Assignment Day-5 (JDBC)

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.

Program Code:

```
package Assignment;

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

public class CourseConnection {
    public static void main(String[] args) {
        String url = "jdbc:mysql://localhost:3306/course_db";
        String user = "root";
        String password = "Master@2407";

        try {
            Class.forName("com.mysql.cj.jdbc.Driver");
            Connection conn = DriverManager.getConnection(url, user,
password);
            System.out.println("Connected to course_db database");
            conn.close();
        } catch (Exception e) {
            System.out.println("Connection Error: " + e);
```

```
        }
    }
}
```

Output:

Connected to course_db database

• INSERT: Add new courses

```
package Assignment;

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

public class CourseInsert {
      public static void main(String[] args) {
         String url = "jdbc:mysql://localhost:3306/course_db";
         String user = "root";
         String password = "Master@2407";

         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);

             stmt.setInt(1, 001);
             stmt.setString(2, "Java Programming");
             stmt.setString(3, "Chetana");
             stmt.setInt(4, 5);

             int rowsInserted = stmt.executeUpdate();
             if (rowsInserted > 0) {
                 System.out.println("Course inserted successfully");
             }

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

Output:

Course inserted successfully

• SELECT: List available courses.

```
package Assignment;

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

public class CourseSelect {
      public static void main(String[] args) {
         String url = "jdbc:mysql://localhost:3306/course_db";
         String user = "root";
         String password = "Master@2407";

         try {
             Class.forName("com.mysql.cj.jdbc.Driver");
             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\tName\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" + faculty +
"\t" + credits);
             }

             rs.close();
             stmt.close();
             conn.close();
         } catch (Exception e) {
             System.out.println("Select Error: " + e);
         }
     }


}
```

Output:

ID Name Faculty Credits

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• UPDATE: Modify faculty or credit values.

```
package Assignment;

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

public class CourseUpdate {
      public static void main(String[] args) {
        String url = "jdbc:mysql://localhost:3306/course_db";
        String user = "root";
        String password = "Master@2407";

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

            String sql = "UPDATE courses SET faculty = ?, credits = ?
WHERE course_id = ?";
            PreparedStatement stmt = conn.prepareStatement(sql);

            stmt.setString(1, "Arun");
            stmt.setInt(2, 5);
            stmt.setInt(3, 1);

            int rowsUpdated = stmt.executeUpdate();
            if (rowsUpdated > 0) {
                System.out.println("Course updated successfully");
            }

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


}
```

Output:

Course updated successfully

• DELETE: Remove obsolete courses

```
package Assignment;

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

public class CourseDelete {
      public static void main(String[] args) {
        String url = "jdbc:mysql://localhost:3306/course_db";
        String user = "root";
```

```
        String password = "Master@2407";

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

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

            int rowsDeleted = stmt.executeUpdate();
            if (rowsDeleted > 0) {
                System.out.println("Course deleted successfully");
            }

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

Output:

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.

Program Code:

```
package Assignment2;

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

public class ProductConnection {
      public static void main(String[] args) {
         String url = "jdbc:mysql://localhost:3306/inventory_db";
         String user = "root";
         String password = "Master@2407";

         try {
             Class.forName("com.mysql.cj.jdbc.Driver");
             Connection conn = DriverManager.getConnection(url, user,
password);
             System.out.println("Connected to inventory_db database");
             conn.close();
         } catch (Exception e) {
             System.out.println("Connection Error: " + e);
         }
     }

}
```

Output:

Connected to inventory_db database

• INSERT: Add new products to inventory.

```
package Assignment2;

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

public class ProductInsert {
      public static void main(String[] args) {
         String url = "jdbc:mysql://localhost:3306/inventory_db";
         String user = "root";
         String password = "Master@2407";

         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);

            stmt.setInt(1, 101);
            stmt.setString(2, "Laptop");
            stmt.setInt(3, 10);
            stmt.setDouble(4, 65000.00);

            int rowsInserted = stmt.executeUpdate();
            if (rowsInserted > 0) {
                System.out.println("Product inserted successfully");
            }

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

}
```

Output:

Product inserted successfully

• SELECT: View stock levels and prices.

```
package Assignment2;

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

public class ProductSelect {
      public static void main(String[] args) {
        String url = "jdbc:mysql://localhost:3306/inventory_db";
        String user = "root";
        String password = "Master@2407";

        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\tName\t\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" + quantity +
"\t" + price);
            }

            rs.close();
            stmt.close();
            conn.close();
        } catch (Exception e) {
            System.out.println("Select Error: " + e);
        }
    }


}
```

Output:

ID Name Quantity Price

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101 Laptop 10 65000.0

• UPDATE: Update quantity after sale/purchase.

```
package Assignment2;

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

public class ProductUpdate {
      public static void main(String[] args) {
        String url = "jdbc:mysql://localhost:3306/inventory_db";
        String user = "root";
        String password = "Master@2407";

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

            String sql = "UPDATE products SET quantity = ? WHERE
product_id = ?";
            PreparedStatement stmt = conn.prepareStatement(sql);

            stmt.setInt(1, 15);
            stmt.setInt(2, 101);

            int rowsUpdated = stmt.executeUpdate();
            if (rowsUpdated > 0) {
                System.out.println("Product quantity updated
successfully");
            }
```

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

}
```

Output:

Product quantity updated successfully

• DELETE: Remove discontinued products.

```
package Assignment2;

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

public class ProductDelete {
      public static void main(String[] args) {
        String url = "jdbc:mysql://localhost:3306/inventory_db";
        String user = "root";
        String password = "Master@2407";

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

            String sql = "DELETE FROM products WHERE product_id = ?";
            PreparedStatement stmt = conn.prepareStatement(sql);
            stmt.setInt(1, 101);

            int rowsDeleted = stmt.executeUpdate();
            if (rowsDeleted > 0) {
                System.out.println("Product deleted successfully");
            }

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


}
```

Output:

Product deleted successfully