

# Project Proposal

## On Project

### Title

Guided By:-

Trainer Name: Anuj Kumar

Created By:-

Student Name: Anuj Kumar  
AFid : AF04991734

Student Name: Himanshu  
AFid : AF049717773

Student Name: Rahul Prajapati  
AFid :AF04991823  
Batch Code: ANP-D2405  
Course Code: ITPR

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# **Title of the Project**

## **Hospital Management System**

### **Introduction**

The Hospital Management System (HMS) is a software solution designed to digitalize and streamline the daily operations of a hospital. Instead of maintaining separate registers for patients, doctors, appointments, lab tests, and billing, the system stores all data in a centralized database.

The system mainly focuses on:

- Managing patient information and visit details.
- Managing doctors and departments with their specialization.
- Scheduling and tracking appointments between patients and doctors.
- Recording laboratory tests and results.
- Generating billing information for services availed by patients.

## **OBJECTIVE**

- To automate basic operations of a hospital using a computer-based system.
- To maintain accurate and up-to-date records of patients, doctors, and departments.
- To provide a proper system for booking and managing appointments.
- To store and retrieve lab test details and results efficiently.
- To generate bills for patients based on appointments and lab tests.
- To reduce manual paperwork and chances of errors.
- To allow quick searching and reporting from stored data.

# **PROJECT CATEGORY**

- Database Management/Application Development
- Frontend: Core Java (Console/Command Line)
- Backend: MySQL Database
- Connectivity: JDBC (Java Database Connectivity).

## **ANALYSIS**

### **a) Modules and Description**

#### **1. Patient Management Module**

- Add new patient records (name, age, gender, phone, address, etc.).
- Update patient details if any information changes.
- Search and view patient details by Patient ID, name, or phone number.
- Maintain history of visits and tests linked to the patient.

#### **2. Doctor&Department Management Module**

- Add doctor details such as name, specialization, phone, and department.

- Maintain a master list of hospital departments (e.g., Cardiology, Orthopedic, Neurology).
- Link each doctor to a specific department.
- View the list of doctors under each department.

### **3. Appointment Management Module**

- Book appointments between patient and doctor.
- Record appointment date, time, and purpose.
- Check doctor availability before booking.
- Update or cancel appointments when needed.
- View all appointments for a doctor or patient.

### **4. Test Management Module**

- Register lab tests for patients (e.g., Blood test, X-ray, MRI).
- Store test name, type, date, and results.
- Link each lab test to the corresponding patient (and optionally to an appointment/doctor).
- Provide quick access to the patient's test history during future visits.

### **5. Billing Module**

- Generate bills for patients based on consultation fees, lab test charges, and services.
- Store bill amount, date, and payment status

(Paid/Unpaid).

- View bills patient-wise or date-wise.
- Help hospital administration maintain financial records.

**6. Reports Module (Optional but Useful)**

- Patient-wise report (all appointments, tests, and bills).
- Daily appointments report.
- Daily/monthly billing report.

**b) Database Design**

**1. DEPARTMENT Table Design**

Field Name	Datatype	Properties
department_id	int	primary key, auto increment
department_name	varchar(100)	not null

**2. PATIENT Table Design**

Field Name	Datatype	Properties
patient_id	int	primary key, auto increment
name	varchar(100)	not null
gender	varchar(10)	not null
age	int	not null
phone	varchar(15)	not null

address	varchar(200)	not null
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### 3. DOCTOR Table Design

Field Name	Datatype	Properties
doctor_id	int	primary key, auto increment
name	varchar(100)	not null
specialization	varchar(50)	not null
phone	varchar(15)	not null
department_id	int	foreign key → department(department_id)

**Relation:** One patient can have multiple appointment with multiple Doctors.

### 4. APPOINTMENT Table Design

Field Name	Datatype	Properties
appointment_id	int	primary key, auto increment
patient_id	int	foreign key → patient(patient_id)
doctor_id	int	foreign key → doctor(doctor_id)
appointment_date	date	not null
appointment_time	time	not null
remarks	varchar(200) )	nullable



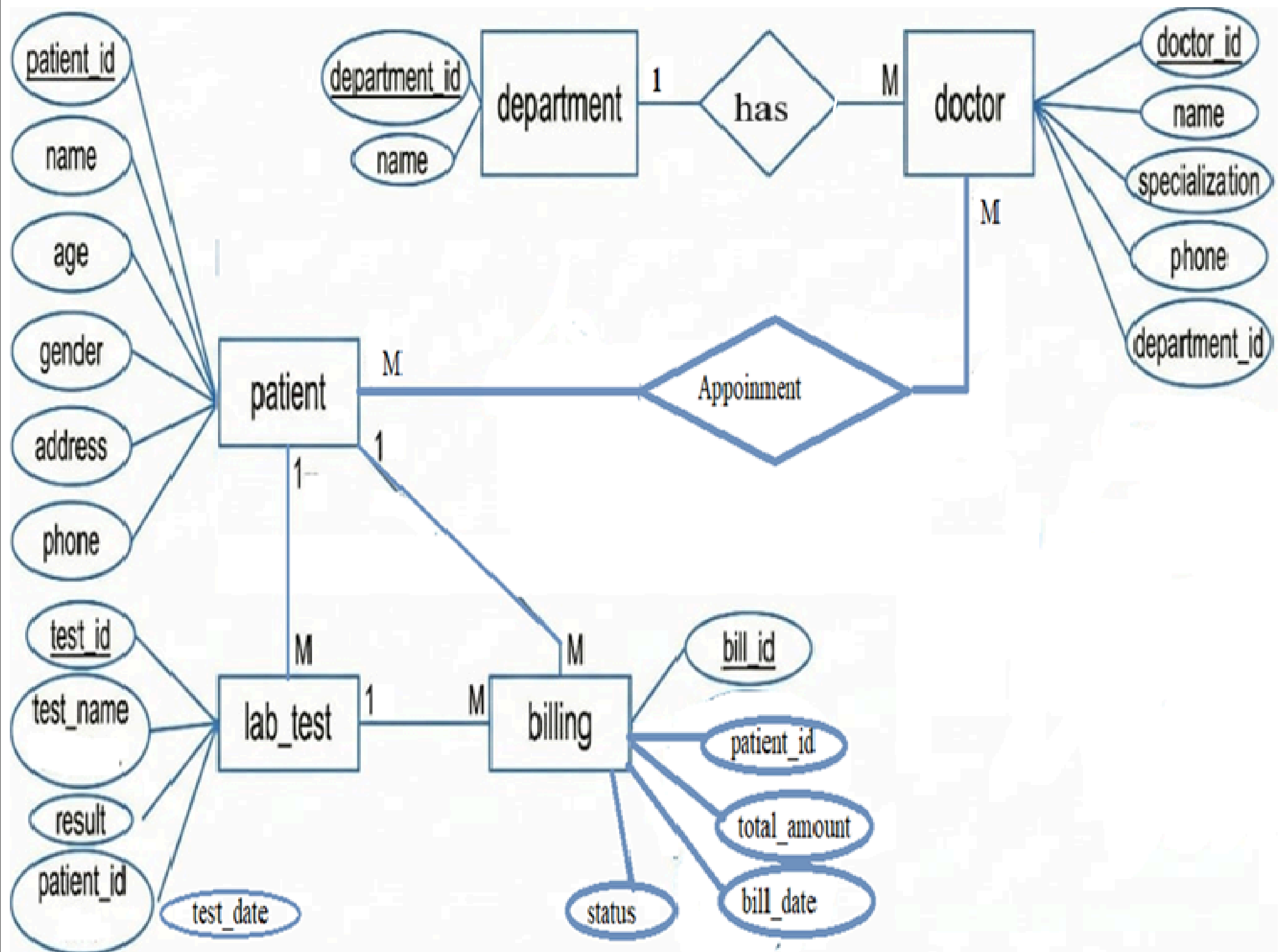
5. LAB\_TEST Table Design

Field Name	Datatype	Properties
test_id	int	primary key, auto increment
patient_id	int	foreign key → patient(patient_id)
test_name	varchar(100)	not null
test_date	date	not null
result	varchar(200)	nullable

6. BILLING Table Design

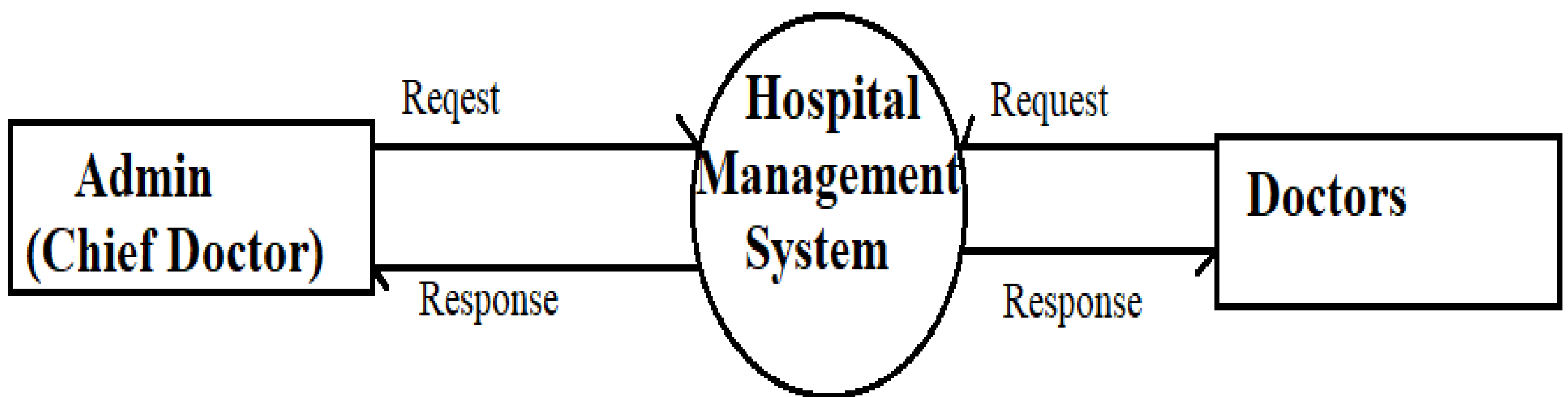
Field Name	Datatype	Properties
bill_id	int	primary key, auto increment
patient_id	int	foreign key → patient(patient_id)
bill_date	date	not null
total_amount	decimal(10,2)	not null
status	varchar(20)	default 'unpaid'

# Entity Relationship Diagram

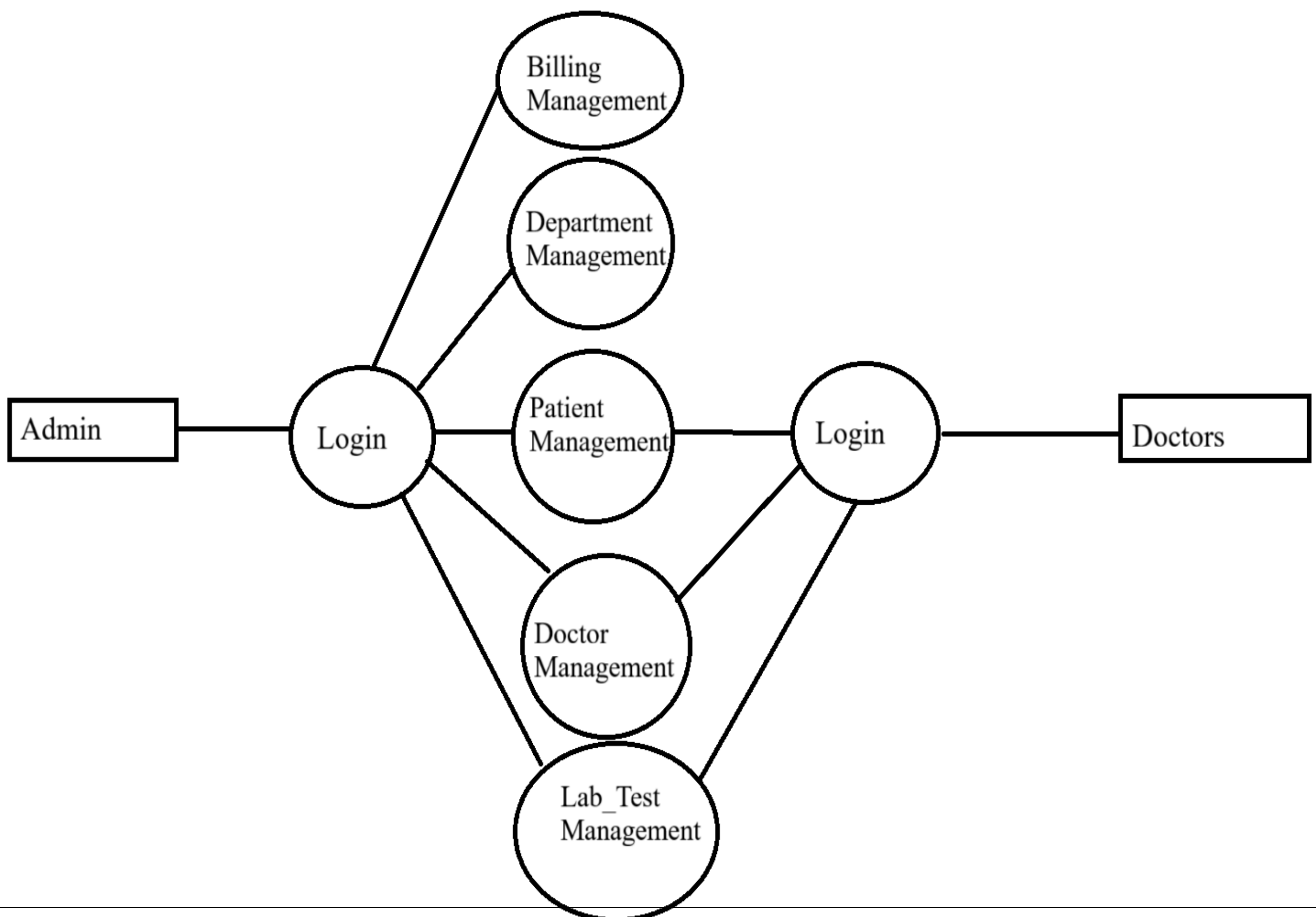


# Data Flow Diagram

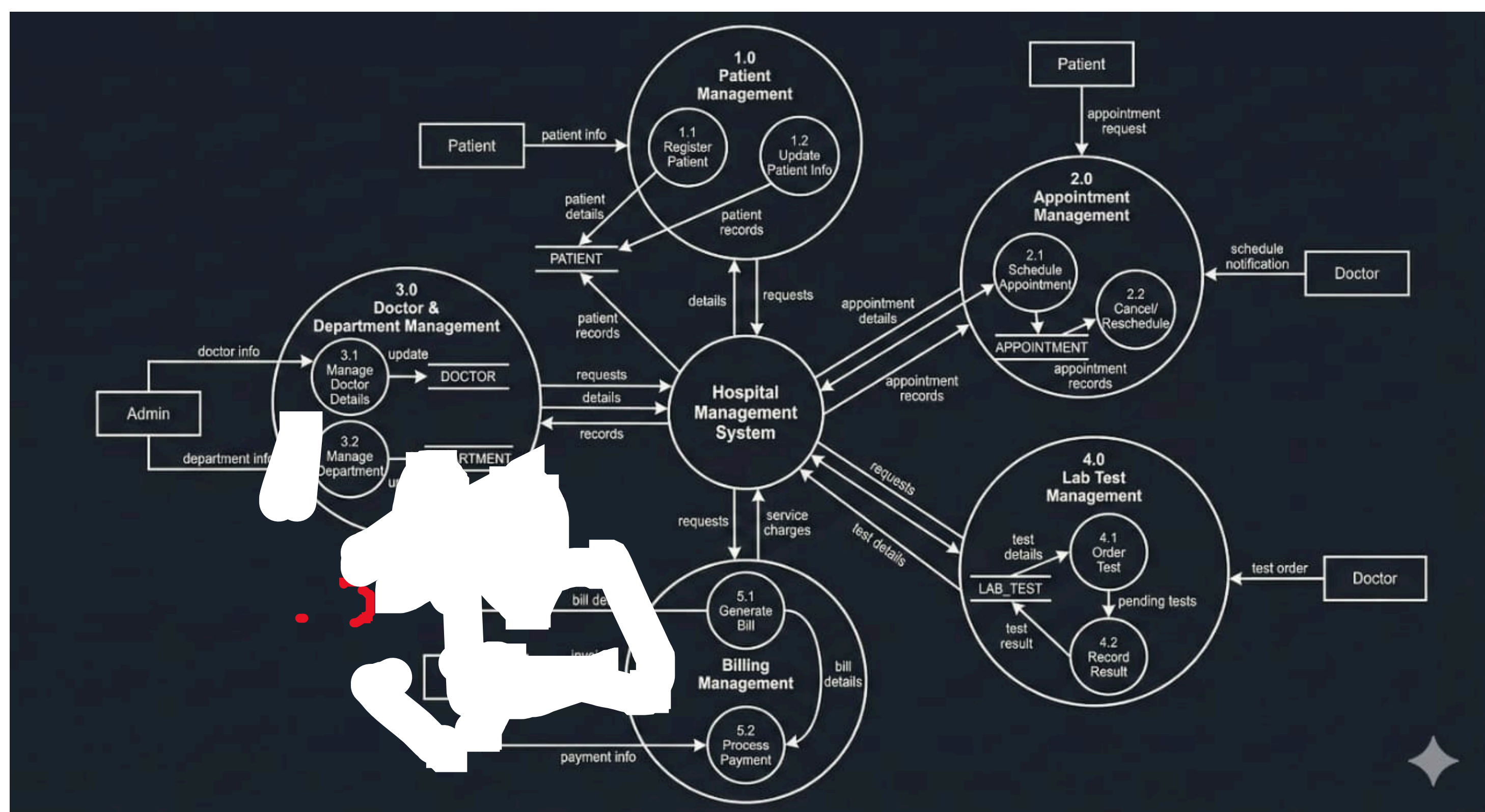
## a) 0 Level DFD



## b) 1 level DFD



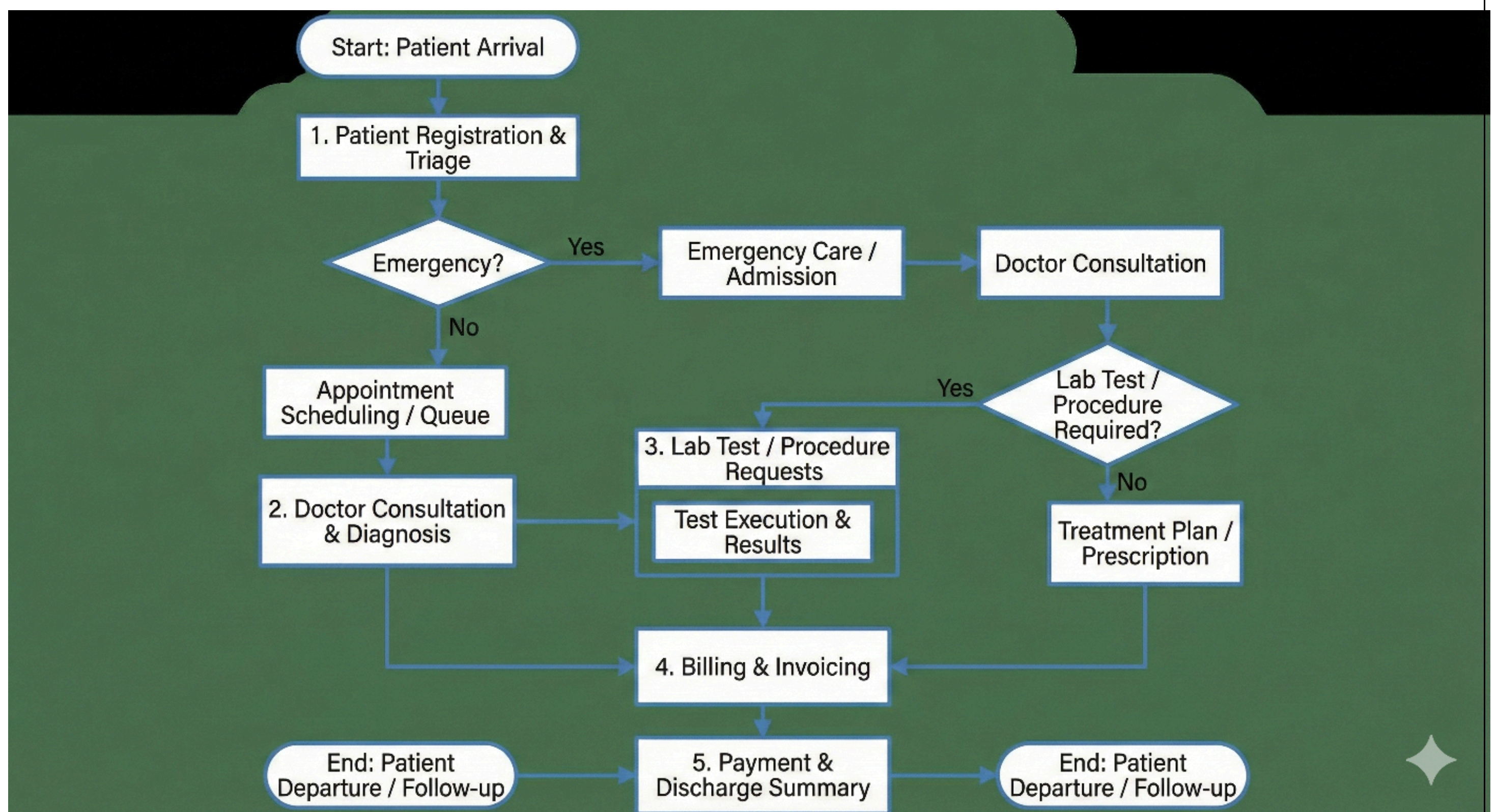
## c) 2 level DFD





# Complete Structure

## Process Logic Diagram





## Platform Used

- **Hardware Requirements:** Any standard PC or laptop is sufficient. Since this is a simple command-line program, minimal specs (e.g. 1– 2 GHz CPU, ~1– 2 GB RAM) are adequate. It does not require specialized hardware; even a low-end machine can run the Java CLI app and MySQL server for demo purposes.
- **Software Requirements:**
  - **Operating System:** Windows, Linux, or macOS (any OS that can run Java and MySQL).
  - **Java Development Kit (JDK):** Java SE (version 8 or later recommended). The application is written in Java, so a JDK must be installed and configured in the system PATH[github.com](https://github.com).
  - **MySQL Server:** MySQL Community Server (or any MySQL-compatible database) to host the hospital database. Ensure MySQL is running and accessible[github.com](https://github.com).
  - **JDBC Connector:** MySQL Connector/J library (JAR) added to the project so Java can connect to MySQL[github.com](https://github.com).
  - **IDE/Text Editor (optional):** Any Java editor (e.g. Eclipse, IntelliJ, VS Code) can be used for coding;

but since the app is CLI, an IDE is not strictly necessary. The GitHub example used VS Code

## **Future Scope**

### **1. Addition of Advanced Modules:**

The system can be expanded to include Billing, Pharmacy Management, Laboratory Reports, Ward/Bed Allocation, and Staff Payroll to transform it into a complete hospital information management solution.

### **2. Upgrade to GUI or Web Application:**

The current command-line system can be redesigned with JavaFX/Swing for a graphical interface or converted into a web-based solution using Spring Boot, improving accessibility and usability.

### **3. Integration of Online Portals:**

Future enhancements may include patient and doctor portals for booking appointments, checking reports, updating medical records, and managing schedules remotely.

#### 4. **Automated Notifications:**

The system can be integrated with SMS/email gateways to send reminders for appointments, medicine refills, and follow-up visits, reducing patient no-shows and improving hospital workflow.

#### 5. **Cloud-Based Deployment:**

Deploying the system on cloud platforms can enable real-time access, automatic backups, multi-branch connectivity, and high scalability for larger healthcare networks.

#### 6. **Enhanced Security:**

Implementation of encryption, role-based access control, secure logins, and audit trails can strengthen data confidentiality and meet healthcare compliance standards.

#### 7. **Mobile App Development:**

A mobile application can be developed for doctors, staff, and patients to access the system from anywhere, improving responsiveness and convenience.

## **Bibliography**

- Java Documentation, Oracle: Official reference for Java programming concepts, object-oriented



structure, and JDBC connectivity.

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- GeeksforGeeks: Conceptual references used for understanding Hospital Management System modules, database design, ER diagrams, and Java examples.
- Tutorials Point: Learning resource for Java fundamentals, JDBC operations, and structured programming techniques.
- GitHub Community Projects.  
Open-source Java– MySQL command-line project examples used for understanding modular structure and