

## **Clinic Management System**

**Course:** Information Systems — CMPn325

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**Level:** Level 2 Computer

**Term:** First Term: 2025–2026

# Abstract

The Clinic Management System is a web-based application designed to streamline clinic operations through a centralized digital platform. The system provides secure access through user authentication, including sign up and login functionality, and offers separate dashboards for patients, doctors, and administrators.

Patients can request appointments with doctors and view their medical information. Doctors can manage their schedules, view their assigned patients, and add prescriptions. The administrator oversees the entire system, with the ability to add and manage doctors, patients, appointments, and prescriptions. The system enhances efficiency, reduces human error, and improves communication within the clinic.

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## 4. System Development Life Cycle (SDLC)

### 4.1 Investigation

- The investigation phase identifies existing problems in clinic operations and determines the need for digital transformation.

- Identify issues in patient registration, appointment scheduling, and record management.
- Understand user needs for patients, doctors, and administrators.
- Determine system goals and required enhancements.

### Feasibility Study

The feasibility study evaluates whether the system can be developed and implemented effectively.

#### a. Technical Feasibility

- The system can be developed using web technologies (frontend, backend, relational database).
- No special hardware is required beyond standard clinic computers and internet access.

#### b. Operational Feasibility

- Doctors, patients, and staff can easily use the system.
- The system reduces paperwork, minimizes errors, and improves workflow.

### **c. Economic Feasibility**

- Development cost is justified by long-term savings in clinic operations.
- The system reduces manual labor and administrative overhead.

### **d. Schedule Feasibility**

- The timeline for development is realistic and follows SDLC phases.

## **4.2 Analysis**

- During this phase, system requirements are collected and analyzed to build a functional model of the clinic workflow.

### **Functional Requirements**

#### **Input Requirements**

- Patient registration via sign up.
- Login credentials for authentication (JWT).
- Appointment requests submitted by patients.
- Prescription details entered by doctors.
- Doctor, patient, medicine, and appointment data entered by admin.

#### **Output Requirements**

- Patient dashboard displaying appointments and prescriptions.
- Doctor dashboard displaying scheduled appointments and patient details and prescriptions.
- Admin dashboard showing management tools.

#### **Processing Requirements**

- Authenticate users using **JWT tokens**.
- Authorize access based on user roles (patient, doctor, admin).
- Process patient appointment requests.
- Allow doctors to create prescriptions.
- Allow admin to add/edit doctors, patients, appointments, prescriptions
- Update dashboards dynamically.

### **Storage Requirements**

- Relational database storage (Oracle DB)

### **Control Requirements**

- Role-based access control using JWT.
- Audit logging for all data changes.
- Encryption of sensitive patient data.
- Input validation mechanisms to ensure data integrity.

### **Non-Functional Requirements:**

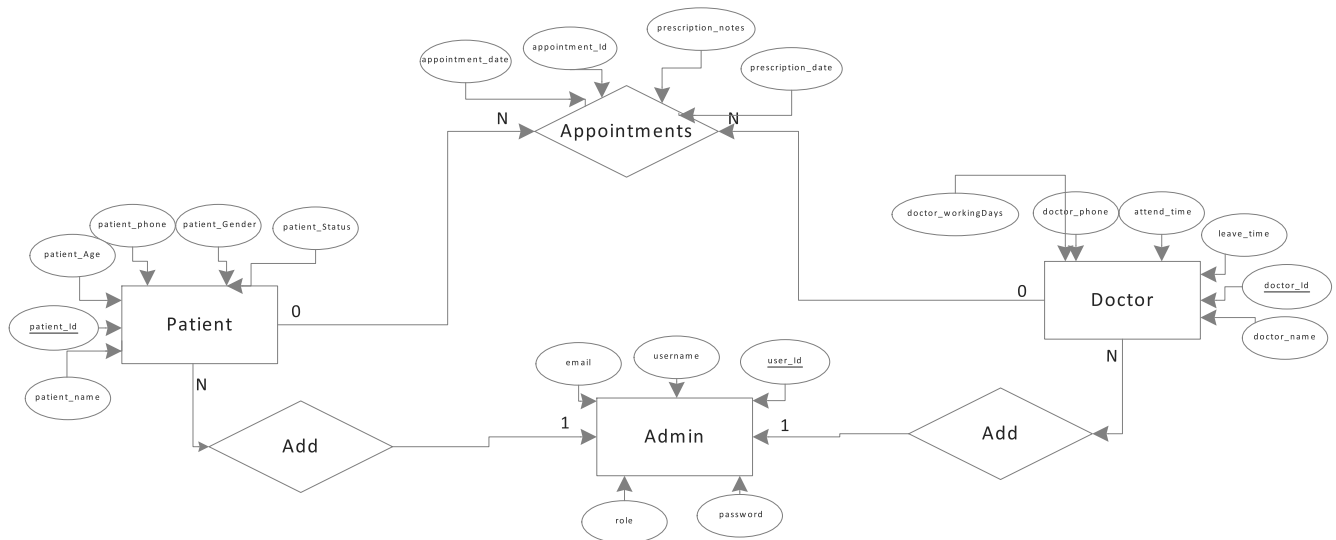
- Security, data validation, and encryption
- High performance and system reliability
- User-friendly interface

## **4.3 Design**

### **User Interface Design:**

- Login / Signup pages
- Patient dashboard (appointments, prescriptions)
- Doctor dashboard (appointments, patients, prescriptions)
- Admin dashboard (full management tools)

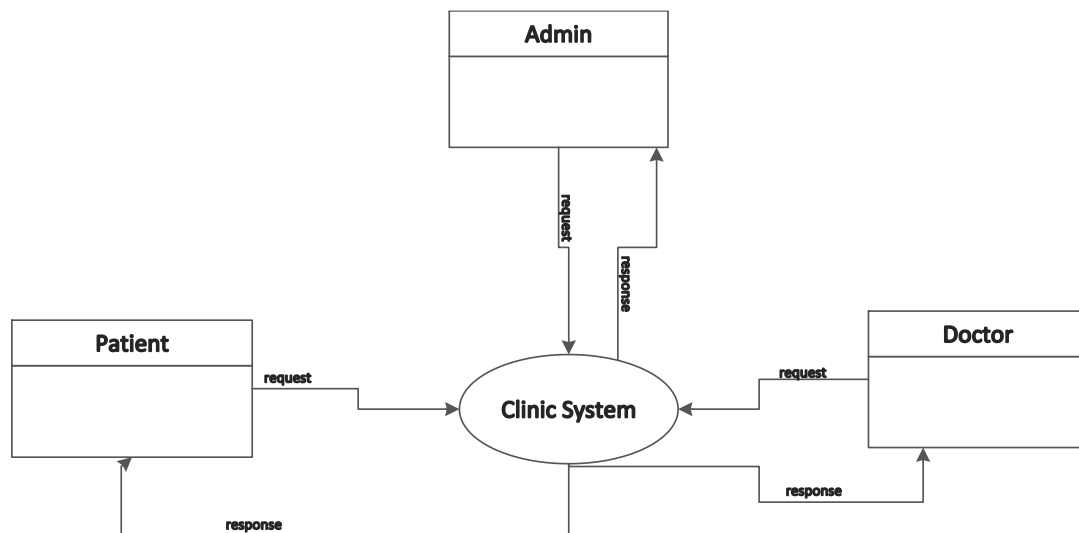
## Data Design (ERD):



## Process Design

- Patient booking workflow
- Doctor prescription workflow
- Admin management workflow
- DFD Levels 0, 1, 2 for modeling data flow

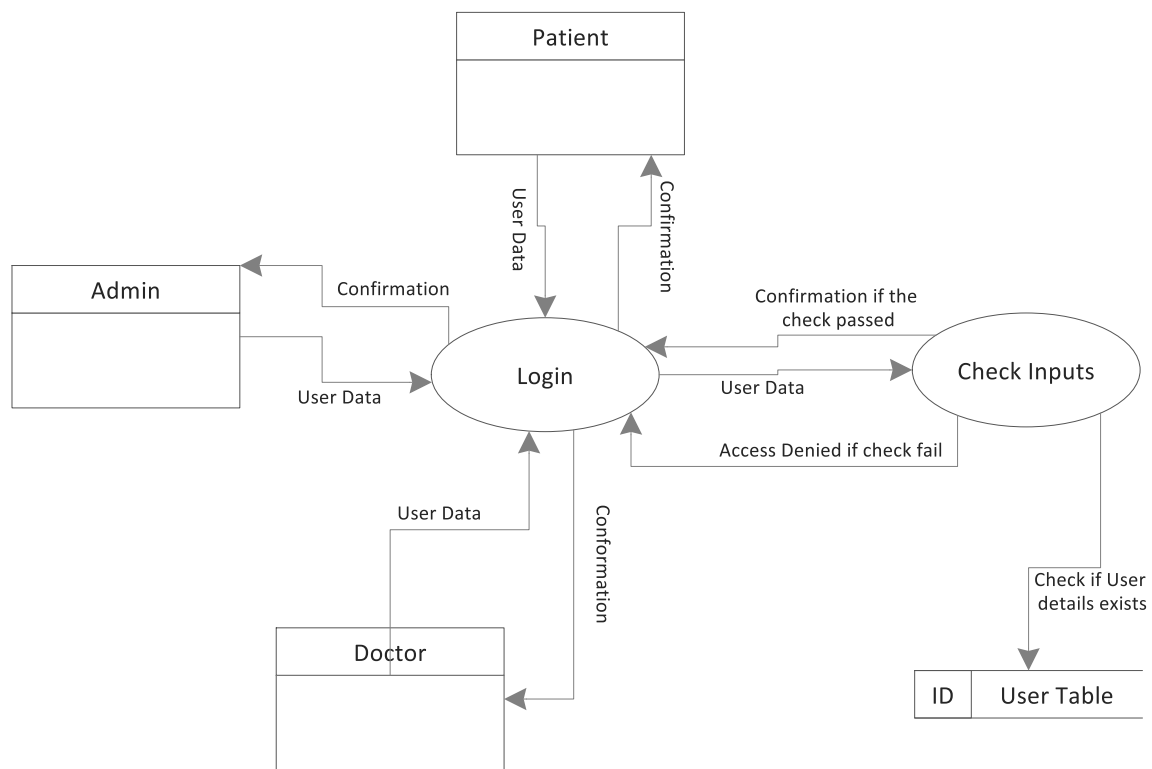
### DFD Level 0:



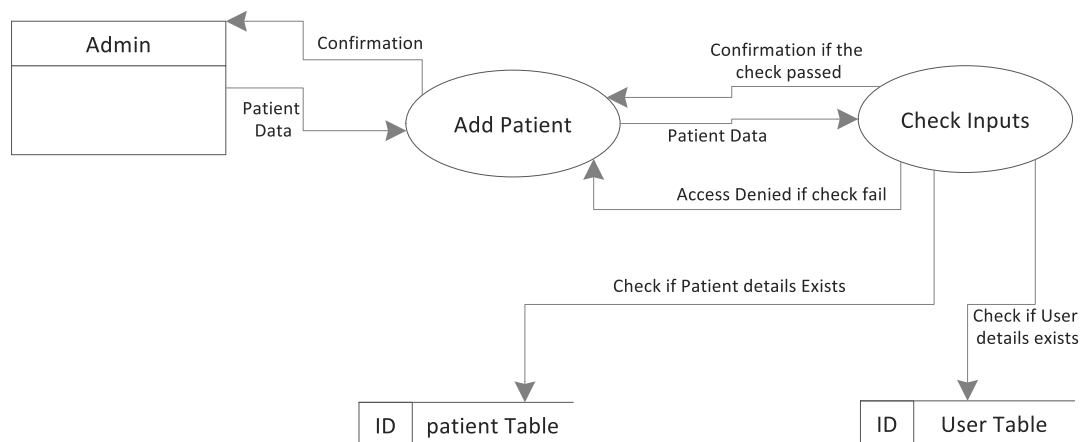
### DFD Level 1:



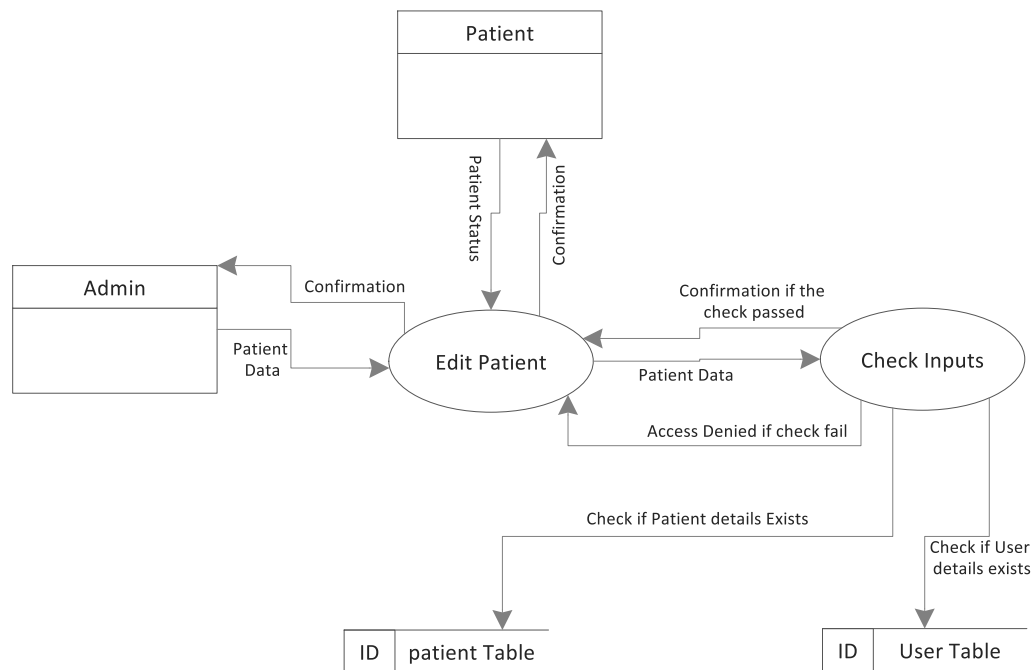
## Login:



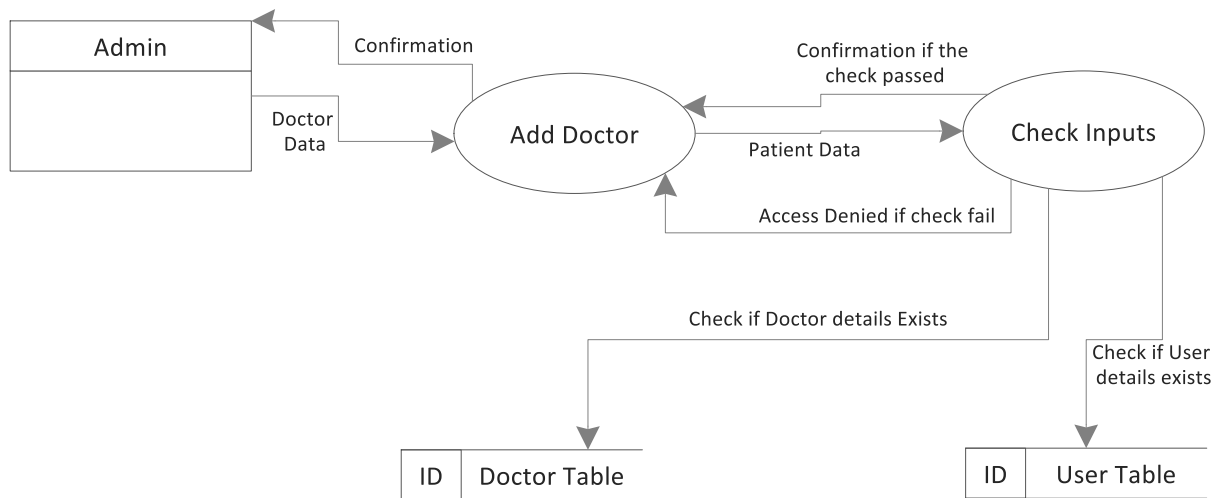
## Add Patient:



## Edit Patient:

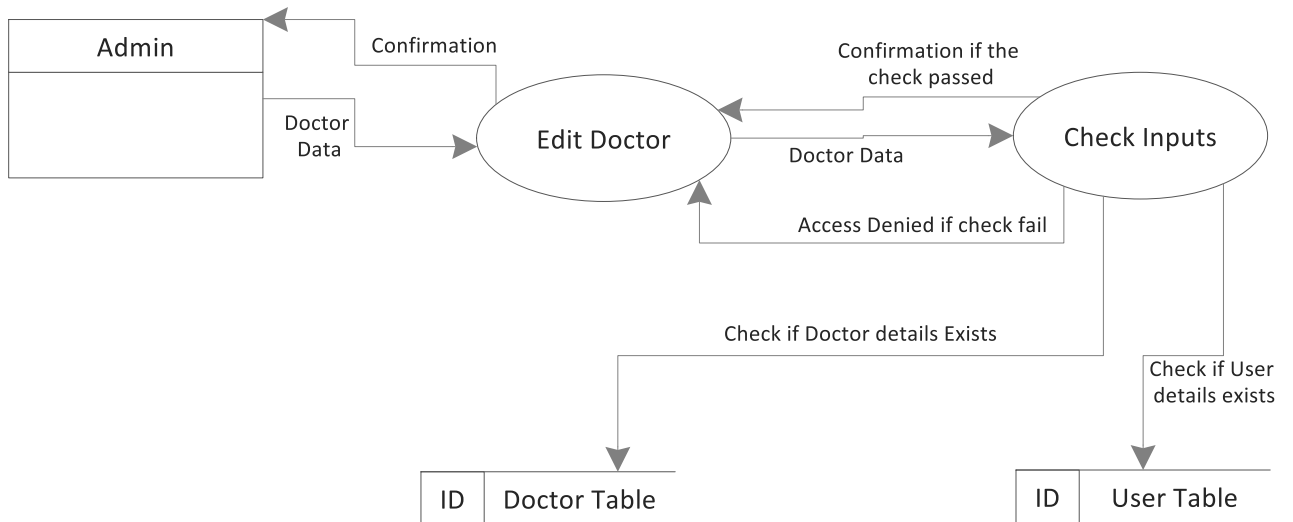


## Add Doctor:

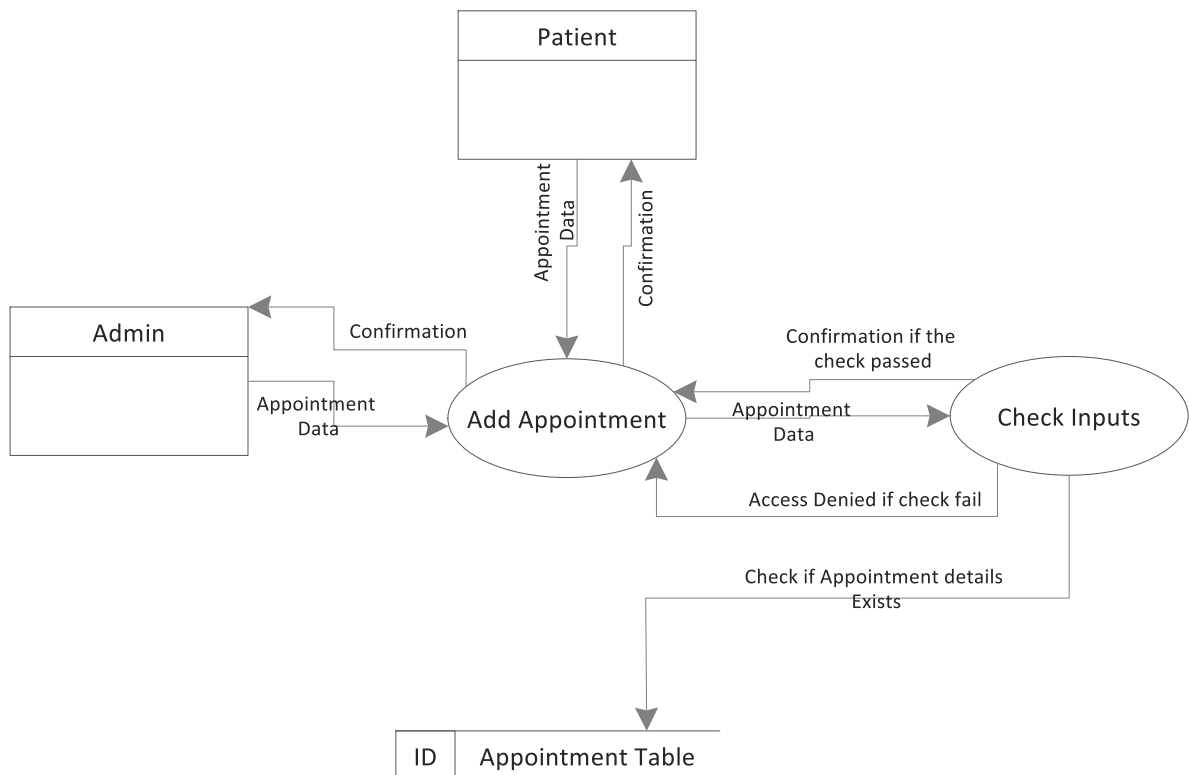




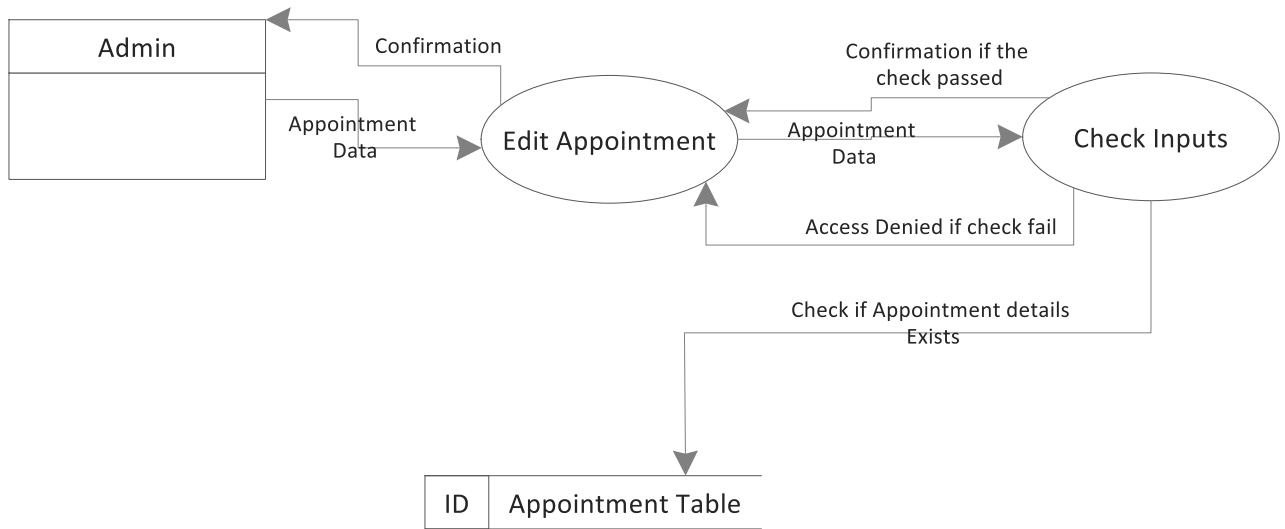
## Edit Doctor:



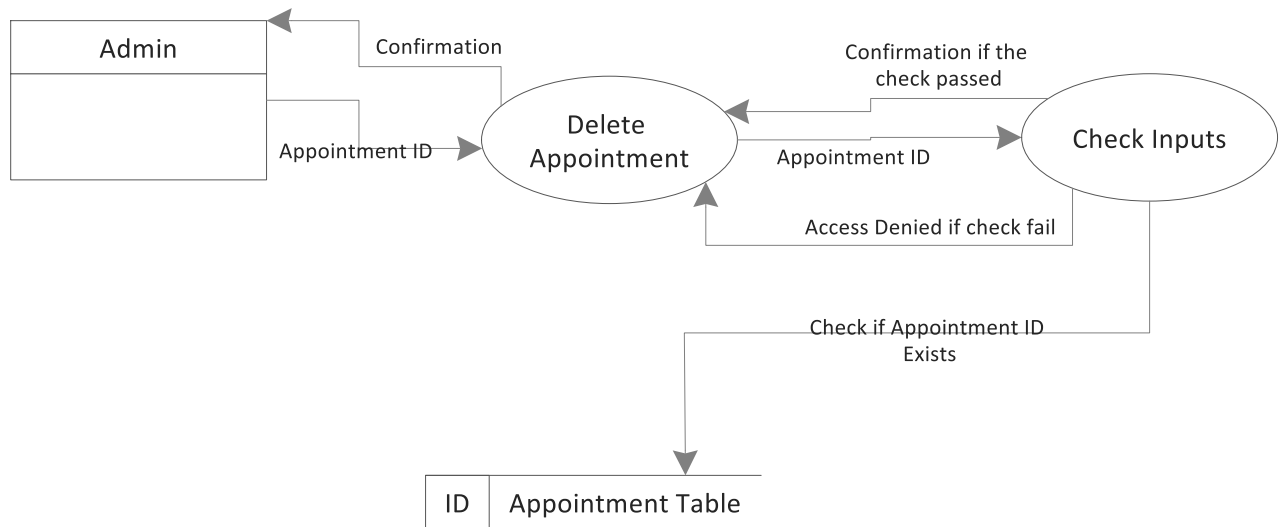
## Add Appointment:



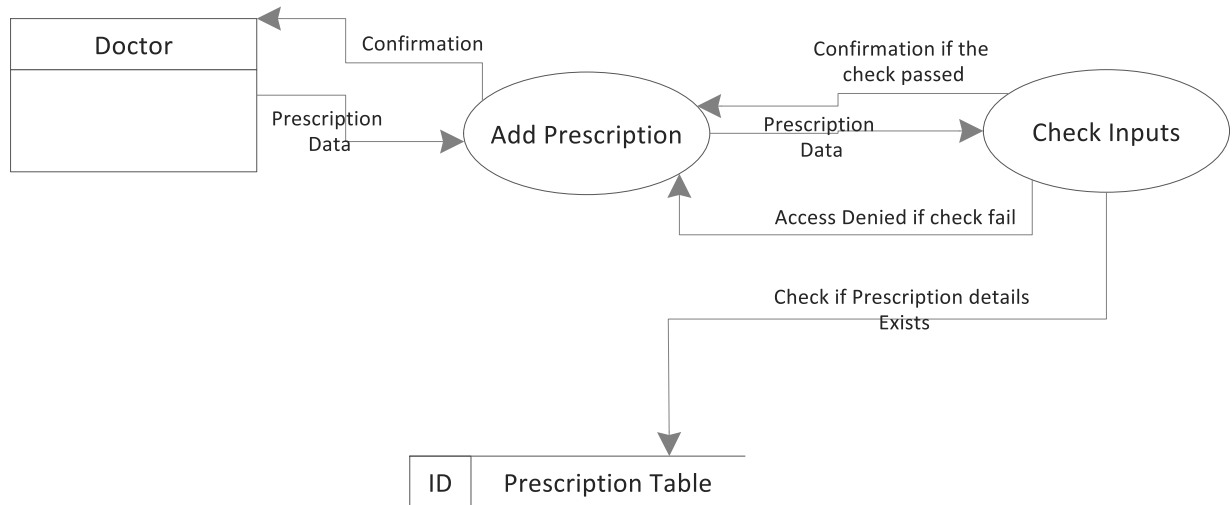
## Edit Appointment:



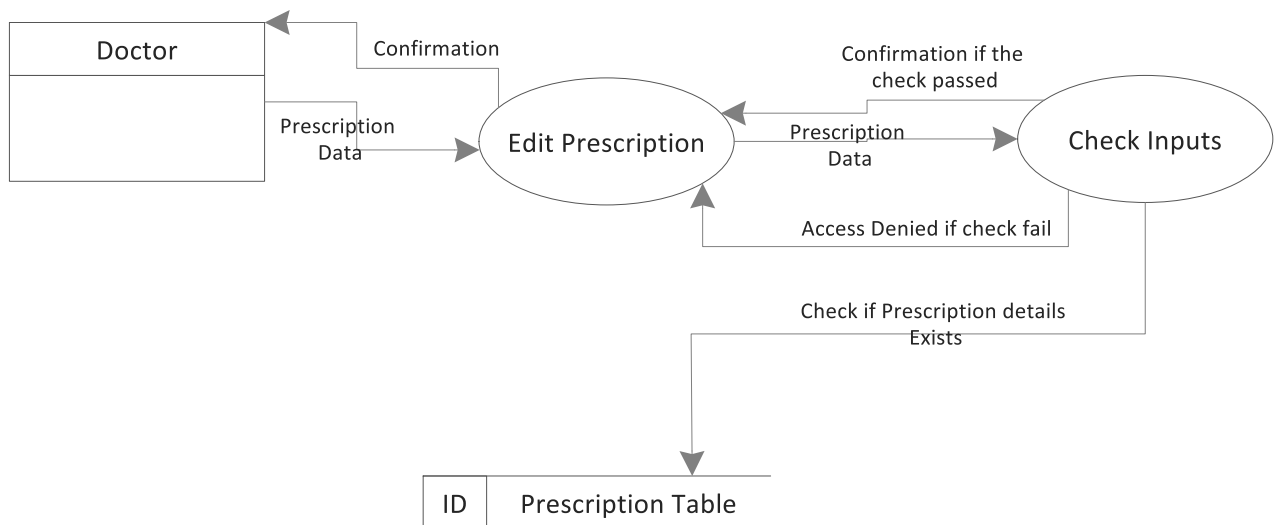
## Delete Appointment:



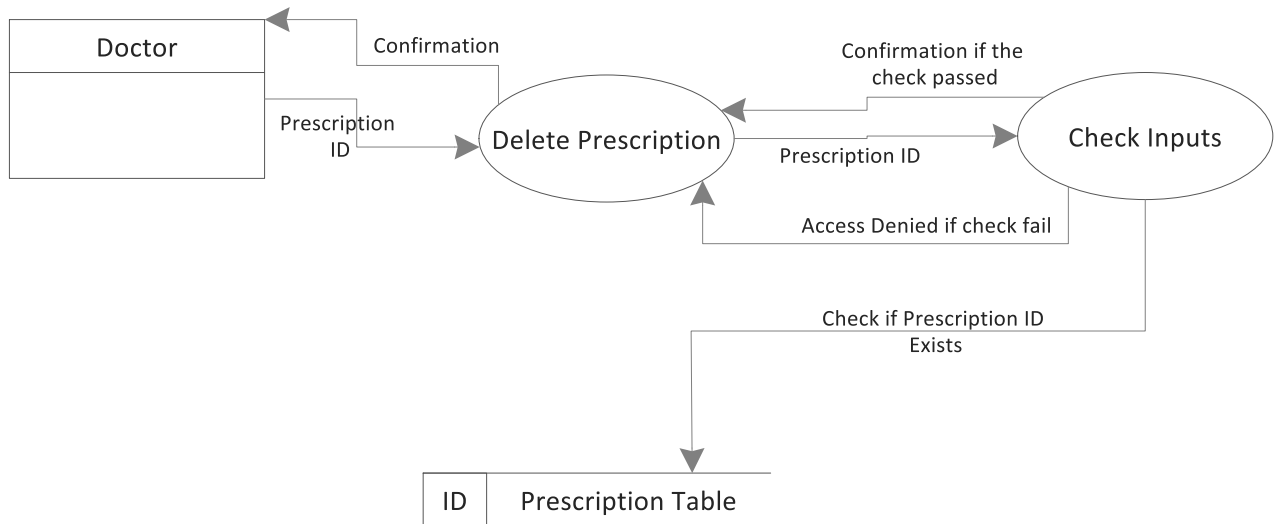
## Add Prescription:



## Edit Prescription:



## Delete Prescription:



## Process Design

- User signup and login using **JWT authentication**.
- Patient adds appointment.
- Admin adds appointments.
- Doctor adds prescriptions for patients.
- Admin manages doctors, patients, appointments, prescriptions
- Dashboards update dynamically based on user role.

## 4.4 Implementation

### Tasks:

- Build frontend and backend modules
- Implement authentication and authorization
- Develop dashboards for all user roles
- Create database tables and relationships
- Integrate system modules using REST APIs

### Technologies Used:

- Programming languages (React + Vite, Tailwind.css, Spring boot (Java))

- Relational database (Oracle)
- JWT for secure authentication

## **4.5 Maintenance**

- Fixing bugs and errors
  - Adding new features based on user feedback
  - Enhancing performance and security
  - Regular database backups
- 

## **5. Outline of Systems Study**

### **5.1 Objectives of the Study**

- Identify issues in patient registration and appointment handling.
  - Collect user requirements to build a digital information system.
  - Implement secure role-based access for all users.
- 

## **6. Detailed Results of Systems Study**

### **6.1 Current System Description**

The Clinic Management System provides separate dashboards for patients, doctors, and admins. Access is secured through authentication.

- Patient Dashboard: View appointments, prescriptions, and request new appointments.
- Doctor Dashboard: View appointments, patients, and add/edit prescriptions.
- Admin Dashboard: Manage doctors, patients, appointments, and prescriptions.

## 7. System Specifications


- **User Interface:** Dashboards for patients, doctors, and admins, login/sign up pages.
  - **Database:** Relational tables with relationships, primary/foreign keys (Oracle DB).
  - **Software:** Backend + frontend, REST APIs, JWT authentication.
  - **Hardware:** Server for app and database.
  - **Personnel:** Admins, doctors, staff, developers.
  - **Documentation:** User manuals and system administrator guides.
- 

## 8. Testing & Acceptance Criteria

- Users can sign up and log in securely with JWT.
  - Patients can request appointments successfully.
  - Doctors can add prescriptions for their patients.
  - Admin can manage all users, appointments.
  - Dashboards reflect real-time data updates.
  - Data security and validation are enforced.
-

# 9. Output Screenshots:

## Signup & Login



### Sign Up

Create your account to access the healthcare portal

Username

john123

Email

john@example.com

Password

\*\*\*\*\*

Patient Name

John Doe


Phone

01012345678

Gender

Male/Female

Age



### HealthCare+ Portal

Sign in to access your healthcare dashboard

Username

JohnDoe

Password


\*\*\*\*\*

Sign In

Don't have an account?

Signup

# Patient Dashboard:

HealthCare+  
patient Portal

Navigation

Dashboard

☐

Welcome, patient1

Your health dashboard and upcoming appointments.

Status: don't know [Edit Status](#)

Upcoming Appointments

Appointment Id: 1

Dr: doc1

08/12/2025 1:30:00 PM

Recent Prescriptions


Appointment Id: 1

Dr: doc1

08/12/2025 12:00:00 AM

Notes: test

+ Add Appointment

HealthCare+  
patient Portal

Navigation

Dashboard

☐

Welcome, patient1

Your health dashboard and upcoming appointments.

Status: don't know [Edit Status](#)

Upcoming Appointments

Appointment Id: 1

Dr: doc1

08/12/2025 1:30:00 PM

Recent Prescriptions

Appointment Id: 1

Dr: doc1

08/12/2025 12:00:00 AM

Notes: test

+ Add Appointment

Add Appointment

The Clinic is Open from 7:00 AM to 11:59 PM

Appointment Date

mm/dd/yyyy --:-- -- ☐

Select Doctor

Select a doctor ▾

Cancel

Add



## Doctor Dashboard:

The image displays a web application for a doctor's portal. The top navigation bar includes the 'HealthCare+ doctor Portal' logo and a 'Dashboard' link. The main content area is divided into two sections. The top section, 'Welcome, Dr. doc1', features a '+ Add Prescription' button and three summary cards: 'Appointments' (1 total), 'Patients' (1 assigned), and 'Prescriptions' (1 total). The bottom section, 'Doctor Appointments', shows a list of appointments. One appointment is selected, displaying details: Id: 1, Patient name: patient1, Date: 08/12/2025 1:30:00 PM. Below this, the 'Your Patients' section shows a patient named 'patient1' with phone number '01012345678' and status 'don't know'. The 'Your Prescriptions' section shows a prescription for 'patient1' with appointment id '1', date '2025-12-08', and notes 'test'. The interface is clean and modern, using a light blue color scheme.

HealthCare+

Doctor Portal

Navigation

Dashboard

Total prescriptions

1

Doctor Appointments

Id: 1

Patient name: patient1

Date: 08/12/2025 1:30:00 PM

Your Patients

Patient name: patient1

Patient phone: 01012345678

Status: don't know

Edit Status

Your Prescriptions

Patient: patient1

Appointment Id: 1

Date: 2025-12-08

Notes: test

Edit

Delete

Add Prescription

Date

mm/dd/yyyy

Notes

Enter notes

Patient

Select patient

Appointment

Select appointment

Cancel

Add Prescription

HealthCare+

Doctor Portal

Navigation

Dashboard

Total prescriptions

1

Doctor Appointments

Id: 1

Patient name: patient1

Date: 08/12/2025 1:30:00 PM

Your Patients

Patient name: patient1

Patient phone: 01012345678

Status: don't know

Edit Status

Your Prescriptions

Patient: patient1

Appointment Id: 1

Date: 2025-12-08

Notes: test

Edit

Delete

Edit Prescription

Patient

patient1

Date

12/08/2025

Notes

test

Appointment

ID: 1 - patient1 (08/12/2025 1:30:00 PM)

Cancel

Update Prescription

# Admin Dashboard:

## Admin Dashboard

Manage your healthcare system efficiently

### Doctors

3 total

+ Add

doc2 - 01200158856 - 2:00 PM to 5:00 PM [MONDAY, WEDNESDAY, FRIDAY]

Edit

doc1 - 01225641451 - 7:30 AM to 2:00 PM [TUESDAY, MONDAY, WEDNESDAY]

Edit

Hadeer - 01122445660 - 11:00 AM to 5:00 PM [MONDAY, TUESDAY]

Edit

### Patients

3 total

+ Add

patient3 - Status: mmm - Phone: 0122356478

Edit

patient1 - Status: don't know - Phone: 01012345678

Edit

Hadeer - 01122445660 - 11:00 AM to 5:00 PM [MONDAY, TUESDAY]

Edit

### Patients

3 total

+ Add

patient3 - Status: mmm - Phone: 0122356478

Edit

patient1 - Status: don't know - Phone: 01012345678

Edit

patient2 - Status: stomach - Phone: 0122564857

Edit

### Appointments

2 total

+ Add

ID: 1 - Patient: patient1 - Date: 08/12/2025 1:30:00 PM with Dr.doc1

Edit

Delete

ID: 21 - Patient: patient2 - Date: 17/12/2025 3:27:00 PM with Dr.doc2

Edit

Delete

HealthCare+  
admin Portal

Navigation  
Dashboard

Admin

add doctor

Username

Email

Password

Doctor Name

Phone

Working Days

HealthCare+  
admin Portal

Navigation  
Dashboard

Admin

edit doctor

Doctor Name

doc2

Phone

01200158856

Working Days

☒ MONDAY ☐ TUESDAY ☒ WEDNESDAY ☐ THURSDAY ☒ FRIDAY ☐ SATURDAY ☐ SUNDAY

The Clinic is Open from 7:00 AM to 11:59 PM

Attend Time

02:00 PM

Leave Time

05:00 PM

HealthCare+

admin Portal

Navigation

Dashboard

doc1 - 01225641451 - 7:30 AM to 2:00 PM

Edit

Hadeer - 01122445660 - 11:00 AM to 1:00 PM

Edit

Patients

3 total

patient3 - Status: none - Phone: 01225641451

Edit

+ Add

patient1 - Status: don't know - Phone: 01225641451

Edit

patient2 - Status: stomach - Phone: 01225641451

Edit

Appointments

2 total

ID: 1 - Patient: patient1 - Date: 08/12/2025

Edit

Delete

ID: 21 - Patient: patient2 - Date: 17/12/2025 3:27:00 PM with Dr.doc2

Edit

Delete

Add patient

×

Username

Email

Password

Patient Name

Phone

Gender

HealthCare+

admin Portal

Navigation

Dashboard

doc1 - 01225641451 - 7:30 AM to 2:00 PM

Edit

Hadeer - 01122445660 - 11:00 AM to 1:00 PM

Edit

Patients

3 total

patient3 - Status: none - Phone: 01225641451

Edit

+ Add

patient1 - Status: don't know - Phone: 01225641451

Edit

patient2 - Status: stomach - Phone: 01225641451

Edit

Appointments

2 total

ID: 1 - Patient: patient1 - Date: 08/12/2025

Edit

Delete

ID: 21 - Patient: patient2 - Date: 17/12/2025 3:27:00 PM with Dr.doc2

Edit

Delete

Edit patient

×

Patient Name

patient2

Phone

0122564857

Gender

Male

Age

26

Patient Status

stomach

HealthCare+

admin Portal

Navigation

Dashboard

Radwan - 01122445660 - 11:00 AM to 5:00 PM (MONDAY, TUESDAY)

Edit

3 total

+ Add

patient

Edit

patient

Edit

patient

Edit

2 total

+ Add

ID: 1

Edit

Delete

ID: 2

Edit

Delete

Edit appointment

×

The Clinic is Open from 7:00 AM to 11:59 PM

Patient

Select Patient

▼

Doctor

Select Doctor

▼

Date & Time

12/08/2025 01:30 PM

📅

Cancel

Save

## Schema:

