App Dev 1 Project Report

1. Student Details

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About Me: I am a student at IIT Madras BS Degree program with a deep interest in web application development , modern development and data-driven technologies. I enjoy building meaningful applications that combine learning, analytics, and user experience.

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2. Project Details

Project Title: Hospital Management System

Problem Statement:

Hospitals need efficient systems to manage patients, doctors, appointments, and treatments. Currently, many hospitals use manual registers or disconnected software, which makes it difficult to manage records, avoid scheduling conflicts, and track patient history.

Approach:

The app was built using Flask as the backend framework with a modular structure. It allows hospitals to manage activities daily, visualize appointments through interactive ways, and manage doctors , patients in an efficient manner .

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3. AI/LLM Declaration

I used **claude 4** to assist in writing SQLAlchemy model definitions , some styling , some flask code and improving code reusability.
The extent of AI/LLM usage is around **25–35%**, limited to **code suggestions and documentation formatting**.
All final implementation logic, debugging, and integration were done manually.

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4. Technologies and Frameworks Used

Technology / Library	Purpose

Flask	Core backend web framework
SQLAlchemy	Object Relational Mapper for SQLite database
Jinja2	Template engine for rendering dynamic HTML pages
Bootstrap 5	Frontend styling and responsive design
Flask-Login	User authentication and session management
SQLite	Lightweight local database for storing user data

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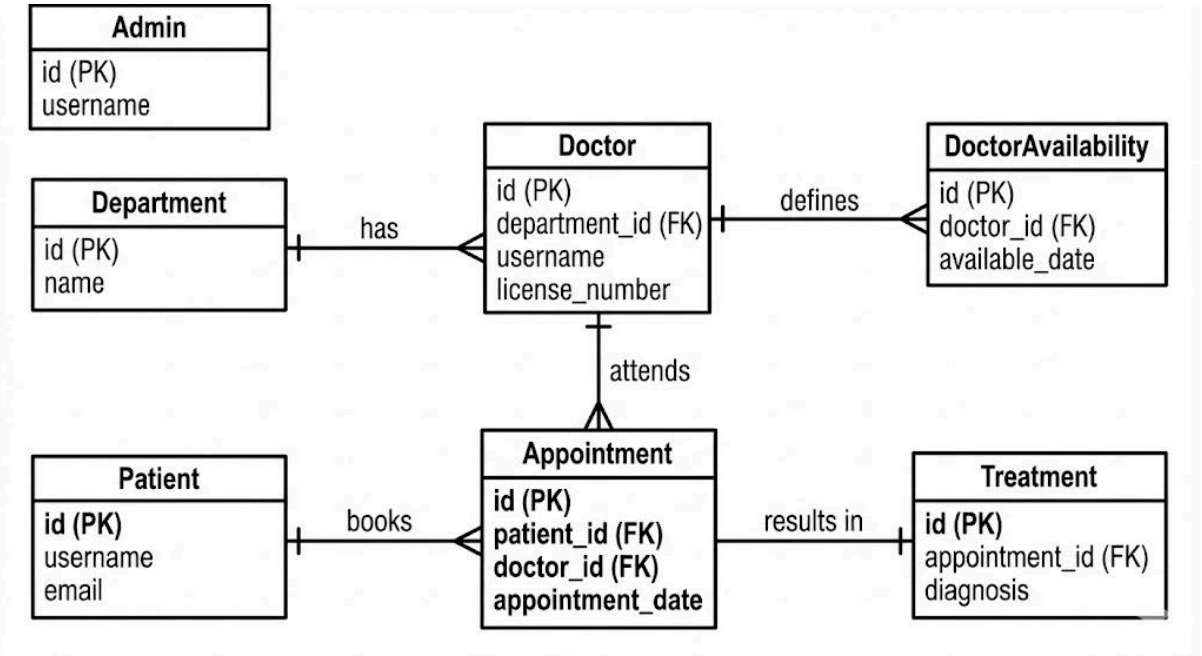
5. Database Schema / ER Diagram

Relationships:

- `ADMIN [id, username]`
- `DEPARTMENT [id, name] -< DOCTOR`
- `DOCTOR [id, dept_id] -< APPOINTMENT`
- `DOCTOR [id] -< AVAILABILITY`
- `PATIENT [id, name] -< APPOINTMENT`
- `APPOINTMENT [id, doc_id, pat_id] - TREATMENT [id, appt_id]`



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6. Architecture and Features

Architecture Overview:

- **app.py** – main Flask application entry point
- **app/models.py** – database models using SQLAlchemy
- **app/routes** – Flask Blueprints for user and activity routes
- **app/templates** – Jinja2 HTML templates
- **app/static** – CSS, JS files
- **Requirements.txt**

Implemented Features:

Patient registration and login
Doctor registration and login
Admin login

Responsive UI built with Bootstrap
Fully functional and mobile friendly design

Appointment scheduling mechanism
Dynamic schedules management for doctors and patients
Searching based on specialisation and availability and departments

Patients , Doctors can edit their profiles
Admin is superuser and can edit , block and manage profiles and appointmnets

Additional Features:

- Treatment history with prescribed medicines and notes
- Responsive management system for user and admin to manage reschedule or cancel appointments

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8. Video Presentation

Drive Link:
https://drive.google.com/file/d/1a0wNBUuafTLDGWo5Ro2F2m03-_BJLNMn/view?usp=drive_link
(Accessible to all with “View” permission.)