EXPERIMENT- 7

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Subject Name: Project Based Learning in Java **Subject Code:**22CSH-359

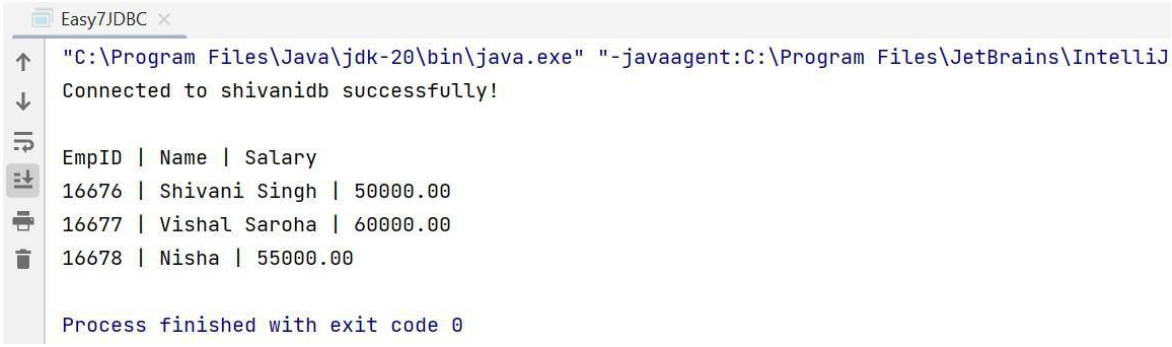
EASY LEVEL

1. **Aim**: Create a Java program to connect to a MySQL database and fetch data from a single table.
2. **Objective:** To retrieve and display all records from a table named Employee with columns EmpID, Name, and Salary.
3. **Implementation/Code:**

```
package Project1; import java.sql.*; public
class Easy7JDBC {     public static void
main(String[] args) {
        // Database connection details
        String url = "jdbc:mysql://localhost:3306/shivanidb";
         Strin  username
         g      =          "root";
         Strin  password
         g      =          "Shivani@1234";
         //
         SQL    Query
         Strin  query                                    try
         g      =       "SELECT * FROM Employee";        (Connection
 conn = DriverManager.getConnection(url, username, password);
              Statemen
              t         stmt = conn.createStatement();
              ResultSe  r   = stmt.executeQuery(query))
              t         s   {
            System.out.println("Connected to shivanidb successfully!\n");
System.out.println("EmpID | Name | Salary");             while (rs.next())
{
                System.out.printf("%d | %s | %.2f\n",
rs.getInt("EmpID"),                          rs.getString("Name"),
rs.getDouble("Salary"));}
        } catch (SQLException e) {
```

```
            System.err.println("Connection failed: " + e.getMessage());
        }
    }}
```

4. Output:



MEDIUM LEVEL

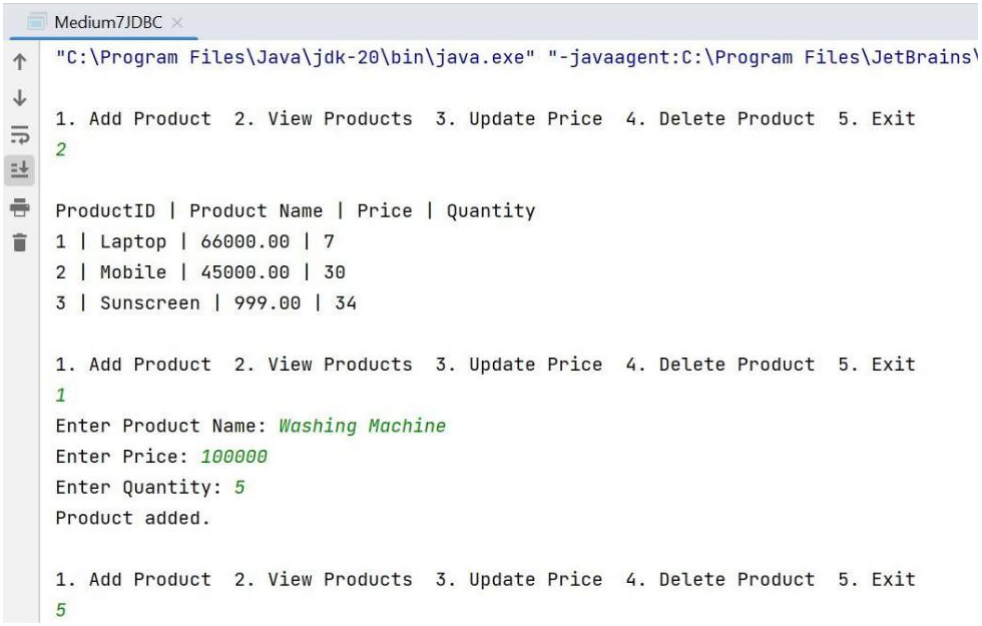
1. **Aim**: Build a program to perform CRUD operations
2. **Objective:** To perform Create, Read, Update, Delete on a database table Product with columns: ProductID, ProductName, Price, and Quantity. The program should include menu-driven options for each operation.
3. **Implementation/Code:**

```
package Project1;          import
java.sql.*;          import
java.util.Scanner; public class
Medium7JDBC {
    public static void main(String[] args) {
        String url = "jdbc:mysql://localhost:3306/shivanidb";
        String user = "root";
                                                Scanner sc =
        String password = "Shivani@1234";       new
Scanner(System.in);          try (Connection conn =
DriverManager.getConnection(url, user, password)) {            while
(true) {
                System.out.println("\n1. Add                    2. View
                Product                                       Products
3. Update Price  4. Delete
Product                              5. Exit");
int choice =
sc.nextInt();                                  if (choice == 1)
addProduct(conn, sc);                  else if (choice == 2)
```

```
                                        else if (choice ==
viewProducts(conn);                                      3)

updateProduct(conn, sc);                   else if (choice == 4)

deleteProduct(conn, sc);                   else if (choice == 5)

break
;
                else System.out.println("Invalid choice.");

            }

        } catch (SQLException e)

              e.printStackTrace();       static
{             }}                         void
addProduct(Connection conn, Scanner sc) throws
SQLException {
        System.out.print("Enter Product Name:
"); sc.nextLine();
```

```
        String name = sc.nextLine();
System.out.print("Ente
r                       Price: ");        double
price = sc.nextDouble();
System.out.print("Ente
r                       Quantity: ");        int
quantity = sc.nextInt();
        PreparedStatement stmt = conn.prepareStatement("INSERT
INTO Product (ProductName, Price, Quantity) VALUES (?, ?, ?)");
stmt.setString(1, name);         stmt.setDouble(2, price);
stmt.setInt(3, quantity);          stmt.executeUpdate();
        System.out.println("Product added.");
    }
    static void viewProducts(Connection conn) throws SQLException
        { ResultSet rs = conn.createStatement().executeQuery("SELECT * FROM
Product");
        System.out.println("\nProductID | Product Name | Price
| Quantity");
        while (rs.next()) {
            System.out.printf("%d | %s | %.2f | %d\n",
rs.getInt(1), rs.getString(2), rs.getDouble(3), rs.getInt(4));
        }
   }
    static void updateProduct(Connection conn, Scanner sc)
throws SQLException {
        System.out.print("Enter ProductID to update:
"); int id = sc.nextInt();
        System.out.print("Enter new Price:
"); double price = sc.nextDouble();
        PreparedStatement stmt = conn.prepareStatement("UPDATE Product
SET Price=? WHERE ProductID=?");         stmt.setDouble(1, price);
stmt.setInt(2, id);         stmt.executeUpdate();
        System.out.println("Product updated.");
    }
    static void deleteProduct(Connection conn, Scanner sc)
throws SQLException {
        System.out.print("Enter ProductID to delete:
"); int id = sc.nextInt();
        PreparedStatement stmt = conn.prepareStatement("DELETE FROM
Product WHERE ProductID=?"); stmt.setInt(1, id);
stmt.executeUpdate();
        System.out.println("Product deleted.");
    }}
```

4. Output:



HARD LEVEL

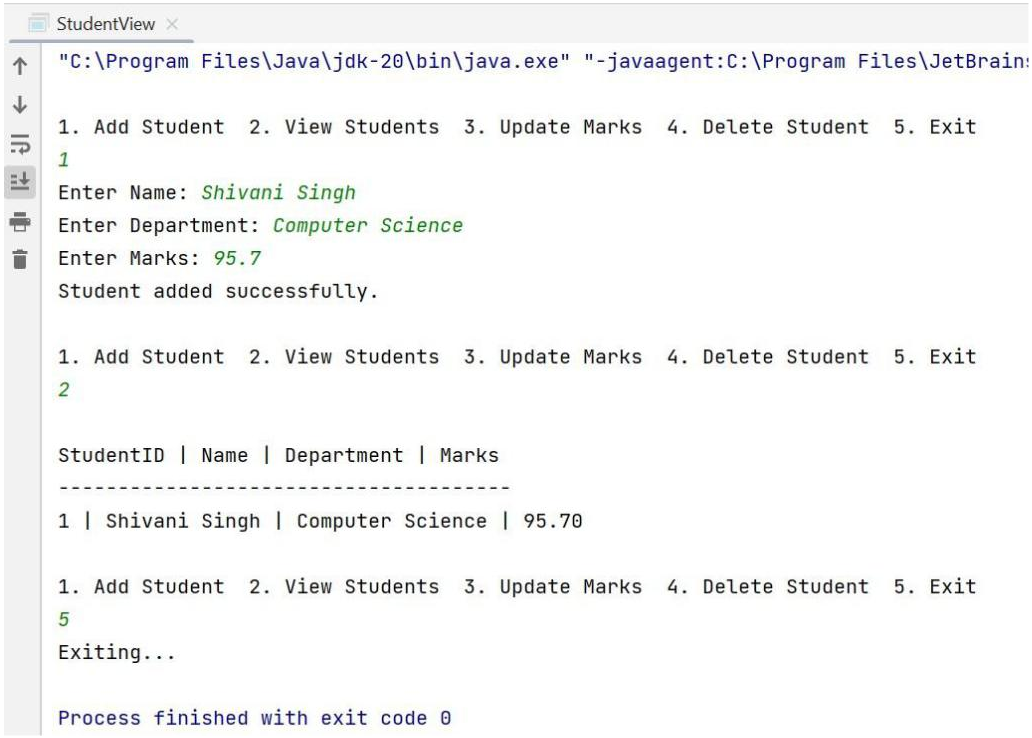
1. **Aim**: Develop a Java application using JDBC and MVC architecture to manage student data.
2. **Objective:** To Use a Student class as the model with fields like StudentID, Name, Department, and Marks. Include a database table to store student data.

3. **Implementation/Code:**

```
package Project1;
 import java.sql.SQLException;
import java.util.List; import
java.util.Scanner;

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

            while (true) {

3. Update Marks 4. Delete Student 5. Exit");
                int choice = sc.nextInt();
                if (choice == 1) {
```

```
                    System.out.print("Enter Name: ");
sc.nextLine();
                    String name = sc.nextLine();
                    System.out.print("Enter Department: ");
                    String dept = sc.nextLine();
System.out.print("Enter Marks: ");                    double marks =
sc.nextDouble();                    controller.addStudent(new
Studentss(0, name, dept, marks));                }
                else if (choice == 2) {
                    List<Studentss> students = controller.getStudents();
                    System.out.println("\nStudentID | Name | Department |
Marks");
                    System.out.println("--------------------------------
-----");
                    for (Studentss s : students) {
                        System.out.printf("%d | %s | %s | %.2f\n",
s.getStudentID(), s.getName(), s.getDepartment(), s.getMarks());
                    }
                }
                else if (choice == 3) {
                    System.out.print("Enter StudentID to update: ");
int id = sc.nextInt();
                    System.out.print("Enter new Marks: ");
double marks = sc.nextDouble();
controller.updateStudentMarks(id, marks);
                }
                else if (choice == 4) {
                    System.out.print("Enter StudentID to delete: ");
int id = sc.nextInt();                    controller.deleteStudent(id);
                }
                else if (choice == 5) {
                     System.out.println("Exiting..."
                     );
 break;                  }                else {
                    System.out.println("Invalid choice.");
                }
            }
        } catch (SQLException e) {
            e.printStackTrace();
        }
    }
}
```

4. Output:



5. Learning Outcomes:

(i) Learn how to **establish a connection** between a Java application and a MySQL database using **JDBC**.

(ii) Understand the use of **DriverManager and Connection objects** to interact with the database.

(iii) Learn to use **PreparedStatement** to securely execute SQL queries.