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2024_28_III_OOPS Using Java Lab

REC_2028_OOPS using Java_Week 11

Attempt : 2
Total Mark : 20
Marks Obtained : 20

Section 1 : Project

1. 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 addItem(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){

```

```

    try

```

```

    {

```

```

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

```

```

        String sql = "INSERT INTO menu (item_id, name, category, price) VALUES
        (?, ?, ?, ?)";

```

```

        PreparedStatement pstmt = conn.prepareStatement(sql);
        pstmt.setInt(1, itemId);
        pstmt.setString(2, name);
        pstmt.setString(3, category);
        pstmt.setDouble(4, price);

```

```
int rows = pstmt.executeUpdate();
if (rows > 0) System.out.println("Menu item added successfully");
else System.out.println("Failed to add item.");
```

```
pstmt.close();
```

```
} catch (Exception e)
```

```
{
```

```
    System.out.println("Failed to add item.");
```

```
}
```

```
}
```

```
public static void updateItemPrice(Connection conn, Scanner scanner)
```

```
{
```

```
    try
```

```
    {
```

```
        int itemId = scanner.nextInt();
        double newPrice = scanner.nextDouble();
        scanner.nextLine();
```

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

```
        int rows = pstmt.executeUpdate();
        if (rows > 0) System.out.println("Item price updated successfully");
        else System.out.println("Item not found.");
```



```
        pstmt.close();

    } catch (Exception e)

    {

        System.out.println("Item not found.");

    }

}

public static void viewItemDetails(Connection conn, Scanner scanner)

{

    try

    {

        int itemId = scanner.nextInt();
        scanner.nextLine();

        String sql = "SELECT item_id, name, category, price FROM menu WHERE
item_id = ?";
        PreparedStatement pstmt = conn.prepareStatement(sql);
        pstmt.setInt(1, itemId);

        ResultSet rs = pstmt.executeQuery();

        if (rs.next())

        {

            System.out.printf("ID: %d | Name: %s | Category: %s | Price: %.2f%n",
```

```
rs.getInt("item_id"),  
rs.getString("name"),  
rs.getString("category"),  
rs.getDouble("price"));
```

```
} else
```

```
{
```

```
    System.out.println("Item not found.");
```

```
}
```

```
    rs.close();  
    pstmt.close();
```

```
} catch (Exception e)
```

```
{
```

```
    System.out.println("Item not found.");
```

```
}
```

```
}
```

```
public static void displayAllMenuItems(Connection conn)
```

```
{
```

```
    try
```

```
    {
```

```
String sql = "SELECT item_id, name, category, price FROM menu ORDER BY  
item_id";
```

```
Statement stmt = conn.createStatement();
```

```
ResultSet rs = stmt.executeQuery(sql);
```

```
System.out.println("ID | Name | Category | Price");
```

```
while (rs.next())
```

```
{
```

```
    System.out.printf("%d | %s | %s | %.2f%n",
```

```
        rs.getInt("item_id"),
```

```
        rs.getString("name"),
```

```
        rs.getString("category"),
```

```
        rs.getDouble("price"));
```

```
}
```

```
    rs.close();
```

```
    stmt.close();
```

```
} catch (SQLException e)
```

```
{
```

```
    System.out.println("Database Error: " + e.getMessage());
```

```
}
```

```
}
```

```
class MenuItem{
```

```
    private int itemId;
```

```
private String name;  
private String category;  
private double price;
```

```
public MenuItem(int itemId, String name, String category, double price)
```

```
{
```

```
    this.itemId = itemId;  
    this.name = name;  
    this.category = category;  
    this.price = price;
```

```
}
```

```
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

2. 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){
```

```
    try
```

```
    {
```

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

```
        String sql = "INSERT INTO patients (patient_id, name, age, status) VALUES
        (?, ?, ?, ?)";
```

```
        PreparedStatement pstmt = conn.prepareStatement(sql);
```

```
        pstmt.setInt(1, patientId);
        pstmt.setString(2, name);
        pstmt.setInt(3, age);
        pstmt.setString(4, status);
```

```
        int rows = pstmt.executeUpdate();
        if (rows > 0) System.out.println("Patient added successfully");
        else System.out.println("Failed to add patient.");
```

```
        pstmt.close();
```

```
    } catch (Exception e)
```

```
    {
```

```
        System.out.println("Failed to add patient.");
```

```
}
```

```
}
```

```
public static void updatePatientStatus(Connection conn, Scanner scanner)
```

```
{
```

```
    try
```

```
    {
```

```
        int patientId = scanner.nextInt();
```

```
        scanner.nextLine();
```

```
        String newStatus = scanner.nextLine();
```

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

```
        PreparedStatement pstmt = conn.prepareStatement(sql);
```

```
        pstmt.setString(1, newStatus);
```

```
        pstmt.setInt(2, patientId);
```

```
        int rows = pstmt.executeUpdate();
```

```
        if (rows > 0) System.out.println("Patient status updated successfully");
```

```
        else System.out.println("Patient not found.");
```

```
        pstmt.close();
```

```
    } catch (Exception e)
```

```
    {
```

```
        System.out.println("Patient not found.");
```

```
    }
```

```
}
```

```
public static void viewPatientRecord(Connection conn, Scanner scanner)
```

```
{
```

```
    try
```

```
    {
```

```
        int patientId = scanner.nextInt();  
        scanner.nextLine();
```

```
        String sql = "SELECT patient_id, name, age, status FROM patients WHERE  
patient_id = ?";
```

```
        PreparedStatement pstmt = conn.prepareStatement(sql);  
        pstmt.setInt(1, patientId);
```

```
        ResultSet rs = pstmt.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.");
```

```
}
```

```
rs.close();  
pstmt.close();
```

```
} catch (Exception e)
```

```
{
```

```
    System.out.println("Patient not found.");
```

```
}
```

```
}
```

```
public static void displayAllPatients(Connection conn)
```

```
{
```

```
    try
```

```
    {
```

```
        String sql = "SELECT patient_id, name, age, status FROM patients ORDER BY  
patient_id";
```

```
        Statement stmt = conn.createStatement();  
        ResultSet rs = stmt.executeQuery(sql);
```

```
        System.out.println("ID | Name | Age | Status");
```

```
        while (rs.next())
```

```
        {
```

```
        System.out.println(
            rs.getInt("patient_id") + " | " +
            rs.getString("name") + " | " +
            rs.getInt("age") + " | " +
            rs.getString("status")
        );
    }

    rs.close();
    stmt.close();

} catch (SQLException e)
{

    System.out.println("Database Error: " + e.getMessage());

}
}
}
```

Status : Correct

Marks : 10/10