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Experiment - 7

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Subject Name: Project Based Learning in Java
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)

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

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

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