CS432 Databases

CheckInOut - Hostel Management System

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1 Introduction

The CheckInOut Hostel Management System is designed to efficiently manage hostel accommodations for students. The system will facilitate student profile management, room mapping, and tracking of check-ins and check-outs. By providing a structured database system, it will ensure smooth operations and accurate record-keeping, reducing manual errors and administrative workload.

2 Objective

• To automate the management of hostel check-ins and check-outs.

• To provide real-time tracking of room occupancy.

• To maintain detailed student records, including room assignments and stay history.

• To enforce data integrity and prevent duplicate room allocations.

• To generate reports for hostel administration regarding student movements and room utilization.

3 Software Stack

• Database: MySQL.

• Backend: PHP, Flask (Python), Java

• Frontend: HTML, CSS, JavaScript (React/Vue.js).

• Tools: Visual Studio Code, MySQL Workbench.

4 Functionalities

- **Student Profile Management:**
  Store student details such as Name, Student ID, Contact Information, and Hostel ID.

Maintain historical records of hostel stays.

- **Room Allocation & Mapping:**

  • Assign rooms to students based on availability and predefined hostel rules.

  • Ensure that no student is assigned multiple rooms simultaneously.

- **Check-in/Check-out Tracking:**

  • Record check-in and check-out times with timestamps.

  • Maintain logs of student movements within and outside the hostel.

  • Prevent unauthorized check-ins and check-outs.

- **Room Monitoring:**

  • Track the status of each room (occupied/vacant).

  • Prevent deletion or reassignment of occupied rooms.

- **Reporting & Logs:**

  • Generate reports on student occupancy, room availability, and stay history.

  • Provide insights for hostel administration on student trends and capacity planning.

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5 Tables

5.1 Students

Holds information about students residing in the hostel.

```
CREATE TABLE Students (
    Student_ID INT PRIMARY KEY AUTO_INCREMENT,
    Name VARCHAR(100) NOT NULL,
    Room_Number VARCHAR(10) NOT NULL,
    Contact_Info VARCHAR(15) NOT NULL,
```

```
    Entry_Status ENUM('Checked-In', 'Checked-Out') NOT NULL DEFAULT
'Checked-In'
);
```

5.2 Rooms

Stores details of available hostel rooms.

```
CREATE TABLE Rooms (
    Room_ID INT PRIMARY KEY AUTO_INCREMENT,
    Room_Number VARCHAR(10) UNIQUE NOT NULL,
    Capacity INT NOT NULL,
    Occupied INT DEFAULT 0
);
```

5.3 CheckInOut_Log

Manages student check-in and check-out records.

```
CREATE TABLE CheckInOut_Log (
    Log_ID INT PRIMARY KEY AUTO_INCREMENT,
    Student_ID INT NOT NULL,
    CheckIn_Time DATETIME DEFAULT CURRENT_TIMESTAMP,
    CheckOut_Time DATETIME,
    FOREIGN KEY (Student_ID) REFERENCES Students(Student_ID) ON DELETE
CASCADE
);
```

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6 SQL Queries

6.1 Retrieve Active Checked-In Students

```
SELECT Student_ID, Name, Room_Number
FROM Students
WHERE Entry_Status = 'Checked-In';
```

6.2 Retrieve Check-in/Check-out History for a Student

```
SELECT * FROM CheckInOut_Log
WHERE Student_ID = 101;
```

6.3 Find Available Rooms

```
SELECT Room_Number FROM Rooms
WHERE Capacity > Occupied;
```

6.4 Count the Total Number of Students Currently in the Hostel

```
SELECT COUNT(*) AS Total_Checked_In
FROM Students
WHERE Entry_Status = 'Checked-In';
```