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# UNIVERSITY INSTITUTE OF COMPUTING

# PROJECT REPORT
# ON
# HOSPITAL MANAGEMENT SYSTEM

Program Name: BCA

Subject Name/Code: Database Management Syatem Lab(23CAP-252)


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# ABSTRACT

## Introduction:

The Hospital Management System (HMS) id designed to manage Patients records, doctors records, Appointments details, Medical records. It provides an efficient way to handle Hospital Management Records, ensuring patients can take his appointment date, id, or doctor details for his information.

## OBJECTIVE:

**The Hospital Management System (HMS) aims to:**

-- 1. Efficiently manage patient records, doctor details, appointments, and medical histories.
-- 2. Streamline hospital operations to improve administrative efficiency.
-- 3. Ensure accurate and secure record-keeping to enhance data integrity.
-- 4. Facilitate quick and easy appointment scheduling and tracking.
-- 5. Improve patient care by providing timely access to medical records.
-- 6. Reduce manual workload and paperwork through automation.
-- 7. Enhance coordination between doctors, patients, and hospital staff.

## Technique:

- **Database Management System (DBMS):** MySQL for data storage.
- **Programming Language:** SQL for database queries.
- **Normalization:** Ensuring data redundancy is minimized.
- **SQL JOINS:** Efficiently retrieving related information.

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# System Configuration:

- **OS:** Windows 10/11 or Linux
- **Processor:** Intel Core i3 (minimum); Core is or higher recommended
- **RAM:** 4 GB (minimum); 8GB recommended
- **Software:** MySQL Server, SQL Workbench, or any compatible database management tool.

# Analysis And Functionality:

-- The Hospital Management System (HMS) is designed to digitize and streamline hospital operations by integrating patient, doctor, appointment, and medical record management.
-- The system eliminates manual errors, reduces paperwork, and ensures efficient handling of medical data.
-- Security and integrity of data are maintained using unique identifiers and foreign key constraints.
-- The system provides quick retrieval of patient records, appointment status updates, and doctor schedules, improving overall hospital efficiency.
-- By using structured tables and relationships, HMS minimizes redundancy and ensures smooth data management.
-- 1. Patient Management:
-- - Add, update, and retrieve patient details such as name, DOB, gender, contact, and medical history.
-- 2. Doctor Management:
-- - Store doctor details including specialization, contact, and email.
-- 3. Appointment Scheduling:
-- - Patients can book appointments with doctors.
-- - Track appointment status (Scheduled, Completed, Cancelled).
-- 4. Medical Records Management:
-- - Store patient diagnosis and treatments.
-- - Retrieve medical history based on patient ID.
-- 5. Data Security & Integrity:
-- - Ensure data integrity using foreign keys.
-- - Enable cascading deletion for efficient record management.

# FUTURE SCOPES:

- Integration with IoT Devices
- AI-based Diagnosis Assistance
- Cloud-based Implementation
- Telemedicine Support
- Automated Billing System
- Multi-Hospital Integration.

# DATABASE SCHEMA:

**CREATE DATABASE HospitalManagement;**

**Use HospitalManagement;**

```
CREATE TABLE patients(
  P_id int auto_increment primary key,
  First_name VARCHAR(30) NOT NULL,
  Last_name VARCHAR(30),
  DOB DATE,
  Gender enum('male','female'),
  Address text,
  Email VARCHAR(30) unique
);
```

```
CREATE TABLE doctors(
  d_id int auto_increment primary key,
  first_name VARCHAR(30) NOT NULL,
  last_name VARCHAR(30),
  specialization VARCHAR(40) NOT NULL,
  contact VARCHAR(15),
  email VARCHAR(20) unique
);
```

```
CREATE TABLE Appointments (
    app_id INT AUTO_INCREMENT PRIMARY KEY,
    p_id INT,
    d_id INT,
    app_date DATETIME,
    status ENUM('Scheduled', 'Completed', 'Cancelled') DEFAULT 'Scheduled',
    FOREIGN KEY (p_id) REFERENCES Patients(p_id) ON DELETE CASCADE,
    FOREIGN KEY (d_id) REFERENCES Doctors(d_id) ON DELETE CASCADE
);
```

```
CREATE TABLE MedicalRecords (
    record_id INT AUTO_INCREMENT PRIMARY KEY,
    p_id INT,
    diagnosis TEXT,
    treatment TEXT,
    record_date DATE DEFAULT CURRENT_DATE,
    FOREIGN KEY (p_id) REFERENCES Patients(p_id) ON DELETE CASCADE
);
```

# SAMPLE DATA INSERTION:

```
INSERT INTO patients(first_name,last_name,dob,gender, address,email)
VALUES
('Abdul','Basit','2003-03-12','male','kharar','abd@gmail.com'),
('Bitu','Titu','2008-05-23','male','jharkhand','bitu@gmail.com),
('Sandesh','kumar','2002-03-11','male','Shivjot','sandesh@gmail.com),
('Prince','Raj','2002-11-18','male','Supaul','prince@gmail.com),
('Subhash','Kumar','2003-11-13','male','Shivjot','subhash@gmail.com),
('Vikram','Kumar','2007-11-14','male','Shivjot','vikram@gmail.com),
```

```
INSERT INTO doctors(first_name,last_name,specialization,contact,email)
VALUES
('Dr.Sonu','Singh',' Medical Specialties','9302900641','sonuksingh@gmail.com'),
('Dr.Adarsh','Mishra','teeth Specialties','9812345670','mishrajii@gmail.com'),
('Dr.Tilu','Jii','Medical Specialties','9302123333','tilu@gmail.com'),
('Dr.Ayush','Raj','Biological Specialties','9303456776','ayush@gmail.com');
('Dr.Raj','kumar','body Specialties','8922123333','RAJ@gmail.com');
```

```
INSERT INTO appointments(p_id,d_id,app_date)
 VALUES
 (1,1,'2025-04-01 10:15:00'),
```

(2,2,'2025-04-01 11:10:00');

INSERT INTO  medicalrecords(p_id,diagnosis,treatment)
VALUES
(1,'Hypertension','Prescribed medication and lifestylechange'),
(2,'Migraine','Pain management and stress reduction techniques');

## SQL QUERY AND OUTPUT:

1. List of Patients-
   SELECT * FROM patients;

OUTPUT:

```
mysql> select * from patients;
+------+------------+-----------+------------+--------+-----------+-------------------+
| p_id | first_name | last_name | dob        | gender | address   | email             |
+------+------------+-----------+------------+--------+-----------+-------------------+
|    1 | Abdul      | Basit     | 2003-03-12 | male   | kharar    | abd@gmail.com     |
|    2 | Bitu       | Titu      | 2008-05-23 | male   | jharkhand | bitu@gmail.com    |
|    3 | Sandesh    | Kumar     | 2002-03-11 | male   | Shivjot   | sandesh@gmail.com |
|    4 | Prince     | Raj       | 2002-11-18 | male   | Supaul    | Prince@gmail.com  |
|    5 | Subhash    | Kumar     | 2003-11-13 | male   | Shivjot   | subhash@gmail.com |
|    6 | Vikarm     | kumar     | 2007-11-14 | male   | Shivjot   | Vikram@gmail.com  |
+------+------------+-----------+------------+--------+-----------+-------------------+
6 rows in set (0.00 sec)
```

2. List of Doctors-
   SELECT * FROM doctors;

OUTPUT:

```
+------+------------+-----------+-----------------------+------------+---------------------+
| d_id | first_name | last_name | specialization        | contact    | email               |
+------+------------+-----------+-----------------------+------------+---------------------+
|    1 | Dr.Sonu    | Singh     | Medical Specialties   | 9302900641 | sonuksingh@gmail.com |
|    2 | Dr.Adarsh  | Mishra    | teeth Specialties     | 9812345670 | mishrajii@gmail.com  |
|    4 | Dr.Tilu    | Jii       | Medical Specialties   | 9302123333 | tilu@gmail.com       |
|    5 | Dr.Ayush   | Raj       | Biological Specialties| 9303456776 | ayush@gmail.com      |
|    6 | Dr.Raj     | kumar     | body Specialties      | 8922123333 | RAJ@gmail.com        |
+------+------------+-----------+-----------------------+------------+---------------------+
5 rows in set (0.00 sec)
```

3. Appointments details:
   Select * from appointments;

**OUTPUT:**

```
+--------+------+------+---------------------+-----------+
| app_id | p_id | d_id | app_date            | status    |
+--------+------+------+---------------------+-----------+
|      2 |    1 |    1 | 2025-04-01 10:15:00 | scheduled |
|      3 |    2 |    2 | 2025-04-01 11:10:00 | scheduled |
|     11 | NULL | NULL | 2025-04-01 10:15:00 | scheduled |
|     12 | NULL | NULL | 2025-04-02 11:15:00 | scheduled |
+--------+------+------+---------------------+-----------+
4 rows in set (0.00 sec)
```

4. List of medical records:
   select * from medicalrecords;

OUTPUT:

```
mysql> select * from medicalrecords;
+-----------+------+--------------+-----------------------------------------------------+-------------+
| record_id | p_id | diagnosis    | treatment                                           | record_date |
+-----------+------+--------------+-----------------------------------------------------+-------------+
|         1 |    1 | Hypertension | Prescribed medication and lifestylechange           | 2025-04-01  |
|         2 |    2 | Migraine     | Pain management and stress reduction techniques     | 2025-04-01  |
|         3 |    3 | Hypertension | Prescribed medication and lifestylechange           | 2025-04-01  |
|         4 |    4 | Migraine     | Pain management and stress reduction techniques     | 2025-04-01  |
+-----------+------+--------------+-----------------------------------------------------+-------------+
4 rows in set (0.00 sec)
```

5. JOINS table of Patients or Doctors and Appointments or Medical Records:
   **COMMAND:-**
   _select p.first_name AS patient,p.last_name,d.first_name AS doctor,d.last_name,a.app_date,a.status FROM patients p JOIN appointments a ON p.p_id=a.p_id JOIN doctors d ON a.d_id=d.d_id;

OUTPUT:

```
+---------+-----------+-----------+-----------+---------------------+-----------+
| patient | last_name | doctor    | last_name | app_date            | status    |
+---------+-----------+-----------+-----------+---------------------+-----------+
| Abdul   | Basit     | Dr.Sonu   | Singh     | 2025-04-01 10:15:00 | scheduled |
| Bitu    | Titu      | Dr.Adarsh | Mishra    | 2025-04-01 11:10:00 | scheduled |
+---------+-----------+-----------+-----------+---------------------+-----------+
2 rows in set (0.06 sec)
```

# CONCLUSION:

The Hospital Management System provides an efficient and structured approach to managing hospital operations, reducing paperwork, and improving patient care.

-- It enhances administrative workflow by digitizing patient records, doctor details, and appointments, ensuring seamless data access and management.

-- With robust data security and integrity, the system minimizes errors and ensures consistency across hospital operations.

-- Future enhancements such as AI-based diagnosis, IoT integration, and telemedicine can further improve the system's effectiveness and accessibility.

-- Overall, this system is a scalable and efficient solution for modern healthcare management.