Experiment - 7

Student Name: Riya Mehta   **UID:** 23BCS10889
Branch: BE-CSE   **Section/Group:** KRG-2B
Semester: 5ᵗʰ   **Date of Performance:**15/10/25
Subject Name: PBLJ   **Subject Code:** 23CSH-304

Aim:

To build a Java program that performs CRUD (Create, Read, Update, Delete) operations on a Product table using JDBC with transaction handling.
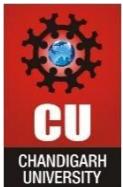
Objective:

To learn how to implement CRUD operations using JDBC, apply transaction handling, and use a menu-driven program for database operations.

Apparatus / Input Used:

• Java (JDK 8 or above)
• MySQL Database
• JDBC API
• MySQL Table: **Product(ProductID, ProductName, Price, Quantity)**
• IDE: Eclipse / IntelliJ / VS Code

Procedure:

1. Create a MySQL table **Product(ProductID, ProductName, Price, Quantity)**
2. Load the MySQL JDBC Driver using Class.forName()
3. Establish a connection using DriverManager.getConnection()
4. Create a menu-driven program with options: Add, View, Update, Delete
5. Use **PreparedStatement** for secure queries
6. Use connection.setAutoCommit(false) for manual transaction mode
7. Use commit() on successful operations
8. Use rollback() on errors
9. Close all JDBC resources properly (Connection, Statement, ResultSet)

Code

```java
import java.sql.*;
import java.util.Scanner;

public class EXPERIMENT7 {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);

        try {
            Class.forName("org.postgresql.Driver");

            Connection con = DriverManager.getConnection(
                "jdbc:postgresql://localhost:5432/testdb",
                "postgres",
                "root"
            );

            con.setAutoCommit(false);

            while (true) {
                System.out.println("\n--- Product Management Menu ---");
                System.out.println("1. Add Product");
                System.out.println("2. View All Products");
                System.out.println("3. Update Product");
                System.out.println("4. Delete Product");
                System.out.println("5. Exit");
                System.out.print("Enter choice: ");

                int choice = sc.nextInt();

                if (choice == 1) {
                    PreparedStatement ps = con.prepareStatement(
                        "INSERT INTO Product (ProductID, ProductName, Price, Quantity) VALUES (?, ?, ?, ?)"
                    );
                    System.out.print("Enter Product ID: ");
                    ps.setInt(1, sc.nextInt());
                    System.out.print("Enter Product Name: ");
                    ps.setString(2, sc.next());
                    System.out.print("Enter Price: ");
                    ps.setDouble(3, sc.nextDouble());
                    System.out.print("Enter Quantity: ");
                    ps.setInt(4, sc.nextInt());

                    ps.executeUpdate();
                    con.commit();
```
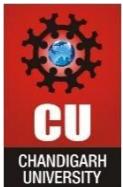
```java
        System.out.println("Product Added Successfully!");
    }

    else if (choice == 2) {
        Statement st = con.createStatement();
        ResultSet rs = st.executeQuery("SELECT * FROM Product");

        System.out.println("\nProductID | Name | Price | Quantity");
        System.out.println("----------------------------------");

        while (rs.next()) {
            System.out.println(
                rs.getInt("ProductID") + " | " +
                rs.getString("ProductName") + " | " +
                rs.getDouble("Price") + " | " +
                rs.getInt("Quantity")
            );
        }
    }

    else if (choice == 3) {
        PreparedStatement ps = con.prepareStatement(
            "UPDATE Product SET Price=?, Quantity=? WHERE ProductID=?"
        );
        System.out.print("Enter Product ID: ");
        ps.setInt(3, sc.nextInt());
        System.out.print("Enter New Price: ");
        ps.setDouble(1, sc.nextDouble());
        System.out.print("Enter New Quantity: ");
        ps.setInt(2, sc.nextInt());

        ps.executeUpdate();
        con.commit();
        System.out.println("Product Updated Successfully!");
    }

    else if (choice == 4) {
        PreparedStatement ps = con.prepareStatement(
            "DELETE FROM Product WHERE ProductID=?"
        );
        System.out.print("Enter Product ID: ");
        ps.setInt(1, sc.nextInt());

        ps.executeUpdate();
        con.commit();
        System.out.println("Product Deleted Successfully!");
    }
```
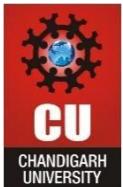
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```java
            else if (choice == 5) {
                System.out.println("Exiting...");
                break;
            }

            else {
                System.out.println("Invalid Choice!");
            }
        }

        con.close();
        sc.close();
    } catch (Exception e) {
        System.out.println("Error! Rolling Back...");
        e.printStackTrace();
    }
  }
}
```

OUTPUT:

```
PS C:\Users\ASUS\Desktop\Sem 5\PBLJ_23B
>>

--- Product Management Menu ---
1. Add Product
2. View All Products
3. Update Product
4. Delete Product
5. Exit
Enter choice: 1
Enter Product ID: 1
Enter Product Name: Phone
Enter Price: 10000
Enter Quantity: 5
Product Added Successfully!
```

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```
--- Product Management Menu ---
1. Add Product
2. View All Products
3. Update Product
4. Delete Product
5. Exit
Enter choice: 2

ProductID | Name | Price | Quantity
----------------------------------
1 | Phone | 10000.0 | 5
```

```
--- Product Management Menu ---
1. Add Product
2. View All Products
3. Update Product
4. Delete Product
5. Exit
Enter choice: 3
Enter Product ID: 1
Enter New Price: 100000
Enter New Quantity: 40
Product Updated Successfully!
```

```
--- Product Management Menu ---
1. Add Product
2. View All Products
3. Update Product
4. Delete Product
5. Exit
Enter choice: 5
Exiting...
PS C:\Users\ASUS\Desktop\Sem 5\PBLJ_23BCS10889_KRG-2B\Experiment_Codes>
```