UNIVERSITI PUTRA MALAYSIA

BERILMU BERBAKTI

ENTERPRISE SYSTEM DEVELOPMENT (SSE4354)

LAB DOCUMENTATION: JSP PRACTICAL

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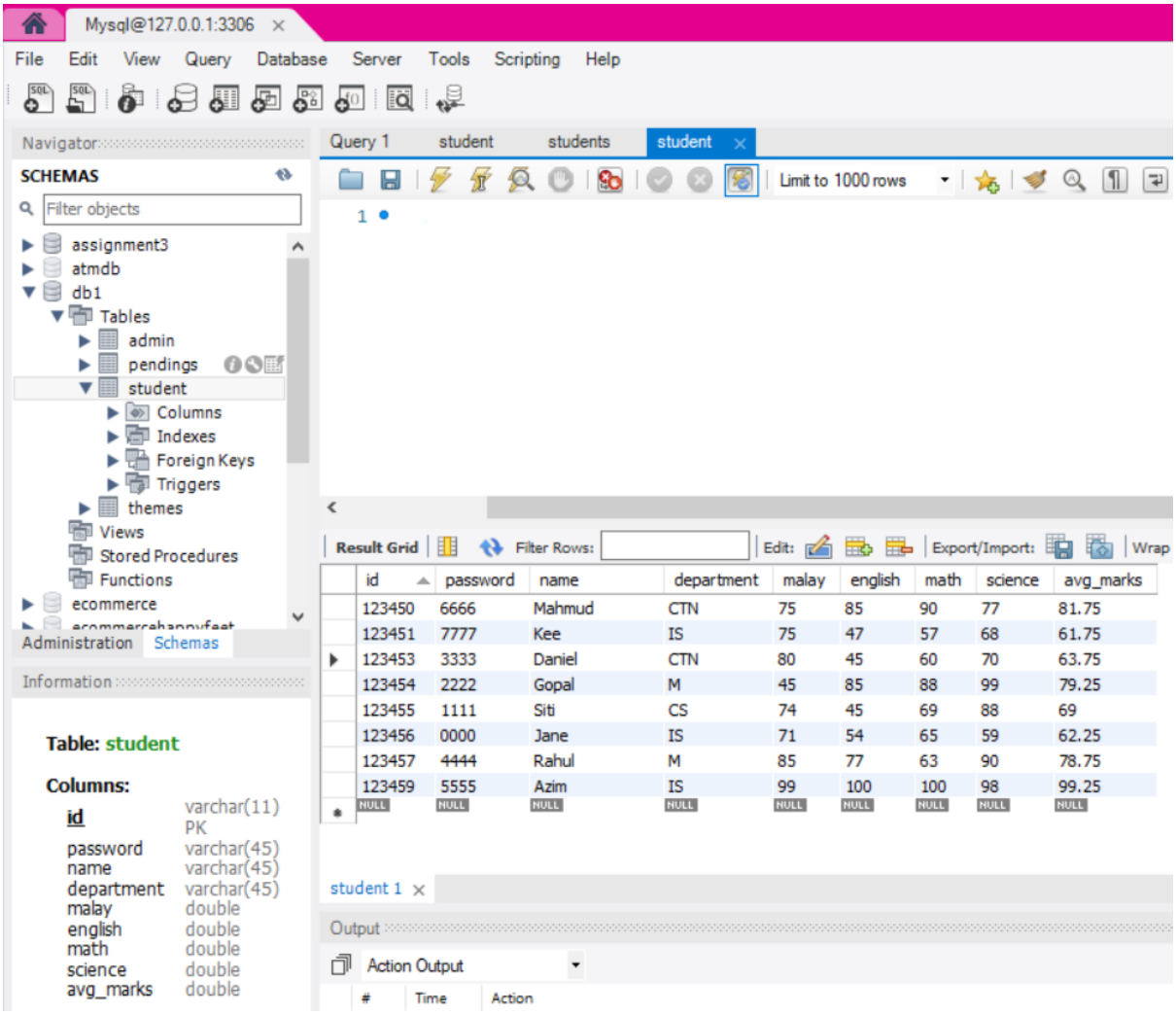
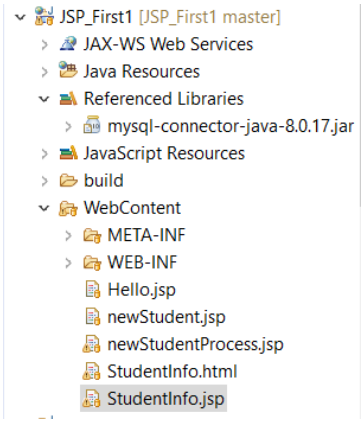
The program is written in JAVA based on JDBC Practical with extended functionalities and the implementation of Java Server Page (JSP) for controlling the content/appearance of the Web pages through the use of servlets. The program also implemented Java Database Connectivity (JDBC) as the MySQL Driver for database connectivity with MySQLWorkBench 8.0 CE and used Apache Tomcat Server 7.0 to implement the JSP.

Database: MySQLWorkBench 8.0 CE



A database with connection name of db1 is used for this program based on JDBC Practical. In db1, a table named Student has been created with columns of id, password, name, department, malay, english, math, science and avg_marks. Each of the columns were filled in with data based on data submission of add new student form in NewStudent.java class inside the program.

Java Project: Eclipse



The Java project is created in Eclipse with the name of JSP_First1 with mysql-connector-java-8.0.12.jar as the MySQL Driver for database connectivity. 4 JSP and 1 HTML page are created under JSP_First1 which are Hello.jsp, StudentInfo.jsp, newStudent.jsp, newStudentProcess.jsp and StudentInfo.html.

Hello.jsp class

Code in Eclipse:

Hello.jsp | newStudent.jsp | StudentInfo.jsp | StudentInfo.html | newStudentProcess.jsp

```
1  <%@ page language="java" contentType="text/html; charset=ISO-8859-1"
2      pageEncoding="ISO-8859-1"%>
3  <!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN" "http://www.w3.org/TR/html4/loose.dtd">
4  <html>
5  <head>
6  <meta http-equiv="Content-Type" content="text/html; charset=ISO-8859-1">
7  <title>Login System</title>
8  </head>
9  <body>
10 <h1>Welcome User</h1>
11 </body>
12 </html>
```

Output of the code:

Welcome User

"Welcome User" is displayed in Hello.jsp page.

Student JSP

Based on JDBC Practical, the program is extended with JSP implementation and to add more functionalities of:

a. Get average student marks for Malay, English, Math and Science – StudentInfo.jsp

Hello.jsp | newStudent.jsp | StudentInfo.jsp | StudentInfo.html | newStudentProcess.jsp | Login System

```jsp
<%@ page import="java.io.*,java.util.*,java.sql.*"%>

<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
    pageEncoding="ISO-8859-1"%>
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN" "http://www.w3.org/TR/html4/loose.dtd">
<html>
<head>
<meta http-equiv="Content-Type" content="text/html; charset=ISO-8859-1">
<title>Student Portal</title>
</head>
<body>
    <%
        boolean login = false;

    String driverName = "com.mysql.jdbc.Driver";
    String connectionUrl = "jdbc:mysql://localhost:3306/";
    String dbName = "db1?useUnicode=true&useJDBCCompliantTimezoneShift=true&useLegacyDatetimeCode=false&serverTimezone=UTC";
    String userId = "root";
    String password = "Database2019";

    Connection connection = null;
    Statement statement = null;

    try {

        Class.forName(driverName);
        connection = DriverManager.getConnection(connectionUrl + dbName, userId, password);

        PreparedStatement stmt = connection.prepareStatement("select name from student where id =? and password =?");
        stmt.setString(1, request.getParameter("id"));
        stmt.setString(2, request.getParameter("password"));

        System.out.println(stmt);
        ResultSet rs = stmt.executeQuery();

        if (rs.next()) {
            login = true;
        }

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

    if (login) {
    %>
    <%
        out.println("Hello ");
    %>

    <%=request.getParameter("id")%>

    , your password is

    <%=request.getParameter("password")%>

    <%
        try {
        statement = connection.createStatement();
        ResultSet rs = statement.executeQuery("select id, name, department, malay, english, math, science, avg_marks from student");
    %>
    <p></p>
    <a href="newStudent.jsp">
        <button type='edit'>Add New Student</button>
    </a>
    <p></p>
    <table id="students">
        <table border="1">
            <tr>
                <th>Student ID</th>
                <th>Name</th>
                <th>Department</th>
```

```
                <th>Malay</th>
                <th>English</th>
                <th>Science</th>
                <th>Math</th>
                <th>Average Marks</th>
            </tr>
            <%
                while (rs.next()) {
            %>

            <%

            double averageMarks = (rs.getDouble("malay") + rs.getDouble("english") + rs.getDouble("science") + rs.getDouble("math"))/4;

            %>

            <tr>
                <td><%=rs.getString("id")%></td>
                <td><%=rs.getString("name")%></td>
                <td><%=rs.getString("department")%></td>
                <td><%=rs.getString("malay")%></td>
                <td><%=rs.getString("english")%></td>
                <td><%=rs.getString("science")%></td>
                <td><%=rs.getString("math")%></td>
                <td><%=averageMarks%></td>
            <tr>

                <%
                    }
                %>

        </table>

        <%
            } catch (Exception e) {
            out.println(e.getMessage());
```

```
        }
        } else {
        %>
        <p>
            Login failed! <a href="StudentInfo.html">Login back?</a>
        </p>
        <%
            }
        %>
        </p>
</body>
</html>
```

b. Add new student to the system – newStudent.jsp and newStudentProcess.jsp

newStudent.jsp

Hello.jsp | newStudent.jsp | StudentInfo.jsp | StudentInfo.html | newStudentProcess.jsp | Login System

```
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
    pageEncoding="ISO-8859-1"%>
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN" "http://www.w3.org/TR/html4/loose.dtd">
<html>
<head>
<meta http-equiv="Content-Type" content="text/html; charset=ISO-8859-1">
<title>Register New Student</title>
</head>
<body>

<form action="newStudentProcess.jsp" method="POST">

<p>Register New Student</p>

    <p>Student ID: <input type="text" name="newid" /></p>
    <p>Password: <input type="password" name="newpassword" /></p>
    <p>Name: <input type="text" name="newname" /></p>
    <p>Department(CTN/M/CS/IS): <input type="text" name="newdepartment"></p>
    <p>Malay: <input type="text" name="malay" /></p>
    <p>English: <input type="text" name="english" /></p>
    <p>Math: <input type="text" name="math" /></p>
    <p>Science: <input type="text" name="science" /></p>

    <p><button type="submit">Submit</button></p>

</form>

</body>
</html>
```

newStudentProcess.jsp

Hello.jsp | newStudent.jsp | StudentInfo.jsp | StudentInfo.html | newStudentProcess.jsp

```
<%@ page import="java.io.*,java.util.*,java.sql.*"%>

<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
    pageEncoding="ISO-8859-1"%>
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN" "http://www.w3.org/TR/html4/loose.dtd">
<html>
<head>
<meta http-equiv="Content-Type" content="text/html; charset=ISO-8859-1">
<title>Student Portal</title>
</head>
<body>
    <%
        boolean login = false;

    String driverName = "com.mysql.jdbc.Driver";
    String connectionUrl = "jdbc:mysql://localhost:3306/";
    String dbName = "db1?useUnicode=true&useJDBCCompliantTimezoneShift=true&useLegacyDatetimeCode=false&serverTimezone=UTC";
    String userId = "root";
    String password = "Database2019";

    Connection connection = null;
    Statement statement = null;

    try {

        Class.forName(driverName);
        connection = DriverManager.getConnection(connectionUrl + dbName, userId, password);

        PreparedStatement stmt = connection.prepareStatement("insert into student(id, password, name, department,  malay, english, math, science) values (?,?,?
        stmt.setString(1, request.getParameter("newid"));
        stmt.setString(2, request.getParameter("newpassword"));
        stmt.setString(3, request.getParameter("newname"));
        stmt.setString(4, request.getParameter("newdepartment"));
        stmt.setString(5, request.getParameter("malay"));
        stmt.setString(6, request.getParameter("english"));
        stmt.setString(7, request.getParameter("math"));
        stmt.setString(8, request.getParameter("science"));
```

```
        System.out.println(stmt);

        int row = stmt.executeUpdate();

        //if password is updated 1 or more
        if (row>0){
            out.println(row + " row(s) changed");
        }
        else{
            out.println("Failed to change row");
        }
        %>

        <p>New updated table: </p>

        <%
        statement = connection.createStatement();
        ResultSet rs = statement.executeQuery("select id, name, department, malay, english, math, science, avg_marks from student");
    %>
    <p></p>
    <a href="newStudent.jsp">
        <button type='edit'>Add New Student</button>
    </a>
    <p></p>
    <table id="students">
        <table border="1">
            <tr>
                <th>Student ID</th>
                <th>Name</th>
                <th>Department</th>
                <th>Malay</th>
                <th>English</th>
                <th>Science</th>
                <th>Math</th>
                <th>Average Marks</th>
            </tr>
```

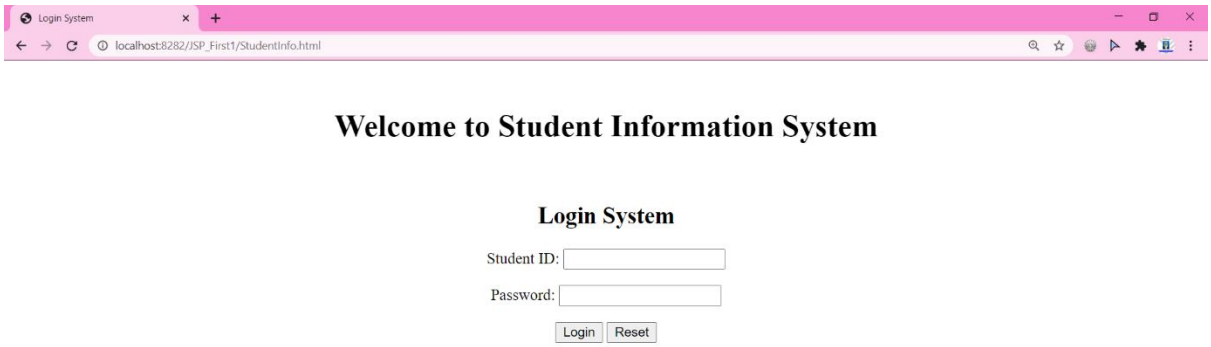
```
            <%
                while (rs.next()) {
            %>

            <%

            double averageMarks = (rs.getDouble("malay") + rs.getDouble("english") + rs.getDouble("science") + rs.getDouble("math"))/4;

            %>

            <tr>
                <td><%=rs.getString("id")%></td>
                <td><%=rs.getString("name")%></td>
                <td><%=rs.getString("department")%></td>
                <td><%=rs.getString("malay")%></td>
                <td><%=rs.getString("english")%></td>
                <td><%=rs.getString("science")%></td>
                <td><%=rs.getString("math")%></td>
                <td><%=averageMarks%></td>
            <tr>

                <%
                    }
                %>

        </table>

        <%
            } catch (Exception e) {
            out.println(e.getMessage());
        }

        %>

</body>
</html>

```

c. Login – StudentInfo.html

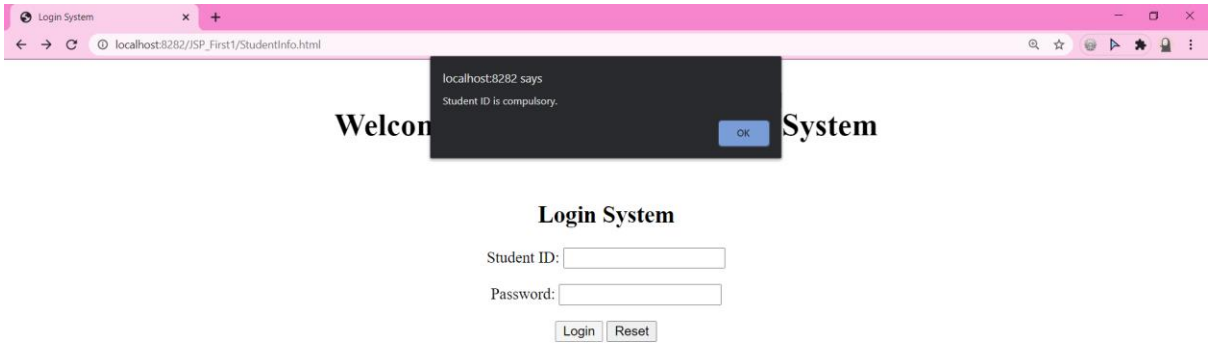
Hello.jsp | newStudent.jsp | StudentInfo.jsp | StudentInfo.html | newStudentProcess.jsp

```
<!DOCTYPE html>
<html>
<head>
<meta charset="ISO-8859-1">
<title>Login System</title>

<script>
//input validation using javascript
function validate() {
    if(document.getElementById('id').value==''){
        alert('Student ID is compulsory.');
    }
    else if(document.getElementById('password').value==''){
        alert('Password is compulsory.');
    }
    else {
        //submit the form
        //document.forms[0].submit();
        document.getElementById('loginForm').submit();
    }
}
</script>

</head>

<body>
    <center>

        <h1>Welcome to Student Information System</h1>
        <br>
        <h2>Login System</h2>


        <form action='StudentInfo.jsp' method='POST' id='loginForm'>
            <p>
                Student ID: <input type='text' name='id' id='id' />
            </p>
            <p>
                Password: <input type='password' name='password' id='password' />
            </p>
            <p>
                <button type='button' onclick="validate()">Login</button>
                <button type='reset'>Reset</button>
            </p>
        </form>

    </center>
</body>

</html>
```

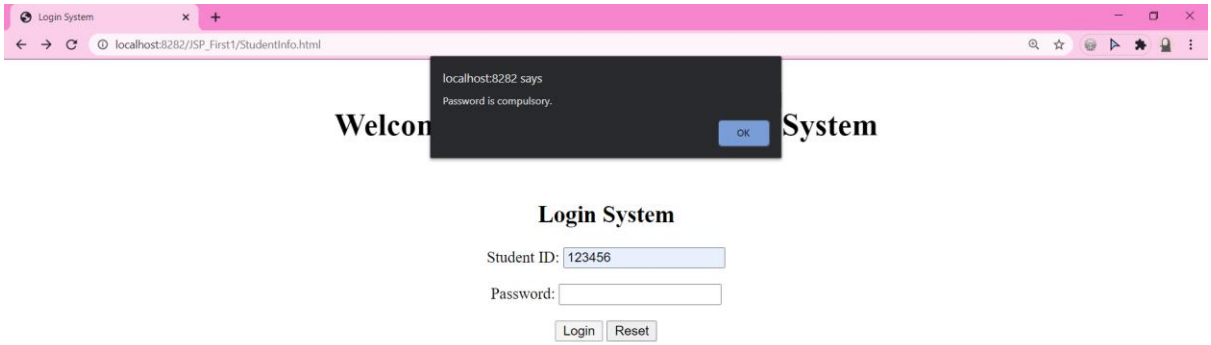
Output:



The application starts with StudentInfo.html. User needs to login with Student ID and password correctly as in the Student table in database db1 in order to access the system.

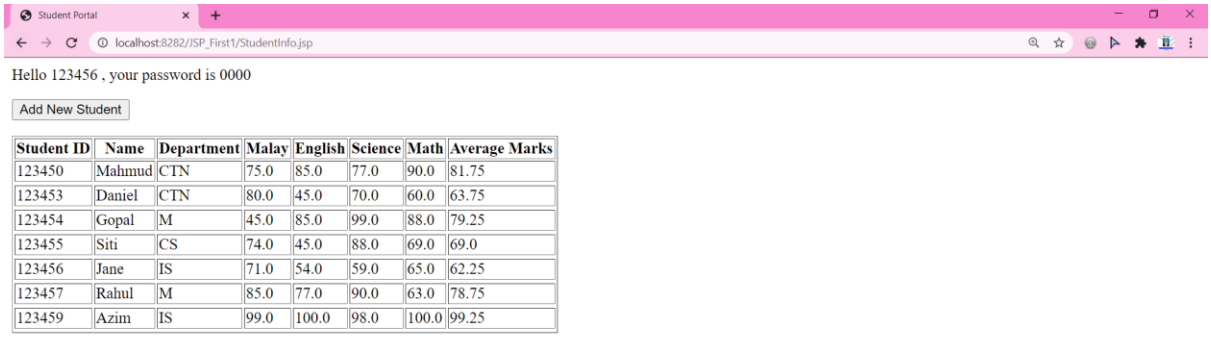


If user did not enter any Student ID, a message will be alerted to the user that Student ID is compulsory to have a successful login.



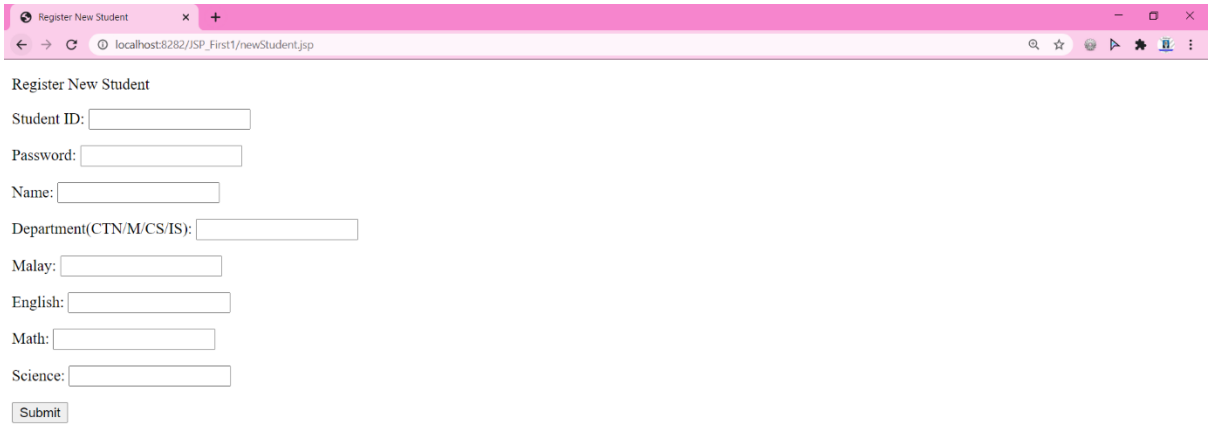
If user did not enter any password, a message will be alerted to the user that password is compulsory to have a successful login.

For unsuccessful login, an error message of “Login failed!” will be displayed with a link for the user to login again.

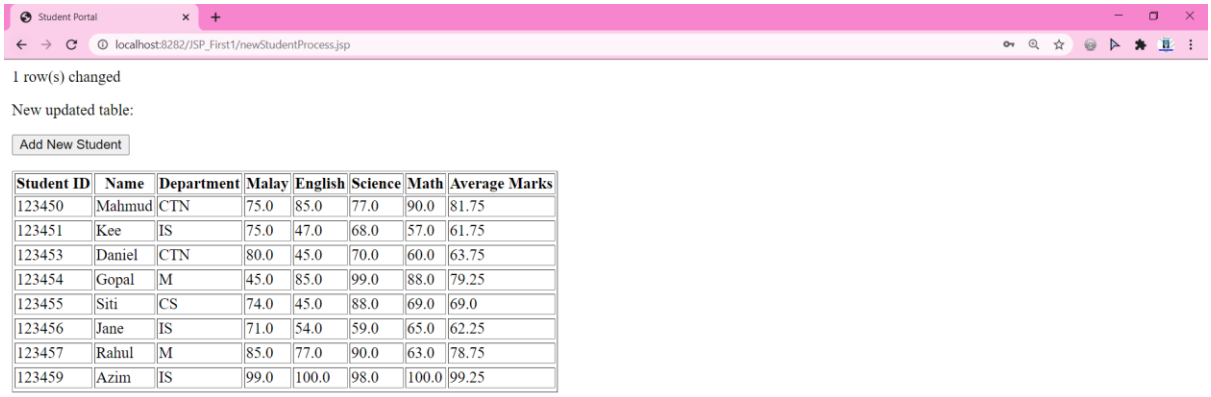


Student ID	Name	Department	Malay	English	Science	Math	Average Marks
123450	Mahmud	CTN	75.0	85.0	77.0	90.0	81.75
123453	Daniel	CTN	80.0	45.0	70.0	60.0	63.75
123454	Gopal	M	45.0	85.0	99.0	88.0	79.25
123455	Siti	CS	74.0	45.0	88.0	69.0	69.0
123456	Jane	IS	71.0	54.0	59.0	65.0	62.25
123457	Rahul	M	85.0	77.0	90.0	63.0	78.75
123459	Azim	IS	99.0	100.0	98.0	100.0	99.25

If the user has successfully login to the system, StudentInfo.jsp will be displayed. In StudentInfo.jsp, a welcome message with Student ID and password are displayed at the top of the page. There is an Add New Student button for user to click if user wants to add new student into the system. A list of all students in the Student table in database db1 with their respective Student ID, Name, Department, Malay, English, Science, Math and Average Marks are displayed in a table inside the page. The marks for Malay, English, Science and Math for each student are calculated in StudentInfo.jsp by retrieving the data for each mark in the database and calculating the average based on the data retrieved to display it under Average Marks column.



If user clicks on Add New Student Button in StudentInfo.jsp, newStudent.jsp will be displayed. Inside newStudent.jsp, a form to register new student is provided. User needs to enter Student ID, Password, Name, Department (CTN/M/CS/IS), Malay, English, Math and Science marks in order to submit the form. Once the Submit button is clicked, the form is submitted and all of the data are kept in the Student table in db1 database.



Student ID	Name	Department	Malay	English	Science	Math	Average Marks
123450	Mahmud	CTN	75.0	85.0	77.0	90.0	81.75
123451	Kee	IS	75.0	47.0	68.0	57.0	61.75
123453	Daniel	CTN	80.0	45.0	70.0	60.0	63.75
123454	Gopal	M	45.0	85.0	99.0	88.0	79.25
123455	Siti	CS	74.0	45.0	88.0	69.0	69.0
123456	Jane	IS	71.0	54.0	59.0	65.0	62.25
123457	Rahul	M	85.0	77.0	90.0	63.0	78.75
123459	Azim	IS	99.0	100.0	98.0	100.0	99.25

When user has successfully submitted the form, newStudentProcess.jsp will be displayed. A message of number of row(s) changed indicates of how many changes has been made into the student table based on row. Since the changes are only for one row, which is inserting a new student information for Student table, therefore only 1 row has changed being displayed. A new updated table with the new student information is also displayed in the page. For example, a student named Kee with a student ID of 123451 has been added into the database and being displayed in the table.