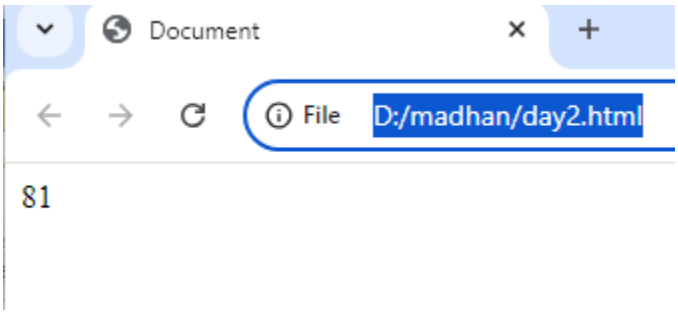
RECURSION AND STACK:

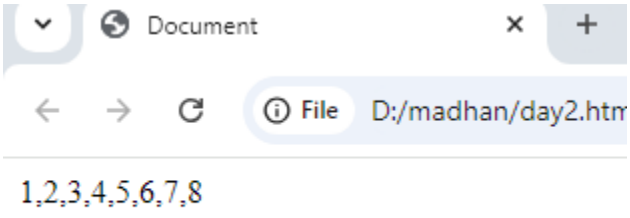
TASK 3:

```html
<!DOCTYPE html>
<html lang="en">

<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Document</title>
</head>

<body>
    <script>
        function noofways(n) {
            if (n == 0) {
                return 1;
            } else if (n < 0) {
                return 0;

            }
            return noofways(n - 1) + noofways(n - 2) + noofways(n - 3);
        }
        document.writeln(noofways(8));
    </script>
</body>

</html>
```



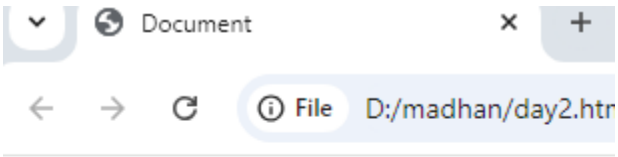
TASK 4:

```html
<!DOCTYPE html>
<html lang="en">

<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Document</title>
</head>

<body>
    <script>
        function flatten(arr) {
            let result = [];

            for (let i = 0; i < arr.length; i++) {
                if (Array.isArray(arr[i])) {
                    result = result.concat(flatten(arr[i]));
                } else {
                    result.push(arr[i]);
                }
            }

            return result;
        }
        document.writeln(flatten([1, 2, 3, [4, 5, 6], 7, 8]));
    </script>
</body>

</html>
```



TASK 5:

```
<!DOCTYPE html>
<html lang="en">

<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Document</title>
</head>

<body>
    <script>
        function towerofhanoi(n, rod1, rod2, rod3) {
            if (n === 1) {
                document.writeln(`move disk1 from ${rod1} to ${rod2}` + "<br>");
                return;
            }
            towerofhanoi(n - 1, rod1, rod3, rod2);
            document.writeln(`move disk ${n} from ${rod1} to ${rod2}` + "<br>");
            towerofhanoi(n - 1, rod3, rod2, rod1);

        }
        var n = 3;
        towerofhanoi(n, 'a', 'b', 'c');
    </script>
</body>

</html>
```

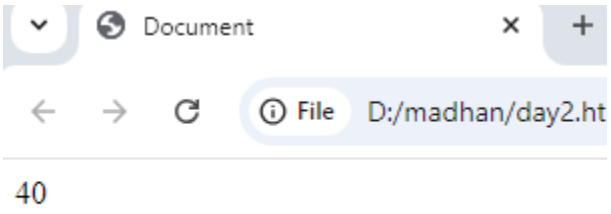


move disk1 from a to b
move disk 2 from a to c
move disk1 from b to c
move disk 3 from a to b
move disk1 from c to a
move disk 2 from c to b
move disk1 from a to b

JSON AND VARIABLE LENGTH ARGUMENTS/SPREAD :

TASK1:

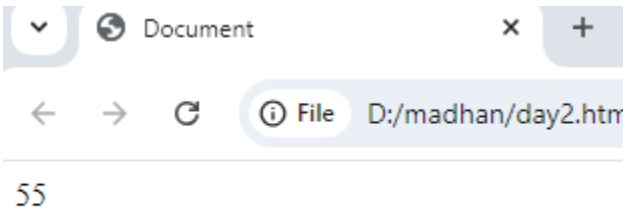
```
<!DOCTYPE html>
<html lang="en">

<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Document</title>
</head>

<body>
    <script>
        function add(...arr) {
            return arr.reduce((sum, carry) => sum + carry, 0);
        }
        document.writeln(add(4, 7, 8, 10, 11));
    </script>
</body>

</html>
```



TASK 2:

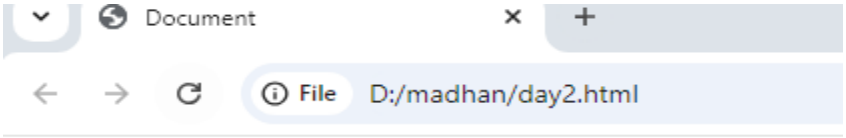
```
<!DOCTYPE html>
<html lang="en">

<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Document</title>
</head>

<body>
```

```
    <script>
        function add(...arr) {
            return arr.reduce((sum, carry) => sum + carry, 0);
        }
        function num(number) {
            return add(...number);
        }
        document.writeln(num([4, 7, 8, 10, 11, 15]));
    </script>
</body>

</html>
```



TASK 3:

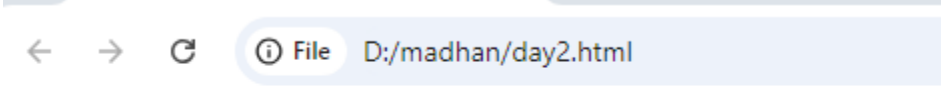
```
<!DOCTYPE html>
<html lang="en">

<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Document</title>
</head>

<body>
    <script>
        const employee = {
            Id: 1498,
            name: "madhan",
            age: 34,
            dept: "production"
        };
        let a = { ...employee }
        document.writeln(JSON.stringify(a));
    </script>
</body>

</html>
```



{"Id":1498,"name":"madhan","age":34,"dept":"production"}

TASK 4;

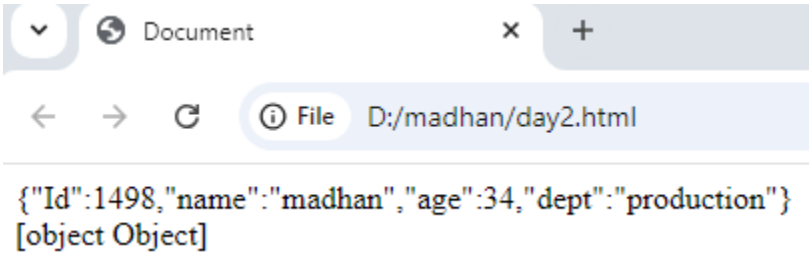
```html
<!DOCTYPE html>
<html lang="en">

<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Document</title>
</head>

<body>
    <script>
        const employee1 = {
            Id: 1498,
            name: "madhan",
            age: 34,
            dept: "production"
        };
        const employee2 = {
            Id: 1278,
            age: 27,
            dept: "sales",
            salary:60000
        };
        let a = { ...employee1, ...employee2 }
        document.writeln(JSON.stringify(a));
    </script>
</body>

</html>
```



{"Id":1278,"name":"madhan","age":27,"dept":"sales","salary":60000}

TASK 5:

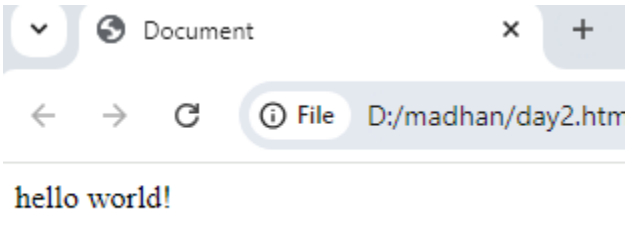
```html
<!DOCTYPE html>
<html lang="en">

<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Document</title>
</head>

<body>
    <script>
        const employee = {
            Id: 1498,
            name: "madhan",
            age: 34,
            dept: "production"
        };
        let a = JSON.stringify({ ...employee });
        document.writeln(a + "<br>");
        let b = JSON.parse(a);
        document.writeln(b);
    </script>
</body>

</html>
```



CLOSURE:

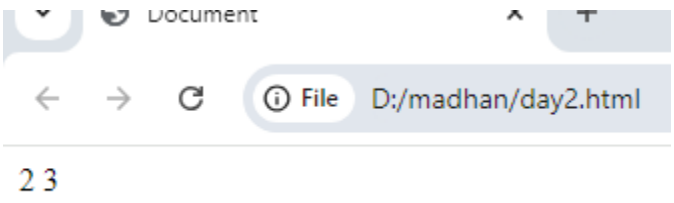
TASK 1:

```
<!DOCTYPE html>
<html lang="en">

<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Document</title>
</head>

<body>
    <script>
        function a() {
            let b = "world!";
            return {
                c: function () {
                    document.writeln(`hello ${b}`);

                }
            }
        }
        (a().c());
    </script>
</body>

</html>
```



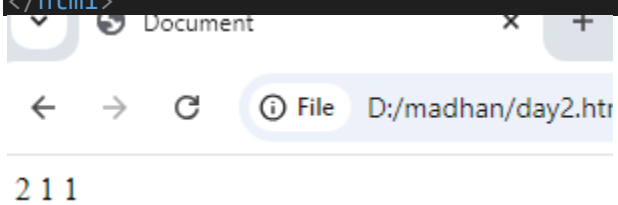
TASK 2:

```html
<!DOCTYPE html>
<html lang="en">

<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Document</title>
</head>

<body>
    <script>
        function counter() {
            let count = 0;
            return {
                increment: function () {
                    count++;
                },
                display: function () {
                    document.writeln(count);

                }
            };
        }
        const result = counter();

        result.increment();
        result.increment();
        result.display();

        result.increment();
        result.display();
    </script>
</body>

</html>
```



TASK 3:

```html
<!DOCTYPE html>
<html lang="en">

<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Document</title>
</head>

<body>
    <script>
        function counter() {
            let count = 0;
            return {
                increment: function () {
                    count++;
                },
                display: function () {
                    document.writeln(count);

                }
            };
        }
        const result1 = counter();
        const result2 = counter();
        const result3 = counter();
        result1.increment();
        result1.increment();
        result1.display();
        result2.increment();
        result2.display();
        result3.increment();
        result3.display();
    </script>
</body>

</html>
```



2 1 1