App Dev Project Report

1. Student Details

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About Me:
 I am a Course Instructor at the IIT Madras BS Degree Program with a strong interest in full-stack application development. I enjoy designing structured, efficient, and user-friendly systems that solve real-world problems. My focus lies in building applications that combine clean architecture, data management, and usability.

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2. Project Details

Project Title:

Hospital Management App

Problem Statement:

To design and build a structured web-based Hospital Management System (HMS) that helps hospitals manage patient records, doctor schedules, appointments, medical reports, and billing efficiently.
 The main goal is to reduce manual paperwork and streamline core operations.

Approach:

The application is built using **Flask** with a modular MVC-based structure.
 It allows hospital administrators, doctors, and staff to:

- Register patients and maintain records
- Handle appointments and doctor availability
- Manage prescriptions and medical reports

The UI is developed with **Bootstrap 5**, and **Jinja2 templates** render all dynamic content. SQLite is used as the backend database. Proper validations, form structures, and session handling ensure secure operations.

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4. Technologies and Frameworks Used

Technology / Library	Purpose
Flask	Core backend framework
SQLAlchemy	ORM for SQLite database
Jinja2	HTML template rendering
Bootstrap 5	Responsive UI design
Flask-Login	User authentication and access control
SQLite	Lightweight database to store hospital data

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5. Database Schema / ER Diagram

Tables:

User

- id
- name
- email
- password
- role (admin / doctor / staff)

Patient

- id
- name
- age
- gender

- contact
- address
- medical_history

Doctor

- id
- name
- specialization
- availability
- experience
- contact

Appointment

- id
- patient_id
- doctor_id
- date
- time
- status

MedicalRecord

- id
- patient_id
- doctor_id
- diagnosis
- prescription
- date

Relationships:

- **User → (Admin/Doctor/Staff)**
- **Patient —< Appointment >— Doctor**
- **Patient —< MedicalRecord**
- **Patient —< Billing**

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6. Architecture and Features

Architecture Overview

```
Hospital-Management-System/
│
├── app/
│   ├── __pycache__/
│   ├── __init__.py
│   ├── config.py
│   ├── controllers.py
│   ├── database.py
│   └── model.py
│
├── database/
│   └── project_db.sqlite3
│
├── database_directory/
│   └── project_db.sqlite3
│
├── static/
│   ├── bootstrap/
│   └── images/
│       ├── hms-home.jpg
│       └── hospital-bg.jpg
│
├── templates/
│   ├── admin_dashboard.html
│   ├── Create_doc.html
│   ├── Department.html
│   ├── doctor_availability.html
│   ├── doctor_dashboard.html
│   ├── doctor_detail.html
│   ├── edit_doctor.html
│   ├── edit_my_profile.html
│   ├── edit_patient.html
│   ├── home.html
│   ├── login.html
│   ├── Manage_appointments.html
│   ├── Manage_doctor.html
│   ├── Manage_patient.html
│   ├── new_appointment.html
│   ├── patient_book_doctor.html
│   ├── patient_dashboard.html
```

```
|     ├── patient_history.html
|     ├── search.html
|     ├── sign_up.html
|     ├── ad_search.html
|     └── update_patient_history.html
|
├── venv/
|
├── main.py
├── requirements.txt
└── README.md
```

Implemented Features:

Admin Features

```
• Add/Edit/Delete Doctors
• Add/Edit/Delete Patients
• Manage Departments
• Monitor Appointments
• Dashboard with system statistics
```

Doctor Features

```
• Doctor login
• Manage availability
• View booked appointments
• Manage patient history
• update/add medical record
```

Patient-Related Features

```
• Patient registration and login
• Book appointment with doctor
• View own history & prescriptions
• Manage profile
```

Additional Features

- Role-based dashboard UI
- Clean mobile-responsive interface

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7. Video Presentation

Drive Link:
https://drive.google.com/file/d/1whpcRcIT9h4IobqGHJBADt8MaE0NNAjU/view?usp=sharing