DS’F24 Morning Portal
Master Professional Build Prompt

Project Name: DS’F24 Morning Portal

Type: Mobile-first Learning Management System (LMS)

Target Users: Data Science – Fall 2024 Morning Session

Input Data: CSV file containing student names and roll numbers

Objective

Build a production-ready mobile LMS application that replicates a university academic portal for managing students, attendance, assignments, quizzes, semesters, and academic analytics. The system must support domain-restricted authentication, semester progression, subject management, and a CR-controlled roll-call interface, while demonstrating the application of Linear Algebra and Calculus in real-world educational technology.

Authentication Rules

• User accounts generated only from CSV data

• Roll Number format: BSDSF24M001 → BSDSF24M062 (CAPITAL letters only)

• Default username: roll number in lowercase

• Default password: roll number in UPPERCASE

• Mandatory password change on first login

• Secure password hashing

Semester Management

• Support Semester 4 to Semester 8

• Students currently in Semester 3

• Automatic semester progression after configurable duration

Subject Management

• Add subjects per semester

• Subject name, code, credit hours

• Subjects linked to attendance, assignments, and quizzes

User Roles

Student: View attendance, assignments, quizzes, subjects, alerts

CR (Class Representative): Take roll call, mark attendance, view summaries

Roll Call Interface

• CR-controlled roll-call screen

• Present / Absent / Leave toggles

• Subject, date, and semester-specific attendance

Assignments

• Title, description, assigned date, due date

• Subject and semester linkage

• Status: Pending, Submitted, Late

Quizzes

• Quiz title, date, time, syllabus

• Subject and semester linkage

Dashboard

• Current semester

• Subjects enrolled

• Attendance percentage

• Pending assignments

• Upcoming quizzes

• Academic risk indicator

Analytics & Mathematics

• Attendance modeled as matrices

• Student academic state as vectors

• Trend analysis using calculus derivatives

• Risk prediction using thresholds

Technical Stack

• Frontend: Flutter

• Backend: Python (FastAPI)

• Database: SQLite / PostgreSQL

• Architecture: REST-based Client–Server

• Security: Password hashing & session control

Academic Objective

Demonstrate how Linear Algebra and Calculus form the mathematical backbone of modern LMS platforms, suitable for a semester or final-year Computer Science/Data Science project.