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.

DATABASECONNECTION (CoursedbConnection.java)

```
package CourseRegistrationSystem;

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

public class CoursedbConnection {

	public static void main(String[] args) {
		// TODO Auto-generated method stub
		String url="jdbc:mysql://localhost:3306/course_db";
		String user="root";
		String password="P@ssword@2025";
		try {
			Class.forName("com.mysql.cj.jdbc.Driver");
			//establish the connection
			Connection
conn=DriverManager.getConnection(url,user,password);
			System.out.println("Connected to the database");
			conn.close();
		}
		catch(Exception e) {
			System.out.println("Connection Error: "+e);
```

```
            }

        }

}
```

OUTPUT:
Connected to the database

Courses Insertion (InsertCourse.java)

```
package CourseRegistrationSystem;

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

public class InsertCourse {

        public static void main(String[] args) {
                // TODO Auto-generated method stub
                String url="jdbc:mysql://localhost:3306/course_db";
                String user="root";
                String password="P@ssword@2025";
                String[][] courseData= {
                                {"102","SpringBoot","Bhuvaneswari","3"},
                                {"103","MicroServices","Naveen","4"}
                                {"104","React.js","Ahmed","4"}
                };
                try {
                        Class.forName("com.mysql.cj.jdbc.Driver");
                        //establish the connection
                        Connection
conn=DriverManager.getConnection(url,user,password);
                        //Prepare sql statement
```

```
                String sql="INSERT INTO
courses(course_id,course_name,faculty,credits)VALUES(?,?,?,?)";
                PreparedStatement
stmt=conn.prepareStatement(sql);

                for(String[] course:courseData) {
                        stmt.setInt(1, Integer.parseInt(course[0]));
                        stmt.setString(2,course[1]);
                        stmt.setString(3,course[2]);
                        stmt.setInt(4, Integer.parseInt(course[3]));
                        stmt.executeUpdate();
                }
                        System.out.println("All Courses Inserted
successfully");
                stmt.close();
                conn.close();
                }
        catch(Exception e) {
                System.out.println("Connection Error: "+e);
                }


        }

}
```

OUTPUT:

All Courses Inserted Successfully

Display Course Details (ViewCourses.java)

```
package CourseRegistrationSystem;

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

```
import java.sql.ResultSet;
import java.sql.Statement;

public class ViewCourses {

	public static void main(String[] args) {
		// TODO Auto-generated method stub
		String url="jdbc:mysql://localhost:3306/course_db";
		String user="root";
		String password="P@ssword@2025";
		try {
			Class.forName("com.mysql.cj.jdbc.Driver");
			//establish the connection
			Connection
conn=DriverManager.getConnection(url,user,password);
			Statement stmt=conn.createStatement();

			//execute select query
			String sql="SELECT * FROM courses";
			ResultSet rs=stmt.executeQuery(sql);

			//process the resultset

	System.out.println("Course_id\t\tCourse_Name\t\tFaculty\t\tC
redits");
			System.out.println("----------------------------");
			while(rs.next()){
				int course_id=rs.getInt("course_id");
				String
course_name=rs.getString("course_name");
				String faculty=rs.getString("faculty");
				int credits=rs.getInt("credits");

	System.out.println(course_id+"\t"+course_name+"\t\t"+faculty
+"\t\t"+credits);
```

```
                }


                rs.close();
                stmt.close();

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

            }

        }

}
```

Output:

Course_id	Course_Name	Faculty	Credits
101	Java	Harsha	6
102	SpringBoot	Bhuvaneswari	3
103	MicroServices	Naveen	4
104	React.js	Ahmed	4

UpdateCourse Faculty and credits (ModifyCourse.java)

```
package CourseRegistrationSystem;

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

public class ModifyExample {
```

```
	public static void main(String[] args) {
		// TODO Auto-generated method stub
		String url="jdbc:mysql://localhost:3306/course_db";
		String user="root";
		String password="P@ssword@2025";
		try {
			Scanner sc=new Scanner(System.in);
			Class.forName("com.mysql.cj.jdbc.Driver");
			//establish the connection
			Connection
conn=DriverManager.getConnection(url,user,password);

			System.out.println("Enter Course id to Update: ");
			int id=sc.nextInt();
			System.out.println("Enter new faculty");
			String faculty=sc.next();
			System.out.println("Enter new Credits: ");
			int credits=sc.nextInt();
			String query="UPDATE COURSES set
faculty=?,credits=? WHERE course_id=?";
			PreparedStatement
ps=conn.prepareStatement(query);
			ps.setString(1,faculty);
			ps.setInt(2,credits);
			ps.setInt(3, id);
			int rows=ps.executeUpdate();
			if(rows>0) {
				System.out.println("Course Updated
Successfully...");
			}
			else {
				System.out.println("NO Course found with
given ID.");
			}
			sc.close();
```

```
                ps.close();
                conn.close();



            }catch(Exception e) {
                System.out.println(e);
            }

        }

}
```

Output:

```
Enter Course id to Update:
101
Enter new faculty
Hari
Enter new Credits:
4
Course Updated Successfully...
```

DeleteCourse (DeleteCourse.java)

```
package CourseRegistrationSystem;

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) {
        // TODO Auto-generated method stub
        String url="jdbc:mysql://localhost:3306/course_db";
        String user="root";
        String password="P@ssword@2025";
```

```
		try {
			Scanner sc=new Scanner(System.in);
			Class.forName("com.mysql.cj.jdbc.Driver");
			//establish the connection
			Connection
conn=DriverManager.getConnection(url,user,password);

			System.out.println("Enter Course id to Delete: ");
			int id=sc.nextInt();
			String query="DELETE FROM COURSES WHERE
course_id=?";
			PreparedStatement
ps=conn.prepareStatement(query);
			ps.setInt(1, id);
			int rows=ps.executeUpdate();
			if(rows>0) {
				System.out.println("Course Removed
Successfully...");
			}
			else {
				System.out.println("NO Course found with
given ID.");
			}
			sc.close();
			ps.close();
			conn.close();



		}catch(Exception e) {
			System.out.println(e);
		}

	}
```

}

Output:

Enter Course id to Delete:

104

Course Removed 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.

DataBase Connection : (DatabaseConnection.java)

```
package RetailStore;

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

public class DatabaseConnection {

	public static void main(String[] args) {
		// TODO Auto-generated method stub
		String url="jdbc:mysql://localhost:3306/inventory_db";
		String user="root";
		String password="P@ssword@2025";
```

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

		}

	}

}
```

Output:

Connected to the database

Add New Products to Inventory

```
package RetailStore;

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

public class AddProducts {

	public static void main(String[] args) {
		// TODO Auto-generated method stub
		String url="jdbc:mysql://localhost:3306/inventory_db";
		String user="root";
		String password="P@ssword@2025";
		String[][] productsData= {
				{"1","Shirts","100","100000"},
				{"2","Pants","100","60000"},
				{"3","T-shirts","80","40000"}
		};
		try {
			Class.forName("com.mysql.cj.jdbc.Driver");
			//establish the connection
			Connection conn=DriverManager.getConnection(url,user,password);
```

```
                        //Prepare sql statement
                        String sql="INSERT INTO
products(product_id,product_name,quantity,price)VALUES(?,?,?,?)";
                        PreparedStatement stmt=conn.prepareStatement(sql);

                        for(String[] product:productsData) {
                                stmt.setInt(1, Integer.parseInt(product[0]));
                                stmt.setString(2,product[1]);
                                stmt.setInt(3,Integer.parseInt(product[2]));
                                stmt.setDouble(4, Double.parseDouble(product[3]));
                                stmt.executeUpdate();
                        }
                                System.out.println("All Products Inserted successfully");
                        stmt.close();
                        conn.close();
                        }
        catch(Exception e) {
                System.out.println("Connection Error: "+e);
                }

        }

}
```

Output:

All Products Inserted successfully

Display Products

```
package RetailStore;

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

public class ViewProducts {

        public static void main(String[] args) {
                // TODO Auto-generated method stub
                String url="jdbc:mysql://localhost:3306/inventory_db";
                String user="root";
                String password="P@ssword@2025";
                try {
```

```
                Class.forName("com.mysql.cj.jdbc.Driver");
                //establish the connection
                Connection
conn=DriverManager.getConnection(url,user,password);
                Statement stmt=conn.createStatement();

                //execute select query
                String sql="SELECT * FROM products";
                ResultSet rs=stmt.executeQuery(sql);

                //process the resultset

        System.out.println("product_id\t\tproduct_Name\t\tQuantity\t
\tPrice");
                System.out.println("----------------------------");
                while(rs.next()){
                        int product_id=rs.getInt("product_id");
                        String
product_name=rs.getString("product_name");
                        int Quantity=rs.getInt("Quantity");
                        Double Price=rs.getDouble("Price");

        System.out.println(product_id+"\t"+product_name+"\t\t"+Qua
ntity+"\t\t"+Price);
                }


                rs.close();
                stmt.close();

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

```
		}

	}

}
```

Output:(viewProducts.java)

```
product_id	product_Name	Quantity	Price
---------------------------------------------------------------------------
1	Shirts		100		100000.0
2	Pants	100		60000.0
3	T-shirts		80		40000.0
```

Updating Products Quantity and Price (UpdateProduct.java)

```
package RetailStore;

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

public class UpdateProducts {

	public static void main(String[] args) {
		// TODO Auto-generated method stub
		String url="jdbc:mysql://localhost:3306/inventory_db";
		String user="root";
		String password="P@ssword@2025";
		try {
			Scanner sc=new Scanner(System.in);
			Class.forName("com.mysql.cj.jdbc.Driver");
			//establish the connection
			Connection
conn=DriverManager.getConnection(url,user,password);

			System.out.println("Enter Product id to Update: ");
```

```
                    int id=sc.nextInt();
                    System.out.println("Enter new Quantity");
                    int quantity=sc.nextInt();
                    System.out.println("Enter new Price: ");
                    double price=sc.nextDouble();
                    String query="UPDATE products set
quantity=?,price=? WHERE product_id=?";
                    PreparedStatement
ps=conn.prepareStatement(query);
                    ps.setInt(1,quantity);
                    ps.setDouble(2,price);
                    ps.setInt(3, id);
                    int rows=ps.executeUpdate();
                    if(rows>0) {
                        System.out.println("Product Updated
Successfully...");
                    }
                    else {
                        System.out.println("NO Product found with
given ID.");
                    }
                    sc.close();
                    ps.close();
                    conn.close();



                }catch(Exception e) {
                    System.out.println(e);
                }



        }
```

```
}
```
OUTPUT:
```
Enter Product id to Update:
3
Enter new Quantity
150
Enter new Price:
60000
Product Updated Successfully...
```

Remove Products (RemoveProducts.java)

```
package RetailStore;

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

public class RemoveProduct {

	public static void main(String[] args) {
		// TODO Auto-generated method stub
		String url="jdbc:mysql://localhost:3306/inventory_db";
		String user="root";
		String password="P@ssword@2025";
		try {
			Scanner sc=new Scanner(System.in);
			Class.forName("com.mysql.cj.jdbc.Driver");
			//establish the connection
			Connection
conn=DriverManager.getConnection(url,user,password);

			System.out.println("Enter product id to Delete: ");
			int id=sc.nextInt();
```

```
                    String query="DELETE FROM products WHERE
product_id=?";
                    PreparedStatement
ps=conn.prepareStatement(query);
                    ps.setInt(1, id);
                    int rows=ps.executeUpdate();
                    if(rows>0) {
                        System.out.println("Product Removed
Successfully...");
                    }
                    else {
                        System.out.println("NO Product found with
given ID.");
                    }
                    sc.close();
                    ps.close();
                    conn.close();



            }catch(Exception e) {
                    System.out.println(e);
            }


        }

}
```

OUTPUT:

```
Enter product id to Delete:
3
Product Removed Successfully...
```