# Student Performance Tracker

Empowering educators, students, and parents with data-driven insights to optimize academic performance

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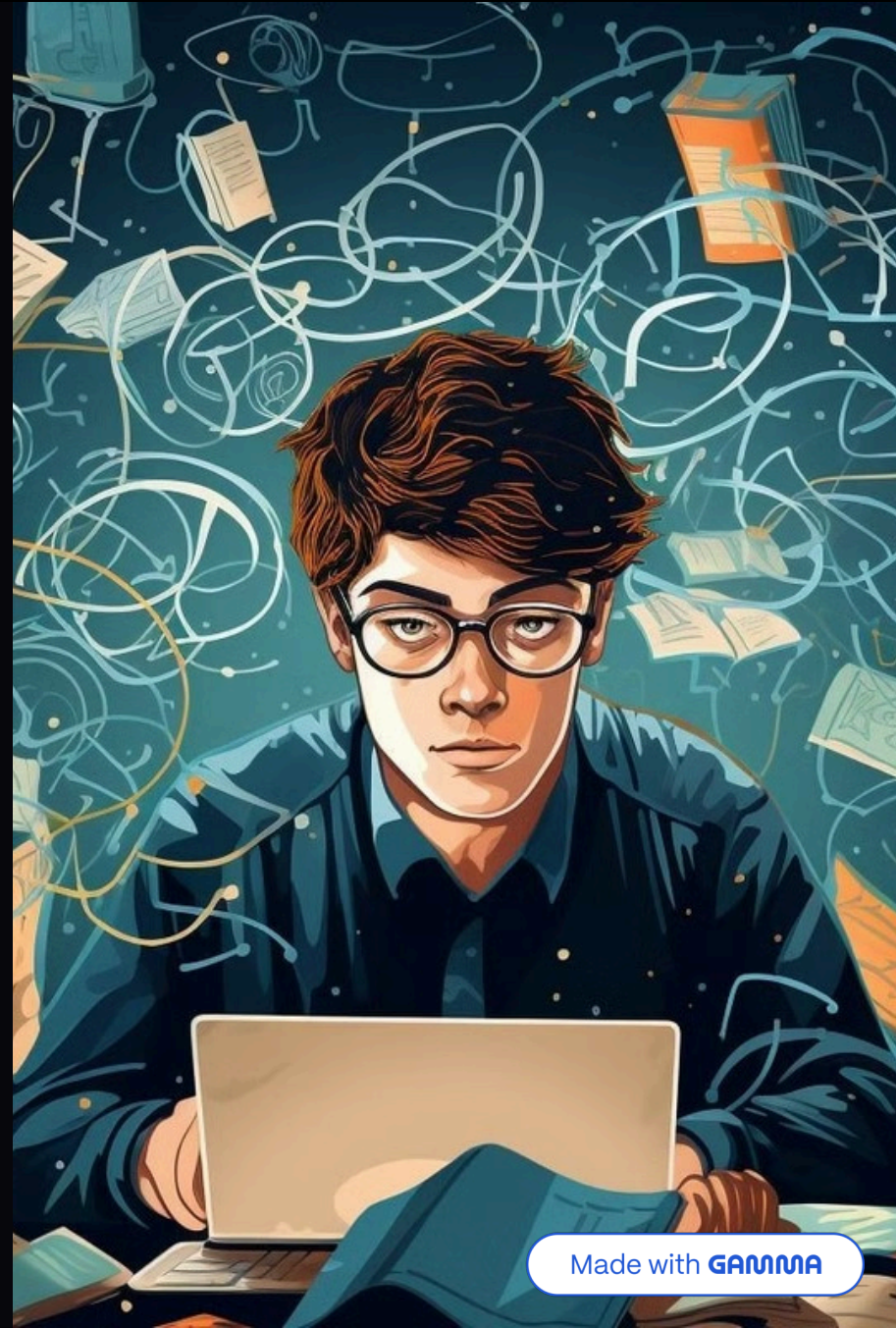
**D15A/48**



# Introduction

- Monitoring student performance is essential for academic success.
- Traditional methods are limited and lack quick access and insights.
- Our solution: A web app that:
  - Manages student profiles
  - Records subject-wise grades
  - Visualizes data trends for better decision-making

## Problem Statement

- Manual record-keeping is inefficient and prone to errors.
- Educators lack tools for real-time performance analysis.
- There's a need for a system that is:
  - Digital
  - User-friendly
  - Real-time and visual

# Proposed System Features

## Efficient Academic Data Management

Centralize and streamline the handling of student academic information, ensuring data is easily accessible and well-organized. The system supports various data formats and provides robust search capabilities for quick retrieval.

## Student Profile Management

Enable administrators and educators to easily add, edit, and remove student profiles. Each profile includes comprehensive details such as contact information, enrollment history, and academic performance records, all in one place.

## Subject-Specific Grade Records

Maintain detailed records of student grades for each subject, allowing for comprehensive performance tracking. The system supports various grading scales and provides tools for calculating averages and identifying areas for improvement.

## Data Visualization through Pie Charts

Present academic data through intuitive and visually appealing pie charts, making it easier to understand performance trends and identify key insights. Charts can be customized to display various metrics, providing a clear overview of student progress.

## Clean and Responsive User Interface

Offer a user-friendly interface that is accessible across various devices, ensuring a seamless experience for all users. The responsive design adapts to different screen sizes, providing optimal usability on desktops, tablets, and smartphones.

# Technology Stack

**Frontend:**

- React (Vite)
- TailwindCSS
- Recharts (for charts)

**Backend:**

- Flask (Python)
- Flask-CORS

**Database:**

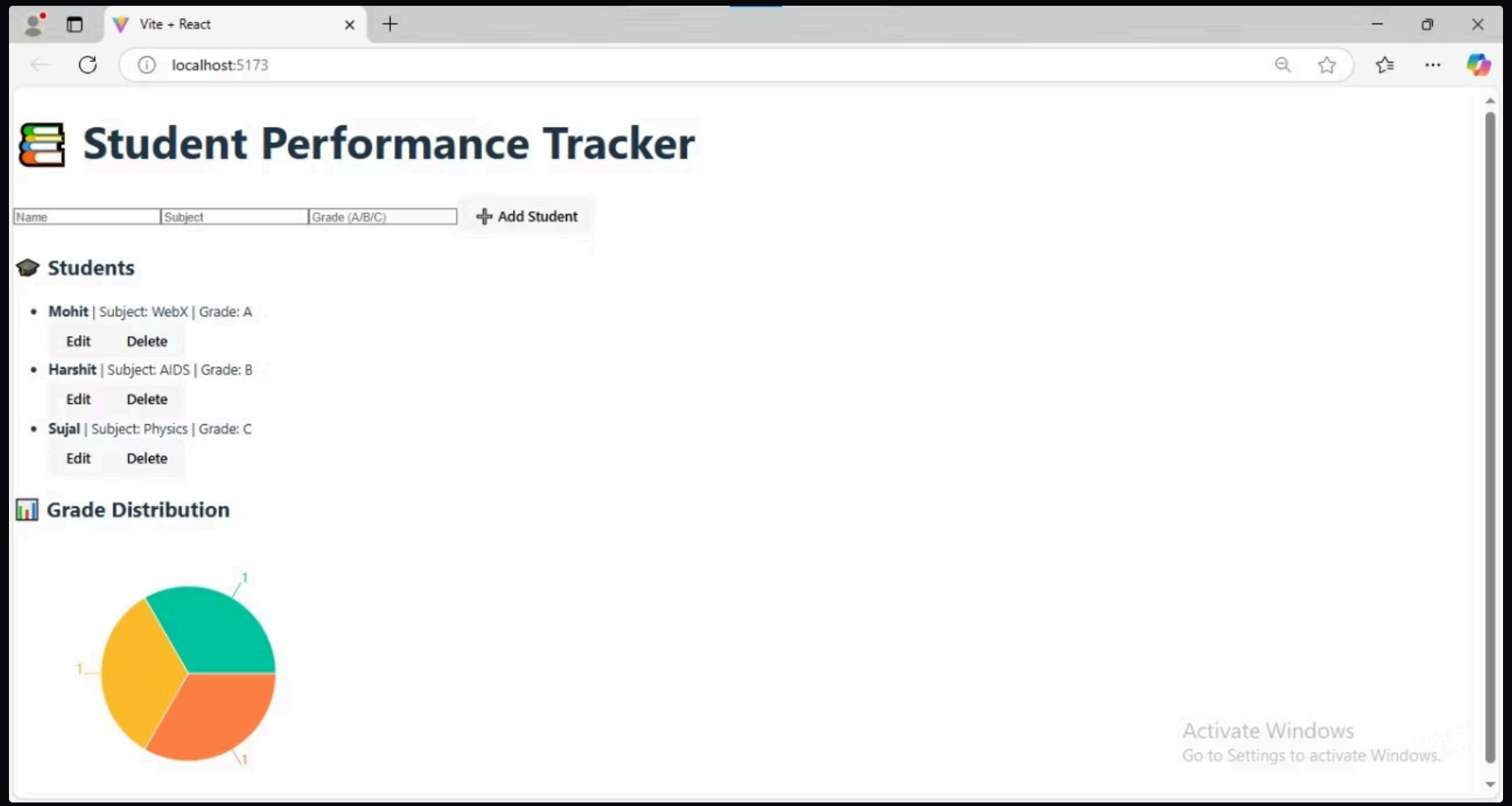
- MongoDB (MongoDB Atlas)

**Other Tools:**

- Axios (for API requests)
- Node.js (Package management)

# Proposed System Features

- Add new student entries with name, subject, and grade: Streamline the process of adding new students to the system by including essential details such as their full name, enrolled subjects, and corresponding grades. This feature ensures comprehensive record-keeping from the start.
- Edit or delete existing student records: Allow administrators and educators to modify or remove student records as needed. This ensures the data remains accurate and up-to-date, accommodating changes in enrollment or corrections to grades.
- Grade distribution chart updates in real-time: Implement real-time updates for grade distribution charts, providing instant visualization of academic performance. This dynamic feature enables immediate insights into trends and patterns, supporting timely intervention and decision-making.
- Minimalistic, clean user interface: Offer a user-friendly interface that is easy to navigate and visually appealing. The minimalistic design ensures that users can quickly find and interact with the features they need, enhancing overall usability.
- Dashboard updates dynamically with each action: Ensure the dashboard reflects the most current state of the system by updating dynamically with each action performed. This includes new entries, edits, and deletions, providing a live overview of student performance and system status.



# System Architecture

- **Client-Server Architecture**
- React frontend handles:
  - Form submissions
  - Data display
  - Chart rendering
- Flask backend provides REST API for data operations
- MongoDB stores student data as JSON-like documents
- UI is divided into components: form, list, and chart

# Implementation Details

- **Form Submission** uses Axios to send data to the backend
- **API Endpoints** support:
  - `GET`: fetch all records
  - `POST`: add new record
  - `PUT`: edit record
  - `DELETE`: remove record
- **MongoDB** stores each student entry
- **Recharts** library generates a real-time pie chart
- **TailwindCSS** ensures responsive and aesthetic design

# Result Analysis

- **Tested with multiple users and subjects:** The system underwent rigorous testing with a diverse group of teachers and students across various subjects to ensure broad applicability and reliability.
- **Add/edit/delete functionality works perfectly:** The add, edit, and delete functionalities were thoroughly tested and confirmed to operate flawlessly, providing seamless data management capabilities.
- **Real-time pie chart shows grade distribution instantly:** The real-time pie chart accurately reflects grade distribution changes as they occur, offering immediate visual insights into student performance.
- **Teachers can easily visualize and interpret data:** The intuitive design and clear data presentation enable teachers to easily visualize and interpret student performance data, facilitating informed decision-making.
- **Improves accuracy and decision-making:** By providing a centralized and accurate view of student grades and performance trends, the system significantly improves accuracy and enhances the quality of decision-making in academic settings.

# Conclusion & Future Scope

**Conclusion:**

- Simple yet effective platform to track academic performance
- Real-time analytics with modern UI
- Lightweight and easy to use

**Future Enhancements:**

- Add authentication for secure access
- Export reports (PDF/Excel)
- Use line/bar charts for trend analysis over semesters