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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

```
package jdbc.demo;
import java.sql.Connection;
import java.sql.DriverManager;
public class JDBC_Coursemanager {
        public static void main(String[] args) {
                // TODO Auto-generated method stub
                String url = "jdbc:mysql://localhost:3306/course_db";
                String user = "root";
                String password = "Murthy@2003";
                try
                {
                        Class.forName("com.mysql.cj.jdbc.Driver");
                        Connection conn = DriverManager.getConnection(url,user,password);
                        System.out.println("Connected to the course_db database!!");
```

```java
conn.close();
            }
            catch(Exception e)
            {
                System.out.println("Connection error: "+e);
            }
        }
}
```

Insert: Add new courses

```java
package jdbc.demo;
import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.PreparedStatement;
public class JDBC_insertcourses {
    public static void main(String[] args) {
        // TODO Auto-generated method stub
        String url = "jdbc:mysql://localhost:3306/course_db";
        String user = "root";
        String password = "Murthy@2003";
        try
        {
            Class.forName("com.mysql.cj.jdbc.Driver");
            Connection conn = DriverManager.getConnection(url,user,password);
            String sql = "INSERT INTO courses (course_id,course_name,faculty,credits) VALUES(?,?,?,?)";
            PreparedStatement stmt = conn.prepareStatement(sql);
            //System.out.println("Connected to the database");
            stmt.setInt(1, 301);
            stmt.setString(2, "Maths");
            stmt.setString(3, "Mr.Sharma");
```

```java
                stmt.setInt(4, 3);
                int rowsInserted = stmt.executeUpdate();
                if(rowsInserted>0)
                {
                        System.out.println("courses inserted successfully");
                }
                //stmt.close();
                conn.close();
            }
        catch(Exception e)
        {
                System.out.println("Connection error: "+e);
        }
    }
}
```

SELECT: List available courses.

```java
package jdbc.demo;
import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.ResultSet;
import java.sql.Statement;
public class JDBCSelectcourses {
    public static void main(String[] args) {
        // TODO Auto-generated method stub
        String url = "jdbc:mysql://localhost:3306/course_db";
        String user = "root";
        String password = "Murthy@2003";
        try
        {
                Class.forName("com.mysql.cj.jdbc.Driver");
```

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

                    Statement stmt = conn.createStatement();

                    String sql = "SELECT * FROM courses";

                    ResultSet rs = stmt.executeQuery(sql);

                    System.out.println("ID\tCourse_Name\tFaculty\t\tCredits");

                    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.println(id + "\t" + name + "\t\t" + faculty +
"\t"+credits);

                    }

                    rs.close();

                    stmt.close();

                    //System.out.println("Connected to the database.");

                    conn.close();

            }

            catch(Exception e) {

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

            }

        }

}
```

UPDATE: Modify faculty or credit values.

```java
package jdbc.demo;

import java.sql.Connection;

import java.sql.DriverManager;

import java.sql.PreparedStatement;

import java.util.Scanner;
```

```java
public class JDBCUpdatecourses {
    public static void main(String[] args) {
        // TODO Auto-generated method stub
        String url = "jdbc:mysql://localhost:3306/course_db";
        String user = "root";
        String password = "Murthy@2003";
        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.");
```

```java
            }
            else
            {
                    System.out.println("Course ID not found.");
            }
            conn.close();
            sc.close();
            }
        catch (Exception e)
        {
                System.out.println("Error: " + e);
        }
    }
}
```

DELETE:delete the course from the list

```java
package jdbc.demo;
import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.PreparedStatement;
import java.util.Scanner;
public class JDBC_Deletecourse {
    public static void main(String[] args)
    {
            // TODO Auto-generated method stub
            String url = "jdbc:mysql://localhost:3306/course_db";
            String user = "root";
            String password = "Murthy@2003";
            try {
                    Class.forName("com.mysql.cj.jdbc.Driver");
```

```java
            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);

            }

    }

}
```

Case Study 2: Product Inventory System

Objective: Track product stock in a retail store.

Table Structure:C

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:

```
package jdbc.demo;

import java.sql.Connection;

import java.sql.DriverManager;

public class InventoryConnection {

        public static void main(String[] args) {

                // TODO Auto-generated method stub

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

                String user = "root";

                String password = "Murthy@2003";

                try

                {

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

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

                        System.out.println("Connected to the inventory_db");

                        conn.close();

                }

                catch(Exception e)

                {

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

                }

        }

}
```

INSERT: Add new products to inventory.

```java
package jdbc.demo;

import java.sql.Connection;

import java.sql.DriverManager;

import java.sql.PreparedStatement;

public class InsertProduct {

    public static void main(String[] args) {

        // TODO Auto-generated method stub

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

        String user = "root";

        String password = "Murthy@2003";

        try

        {

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

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

            String sql = "INSERT INTO products (product_id, product_name, quantity, price) VALUES (?, ?, ?, ?)";

            PreparedStatement stmt = conn.prepareStatement(sql);

            //System.out.println("Connected to the database");

            stmt.setInt(1, 101);

            stmt.setString(2, "Pen");

            stmt.setInt(3, 50);

            stmt.setDouble(4, 10.50);

            int rowsInserted = stmt.executeUpdate();

            if(rowsInserted>0)

            {

                System.out.println("product inserted successfully");

            }

            //stmt.close();

            conn.close();
```

```java
            }
            catch(Exception e)
            {
                    System.out.println("Connection error: "+e);
            }
        }
}
```

SELECT: View stock levels and prices.

```java
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) {
                // TODO Auto-generated method stub
                String url = "jdbc:mysql://localhost:3306/inventory_db";
                String user = "root";
                String password = "Murthy@2003";
                try
                {
                        Class.forName("com.mysql.cj.jdbc.Driver");
                        Connection conn = DriverManager.getConnection(url,user,password);
                        Statement stmt = conn.createStatement();
                        String sql = "SELECT * FROM products";
                        ResultSet rs = stmt.executeQuery(sql);
                        System.out.println("ID\tproduct_Name\tQuantity\t\tPrice");
                        System.out.println("-------------------------------------------------");
                        while(rs.next()) {
                                int id = rs.getInt("product_id");
```

```java
                    String name = rs.getString("product_name");

                    String faculty = rs.getString("quantity");

                    int credits = rs.getInt("price");

                    System.out.println(id + "\t" + name + "\t\t" + faculty +
"\t\t"+credits);

                }

            rs.close();

            stmt.close();

            //System.out.println("Connected to the database.");

            conn.close();

        }

        catch(Exception e) {

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

        }

    }

}
```

UPDATE: Update quantity after sale/purchase.

```java
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) {

        // TODO Auto-generated method stub

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

        String user = "root";

        String password = "Murthy@2003";

        try {

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

```java
            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);

        }

    }


}
```

DELETE: Remove discontinued products.

```java
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) {
        // TODO Auto-generated method stub
        String url = "jdbc:mysql://localhost:3306/inventory_db";
        String user = "root";
        String password = "Murthy@2003";
        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.");
```

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