

Rajalakshmi Engineering College

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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 Inventory Management System that handles runtime input to manage items in an inventory. The system should allow users to:

Add a new item (item ID, name, quantity, price).

Restock an item by increasing its quantity.

Reduce the stock of an item, ensuring sufficient quantity.

Display all items in the inventory in a sorted order by item ID.

Exit the application.

Half of the code is given here; Only the remaining part should be completed.

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 items table has already been created with the following structure:

Table Name: items

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 Item):

- The second line consists of an integer item_id.
- The third line consists of a string name.
- The fourth line consists of an integer quantity.
- The fifth line consists of a double price.

For choice 2 (Restock Item):

- The second line consists of an integer item_id.
- The third line consists of an integer quantity_to_add (must be positive).

For choice 3 (Reduce Stock):

- The second line consists of an integer item_id.
- The third line consists of an integer quantity_to_remove (must be positive).

For choice 4 (Display Inventory):

- No additional inputs are required.

For choice 5 (Exit):

- No additional inputs are required.

Output Format

For choice 1 (Add Item):

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

For choice 2 (Restock Item):

- Print "Item restocked successfully" if the restock was successful.
- Print "Item not found." if the specified item ID does not exist.

For choice 3 (Reduce Stock):

- Print "Stock reduced successfully" if the stock reduction was successful.
- Print "Not enough stock to remove." if there is insufficient quantity.
- Print "Item not found." if the specified item ID does not exist.

For choice 4 (Display Inventory):

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

For choice 5 (Exit):

- Print "Exiting Inventory Management System."

For invalid input:

- Print "Invalid choice. Please try again."

Sample Test Case

Input: 1

101

Laptop

50

```
1200.00  
4  
5  
Output: Item added successfully  
ID | Name | Quantity | Price  
101 | Laptop | 50 | 1200.00  
Exiting Inventory Management System.
```

Answer

```
import java.sql.*;  
import java.util.Scanner;  
  
class InventoryManagementSystem {  
    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:  
                    addItem(conn, scanner);  
                    break;  
                case 2:  
                    restockItem(conn, scanner);  
                    break;  
                case 3:  
                    reduceStock(conn, scanner);  
                    break;  
                case 4:  
                    displayInventory(conn);  
                    break;  
                case 5:  
                    System.out.println("Exiting Inventory Management System.");  
                    running = false;  
                    break;  
                default:
```

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

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

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

    double price = scanner.nextDouble();

    String insertQuery = "INSERT INTO items (item_id, name, quantity, price)
VALUES (?, ?, ?, ?);"
    try (PreparedStatement stmt = conn.prepareStatement(insertQuery)) {
        stmt.setInt(1, itemId);
        stmt.setString(2, name);
        stmt.setInt(3, quantity);
        stmt.setDouble(4, price);

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

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

    int quantityToAdd = scanner.nextInt();

    // Check if the quantity is positive
    if (quantityToAdd <= 0) {
        System.out.println("Quantity to add must be positive.");
        return;
    }
}
```

```
        }

        String updateQuery = "UPDATE items SET quantity = quantity + ? WHERE
item_id = ?";
        try (PreparedStatement stmt = conn.prepareStatement(updateQuery)) {
            stmt.setInt(1, quantityToAdd);
            stmt.setInt(2, itemId);

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

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

        int quantityToRemove = scanner.nextInt();

        // Check if the quantity is positive
        if (quantityToRemove <= 0) {
            System.out.println("Quantity to remove must be positive.");
            return;
        }

        String checkQuantityQuery = "SELECT quantity FROM items WHERE item_id
= ?";
        String updateQuery = "UPDATE items SET quantity = quantity - ? WHERE
item_id = ?";

        try (PreparedStatement checkStmt =
conn.prepareStatement(checkQuantityQuery)) {
            checkStmt.setInt(1, itemId);
            ResultSet rs = checkStmt.executeQuery();

            if (rs.next()) {
                int currentQuantity = rs.getInt("quantity");

                if (currentQuantity >= quantityToRemove) {
                    try (PreparedStatement stmt =
conn.prepareStatement(updateQuery)) {
                        stmt.setInt(1, currentQuantity - quantityToRemove);
                        stmt.setInt(2, itemId);
                        stmt.executeUpdate();
                    }
                }
            }
        }
    }
}
```

```

conn.prepareStatement(updateQuery)) {
    stmt.setInt(1, quantityToRemove);
    stmt.setInt(2, itemId);

    int rowsUpdated = stmt.executeUpdate();
    System.out.println(rowsUpdated > 0 ? "Stock reduced
successfully" : "Failed to reduce stock.");
}
} else {
    System.out.println("Not enough stock to remove.");
}
} else {
    System.out.println("Item not found.");
}
} catch (SQLException e) {
    System.out.println("Error during stock reduction: " + e.getMessage());
}
}

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

        System.out.println("ID | Name | Quantity | Price");
        while (rs.next()) {
            System.out.printf("%d | %s | %d | %.2f%n",
                rs.getInt("item_id"),
                rs.getString("name"),
                rs.getInt("quantity"),
                rs.getDouble("price"));
        }
    } catch (SQLException e) {
        System.out.println("Error displaying inventory: " + 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

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Scan to verify results



2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 1_Q2

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. PROBLEM STATEMENT:

Dave got two students who wants help with their doubt. Each handouts an integer and wants to find if one Integer Positive While the Other is Not Divisible by 3. Write a program to achieve this and conclude for them.

Input Format

The first line of input represents the first integer.

The second line of input represents the second integer.

Output Format

The output should display as "One of the integers is positive while the other is not divisible by 3." or "Neither of the integers meets the condition."

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 4

3

Output: One of the integers is positive while the other is not divisible by 3.

Answer

```
// You are using Java
import java.util.*;

public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int a = sc.nextInt();
        int b = sc.nextInt();
        if ((a > 0 && b % 3 != 0) || (b > 0 && a % 3 != 0)) {
            System.out.println("One of the integers is positive while the other is not
divisible by 3.");
        } else {
            System.out.println("Neither of the integers meets the condition.");
        }
    }
}
```

Status : Correct

Marks : 10/10