

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.

Connection database to Javacode

```
package jdbc.demo;

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

public class JDBCConnection {

    public static void main(String[] args) {
        String url = "jdbc:mysql://localhost:3306/testdb";
        String user = "root";
        String password = "Sreevani@8059";
        try {
            Class.forName("com.mysql.cj.jdbc.Driver");

            //Establish Connection
            Connection conn = DriverManager.getConnection(url,user,password);
            System.out.println("Connected to course_db ");
            conn.close();
        }
        catch(Exception e) {
```

```

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

```

Output:

Connected to course_db

- **INSERT:** Add new courses.

Code:

```

package JDBC.demo;

import java.sql.Connection;

import java.sql.DriverManager;

import java.sql.PreparedStatement;

public class JDBCInsertCourse {

    public static void main(String[] args) {

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

        String user = "root";

        String password = "Sreevani@8059";

        try {

            // Load Driver

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

            // Establish Connection

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

            // Prepare SQL Insert Statement

            String sql = "INSERT INTO courses(course_id, course_name,
faculty, credits) VALUES (?, ?, ?, ?)";

            PreparedStatement stmt = conn.prepareStatement(sql);

            // Set values

            stmt.setInt(1, 201);

            stmt.setString(2, "DBMS");

```

```

        stmt.setString(3, "Dr. Latha");

        stmt.setInt(4, 4);

        // Execute the query

        int rowsInserted = stmt.executeUpdate();

        if (rowsInserted > 0) {

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

        }

        // Close connections

        stmt.close();

        conn.close();

    } catch (Exception e) {

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

    }

}

}

```

Output:

Connected to course_db

Course inserted successfully.

- **SELECT:** List available courses.

Program

```

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) {

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

```

```

String user = "root";

String password = "Sreevani@8059";

try {

    // Load JDBC driver

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

    // Establish Connection

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

    Statement stmt = conn.createStatement();

    // Select all courses

    String sql = "SELECT * FROM courses";

    ResultSet rs = stmt.executeQuery(sql);

    System.out.println("ID\tCourse Name\t\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\t" +
credits);

    }

    rs.close();

    stmt.close();

    conn.close();

} catch (Exception e) {

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

}

}

}

```

Output:

Connected to course_db

ID	Course Name	Faculty	Credits

201	DBMS	Dr. Latha	4

- **UPDATE:** Modify faculty or credit values.

Package JDBC.demo;

import java.sql.Connection;

import java.sql.DriverManager;

import java.sql.PreparedStatement;

public class JDBCUpdateCourse {

 public static void main(String[] args) {

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

 String user = "root";

 String password = "Sreevani@8059";

 try {

 // Load JDBC driver

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

 // Connect to database

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

 // SQL update statement to modify faculty and credits

 String sql = "UPDATE courses SET faculty = ?, credits = ? WHERE
course_id = ?";

```

PreparedStatement stmt = conn.prepareStatement(sql);

// Set new faculty and credits for course_id = 201
stmt.setString(1, "Prof. Anil");
stmt.setInt(2, 5);
stmt.setInt(3, 201);

int rowsUpdated = stmt.executeUpdate();
if (rowsUpdated > 0) {
    System.out.println("Course updated successfully.");
} else {
    System.out.println("No course found with the given ID.");
}

stmt.close();
conn.close();

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

```

Output:

Connected to course_db

Course updated successfully.

- **DELETE:** Remove obsolete courses.

```

package JDBC.demo;

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

```

```

public class JDBCDeleteCourse {

    public static void main(String[] args) {

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

        String user = "root";

        String password = "Sreevani@8059";

        try {

            // Load JDBC Driver

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

            // Connect to the database

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

            // Prepare SQL DELETE statement

            String sql = "DELETE FROM courses WHERE course_id = ?";

            PreparedStatement stmt = conn.prepareStatement(sql);

            // Set course_id to delete

            stmt.setInt(1, 201); // You can change this to any existing course_id

            int rowsDeleted = stmt.executeUpdate();

            if (rowsDeleted > 0) {

                System.out.println("Course deleted successfully.");

            } else {

                System.out.println("No course found with the given ID.");

            }

            stmt.close();

            conn.close();

        } catch (Exception e) {

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

        }

    }

}

```

Ouput:

Connected to course_db

Course deleted successfully.

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:

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

Connection data to java code

```
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/testdb";
        String user = "root";
        String password = "Sreevani@8059";
        try {
            Class.forName("com.mysql.cj.jdbc.Driver");

            //Establish Connection
```



```

        Connection conn = DriverManager.getConnection(url,user,password);
        System.out.println("Connected to inventory_db ");
        conn.close();
    }
    catch(Exception e) {
        System.out.println("Connection 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 InsertInventory {
    public static void main(String[] args) {
```

```
        String url = "jdbc:mysql://localhost:3306/inventory_db";
        String user = "root";
        String password = "Sreevani@8059"; // Updated password
```

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

```
        String url = "jdbc:mysql://localhost:3306/inventory_db";
        String user = "root";
        String password = "Sreevani@8059";
```

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

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

```
            System.out.println("ID\tName\tQuantity\tPrice");
            System.out.println("-----");
```

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

```
                System.out.println(id + "\t" + name + "\t\t" + quantity + "\t\t" + price);
            }
```

```
            rs.close();
            stmt.close();
            conn.close();
        }
    }
}
```

```

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

```

Output:

Connected to inventory_db

ID	Name	Quantity	Price
101	Pen	50	10.5

- **UPDATE:** Update quantity after sale/purchase.

```
package JDBC.demo;
```

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

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

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

```
public class UpdateInventory {
```

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

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

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

```
        String password = "Sreevani@8059";
```

```
        try {
```

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

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

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

```
            // Update quantity for a specific product
```

```
            String sql = "UPDATE products SET quantity = ? WHERE product_id = ?";
```

```
            PreparedStatement ps = conn.prepareStatement(sql);
```

```

        ps.setInt(1, 80);    // new quantity after sale/purchase

        ps.setInt(2, 101);   // product_id to update


        int rowsUpdated = ps.executeUpdate();

        if (rowsUpdated > 0) {

            System.out.println("Product quantity updated successfully.");

        } else {

            System.out.println("Product ID not found.");

        }


        ps.close();

        conn.close();


    } catch (Exception e) {

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

    }

}

}

```

Output:

Connected to inventory_db

Product quantity updated successfully.

- **DELETE:** Remove discontinued products.

```
package JDBC.demo;
```

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

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

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

```
public class DeleteInventory {  
    public static void main(String[] args) {  
  
        String url = "jdbc:mysql://localhost:3306/inventory_db";  
        String user = "root";  
        String password = "Sreevani@8059";  
  
        try {  
            Class.forName("com.mysql.cj.jdbc.Driver");  
            Connection conn = DriverManager.getConnection(url, user, password);  
            System.out.println("Connected to inventory_db");  
  
            // Delete product with specific product_id  
            String sql = "DELETE FROM products WHERE product_id = ?";  
            PreparedStatement ps = conn.prepareStatement(sql);  
  
            ps.setInt(1, 101); // product_id to delete  
  
            int rowsDeleted = ps.executeUpdate();  
            if (rowsDeleted > 0) {  
                System.out.println("Product deleted successfully.");  
            } else {  
                System.out.println("Product ID not found.");  
            }  
  
            ps.close();  
            conn.close();  
  
        } catch (Exception e) {
```

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

Output:

Connected to inventory_db

Product deleted successfully.