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25.07.2025

Case Study 1: Online Course Registration System Objective:
Allow students to register/unregister for courses and view course details.

Table Structure:

```
CREATE DATABASE coursedb;
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/coursedb";
            String user = "root";
            String password = "spoorthib2003$";
 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 coursedb database!");

                  // Close connection conn.close();

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

OUTPUT:
Connected to coursedb database!

INSERT: Add new courses.

```
package jdbc.demo;
 import java.sql.Connection;

import java.sql.DriverManager;
```

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```
import java.sql.PreparedStatement; public
class InsertedCourses {

      public static void main(String[] args) {

            String url = "jdbc:mysql://localhost:3306/coursedb";
            String user = "root";
            String password = " spoorthib2003$";
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.Anitha");        // 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 coursedb
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) {
```

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```
        String url = "jdbc:mysql://localhost:3306/coursedb";
        String user = "root";
        String password = " spoorthib2003$";
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.Anitha	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;
```

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

            String url = "jdbc:mysql://localhost:3306/coursedb";
            String user = "root";
            String password = " spoorthib2003$";
 try {
                    Class.forName("com.mysql.cj.jdbc.Driver");
                    Connection conn = DriverManager.getConnection(url, user, password);
                    System.out.println("Connected to coursedb");

                    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
```

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Course updated successfully.

DELETE: Remove obsoleteÂ 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 = " spoorthib2003$";
 try {
                    Class.forName("com.mysql.cj.jdbc.Driver");
                    Connection conn = DriverManager.getConnection(url, user, password);
                    System.out.println("Connected to coursedb");

                    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 cours_db Enter Course ID to delete: 301 Course deleted successfully.

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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:
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 = " spoorthib2003$";
 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;
```

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```
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 = " spoorthib2003$";
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;
```

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

            String url = "jdbc:mysql://localhost:3306/inventorydb";
            String user = "root";
            String password = " spoorthib2003$";
 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 inventorydb
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;
```

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```
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/inventorydb";
            String user = "root";
            String password = spoorthib2003$";
 try {
                    Class.forName("com.mysql.cj.jdbc.Driver");
                    Connection conn = DriverManager.getConnection(url, user, password);
                    System.out.println("Connected to inventorydb");

                    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 inventorydb Enter Product ID to delete: 101 Product deleted successfully.