

Recursion Task

```
<!DOCTYPE html>
<html>
<head>
  <title>Recursion Tasks</title>
</head>
<body>
  <script>
    // Task-1
    function factorial(n) {
      if (n === 0 || n === 1) return 1;
      return n * factorial(n - 1);
    }
    console.log("Factorial :", factorial(5));

    // Task 2:
    function fibonacci(n) {
      if (n === 0) return 0;
      if (n === 1) return 1;
      return fibonacci(n - 1) + fibonacci(n - 2);
    }
    console.log("nth Fibonacci number:", fibonacci(5));

    // Task 3:
    function climbStairs(n) {
      if (n === 0) return 1;
      if (n < 0) return 0;
      return climbStairs(n - 1) + climbStairs(n - 2) + climbStairs(n - 3);
    }
    console.log("Ways to climb 4 steps:", climbStairs(4));

    // Task 4:
    function flattenArray(arr) {
      let result = [];
      for (let element of arr) {
        if (Array.isArray(element)) {
          result = result.concat(flattenArray(element));
        } else {
          result.push(element);
        }
      }
      return result;
    }
    console.log("Flattened array:", flattenArray([1, [2, [3, 4], 5], 6]));

    // Task 5:
    function towerOfHanoi(n, fromRod, toRod, auxRod) {
      if (n === 1) {
        console.log(`Move disk 1 from ${fromRod} to ${toRod}`);
        return;
      }
      towerOfHanoi(n - 1, fromRod, auxRod, toRod);
      console.log(`Move disk ${n} from ${fromRod} to ${toRod}`);
      towerOfHanoi(n - 1, auxRod, toRod, fromRod);
    }
    towerOfHanoi(3, 'A', 'C', 'B');

  </script>
</body>
</html>
```

JSON TASKS

```
<!DOCTYPE html>
<html>
<head>
</head>
<body>
  <h1>JSON and Spread Syntax Tasks</h1>
  <script>
    // Task 1:
    function sumAll(...args) {
      return args.reduce((sum, num) => sum + num, 0);
    }
    console.log("Sum of numbers:", sumAll(1, 2, 3, 4, 5));
  </script>

  <script>
    // Task 2:
    function sumArray(numbers) {
      return sumAll(...numbers);
    }
    console.log(" Sum of array:", sumArray([1, 2, 3, 4, 5]));
  </script>

  <script>
    // Task 3:
    function deepClone(obj) {
      return JSON.parse(JSON.stringify(obj));
    }
    const originalObject = { a: 1, b: { c: 2, d: 3 } };
    const clonedObject = deepClone(originalObject);
    console.log(" Original Object:", originalObject);
    console.log(" Cloned Object:", clonedObject);
  </script>

  <script>
    // Task 4:
    function mergeObjects(obj1, obj2) {
      return { ...obj1, ...obj2 };
    }
    const object1 = { a: 1, b: 2 };
    const object2 = { b: 3, c: 4 };
    const mergedObject = mergeObjects(object1, object2);
    console.log(" Merged Object:", mergedObject);
  </script>

  <script>
    // Task 5:
    const jsObject = { name: "John", age: 30 };
    const jsonString = JSON.stringify(jsObject);
    const parsedObject = JSON.parse(jsonString);
    console.log(" JSON String:", jsonString);
    console.log(" Parsed Object:", parsedObject);
  </script>
</body>
</html>
```