UNIVERSITI MALAYSIA TERENGGANU

CSM3023 WEB BASED APPLICATION DEVELOPMENT

BACHELOR OF COMPUTER SCIENCE (MOBILE COMPUTING) WITH HONORS

LAB 4

SEMESTER II 2023/2024

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Task 1: Using JSP Scripting

Code:

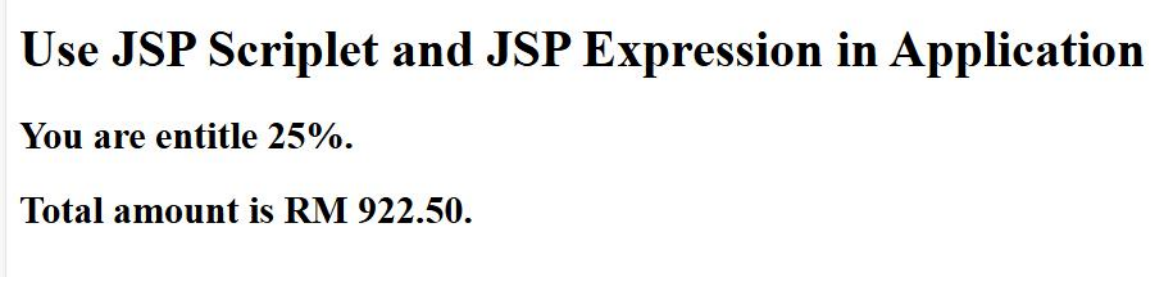
Customer.html

```
<html>
    <head>
        <title>Task 1</title>
        <meta charset="UTF-8">
        <meta name="viewport" content="width=device-width, initial-scale=1.0">
    </head>
    <body>
        <header>
            <h1>Use JSP Scriplet and JSP Expression in Application</h1>
        </header>

        <main>
            <h2>Customer discount</h2>
            <form action="processCustomer.jsp" method="post">
                <table>
                    <tr>
                        <td><label for="custCode">Customer Code:</label></td>
                        <td><input type="text" name="custCode" id="custCode" placeholder="Key-in customer code"></td>
                    </tr>
                    <tr>
                        <td><label for="quantity">Quantity:</label></td>
                        <td><input type="number" name="quantity" id="quantity" placeholder="Key-in quantity"></td>
                    </tr>
                    <tr>
                        <td><label>Customer Type:</label></td>
                        <td>
                            <input type="radio" name="custType" id="normal" value="1">
                            <label for="normal">Normal Customer</label>
                            <input type="radio" name="custType" id="privilege" value="2">
                            <label for="privilege">Privilege Customer</label>
                        </td>
                    </tr>
                    <tr>
                        <td>
                            <button type="reset">Cancel</button>
                            <button type="submit">Submit</button>
                        </td>
                    </tr>
                </table>
            </form>
        </main>

    </body>
</html>
```

processCustomer.jsp

```jsp
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>Task 1</title>
    </head>
    <body>
        <h1>Use JSP Scriplet and JSP Expression in Application</h1>

        <%
            final int PRICE = 10;

            //Using JSP Scriplet..
            String custCode = request.getParameter("custCode");
            int quantity = Integer.parseInt(request.getParameter("quantity"));
            String custType = request.getParameter("custType");

            //Determine customer..
            if (custType.equals("1") && quantity > 100) {
                out.print("<h2>You are entitle 10%.</h2>");
                out.print("<h2>Total amount is RM " + String.format("%.2f", quantity * PRICE * 0.9) + ".</h2>");
            }
            else if (custType.equals("2") && quantity > 100) {
                out.print("<h2>You are entitle 25%.</h2>");
                out.print("<h2>Total amount is RM " + String.format("%.2f", quantity * PRICE * 0.75) + ".</h2>");
            }
            else {
                out.print("<h2>You are not entitle discount..!</h2>");
                out.print("<h2>Total amount is RM " + String.format("%.2f", (double) (quantity * PRICE)) + ".</h2>");
            }
        %>
    </body>
</html>
```

Output:



Use JSP Scriplet and JSP Expression in Application

Customer discount

Customer Code: 1002
Quantity: 99
Customer Type: (•) Normal Customer ( ) Privilege Customer
Cancel Submit

Use JSP Scriplet and JSP Expression in Application

You are not entitle discount..!

Total amount is RM 990.00.

Use JSP Scriplet and JSP Expression in Application

Customer discount

Customer Code: 1003
Quantity: 103
Customer Type: (•) Normal Customer ( ) Privilege Customer
Cancel Submit

Use JSP Scriplet and JSP Expression in Application

You are entitle 10%.

Total amount is RM 927.00.

Reflections

1. What you have learnt from this exercise?

   From this exercise I learnt how to use JSP scriptlets and expressions to process user input from a form and display dynamic content. The form and basic HTML structure reside in customer.html. Business logic for calculating discounts is handled in the processCustomer.jsp. Scriptlets (<% %> blocks) are used to access form data (request.getParameter) and perform calculations like determining the discount and total amount. Expressions (<%= %>) are used to embed calculated values like the discount and total amount directly within the HTML output.

2. Explain three (3) types of JSP scripting?

   - Scriptlets (<% %>): Scriptlets allow to write any valid Java code within the JSP page.
   - Declarations (<%! %>): Declarations are used to define variables or methods that can be accessed throughout the JSP page.
   - Expressions (<%= %>): Expressions evaluate a Java expression and insert the result directly into the generated HTML output.

Task 2: Using JSP (Scripting, Declaration and Expression)

Code:

currencyConversion.html

```
<html>
    <head>
        <title>Task 2</title>
        <meta charset="UTF-8">
        <meta name="viewport" content="width=device-width, initial-scale=1.0">
    </head>
    <body>
        <header>
            <h1>Use JSP Declaration Tag, JSP Scriplet, and JSP Expression in Application</h1>
        </header>

        <main>
            <h2>Currency Conversion</h2>
            <form action="processCurrency.jsp" onsubmit="return validateInput()">
                <table>
                    <tr>
                        <td><label for="amount">Amount (in RM):</label></td>
                        <td><input type="text" name="amount" id="amount" placeholder="Key-in amount"></td>
                    </tr>
                    <tr>
                        <td><label for="currency">Convert to:</label></td>
                        <td>
                            <select name="currency" id="currency">
                                <option value="1">USD</option>
                                <option value="2">Pound Sterling</option>
                                <option value="3">Euro</option>
                            </select>
                        </td>
                    </tr>
                    <tr>
                        <td>
                            <button type="reset">Cancel</button>
                            <button type="submit">Submit</button>
                        </td>
                    </tr>
                </table>
            </form>
        </main>

        <script>
            function validateInput() {
                var input = document.getElementById("amount").value;

                // Check if input is a valid number or float
                if(isNaN(input) || input === "" || !Number.isFinite(parseFloat(input))) {
                    alert("Invalid input.");
                    return false;
                }
                return true;
            }
        </script>
    </body>
</html>
```

processCurrency.jsp

```jsp
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>Task 2</title>
    </head>
    <body>
        <header>
            <h1>Use JSP Declaration Tag, JSP Scriplet, and JSP Expression in Application</h1>
        </header>

        <%!
            //Define constant..
            final double USD = 4.75;
            final double STG = 5.94;
            final double EURO = 5.09;

            //Define method to perform currency exchange....
            private double calculateRate(String currency, int amount) {
                double currencyChange = 0.00f;

                switch (currency) {
                    case "1" :
                        currencyChange = (double) (amount * USD);
                        break;

                    case "2" :
                        currencyChange = (double) (amount * STG);
                        break;

                    case "3" :
                        currencyChange = (double) (amount * USD);
                        break;
                }

                return currencyChange; //return the result....
            }
        %>

        <%
            int amount = Integer.parseInt(request.getParameter("amount"));
            String currency = request.getParameter("currency");
            String strCurrency = "";
            String result = String.format("%.2f", calculateRate(currency, amount));

            switch (currency) {
                case "1" :
                    strCurrency = "USD";
                    break;

                case "2" :
                    strCurrency = "Pound Sterling";
                    break;

                case "3" :
                    strCurrency = "Euro";
                    break;
            }
        %>
        <h2>Amount in Ringgit Malaysia is RM <%=String.format("%.2f", (double) amount)%>.</h2>
        <h2>Amount in <%=strCurrency%> is RM <%=result%>.</h2>

    </body>
</html>
```

Output:

Reflection

1. What have you learned from this exercise?

   From this exercise I learned how to demonstrate the combined use of JSP Declarations, Scriptlets, and Expressions for currency conversion. The final keyword is used to define constants for exchange rates (USD, STG, EURO) within a declaration block (<%! %>). A function calculateRate is defined within a scriptlet block (<%! %>). This function takes the selected currency and amount as arguments and performs the conversion based on a switch statement. Expressions (<%= %>) are used throughout the page to display the original amount in Ringgit Malaysia to access the converted amount returned by the calculateRate function through the result variable to display the converted currency type retrieved from the strCurrency variable. The JSP retrieves form data (amount and currency) using request.getParameter.

Task 3: Using JSP Standard Action (Include and Param)

Code:

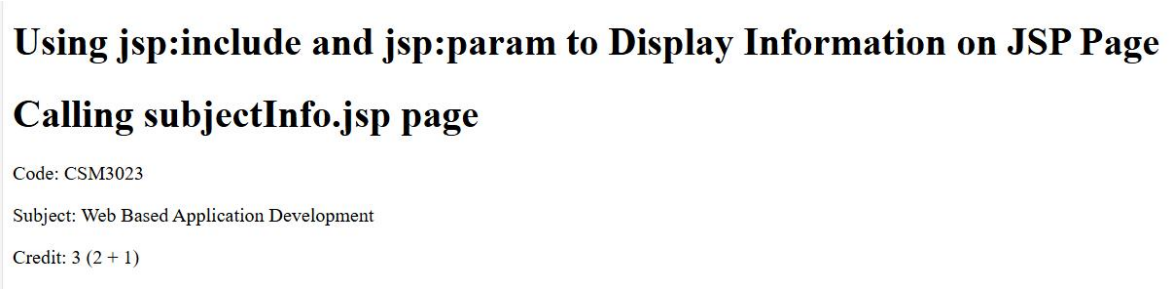
jspParameter.jsp

```
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>Task 3</title>
    </head>
    <body>
        <h1>Using jsp:include and jsp:param to Display Information on JSP Page</h1>

        <%
            String sCode = "CSM3023";
            String sSubject = "Web Based Application Development";
            String sCredit = "3 (2 + 1)";
        %>

        <jsp:include page="subjectInfo.jsp" flush="true">
            <jsp:param name="code" value="<%=sCode%>"/>
            <jsp:param name="subject" value="<%=sSubject%>"/>
            <jsp:param name="credit" value="<%=sCredit%>"/>
        </jsp:include>
    </body>
</html>
```

subjectInfo.jsp

```
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>Task 3</title>
    </head>
    <body>
        <h1>Calling subjectInfo.jsp page</h1>
        <p>Code: <%=request.getParameter("code")%></p>
        <p>Subject: <%=request.getParameter("subject")%></p>
        <p>Credit: <%=request.getParameter("credit")%></p>
    </body>
</html>
```

Output:



Reflections

1. What you have learnt from this exercise?

   From this exercise I learned how to demonstrates using jsp:include and jsp:param tags to achieve modularity and reusability in JSP. The course information is displayed within a separate JSP (subjectInfo.jsp). The jsp:param tag effectively transmits course details (code, subject, credit) as parameters to the included JSP (subjectInfo.jsp). Within subjectInfo.jsp, the passed parameters can be accessed using request.getParameter("parameterName").

2. List TWO (2) other JSP Standard Action Tag.

   - jsp:forward: Similar to jsp:include, it forwards the request to another JSP but doesn't include the content on the current page. This is useful for redirecting users after form processing or authentication.
   - jsp:useBean: This tag simplifies working with JavaBeans in JSP. It allows you to create or locate an existing JavaBean instance and access its properties and methods within the JSP page.

Task 4: Using JSP Standard Action (Forward)

Code:

forward.jsp

```jsp
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>Task 4</title>
    </head>
    <body>
        <h2>Using jsp:forward to display user info.</h2>
        <jsp:forward page="forwardInfo.jsp">
            <jsp:param name="u_name" value="Fouad Abdulameer"/>
            <jsp:param name="email" value="fouadaug@gmail.com"/>
            <jsp:param name="nationality" value="Iraqi"/>
            <jsp:param name="background" value="Developer"/>
        </jsp:forward>
    </body>
</html>
```

forwardInfo.jsp

```jsp
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>Task 4</title>
    </head>
    <body>
        <%
            String name = request.getParameter("u_name");
            String email = request.getParameter("email");
            String nationality = request.getParameter("nationality");
            String background = request.getParameter("background");

            if (name != null) {%>
                <b>
                    <br>
                    <br>
                    <h2 align="center">
                        <%= name %><br>
                        <%= email %><br>
                        <%= nationality %><br>
                        <%= background %><br>
                        <br>
                        <% out.print("Today is: " + java.util.Calendar.getInstance().getTime()); %>
                    </h2>
                </b>
                <br>
                <%
            }
        %>
    </body>
</html>
```

Output:

Reflection

1. What you have learnt from this exercise?

   From this exercise I learned how to demonstrates using jsp:forward to transfer user information to another JSP for display. The jsp:forward tag redirects the request to forwardInfo.jsp. jsp:param tags are used to transmit user information (name, email, nationality, background) as parameters to forwardInfo.jsp. In forwardInfo.jsp, the forwarded parameters can be retrieved using request.getParameter("parameterName") to display the user details.

2. List TWO (2) more JSP Standard Action Tag.

   - jsp:useBean: This tag simplifies working with JavaBeans in JSP. It allows to create or locate an existing JavaBean instance and access its properties and methods within the JSP page.
   - jsp:setProperty: This tag is used in conjunction with jsp:useBean to set the properties of a JavaBean within a JSP page. This allows to dynamically modify the state of a JavaBean based on user input or other factors.

Task 5: Use Java Scriptlet to Construct Business Logic

Code:

insuranceQuotation.jsp

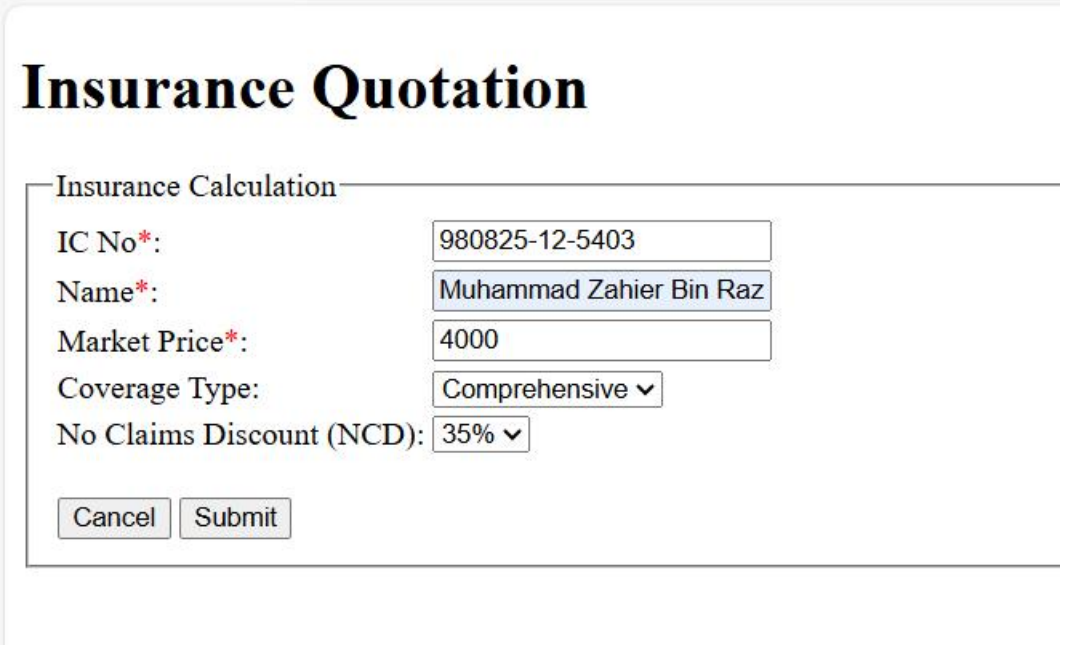
```jsp
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>Task 5</title>
        <style>
            span {
                color: red;
            }
        </style>
    </head>
    <body>
        <h1>Insurance Quotation</h1>
        <form action="processInsuranceQuotation.jsp">
            <fieldset>
                <legend>Insurance Calculation</legend>
                <table>
                    <tr>
                        <td><label for="icNo">IC No<span>*</span>:</label></td>
                        <td><input type="text" name="icNo" id="icNo" placeholder="E.g. 821210-05-3478" required></td>
                    </tr>
                    <tr>
                        <td><label for="name">Name<span>*</span>:</label></td>
                        <td><input type="text" name="name" id="name" placeholder="E.g. Ali bin Ahmad" required></td>
                    </tr>
                    <tr>
                        <td><label for="marketPrice">Market Price<span>*</span>:</label></td>
                        <td><input type="number" name="marketPrice" id="marketPrice" placeholder="E.g. 4000" required></td>
                    </tr>
                    <tr>
                        <td><label for="coverage">Coverage Type:</label></td>
                        <td>
                            <select name="coverage" id="coverage">
                                <option value="1">Third Party</option>
                                <option value="2">Comprehensive</option>
                            </select>
                        </td>
                    </tr>
                    <tr>
                        <td><label for="ncd">No Claims Discount (NCD):</label></td>
                        <td>
                            <select name="ncd" id="ncd">
                                <option value="1">10%</option>
                                <option value="2">25%</option>
                                <option value="3">35%</option>
                                <option value="4">55%</option>
                            </select>
                        </td>
                    </tr>
                    <tr>
                        <td>
                            <br>
                            <button type="reset">Cancel</button>
                            <button type="submit">Submit</button>
                        </td>
                    </tr>
                </table>
            </fieldset>
        </form>
    </body>
</html>
```

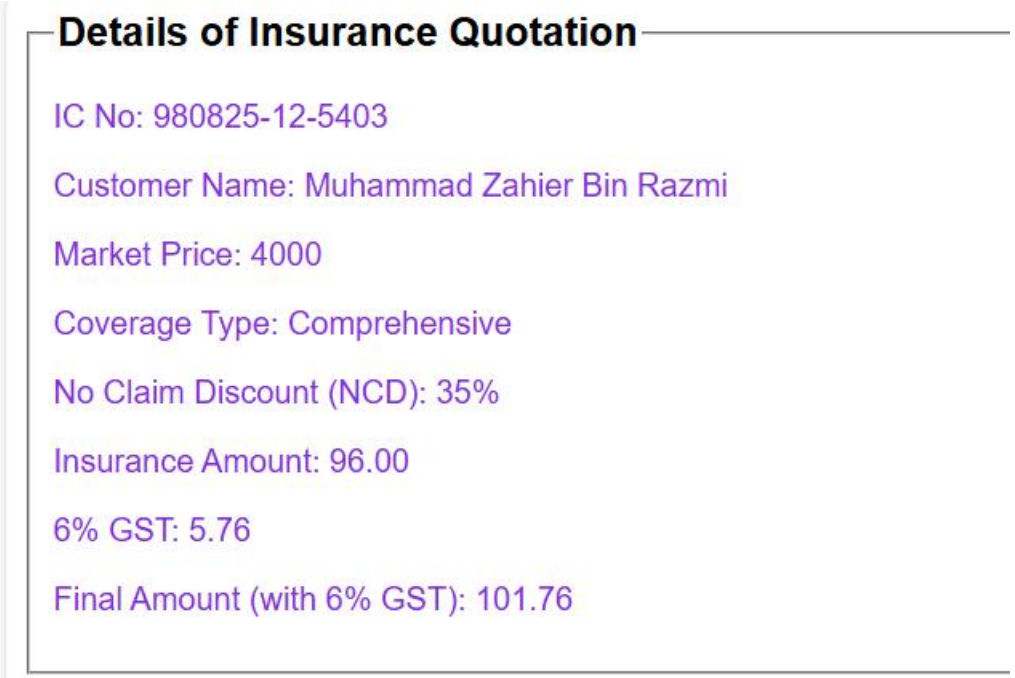
processInsuranceQuotation.jsp

```jsp
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>Task 5</title>
        <style>
            body {
                font-family: Arial, Helvetica, sans-serif;
            }

            legend {
                font-size: 20px;
                font-weight: bold;
            }

            p {
                color: blueviolet;
            }
        </style>
    </head>
    <body>
        <%
            String icNo = request.getParameter("icNo");
            String name = request.getParameter("name");
            int marketPrice = Integer.parseInt(request.getParameter("marketPrice"));
            String coverage = request.getParameter("coverage");
            String ncd = request.getParameter("ncd");
            double amount = 0.00f;
            double gst = 0.00f;
            double final_amount = 0.00f;
            String strCoverage = "";
            String strNCD = "";

            switch (coverage) {
                case "1":
                    strCoverage = "Third Party";
                    switch (ncd) {
                        case "1":
                            strNCD = "10%";
                            amount = 0.033 * marketPrice;
                            break;

                        case "2":
                            strNCD = "25%";
                            amount = 0.025 * marketPrice;
                            break;

                        case "3":
                            strNCD = "35%";
                            amount = 0.018 * marketPrice;
                            break;

                        case "4":
                            strNCD = "55%";
                            amount = 0.012 * marketPrice;
                            break;
                    }
                    break;
```

```
                case "2":
                    strCoverage = "Comprehensive";
                    switch (ncd) {
                        case "1":
                            strNCD = "10%";
                            amount = 0.038 * marketPrice;
                            break;

                        case "2":
                            strNCD = "25%";
                            amount = 0.030 * marketPrice;
                            break;

                        case "3":
                            strNCD = "35%";
                            amount = 0.024 * marketPrice;
                            break;

                        case "4":
                            strNCD = "55%";
                            amount = 0.018 * marketPrice;
                            break;
                    }
                    break;
            }

            gst = 0.06 * amount;
            final_amount = amount + gst;
        %>
        <fieldset>
            <legend>Details of Insurance Quotation</legend>
            <p>IC No: <%= icNo %></p>
            <p>Customer Name: <%= name %></p>
            <p>Market Price: <%= marketPrice %></p>
            <p>Coverage Type: <%= strCoverage %></p>
            <p>No Claim Discount (NCD): <%= strNCD %></p>
            <p>Insurance Amount: <%= String.format("%.2f", amount) %></p>
            <p>6% GST: <%= String.format("%.2f", gst) %></p>
            <p>Final Amount (with 6% GST): <%= String.format("%.2f", final_amount) %></p>
        </fieldset>
    </body>
</html>
```

Output:





Reflection

1. What you have learnt from this exercise?

   From this exercise I learned how to demonstrates building an insurance quotation form with data processing in JSP Scriptlets. An HTML form collects user information like IC number, name, market price, coverage type, and NCD. The second JSP (processInsuranceQuotation.jsp) retrieves form data using request.getParameter. Scriptlets perform calculations based on user selections. Insurance amount is determined by multiplying the market price with a factor based on coverage and NCD. GST is calculated as 6% of the insurance amount. The final amount is the sum of insurance amount and GST. The calculated values (insurance amount, GST, final amount) are displayed along with the retrieved user information in a formatted table.

2. List all Java features you used in Java Scriptlet.

   - Variables: Variables declaration like icNo, name, marketPrice, amount, gst, and final_amount to store user input, calculation results, and final values.

- Data Types: Data types like String (text), int (integer), and double (floating-point number) are used to represent different kinds of data.
- Operators: Arithmetic operators (+, -, /, *) are used for calculations like determining insurance amount and final amount with GST.
- Conditional Statements: A switch statement is used to calculate the insurance amount based on the selected coverage type and NCD combination.
- Formatting: The String.format("%.2f", number) method is used to format numeric values (amount, GST, final amount) to display them with two decimal places.

Exercise

Code:

bmiCalculator.jsp

```jsp
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>Exercise</title>
    </head>
    <body>
        <h1>BMI Calculator</h1>
        <form action="processBMICalculator.jsp" onsubmit="return validateForm()">
            <table>
                <tr>
                    <td><label for="weight">Weight (kg):</label></td>
                    <td><input type="text" name="weight" id="weight" placeholder="Enter weight"></td>
                </tr>
                <tr>
                    <td><label for="height">Height (cm):</label></td>
                    <td><input type="text" name="height" id="height" placeholder="Enter height"></td>
                </tr>
                <tr>
                    <td>
                        <br>
                        <button type="reset">Clear</button>
                        <button type="submit">Submit</button>
                    </td>
                </tr>
            </table>
        </form>
        <script>
            function validateForm() {
                var weight = document.getElementById("weight").value;
                var height = document.getElementById("height").value;

                // Check if weight is a positive number
                if (isNaN(weight) || weight <= 0) {
                    alert("Please enter a valid weight.");
                    return false;
                }

                // Check if height is a positive number
                if (isNaN(height) || height <= 0) {
                    alert("Please enter a valid height.");
                    return false;
                }

                return true;
            }
        </script>
    </body>
</html>
```

processBMICalculator.jsp

```jsp
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>Exercise</title>
    </head>
    <body>
        <h1>BMI Calculator</h1>
        <%
            double weight = Double.parseDouble(request.getParameter("weight"));
            double height = Double.parseDouble(request.getParameter("height"));

            double bmi = weight / (Math.pow((height / 100), 2));

            String weightCategory = "";

            if (bmi < 18.5)
                weightCategory = "Underweight";
            else if (bmi >= 25)
                weightCategory = "Overweight";
            else
                weightCategory = "Optimal";
        %>
        <h2>Your BMI Results</h2>
        <p>Your BMI is: <%= String.format("%.1f", bmi) %></p>
        <p>Your weight category is: <%= weightCategory %></p>
    </body>
</html>
```

Output: