CENTURION UNIVERSITY OF TECHNOLOGY AND MANAGEMENT

MASTER IN COMPUTER APPLICATION

of the

DEPARTMENT OF APPLIED SCIENCE

A PROJECT REPORT ON

"Remotel - Hostel Room Management System"

Submitted by

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Under the Guidance of

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In partial fulfilment for the award of the degree
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MASTER IN COMPUTER APPLICATION

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CENTURION UNIVERSITY OF TECHNOLOGY AND MANAGEMENT, ODISHA

SCHOOL OF APPLIED SCIENCES, BHUBANESWAR CAMPUS

DEPARTMENT OF MASTERS IN COMPUTER APPLICATION(MCA)

BONAFIDE CERTIFICATE

This is to be certified that the project report "**Remotel - Hostel Room Management System**" has been submitted for the Masters in Computer Application (MCA), School of Applied Sciences, CUTM, Jatani during the academic year 2024-2025 is a persuasive piece of project work carried out by **"Manish Ram**", who carried out the project work under the guidance of **Prof. Rakesh Kumar Ray** and also certified that the above-mentioned project has been duly carried out as per the norm of the school statutes of the university.

Signature of HOD of MCA

Prof. Rakesh Kumar Ray

Signature of Project Guide

Prof. Rakesh Kumar Ray

CENTURION UNIVERSITY OF TECHNOLOGY AND MANAGEMENT (CUTM)
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DECLARATION

I am **Manish Ram (240720100067),** Bonafide student of CENTURION UNIVERSITY OF TECHNOLOGY AND MANAGEMENT, hereby declare that the dissertation entitled, **"Remotel - Hostel Room Management System"** is an original work and data provided in the study is authentic one, carried out by me under the guidance of **Prof. Rakesh Kumar Ray**, in partial fulfilment of the requirements for the MASTER OF COMPUTER APPLICATION, of the CENTURION UNIVERSITY OF TECHNOLOGY AND MANAGEMENT, BHUBANESWAR during the academic year 2024-2025.

Signature of HOD of MCA

Prof. Rakesh Kumar Ray

Signature of Project Guide

Prof. Rakesh Kumar Ray

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Manish Ram (240720100067)

ABSTRACT

Remotel is a desktop-based application developed to streamline and automate hostel room management processes. Traditionally, room allotment and user request handling in hostels are done manually, leading to inefficiencies, data inconsistencies, and administrative overhead. Remotel addresses these challenges by providing a centralized and user-friendly system that allows users to register, request rooms, and manage their data seamlessly.

Built using **Java Swing** for the graphical user interface and **SQLite** for local database management, the system follows the **DAO and MVC design patterns** to ensure modularity, maintainability, and clear separation of concerns.

Administrators are equipped with a dedicated dashboard to review requests, manage room availability, and update records efficiently.

The application not only automates tedious tasks but also minimizes errors associated with manual record-keeping. Future enhancements may include adding network support or developing a mobile version for broader accessibility.

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❖ INTRODUCTION

- ❖ Remotel is a desktop-based application developed to simplify and automate the process of hostel room management. It provides a centralized platform for handling user registrations, room requests, and administrative operations efficiently. The application is built using Java for backend logic and Java Swing for the user interface, with SQLite serving as the local database for data persistence.
- ❖ Designed with both functionality and usability in mind, Remotel follows the DAO (Data Access Object) and MVC (Model-View-Controller) design patterns to maintain clear separation between data handling, logic, and presentation. The system enables students to register and request rooms seamlessly, while providing administrators with tools to review and manage requests, assign rooms, and maintain records—all from a single dashboard.
- ❖ By replacing manual processes with automation, Remotel reduces human error, improves operational efficiency, and enhances the overall user experience for both students and administrators.

Key Features

- User Registration and Login:

Students can create accounts and securely log in to access hostel services.

- Room Request and Booking System:

Users can submit room requests, which are processed by the admin through an approval system.

- Admin Dashboard:

A dedicated interface for administrators to view, approve/deny room requests, and manage room availability and user details.

- Database Integration with SQLite:

All data related to users, rooms, and requests is stored in a local SQLite database for quick and reliable access.

- Clear Separation of Concerns:

The system is built using the DAO (Data Access Object) and MVC (Model-View-Controller) patterns, ensuring clean code organization and easier maintenance.

- Status Tracking and Updates:

Real-time status updates for room requests and room assignments.

- Standalone Desktop Application:

Fully functional without requiring internet connectivity, ideal for local deployment in hostel offices.

AIM:

The aim of the *Remotel* project is to **develop a desktop-based application** that automates and simplifies the hostel room management process. It seeks to:

- Replace the traditional manual system with a **digital solution**.
- Ensure **efficient handling of room allotments** and user requests.
- Provide an **intuitive interface** for both students and administrators.
- Maintain **accurate and secure records** through database integration.
- Reduce administrative burden and **minimize human error**.

SCOPE:

The *Remotel* application is designed to address the needs of hostel administrators and residents by providing an efficient digital platform for room management. The scope of the project includes:

- **User Management:** Registration, login, and profile handling for hostel residents.
- **Room Allotment:** Online submission and processing of room requests with automated status tracking.
- **Admin Operations:** Tools for administrators to manage room availability, view user requests, and assign rooms efficiently.
- **Local Deployment:** As a desktop-based application, Remotel is intended for use within the local hostel network without relying on continuous internet connectivity.
- **Scalability:** The application architecture allows for future expansion, such as adding networking features or migrating to a web or mobile-based platform.

❖ SOFTWARE AND HARDWARE REQUIREMENTS

SOFTWARE REQUIREMENTS

- Programming Language: Java (JDK 8 or higher)
- IDE: Eclipse / IntelliJ IDEA / NetBeans (any Java-supported IDE)
- UI Framework: Java Swing
- Database: SQLite
- Database Browser: SQLite DB Browser (optional for visualization)
- Operating System: Windows 7 or later / Linux / macOS
- Java Runtime: Java Runtime Environment (JRE 8 or higher)

HARDWARE REQUIREMENTS

- Processor: Intel i3 or higher
- RAM: Minimum 4 GB (8 GB recommended)
- Hard Disk: Minimum 200 MB free space
- Display: Minimum 1024x768 resolution
- Input Devices: Keyboard and Mouse

❖ THEORY OF OPERATION

The project Remotel ran through following steps:

1. User Registration/Login
   - New users register with basic details.
   - Existing users log in using credentials.
2. Room Request Submission
   - Logged-in users browse available rooms.
   - Users submit room allotment requests.
3. Admin Review
   - Admin accesses the dashboard.
   - Admin reviews pending requests.
4. Approval or Rejection
   - Admin approves or denies room requests.
   - Status is updated in the system.
5. Database Update
   - Room status (available/booked) is updated.
   - User assignment details are saved.
6. User Notification
   - User is notified of the room allotment decision

❖ IMPLEMENTATION

Overview:

- The implementation phase of the *Remotel* project involved the development of a desktop-based hostel room management system using Java technologies and SQLite database. This chapter outlines the step-by-step process followed to build the system, from setting up the development environment to coding the application logic and testing each module thoroughly.

Development Environment Setup

- Before initiating development, the following tools and setup were configured to ensure smooth project execution:
- **Install Java JDK 8+**: The core language used for developing the system.
- **Install SQLite**: Lightweight, file-based relational database for local data storage.
- **Set Up IDE**: Eclipse or IntelliJ IDEA configured with necessary plugins for Java Swing and database access.
- **Install SQLite JDBC Driver**: Added to the project libraries to enable Java-SQLite integration.

Application Development

- The development process was divided into the following key components:
- **Design Database:** The SQLite database schema was designed to support the main functionalities of the system. Key tables include:
- **Users Table**: Stores user login data and personal information.
- **Rooms Table**: Stores room numbers, status (available/booked), and details.
- **Requests Table**: Manages room booking requests and their statuses (pending, approved, denied).

Back-end Development

- The core application logic was implemented using Java, structured with DAO and MVC design patterns:
- **DAO Layer**: Interfaces for performing operations like addUser(), getRoomStatus(), and updateRequest().
- **Model Classes**: Represented entities like User, Room, and Request.
- **Service Classes**: Contained business logic for handling room assignments and admin decisions.

Front-end Development

- The graphical user interface (GUI) was developed using **Java Swing**, offering a clean and interactive layout:
- **User Forms**: For registration, login, and room request submissions.

- **Admin Panel**: For reviewing requests, updating room details, and managing users.
- **Dialogs and Tables**: Used to display information dynamically based on database data.

Testing

- Extensive testing was conducted to ensure the system's reliability:
- **Unit Testing**: Core functions like database CRUD operations, login, and request processing were tested using JUnit.
- **Manual Testing**: Each form and feature was manually tested to check usability and correctness.
- **Edge Case Handling**: Scenarios like duplicate requests, invalid login attempts, and full occupancy were tested and handled gracefully.

Deployment

- Since Remotel is a **desktop application**, deployment was done locally:
- **Packaging**: The project was compiled into .jar executable format using the IDE's build tools.
- **Distribution**: The JAR file, along with the SQLite database, can be distributed to run on any compatible system with Java installed.
- **Database File Setup**: The SQLite .db file is placed in the working directory for persistent data access.

Key Functionalities Implemented

- **User Registration & Login**: Secure access to the system based on user roles.
- **Room Request Submission**: Users can submit requests for room allotment.
- **Admin Dashboard**: View, approve, or deny room requests.
- **Database Integration**: Real-time updates to room availability and user assignments.
- **Status Notifications**: Users are notified of their request outcomes.

❖ SOURCE CODE AND OUTPUT

➢ Source Code:

File name: RoomDAO.java

```
package com.hostel.dao;
import com.hostel.model.Room;
import com.hostel.util.DatabaseUtil;
import java.sql.*;
import java.util.ArrayList;
import java.util.List;
import java.util.Date;
import java.util.HashMap;
import java.util.Map;
public class RoomDAO {
    public boolean addRoom(Room room) {
        String query = "INSERT INTO rooms (room_number, room_type,
is_occupied, status) VALUES (?, ?, ?, ?)";
        try (Connection conn = DatabaseUtil.getConnection();
             PreparedStatement pstmt = conn.prepareStatement(query)) {
            pstmt.setString(1, room.getRoomNumber());
            pstmt.setString(2, room.getRoomType());
            pstmt.setBoolean(3, room.isOccupied());
            pstmt.setString(4, room.getStatus());
            return pstmt.executeUpdate() > 0;
        } catch (SQLException e) {
            e.printStackTrace();
            return false;
        }
    }
    public List<Room> getAllRooms() {
        List<Room> rooms = new ArrayList<>();
        String query = "SELECT * FROM rooms";
        try (Connection conn = DatabaseUtil.getConnection();
             Statement stmt = conn.createStatement();
             ResultSet rs = stmt.executeQuery(query)) {
            while (rs.next()) {
                rooms.add(extractRoomFromResultSet(rs));
            }
```

```
        } catch (SQLException e) {
            e.printStackTrace();
        }
        return rooms;
    }
    public List<Room> getAvailableRooms() {
        List<Room> rooms = new ArrayList<>();
        String query = "SELECT * FROM rooms WHERE status = 'available' AND
is_occupied = false";
        try (Connection conn = DatabaseUtil.getConnection();
             Statement stmt = conn.createStatement();
             ResultSet rs = stmt.executeQuery(query)) {
            while (rs.next()) {
                rooms.add(extractRoomFromResultSet(rs));
            }
        } catch (SQLException e) {
            e.printStackTrace();
        }
        return rooms;
    }
    public boolean updateRoomStatus(int roomId, String status, boolean
isOccupied, Integer occupantId) {
        String query = "UPDATE rooms SET status = ?, is_occupied = ?, occupant_id
= ? WHERE room_id = ?";
        try (Connection conn = DatabaseUtil.getConnection();
             PreparedStatement pstmt = conn.prepareStatement(query)) {
            pstmt.setString(1, status);
            pstmt.setBoolean(2, isOccupied);
            if (occupantId != null) {
                pstmt.setInt(3, occupantId);
            } else {
                pstmt.setNull(3, Types.INTEGER);
            }
            pstmt.setInt(4, roomId);
            return pstmt.executeUpdate() > 0;
        } catch (SQLException e) {
            e.printStackTrace();
            return false;
        }
    }
```

```
   public boolean allocateRoom(int roomId, int userId, Date
expectedCheckoutDate) {
       Connection conn = null;
       try {
          conn = DatabaseUtil.getConnection();
          conn.setAutoCommit(false);  // Start transaction
          // Update room status
          String updateRoomQuery = "UPDATE rooms SET is_occupied = ?,
occupant_id = ?, status = ?, allocation_date = CURRENT_TIMESTAMP,
expected_checkout_date = ? WHERE room_id = ?";
          try (PreparedStatement pstmt =
conn.prepareStatement(updateRoomQuery)) {
             pstmt.setBoolean(1, true);
             pstmt.setInt(2, userId);
             pstmt.setString(3, "occupied");
             pstmt.setTimestamp(4, new
Timestamp(expectedCheckoutDate.getTime()));
             pstmt.setInt(5, roomId);
             pstmt.executeUpdate();
          }
          // Add entry to allocation history
          String insertHistoryQuery = "INSERT INTO room_allocation_history
(room_id, user_id, allocation_date, status) VALUES (?, ?,
CURRENT_TIMESTAMP, 'active')";
          try (PreparedStatement pstmt =
conn.prepareStatement(insertHistoryQuery)) {
             pstmt.setInt(1, roomId);
             pstmt.setInt(2, userId);
             pstmt.executeUpdate();
          }
          conn.commit();
          return true;
       } catch (SQLException e) {
          if (conn != null) {
             try {
                conn.rollback();
             } catch (SQLException ex) {
                ex.printStackTrace();
             }
          }
```

```
            e.printStackTrace();
            return false;
        } finally {
            if (conn != null) {
                try {
                    conn.setAutoCommit(true);
                    conn.close();
                } catch (SQLException e) {
                    e.printStackTrace();
                }
            }
        }
    }
    public boolean deallocateRoom(int roomId, String remarks) {
        Connection conn = null;
        try {
            conn = DatabaseUtil.getConnection();
            conn.setAutoCommit(false);  // Start transaction
            // Update room status
            String updateRoomQuery = "UPDATE rooms SET is_occupied = FALSE,
occupant_id = NULL, status = 'available', allocation_date = NULL,
expected_checkout_date = NULL WHERE room_id = ?";
            try (PreparedStatement pstmt =
conn.prepareStatement(updateRoomQuery)) {
                pstmt.setInt(1, roomId);
                pstmt.executeUpdate();
            }
            // Update allocation history
            String updateHistoryQuery = "UPDATE room_allocation_history SET
checkout_date = CURRENT_TIMESTAMP, status = 'completed', remarks = ?
WHERE room_id = ? AND status = 'active'";
            try (PreparedStatement pstmt =
conn.prepareStatement(updateHistoryQuery)) {
                pstmt.setString(1, remarks);
                pstmt.setInt(2, roomId);
                pstmt.executeUpdate();
            }
            conn.commit();
            return true;
        } catch (SQLException e) {
```

```
            if (conn != null) {
                try {
                    conn.rollback();
                } catch (SQLException ex) {
                    ex.printStackTrace();
                }
            }
            e.printStackTrace();
            return false;
        } finally {
            if (conn != null) {
                try {
                    conn.setAutoCommit(true);
                    conn.close();
                } catch (SQLException e) {
                    e.printStackTrace();
                }
            }
        }
    }
    public List<Room> getRoomsWithAllocationInfo() {
        List<Room> rooms = new ArrayList<>();
        String query = """
            SELECT r.*, u.name as occupant_name
            FROM rooms r
            LEFT JOIN users u ON r.occupant_id = u.id
            ORDER BY r.room_number
        """;
        try (Connection conn = DatabaseUtil.getConnection();
             Statement stmt = conn.createStatement();
             ResultSet rs = stmt.executeQuery(query))
            while (rs.next()) {
                Room room = extractRoomFromResultSet(rs);
                // Add occupant name if available
                if (rs.getString("occupant_name") != null) {
                    room.setOccupantName(rs.getString("occupant_name"));
                }
                rooms.add(room);
            }
        } catch (SQLException e) {
```

```
            e.printStackTrace();
        }
        return rooms;
    }
    public List<Map<String, Object>> getAllocationHistory(int roomId) {
        List<Map<String, Object>> history = new ArrayList<>();
        String query = """
            SELECT rh.*, r.room_number, u.name as user_name
            FROM room_allocation_history rh
            JOIN rooms r ON rh.room_id = r.room_id
            JOIN users u ON rh.user_id = u.id
            WHERE rh.room_id = ?
            ORDER BY rh.allocation_date DESC
        """;
        try (Connection conn = DatabaseUtil.getConnection();
             PreparedStatement pstmt = conn.prepareStatement(query))
            pstmt.setInt(1, roomId);
            try (ResultSet rs = pstmt.executeQuery()) {
                while (rs.next()) {
                    Map<String, Object> record = new HashMap<>();
                    record.put("allocation_id", rs.getInt("allocation_id"));
                    record.put("room_number", rs.getString("room_number"));
                    record.put("user_name", rs.getString("user_name"));
                    record.put("allocation_date", rs.getTimestamp("allocation_date"));
                    record.put("checkout_date", rs.getTimestamp("checkout_date"));
                    record.put("status", rs.getString("status"));
                    record.put("remarks", rs.getString("remarks"));
                    history.add(record);
                }
            }
        } catch (SQLException e) {
            e.printStackTrace();
        }
        return history;
    }
    private Room extractRoomFromResultSet(ResultSet rs) throws SQLException {
        return new Room(
            rs.getInt("room_id"),
            rs.getString("room_number"),
            rs.getString("room_type"),
```

```
            rs.getBoolean("is_occupied"),
            rs.getInt("occupant_id"),
            rs.getString("status")
        );
    }
}
```

File name: RoomRequestDAO.java

```
package com.hostel.dao;
import com.hostel.model.RoomRequest;
import com.hostel.util.DatabaseUtil;
import java.sql.*;
import java.util.ArrayList;
import java.util.List;
public class RoomRequestDAO {
    public boolean createRequest(RoomRequest request) {
        String query = "INSERT INTO room_requests (user_id, preferred_room_type, status, remarks,
preferred_checkout_date) VALUES (?, ?, ?, ?, ?)";
        try (Connection conn = DatabaseUtil.getConnection();
             PreparedStatement pstmt = conn.prepareStatement(query)) {
            pstmt.setInt(1, request.getUserId());
            pstmt.setString(2, request.getPreferredRoomType());
            pstmt.setString(3, "pending");
            pstmt.setString(4, request.getRemarks());
            if (request.getPreferredCheckoutDate() != null) {
                pstmt.setTimestamp(5, new Timestamp(request.getPreferredCheckoutDate().getTime()));
            } else {
                pstmt.setNull(5, Types.TIMESTAMP);
            }
            return pstmt.executeUpdate() > 0;
        } catch (SQLException e) {
            e.printStackTrace();
            return false;
        }
    }
    public List<RoomRequest> getAllRequests() {
        List<RoomRequest> requests = new ArrayList<>();
        String query = "SELECT * FROM room_requests ORDER BY request_date DESC";
        try (Connection conn = DatabaseUtil.getConnection();
             Statement stmt = conn.createStatement();
             ResultSet rs = stmt.executeQuery(query)) {
            while (rs.next()) {
                requests.add(extractRequestFromResultSet(rs));
            }
        } catch (SQLException e) {
            e.printStackTrace();
        }
        return requests;
    }
```

```
    public List<RoomRequest> getRequestsByUser(int userId) {
        List<RoomRequest> requests = new ArrayList<>();
        String query = "SELECT * FROM room_requests WHERE user_id = ? ORDER BY request_date
DESC";
        try (Connection conn = DatabaseUtil.getConnection();
             PreparedStatement pstmt = conn.prepareStatement(query)) {
            pstmt.setInt(1, userId);
            try (ResultSet rs = pstmt.executeQuery()) {
                while (rs.next()) {
                    requests.add(extractRequestFromResultSet(rs));
                }
            }
        } catch (SQLException e) {
            e.printStackTrace();
        }
        return requests;
    }
    public boolean updateRequestStatus(int requestId, String status, String remarks) {
        String query = "UPDATE room_requests SET status = ?, remarks = ? WHERE request_id = ?";
        try (Connection conn = DatabaseUtil.getConnection();
             PreparedStatement pstmt = conn.prepareStatement(query)) {
            pstmt.setString(1, status);
            pstmt.setString(2, remarks);
            pstmt.setInt(3, requestId);
            return pstmt.executeUpdate() > 0;
        } catch (SQLException e) {
            e.printStackTrace();
            return false;
        }
    }
    private RoomRequest extractRequestFromResultSet(ResultSet rs) throws SQLException {
        RoomRequest request = new RoomRequest(
            rs.getInt("request_id"),
            rs.getInt("user_id"),
            rs.getString("preferred_room_type"),
            rs.getString("status"),
            rs.getTimestamp("request_date"),
            rs.getString("remarks")
        );
        Timestamp checkoutDate = rs.getTimestamp("preferred_checkout_date");
        if (checkoutDate != null) {
            request.setPreferredCheckoutDate(checkoutDate);
        }
        return request;
    }
}
```

File name: UserDAO.java

```
package com.hostel.dao;

import com.hostel.model.User;
import com.hostel.util.DatabaseUtil;

import java.sql.*;
import java.util.ArrayList;
import java.util.List;

public class UserDAO {

    public User authenticate(String username, String password) {
        String query = "SELECT * FROM users WHERE username = ? AND
password = ?";
        try (Connection conn = DatabaseUtil.getConnection();
             PreparedStatement pstmt = conn.prepareStatement(query)) {

            pstmt.setString(1, username);
            pstmt.setString(2, password);

            try (ResultSet rs = pstmt.executeQuery()) {
                if (rs.next()) {
                    return extractUserFromResultSet(rs);
                }
            }
        } catch (SQLException e) {
            e.printStackTrace();
        }
        return null;
    }

    public boolean isUsernameExists(String username) {
        String query = "SELECT COUNT(*) FROM users WHERE username = ?";
        try (Connection conn = DatabaseUtil.getConnection();
             PreparedStatement pstmt = conn.prepareStatement(query)) {

            pstmt.setString(1, username);
            try (ResultSet rs = pstmt.executeQuery()) {
                if (rs.next()) {
```

```
                return rs.getInt(1) > 0;
            }
        }
    } catch (SQLException e) {
        e.printStackTrace();
    }
    return false;
}

public boolean createUser(User user) {
    // First check if username already exists
    if (isUsernameExists(user.getUsername())) {
        return false;
    }
    String query = "INSERT INTO users (username, password, role, name, email)
VALUES (?, ?, ?, ?, ?)";
    try (Connection conn = DatabaseUtil.getConnection();
         PreparedStatement pstmt = conn.prepareStatement(query)) {

        pstmt.setString(1, user.getUsername());
        pstmt.setString(2, user.getPassword());
        pstmt.setString(3, user.getRole());
        pstmt.setString(4, user.getName());
        pstmt.setString(5, user.getEmail());

        return pstmt.executeUpdate() > 0;
    } catch (SQLException e) {
        e.printStackTrace();
        return false;
    }
}
public boolean createAdmin(String username, String password, String name,
String email) {
    // Check if username already exists
    if (isUsernameExists(username)) {
        return false;
    }

    String query = "INSERT INTO users (username, password, role, name, email)
VALUES (?, ?, 'admin', ?, ?)";
```

```
        try (Connection conn = DatabaseUtil.getConnection();
             PreparedStatement pstmt = conn.prepareStatement(query)) {

            pstmt.setString(1, username);
            pstmt.setString(2, password);
            pstmt.setString(3, name);
            pstmt.setString(4, email);

            return pstmt.executeUpdate() > 0;
        } catch (SQLException e) {
            e.printStackTrace();
            return false;
        }
    }
    public List<User> getAllUsers() {
        List<User> users = new ArrayList<>();
        String query = "SELECT * FROM users";
        try (Connection conn = DatabaseUtil.getConnection();
             Statement stmt = conn.createStatement();
             ResultSet rs = stmt.executeQuery(query)) {

            while (rs.next()) {
                users.add(extractUserFromResultSet(rs));
            }
        } catch (SQLException e) {
            e.printStackTrace();
        }
        return users;
    }
    private User extractUserFromResultSet(ResultSet rs) throws SQLException {
        return new User(
            rs.getInt("id"),
            rs.getString("username"),
            rs.getString("password"),
            rs.getString("role"),
            rs.getString("name"),
            rs.getString("email")
        );
    }
}
```

File name: Room.java

```
package com.hostel.model;

import java.util.Date;

public class Room {
   private int roomId;
   private String roomNumber;
   private String roomType;
   private boolean isOccupied;
   private int occupantId;
   private String status; // available, allocated, maintenance
   private Date allocationDate;
   private Date expectedCheckoutDate;
   private String occupantName; // To display in UI

   public Room() {}

   public Room(int roomId, String roomNumber, String roomType, boolean isOccupied, int occupantId,
String status) {
      this.roomId = roomId;
      this.roomNumber = roomNumber;
      this.roomType = roomType;
      this.isOccupied = isOccupied;
      this.occupantId = occupantId;
      this.status = status;
   }

   // Getters and Setters
   public int getRoomId() { return roomId; }
   public void setRoomId(int roomId) { this.roomId = roomId; }

   public String getRoomNumber() { return roomNumber; }
   public void setRoomNumber(String roomNumber) { this.roomNumber = roomNumber; }

   public String getRoomType() { return roomType; }
   public void setRoomType(String roomType) { this.roomType = roomType; }

   public boolean isOccupied() { return isOccupied; }
   public void setOccupied(boolean occupied) { isOccupied = occupied; }

   public int getOccupantId() { return occupantId; }
   public void setOccupantId(int occupantId) { this.occupantId = occupantId; }

   public String getStatus() { return status; }
   public void setStatus(String status) { this.status = status; }

   public Date getAllocationDate() { return allocationDate; }
   public void setAllocationDate(Date allocationDate) { this.allocationDate = allocationDate; }
```

```
    public Date getExpectedCheckoutDate() { return expectedCheckoutDate; }
    public void setExpectedCheckoutDate(Date expectedCheckoutDate) { this.expectedCheckoutDate =
expectedCheckoutDate; }

    public String getOccupantName() { return occupantName; }
    public void setOccupantName(String occupantName) { this.occupantName = occupantName; }

    @Override
    public String toString() {
        StringBuilder sb = new StringBuilder();
        sb.append("Room ").append(roomNumber);
        sb.append(" (").append(roomType).append(")");
        if (isOccupied && occupantName != null) {
            sb.append(" - Occupied by: ").append(occupantName);
        } else {
            sb.append(" - ").append(status);
        }
        return sb.toString();
    }
}
```

File name: RoomRequest.java

```
 package com.hostel.model;

import java.util.Date;

public class RoomRequest {
    private int requestId;
    private int userId;
    private String preferredRoomType;
    private String status; // pending, approved, rejected
    private Date requestDate;
    private String remarks;
    private Date preferredCheckoutDate;

    public RoomRequest() {}

    public RoomRequest(int requestId, int userId, String preferredRoomType, String status, Date
requestDate, String remarks) {
        this.requestId = requestId;
        this.userId = userId;
        this.preferredRoomType = preferredRoomType;
        this.status = status;
        this.requestDate = requestDate;
        this.remarks = remarks;
    }

    public RoomRequest(int requestId, int userId, String preferredRoomType, String status, Date
requestDate, String remarks, Date preferredCheckoutDate) {
        this(requestId, userId, preferredRoomType, status, requestDate, remarks);
```

```
        this.preferredCheckoutDate = preferredCheckoutDate;
    }

    // Getters and Setters
    public int getRequestId() { return requestId; }
    public void setRequestId(int requestId) { this.requestId = requestId; }

    public int getUserId() { return userId; }
    public void setUserId(int userId) { this.userId = userId; }

    public String getPreferredRoomType() { return preferredRoomType; }
    public void setPreferredRoomType(String preferredRoomType) { this.preferredRoomType =
preferredRoomType; }

    public String getStatus() { return status; }
    public void setStatus(String status) { this.status = status; }

    public Date getRequestDate() { return requestDate; }
    public void setRequestDate(Date requestDate) { this.requestDate = requestDate; }

    public String getRemarks() { return remarks; }
    public void setRemarks(String remarks) { this.remarks = remarks; }

    public Date getPreferredCheckoutDate() { return preferredCheckoutDate; }
    public void setPreferredCheckoutDate(Date preferredCheckoutDate) { this.preferredCheckoutDate =
preferredCheckoutDate; }
}
```

File name: User.java

```
package com.hostel.model;

public class User {
    private int id;
    private String username;
    private String password;
    private String role;
    private String name;
    private String email;

    public User() {}

    public User(int id, String username, String password, String role, String name, String email) {
        this.id = id;
        this.username = username;
        this.password = password;
        this.role = role;
        this.name = name;
        this.email = email;
    }
```

```
    // Getters and Setters
    public int getId() { return id; }
    public void setId(int id) { this.id = id; }

    public String getUsername() { return username; }
    public void setUsername(String username) { this.username = username; }

    public String getPassword() { return password; }
    public void setPassword(String password) { this.password = password; }

    public String getRole() { return role; }
    public void setRole(String role) { this.role = role; }

    public String getName() { return name; }
    public void setName(String name) { this.name = name; }

    public String getEmail() { return email; }
    public void setEmail(String email) { this.email = email; }
}
```

File name: AdminDashboard.java

```
package com.hostel.ui;
import com.hostel.dao.RoomDAO;
import com.hostel.dao.RoomRequestDAO;
import com.hostel.model.Room;
import com.hostel.model.RoomRequest;
import com.hostel.model.User;

import javax.swing.*;
import javax.swing.table.DefaultTableModel;
import java.awt.*;
import java.awt.event.*;
import java.text.SimpleDateFormat;
import java.util.*;
import java.util.List;
import java.sql.Timestamp;

public class AdminDashboard extends JFrame {
    private final User admin;
    private final RoomDAO roomDAO;
    private final RoomRequestDAO requestDAO;
    private JTable roomsTable;
    private JTable requestsTable;
    private DefaultTableModel roomsModel;
    private DefaultTableModel requestsModel;
```

```
private JTextField searchField;
private SimpleDateFormat dateFormat = new SimpleDateFormat("yyyy-MM-dd HH:mm");

public AdminDashboard(User admin) {
    this.admin = admin;
    this.roomDAO = new RoomDAO();
    this.requestDAO = new RoomRequestDAO();

    setTitle("Admin Dashboard - Hostel Room Allotment");
    setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
    setSize(1000, 600);
    setLocationRelativeTo(null);

    // Main panel
    JPanel mainPanel = new JPanel(new BorderLayout(10, 10));
    mainPanel.setBorder(BorderFactory.createEmptyBorder(20, 20, 20, 20));
    mainPanel.setBackground(Color.WHITE);

    // Top panel with welcome message and search
    JPanel topPanel = createTopPanel();
    mainPanel.add(topPanel, BorderLayout.NORTH);

    // Center panel with tables
    JSplitPane splitPane = createSplitPane();
    mainPanel.add(splitPane, BorderLayout.CENTER);

    // Bottom panel with actions
    JPanel bottomPanel = createBottomPanel();
    mainPanel.add(bottomPanel, BorderLayout.SOUTH);

    add(mainPanel);

    // Load initial data
    refreshTables();
}

private JPanel createTopPanel() {
    JPanel panel = new JPanel(new BorderLayout(10, 10));
    panel.setBackground(Color.WHITE);

    // Welcome message
    JLabel welcomeLabel = new JLabel("Welcome, " + admin.getName());
    welcomeLabel.setFont(new Font("Arial", Font.BOLD, 16));
    panel.add(welcomeLabel, BorderLayout.WEST);

    // Search panel
```

```
        JPanel searchPanel = new JPanel(new FlowLayout(FlowLayout.RIGHT));
        searchPanel.setBackground(Color.WHITE);
        searchField = new JTextField(20);
        JButton searchButton = new JButton("Search");
        searchButton.setBackground(new Color(37, 99, 235));
        searchButton.setForeground(Color.BLACK);

        searchPanel.add(new JLabel("Search:"));
        searchPanel.add(searchField);
        searchPanel.add(searchButton);

        panel.add(searchPanel, BorderLayout.EAST);

        // Add search functionality
        searchButton.addActionListener(e -> filterRooms());
        searchField.addActionListener(e -> filterRooms());

        return panel;
    }

    private JSplitPane createSplitPane() {
        // Rooms table
        roomsModel = new DefaultTableModel(
            new Object[]{"Room ID", "Room Number", "Type", "Status", "Occupant", "Allocation
Date", "Expected Checkout"}, 0
        ) {
            @Override
            public boolean isCellEditable(int row, int column) {
                return false;
            }
        };
        roomsTable = new JTable(roomsModel);
        JScrollPane roomsScrollPane = new JScrollPane(roomsTable);
        roomsScrollPane.setBorder(BorderFactory.createTitledBorder("Rooms"));

        // Requests table - Added Preferred Checkout column
        requestsModel = new DefaultTableModel(
            new Object[]{"Request ID", "User ID", "Room Type", "Status", "Request Date",
"Preferred Checkout", "Remarks"}, 0
        ) {
            @Override
            public boolean isCellEditable(int row, int column) {
                return false;
            }
        };
        requestsTable = new JTable(requestsModel);
```

```
        JScrollPane requestsScrollPane = new JScrollPane(requestsTable);
        requestsScrollPane.setBorder(BorderFactory.createTitledBorder("Room Requests"));

        // Split pane
        JSplitPane splitPane = new JSplitPane(JSplitPane.VERTICAL_SPLIT, roomsScrollPane,
requestsScrollPane);
        splitPane.setResizeWeight(0.5);

        // Add double-click listeners
        roomsTable.addMouseListener(new MouseAdapter() {
            public void mouseClicked(MouseEvent e) {
                if (e.getClickCount() == 2) {
                    showRoomHistory();
                }
            }
        });

        requestsTable.addMouseListener(new MouseAdapter() {
            public void mouseClicked(MouseEvent e) {
                if (e.getClickCount() == 2) {
                    handleRequest();
                }
            }
        });

        return splitPane;
    }

    private JPanel createBottomPanel() {
        JPanel panel = new JPanel(new FlowLayout(FlowLayout.LEFT, 10, 10));
        panel.setBackground(Color.WHITE);

        JButton addRoomButton = new JButton("Add Room");
        addRoomButton.setBackground(new Color(22, 163, 74));
        addRoomButton.setForeground(Color.BLACK);

        JButton logoutButton = new JButton("Logout");
        logoutButton.setBackground(new Color(220, 38, 38));
        logoutButton.setForeground(Color.BLACK);

        panel.add(addRoomButton);
        panel.add(logoutButton);

        addRoomButton.addActionListener(e -> addNewRoom());
        logoutButton.addActionListener(e -> logout());
```

```
        return panel;
    }

    private void refreshTables() {
        // Clear existing data
        roomsModel.setRowCount(0);
        requestsModel.setRowCount(0);

        // Load rooms with allocation info
        List<Room> rooms = roomDAO.getRoomsWithAllocationInfo();
        for (Room room : rooms) {
            roomsModel.addRow(new Object[]{
                room.getRoomId(),
                room.getRoomNumber(),
                room.getRoomType(),
                room.getStatus(),
                room.getOccupantName() != null ? room.getOccupantName() : "-",
                room.getAllocationDate() != null ? dateFormat.format(room.getAllocationDate()) : "-",
                room.getExpectedCheckoutDate() != null ?
dateFormat.format(room.getExpectedCheckoutDate()) : "-"
            });
        }

        // Load requests
        List<RoomRequest> requests = requestDAO.getAllRequests();
        for (RoomRequest request : requests) {
            String checkoutDate = request.getPreferredCheckoutDate() != null ?
                dateFormat.format(request.getPreferredCheckoutDate()) : "-";
            requestsModel.addRow(new Object[]{
                request.getRequestId(),
                request.getUserId(),
                request.getPreferredRoomType(),
                request.getStatus(),
                dateFormat.format(request.getRequestDate()),
                checkoutDate,
                request.getRemarks()
            });
        }
    }

    private void filterRooms() {
        String searchText = searchField.getText().toLowerCase();
        roomsModel.setRowCount(0);

        List<Room> rooms = roomDAO.getRoomsWithAllocationInfo();
        for (Room room : rooms) {
```

```
            if (room.getRoomNumber().toLowerCase().contains(searchText) ||
                room.getRoomType().toLowerCase().contains(searchText) ||
                room.getStatus().toLowerCase().contains(searchText)) {

                roomsModel.addRow(new Object[]{
                    room.getRoomId(),
                    room.getRoomNumber(),
                    room.getRoomType(),
                    room.getStatus(),
                    room.getOccupantName() != null ? room.getOccupantName() : "-",
                    room.getAllocationDate() != null ? dateFormat.format(room.getAllocationDate()) :
"-",
                    room.getExpectedCheckoutDate() != null ?
dateFormat.format(room.getExpectedCheckoutDate()) : "-"
                });
            }
        }
    }

    private void addNewRoom() {
        JTextField roomNumberField = new JTextField();
        JComboBox<String> roomTypeCombo = new JComboBox<>(new String[]{"Single",
"Double", "Triple"});

        JPanel panel = new JPanel(new GridLayout(0, 1));
        panel.add(new JLabel("Room Number:"));
        panel.add(roomNumberField);
        panel.add(new JLabel("Room Type:"));
        panel.add(roomTypeCombo);

        int result = JOptionPane.showConfirmDialog(this, panel, "Add New Room",
                JOptionPane.OK_CANCEL_OPTION, JOptionPane.PLAIN_MESSAGE);

        if (result == JOptionPane.OK_OPTION) {
            String roomNumber = roomNumberField.getText();
            String roomType = (String) roomTypeCombo.getSelectedItem();

            if (!roomNumber.isEmpty()) {
                Room newRoom = new Room(0, roomNumber, roomType, false, 0, "available");
                if (roomDAO.addRoom(newRoom)) {
                    refreshTables();
                    JOptionPane.showMessageDialog(this, "Room added successfully!");
                } else {
                    JOptionPane.showMessageDialog(this, "Failed to add room", "Error",
JOptionPane.ERROR_MESSAGE);
                }
```

```
        }
    }
}

private void editRoom() {
    int selectedRow = roomsTable.getSelectedRow();
    if (selectedRow == -1) return;

    int roomId = (int) roomsTable.getValueAt(selectedRow, 0);
    String currentStatus = (String) roomsTable.getValueAt(selectedRow, 3);
    boolean isOccupied = !currentStatus.equals("available");

    JPanel panel = new JPanel(new GridLayout(0, 1));
    String[] statuses = isOccupied ?
        new String[]{"occupied", "maintenance"} :
        new String[]{"available", "maintenance"};
    JComboBox<String> statusCombo = new JComboBox<>(statuses);
    statusCombo.setSelectedItem(currentStatus);

    panel.add(new JLabel("Status:"));
    panel.add(statusCombo);

    // Add deallocate option if room is occupied
    if (isOccupied) {
        JButton deallocateButton = new JButton("Deallocate Room");
        deallocateButton.addActionListener(e -> {
            String remarks = JOptionPane.showInputDialog(this, "Enter remarks for
deallocation:");
            if (remarks != null) {
                if (roomDAO.deallocateRoom(roomId, remarks)) {
                    refreshTables();
                    JOptionPane.showMessageDialog(this, "Room deallocated successfully!");
                    Window win = SwingUtilities.getWindowAncestor(panel);
                    if (win != null) win.dispose();
                } else {
                    JOptionPane.showMessageDialog(this, "Failed to deallocate room", "Error",
JOptionPane.ERROR_MESSAGE);
                }
            }
        });
        panel.add(deallocateButton);
    }

    int result = JOptionPane.showConfirmDialog(this, panel, "Edit Room",
            JOptionPane.OK_CANCEL_OPTION, JOptionPane.PLAIN_MESSAGE);
```

```
        if (result == JOptionPane.OK_OPTION) {
            String newStatus = (String) statusCombo.getSelectedItem();
            if (roomDAO.updateRoomStatus(roomId, newStatus, newStatus.equals("occupied"),
null)) {
                refreshTables();
                JOptionPane.showMessageDialog(this, "Room updated successfully!");
            } else {
                JOptionPane.showMessageDialog(this, "Failed to update room", "Error",
JOptionPane.ERROR_MESSAGE);
            }
        }
    }

    private void showRoomHistory() {
        int selectedRow = roomsTable.getSelectedRow();
        if (selectedRow == -1) return;

        int roomId = (int) roomsTable.getValueAt(selectedRow, 0);
        List<Map<String, Object>> history = roomDAO.getAllocationHistory(roomId);

        // Create history dialog
        JDialog historyDialog = new JDialog(this, "Room Allocation History", true);
        historyDialog.setSize(600, 400);
        historyDialog.setLocationRelativeTo(this);

        // Create history table
        String[] columns = {"Occupant", "Allocation Date", "Checkout Date", "Status",
"Remarks"};
        DefaultTableModel historyModel = new DefaultTableModel(columns, 0) {
            @Override
            public boolean isCellEditable(int row, int column) {
                return false;
            }
        };

        JTable historyTable = new JTable(historyModel);
        JScrollPane scrollPane = new JScrollPane(historyTable);

        // Add history data
        for (Map<String, Object> record : history) {
            historyModel.addRow(new Object[]{
                record.get("user_name"),
                formatDate((Timestamp) record.get("allocation_date")),
                formatDate((Timestamp) record.get("checkout_date")),
                record.get("status"),
                record.get("remarks")
```

```
        });
    }

    historyDialog.add(scrollPane);
    historyDialog.setVisible(true);
}

private void handleRequest() {
    int selectedRow = requestsTable.getSelectedRow();
    if (selectedRow == -1) return;

    int requestId = (int) requestsTable.getValueAt(selectedRow, 0);
    int userId = (int) requestsTable.getValueAt(selectedRow, 1);
    String currentStatus = (String) requestsTable.getValueAt(selectedRow, 3);
    String preferredCheckout = (String) requestsTable.getValueAt(selectedRow, 5);

    if (!currentStatus.equals("pending")) {
        JOptionPane.showMessageDialog(this, "This request has already been processed.");
        return;
    }

    // Show available rooms of requested type
    String preferredRoomType = (String) requestsTable.getValueAt(selectedRow, 2);
    List<Room> availableRooms = roomDAO.getAvailableRooms();
    List<Room> matchingRooms = new ArrayList<>();
    for (Room room : availableRooms) {
        if (room.getRoomType().equals(preferredRoomType)) {
            matchingRooms.add(room);
        }
    }

    if (matchingRooms.isEmpty()) {
        int choice = JOptionPane.showConfirmDialog(this,
                "No matching rooms available. Would you like to reject the request?",
                "No Rooms Available",
                JOptionPane.YES_NO_OPTION);
        if (choice == JOptionPane.YES_OPTION) {
            String remarks = JOptionPane.showInputDialog(this, "Enter remarks for rejection:");
            if (remarks != null) {
                requestDAO.updateRequestStatus(requestId, "rejected", remarks);
                refreshTables();
            }
        }
        return;
    }
```

```
        // Show room selection dialog
        Room selectedRoom = (Room) JOptionPane.showInputDialog(this,
                "Select a room to allocate:",
                "Allocate Room",
                JOptionPane.QUESTION_MESSAGE,
                null,
                matchingRooms.toArray(),
                matchingRooms.get(0));

        if (selectedRoom != null) {
            // Use preferred checkout date from request
            try {
                Date checkoutDate;
                if (!preferredCheckout.equals("-")) {
                    checkoutDate = dateFormat.parse(preferredCheckout);
                } else {
                    // If no preferred date, ask for one
                    String checkoutDateStr = JOptionPane.showInputDialog(this,
                            "Enter expected checkout date (yyyy-MM-dd):",
                            new SimpleDateFormat("yyyy-MM-dd").format(new Date()));

                    checkoutDate = new SimpleDateFormat("yyyy-MM-dd").parse(checkoutDateStr);
                }

                if (roomDAO.allocateRoom(selectedRoom.getRoomId(), userId, checkoutDate)) {
                    requestDAO.updateRequestStatus(requestId, "approved", "Room " +
selectedRoom.getRoomNumber() + " allocated");
                    refreshTables();
                    JOptionPane.showMessageDialog(this, "Room allocated successfully!");
                } else {
                    JOptionPane.showMessageDialog(this, "Failed to allocate room", "Error",
JOptionPane.ERROR_MESSAGE);
                }
            } catch (Exception e) {
                JOptionPane.showMessageDialog(this, "Invalid date format", "Error",
JOptionPane.ERROR_MESSAGE);
            }
        }
    }

    private String formatDate(Timestamp timestamp) {
        return timestamp != null ? dateFormat.format(timestamp) : "-";
    }

    private void logout() {
        new LoginWindow().setVisible(true);
```

```
        this.dispose();
    }
}
```

File name: LoginWindow.java

```
package com.hostel.ui;

import com.hostel.dao.UserDAO;
import com.hostel.model.User;

import javax.swing.*;
import java.awt.*;
import javax.swing.border.EmptyBorder;
// javac -cp "lib/*;bin" -d bin src/main/java/com/hostel/ui/LoginWindow.java
// java -cp "lib/*;bin" com.hostel.ui.LoginWindow
public class LoginWindow extends JFrame {
    private final UserDAO userDAO;
    private final JTextField usernameField;
    private final JPasswordField passwordField;

    public LoginWindow() {
        userDAO = new UserDAO();

        setTitle("Hostel Room Allotment - Login");
        setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
        setSize(400, 300);
        setLocationRelativeTo(null);

        // Main panel with padding
        JPanel mainPanel = new JPanel();
        mainPanel.setLayout(new BorderLayout());
        mainPanel.setBorder(new EmptyBorder(20, 20, 20, 20));
        mainPanel.setBackground(Color.WHITE);

        // Form panel
        JPanel formPanel = new JPanel();
        formPanel.setLayout(new GridBagLayout());
        formPanel.setBackground(Color.WHITE);
        GridBagConstraints gbc = new GridBagConstraints();
        gbc.fill = GridBagConstraints.HORIZONTAL;
        gbc.insets = new Insets(5, 5, 5, 5);

        // Title
        JLabel titleLabel = new JLabel("Login", SwingConstants.CENTER);
        titleLabel.setFont(new Font("Arial", Font.BOLD, 24));
        gbc.gridx = 0;
        gbc.gridy = 0;
```

```
gbc.gridwidth = 2;
formPanel.add(titleLabel, gbc);

// Username
JLabel usernameLabel = new JLabel("Useme:");
gbc.gridx = 0;
gbc.gridy = 1;
gbc.gridwidth = 1;
formPanel.add(usernameLabel, gbc);

usernameField = new JTextField(20);
gbc.gridx = 1;
formPanel.add(usernameField, gbc);

// Password
JLabel passwordLabel = new JLabel("Password:");
gbc.gridx = 0;
gbc.gridy = 2;
formPanel.add(passwordLabel, gbc);

passwordField = new JPasswordField(20);
gbc.gridx = 1;
formPanel.add(passwordField, gbc);

// Login button
JButton loginButton = new JButton("Login");
loginButton.setBackground(new Color(0, 0, 0));
loginButton.setForeground(Color.BLACK);
loginButton.setFocusPainted(true);
gbc.gridx = 0;
gbc.gridy = 3;
gbc.gridwidth = 2;
gbc.fill = GridBagConstraints.NONE;
formPanel.add(loginButton, gbc);

// Register button
JButton registerButton = new JButton("Register");
registerButton.setBackground(new Color(0,0,0));
registerButton.setForeground(Color.BLACK);
registerButton.setFocusPainted(true);
gbc.gridy = 4;
formPanel.add(registerButton, gbc);

mainPanel.add(formPanel, BorderLayout.CENTER);
add(mainPanel);
```

```
    // Add action listeners
    loginButton.addActionListener(e -> handleLogin());
    registerButton.addActionListener(e -> openRegistrationWindow());

    // Make enter key trigger login
    getRootPane().setDefaultButton(loginButton);
}

private void handleLogin() {
    String username = usernameField.getText();
    String password = new String(passwordField.getPassword());

    if (username.isEmpty() || password.isEmpty()) {
        JOptionPane.showMessageDialog(this,
                "Please enter both username and password",
                "Login Error",
                JOptionPane.ERROR_MESSAGE);
        return;
    }

    User user = userDAO.authenticate(username, password);
    if (user != null) {
        if (user.getRole().equals("admin")) {
            new AdminDashboard(user).setVisible(true);
        } else {
            new StudentDashboard(user).setVisible(true);
        }
        this.dispose();
    } else {
        JOptionPane.showMessageDialog(this,
                "Invalid username or password",
                "Login Error",
                JOptionPane.ERROR_MESSAGE);
    }
}

private void openRegistrationWindow() {
    new RegistrationWindow().setVisible(true);
    this.dispose();
}

public static void main(String[] args) {
    try {
        UIManager.setLookAndFeel(UIManager.getSystemLookAndFeelClassName());
    } catch (Exception e) {
        e.printStackTrace();
```

```
        }

        SwingUtilities.invokeLater(() -> {
            new LoginWindow().setVisible(true);
        });
    }
}
```

File name: RegistrationWindow.java

```
package com.hostel.ui;

import com.hostel.dao.UserDAO;
import com.hostel.model.User;
// javac -cp "lib/*;bin" -d bin src/main/java/com/hostel/ui/RegistrationWindow.java
import javax.swing.*;
import java.awt.*;
import javax.swing.border.EmptyBorder;

public class RegistrationWindow extends JFrame {
    private final UserDAO userDAO;
    private final JTextField usernameField;
    private final JPasswordField passwordField;
    private final JPasswordField confirmPasswordField;
    private final JTextField nameField;
    private final JTextField emailField;

    public RegistrationWindow() {
        userDAO = new UserDAO();

        setTitle("Register - Hostel Room Allotment");
        setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
        setSize(400, 500);
        setLocationRelativeTo(null);

        // Main panel with padding
        JPanel mainPanel = new JPanel();
        mainPanel.setLayout(new BorderLayout());
        mainPanel.setBorder(new EmptyBorder(20, 20, 20, 20));
        mainPanel.setBackground(Color.WHITE);

        // Form panel
        JPanel formPanel = new JPanel();
        formPanel.setLayout(new GridBagLayout());
        formPanel.setBackground(Color.WHITE);
        GridBagConstraints gbc = new GridBagConstraints();
        gbc.fill = GridBagConstraints.HORIZONTAL;
        gbc.insets = new Insets(5, 5, 5, 5);
```

```
// Title
JLabel titleLabel = new JLabel("Registration", SwingConstants.CENTER);
titleLabel.setFont(new Font("Arial", Font.BOLD, 24));
gbc.gridx = 0;
gbc.gridy = 0;
gbc.gridwidth = 2;
formPanel.add(titleLabel, gbc);

// Name
JLabel nameLabel = new JLabel("Full Name:");
gbc.gridx = 0;
gbc.gridy = 1;
gbc.gridwidth = 1;
formPanel.add(nameLabel, gbc);

nameField = new JTextField(20);
gbc.gridx = 1;
formPanel.add(nameField, gbc);

// Username
JLabel usernameLabel = new JLabel("Username:");
gbc.gridx = 0;
gbc.gridy = 2;
formPanel.add(usernameLabel, gbc);

usernameField = new JTextField(20);
gbc.gridx = 1;
formPanel.add(usernameField, gbc);

// Email
JLabel emailLabel = new JLabel("Email:");
gbc.gridx = 0;
gbc.gridy = 3;
formPanel.add(emailLabel, gbc);

emailField = new JTextField(20);
gbc.gridx = 1;
formPanel.add(emailField, gbc);

// Password
JLabel passwordLabel = new JLabel("Password:");
gbc.gridx = 0;
gbc.gridy = 4;
formPanel.add(passwordLabel, gbc);
```

```
        passwordField = new JPasswordField(20);
        gbc.gridx = 1;
        formPanel.add(passwordField, gbc);

        // Confirm Password
        JLabel confirmPasswordLabel = new JLabel("Confirm Password:");
        gbc.gridx = 0;
        gbc.gridy = 5;
        formPanel.add(confirmPasswordLabel, gbc);

        confirmPasswordField = new JPasswordField(20);
        gbc.gridx = 1;
        formPanel.add(confirmPasswordField, gbc);

        // Register button
        JButton registerButton = new JButton("Register");
        registerButton.setBackground(new Color(0,0,0)); // bg-green-600
        registerButton.setForeground(Color.BLACK);
        registerButton.setFocusPainted(false);
        gbc.gridx = 0;
        gbc.gridy = 6;
        gbc.gridwidth = 2;
        gbc.fill = GridBagConstraints.NONE;
        formPanel.add(registerButton, gbc);

        // Back to Login button
        JButton backButton = new JButton("Back to Login");
        backButton.setBackground(new Color(0,0,0)); // bg-blue-600
        backButton.setForeground(Color.BLACK);
        backButton.setFocusPainted(false);
        gbc.gridy = 7;
        formPanel.add(backButton, gbc);

        mainPanel.add(formPanel, BorderLayout.CENTER);
        add(mainPanel);

        // Add action listeners
        registerButton.addActionListener(e -> handleRegistration());
        backButton.addActionListener(e -> backToLogin());

        // Make enter key trigger registration
        getRootPane().setDefaultButton(registerButton);
    }

    private void handleRegistration() {
        String name = nameField.getText();
```

```
        String username = usernameField.getText();
        String email = emailField.getText();
        String password = new String(passwordField.getPassword());
        String confirmPassword = new String(confirmPasswordField.getPassword());

        // Validation
        if (name.isEmpty() || username.isEmpty() || email.isEmpty() || password.isEmpty()) {
            JOptionPane.showMessageDialog(this,
                    "Please fill in all fields",
                    "Registration Error",
                    JOptionPane.ERROR_MESSAGE);
            return;
        }

        if (!password.equals(confirmPassword)) {
            JOptionPane.showMessageDialog(this,
                    "Passwords do not match",
                    "Registration Error",
                    JOptionPane.ERROR_MESSAGE);
            return;
        }

        if (!email.matches("^[A-Za-z0-9+_.-]+@(.+)$")) {
            JOptionPane.showMessageDialog(this,
                    "Please enter a valid email address",
                    "Registration Error",
                    JOptionPane.ERROR_MESSAGE);
            return;
        }

        User newUser = new User(0, username, password, "student", name, email);
        if (userDAO.createUser(newUser)) {
            JOptionPane.showMessageDialog(this,
                    "Registration successful! Please login.",
                    "Success",
                    JOptionPane.INFORMATION_MESSAGE);
            backToLogin();
        } else {
            JOptionPane.showMessageDialog(this,
                    "Registration failed. Username may already exist.",
                    "Registration Error",
                    JOptionPane.ERROR_MESSAGE);
        }
    }

    private void backToLogin() {
```

```
        new LoginWindow().setVisible(true);
        this.dispose();
    }
}
```

File name: StudentDashboard.java

```
package com.hostel.ui;

import com.hostel.dao.RoomDAO;
import com.hostel.dao.RoomRequestDAO;
import com.hostel.model.Room;
import com.hostel.model.RoomRequest;
import com.hostel.model.User;
//  javac -cp "lib/*;bin" -d bin src/main/java/com/hostel/ui/StudentDashboard.java
import javax.swing.*;
import javax.swing.table.DefaultTableModel;
import java.awt.*;
import java.util.List;
import java.text.SimpleDateFormat;
import java.text.ParseException;
import java.util.Calendar;
import java.util.Date;

public class StudentDashboard extends JFrame {
    private final User student;
    private final RoomDAO roomDAO;
    private final RoomRequestDAO requestDAO;
    private JTable roomsTable;
    private JTable requestsTable;
    private DefaultTableModel roomsModel;
    private DefaultTableModel requestsModel;

    public StudentDashboard(User student) {
        this.student = student;
        this.roomDAO = new RoomDAO();
        this.requestDAO = new RoomRequestDAO();

        setTitle("Student Dashboard - Hostel Room Allotment");
        setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
        setSize(900, 600);
        setLocationRelativeTo(null);

        // Main panel
        JPanel mainPanel = new JPanel(new BorderLayout(10, 10));
        mainPanel.setBorder(BorderFactory.createEmptyBorder(20, 20, 20, 20));
        mainPanel.setBackground(Color.WHITE);
```

```
        // Top panel with welcome message
        JPanel topPanel = createTopPanel();
        mainPanel.add(topPanel, BorderLayout.NORTH);

        // Center panel with tables
        JSplitPane splitPane = createSplitPane();
        mainPanel.add(splitPane, BorderLayout.CENTER);

        // Bottom panel with actions
        JPanel bottomPanel = createBottomPanel();
        mainPanel.add(bottomPanel, BorderLayout.SOUTH);

        add(mainPanel);

        // Load initial data
        refreshTables();
    }

    private JPanel createTopPanel() {
        JPanel panel = new JPanel(new BorderLayout(10, 10));
        panel.setBackground(Color.WHITE);

        // Welcome message
        JLabel welcomeLabel = new JLabel("Welcome, " + student.getName());
        welcomeLabel.setFont(new Font("Arial", Font.BOLD, 16));
        panel.add(welcomeLabel, BorderLayout.WEST);

        return panel;
    }

    private JSplitPane createSplitPane() {
        // Available Rooms table
        roomsModel = new DefaultTableModel(
            new Object[]{"Room Number", "Type", "Status"}, 0
        ) {
            @Override
            public boolean isCellEditable(int row, int column) {
                return false;
            }
        };
        roomsTable = new JTable(roomsModel);
        JScrollPane roomsScrollPane = new JScrollPane(roomsTable);
        roomsScrollPane.setBorder(BorderFactory.createTitledBorder("Available Rooms"));

        // My Requests table
        requestsModel = new DefaultTableModel(
```

```
            new Object[]{"Request ID", "Room Type", "Status", "Date", "Remarks"}, 0
        ) {
            @Override
            public boolean isCellEditable(int row, int column) {
                return false;
            }
        };
        requestsTable = new JTable(requestsModel);
        JScrollPane requestsScrollPane = new JScrollPane(requestsTable);
        requestsScrollPane.setBorder(BorderFactory.createTitledBorder("My Room Requests"));

        // Split pane
        JSplitPane splitPane = new JSplitPane(JSplitPane.VERTICAL_SPLIT, roomsScrollPane,
requestsScrollPane);
        splitPane.setResizeWeight(0.5);

        return splitPane;
    }

    private JPanel createBottomPanel() {
        JPanel panel = new JPanel(new FlowLayout(FlowLayout.LEFT, 10, 10));
        panel.setBackground(Color.WHITE);

        JButton requestRoomButton = new JButton("Request Room");
        requestRoomButton.setBackground(new Color(37, 99, 235)); // bg-blue-600
        requestRoomButton.setForeground(Color.BLACK);
        requestRoomButton.setFocusPainted(false);

        JButton logoutButton = new JButton("Logout");
        logoutButton.setBackground(new Color(220, 38, 38)); // bg-red-600
        logoutButton.setForeground(Color.BLACK);
        logoutButton.setFocusPainted(false);

        panel.add(requestRoomButton);
        panel.add(logoutButton);

        requestRoomButton.addActionListener(e -> showRequestDialog());
        logoutButton.addActionListener(e -> logout());

        return panel;
    }

    private void refreshTables() {
        // Clear existing data
        roomsModel.setRowCount(0);
        requestsModel.setRowCount(0);
```

```
        // Load available rooms
        List<Room> rooms = roomDAO.getAvailableRooms();
        for (Room room : rooms) {
            roomsModel.addRow(new Object[]{
                room.getRoomNumber(),
                room.getRoomType(),
                room.getStatus()
            });
        }

        // Load student's requests
        List<RoomRequest> requests = requestDAO.getRequestsByUser(student.getId());
        for (RoomRequest request : requests) {
            requestsModel.addRow(new Object[]{
                request.getRequestId(),
                request.getPreferredRoomType(),
                request.getStatus(),
                request.getRequestDate(),
                request.getRemarks()
            });
        }
    }

    private void showRequestDialog() {
        JComboBox<String> roomTypeCombo = new JComboBox<>(new String[]{"Single",
"Double", "Triple"});
        JTextArea remarksArea = new JTextArea(3, 20);
        remarksArea.setLineWrap(true);
        remarksArea.setWrapStyleWord(true);
        JScrollPane remarksScroll = new JScrollPane(remarksArea);

        // Create date field with default value (3 months from now)
        Calendar cal = Calendar.getInstance();
        cal.add(Calendar.MONTH, 3);
        SimpleDateFormat dateFormat = new SimpleDateFormat("yyyy-MM-dd");
        JTextField checkoutDateField = new JTextField(dateFormat.format(cal.getTime()));

        JPanel panel = new JPanel(new GridLayout(0, 1, 5, 5));
        panel.add(new JLabel("Preferred Room Type:"));
        panel.add(roomTypeCombo);
        panel.add(new JLabel("Preferred Checkout Date (yyyy-MM-dd):"));
        panel.add(checkoutDateField);
        panel.add(new JLabel("Additional Remarks:"));
        panel.add(remarksScroll);
```

```
        int result = JOptionPane.showConfirmDialog(this, panel, "Request Room",
            JOptionPane.OK_CANCEL_OPTION, JOptionPane.PLAIN_MESSAGE);

        if (result == JOptionPane.OK_OPTION) {
            String roomType = (String) roomTypeCombo.getSelectedItem();
            String remarks = remarksArea.getText();

            try {
                Date checkoutDate = dateFormat.parse(checkoutDateField.getText());
                // Validate checkout date is in the future
                if (checkoutDate.before(new Date())) {
                    JOptionPane.showMessageDialog(this,
                        "Checkout date must be in the future",
                        "Invalid Date",
                        JOptionPane.ERROR_MESSAGE);
                    return;
                }

                RoomRequest request = new RoomRequest(0, student.getId(), roomType, "pending",
null, remarks);
                request.setPreferredCheckoutDate(checkoutDate);

                if (requestDAO.createRequest(request)) {
                    refreshTables();
                    JOptionPane.showMessageDialog(this, "Room request submitted successfully!");
                } else {
                    JOptionPane.showMessageDialog(this, "Failed to submit request", "Error",
JOptionPane.ERROR_MESSAGE);
                }
            } catch (ParseException e) {
                JOptionPane.showMessageDialog(this,
                    "Invalid date format. Please use yyyy-MM-dd",
                    "Error",
                    JOptionPane.ERROR_MESSAGE);
            }
        }
    }

    private void logout() {
        new LoginWindow().setVisible(true);
        this.dispose();
    }
}
```

File name: DatabaseUtil.java

```
package com.hostel.util;
```

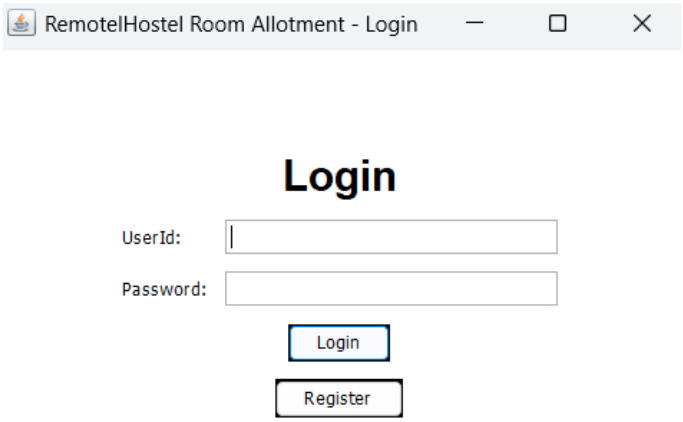
```
import com.hostel.dao.UserDAO;
import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.SQLException;
import java.sql.Statement;

public class DatabaseUtil {
    private static final String DB_FILE = "hostel.db";
    private static final String DB_URL = "jdbc:sqlite:" + DB_FILE;

    static {
        // Initialize database on class load
        try {
            Class.forName("org.sqlite.JDBC");
            initializeDatabase();
        } catch (ClassNotFoundException e) {
            System.err.println("SQLite JDBC driver not found: " + e.getMessage());
            System.exit(1);
        }
    }

    public static Connection getConnection() throws SQLException {
        return DriverManager.getConnection(DB_URL);
    }

    public static void initializeDatabase() {
        try (Connection conn = getConnection();
             Statement stmt = conn.createStatement()) {

            // Create Users table
            stmt.execute("""
                CREATE TABLE IF NOT EXISTS users (
                    id INTEGER PRIMARY KEY AUTOINCREMENT,
                    username TEXT UNIQUE NOT NULL,
                    password TEXT NOT NULL,
                    role TEXT NOT NULL,
                    name TEXT NOT NULL,
                    email TEXT
                )
            """);

            // Create Rooms table with additional fields
            stmt.execute("""
                CREATE TABLE IF NOT EXISTS rooms (
                    room_id INTEGER PRIMARY KEY AUTOINCREMENT,
                    room_number TEXT UNIQUE NOT NULL,
```

```
                room_type TEXT NOT NULL,
                is_occupied BOOLEAN DEFAULT FALSE,
                occupant_id INTEGER,
                status TEXT DEFAULT 'available',
                allocation_date TIMESTAMP,
                expected_checkout_date TIMESTAMP,
                FOREIGN KEY (occupant_id) REFERENCES users(id)
            )
            """);

            // Create RoomRequests table with preferred_checkout_date
            stmt.execute("""
                CREATE TABLE IF NOT EXISTS room_requests (
                    request_id INTEGER PRIMARY KEY AUTOINCREMENT,
                    user_id INTEGER NOT NULL,
                    preferred_room_type TEXT NOT NULL,
                    status TEXT DEFAULT 'pending',
                    request_date TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
                    remarks TEXT,
                    preferred_checkout_date TIMESTAMP,
                    FOREIGN KEY (user_id) REFERENCES users(id)
                )
            """);

            // Create RoomAllocationHistory table
            stmt.execute("""
                CREATE TABLE IF NOT EXISTS room_allocation_history (
                    allocation_id INTEGER PRIMARY KEY AUTOINCREMENT,
                    room_id INTEGER NOT NULL,
                    user_id INTEGER NOT NULL,
                    allocation_date TIMESTAMP NOT NULL,
                    checkout_date TIMESTAMP,
                    status TEXT NOT NULL,
                    remarks TEXT,
                    FOREIGN KEY (room_id) REFERENCES rooms(room_id),
                    FOREIGN KEY (user_id) REFERENCES users(id)
                )
            """);

            // Create default admin user if not exists
            UserDAO userDAO = new UserDAO();
            userDAO.createAdmin("admin", "admin123", "System Administrator",
"admin@hostel.com");

        } catch (SQLException e) {
            e.printStackTrace();
```

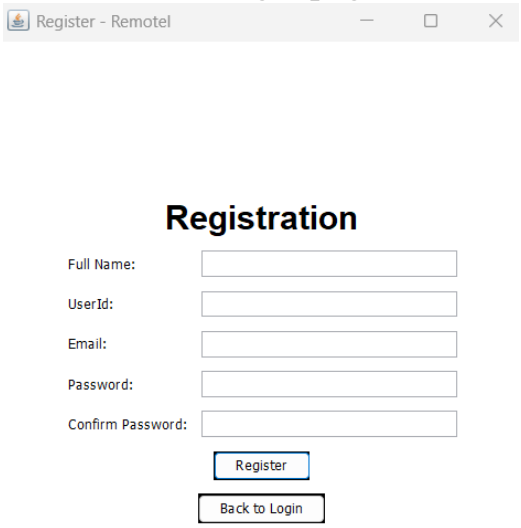
```
            System.err.println("Error initializing database: " + e.getMessage());
        }
    }

    public static void closeConnection(Connection conn) {
        if (conn != null) {
            try {
                conn.close();
            } catch (SQLException e) {
                e.printStackTrace();
            }
        }
    }
}
```

➢ Output:

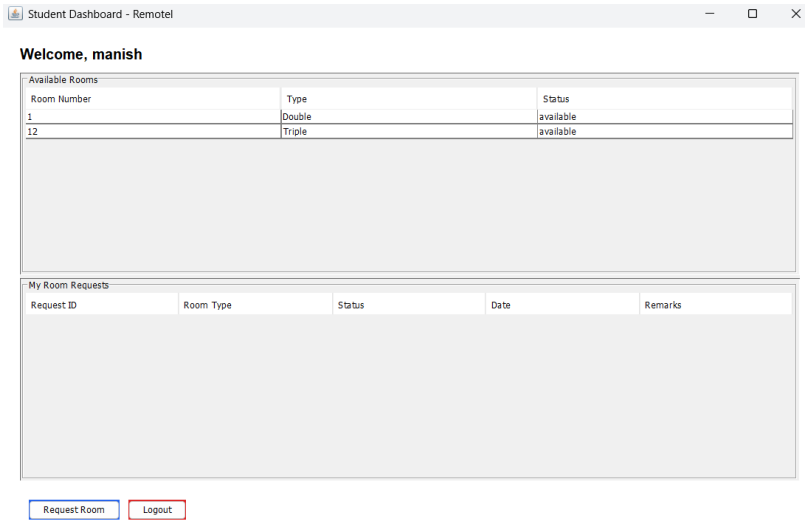
- Start the project by opening path and using command “java -cp "lib/*;bin" com.hostel.ui.LoginWindow”
- LoginWindow



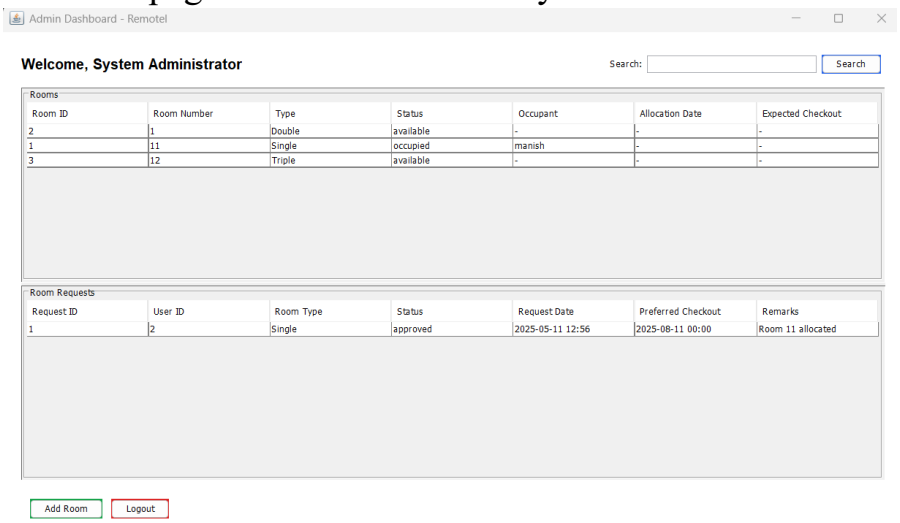
- If You are a new user then register yourself else input your credentials
- If you clicked register Button then RegistrationWindow opens and Now complete your registration and then login page occurs.



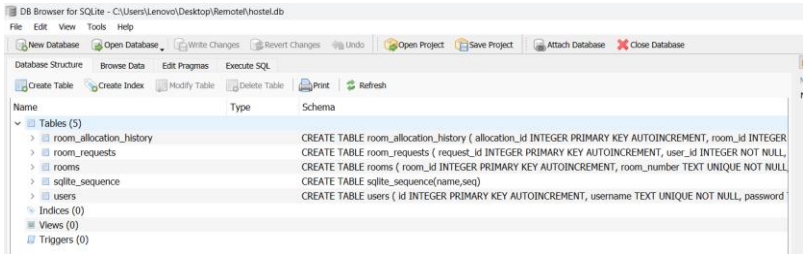
- Now as I have an account after putting my credentials StudentDashboard page pop outs and now as a student now we can request the available rooms.



- if an admin wants to manage room availability and requests of students by putting “admin” and “admin123” as userid and password now AdminDashboard page will be available for you.



- Database visuals



❖ CONCLUSION

The *Remotel* project successfully addresses the common challenges faced in manual hostel room management by automating the process through a user-friendly desktop application. By utilizing **Java Swing** for the GUI, **SQLite** for lightweight database storage, and the **DAO and MVC design patterns** for modularity and maintainability, the system ensures a robust and efficient solution for both users and administrators.

The application simplifies tasks such as **room request submission**, **user registration**, and **administrative approval workflows**, thereby minimizing human errors and administrative overhead. The layered architecture ensures ease of scalability and future enhancements, such as adding network capabilities or transitioning to a mobile or web-based version.

Overall, *Remotel* demonstrates a practical and well-structured implementation of software development principles, successfully achieving its objectives of improving hostel room allocation through automation.

❖ REFERENCE

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   https://docs.oracle.com/javase/
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6. SQLite JDBC Integration – JDBC for SQLite

❖ ASSESSMENT

Internal:

SL NO	RUBRICS	FULL MARK	MARKS OBTAINED	REMARKS
1	Understanding the relevance, scope and dimension of the project	10		
2	Methodology	10		
3	Quality of Analysis and Results	10		
4	Interpretations and Conclusions	10		
5	Report	10		
	Total	**50**		

Date: **Signature of the Faculty**

❖ COURSE OUTCOME (COs) ATTAINMENT

➢ **Expected Course Outcomes (COs):**

(Refer to COs Statement in the Syllabus)

_____

_____

_____

_____

➢ **Course Outcome Attained:**

How would you rate your learning of the subject based on the specified COs?

☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

1 2 3 4 5 6 7 8 9 10

LOW HIGH

➢ **Learning Gap (if any):**

_____

_____

_____

_____

➢ **Books / Manuals Referred:**

_____

_____

_____

_____

Date: **Signature of the Student**

➢ **Suggestions / Recommendations:**

(By the Course Faculty)

_____

_____

_____

_____

Date: **Signature of the Faculty**