

Case Study 1: Online Course Registration System

Objective:

Allow students to register/unregister for courses and view course details.

Table Structure:

```
CREATE DATABASE course db;
USE course db;
CREATE TABLE courses (
course id INT PRIMARY KEY,
course name VARCHAR(100),
faculty VARCHAR(100),
credits INT
);
```

JDBC Operations:

Creating Table:

```
package jdbc.demo;
```

```
import java.sql.Connection;
```

```
import java.sql.DriverManager;
```

```
public class CourseManager {
```

```
    public static void main(String[] args) {
```

```
        // Connection details
```

```
        String url = "jdbc:mysql://localhost:3306/course_db";
```

```
        String user = "root";
```

```
        String password = "sudha@123";
```

```
        try {
```

```
            // Load MySQL JDBC driver
```

```
            Class.forName("com.mysql.cj.jdbc.Driver");
```

```
            // Connect to database
```

```
            Connection conn = DriverManager.getConnection(url, user, password);
```

```
            System.out.println(" Connected to course_db database!");
```

```
            // Close connection
```

```
            conn.close();
```

```
        } catch (Exception e) {
```

```
            System.out.println(" Connection error: " + e);
```

```
        }
```

```
    }
```

```
}
```

OUTPUT:

```
Connected to course_db database!
```

INSERT: Add new courses.

```
package jdbc.demo;
```

```
import java.sql.Connection;
```

```
import java.sql.DriverManager;
```

```
import java.sql.PreparedStatement;
```

```
public class InsertedCourses {
```

```
    public static void main(String[] args) {
```

```
        String url = "jdbc:mysql://localhost:3306/course_db";
```

```
        String user = "root";
```

```

String password = "sudha@123";

try {
    Class.forName("com.mysql.cj.jdbc.Driver");
    Connection conn = DriverManager.getConnection(url, user, password);
    System.out.println("Connected to course_db");

    String sql = "INSERT INTO courses (course_id, course_name, faculty,
credits) VALUES (?, ?, ?, ?)";
    PreparedStatement ps = conn.prepareStatement(sql);

    ps.setInt(1, 101);                // course_id
    ps.setString(2, "Java");          // course_name
    ps.setString(3, "Ms.Sudha");      // faculty
    ps.setInt(4, 3);                  // credits

    int rowsInserted = ps.executeUpdate();

    if (rowsInserted > 0) {
        System.out.println("Course inserted successfully.");
    }

    conn.close();

} catch (Exception e) {
    System.out.println("Error: " + e);
}
}

```

OUTPUT:

```

Connected to course_db
Course inserted successfully.

```

SELECT: List available courses.

```

package jdbc.demo;

```

```

import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.ResultSet;
import java.sql.Statement;

```

```

public class SelectCourses {

    public static void main(String[] args) {

        String url = "jdbc:mysql://localhost:3306/course_db";
        String user = "root";
        String password = "sudha@123";

        try {
            Class.forName("com.mysql.cj.jdbc.Driver");
            Connection conn = DriverManager.getConnection(url, user, password);
            System.out.println("Connected to course_db");

            String sql = "SELECT * FROM courses";
            Statement stmt = conn.createStatement();
            ResultSet rs = stmt.executeQuery(sql);

            System.out.println("Course List:");
            System.out.println("-----");
            System.out.printf("%-10s %-20s %-15s %-10s\n", "ID", "Course Name",

```

```

"Faculty", "Credits");
    System.out.println("-----");

    while (rs.next()) {
        int id = rs.getInt("course_id");
        String name = rs.getString("course_name");
        String faculty = rs.getString("faculty");
        int credits = rs.getInt("credits");

        System.out.printf("%-10d %-20s %-15s %-10d\n", id, name,
faculty, credits);
    }

    conn.close();

    } catch (Exception e) {
        System.out.println("Error: " + e);
    }
}
}

```

OUTPUT:

Connected to course_db

Course List:

ID	Course Name	Faculty	Credits
101	Java	Raga	5
301	Java	MS.Sudha	3

UPDATE: Modify faculty or credit values.

```
package jdbc.demo;
```

```
import java.sql.Connection;
```

```
import java.sql.DriverManager;
```

```
import java.sql.PreparedStatement;
```

```
import java.util.Scanner;
```

```
public class UpdateCourse {
```

```
    public static void main(String[] args) {
```

```
        String url = "jdbc:mysql://localhost:3306/course_db";
```

```
        String user = "root";
```

```
        String password = "sudha@123";
```

```
        try {
```

```
            Class.forName("com.mysql.cj.jdbc.Driver");
```

```
            Connection conn = DriverManager.getConnection(url, user, password);
```

```
            System.out.println("Connected to course_db");
```

```
            Scanner sc = new Scanner(System.in);
```

```
            // Get input from user
```

```
            System.out.print("Enter Course ID to update: ");
```

```
            int courseId = sc.nextInt();
```

```
            sc.nextLine(); // consume newline
```

```
            System.out.print("Enter new Faculty Name: ");
```

```
            String newFaculty = sc.nextLine();
```

```
            System.out.print("Enter new Credits: ");
```

```
            int newCredits = sc.nextInt();
```

```

        // Update query
        String sql = "UPDATE courses SET faculty = ?, credits = ? WHERE
course_id = ?";
        PreparedStatement ps = conn.prepareStatement(sql);

        ps.setString(1, newFaculty);
        ps.setInt(2, newCredits);
        ps.setInt(3, courseId);

        int rowsUpdated = ps.executeUpdate();

        if (rowsUpdated > 0) {
            System.out.println("Course updated successfully.");
        } else {
            System.out.println("Course ID not found.");
        }

        conn.close();
        sc.close();

    } catch (Exception e) {
        System.out.println("Error: " + e);
    }
}
}

```

OUTPUT:

```

Connected to course_db
Enter Course ID to update: 301
Enter new Faculty Name: ssdmemer
Enter new Credits: 5
Course updated successfully.

```

DELETE: Remove obsolete courses.

```

package jdbc.demo;

```

```

import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.PreparedStatement;
import java.util.Scanner;

```

```

public class DeleteCourse {

    public static void main(String[] args) {

        String url = "jdbc:mysql://localhost:3306/course_db";
        String user = "root";
        String password = "sudha@123";

        try {
            Class.forName("com.mysql.cj.jdbc.Driver");
            Connection conn = DriverManager.getConnection(url, user, password);
            System.out.println("Connected to course_db");

            Scanner sc = new Scanner(System.in);

            // Get Course ID from user
            System.out.print("Enter Course ID to delete: ");
            int courseId = sc.nextInt();

            // Delete query

```

```

        String sql = "DELETE FROM courses WHERE course_id = ?";
        PreparedStatement ps = conn.prepareStatement(sql);
        ps.setInt(1, courseId);

        int rowsDeleted = ps.executeUpdate();

        if (rowsDeleted > 0) {
            System.out.println("Course deleted successfully.");
        } else {
            System.out.println("Course ID not found.");
        }

        conn.close();
        sc.close();

    } catch (Exception e) {
        System.out.println("Error: " + e);
    }
}
}

```

OUTPUT:

```

Connected to course_db
Enter Course ID to delete: 301
Course deleted successfully.

```

```

-----
-----
--

```

Case Study 2: Product Inventory System

Objective: Track product stock in a retail store.

Table Structure:

```

CREATE DATABASE inventory_db;
USE inventory_db;

```

```

CREATE TABLE products (product_id INT PRIMARY KEY, product name VARCHAR(100),
quantity INT, price DECIMAL(10,2));

```

JDBC Operations:

Creating Table:

```

package jdbc.demo;

```

```

import java.sql.Connection;
import java.sql.DriverManager;

```

```

public class InventoryConnection {

```

```

    public static void main(String[] args) {

```

```

        String url = "jdbc:mysql://localhost:3306/inventory_db";
        String user = "root";
        String password = "sudha@123";

```

```

        try {
            Class.forName("com.mysql.cj.jdbc.Driver");
            Connection conn = DriverManager.getConnection(url, user, password);
            System.out.println("Connected to inventory_db");

```

```

        conn.close();
    } catch (Exception e) {
        System.out.println("Error: " + e);
    }
}
}

```

OUTPUT:

Connected to inventory_db

INSERT: Add new products to inventory.
package jdbc.demo;

```

import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.PreparedStatement;

```

```

public class InsertProduct {

    public static void main(String[] args) {

        String url = "jdbc:mysql://localhost:3306/inventory_db";
        String user = "root";
        String password = "sudha@123";

        try {
            Class.forName("com.mysql.cj.jdbc.Driver");
            Connection conn = DriverManager.getConnection(url, user, password);
            System.out.println("Connected to inventory_db");

            String sql = "INSERT INTO products (product_id, product_name,
quantity, price) VALUES (?, ?, ?, ?)";
            PreparedStatement ps = conn.prepareStatement(sql);

            // Set product details
            ps.setInt(1, 101);                // product_id
            ps.setString(2, "Pen");           // product_name
            ps.setInt(3, 50);                 // quantity
            ps.setDouble(4, 10.50);           // price

            int rowsInserted = ps.executeUpdate();

            if (rowsInserted > 0) {
                System.out.println("Product inserted successfully.");
            }

            conn.close();

        } catch (Exception e) {
            System.out.println("Error: " + e);
        }
    }
}

```

OUTPUT:

Connected to inventory_db
Product inserted successfully.

SELECT: View stock levels and prices.
package jdbc.demo;

```

import java.sql.Connection;
import java.sql.DriverManager;

```

```

import java.sql.ResultSet;
import java.sql.Statement;

public class SelectProducts {

    public static void main(String[] args) {

        String url = "jdbc:mysql://localhost:3306/inventory_db";
        String user = "root";
        String password = "sudha@123";

        try {
            Class.forName("com.mysql.cj.jdbc.Driver");
            Connection conn = DriverManager.getConnection(url, user, password);
            System.out.println("Connected to inventory_db");

            String sql = "SELECT * FROM products";
            Statement stmt = conn.createStatement();
            ResultSet rs = stmt.executeQuery(sql);

            System.out.println("Product List:");

            System.out.println("----- ");
            System.out.printf("%-10s %-20s %-10s %-10s\n", "ID", "Product Name",
"Quantity", "Price");
            System.out.println("----- ");

            while (rs.next()) {
                int id = rs.getInt("product_id");
                String name = rs.getString("product_name");
                int qty = rs.getInt("quantity");
                double price = rs.getDouble("price");

                System.out.printf("%-10d %-20s %-10d %-10.2f\n", id, name, qty,
price);
            }

            conn.close();

        } catch (Exception e) {
            System.out.println("Error: " + e);
        }
    }
}

```

OUTPUT:

Connected to inventory_db
Product List:

ID	Product Name	Quantity	Price
101	Pen	50	10.50

UPDATE: Update quantity after sale/purchase.
package jdbc.demo;

```

import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.PreparedStatement;
import java.util.Scanner;

public class UpdateProductQuantity {

```

```

public static void main(String[] args) {

    String url = "jdbc:mysql://localhost:3306/inventory_db";
    String user = "root";
    String password = "sudha@123";

    try {
        Class.forName("com.mysql.cj.jdbc.Driver");
        Connection conn = DriverManager.getConnection(url, user, password);
        System.out.println("Connected to inventory_db");

        Scanner sc = new Scanner(System.in);

        // Get product ID and quantity change from user
        System.out.print("Enter Product ID to update quantity: ");
        int productId = sc.nextInt();

        System.out.print("Enter new quantity: ");
        int newQuantity = sc.nextInt();

        // Update query
        String sql = "UPDATE products SET quantity = ? WHERE product_id
= ?";

        PreparedStatement ps = conn.prepareStatement(sql);

        ps.setInt(1, newQuantity);
        ps.setInt(2, productId);

        int rowsUpdated = ps.executeUpdate();

        if (rowsUpdated > 0) {
            System.out.println("Product quantity updated successfully.");
        } else {
            System.out.println("Product ID not found.");
        }

        conn.close();
        sc.close();

    } catch (Exception e) {
        System.out.println("Error: " + e);
    }
}

```

OUTPUT:

```

Connected to inventory_db
Enter Product ID to update quantity: 101
Enter new quantity: 6
Product quantity updated successfully.

```

DELETE: Remove discontinued products.

```

package jdbc.demo;

```

```

import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.PreparedStatement;
import java.util.Scanner;

```

```

public class DeleteProduct {

    public static void main(String[] args) {

        String url = "jdbc:mysql://localhost:3306/inventory_db";
    }
}

```



```

String user = "root";
String password = "@123";

try {
    Class.forName("com.mysql.cj.jdbc.Driver");
    Connection conn = DriverManager.getConnection(url, user, password);
    System.out.println("Connected to inventory_db");

    Scanner sc = new Scanner(System.in);

    // Get product ID to delete
    System.out.print("Enter Product ID to delete: ");
    int productId = sc.nextInt();

    String sql = "DELETE FROM products WHERE product_id = ?";
    PreparedStatement ps = conn.prepareStatement(sql);
    ps.setInt(1, productId);

    int rowsDeleted = ps.executeUpdate();

    if (rowsDeleted > 0) {
        System.out.println("Product deleted successfully.");
    } else {
        System.out.println("Product ID not found.");
    }

    conn.close();
    sc.close();

} catch (Exception e) {
    System.out.println("Error: " + e);
}
}

```

OUTPUT:

```

Connected to inventory_db
Enter Product ID to delete: 101
Product deleted successfully.

```