



EXPERIMENT- 7

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Subject Name: Project Based Learning in Java

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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";
    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:

```
Easy7JDBC x
" C:\Program Files\Java\jdk-20\bin\java.exe " "-javaagent:C:\Program Files\JetBrains\IntelliJ
Connected to shivanidb successfully!

EmpID | Name | Salary
16676 | Shivani Singh | 50000.00
16677 | Vishal Saroha | 60000.00
16678 | Nisha | 55000.00

Process finished with exit code 0
```

MEDIUM LEVEL

- Aim:** Build a program to perform CRUD operations
- 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.
- 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";
        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();
```



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```
        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:

```
Medium7JDBC x
"C:\Program Files\Java\jdk-20\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\

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

ProductID | Product Name | Price | Quantity
1 | Laptop | 66000.00 | 7
2 | Mobile | 45000.00 | 30
3 | Sunscreen | 999.00 | 34

1. Add Product  2. View Products  3. Update Price  4. Delete Product  5. Exit
1
Enter Product Name: Washing Machine
Enter Price: 100000
Enter Quantity: 5
Product added.

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

HARD LEVEL

- Aim:** Develop a Java application using JDBC and MVC architecture to manage student data.
- 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) {
```



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```
        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:

```
StudentView x
"C:\Program Files\Java\jdk-20\bin\java.exe" "-javaagent:C:\Program Files\JetBrain:

1. Add Student  2. View Students  3. Update Marks  4. Delete Student  5. Exit
1
Enter Name: Shivani Singh
Enter Department: Computer Science
Enter Marks: 95.7
Student added successfully.

1. Add Student  2. View Students  3. Update Marks  4. Delete Student  5. Exit
2

StudentID | Name | Department | Marks
-----
1 | Shivani Singh | Computer Science | 95.70

1. Add Student  2. View Students  3. Update Marks  4. Delete Student  5. Exit
5
Exiting...

Process finished with exit code 0
```

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.