LAB 6

Topics: JDBC, Servlet, JSP

1. Write a Java application to store and fetch student registration information (like firstName, lastName, branch, username and password) from a database using JDBC. Practice the use of the following methods of the ResultSet interface: absolute(), afterLast(), beforeFirst(), first(), isFirst(), isLast(), last(), previous(), next(), relative().

*java application

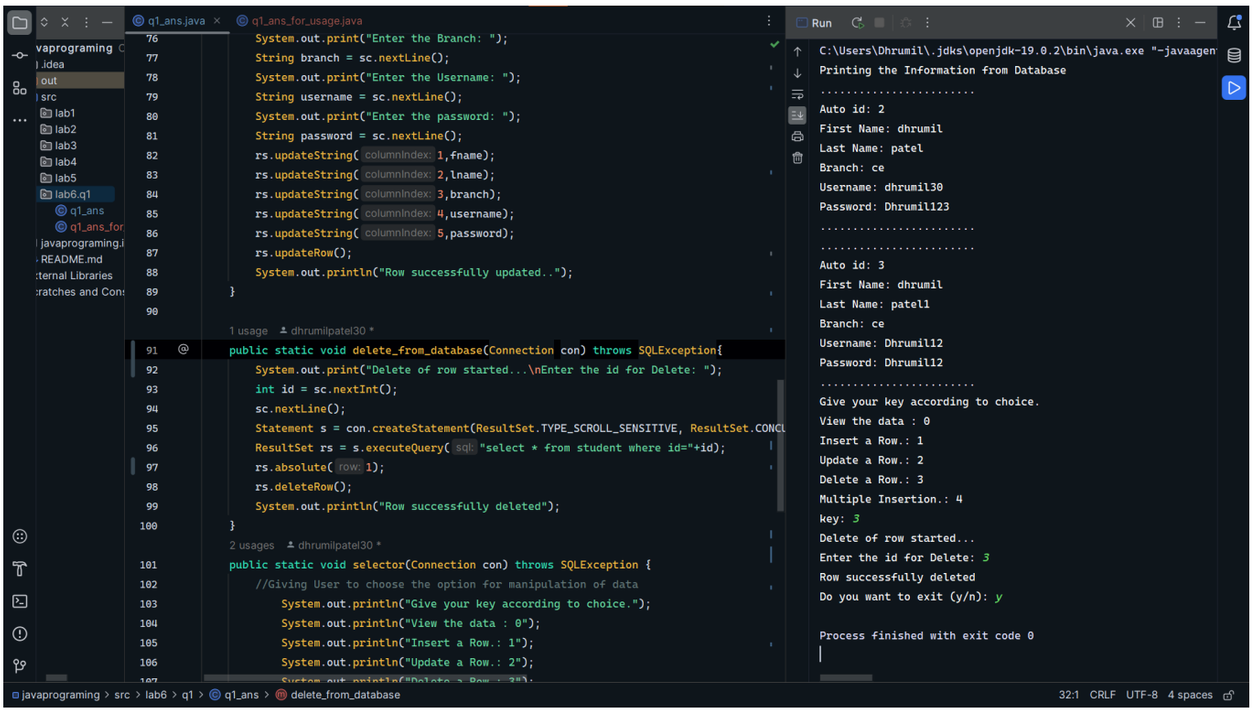
```
package lab6.q1;

import java.sql.*;
import java.util.Scanner;

public class q1_ans {//Student Registration form
    private static final Scanner sc = new Scanner(System.in);
    public static void print_from_database(Connection con) throws SQLException {
        Statement s = con.createStatement();
        String selectQuery = "select * from `student`";
        ResultSet rs;
        rs = s.executeQuery(selectQuery);
        System.out.println("Printing the Information from Database");
        while (rs.next()) {
            System.out.println(".....................");
            System.out.println("Auto id: " + rs.getInt(6));
            System.out.println("First Name: " + rs.getString(1));
            System.out.println("Last Name: " + rs.getString(2));
            System.out.println("Branch: " + rs.getString(3));
            System.out.println("Username: " + rs.getString(4));
            System.out.println("Password: " + rs.getString(5));
            System.out.println(".....................");
        }
    }

    public static void insert_in_database(Connection con){
        System.out.println("\n\nInsertion of a Row Started....\nGive proper Inputs");

        try {
            System.out.print("Enter the First Name: ");
            String fname = sc.nextLine();
            System.out.print("Enter the Last Name: ");
            String lname = sc.nextLine();
            System.out.print("Enter the Branch: ");
            String branch = sc.nextLine();
            System.out.print("Enter the Username: ");
            String username = sc.nextLine();
            System.out.print("Enter the password: ");
            String password = sc.nextLine();
            PreparedStatement ps=con.prepareStatement("insert into student(`fname`, `lname`, `branch`,
`username`, `password`) values(?,?,?,?,?)");
            ps.setString(1,fname);
            ps.setString(2,lname);
            ps.setString(3,branch);
            ps.setString(4,username);
            ps.setString(5,password);
                    ps.executeUpdate();
            ps = con.prepareStatement("select * from student where username=?");
            ps.setString(1,username);
            ResultSet rs = ps.executeQuery();
            rs.next();
                    System.out.println("row inserted, the given auto id to student is: "+rs.getInt(6));
```

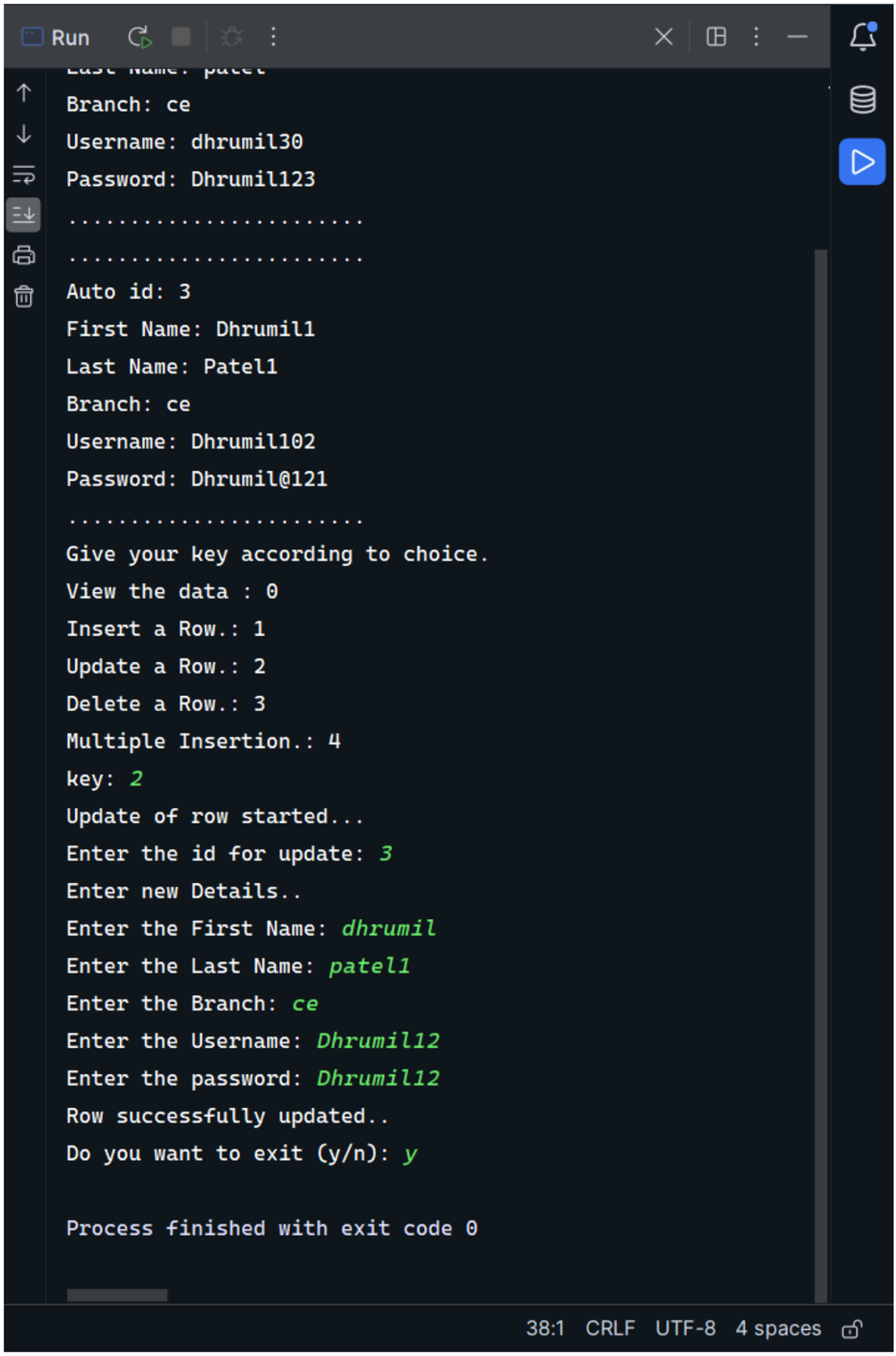
```
        }
        catch (SQLIntegrityConstraintViolationException e){
            e.printStackTrace();
            System.out.println("Try again with different Username please");
            insert_in_database(con);
        }
        catch (Exception e){
            System.out.println("Unknown Error occurred");
            e.printStackTrace();
        }
    }

    public static void update_in_database(Connection con) throws SQLException{
        System.out.print("Update of row started...\nEnter the id for update: ");
        int id = sc.nextInt();
        sc.nextLine();
        Statement s = con.createStatement(ResultSet.TYPE_SCROLL_SENSITIVE, ResultSet.CONCUR_UPDATABLE);
        ResultSet rs = s.executeQuery("select * from student where id="+id);
        System.out.println("Enter new Details..");
        rs.next();
        System.out.print("Enter the First Name: ");
        String fname = sc.nextLine();
        System.out.print("Enter the Last Name: ");
        String lname = sc.nextLine();
        System.out.print("Enter the Branch: ");
        String branch = sc.nextLine();
        System.out.print("Enter the Username: ");
        String username = sc.nextLine();
        System.out.print("Enter the password: ");
        String password = sc.nextLine();
        rs.updateString(1,fname);
        rs.updateString(2,lname);
        rs.updateString(3,branch);
        rs.updateString(4,username);
        rs.updateString(5,password);
        rs.updateRow();
        System.out.println("Row successfully updated..");
    }

    public static void delete_from_database(Connection con) throws SQLException{
        System.out.print("Delete of row started...\nEnter the id for Delete: ");
        int id = sc.nextInt();
        sc.nextLine();
        Statement s = con.createStatement(ResultSet.TYPE_SCROLL_SENSITIVE, ResultSet.CONCUR_UPDATABLE);
        ResultSet rs = s.executeQuery("select * from student where id="+id);
        rs.absolute(1);
        rs.deleteRow();
        System.out.println("Row successfully deleted");
    }
    public static void selector(Connection con) throws SQLException {
        //Giving User to choose the option for manipulation of data
            System.out.println("Give your key according to choice.");
            System.out.println("View the data : 0");
            System.out.println("Insert a Row.: 1");
            System.out.println("Update a Row.: 2");
            System.out.println("Delete a Row.: 3");
            System.out.print("Multiple Insertion.: 4\nkey: ");
            int choice = sc.nextInt();
            sc.nextLine();
            if(0 == choice)print_from_database(con);
            if(1 == choice)insert_in_database(con);
            if(2 == choice)update_in_database(con);
```

```
            if(3 == choice)delete_from_database(con);
            if(4 == choice) {
                System.out.println("Enter the number of insertions: ");
                int loop = sc.nextInt();
                sc.nextLine();
                while (0 =≠ loop--) {
                    insert_in_database(con);
                }
            }
    }

    public static void main(String[] args) {
        //setting up database
        try (Connection con =
DriverManager.getConnection("jdbc:mysql://localhost/student-registration", "root", "")) {
            //initially showing information already present in database
            print_from_database(con);
            //starting selections
            selector(con);
            while(true){
                System.out.print("Do you want to exit (y/n): ");
                String s = sc.nextLine();
                if(s.equals("y"))break;
                selector(con);
            }
        } catch (SQLException e) {
            e.printStackTrace();
        }
    }
}
```

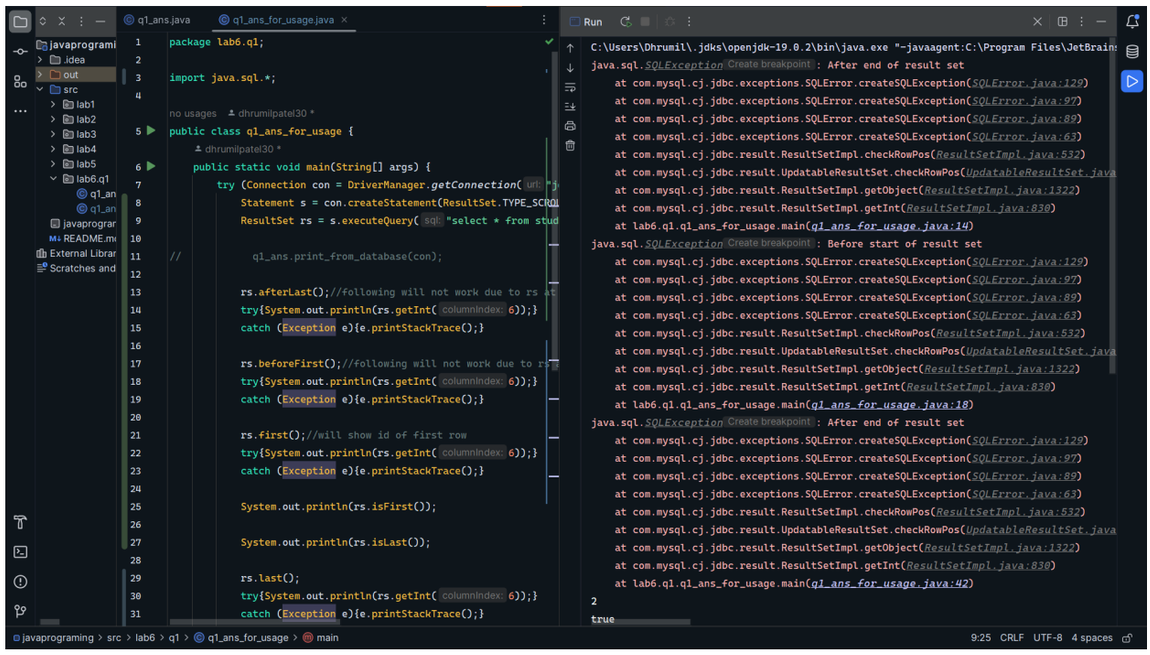
```
package lab6.q1;

import java.sql.*;

public class q1_ans_for_usage {
    public static void main(String[] args) {
        try (Connection con =
DriverManager.getConnection("jdbc:mysql://localhost/student-registration", "root", "")){
            Statement s = con.createStatement(ResultSet.TYPE_SCROLL_SENSITIVE,
ResultSet.CONCUR_UPDATABLE);
            ResultSet rs = s.executeQuery("select * from student");

//            q1_ans.print_from_database(con);

            rs.afterLast();//following will not work due to rs at end of dataset
            try{System.out.println(rs.getInt(6));}
            catch (Exception e){e.printStackTrace();}

            rs.beforeFirst();//following will not work due to rs at start of dataset not initialised
            try{System.out.println(rs.getInt(6));}
            catch (Exception e){e.printStackTrace();}

            rs.first();//will show id of first row
            try{System.out.println(rs.getInt(6));}
            catch (Exception e){e.printStackTrace();}

            System.out.println(rs.isFirst());
```

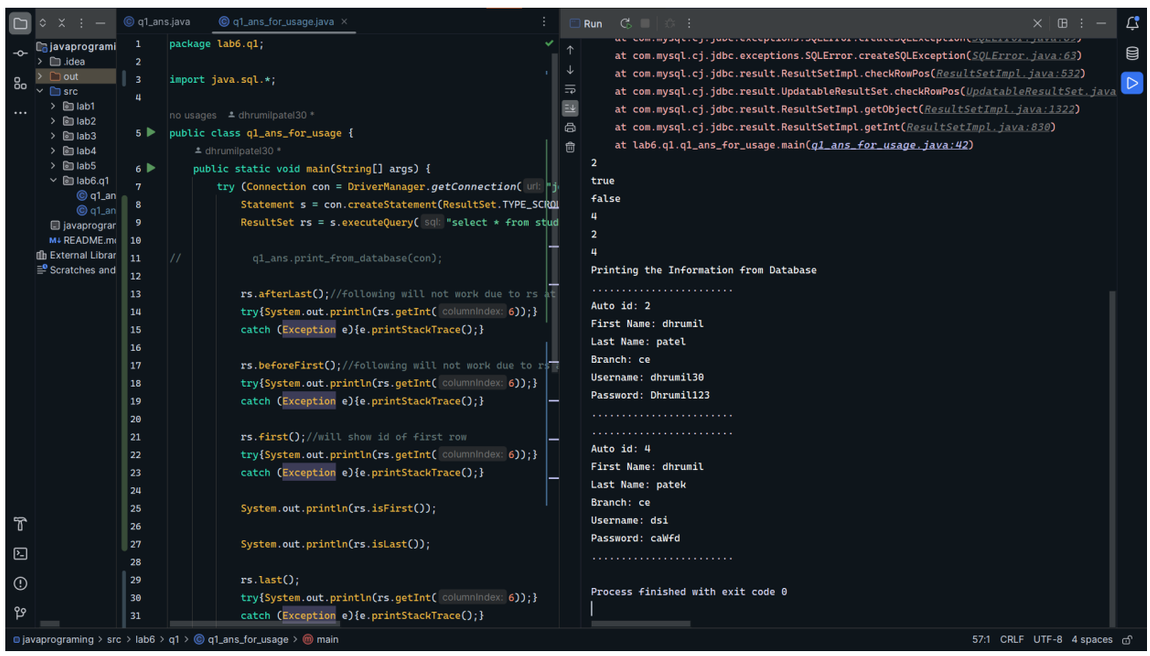
```
            System.out.println(rs.isLast());

            rs.last();
            try{System.out.println(rs.getInt(6));}
            catch (Exception e){e.printStackTrace();}

            rs.previous();
            try{System.out.println(rs.getInt(6));}
            catch (Exception e){e.printStackTrace();}

            rs.next();
            try{System.out.println(rs.getInt(6));}
            catch (Exception e){e.printStackTrace();}

            rs.relative(1);//shift row position
            try{System.out.println(rs.getInt(6));}
            catch (Exception e){e.printStackTrace();}

            //to view data in database
            q1_ans.print_from_database(con);
        } catch (SQLException e) {
            e.printStackTrace();
        }
    }
}
```




Run
Branch: ce
Username: dhrumil30
Password: Dhrumil123
.....
.....
Auto id: 3
First Name: Dhrumil1
Last Name: Patel1
Branch: ce
Username: Dhrumil102
Password: Dhrumil@121
.....
Give your key according to choice.
View the data : 0
Insert a Row.: 1
Update a Row.: 2
Delete a Row.: 3
Multiple Insertion.: 4
key: 2
Update of row started...
Enter the id for update: 3
Enter new Details..
Enter the First Name: dhrumil
Enter the Last Name: patel1
Enter the Branch: ce
Enter the Username: Dhrumil12
Enter the password: Dhrumil12
Row successfully updated..
Do you want to exit (y/n): y
Process finished with exit code 0
38:1 CRLF UTF-8 4 spaces

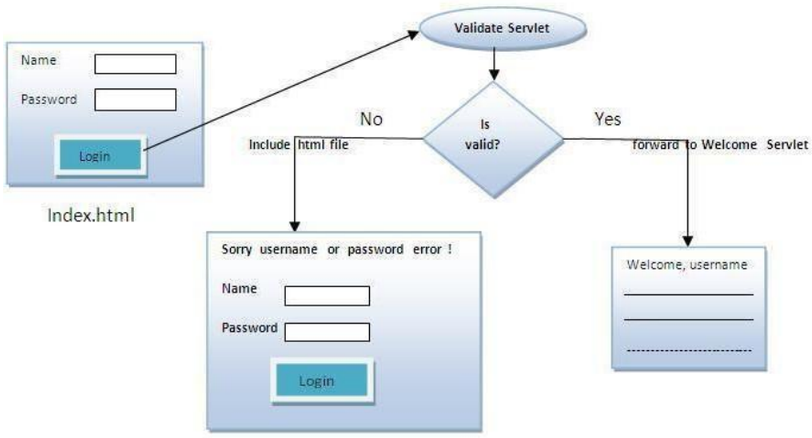
output of 2nd program





2. Write a Java web application for a login module which contains the following components:

- **index.jsp:** for getting input from the user.
- **ValidateServlet.java:** a servlet class for validating the user. If it is a valid user (validate from a database using PreparedStatement), it will forward the request to the WelcomeServlet. If the user is not validated then it displays an Error message along with the response from index.html.
- **WelcomeServlet.java:** a servlet class for displaying the welcome message.

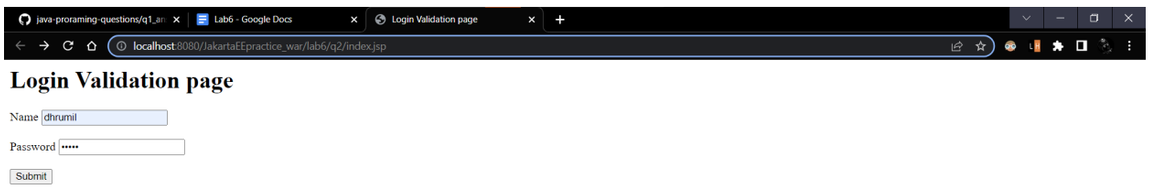


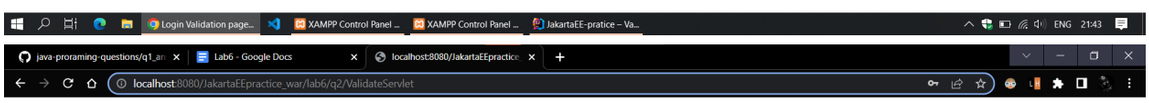

```
<%@ page contentType="text/html;charset=UTF-8" %>
<html>
<head>
      <title>Login Validation page</title>
</head>
<body>
<h1>Login Validation page</h1>
<form action="ValidateServlet" method="post">
      <label>Name
            <input type="text" name="username">
      </label><br><br>
      <label>Password
            <input type="password" name="password">
      </label><br><br>
      <input type="submit" value="Submit">
</form>
</body>
</html>
```

```
package lab6.q2;

import jakarta.servlet.*;
import jakarta.servlet.http.*;
import jakarta.servlet.annotation.*;
import java.sql.*;

import java.io.IOException;
import java.io.PrintWriter;

@WebServlet(name = "ValidateServlet", value = "/lab6/q2/ValidateServlet")
public class ValidateServlet extends HttpServlet {
    @Override
    protected void doGet(HttpServletRequest request, HttpServletResponse response) throws
ServletException, IOException {
```

```
        response.setContentType("text/html");
        String username = request.getParameter("username");
        String password = request.getParameter("password");
        PrintWriter out = response.getWriter();
        try (Connection con =
DriverManager.getConnection("jdbc:mysql://localhost:3306/student-registration", "root", ""))
{
            PreparedStatement ps = con.prepareStatement("select * from student where
username=? and password=?", ResultSet.TYPE_SCROLL_INSENSITIVE, ResultSet.CONCUR_READ_ONLY);
            ps.setString(1,username);
            ps.setString(2,password);
            ResultSet rs = ps.executeQuery();
            rs.last();
            if(0 == rs.getRow()){
                out.println("Sorry Username or password error");
                RequestDispatcher rd = request.getRequestDispatcher("/lab6/q2/index.jsp");
                rd.include(request,response);
            }
            else {
                RequestDispatcher rd = request.getRequestDispatcher("/WelcomeServlet");
                rd.forward(request,response);
            }
         } catch (SQLException e) {
            throw new RuntimeException(e);
        }
//         out.println(username+password);
    }

    @Override
    protected void doPost(HttpServletRequest request, HttpServletResponse response) throws
ServletException, IOException {
        doGet(request,response);
    }
}

package lab6.q2;

import jakarta.servlet.*;
import jakarta.servlet.http.*;
import jakarta.servlet.annotation.*;

import java.io.IOException;
import java.io.PrintWriter;

@WebServlet(name = "WelcomeServlet", value = "/WelcomeServlet")
public class WelcomeServlet extends HttpServlet {
    @Override
    protected void doGet(HttpServletRequest request, HttpServletResponse response) throws
ServletException, IOException {
        PrintWriter out = response.getWriter();
        String username = request.getParameter("username");
        out.println("Welcome  "+username);
    }

    @Override
    protected void doPost(HttpServletRequest request, HttpServletResponse response) throws
```

```
ServletException, IOException {
        doGet(request,response);
    }
}
```

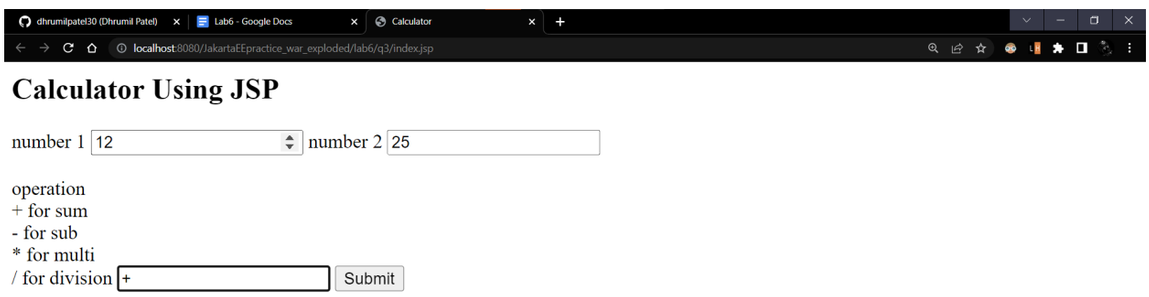


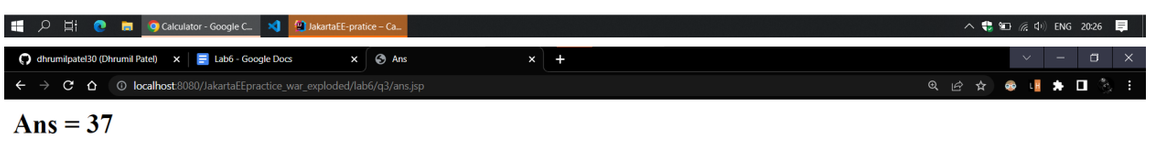


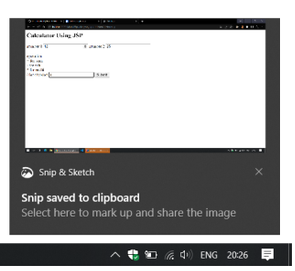
3. Write a web based java application containing a JSP which performs the simple arithmetic calculation. Take the necessary operands and operators in textboxes. Write your JSP code using **jsp:useBean** action tag.

```
<%@ page contentType="text/html;charset=UTF-8" language="java" %>
<html>
<head>
    <title>Calculator</title>
</head>
<body>
<h2>Calculator Using JSP</h2>
<form method="post" action="ans.jsp">
  <label>number 1
    <input type="number" name="a">
  </label>
  <label>number 2
    <input type="number" name="b">
  </label>
  <label><br></br>operation
    <br>+ for sum
    <br>– for sub
    <br>* for multi
    <br>/ for division
    <input type="text" name="operation">
  </label>
  <input type="submit" value="Submit">
</form>

</body>
</html>

<%@ page contentType="text/html;charset=UTF-8" language="java" %>
<html>
<head>
      <title>Ans</title>
</head>
<body>
<jsp:useBean id="obj" class="lab6.q3.Calculator" />
<jsp:setProperty name="obj" property="*" />
<h2>Ans = <%= obj.calc() %></h2>
</body>
</html>
package lab6.q3;

public class Calculator {
    int a;
    int b;
    String operation;
    int ans;
    public int getA() {
        return a;
    }
    public void setA(int a) {
        this.a = a;
    }
    public int getB() {
        return b;
    }
    public void setB(int b) {
        this.b = b;
```

```
    }
    public String getOperation() {
        return operation;
    }
    public void setOperation(String operation) {
        this.operation = operation;
    }
    public int getAns() {
        return ans;
    }
    public void setAns(int ans) {
        this.ans = ans;
    }
    public int calc(){
        if(operation.equals("+"))return ans=a+b;
        if(operation.equals("-"))return ans=a-b;
        if(operation.equals("*"))return ans=a*b;
        if(operation.equals("/"))return ans=a/b;
        else return ans=-1;
    }
}
```







Practice Problem

1. Write a Java web application to search a word or phrase on Google search engine. The application should have the following components:
   Search.html: It contains a textbox to accept search-word or phrase from the user.
   SearchOnGoogleServlet.java: It should redirect the search query to Google search engine.

2. Write a Java web application to demonstrate usage of JSP Scripting Elements (Scriptlet, Expression, Declaration) and JSP implicit objects (out, request, response.) Use method post to submit a feedback form (html) (Full Name, Email, Subject, Message) to a jsp page and let the jsp page preview the same as the confirmation page with additional text "Feedback received. Thank you."
3. Write a web based java application that contains a scriptless JSP which works like a unit convertor. (Hint: create a bean to do calculations)

a) Length Meter ↔ Centimeter Inch ↔ Centimeter **b) Temperature** Celsius ↔ Fahrenheit