College Placement Portal - Development Report

Project Overview

A comprehensive Flask-based web application for managing college placement activities. Features AI-powered chatbot, resume analysis, interview scheduling, and multi-user role management.

Key Features Implemented

Feature	Description	Status
Multi-User Authentication	Students, Companies, CDC Officers	■ Complete
AI Chatbot (Google Gemini)	Resume analysis, coding help, interview prep	■ Complete
Resume Upload & Analysis	PDF upload with AI-powered feedback	■ Complete
Job Posting Management	Company job creation and management	■ Complete
Application Tracking	Student applications and status updates	■ Complete
Mock Interview Scheduling	CDC-organized mock interviews	■ Complete
Interview Question Generation	AI-generated questions based on JD	■ Complete
Selection Prediction	AI-powered placement chances prediction	■ Complete

Technical Stack

Component	Technology
Backend Framework	Flask (Python)
Database	SQLite with SQLAlchemy ORM
Frontend	HTML5, CSS3, Bootstrap 5, JavaScript
AI Integration	Google Gemini API
Authentication	Flask-Login
File Handling	PyMuPDF for PDF processing
Forms	Flask-WTF with WTForms
Email	Flask-Mail

Quick Setup Instructions

1. Clone the repository
2. Create virtual environment: python -m venv venv
3. Activate virtual environment: venv\Scripts\activate (Windows)

4. Install dependencies: pip install -r requirements.txt
5. Set up environment variables (GEMINI_API_KEY)
6. Initialize database: flask db init && flask db migrate && flask db upgrade
7. Run the application: venv\Scripts\python.exe app.py
8. Access at: http://localhost:5000

Key Issues Resolved During Development

Issue	Solution
App Initialization Error	Fixed create_app() function usage
Form Validation Errors	Added missing user_id field handling
Database Import Errors	Cleared and recreated database
File Upload Errors	Created static/uploads directory
Template URL Errors	Fixed url_for() with routes prefix
Chatbot Visibility Issues	Updated CSS and removed conflicting themes
Resume Analysis Errors	Added PyMuPDF text extraction
Mock Interview Validation	Added server-side and client-side validation

User Roles & Permissions

Role	Permissions
Student	Profile management, job applications, resume upload, chatbot access
Company	Job posting, application review, interview scheduling, feedback
CDC Officer	Company management, student applications, mock interview scheduling

AI-Powered Features

• Resume Analysis: Extracts text and provides improvement suggestions
• Interview Questions: Generates technical and behavioral questions
• Coding Help: Debugs code and explains programming concepts
• Selection Prediction: Analyzes resume-job fit and predicts chances
• General Assistance: Academic guidance and career advice

Current Project Status

■ Core functionality complete and tested ■ AI integration working with Google Gemini ■ Multi-user authentication and role management ■ Database operations and file handling ■ Responsive UI with Bootstrap ■ Real-time chatbot with conversation context ■■ Minor template URL fixes needed (in progress)

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