UNIVERSITI MALAYSIA TERENGGANU

CSM3023 – WEB BASED APPLICATION

BACHELOR OF COMPUTER SCIENCE (MOBILE COMPUTING) WITH HONORS

LAB 1 – Introduction to Servlet, JSP and MySQL Database

SEMESTER II 2023/2024

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Task 1

Reflection

What have you learnt from this exercise?

I learned how to install and configure xampp to use tomcat and mysql.

Task 2

Reflection

What have you learned from this exercise?

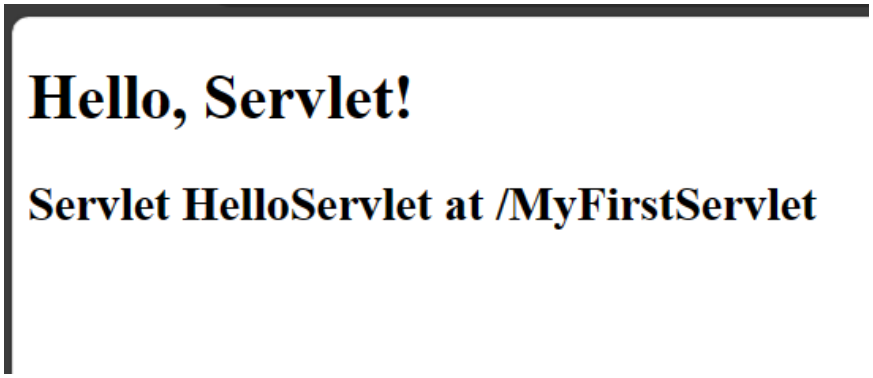
I have learned how to change mysql password by using command prompt.

Task 5

Before modification:

```java
package com.mycompany.myfirstservlet;

import java.io.IOException;
import java.io.PrintWriter;
import jakarta.servlet.ServletException;
import jakarta.servlet.http.HttpServlet;
import jakarta.servlet.http.HttpServletRequest;
import jakarta.servlet.http.HttpServletResponse;
import jakarta.annotation.*;

/**
 *
 * @author USER
 */
public class HelloServlet extends HttpServlet {

    /**
     * Processes requests for both HTTP <code>GET</code> and <code>POST</code>
     * methods.
     *
     * @param request servlet request
     * @param response servlet response
     * @throws ServletException if a servlet-specific error occurs
     * @throws IOException if an I/O error occurs
     */
    protected void processRequest(HttpServletRequest request, HttpServletResponse response)
            throws ServletException, IOException {
        response.setContentType("text/html;charset=UTF-8");
        try (PrintWriter out = response.getWriter()) {
            /* TODO output your page here. You may use following sample code. */
            out.println("<!DOCTYPE html>");
            out.println("<html>");
            out.println("<head>");
            out.println("<title>Servlet HelloServlet</title>");
            out.println("</head>");
            out.println("<body>");
            out.println("<h1>Hello, Servlet!</h1>");
            out.println("<h2>Servlet HelloServlet at " + request.getContextPath() + "</h2>");
            out.println("</body>");
            out.println("</html>");
        }
    }
```

Output:



After modification:

```
        protected void doGet(HttpServletRequest request, HttpServletResponse response
                throws ServletException, IOException {

            response.setContentType("text/html");

            PrintWriter out = response.getWriter();

            String name = request.getParameter("name");

            if(name==null)
                processRequest(request, response);

            out.println("<html><body>");

            out.println("Hello, "+name+"!"+"<br>");
            out.println("Apa khabar?"+"<hr>");
            out.println("Waktu dan tarikh di Server ialah "+new java.util.Date());
            out.println("</html></body>");
}
    }
```

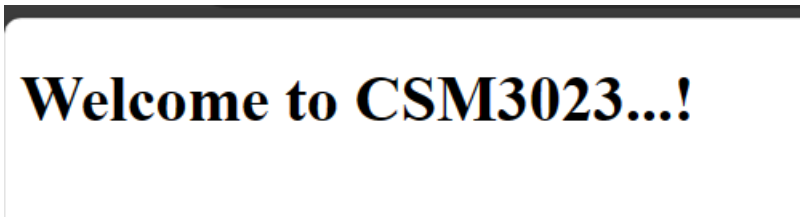
Output:

When there are no parameter, the output will show same as before modification because both call processRequest method.

Task 6

```
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>CSM3023 - Web Programming</title>
    </head>
    <body>
        <h1>Welcome to CSM3023...!</h1>
    </body>
</html>
```

Output:



Reflection

1. What have you learned from this exercise?

I have learned how to make JSP page by using html syntax.

2. Explain the general concept of how the JSP's file work?

JSP is dynamic web page that is returned when client make http request to the web server.

3. Based on your observation of the previous tasks (Task 3 and Task 4), what are the differences you can find between servlet and JSP?

Servlet is mediator to create dynamic web content while JSP is dynamic web page returned when client request resources from the web server, it also allow for embedding java code inside html code.

Task 7

```jsp
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<%@page import="java.util.Date"%>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>Using Java's object in JSP Page</title>
    </head>
    <body>
        <h1>Display Current Date and perform Auto Refresh Header</h1>

        <%
            Date todayDate = new Date();
            out.print("<p>Current date and time is " + todayDate.toString() + "</p>");
        %>

        <%
            response.setIntHeader("Refresh", 5);
         %>
    </body>
</html>
```

Output:

Reflection

1. What have you learnt from this exercise?

I have learned how to create a JSP page that can refresh automatically within a specific time.

2. What is Java Scriplet?

Java Scriplet is java code that we write inside the JSP page source code.

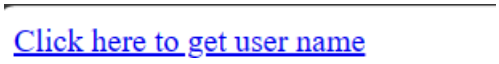
3. How to use Java code in your JSP's page?

By surrounding the java code within the <%% and %> tag.

Task 8

```
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<%@page import="java.math.*"%>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>Implicit JSP</title>
    </head>
    <body>
        <% session.setAttribute("user", "Fouad Adbulameer");%>
        <a href="GetAttribute.jsp">Click here to get user name </a>

        <p>
            <a href="MathematicsOperations.jsp">Result of mathematics operations </a></p>
    </body>
</html>
```

Output:



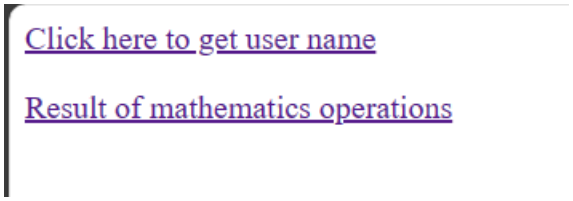
After GetAttribute JSP page is created, Link is clicked:

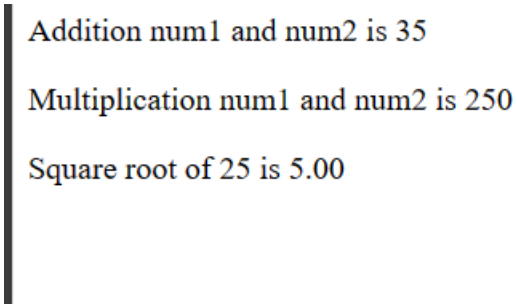
MathematicsOperations JSP page:

```jsp
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
<head>
    <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
    <title>Implicit JSP</title>
</head>
<body>
<%
    int num1 = 25;
    int num2 = 10;
    int addition_output;
    int multiply_output;
    double squareroot = 0.00;

    addition_output = num1 + num2;
    multiply_output = num1 * num2;

    squareroot = Math.sqrt(num1);

    out.print("<p>Addition num1 and num2 is " + addition_output + "</p>");
    out.print("<p>Multiplication num1 and num2 is " + multiply_output + "</p>");

    out.print("<p></p>");
    out.print("<p>Square root of " + num1 + " is " + String.format("%.2f", squareroot) + "</p>");
%>
</body>
</html>
```

```jsp
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<%@page import="java.math.*"%>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>Implicit JSP</title>
    </head>
    <body>
        <% session.setAttribute("user", "Fouad Adbulameer");%>
        <a href="GetAttribute.jsp">Click here to get user name </a>

        <p>
            <a href="MathematicsOperations.jsp">Result of mathematics operations </a></p>
    </body>
</html>
```

Output:





Reflection

1. How do you want to submit specific information from one form to next form?

By calling set and get method.

2. What happened if the field name you specify in request.getParameter ("field_name") in the second page is different from the field name you defined in the first page?

Error encountered because the requested paremeter does not existed.

Task 9

```
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Populate Array</title>
    <style>
        table {
            border-collapse: collapse;
            width: 100%;
        }
        th, td {
            border: 1px solid black;
            padding: 3px;
            text-align: center;
        }
    </style>
</head>
<body>
    <%
        // Storing sales data in a 2D array
        String[][] salesData = {
            {"Salesman", "Jan", "Feb", "Mar"},
            {"Salesman 1", "2500", "2100", "2200"},
            {"Salesman 2", "2000", "1900", "2400"},
            {"Salesman 3", "1800", "2200", "2450"}
        };
        // Setting the array as a request attribute for later retrieval
        request.setAttribute("salesData", salesData);
    %>
    <h2>Read Java array and populate it into HTML's table</h2>
    <table id="salesTable">
        <thead>
            <tr>
                <% for (String header : salesData[0]) { %>
                    <th><%= header %></th>
                <% } %>
            </tr>
        </thead>
        <tbody>
            <% for (int i = 1; i < salesData.length; i++) { %>
                <tr>
                    <% for (String value : salesData[i]) { %>
                        <td><%= value %></td>
                    <% } %>
                </tr>
            <% } %>
        </tbody>
    </table>
</body>
</html>
```

Output:

Read Java array and populate it into HTML's table

Salesman	Jan	Feb	Mar
Salesman 1	2500	2100	2200
Salesman 2	2000	1900	2400
Salesman 3	1800	2200	2450

Reflection

1. Write a sample syntax to declare 2D Java array.

int[][] sales;

2. Define a sequence of steps on how you accomplish Task 7.

Create the table in html then fill each cell with element from the 2d array declared before.

3. What is the difference between HTML's page and JSP's page?

Html page is static page while JSP page is dynamic page that returned when client request resources from the web server.

Exercise

1.

calculateArea.jsp

calculateRadius.jsp

```
<%@ page language="java" contentType="text/html; charset=UTF-8" pageEncoding="UTF-8"%>
<%@ page import="java.util.Scanner" %>
<%@ page import="java.text.DecimalFormat" %>
<!DOCTYPE html>
<html>
<%@ page language="java" contentType="text/html; charset=UTF-8" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
    <head>
        <meta charset="UTF-8">
        <title>Calculate Circle Area</title>
    </head>
    <body>
        <h1>Calculate Circle Area</h1>
        <form method="post" action="calculateArea.jsp">
            <label for="radius">Enter the radius:</label>
            <input type="text" id="radius" name="radius" pattern="[0-9]+" title="Please enter a number" required>
            <button type="submit">Calculate</button>
        </form>
    </body>
</html>
            <%-- Format the area value --%>
            <% DecimalFormat df = new DecimalFormat("#.##"); %>

            <%-- Display the result --%>
            <p>The area of the circle with radius <%= radius %> is <%= df.format(area) %>.</p>
        <% } else { %>
            <%-- Display an error message if the radius value is missing or not a valid number --%>
            <p>Please enter a valid number for the radius.</p>
        <% } %>
    </body>
</html>
```

Output:

Calculate Circle Area

Enter the radius: 5 Calculate

Area Result

The area of the circle with radius 5 is 78.54.

2.

```jsp
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<%@ page import="java.io.*, java.util.*" %>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>Read CSV File</title>
        <style>
            table, th, td {
                border: 1px solid black;
                border-collapse: collapse;
                padding: 8px 30px;
                text-align: center;
            }

            th {
                background-color: lightsalmon;
            }
        </style>
    </head>
    <body>

        <h1>Read CSV files and populate it into HTML's table</h1>

        <%
            // Path to the CSV file
            String filePath = "C:/Users/USER/Documents/DEGREE/SEM 4/Web 2/lab/Lab 1/Sales.csv";

            // List to hold the data from the CSV file
            List<String[]> csvData = new ArrayList<>();

            // Read the CSV file and populate the list
            try {
                BufferedReader br = new BufferedReader(new FileReader(filePath));
                String line;
                while ((line = br.readLine()) != null) {
                    String[] parts = line.split(",");
                    csvData.add(parts);
                }
                br.close();
            } catch (IOException e) {
                out.println("Error reading CSV file: " + e.getMessage());
            }
        %>

        <table>
            <thead>
                <tr>
                    <th>Customer</th>
                    <th>Cust. Type</th>
                    <th>Purchase</th>
                    <th>Discount</th>
                </tr>
            </thead>
            <tbody>
                <% for (int i = 0; i < csvData.size(); i++) { %>
                    <tr>
                        <%
                            String[] rowData = csvData.get(i);
                            String customer = rowData[0];
                            String custType = rowData[1];
                            int purchase = Integer.parseInt(rowData[2]);
                            double discount = 0.0;
                            if (custType.equalsIgnoreCase("Cash")) {
                                discount = purchase * 0.1; // 10% discount for cash customers
                            }
                        %>
                        <td><%= customer %></td>
                        <td><%= custType %></td>
                        <td><%= purchase %></td>
                        <td><%= String.format("%.2f", discount) %></td>
                    </tr>
                <% } %>
            </tbody>
        </table>

    </body>
</html>
```

Output:

Read CSV files and populate it into HTML's table

Customer	Cust. Type	Purchase	Discount
10001	Credit	5000	0.00
10002	Cash	2500	250.00
10003	Credit	3000	0.00
10004	Cash	3200	320.00
10005	Credit	1200	0.00
10006	Cash	6000	600.00
10007	Credit	7400	0.00
10008	Cash	800	80.00