Experiment - 7

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Subject Name: Project Based Learning in Java
Subject Code: 23CSH-304

1.Aim:

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

2.Objective:

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

3.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)

4.Program Code:

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

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

        try

            { Class.forName("com.mysql.cj.jdbc.Dr iver");
            Connection con = DriverManager.getConnection(
                  "jdbc:mysql://localhost:3306/testdb",          "root",
 "password"
            );

            con.setAutoCommit(false);
            int choice;

            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:     ");
choice = sc.nextInt();

if (choice == 1) {

        PreparedStatement          ps          =
            con.prepareStatement(      "INSERT
            INTO Product 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();
        System.out.println("Product   Added
Successfully!");

}

else if (choice == 2) {

    Statement st = con.createStatement();

    ResultSet rs = st.executeQuery("SELECT * FROM

        Product"); while (rs.next())    {
            System.out.println(rs.getInt(1)        +   "   |   "
            +       rs.getString(2) +   "   |   "   + rs.getDouble(3)

      + " | " + rs.getInt(4));
```

```
                    }
                } 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!");
                }
                else if (choice == 5)
                    { System.out.println("Exiting..
                    "); break;
```

```
                    }
                    e
                    l
                    s
                    e
                    {
                            System.out.println("Invalid          Choice");
                    }
                }
                con.close();
            } catch (Exception e)
                { System.out.println("Error! Rolling Back...");
            }
        }
}
```

5. Sample Output:

--- Product Management Menu ---

1. Add Product
2. View All Products
3. Update Product
4. Delete Product
5. Exit

Enter choice: 1

Enter Product ID: 101

Enter Product Name: Pen

Enter Price: 10

Enter Quantity: 100
Product Added Successfully!

Enter choice: 2

101 | Pen | 10.0 | 100