

# Rajalakshmi Engineering College

Name: Rahulan R  
Email: 240701412@rajalakshmi.edu.in  
Roll no: 240701412  
Phone: 9444114186  
Branch: REC  
Department: CSE - Section 10  
Batch: 2028  
Degree: B.E - CSE

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## 2024\_28\_III\_OOPS Using Java Lab

### REC\_2028\_OOPS using Java\_Week 11

Attempt : 1  
Total Mark : 20  
Marks Obtained : 20

#### **Section 1 : Project**

##### **1. Problem Statement**

Create a JDBC-based Hospital Management System that handles runtime input to manage patient records. The system should allow users to:

- Add a new patient (patient ID, name, age, status).
- Update a patient's status.
- View a specific patient's record by patient ID.
- Display all patient records in the database.
- Exit the application.

The system should connect to a MySQL database using the following default credentials:

DB URL: jdbc:mysql://localhost/ri\_db

USER: test

PWD: test123

The patients table has already been created with the following structure:

Table Name: patients

### ***Input Format***

The first line of input consists of an integer choice, representing the operation to be performed:

(1 for Add Patient, 2 for Update Patient Status, 3 for View Patient Record, 4 for Display All Patients, 5 for Exit)

For choice 1 (Add Patient):

- The second line consists of an integer patient\_id.
- The third line consists of a string name.
- The fourth line consists of an integer age.
- The fifth line consists of a string status.

For choice 2 (Update Patient Status):

- The second line consists of an integer patient\_id.
- The third line consists of a string new\_status.

For choice 3 (View Patient Record):

- The second line consists of an integer patient\_id.

For choice 4 (Display All Patients):

- No additional inputs are required.

For choice 5 (Exit):

- No additional inputs are required.

#### ***Output Format***

For choice 1 (Add Patient):

- Print "Patient added successfully" if the patient was added.
- Print "Failed to add patient." if the insertion failed.

For choice 2 (Update Patient Status):

- Print "Patient status updated successfully" if the update was successful.
- Print "Patient not found." if the specified patient ID does not exist.

For choice 3 (View Patient Record):

- Display the patient details in the format:  
- ID: [patient\_id] | Name: [name] | Age: [age] | Status: [status]
- Print "Patient not found." if the specified patient ID does not exist.

For choice 4 (Display All Patients):

- Display each patient on a new line in the format:  
- ID | Name | Age | Status
- If no records are available, print nothing (or handle it with an appropriate message if desired).

For choice 5 (Exit):

- Print "Exiting Hospital Management System."

For invalid input:

- Print "Invalid choice. Please try again."

#### ***Sample Test Case***

Input: 1

101

John Doe

45

Admitted

4

5

Output: Patient added successfully  
ID | Name | Age | Status  
101 | John Doe | 45 | Admitted  
Exiting Hospital Management System.

### Answer

```
import java.sql.*;  
import java.util.Scanner;  
  
class HospitalManagementSystem {  
    public static void main(String[] args) {  
        try (Connection conn = DriverManager.getConnection("jdbc:mysql://  
localhost/ri_db", "test", "test123");  
        Scanner scanner = new Scanner(System.in)) {  
  
            boolean running = true;  
  
            while (running) {  
  
                int choice = scanner.nextInt();  
  
                switch (choice) {  
                    case 1:  
                        addPatient(conn, scanner);  
                        break;  
                    case 2:  
                        updatePatientStatus(conn, scanner);  
                        break;  
                    case 3:  
                        viewPatientRecord(conn, scanner);  
                        break;  
                    case 4:  
                        displayAllPatients(conn);  
                        break;  
                    case 5:  
                        System.out.println("Exiting Hospital Management System.");  
                        running = false;  
                        break;  
                    default:  
                        System.out.println("Invalid choice. Please try again.");  
                }  
            }  
        }  
    }  
}
```

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

public static void addPatient(Connection conn, Scanner scanner) {
    int patientId = scanner.nextInt();
    scanner.nextLine(); // Consume newline

    String name = scanner.nextLine();
    int age = scanner.nextInt();

    scanner.nextLine(); // Consume newline
    String status = scanner.nextLine();

    String insertQuery = "INSERT INTO patients (patient_id, name, age, status)
VALUES (?, ?, ?, ?);"
    try (PreparedStatement stmt = conn.prepareStatement(insertQuery)) {
        stmt.setInt(1, patientId);
        stmt.setString(2, name);
        stmt.setInt(3, age);
        stmt.setString(4, status);

        int rowsInserted = stmt.executeUpdate();
        System.out.println(rowsInserted > 0 ? "Patient added successfully" :
"Failed to add patient.");
    } catch (SQLException e) {
        System.out.println("Error adding patient: " + e.getMessage());
    }
}

public static void updatePatientStatus(Connection conn, Scanner scanner) {
    int patientId = scanner.nextInt();
    scanner.nextLine(); // Consume newline

    String newStatus = scanner.nextLine();

    String updateQuery = "UPDATE patients SET status = ? WHERE patient_id
= ?";
```

```
try (PreparedStatement stmt = conn.prepareStatement(updateQuery)) {
    stmt.setString(1, newStatus);
    stmt.setInt(2, patientId);

    int rowsUpdated = stmt.executeUpdate();
    System.out.println(rowsUpdated > 0 ? "Patient status updated
successfully" : "Patient not found.");
} catch (SQLException e) {
    System.out.println("Error updating patient status: " + e.getMessage());
}

}

public static void viewPatientRecord(Connection conn, Scanner scanner) {
    int patientId = scanner.nextInt();

    String selectQuery = "SELECT * FROM patients WHERE patient_id = ?";
    try (PreparedStatement stmt = conn.prepareStatement(selectQuery)) {
        stmt.setInt(1, patientId);

        ResultSet rs = stmt.executeQuery();
        if (rs.next()) {
            System.out.printf("ID: %d | Name: %s | Age: %d | Status: %s%n",
                rs.getInt("patient_id"),
                rs.getString("name"),
                rs.getInt("age"),
                rs.getString("status"));
        } else {
            System.out.println("Patient not found.");
        }
    } catch (SQLException e) {
        System.out.println("Error retrieving patient record: " + e.getMessage());
    }
}

public static void displayAllPatients(Connection conn) {
    String displayQuery = "SELECT * FROM patients ORDER BY patient_id";
    try (Statement stmt = conn.createStatement();
        ResultSet rs = stmt.executeQuery(displayQuery)) {

        System.out.println("ID | Name | Age | Status");
        while (rs.next()) {
            System.out.printf("%d | %s | %d | %s%n",

```

```
        rs.getInt("patient_id"),
        rs.getString("name"),
        rs.getInt("age"),
        rs.getString("status"));
    }
} catch (SQLException e) {
    System.out.println("Error displaying patients: " + e.getMessage());
}
}

}
```

**Status : Correct**

**Marks : 10/10**

## 2. Problem Statement

In Café Central, the menu is cataloged and stored in a database.

To efficiently manage the restaurant's menu using Java and JDBC, you must build a Restaurant Management System that supports:

Adding new menu items

Updating menu item prices

Viewing details of a menu item

Displaying all menu items in sorted order

You are given two files:

File 1: MenuItem.java (POJO Class)

This class represents the MenuItem entity.

A MenuItem contains the following details:

Field Description

itemId Unique Menu Item ID (Integer)

name Item Name (String)

category Item Category (String)

price Item Price (Double)

Students must write code in the marked area:

```
class MenuItem {  
    private int itemId;  
    private String name;  
    private String category;  
    private double price;  
  
    public MenuItem() {}  
  
    public MenuItem(int itemId, String name, String category, double price) {  
        // write your code here  
    }  
  
    // Include getters and setters  
}
```

Expected in this part:

Assign parameter values to instance variables inside the constructor.

Add getters and setters for all attributes.

File 2: MenuItemDAO.java (Data Access Layer)

This class handles all database operations using JDBC.

Students must complete the missing JDBC logic in the following methods:

```
class MenuItemDAO {  
  
    public void addMenuItem(Connection conn, MenuItem menuItem)  
throws SQLException {  
    // write your code here  
}
```

```
}

public void updateItemPrice(Connection conn, int itemId, double
newPrice) throws SQLException {
    // write your code here
}

public void deleteMenuItem(Connection conn, int itemId) throws
SQLException {
    // write your code here
}

public MenuItem viewItemDetails(Connection conn, int itemId) throws
SQLException {
    // write your code here
}

public List<MenuItem> displayAllMenuItems(Connection conn) throws
SQLException {
    // write your code here
}

private MenuItem mapToMenuItem(ResultSet rs) throws SQLException {
    return new MenuItem(
        // write your code here
    );
}

}
```

Expected in this part:

Write SQL queries for INSERT, UPDATE, DELETE, SELECT.

Execute queries using PreparedStatement or Statement.

Map ResultSet rows to MenuItem objects using mapToMenuItem().

Return a List<MenuItem> where required.

The system should connect to a MySQL database using the following default credentials:

DB URL: jdbc:mysql://localhost/ri\_db

USER: test

PWD: test123

The menu table has already been created with the following structure:

Table Name: menu

### ***Input Format***

The first line of input consists of an integer choice, representing the operation to be performed (1 for Add Item, 2 for Restock item, 3 for reduce item, 4 for Display, 5 for Exit).

For choice 1 (Add Menu Item):

- The second line consists of an integer item\_id.
- The third line consists of a string name.
- The fourth line consists of a string category.
- The fifth line consists of a double price.

For choice 2 (Update Item Price):

- The second line consists of an integer item\_id.
- The third line consists of a double new\_price.

For choice 3 (View Item Details):

- The second line consists of an integer item\_id.

For choice 4 (Display All Menu Items):

- No additional inputs are required.

For choice 5 (Exit):

- No additional inputs are required.

#### ***Output Format***

For choice 1 (Add Menu Item):

- Print "Menu item added successfully" if the item was added.
- Print "Failed to add item." if the insertion failed.

For choice 2 (Update Item Price):

- Print "Item price updated successfully" if the price update was successful.
- Print "Item not found." if the specified item ID does not exist.

For choice 3 (View Item Details):

- Display the item details in the format:
- ID: [item\_id] | Name: [name] | Category: [category] | Price: [price]
- Print "Item not found." if the specified item ID does not exist.

For choice 4 (Display All Menu Items):

- Display each item on a new line in the format:
- ID | Name | Category | Price
- If no items are available, print nothing (or handle with an appropriate message if desired).

For choice 5 (Exit):

- Print "Exiting Restaurant Management System."

For invalid input:

- Print "Invalid choice. Please try again."

#### ***Sample Test Case***

Input: 1

11

Margherita Pizza

Main Course  
12.99  
4  
5

Output: Menu item added successfully  
ID | Name | Category | Price  
11 | Margherita Pizza | Main Course | 12.99  
Exiting Restaurant Management System.

### **Answer**

```
import java.sql.*;  
import java.util.Scanner;  
  
class RestaurantManagementSystem {  
    public static void main(String[] args) {  
        try (Connection conn = DriverManager.getConnection("jdbc:mysql://  
localhost/ri_db", "test", "test123");  
        Scanner scanner = new Scanner(System.in)) {  
  
            boolean running = true;  
  
            while (running) {  
                int choice = scanner.nextInt();  
  
                switch (choice) {  
                    case 1:  
                        addMenuItem(conn, scanner);  
                        break;  
                    case 2:  
                        updateItemPrice(conn, scanner);  
                        break;  
                    case 3:  
                        viewItemDetails(conn, scanner);  
                        break;  
                    case 4:  
                        displayAllMenuItems(conn);  
                        break;  
                    case 5:  
                        System.out.println("Exiting Restaurant Management System.");  
                        running = false;  
                        break;  
                    default:
```

```
        System.out.println("Invalid choice. Please try again.");
    }
}
} catch (SQLException e) {
    e.printStackTrace();
}
}

public static void addMenuItem(Connection conn, Scanner scanner) {
    int itemId = scanner.nextInt();
    scanner.nextLine(); // Consume newline

    String name = scanner.nextLine();
    String category = scanner.nextLine();
    double price = scanner.nextDouble();

    MenuItem menuItem = new MenuItem(itemId, name, category, price); // Using POJO

    String insertQuery = "INSERT INTO menu (item_id, name, category, price)  
VALUES (?, ?, ?, ?);";
    try (PreparedStatement stmt = conn.prepareStatement(insertQuery)) {
        stmt.setInt(1, menuItem.getItemId());
        stmt.setString(2, menuItem.getName());
        stmt.setString(3, menuItem.getCategory());
        stmt.setDouble(4, menuItem.getPrice());

        int rowsInserted = stmt.executeUpdate();
        System.out.println(rowsInserted > 0 ? "Menu item added successfully" :  
"Failed to add item.");
    } catch (SQLException e) {
        System.out.println("Error adding item: " + e.getMessage());
    }
}

public static void updateItemPrice(Connection conn, Scanner scanner) {
    int itemId = scanner.nextInt();
    double newPrice = scanner.nextDouble();

    String updateQuery = "UPDATE menu SET price = ? WHERE item_id = ?;";
    try (PreparedStatement stmt = conn.prepareStatement(updateQuery)) {
        stmt.setDouble(1, newPrice);
        stmt.setInt(2, itemId);
```

```
        int rowsUpdated = stmt.executeUpdate();
        System.out.println(rowsUpdated > 0 ? "Item price updated successfully";
"Item not found.");
    } catch (SQLException e) {
        System.out.println("Error updating price: " + e.getMessage());
    }
}

public static void viewItemDetails(Connection conn, Scanner scanner) {
    int itemId = scanner.nextInt();

    String selectQuery = "SELECT * FROM menu WHERE item_id = ?";
    try (PreparedStatement stmt = conn.prepareStatement(selectQuery)) {
        stmt.setInt(1, itemId);

        ResultSet rs = stmt.executeQuery();
        if (rs.next()) {
            MenuItem menuItem = new MenuItem(
                rs.getInt("item_id"),
                rs.getString("name"),
                rs.getString("category"),
                rs.getDouble("price")
            );

            System.out.printf("ID: %d | Name: %s | Category: %s | Price: %.2f%n",
                menuItem.getItemId(),
                menuItem.getName(),
                menuItem.getCategory(),
                menuItem.getPrice());
        } else {
            System.out.println("Item not found.");
        }
    } catch (SQLException e) {
        System.out.println("Error retrieving item details: " + e.getMessage());
    }
}

public static void displayAllMenuItems(Connection conn) {
    String displayQuery = "SELECT * FROM menu ORDER BY item_id";
    try (Statement stmt = conn.createStatement());
        ResultSet rs = stmt.executeQuery(displayQuery)) {
```

```
System.out.println("ID | Name | Category      | Price");
while (rs.next()) {
    MenuItem menuItem = new MenuItem(
        rs.getInt("item_id"),
        rs.getString("name"),
        rs.getString("category"),
        rs.getDouble("price")
    );
    System.out.printf("%d | %s | %s | %.2f%n",
        menuItem.getItemId(),
        menuItem.getName(),
        menuItem.getCategory(),
        menuItem.getPrice());
}
} catch (SQLException e) {
    System.out.println("Error displaying menu items: " + e.getMessage());
}
}

class MenuItem {
private int itemId;
private String name;
private String category;
private double price;

// Constructor
public MenuItem(int itemId, String name, String category, double price) {
    this.itemId = itemId;
    this.name = name;
    this.category = category;
    this.price = price;
}

// Getters and Setters
public int getItemId() { return itemId; }
public void setItemId(int itemId) { this.itemId = itemId; }

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

```
public String getCategory() { return category; }
public void setCategory(String category) { this.category = category; }

public double getPrice() { return price; }
public void setPrice(double price) { this.price = price; }
}

//
```

**Status : Correct**

**Marks : 10/10**