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<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>Gradient Background Generator & Factorial Calculator</title>
  <link rel="stylesheet" href="styles.css">
</head>
<body>
  <div class="container">
    <!-- Gradient Generator -->
    <section id="gradient-generator">
      <h2>Gradient Background Generator</h2>
      <label for="color1">Color 1:</label>
      <input type="color" id="color1" value="#ff0000">
      <label for="color2">Color 2:</label>
      <input type="color" id="color2" value="#0000ff">
      <label for="angle">Angle (degrees):</label>
      <input type="number" id="angle" value="45">
      <button onclick="generateGradient()">Generate Gradient</button>
      <div id="gradient-output" class="gradient-box"></div>
    </section>

    <!-- Factorial Calculator -->
    <section id="factorial-calculator">
      <h2>Factorial Calculator</h2>
      <label for="number">Enter a positive integer:</label>
      <input type="number" id="number" min="0" placeholder="Enter number">
      <button onclick="calculateFactorial()">Calculate Factorial</button>
      <div id="factorial-output"></div>
    </section>
  </div>

  <script src="script.js"></script>
</body>
</html>

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/****CSS*****/

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* {
  margin: 0;
  padding: 0;
  box-sizing: border-box;
}

body {
  font-family: Arial, sans-serif;
  background-color: #f4f4f9;
  display: flex;
  justify-content: center;
  align-items: center;
  height: 100vh;
  flex-direction: column;
}

.container {
  width: 80%;
  max-width: 600px;
  padding: 20px;
  background-color: #ffffff;
  border-radius: 8px;
  box-shadow: 0 4px 8px rgba(0, 0, 0, 0.1);
}

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}

section {
  margin-bottom: 30px;
}

h2 {
  font-size: 24px;
  margin-bottom: 15px;
}

label {
  margin-right: 10px;
  font-weight: bold;
}

input[type="color"],
input[type="number"] {
  margin-bottom: 10px;
  padding: 8px;
  border: 1px solid #ccc;
  border-radius: 4px;
}

button {
  padding: 10px 20px;
  background-color: #28a745;
  color: white;
  border: none;
  border-radius: 4px;
  cursor: pointer;
}

button:hover {
  background-color: #218838;
}

.gradient-box {
  height: 150px;
  margin-top: 20px;
  border: 1px solid #ddd;
  background-size: cover;
}

#factorial-output {
  margin-top: 10px;
  font-size: 18px;
  font-weight: bold;
  color: #333;
}

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/////*****.JS*****/

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// Gradient Generator Function
function generateGradient() {
  const color1 = document.getElementById('color1').value;
  const color2 = document.getElementById('color2').value;
  const angle = document.getElementById('angle').value;

  const gradient = `linear-gradient(${angle}deg, ${color1}, ${color2})`;

  document.getElementById('gradient-output').style.background = gradient;
}

```

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}

// Factorial Calculation
function calculateFactorial() {
  const number = document.getElementById('number').value;
  const outputDiv = document.getElementById('factorial-output');

  if (number === '' || number < 0 || isNaN(number)) {
    outputDiv.textContent = 'Please enter a valid positive integer.';
    return;
  }

  const num = parseInt(number);
  const iterativeResult = factorialIterative(num);
  const recursiveResult = factorialRecursive(num);

  outputDiv.innerHTML = `
    <p>Factorial (Iterative Method): ${iterativeResult}</p>
    <p>Factorial (Recursive Method): ${recursiveResult}</p>
  `;
}

// Iterative Factorial
function factorialIterative(n) {
  let result = 1;
  for (let i = 1; i <= n; i++) {
    result *= i;
  }
  return result;
}

// Recursive Factorial
function factorialRecursive(n) {
  if (n === 0 || n === 1) {
    return 1;
  }
  return n * factorialRecursive(n - 1);
}

```