EXPERIMENT- 7

Student Name: BIJAYINI BEHERA **UID:** 22BCS10780

Branch: CSE **Section/Group:** 22BCS_IOT-639-A

Semester: 6 **Date of Performance:** 10.03.25

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

EASY

1. **Aim**: Create a Java program to connect to a MySQL database and fetch data from a single table.

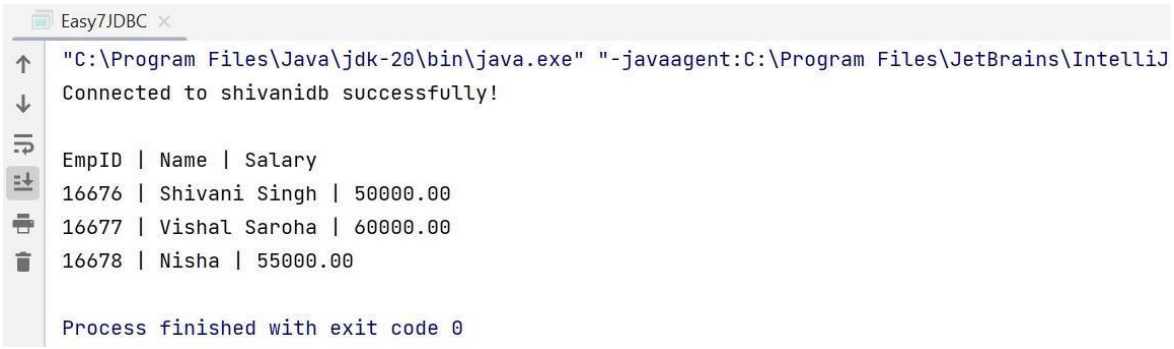
2. **Objective:** To retrieve and display all records from a table named Employee with columns EmpID, Name, and Salary.

3. **Implementation/Code:**

```
import java.sql.*;

public class Easy7JDBC {
    public static void main(String[] args) {
        // Database connection details
        String url = "jdbc:mysql://localhost:3306/shivanidb";
        String username = "root";
        String password = "Shivani@1234";

        // SQL Query
        String query = "SELECT * FROM Employee";

        try (Connection conn = DriverManager.getConnection(url, username, password);
             Statement stmt = conn.createStatement();
             ResultSet rs = stmt.executeQuery(query)) {

            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

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.

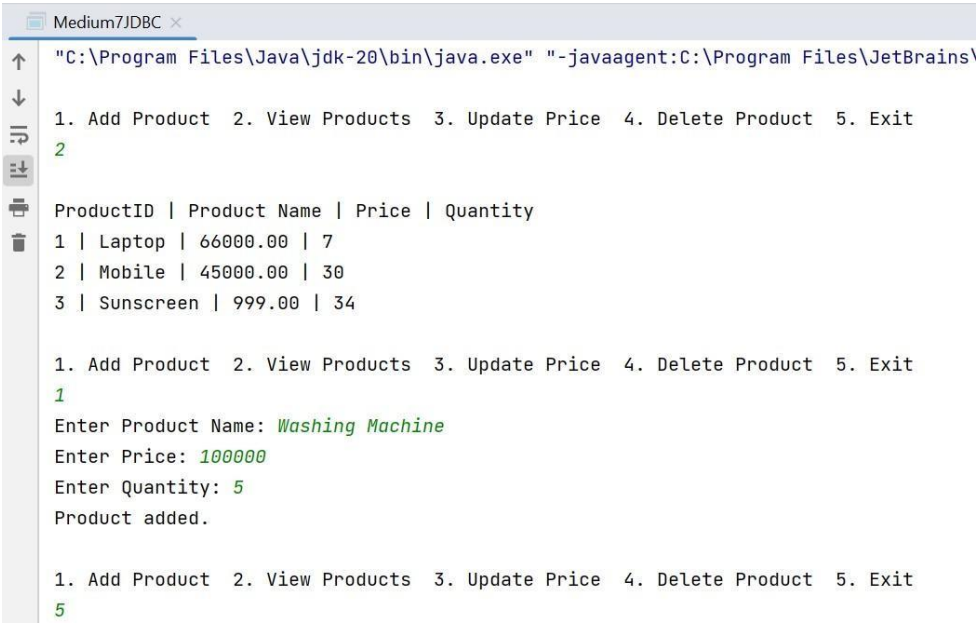
3. **Implementation/Code:**

```
      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";
        String password = "Shivani@1234";
        Scanner sc = new Scanner(System.in);

        try (Connection conn = DriverManager.getConnection(url, user, password)) {
            while (true) {
                System.out.println("\n1. Add Product 2. View Products 3. Update Price 4.
Delete Product 5. Exit");
                int choice = sc.nextInt();

                if (choice == 1) {
                    addProduct(conn, sc);
                } else if (choice == 2) {
                    viewProducts(conn);
                } else if (choice == 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("Enter Price: ");
        double price = sc.nextDouble();

        System.out.print("Enter 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

1. **Aim**: Develop a Java application using JDBC and MVC architecture to manage student data.

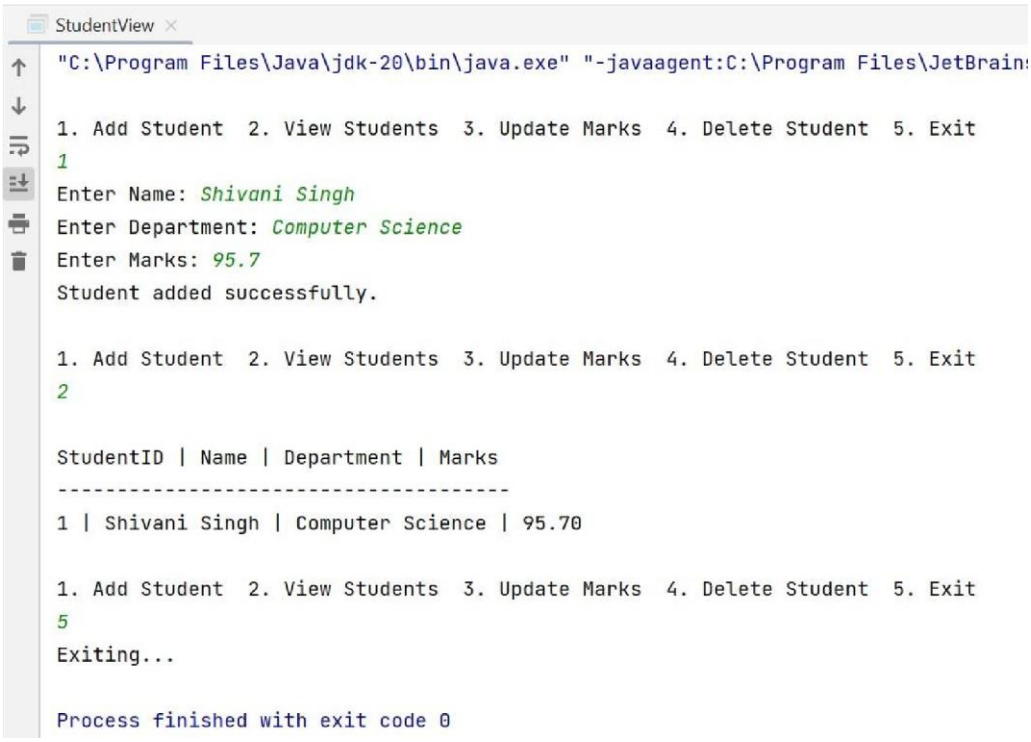
2. **Objective:** To Use a Student class as the model with fields like StudentID, Name, Department, and Marks. Include a database table to store student data.

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) {
                System.out.println("\n1. Add Student 2. View Students 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.