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BCSE203E- Web Programming

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Problem 1

Using JavaScript, given an unsorted array of integers, sort the array into a wave-like array. An array ‘arr[0..n-1]’ is sorted in wave form if arr[0] >= arr[1] <= arr[2] >= arr[3] <= arr[4] >= …

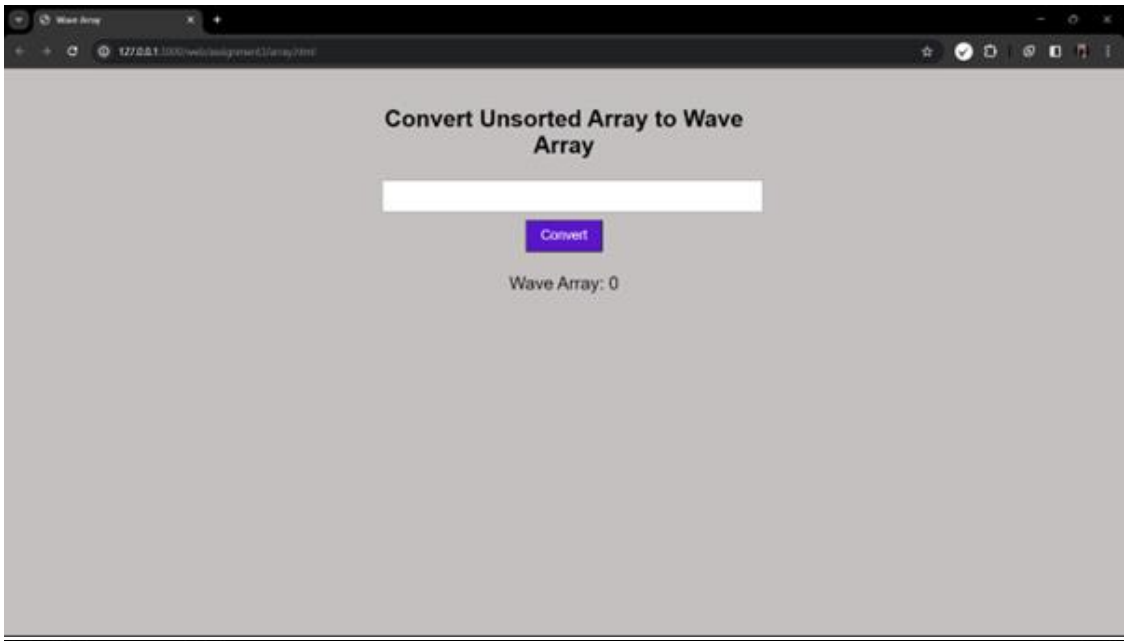
Input: arr[] = {10, 5, 6, 3, 2, 20, 100, 80}

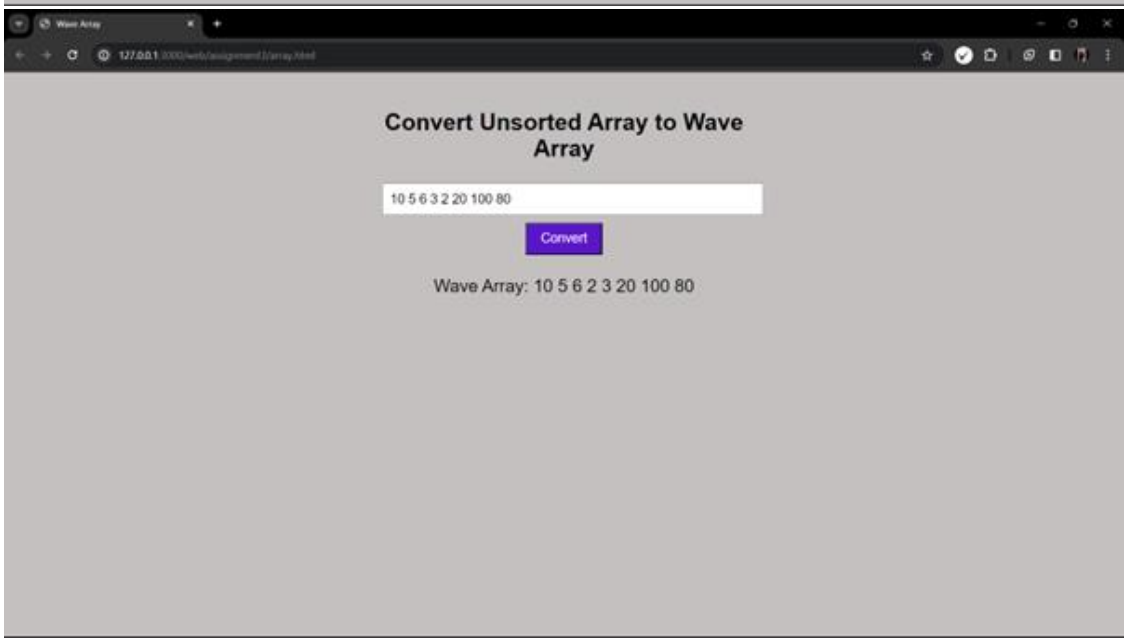
Output: arr[] = {10, 5, 6, 2, 20, 3, 100, 80} OR {20, 5, 10, 2, 80, 6, 100, 3} OR

CODE:

```html
<!DOCTYPE html>
<html>
<head>
    <title>Wave Array</title>
    <style>
        body {
            font-family: Arial, sans-serif;
            background-color: #c4c0c0;
            max-width: 500px;
            margin: 0 auto;
            text-align: center;
        }
        h1 {
            margin-top: 50px;
        }
        form {
            margin-top: 30px;
        }
        input[type="text"] {
            padding: 10px;
            font-size: 18px;
            width: 100%;
        }
        button {
            padding: 10px 20px;
            font-size: 18px;
            background-color: #5b16ca;
            color: white;
            margin-top: 10px;
        }
        #result {
            margin-top: 30px;
            font-size: 24px;
        }
    </style>
</head>
<body>
    <h1>Convert Unsorted Array to Wave Array</h1>
    <form id="array-form">
        <input type="text" id="array-input" value="" />
        <button type="button" id="convert-button">Convert</button>
    </form>
    <div id="result"></div>
    <script>
        document.getElementById('convert-button').addEventListener('click', function() {
            var input = document.getElementById('array-input').value;
            var arr = input.split(' ').map(Number);
            var waveArray = convertToWaveArray(arr);
            document.getElementById('result').innerText = 'Wave Array: ' + waveArray.join(' ');
        });
        function convertToWaveArray(arr) {
            for (var i = 0; i < arr.length - 1; i += 2) {
                if (i === 0) {
                    if (arr[i] < arr[i + 1]) {
                        swap(arr, i, i + 1);
                    }
                } else if (arr[i] < arr[i - 1]) {
                    swap(arr, i, i - 1);
                } else if (arr[i] < arr[i + 1]) {
                    swap(arr, i, i + 1);
                }
            }
            return arr;
        }
        function swap(arr, i, j) {
            var temp = arr[i];
            arr[i] = arr[j];
            arr[j] = temp;
        }
    </script>
</body>
</html>
```

OUTPUT:


Convert Unsorted Array to Wave Array
Convert
Wave Array: 0


Convert Unsorted Array to Wave Array
10 5 6 3 2 20 100 80
Convert
Wave Array: 10 5 6 2 3 20 100 80

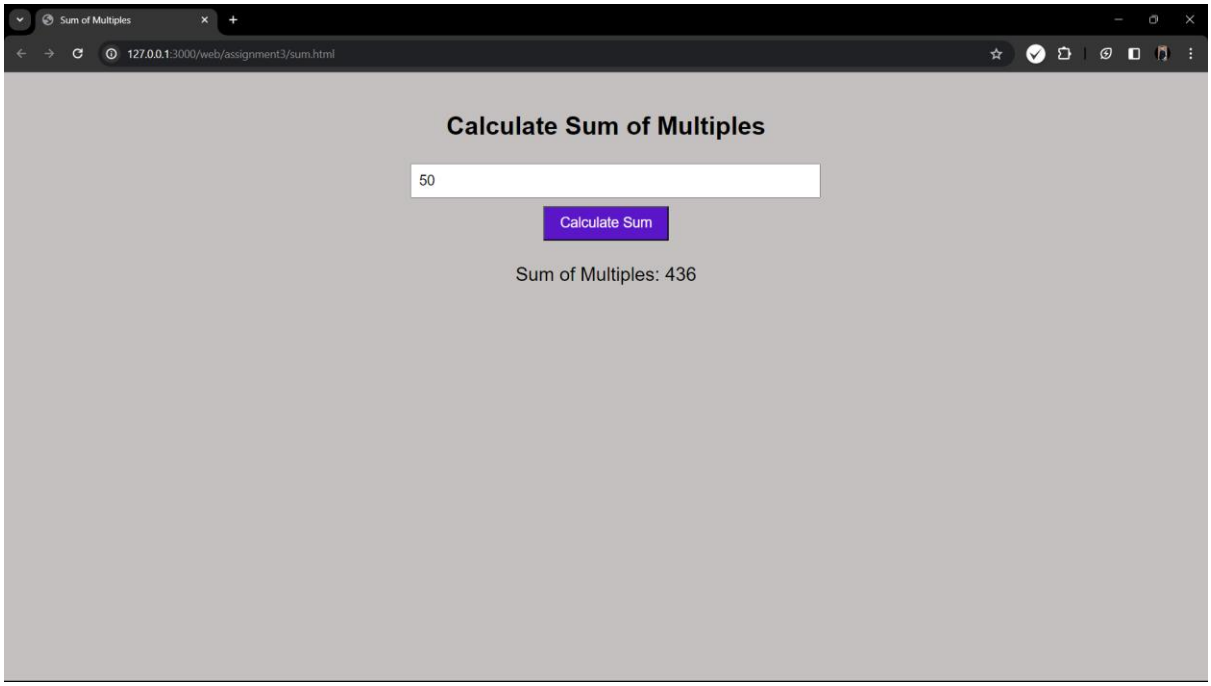
Problem 2

Write a JavaScript function which Calculate the sum of multiples of 5 and 7 for a given limit.

CODE:-

```html
<!DOCTYPE html>
<html>
<head>
    <title>Sum of Multiples</title>
    <style>
        body {
            font-family: Arial, sans-serif;
            background-color: #c4c0c0;
            max-width: 500px;
            margin: 0 auto;
            text-align: center;
        }
        h1 {
            margin-top: 50px;
        }
        form {
            margin-top: 30px;
        }
        input[type="number"] {
            padding: 10px;
            font-size: 18px;
            width: 100%;
        }
        button {
            padding: 10px 20px;
            font-size: 18px;
            background-color: #5b16ca;
            color: white;
            margin-top: 10px;
        }
        #result {
            margin-top: 30px;
            font-size: 24px;
        }
    </style>
</head>
<body>
    <h1>Calculate Sum of Multiples</h1>
    <form id="limit-form">
        <input type="number" id="limit-input" />
        <button type="button" id="calculate-button">Calculate Sum</button>
    </form>
    <div id="result"></div>

    <script>
        document.getElementById('calculate-button').addEventListener('click', function() {
            var limit = document.getElementById('limit-input').value;
            var sum = calculateSumOfMultiples(limit);
            document.getElementById('result').innerText = 'Sum of Multiples: ' + sum;
        });

        function calculateSumOfMultiples(limit) {
            var sum = 0;
            for (var i = 1; i <= limit; i++) {
                if (i % 5 === 0 || i % 7 === 0) {
                    sum += i;
                }
            }
            return sum;
        }
    </script>
</body>
</html>
```

OUTPUT:-



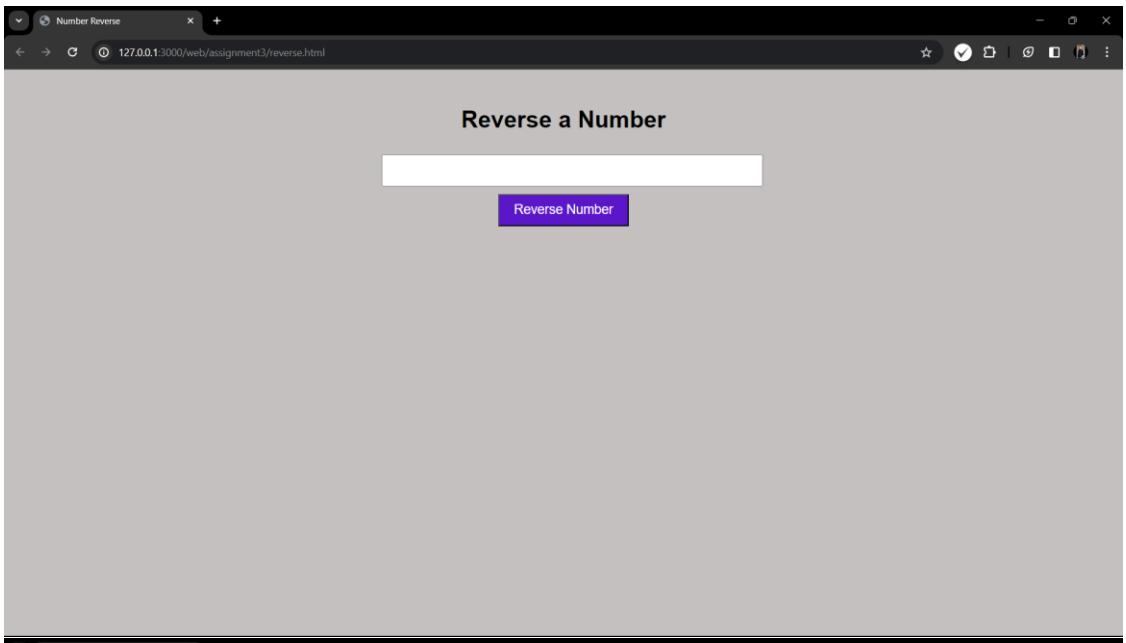
Problem 3

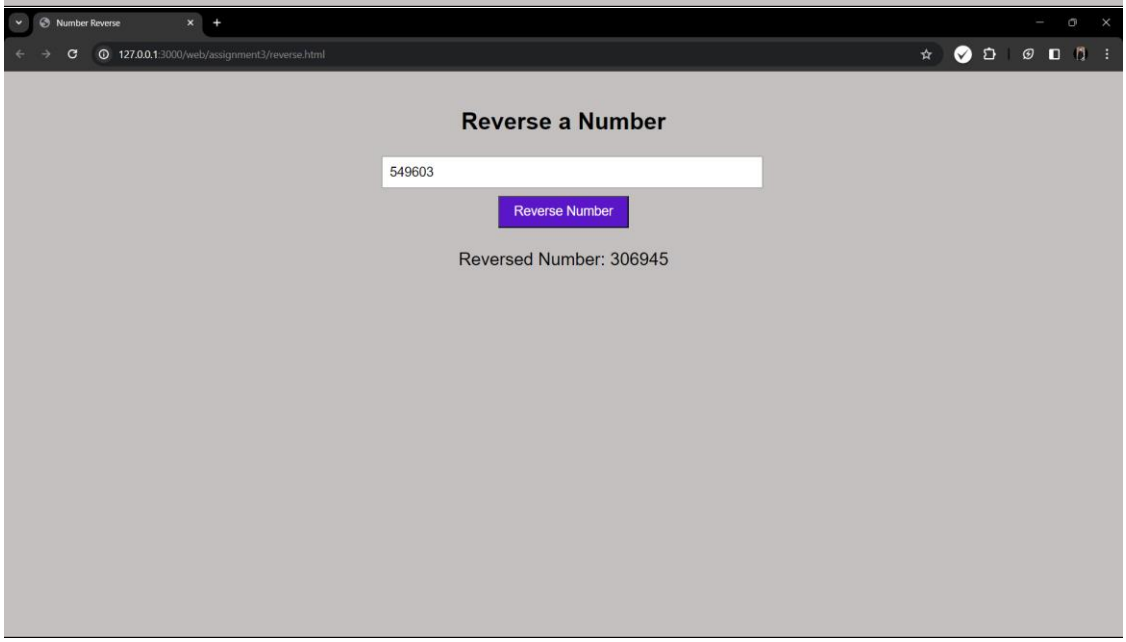
Write a JavaScript function that reverses a number.
Example x = 32243;
Expected Output : 34223

CODE:-

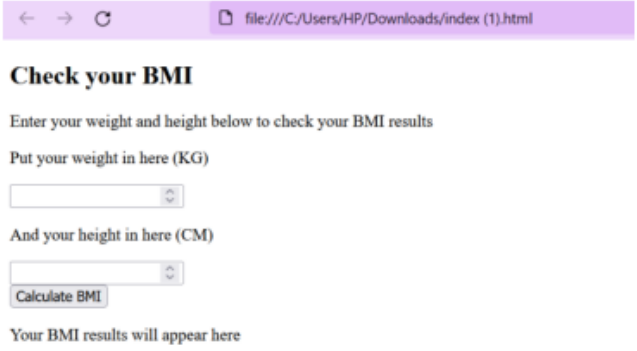
```html
<!DOCTYPE html>
<html>
<head>
  <title>Number Reverse</title>
  <style>
    body {
      font-family: Arial, sans-serif;
      background-color: #c4c0c0;
      max-width: 500px;
      margin: 0 auto;
      text-align: center;
    }
    h1 {
      margin-top: 50px;
    }
    form {
      margin-top: 30px;
    }
    input[type="number"] {
      padding: 10px;
      font-size: 18px;
      width: 100%;
    }
    button {
      padding: 10px 20px;
      font-size: 18px;
      background-color: #5b16ca;
      color: #fff;
      margin-top: 10px;
    }
    #result {
      margin-top: 30px;
      font-size: 24px;
    }
  </style>
</head>
<body>
  <h1>Reverse a Number</h1>
  <form id="number-form">
    <input type="number" id="number-input" />
    <button type="button" id="reverse-button">Reverse Number</button>
  </form>
  <div id="result"></div>
  <script>
    document.getElementById('reverse-button').addEventListener('click', function() {
      var num = document.getElementById('number-input').value;
      var reversedNum = reverseNumber(num);
      document.getElementById('result').innerText = 'Reversed Number: ' + reversedNum;
    });

    function reverseNumber(num) {
      return parseInt(num.toString().split('').reverse().join(''), 10);
    }
  </script>
</body>
</html>
```

OUTPUT:-





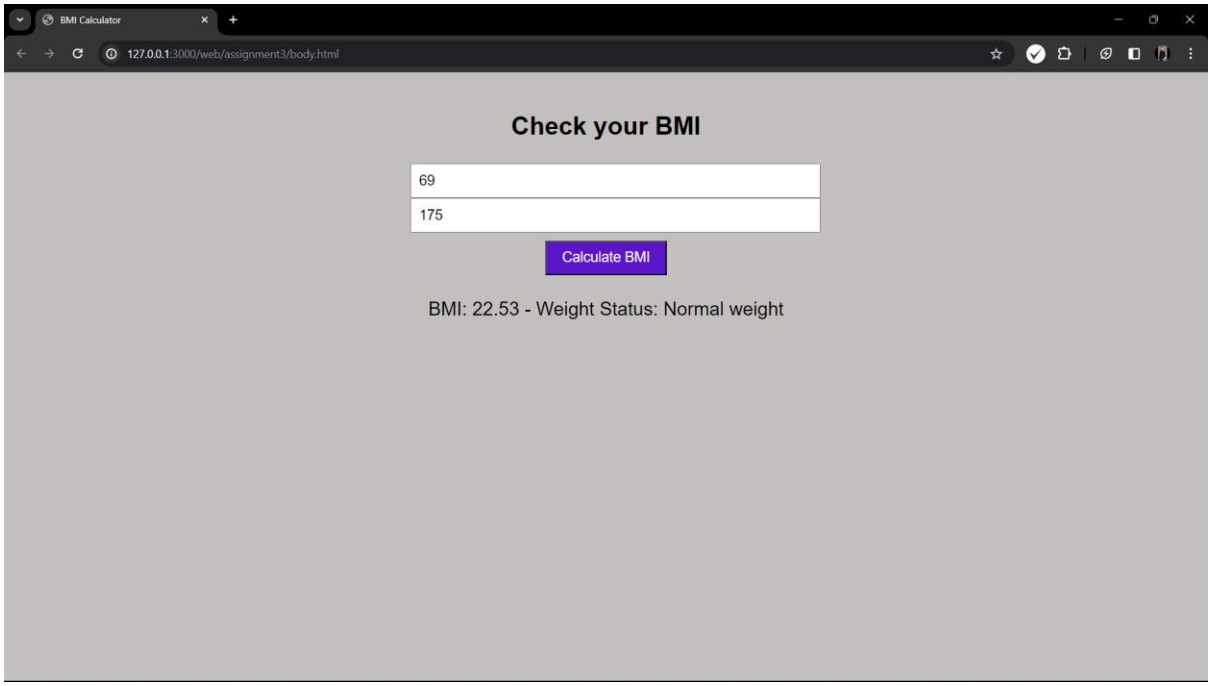
Problem 4 Design a web page to calculate the BMI of a person

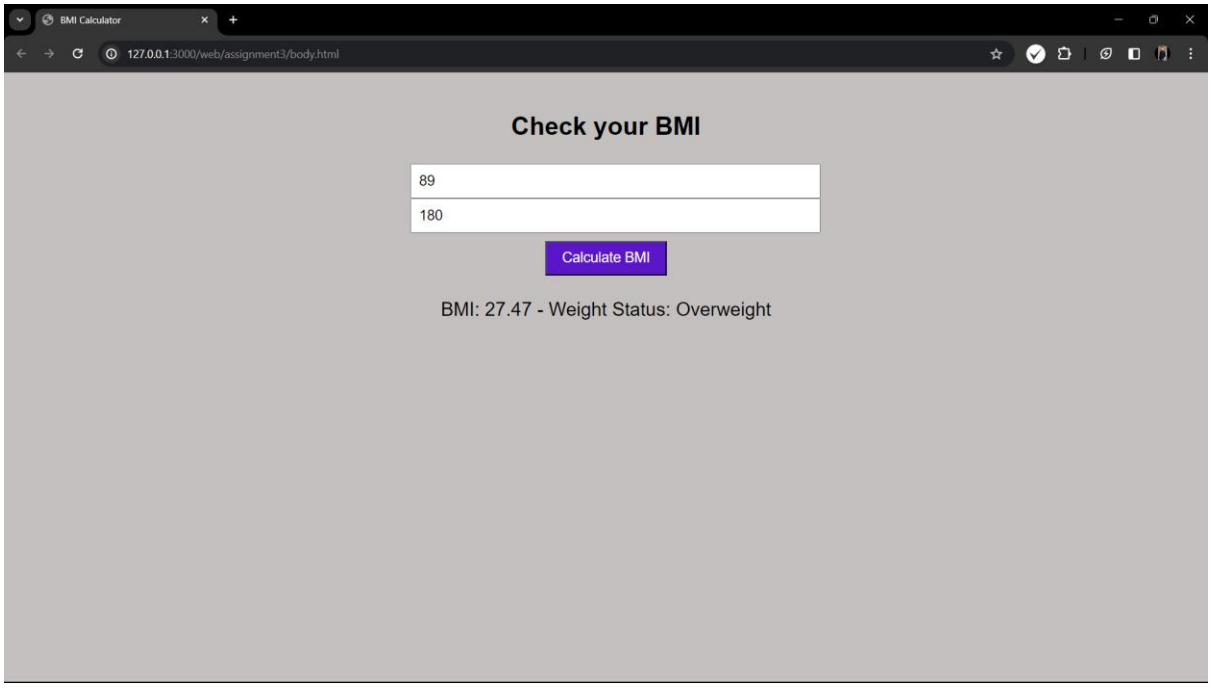


CODE:-

```html
<!DOCTYPE html>
<html>
<head>
    <title>BMI Calculator</title>
    <style>
        body {
            font-family: Arial, sans-serif;
            background-color: #c4c0c0;
            max-width: 500px;
            margin: 0 auto;
            text-align: center;
        }
        h1 {
            margin-top: 50px;
        }
        form {
            margin-top: 30px;
        }
        input[type="number"] {
            padding: 10px;
            font-size: 18px;
            width: 100%;
        }
        button {
            padding: 10px 20px;
            font-size: 18px;
            background-color: #5b16ca;
            color: white;
            margin-top: 10px;
        }
        #result {
            margin-top: 30px;
            font-size: 24px;
        }
    </style>
</head>
<body>
    <h1>Check your BMI</h1>
    <form id="bmi-form">
        <input type="number" id="weight-input" placeholder="Put your weight in here (KG)" step="0.1" />
        <input type="number" id="height-input" placeholder="And your height in here (CM)" step="0.1" />
        <button type="button" id="calculate-button">Calculate BMI</button>
    </form>
    <div id="result"></div>
    <script>
        document.getElementById('calculate-button').addEventListener('click', function() {
            var weight = document.getElementById('weight-input').value;
            var height = document.getElementById('height-input').value;
            var bmi = calculateBMI(weight, height);
            var weightStatus = getWeightStatus(bmi);
            document.getElementById('result').innerText = 'BMI: ' + bmi + ' - Weight Status: ' + weightStatus;
        });
        function calculateBMI(weight, height) {
            height = height / 100; // convert height from CM to M
            var bmi = weight / (height * height);
            return parseFloat(bmi.toFixed(2));
        }
        function getWeightStatus(bmi) {
            if (bmi < 18.5) {
                return 'Underweight';
            } else if (bmi >= 18.5 && bmi < 24.9) {
                return 'Normal weight';
            } else if (bmi >= 25 && bmi < 29.9) {
                return 'Overweight';
            } else {
                return 'Obesity';
            }
        }
    </script>
</body>
</html>
```

OUTPUT:-


BMI Calculator
127.0.0.1:3000/web/assignment3/body.html
Check your BMI
69
175
Calculate BMI
BMI: 22.53 - Weight Status: Normal weight


BMI Calculator
127.0.0.1:3000/web/assignment3/body.html
Check your BMI
89
180
Calculate BMI
BMI: 27.47 - Weight Status: Overweight