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: • INSERT: Add new courses. • SELECT: List available courses. • UPDATE: Modify faculty or credit values. • DELETE: Remove obsolete courses.

```
package Day5_JDBC_CaseStudy;
import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.PreparedStatement;
import java.util.Scanner;
public class OnlineCourseRegistrationInsert {
	public static void main(String[] args) {

		String url = "jdbc:mysql://localhost:3306/onlinecourseregistrationsystem";
		String user = "root";
		String password = "root";

		Scanner sc = new Scanner(System.in);
		try {
			// Load JDBC Driver
			Class.forName("com.mysql.cj.jdbc.Driver");

			//Establish Connection
			Connection conn = DriverManager.getConnection(url, user, password);
			System.out.println("Connected to the Database.");
	System.out.print("Course ID: ");
	int id = sc.nextInt();
	sc.nextLine();
	System.out.print("Course Name: ");
	String name = sc.nextLine();
	System.out.print("Faculty: ");
	String faculty = sc.nextLine();
	System.out.print("Credits: ");
	int credits = sc.nextInt();
	String sql = "INSERT INTO courses(course_id, course_name, faculty, credits) VALUES (?, ?, ?,
?)";
```

```
        PreparedStatement stmt = conn.prepareStatement(sql);
        stmt.setInt(1, id);
        stmt.setString(2, name);
        stmt.setString(3, faculty);
        stmt.setInt(4, credits);

        stmt.executeUpdate();
        System.out.println("Course added successfully!");
        sc.close();
    }
                catch(Exception e) {
                        System.out.println("Error connecting to Database: "+e);
                }
        }
}

package Day5_JDBC_CaseStudy;
import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.ResultSet;
import java.sql.Statement;
public class OnlineCourseRegistrationSelect {
        public static void main(String[] args) {

                String url = "jdbc:mysql://localhost:3306/onlinecourseregistrationsystem";
                String user = "root";
                String password = "root";

                try {
                        // Load JDBC Driver
                        Class.forName("com.mysql.cj.jdbc.Driver");

                        //Establish Connection
                        Connection conn = DriverManager.getConnection(url, user, password);
                        System.out.println("Connected to the Database.");

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

                        if (!rs.next()) {
                           System.out.println("No courses");
                        } else {
                           do {
                              System.out.println(rs.getInt("course_id") + " | " +
                                                 rs.getString("course_name") + " | " +
                                                 rs.getString("faculty") + " | " +
                                                 rs.getInt("credits"));
                           } while (rs.next());
```

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

package Day5_JDBC_CaseStudy;
import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.PreparedStatement;
import java.sql.ResultSet;
import java.util.Scanner;
public class OnlineCourseRegistrationUpdate {
        public static void main(String[] args) {

                String url = "jdbc:mysql://localhost:3306/onlinecourseregistrationsystem";
                String user = "root";
                String password = "root";

                Scanner sc = new Scanner(System.in);

                try {
                        // Load JDBC Driver
                        Class.forName("com.mysql.cj.jdbc.Driver");

                        //Establish Connection
                        Connection conn = DriverManager.getConnection(url, user, password);
                        System.out.println("Connected to the Database.\n");

                 System.out.print("Enter Course ID to update: ");
      int updateId = sc.nextInt();
      sc.nextLine();

      String checkSQL = "SELECT * FROM courses WHERE course_id = ?";
      try (PreparedStatement checkPst = conn.prepareStatement(checkSQL)) {
         checkPst.setInt(1, updateId);
         ResultSet rs = checkPst.executeQuery();
         if (!rs.next()) {
            System.out.println("Error: Course with ID " + updateId + " not found.");
            return;
         }
      }

      System.out.print("New Faculty: ");
      String newFaculty = sc.nextLine();
```

```
        System.out.print("New Credits: ");
        int newCredits = sc.nextInt();
        String updateSQL = "UPDATE courses SET faculty = ?, credits = ? WHERE course_id = ?";
        try (PreparedStatement pst = conn.prepareStatement(updateSQL)) {
            pst.setString(1, newFaculty);
            pst.setInt(2, newCredits);
            pst.setInt(3, updateId);
            int rows = pst.executeUpdate();
            if (rows > 0) System.out.println("Course updated successfully!");
            else System.out.println("Course update failed.");
        }
            }
                    catch(Exception e ) {
                            System.out.println("ERROR: "+e);
                    }
        sc.close();
            }
}

package Day5_JDBC_CaseStudy;
import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.PreparedStatement;
import java.util.Scanner;
public class OnlineCourseRegistrationDelete {
            public static void main(String[] args) {

                    String url = "jdbc:mysql://localhost:3306/onlinecourseregistrationsystem";
                    String user = "root";
                    String password = "root";

                    Scanner sc = new Scanner(System.in);

                    try {
                            // Load JDBC Driver
                            Class.forName("com.mysql.cj.jdbc.Driver");

                            //Establish Connection
                            Connection conn = DriverManager.getConnection(url, user, password);
                            System.out.println("Connected to the Database.\n");

                            System.out.print("Enter Course ID to delete: ");
                    int deleteId = sc.nextInt();

                    String deleteSQL = "DELETE FROM courses WHERE course_id = ?";
                    try (PreparedStatement pst = conn.prepareStatement(deleteSQL)) {
                        pst.setInt(1, deleteId);
                        int rows = pst.executeUpdate();
                        if (rows > 0) System.out.println("Course deleted successfully!");
```

```
                else System.out.println("Course not found.");
            }
                }

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

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: • INSERT: Add new products to inventory. • SELECT: View stock levels and prices. • UPDATE: Update quantity after sale/purchase. • DELETE: Remove discontinued products.

```
package Day5_JDBC_CaseStudy;
import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.PreparedStatement;
import java.util.Scanner;
public class ProductInventoryInsert {
        public static void main(String[] args) {

                String url = "jdbc:mysql://localhost:3306/productinventorysystem";
                String user = "root";
                String password = "root";

                Scanner sc = new Scanner(System.in);
                try {
                        // Load JDBC Driver
                        Class.forName("com.mysql.cj.jdbc.Driver");

                        //Establish Connection
```

```
                        Connection conn = DriverManager.getConnection(url, user, password);
                        System.out.println("Connected to the Database.");
        System.out.print("Product ID: ");
        int id = sc.nextInt();
        sc.nextLine();
        System.out.print("Product Name: ");
        String name = sc.nextLine();
        System.out.print("Quantity: ");
        int quantity = sc.nextInt();
        System.out.print("Price: ");
        double price = sc.nextDouble();
        String sql = "INSERT INTO products(product_id, product_name, quantity, price) VALUES (?, ?, ?,
?)";
        PreparedStatement stmt = conn.prepareStatement(sql);
        stmt.setInt(1, id);
        stmt.setString(2, name);
        stmt.setInt(3, quantity);
        stmt.setDouble(4, price);

        stmt.executeUpdate();
        System.out.println("Product added successfully!");
        sc.close();
    }
                catch(Exception e) {
                        System.out.println("Error connecting to Database: "+e);
                }
        }
}

package Day5_JDBC_CaseStudy;
import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.ResultSet;
import java.sql.Statement;
public class ProductInventorySelect {
        public static void main(String[] args) {
                String url = "jdbc:mysql://localhost:3306/productinventorysystem";
                String user = "root";
                String password = "root";

                try {
                        // Load JDBC Driver
                        Class.forName("com.mysql.cj.jdbc.Driver");

                        //Establish Connection
                        Connection conn = DriverManager.getConnection(url, user, password);
                        System.out.println("Connected to the Database.");
        String sql = "SELECT * FROM products";
        Statement st = conn.createStatement();
```

```
                        ResultSet rs = st.executeQuery(sql);

                        if(!rs.next()) {
                                System.out.println("No products");
                        }
                        else {
                                do {
                                        System.out.println(rs.getInt("product_id") + " | " +
                                rs.getString("product_name") + " | " +
                                rs.getInt("quantity") + " | " +
                                rs.getDouble("price"));
                        }
                                while (rs.next());

                        }

        st.close();
        rs.close();
                }
                catch(Exception e) {
                        System.out.println("Error connecting to Database: "+e);
                }
         }
}

package Day5_JDBC_CaseStudy;
import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.PreparedStatement;
import java.sql.ResultSet;
import java.util.Scanner;
public class ProductInventoryUpdate {
         public static void main(String[] args) {
                String url = "jdbc:mysql://localhost:3306/productinventorysystem";
                String user = "root";
                String password = root";

                Scanner sc = new Scanner(System.in);
                try {
                        // Load JDBC Driver
                        Class.forName("com.mysql.cj.jdbc.Driver");

                        //Establish Connection
                        Connection conn = DriverManager.getConnection(url, user, password);
                        System.out.println("Connected to the Database.");
        System.out.print("Enter Product ID to update: ");
        int id = sc.nextInt();
        sc.nextLine();
```

```
        String checkSQL = "SELECT * FROM products WHERE product_id = ?";
        try (PreparedStatement checkPst = conn.prepareStatement(checkSQL)) {
            checkPst.setInt(1, id);
            ResultSet rs = checkPst.executeQuery();
            if (!rs.next()) {
                System.out.println("Error: Product with ID " + id + " not found.");
                return;
            }
        }

        System.out.print("New Quantity: ");
        int quantity = sc.nextInt();
        String sql = "UPDATE products SET quantity = ? WHERE product_id = ?";
        PreparedStatement stmt = conn.prepareStatement(sql);
        stmt.setInt(1, quantity);
        stmt.setInt(2, id);

        int rows = stmt.executeUpdate();
        if (rows > 0) System.out.println("Product updated successfully!");
        else System.out.println("Course update failed.");
        sc.close();
    }
                catch(Exception e) {
                        System.out.println("Error connecting to Database: "+e);
                }
        }
}

package Day5_JDBC_CaseStudy;
import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.PreparedStatement;
import java.util.Scanner;
public class ProductInventoryDelete {
        public static void main(String[] args) {
                String url = "jdbc:mysql://localhost:3306/productinventorysystem";
                String user = "root";
                String password = "root";

                Scanner sc = new Scanner(System.in);

                try {
                        // Load JDBC Driver
                        Class.forName("com.mysql.cj.jdbc.Driver");

                        //Establish Connection
                        Connection conn = DriverManager.getConnection(url, user, password);
                        System.out.println("Connected to the Database.\n");
```

```
                    System.out.print("Enter Product ID to delete: ");
                int deleteId = sc.nextInt();

                String deleteSQL = "DELETE FROM products WHERE product_id = ?";
                try (PreparedStatement pst = conn.prepareStatement(deleteSQL)) {
                    pst.setInt(1, deleteId);
                    int rows = pst.executeUpdate();
                    if (rows > 0) System.out.println("Product deleted successfully!");
                    else System.out.println("Product not found.");
                }
                    }

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