✅ 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
);
```

Solution:

```
use course_db;
create table courses(course_id INT PRIMARY KEY, course_name
VARCHAR(100), faculty VARCHAR(100), credits INT
);
select*from courses;
```

JDBC Operations:

INSERT: Add new courses.

```
package Day5_JDBC_Assignment;

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

public class AddCourse {
    public static void main(String[] args) {
        String url = "jdbc:mysql://localhost:3306/course_db";
        String user = "root";
        String password = "Indumathi@1312";

        try {
            Class.forName("com.mysql.cj.jdbc.Driver");
            Connection conn = DriverManager.getConnection(url, user, password);
            Scanner sc = new Scanner(System.in);
            System.out.print("Enter Course ID: ");
```

```java
            int id = sc.nextInt();
            sc.nextLine(); // consume newline
            System.out.print("Enter Course Name: ");
            String name = sc.nextLine();
            System.out.print("Enter Faculty Name: ");
            String faculty = sc.nextLine();
            System.out.print("Enter Credits: ");
            int credits = sc.nextInt();

            String query = "INSERT INTO courses VALUES (?, ?, ?, ?)";
            PreparedStatement stmt = conn.prepareStatement(query);
            stmt.setInt(1, id);
            stmt.setString(2, name);
            stmt.setString(3, faculty);
            stmt.setInt(4, credits);

            int rows = stmt.executeUpdate();
            System.out.println(rows + " course(s) inserted.");
            conn.close();
            sc.close();
        } catch (Exception e) {
            System.out.println("Error: " + e);
        }
    }
}
```

MY OUTPUT:

```
Enter Course ID: 6
Enter Course Name: Java
Enter Faculty Name: Parvathi
Enter Credits: 12
1 course(s) inserted.
```

SELECT: List available courses.

```java
package Day5_JDBC_Assignment;

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 = "Indumathi@1312";
```

```java
        try {

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

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

            Statement stmt = conn.createStatement();

            ResultSet rs = stmt.executeQuery("SELECT * FROM courses");

            while (rs.next()) {

                System.out.println("Course ID: " + rs.getInt("course_id"));

                System.out.println("Course Name: " + rs.getString("course_name"));

                System.out.println("Faculty: " + rs.getString("faculty"));

                System.out.println("Credits: " + rs.getInt("credits"));

                System.out.println("************");

            }

            conn.close();

        } catch (Exception e) {

            System.out.println("Error: " + e);

        }

    }

}
```

MY OUTPUT:

```
Course ID: 1
Course Name: Java
Faculty: Sujatha
Credits: 8
************
Course ID: 2
Course Name: python
Faculty: Noorjahan
Credits: 9
************
Course ID: 3
Course Name: C
Faculty: Jaanu
Credits: 8
************
Course ID: 4
Course Name: CPP
Faculty: Harika
Credits: 10
************
```

UPDATE: Modify faculty or credit values.

```java
package Day5_JDBC_Assignment;

import java.sql.*;
import java.util.Scanner;

public class UpdateCourse {
public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

System.out.print("Enter Course ID to update: ");
int id = sc.nextInt();
sc.nextLine();
System.out.print("Enter new Faculty Name: ");
String faculty = sc.nextLine();
System.out.print("Enter new Credit value: ");
int credits = sc.nextInt();

try {
Connection con =
DriverManager.getConnection("jdbc:mysql://localhost:3306/course_db", "root",
"Indumathi@1312");
String sql = "UPDATE courses SET faculty = ?, credits = ? WHERE course_id = ?";
PreparedStatement ps = con.prepareStatement(sql);
ps.setString(1, faculty);
ps.setInt(2, credits);
ps.setInt(3, id);

int rows = ps.executeUpdate();
if (rows > 0) {
System.out.println("Course updated successfully.");
} else {
System.out.println("Course ID not found.");
}

ps.close();
con.close();
sc.close();

} catch (Exception e) {
e.printStackTrace();
}
}
}
```

MY OUTPUT:

```
Enter Course ID to update: 4
Enter new Faculty Name: Indu
Enter new Credit value: 9
Course updated successfully.
```

DELETE: Remove obsolete courses.

```java
package Day5_JDBC_Assignment;

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

```java
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 = "Indumathi@1312";

try {
Class.forName("com.mysql.cj.jdbc.Driver");
Connection conn = DriverManager.getConnection(url, user, password);

Scanner sc = new Scanner(System.in);
System.out.print("Enter Course ID to delete: ");
int id = sc.nextInt();

String query = "DELETE FROM courses WHERE course_id = ?";
PreparedStatement stmt = conn.prepareStatement(query);
stmt.setInt(1, id);

int rows = stmt.executeUpdate();
System.out.println(rows + " course(s) deleted.");
conn.close();
sc.close();
} catch (Exception e) {
System.out.println("Error: " + e);
}
}
}
```

MY OUTPUT:

```
Enter Course ID to delete: 3
1 course(s) deleted.
```

✅ Case Study 2: Product Inventory System

🎯 Objective:

Track product stock in a retail store.

📊 Table Structure:C

```sql
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)
);
```

Solution:

```
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)
);
select*from product;
```

JDBC Operations:

INSERT: Add new products to inventory.

```java
package Day5_JDBC_Assignment;

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

public class InsertProduct {
public static void main(String[] args) {
String url = "jdbc:mysql://localhost:3306/inventory_db";
String user = "root";
String password = "Indumathi@1312";

try {
Class.forName("com.mysql.cj.jdbc.Driver");
Connection conn = DriverManager.getConnection(url, user, password);

Scanner sc = new Scanner(System.in);
System.out.print("Enter Product ID: ");
int id = sc.nextInt();
sc.nextLine(); // consume newline
System.out.print("Enter Product Name: ");
String name = sc.nextLine();
System.out.print("Enter Quantity: ");
int quantity = sc.nextInt();
System.out.print("Enter Price: ");
double price = sc.nextDouble();

String query = "INSERT INTO products VALUES (?, ?, ?, ?)";
PreparedStatement pstmt = conn.prepareStatement(query);
pstmt.setInt(1, id);
pstmt.setString(2, name);
pstmt.setInt(3, quantity);
pstmt.setDouble(4, price);

int rows = pstmt.executeUpdate();
System.out.println(rows + " product(s) inserted.");
conn.close();
} catch (Exception e) {
```

```
System.out.println("Insert Error: " + e);
}
}
}
```

```
Enter Product ID: 1
Enter Product Name: TV
Enter Quantity: 1
Enter Price: 55000
1 product(s) inserted.
```

SELECT: View stock levels and prices.

```
package Day5_JDBC_Assignment;

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

public class ViewProducts {
public static void main(String[] args) {
String url = "jdbc:mysql://localhost:3306/inventory_db";
String user = "root";
String password = "Indumathi@1312";

try {
Class.forName("com.mysql.cj.jdbc.Driver");
Connection conn = DriverManager.getConnection(url, user, password);

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

System.out.println("Product ID | Product Name | Quantity | Price");
while (rs.next()) {
System.out.printf("%10d | %-12s | %8d | %.2f\n",
rs.getInt("product_id"),
rs.getString("product_name"),
rs.getInt("quantity"),
rs.getDouble("price")
);
}
conn.close();
} catch (Exception e) {
System.out.println("Select Error: " + e);
}
}
}
```

MY OUTPUT:

```
Product ID | Product Name | Quantity | Price
1          | TV           | 1        | 55000.00
```

UPDATE: Update quantity after sale/purchase.

```java
package Day5_JDBC_Assignment;

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

public class UpdateProduct {
public static void main(String[] args) {
String url = "jdbc:mysql://localhost:3306/inventory_db";
String user = "root";
String password = "Indumathi@1312";

try {
Class.forName("com.mysql.cj.jdbc.Driver");
Connection conn = DriverManager.getConnection(url, user, password);

Scanner sc = new Scanner(System.in);
System.out.print("Enter Product ID to update quantity: ");
int id = sc.nextInt();
System.out.print("Enter new Quantity: ");
int quantity = sc.nextInt();

String query = "UPDATE products SET quantity = ? WHERE product_id = ?";
PreparedStatement pstmt = conn.prepareStatement(query);
pstmt.setInt(1, quantity);
pstmt.setInt(2, id);

int rows = pstmt.executeUpdate();
System.out.println(rows + " product(s) updated.");
conn.close();
sc.close();
} catch (Exception e) {
System.out.println("Update Error: " + e);
}
}
}
```

MY OUTPUT:

```
Enter Product ID to update quantity: 1
Enter new Quantity: 6700
1 product(s) updated.
```

DELETE: Remove discontinued products.

```java
package Day5_JDBC_Assignment;

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 = "Indumathi@1312";
```

```java
try {
Class.forName("com.mysql.cj.jdbc.Driver");
Connection conn = DriverManager.getConnection(url, user, password);

Scanner sc = new Scanner(System.in);
System.out.print("Enter Product ID to delete: ");
int id = sc.nextInt();

String query = "DELETE FROM products WHERE product_id = ?";
PreparedStatement pstmt = conn.prepareStatement(query);
pstmt.setInt(1, id);

int rows = pstmt.executeUpdate();
System.out.println(rows + " product(s) deleted.");
conn.close();
sc.close();
} catch (Exception e) {
System.out.println("Delete Error: " + e);
}
}
}
```

MY OUTPUT:

```
Enter Product ID to delete: 1
1 product(s) deleted.
```