First 2 for interaction :

Add Patient Record

```
@startuml
actor Staff as Staff
actor Doctor as Doctor
participant System
participant Database

Staff -> System: Log in
System -> Database: Validate credentials
Database --> System: Success
Staff -> System: Add Patient Record
System -> Staff: Enter patient details
Staff -> System: Confirm details
System -> Database: Save patient record
Database --> System: Save success
System -> Staff:
Display success message
@enduml
```

Schedule Appointment

```
@startuml
actor Patient as Patient
participant System
participant Doctor as Doctor

Patient -> System: Log in
System -> Database: Validate credentials
Database --> System: Success
Patient -> System: Schedule Appointment
System -> Patient: Show available slots
Patient -> System: Select slot and confirm
System -> Doctor: Notify of new appointment
System -> Database: Update schedule
Database --> System: Save success
System -> Patient: Appointment confirmed
@enduml
Domain Model
```

```
@startuml
' Define entities
class Patient {
    - int patientId
    - String name
    - int age
    - String contactInfo
    - String medicalHistory
    - String email
    - String password
}

class Doctor {
    - int doctorId
    - String name
    - String specialty
    - String contactInfo
    - Schedule schedule
}

class Appointment {
    - int appointmentId
    - Patient patient
    - Doctor doctor
    - String date
    - String time
    - String status
}

class Bill {
    - int billId
    - Patient patient
    - double amount
    - String paymentStatus
    - String services
}

class Report {
    - int reportId
    - Patient patient
    - Doctor doctor
    - String date
    - String diagnosis
    - String treatmentPlan
```

```
}

class Pharmacy {
    - int medicationId
    - String name
    - int stock
    - double price
    - Prescription prescription
}

class Schedule {
    - int scheduleId
    - Doctor doctor
    - String availableSlots
    - String bookedSlots
}

class Notification {
    - int notificationId
    - String recipientId
    - String message
    - String date
}

' Define relationships
Patient "1" <-- "0..*" Appointment
Doctor "1" <-- "0..*" Appointment
Patient "1" <-- "0..*" Bill
Patient "1" <-- "0..*" Report
Doctor "1" <-- "0..*" Report
Doctor "1" <-- "1" Schedule
Notification "0..*" --> "1" Patient
Pharmacy "0..*" --> "1" Prescription
@enduml
```

Activity Digram

```
@startuml
start
:Login to system;
if (Actor role?) then (Patient)
    :Access Patient Dashboard;
    if (Action?) then (Schedule Appointment)
```

```
        :Choose Doctor and Time Slot;
        if (Slot available?) then (Yes)
            :Confirm Appointment;
            :Notify Doctor;
        else (No)
            :Prompt to Choose Another Slot;
        endif
    else if (View Medical Data)
        :View Treatments and Appointments;
    else if (Update Information)
        :Update Contact/Other Info;
    endif
else if (Doctor)
    :Access Doctor Dashboard;
    if (Action?) then (Manage Schedule)
        :Update/Cancel Appointments;
        :Notify Patients;
    else if (Track Treatment Progress)
        :Select Patient;
        :Review Treatment History;
        :Update Progress Notes;
    endif
else if (Staff)
    :Access Staff Dashboard;
    if (Action?) then (Add Patient Record)
        :Enter Patient Details;
        if (All Fields Valid?) then (Yes)
            :Save Record;
            :Display Success Message;
        else (No)
            :Prompt to Fill Mandatory Fields;
        endif
    else if (Generate Bill)
        :Enter Patient ID;
        if (ID Valid?) then (Yes)
            :Calculate and Print Bill;
        else (No)
            :Prompt for Valid ID;
        endif
    endif
else if (Pharmacist)
    :Access Pharmacy Dashboard;
    if (Manage Stock?)
        :View/Update Stock Levels;
```

```
    if (Medication Available?) then (Yes)
        :Dispense Medication;
        :Notify Patient;
    else (No)
        :Alert Pharmacist;
    endif
  endif
endif
stop
@enduml
```

State DIAGRAM

```
@startuml
[*] --> Login : Start

Login --> Dashboard : Successful Login
Login --> Login : Invalid Credentials

Dashboard --> PatientManagement : Select "Manage Patients"
Dashboard --> AppointmentManagement : Select "Manage Appointments"
Dashboard --> BillingManagement : Select "Manage Billing"
Dashboard --> DoctorSchedule : Select "Doctor Schedule"
Dashboard --> Reports : Select "View Reports"
Dashboard --> Pharmacy : Select "Manage Pharmacy"

PatientManagement --> AddPatient : Select "Add Patient"
PatientManagement --> UpdatePatient : Select "Update Patient"
PatientManagement --> DeletePatient : Select "Delete Patient"
AddPatient --> PatientManagement : Save or Cancel
UpdatePatient --> PatientManagement : Save or Cancel
DeletePatient --> PatientManagement : Confirm Deletion

AppointmentManagement --> ViewAppointments : Select "View Appointments"
AppointmentManagement --> ScheduleAppointment : Select "Schedule Appointment"
AppointmentManagement --> CancelAppointment : Select "Cancel Appointment"
ViewAppointments --> AppointmentManagement : Back
ScheduleAppointment --> AppointmentManagement : Save or Cancel
CancelAppointment --> AppointmentManagement : Confirm Cancellation

BillingManagement --> GenerateBill : Select "Generate Bill"
BillingManagement --> ViewBill : Select "View Bill"
GenerateBill --> BillingManagement : Save or Cancel
```

ViewBill --> BillingManagement : Back

DoctorSchedule --> UpdateSchedule : Select "Update Schedule"
DoctorSchedule --> ViewSchedule : Select "View Schedule"
UpdateSchedule --> DoctorSchedule : Save or Cancel
ViewSchedule --> DoctorSchedule : Back

Reports --> GenerateReport : Select "Generate Report"
GenerateReport --> Reports : Save or Cancel

Pharmacy --> AddMedicine : Select "Add Medicine"
Pharmacy --> UpdateMedicine : Select "Update Medicine"
Pharmacy --> DeleteMedicine : Select "Delete Medicine"
AddMedicine --> Pharmacy : Save or Cancel
UpdateMedicine --> Pharmacy : Save or Cancel
DeleteMedicine --> Pharmacy : Confirm Deletion

Dashboard --> Logout : Select "Logout"
Logout --> [*] : End Session
@enduml