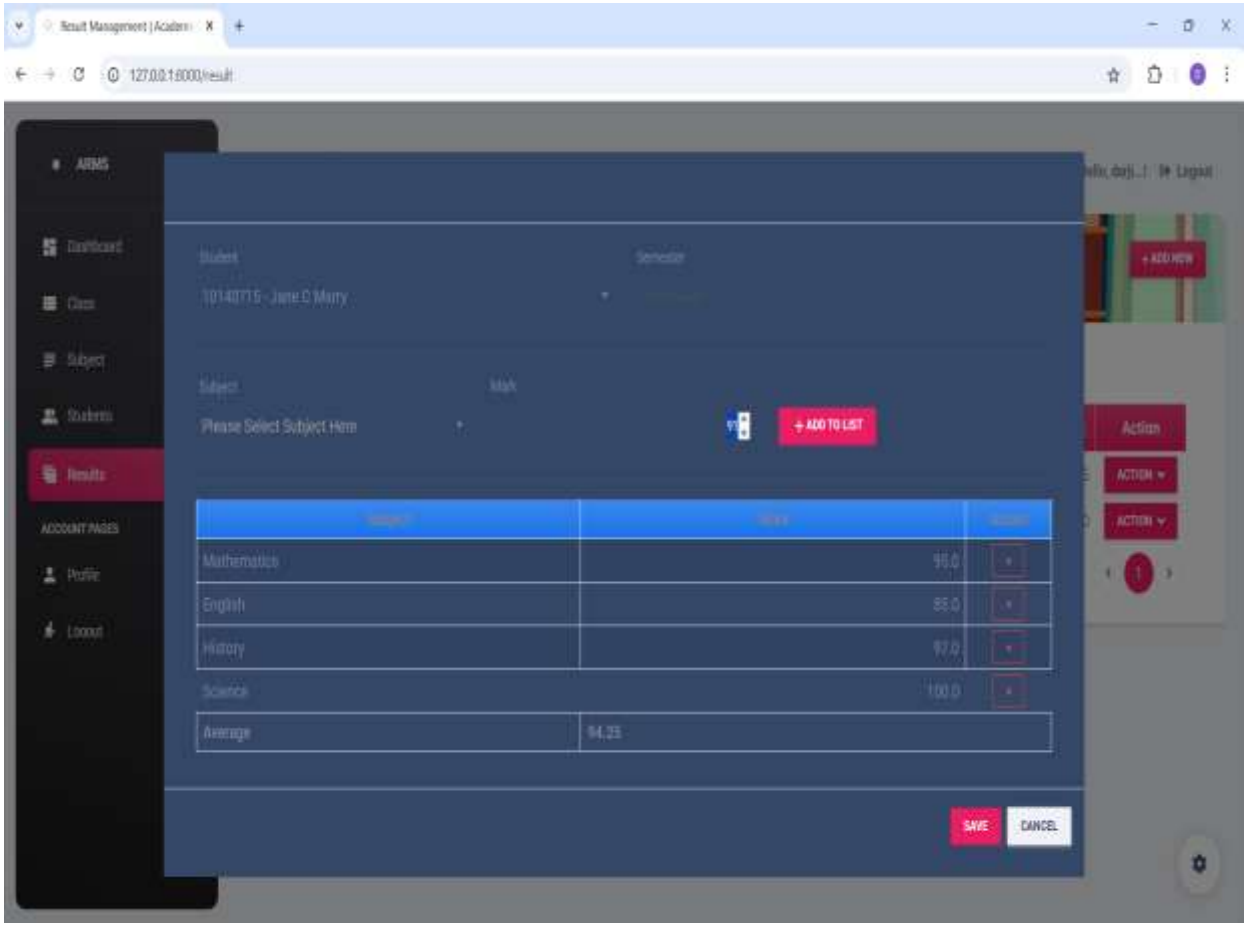


Figure-6: Result page

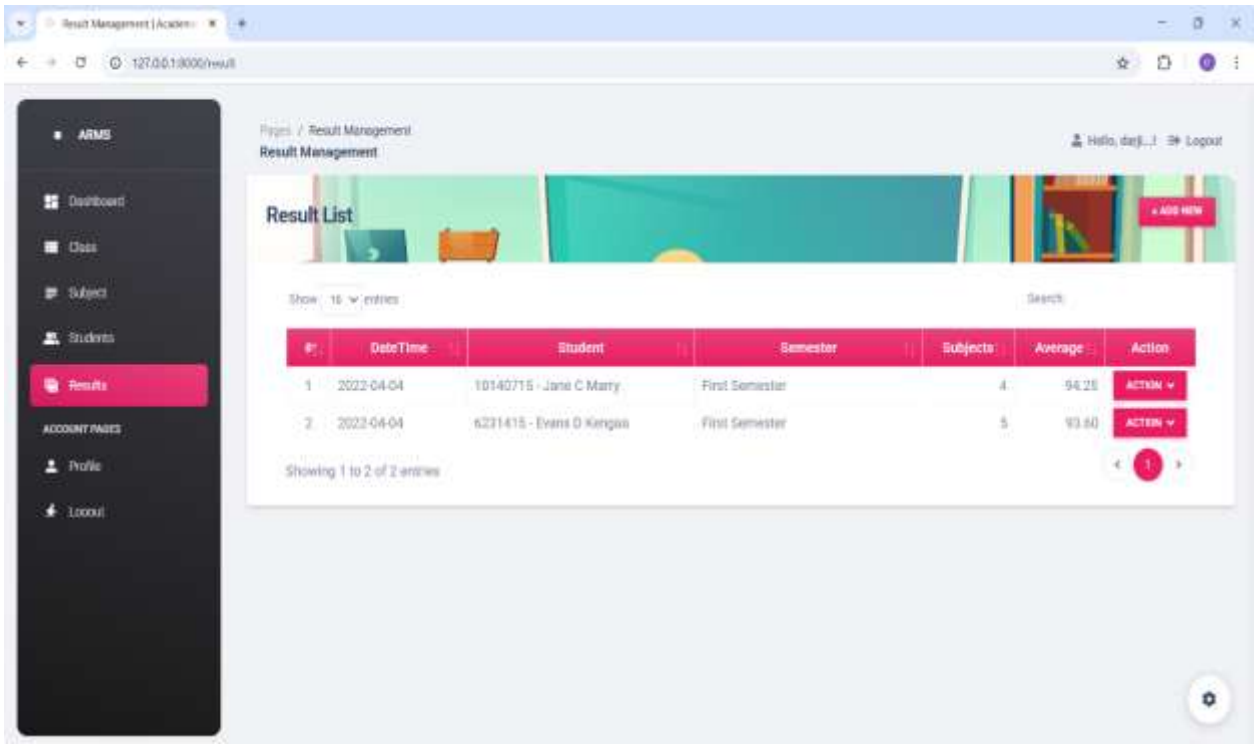


Figure-7: Average

9. CONCLUSION

The goal of this project was to develop an efficient and user-friendly web-based system for managing academic results and student performance. By utilizing Django, a robust Python web framework, the system facilitates secure access for both administrators and students. The admin module allows administrators to easily input, manage, and validate student data and results, ensuring that academic performance information is accurate and up-to-date. The student module enables students to view their individual results, promoting transparency and enabling them to track their academic progress. Although the project does not incorporate machine learning algorithms, it effectively addresses the key challenges of academic result management by automating data entry, validation, and retrieval processes. This reduces manual errors and increases the efficiency of handling large amounts of student data. The success of this project lies in its practical application for educational institutions, offering a comprehensive and accessible platform for managing academic results.

10. FUTURE ENHANCEMENTS

Feature enhancement in this project aims to enrich the predictive capabilities of the hybrid model by incorporating additional data features and refining existing ones. This involves a thorough analysis of the dataset to identify potentially valuable attributes that could contribute to a more accurate prediction of at-risk students. Possible enhancements may include the inclusion of socio-economic factors, behavioral indicators, or extracurricular activities, which can provide deeper insights into students' academic performance and potential risk factors. Furthermore, feature engineering techniques such as dimensionality reduction, feature scaling, and transformation may be employed to optimize the input variables and improve the model's interpretability and performance. Additionally, the project may explore advanced data preprocessing methods to handle missing values, outliers, and categorical variables effectively.

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