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# Hospital Management System (HMS)

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Common Project Documentation



**PREPARED BY**

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## 1. Project Goals & Objectives

### Overview

- This project aims to develop a basic **Hospital Management System** that allows users to manage data related to doctors, departments, patients, and appointments efficiently.
- The application should include CRUD operations, session management, filter & validations for all required screens.

### Goals

- **Design a Normalized Database Structure:**
  - Create efficient and normalized tables to manage Users, Doctors, Departments, Patients, and Appointments.
  - Implement proper primary and foreign key relationships, including a many-to-many association as and when required.
- **Implement CRUD & Authentication Functionality:**
  - Develop Create, Read, Update, and Delete operations for all major entities.
  - Ensure smooth user interaction and data management through forms and listings with login/logout & user registration.
- **Ensure Data Integrity and Validation:**
  - Apply appropriate validations on input fields and ensure data consistency.
- **Develop an Intuitive User Interface:**
  - Provide a clean and easy-to-use frontend for managing hospital operations.
- **Encourage Good Software Development Practices:**
  - Apply modular coding, separation of concerns, and basic MVC principles.

### Objectives

- **Doctor Management:**
  - Enable users to create, view, edit, and delete doctor profiles, including personal and professional information.
- **Department Management:**
  - Allow the creation and management of medical departments, and associate one or more departments with individual doctors.
- **Patient Registration and Management:**
  - Provide functionality to register new patients, view their records, and update or delete them as needed.
- **Appointment Scheduling:**
  - Facilitate the scheduling, updating, viewing, and cancellation of appointments between doctors and patients.
- **Doctor-Department Association:**
  - Maintain a many-to-many relationship between doctors and departments using a mapping table (DoctorDepartment).
- **Data Integrity and Validation:**
  - Ensure valid, consistent data input and storage through appropriate field validations and relational constraints.

## 2. Scope of the Project

- **Doctor and Department Management**
  - Ability for administrators to manage doctor records.
  - Create and manage departments with specialization tags.
  - Associate doctors with one or more departments through DoctorDepartment.
- **Patient Management**
  - Register new patients with contact and medical details.
  - View and update existing patient records.
  - Delete records when no longer needed (soft delete).
- **Appointment Booking and Tracking**
  - Schedule appointments by selecting available doctors and patients.
  - View appointment lists by doctor, department, or patient.
  - Cancel or reschedule appointments with status updates.
- **Dashboard and Data Overview/Statistics**
  - Display key information such as upcoming appointments, available doctors, and department-wise doctor listings.
- **Input Validation and Error Handling**
  - Ensure all inputs are validated for correctness.
  - Proper error messages and user-friendly alerts for invalid actions.

## 3. Project Timeline

Week No.	Week Date	Task List
1	16-06-25 to 21-06-25	To study/analysis different hospital management systems (Mobile app or web), for the understanding of project & Database Design.
2	23-06-25 to 28-06-25	Database Schema – Stored Procedure Creation
3	30-06-25 to 05-07-25	Start Screen Design with Common Layout
4	07-07-25 to 12-07-25	Screen Designs: List Pages and Add/Edit Page
5	14-07-25 to 19-07-25	Prepare Model Classes for the Project with Appropriate Data Annotations/Validations
6	21-07-25 to 26-07-25	CRUD Operation for Single Module/Table
7	28-07-25 to 02-08-25	CRUD Operation 2-3 Module/Table

8	04-08-25 to 08-08-25	CRUD Operation 2 Module/Table
9	11-08-25 to 14-08-25	Export Functionality in All List Pages
10	19-08-25 to 23-08-25	Dashboard Design/Implementation
11	25-08-25 to 30-08-25	Session Management: Implement Login, Logout & User Registration Functionality
12	01-09-25 to 04-09-25	Final Evaluation

#### 4. Database Overview

User		
ColumnName	DataType	Remarks
UserID	Int	PK, AutoIncrement
UserName	Nvarchar(100)	Not Null
Password	Nvarchar(100)	Not Null
Email	Nvarchar(100)	Not Null
MobileNo	Nvarchar(100)	Not Null
IsActive	Bit	Not Null, default 1
Created	DateTime	Default GetDate()
Modified	DateTime	Not Null

Department		
ColumnName	DataType	Remarks
DepartmentID	Int	PK, AutoIncrement
DepartmentName	NVarchar(100)	Not Null
Description	NVarchar(250)	Allow Null
IsActive	Bit	Not Null, default 1
Created	DateTime	Not Null, Default GetDate()
Modified	DateTime	Not Null
UserID	Int	FK_User, Not Null

Doctor		
ColumnName	DataType	Remarks
DoctorID	Int	PK, Auto Increment

Name	Nvarchar(100)	Not Null
Phone	Nvarchar(20)	Not Null
Email	Nvarchar(100)	Not Null
Qualification	Nvarchar(100)	Not Null
Specialization	Nvarchar(100)	Not Null
IsActive	Bit	Not Null, default 1
Created	DateTime	Not Null, Default GetDate()
Modified	DateTime	Not Null
UserID	Int	FK_User, Not Null

### DoctorDepartment

ColumnName	DataType	Remarks
DoctorDepartmentID	Int	PK, AutoIncrement
DoctorID	Int	FK_Doctor, Not Null
DepartmentID	Int	FK_Department, Not Null
Created	DateTime	Not Null, Default GetDate()
Modified	DateTime	Not Null
UserID	Int	FK_User, Not Null

### Patient

ColumnName	DataType	Remarks
PatientID	Int	PK, AutoIncrement
Name	NVarchar(100)	Not Null
DateOfBirth	DateTime	Not Null
Gender	NVarchar(10)	Not Null
Email	NVarchar(100)	Not Null
Phone	NVarchar(100)	Not Null
Address	NVarchar(250)	Not Null
City	NVarchar(100)	Not Null
State	NVarchar(100)	Not Null
IsActive	Bit	Not Null, default 1
Created	DateTime	Not Null, Default GetDate()
Modified	DateTime	Not Null
UserID	Int	FK_User, Not Null

### Appointment

ColumnName	DataType	Remarks
AppointmentID	Int	PK, AutoIncrement
DoctorID	Int	FK_Doctor, Not Null
PatientID	Int	FK_Patient, Not Null

AppointmentDate	DateTime	Not Null
AppointmentStatus	NVarchar(20)	Not Null
Description	NVarchar(250)	Not Null
SpecialRemarks	NVarchar(100)	Not Null
Created	DateTime	Not Null, Default GetDate()
Modified	DateTime	Not Null
UserID	Int	FK_User, Not Null
TotalConsultedAmount	Decimal(5,2)	Null

## 5. Functional Requirements

### User Management: **Priority - 6**

- **Registration**
  - Fields: UserName, Password, Email, Mobile
  - Validation:
    - ✓ UserName: Required, max 100 characters
    - ✓ Password: Required, min 8 characters with alphanumeric and special characters
    - ✓ Email: Valid email format
    - ✓ Mobile: Valid mobile number, max 15 characters
- **Login**
  - Fields: UserName/Email, Password
  - Functionality:
    - ✓ Authenticate users using UserName/Email and Password
    - ✓ Maintain session for logged-in users

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### Department Management: **Priority - 1**

- User can add, edit, view, and delete departments for they own.
- Fields: DepartmentName, Description
- Validation Rules:
  - ✓ DepartmentName: Required, max 100 characters
  - ✓ Description: Optional, max 250 characters

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### Doctor Management: **Priority - 2**

- Admin can add, edit, view, and delete doctors for they own.
- Fields: Name, Phone, Email, Qualification, Specialization
- Validation Rules:
  - ✓ Name: Required, max 100 characters
  - ✓ Phone: Required, max 20 characters
  - ✓ Email: Required, max 100 characters
  - ✓ Qualification: Required, max 100 characters

- ✓ Specialization: Required, max 100 characters
- 

#### **Doctor-Departments Management: Priority - 4**

- User can add, edit, view, and delete doctor-departments for they own.
  - Fields: DepartmentName, DoctorName
  - Validation Rules:
    - ✓ DepartmentName: Required, Department Selection
    - ✓ DoctorName: Required, Selection of Doctor we want to assign in department
- 

#### **Patient Management: Priority - 3**

- Admin can add, edit, view, and delete patients for they own.
  - Fields: Name, DateOfBirth, Gender, Email, Phone, Address, City, State
  - Validation Rules:
    - ✓ Name: Required, max 100 characters
    - ✓ DateOfBirth: Required, Date Selection
    - ✓ Gender: Required, Selection
    - ✓ Email: Required, max 100 characters
    - ✓ Phone: Required, max 20 characters
    - ✓ Address: Required, max 250 characters
    - ✓ City: Required, max 100 characters
    - ✓ State: Required, max 100 characters
- 

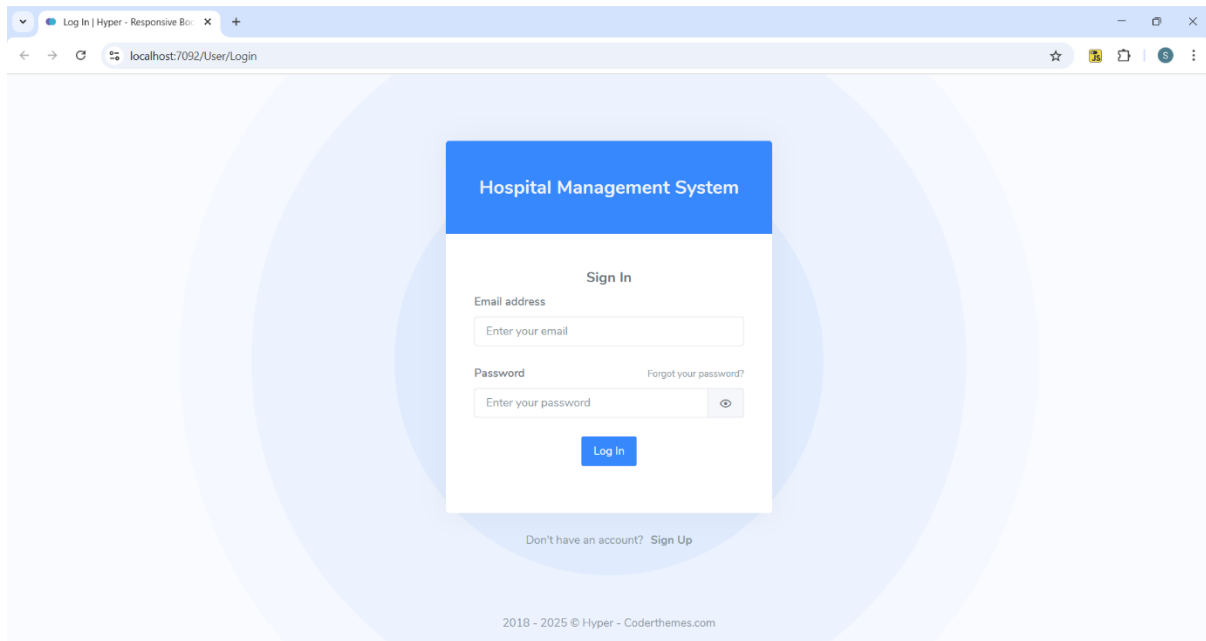
#### **Appointment Management: Priority - 5**

- Admin can add, edit, view, and delete appointments for their patients.
- Fields: PatientName, DepartmentName, DoctorName, AppointmentDate, AppointmentStatus, Description, SpecialRemarks
- Validation Rules:
  - ✓ PatientName: Required, Selection of Patient
  - ✓ DepartmentName: Required, Selection of Department
  - ✓ DoctorName: Required, Selection of Doctor
  - ✓ AppointmentDate: Required, Selection of Date
  - ✓ AppointmentStatus: Required, Default Pending
  - ✓ Description: Optional, max 250 characters
  - ✓ SpecialRemarks: Optional, max 250 characters



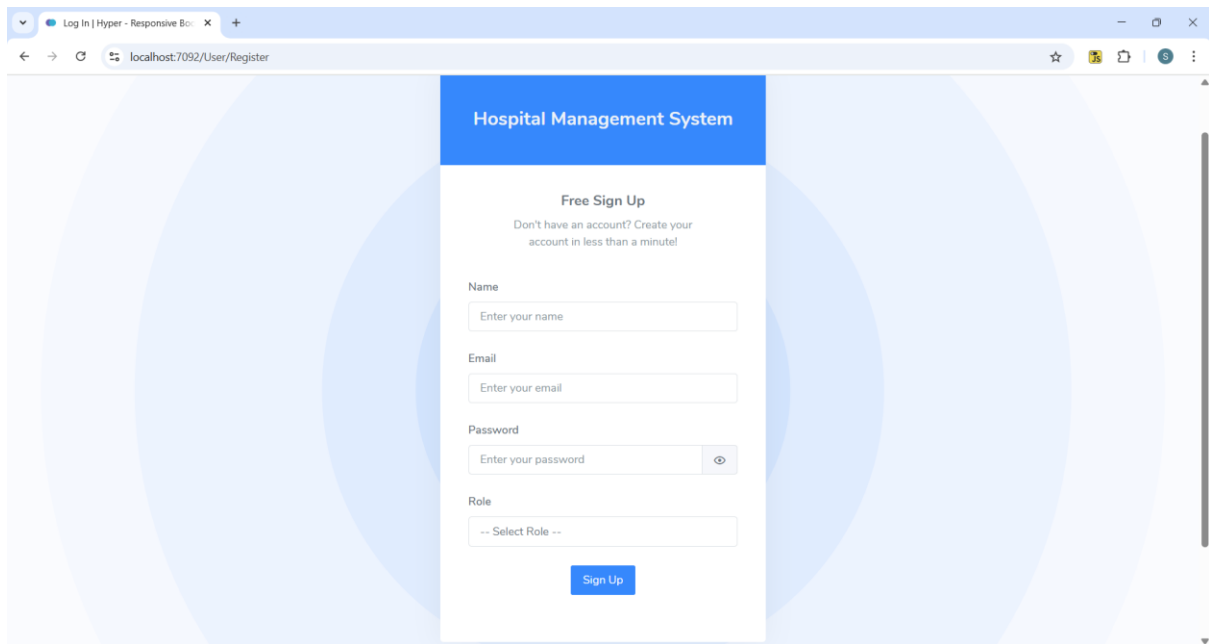
## 6. Screen Design Reference

### Login Page



The screenshot displays a web browser window with the address bar showing 'localhost:7092/User/Login'. The page features a light blue background with a large, faint circular pattern. In the center, there is a white login card with a blue header that reads 'Hospital Management System'. Below the header, the card is titled 'Sign In'. It contains two input fields: 'Email address' with the placeholder text 'Enter your email', and 'Password' with the placeholder text 'Enter your password'. A 'Forgot your password?' link is positioned to the right of the password field. A blue 'Log In' button is located at the bottom of the card. Below the card, there is a link that says 'Don't have an account? Sign Up'. At the very bottom of the page, a copyright notice reads '2018 - 2025 © Hyper - Coderthemes.com'.

## Sign-Up Page



**Hospital Management System**

**Free Sign Up**  
Don't have an account? Create your account in less than a minute!

Name  
Enter your name

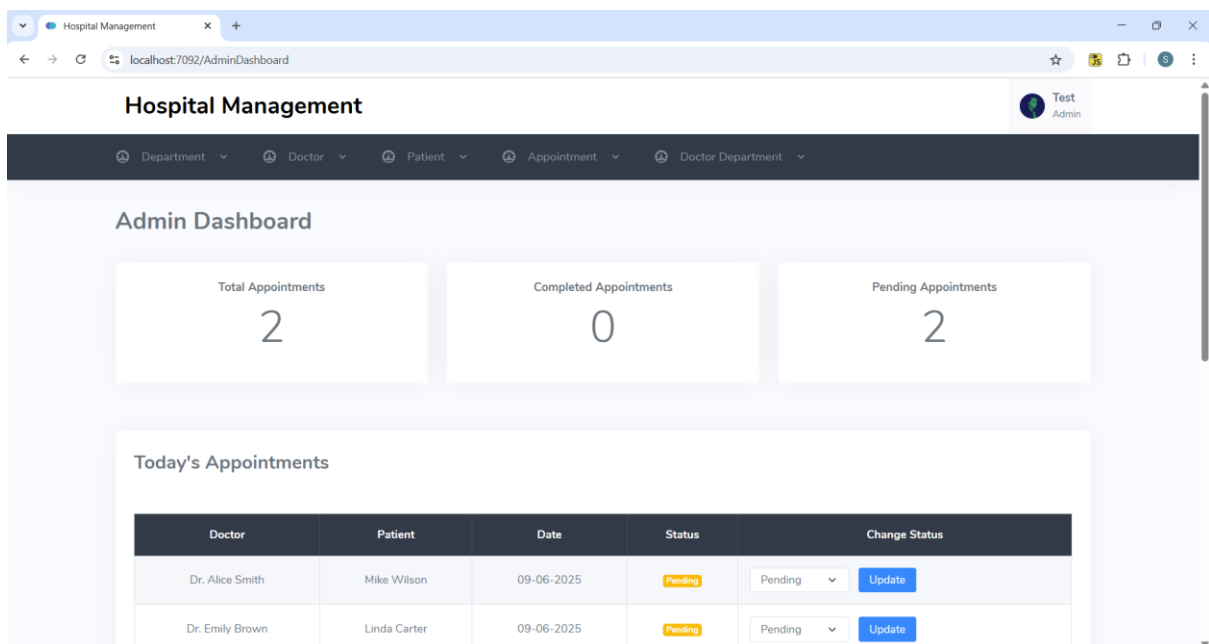
Email  
Enter your email

Password  
Enter your password

Role  
-- Select Role --

**Sign Up**

## Dashboard



**Hospital Management**

Test Admin

Department Doctor Patient Appointment Doctor Department

**Admin Dashboard**

Total Appointments  
2

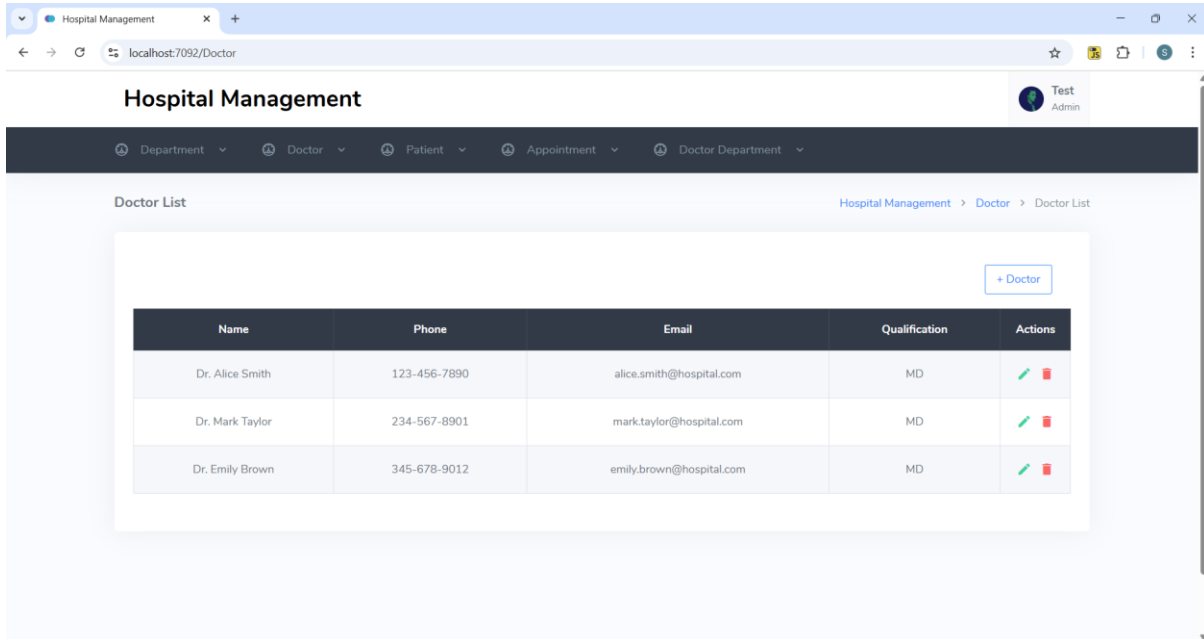
Completed Appointments  
0

Pending Appointments  
2

**Today's Appointments**

Doctor	Patient	Date	Status	Change Status
Dr. Alice Smith	Mike Wilson	09-06-2025	Pending	Pending <b>Update</b>
Dr. Emily Brown	Linda Carter	09-06-2025	Pending	Pending <b>Update</b>

## Doctor List Page



**Hospital Management**

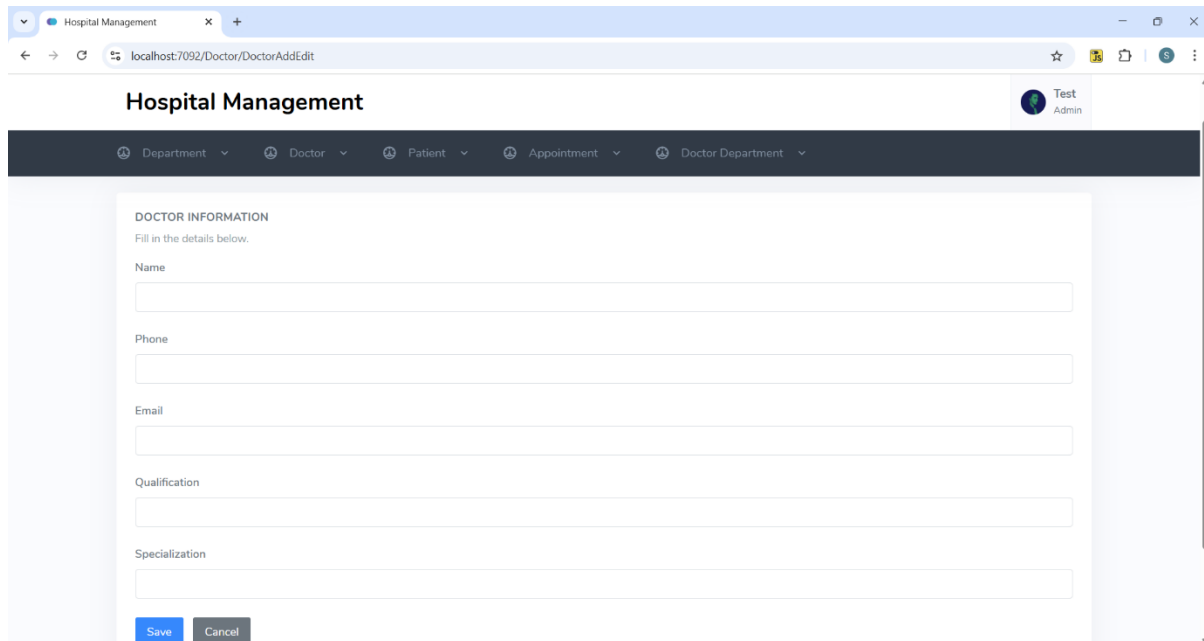
Department ▾ Doctor ▾ Patient ▾ Appointment ▾ Doctor Department ▾

Doctor List Hospital Management > Doctor > Doctor List

[+ Doctor](#)

Name	Phone	Email	Qualification	Actions
Dr. Alice Smith	123-456-7890	alice.smith@hospital.com	MD	<a href="#">Edit</a> <a href="#">Delete</a>
Dr. Mark Taylor	234-567-8901	mark.taylor@hospital.com	MD	<a href="#">Edit</a> <a href="#">Delete</a>
Dr. Emily Brown	345-678-9012	emily.brown@hospital.com	MD	<a href="#">Edit</a> <a href="#">Delete</a>

## Doctor Add/Edit Page



**Hospital Management**

Department ▾ Doctor ▾ Patient ▾ Appointment ▾ Doctor Department ▾

Doctor Add/Edit Hospital Management > Doctor > Doctor Add/Edit

**DOCTOR INFORMATION**  
Fill in the details below.

Name

Phone

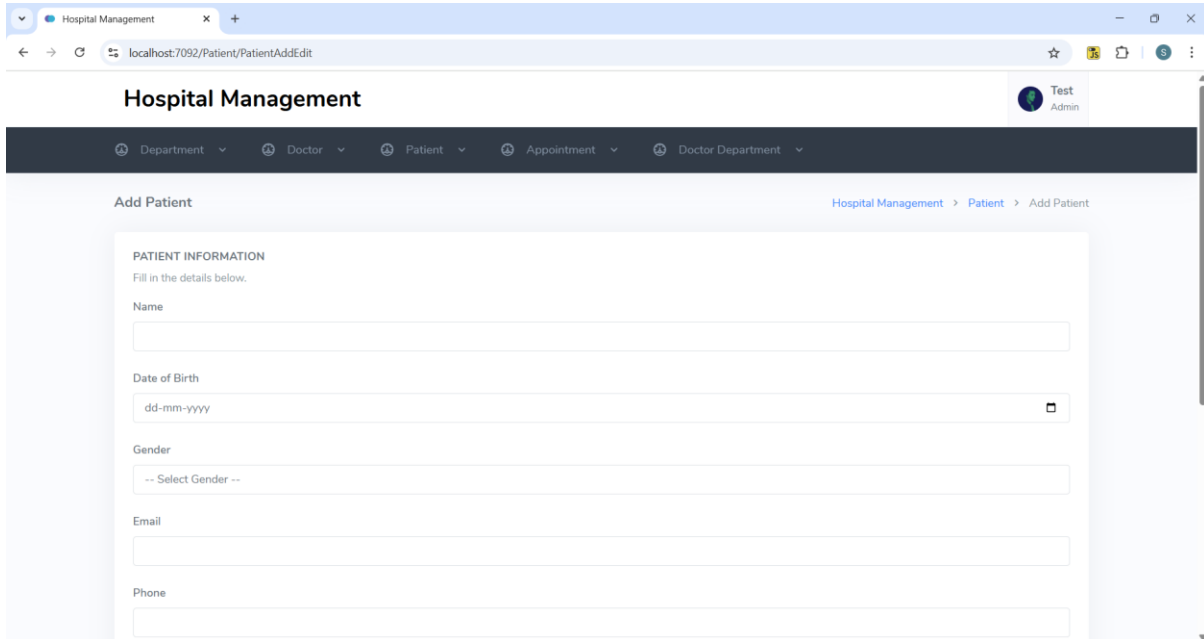
Email

Qualification

Specialization

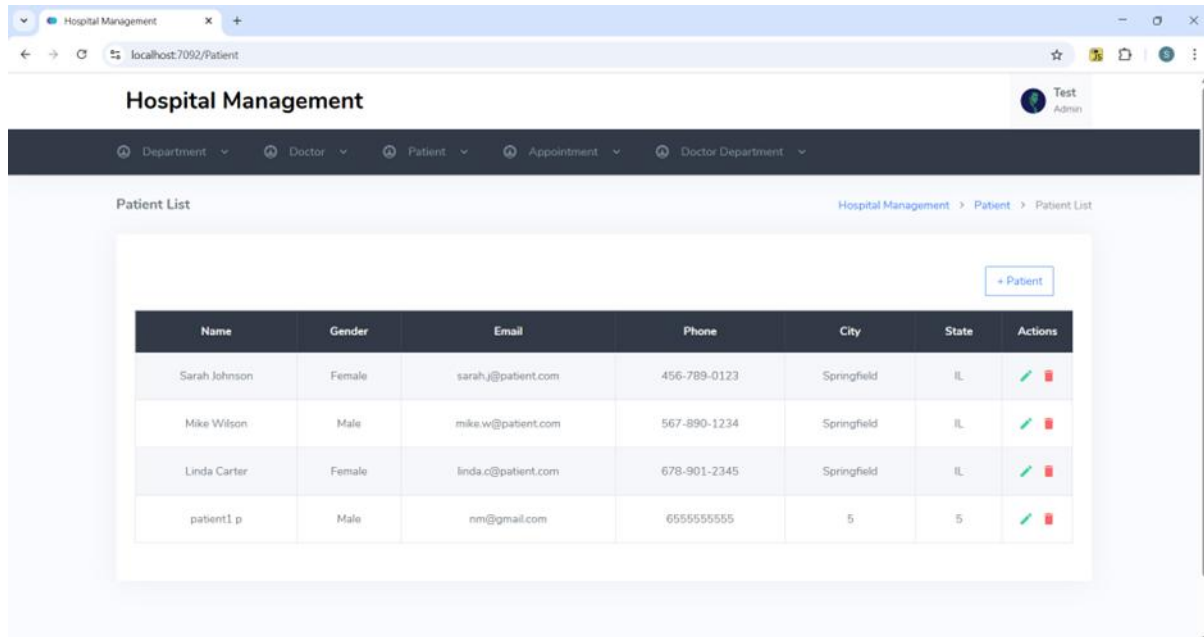
[Save](#) [Cancel](#)

## Patient Add/Edit Page











The screenshot shows the 'Add Patient' page of the Hospital Management application. The page has a dark blue header with the application name 'Hospital Management' and a user profile 'Test Admin'. Below the header is a navigation bar with dropdown menus for Department, Doctor, Patient, Appointment, and Doctor Department. The main content area is titled 'Add Patient' and contains a form for entering patient information. The form includes fields for Name, Date of Birth (with a date picker), Gender (a dropdown menu), Email, and Phone. The breadcrumb trail at the top right reads 'Hospital Management > Patient > Add Patient'.

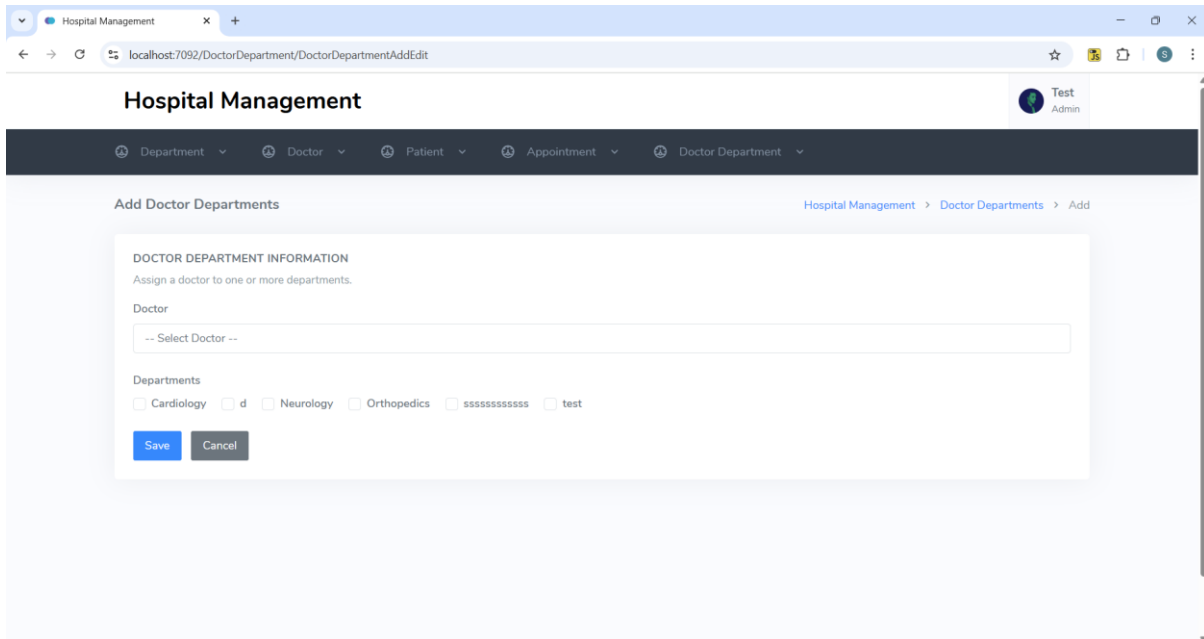
## Patient List Page



The screenshot shows the 'Patient List' page of the Hospital Management application. The page has the same header and navigation bar as the previous page. The main content area is titled 'Patient List' and contains a table of patients. A '+ Patient' button is located at the top right of the table. The table has columns for Name, Gender, Email, Phone, City, State, and Actions. The breadcrumb trail at the top right reads 'Hospital Management > Patient > Patient List'.

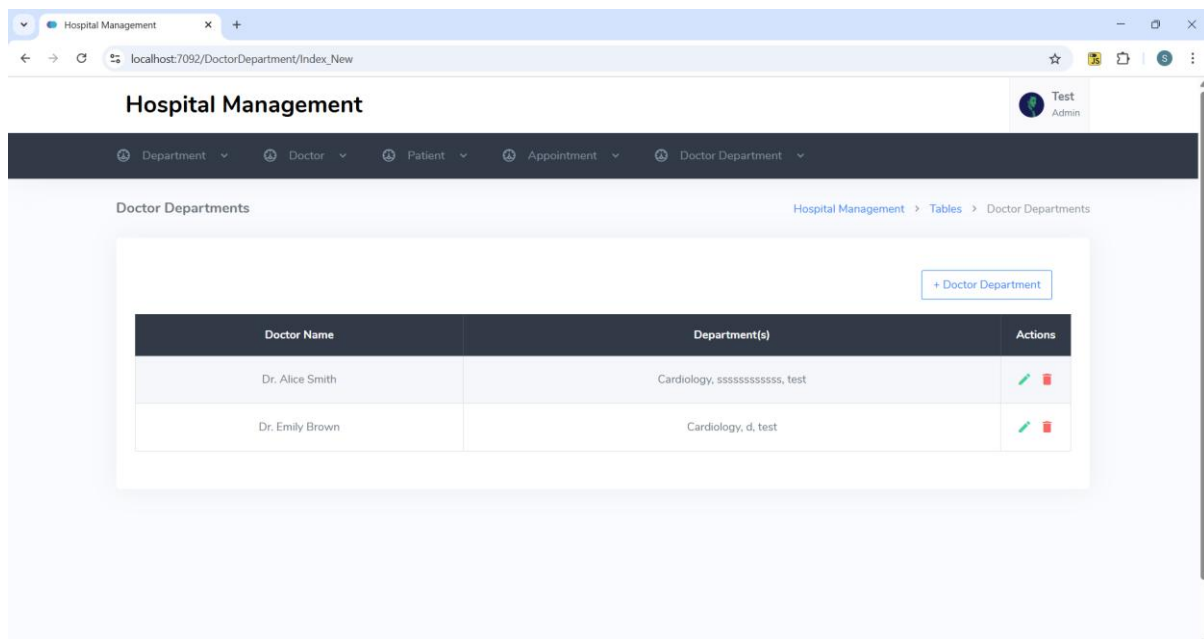
Name	Gender	Email	Phone	City	State	Actions
Sarah Johnson	Female	sarah.j@patient.com	456-789-0123	Springfield	IL	 
Mike Wilson	Male	mike.w@patient.com	567-890-1234	Springfield	IL	 
Linda Carter	Female	linda.c@patient.com	678-901-2345	Springfield	IL	 
patient1 p	Male	nm@gmail.com	6555555555	5	5	 

## Doctor-Department Add/Edit Page







The screenshot shows the 'Add Doctor Departments' form in the Hospital Management application. The form is titled 'DOCTOR DEPARTMENT INFORMATION' and includes a sub-header 'Assign a doctor to one or more departments.' Below this, there is a 'Doctor' dropdown menu with the placeholder text '-- Select Doctor --'. Under the 'Departments' section, there are checkboxes for 'Cardiology', 'd', 'Neurology', 'Orthopedics', 'ssssssssss', and 'test'. At the bottom of the form, there are 'Save' and 'Cancel' buttons. The breadcrumb trail at the top right reads 'Hospital Management > Doctor Departments > Add'.

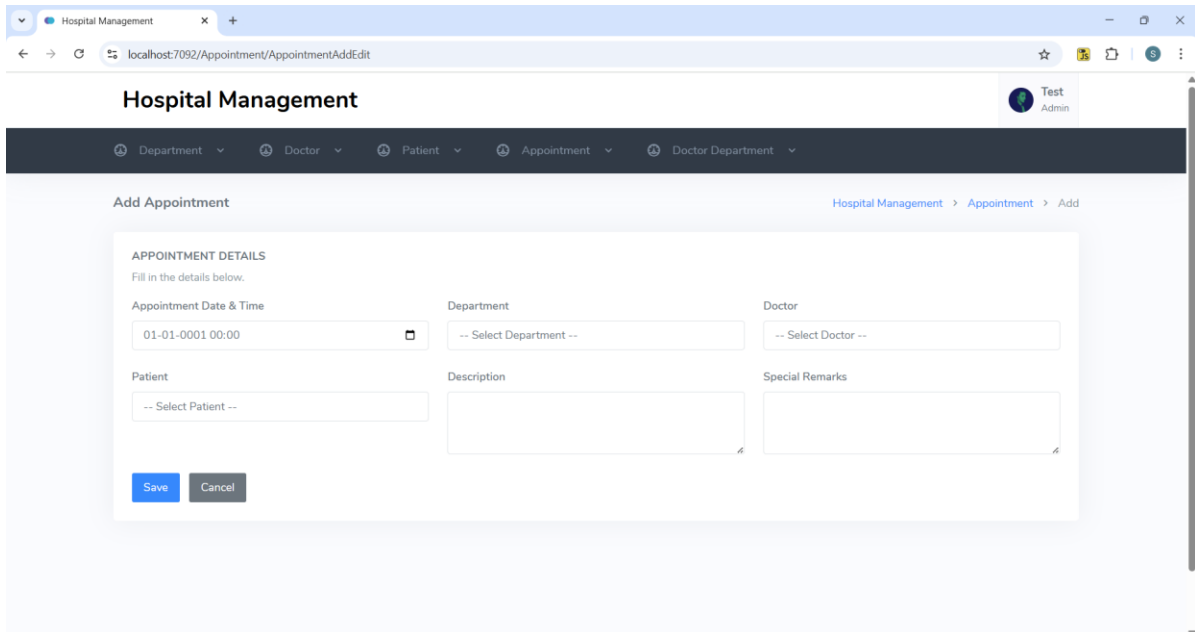
## Doctor-Department List Page



The screenshot shows the 'Doctor Departments' list page in the Hospital Management application. The page features a table with two columns: 'Doctor Name' and 'Department(s)', and an 'Actions' column. The table contains two rows of data. Above the table, there is a '+ Doctor Department' button. The breadcrumb trail at the top right reads 'Hospital Management > Tables > Doctor Departments'.

Doctor Name	Department(s)	Actions
Dr. Alice Smith	Cardiology, sssssssssss, test	 
Dr. Emily Brown	Cardiology, d, test	 

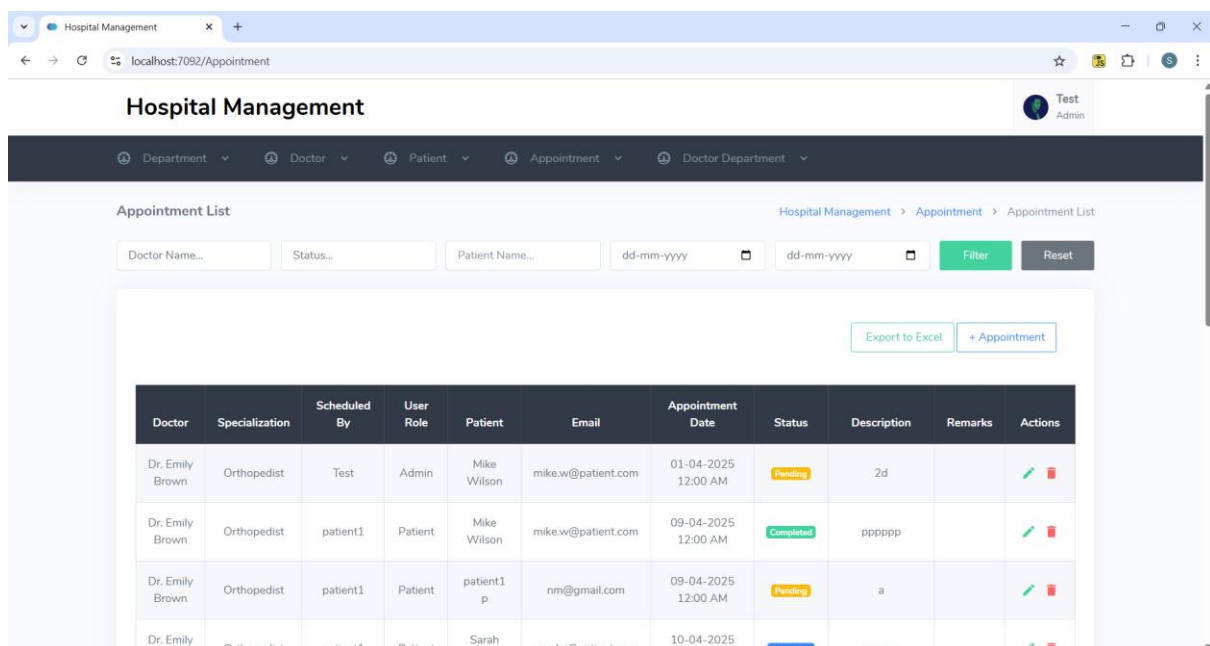
## Appointment Add/Edit Page



The screenshot shows the 'Appointment Add/Edit' page. The page has a header with 'Hospital Management' and a user profile 'Test Admin'. Below the header is a navigation bar with links: Department, Doctor, Patient, Appointment, and Doctor Department. The main content area is titled 'Add Appointment' and contains a form with the following fields:

- APPOINTMENT DETAILS**: Fill in the details below.
- Appointment Date & Time**: 01-01-0001 00:00
- Department**: -- Select Department --
- Doctor**: -- Select Doctor --
- Patient**: -- Select Patient --
- Description**: (Empty text area)
- Special Remarks**: (Empty text area)
- Buttons**: Save, Cancel









## Appointment List Page



The screenshot shows the 'Appointment List' page. The page has a header with 'Hospital Management' and a user profile 'Test Admin'. Below the header is a navigation bar with links: Department, Doctor, Patient, Appointment, and Doctor Department. The main content area is titled 'Appointment List' and contains a table with the following columns:

- Doctor
- Specialization
- Scheduled By
- User Role
- Patient
- Email
- Appointment Date
- Status
- Description
- Remarks
- Actions

Below the table are buttons for 'Export to Excel' and '+ Appointment'.

Doctor	Specialization	Scheduled By	User Role	Patient	Email	Appointment Date	Status	Description	Remarks	Actions
Dr. Emily Brown	Orthopedist	Test	Admin	Mike Wilson	mike.w@patient.com	01-04-2025 12:00 AM	Pending	2d		 
Dr. Emily Brown	Orthopedist	patient1	Patient	Mike Wilson	mike.w@patient.com	09-04-2025 12:00 AM	Completed	pppppp		 
Dr. Emily Brown	Orthopedist	patient1	Patient	patient1 p	nm@gmail.com	09-04-2025 12:00 AM	Pending	a		 
Dr. Emily	Orthopedist	patient1	Patient	Sarah	sarah@patient.com	10-04-2025	Scheduled	ssssss		 

*Best of luck!*