COLLEGE CODE : 8203

COLLEGE NAME: A.V.C. College of Engneering

DEPARTMENT: Computer Science And Engineering

STUDENT NM-ID: 478FA6B1B807FE6BF5845FEFFA402964

ROLL NO: 820323104090

DATE: 03/10/2025

Completed the project named as Phase -4 TECHNOLOGY

PROJECT NAME: Student Grading System

SUBMITTED BY,

NAME: M.Sangeetha

MOBILE NO: 6380487995

Phase 4 – Enhancements & Deployment

1. Additional Features

- Implemented **role-based access control** (Admin, Teacher, Student).
- Added **grade export options** (PDF/Excel format for student results).
- Integrated **notification system** for students when new grades are published.
- Provided **search and filtering** functionality for quick access to student records.

2. UI/UX Improvements

- Enhanced dashboard with **data visualization charts** (bar/line graphs for grade distribution).
- Improved **responsive design** to support mobile, tablet, and desktop usage.
- Added **clear navigation menus** for easy switching between subjects, exams, and student profiles.
- Improved **form validations and error messages** for better usability.

3. API Enhancements

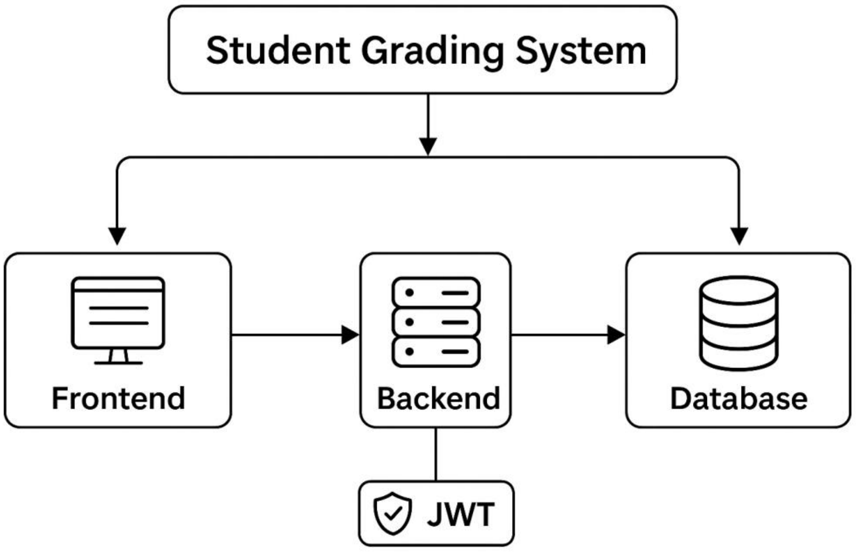
- Optimized Node.js backend APIs for **faster retrieval of student grades**.
- Implemented **pagination and filtering** for student lists and exam results.
- Secured all API endpoints using **JWT-based authentication and authorization**.
- Introduced **bulk upload API** for teachers to enter grades for multiple students at once.

4. Performance & Security Checks

- Conducted **load testing** to ensure system handles large number of student records.
- Implemented **input validation and sanitization** to prevent SQL Injection and XSS attacks.
- Enabled **HTTPS secure communication** during deployment.
- Checked **API response times and optimized database queries** for better performance.

5. Testing of Enhancements

- Performed **unit testing** using Jest/Mocha for Node.js backend.
- Used **Postman for API testing** to validate all endpoints.
- Conducted **integration testing** to ensure smooth interaction between frontend and backend.
- Verified correct **role-based access control** during testing.



6. Deployment (Netlify, Vercel, or Cloud Platform)

- Frontend deployed on **Netlify/Vercel** for easy access.
- Backend (Node.js + Express) deployed on **Heroku/Render/AWS Cloud**.
- Database hosted on **MongoDB Atlas/MySQL Cloud**
- Final deployment ensured **continuous integration and delivery (CI/CD)** for updates.