**Experiment 6: Create a Web application for BMI Calculation using JavaScript**

**Aim:** a)Add interactivity to a web page using JavaScript

b)Create a Web application for BMI Calculation using JavaScript

**Tools:** HTML,CSS, Javascript, VSCode

**Theory:**

**1. Introduction to JavaScript:**

JavaScript is a versatile programming language that enables interactivity on web pages. Unlike HTML (which structures content) and CSS (which styles content), JavaScript is responsible for making web pages dynamic and interactive. It allows you to respond to user actions, manipulate the DOM (Document Object Model), and control the flow of a web application.

**2. DOM Manipulation:**

The DOM is a representation of the HTML document as a tree structure. Each element, attribute, and text in the HTML is represented as a node in this tree. JavaScript interacts with the DOM to:

* Access HTML elements using methods like getElementById, querySelector, etc.
* Modify elements' content, attributes, and styles.
* Add or remove elements from the document.
* Listen for and respond to user events (e.g., clicks, key presses).

**3. Event Handling:**

Event handling in JavaScript allows the web page to react to user inputs or actions, such as clicking a button, submitting a form, or hovering over an element. Event listeners are functions that are triggered when an event occurs.

**4. Enhancing User Experience:**

JavaScript enhances user experience by providing immediate feedback, validating inputs, and dynamically updating content without requiring a page reload. This makes the interaction more seamless and engaging.

**5. Understanding BMI (Body Mass Index):**

BMI is a numerical value of a person's weight in relation to their height. It is a widely used metric to categorize individuals into different weight ranges, such as underweight, normal weight, overweight, and obese.

The formula to calculate BMI is: BMI =

**6. Setting Up the HTML Structure:**

The HTML file (index.html) sets up the basic structure of the web application. It includes:

* Input fields for the user's name, gender, weight, and height.
* A submit button to trigger the BMI calculation.
* Placeholder elements for displaying the result and a table of BMI ranges.

**7. Writing the JavaScript Logic:**

The JavaScript file (script.js) contains the core logic for calculating BMI and updating the webpage dynamically. Key tasks include:

* Reading user input from the HTML form.
* Performing calculations to determine the BMI.
* Displaying the BMI result and a personalized message.
* Dynamically generating and updating a table to highlight the user’s BMI range.

**8. The Complete Workflow:**

When a user interacts with the BMI Calculator:

* They enter their personal details (name, gender, weight, height) into the input fields.
* Upon clicking "Submit," the JavaScript function calculateBMI() is triggered.
* The function calculates the BMI, updates the webpage with the result, and highlights the appropriate range in the BMI table.
* The page remains dynamic and interactive, with all updates occurring without a page reload.

**Implementation Code:**

**index.html**

**<!DOCTYPE html>**

**<html lang="en">**

**<head>**

**<meta charset="UTF-8">**

**<meta name="viewport" content="width=device-width, initial-scale=1.0">**

**<title>BMI Calculator</title>**

**<link rel="stylesheet" href="style.css">**

**</head>**

**<body>**

**<div class="container">**

**<h2>BMI Calculator</h2>**

**<form id="bmiForm">**

**<label for="username">Username:</label>**

**<input type="text" id="username" name="username" required>**

**<label for="height">Height (in meters):</label>**

**<input type="number" id="height" name="height" step="0.01" required>**

**<label for="weight">Weight (in kg):</label>**

**<input type="number" id="weight" name="weight" required>**

**<button type="button" onclick="calculateBMI()">Calculate BMI</button>**

**</form>**

**</div>**

**<!-- Result box outside of the form container -->**

**<div id="resultBox" class="result-box" style="display: none;">**

**<h3>BMI Result</h3>**

**<table>**

**<thead>**

**<tr>**

**<th>Username</th>**

**<th>BMI</th>**

**<th>Category</th>**

**</tr>**

**</thead>**

**<tbody id="bmiResults"></tbody>**

**</table>**

**</div>**

**<script src="script.js"></script>**

**</body>**

**</html>**

**style.css**

**body {**

**font-family: Arial, sans-serif;**

**background-color: #f0f0f0;**

**margin: 0;**

**padding: 0;**

**}**

**.container {**

**width: 300px;**

**margin: 100px auto 0 auto;**

**background-color: #fff;**

**padding: 20px;**

**box-shadow: 0 0 10px rgba(0, 0, 0, 0.1);**

**}**

**h2,**

**h3 {**

**text-align: center;**

**}**

**form {**

**display: flex;**

**flex-direction: column;**

**}**

**label {**

**margin-top: 10px;**

**}**

**input {**

**padding: 5px;**

**margin-top: 5px;**

**}**

**button {**

**margin-top: 15px;**

**padding: 10px;**

**background-color: #28a745;**

**color: white;**

**border: none;**

**cursor: pointer;**

**}**

**button:hover {**

**background-color: #218838;**

**}**

**table {**

**width: 100%;**

**margin-top: 20px;**

**border-collapse: collapse;**

**}**

**table,**

**th,**

**td {**

**border: 1px solid #ddd;**

**}**

**th,**

**td {**

**padding: 10px;**

**text-align: center;**

**}**

**th {**

**background-color: #f4f4f4;**

**}**

**.result-box {**

**width: 300px;**

**margin: 10px auto;**

**padding: 20px;**

**border: 1px solid #ddd;**

**background-color: #f9f9f9;**

**box-shadow: 0 0 10px rgba(0, 0, 0, 0.1);**

**}**

**script.js**

**function calculateBMI() {**

**// Get user input**

**const username = document.getElementById("username").value;**

**const height = parseFloat(document.getElementById("height").value);**

**const weight = parseFloat(document.getElementById("weight").value);**

**// Calculate BMI**

**const bmi = (weight / (height \* height)).toFixed(2);**

**// Determine BMI category**

**let category;**

**if (bmi < 18.5) {**

**category = "Underweight";**

**} else if (bmi >= 18.5 && bmi < 24.9) {**

**category = "Normal weight";**

**} else if (bmi >= 25 && bmi < 29.9) {**

**category = "Overweight";**

**} else {**

**category = "Obese";**

**}**

**// Show the result box**

**const resultBox = document.getElementById("resultBox");**

**resultBox.style.display = "block";**

**// Insert the result into the table**

**const bmiResults = document.getElementById("bmiResults");**

**bmiResults.innerHTML = `**

**<tr>**

**<td>${username}</td>**

**<td>${bmi}</td>**

**<td>${category}</td>**

**</tr>**

**`;**

**// Clear form after submission**

**document.getElementById("bmiForm").reset();**

**}**

**Output:**

