

## Lesson 04 Demo 07

# Demonstrating Array Mutability, Immutability, and Advanced Destructuring

**Objective:** To demonstrate advanced array operations in JavaScript, including mutability, immutability, and destructuring for optimized code efficiency

**Tools required:** Visual Studio Code and Node.js

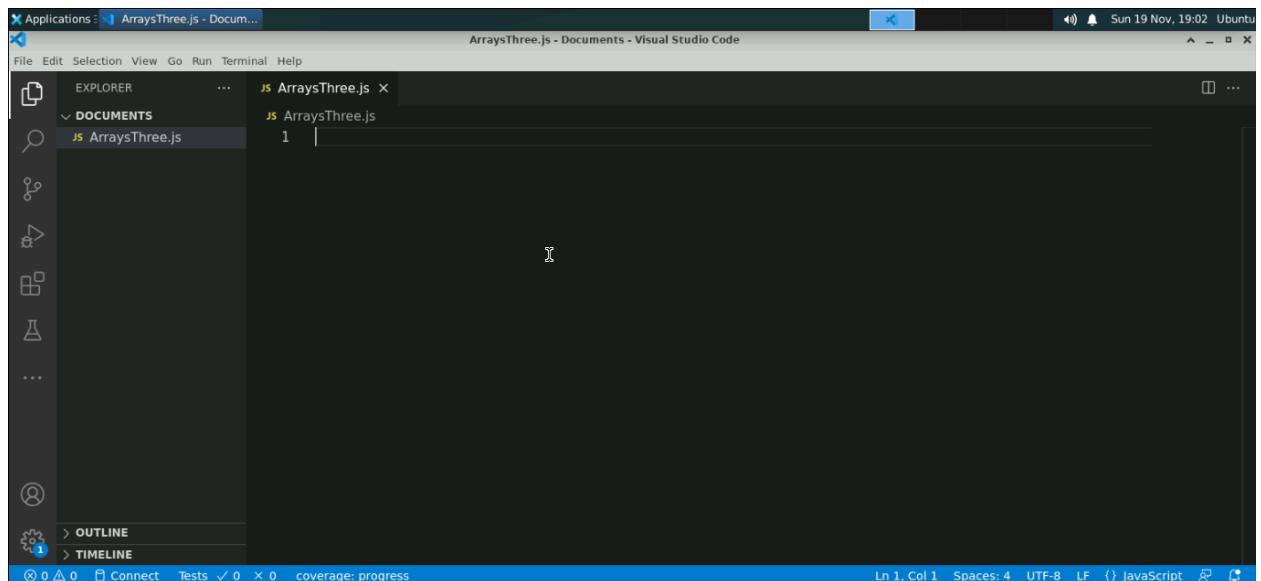
**Prerequisites:** A basic understanding of array mutability, immutability, and destructuring in JavaScript

Steps to be followed:

1. Create and execute the JS file

### Step 1: Create and execute the JS file

- 1.1 Open the Visual Studio Code editor and create a JavaScript file named **ArraysThree.js**



1.2 Add the following code to the **ArraysThree.js** file:

```
// Array Mutability
// Initialize an array for mutability operations:

let mutableArray = [1, 2, 3, 4, 5];
console.log("Mutable Array:", mutableArray);

// Modify elements in the array:

mutableArray[2] = 10;
console.log("Modified Array (Element at Index 2 changed to 10):", mutableArray);

// Change the length of the array:

mutableArray.length = 3;
console.log("Array after changing length to 3:", mutableArray);

// Add elements to the end of the array:

mutableArray.push(6, 7);
console.log("Array after adding elements to the end:", mutableArray);

// Remove elements from the end of the array:

mutableArray.pop();
console.log("Array after removing the last element:", mutableArray);

console.log("Mutable Array:", mutableArray);

// Array Immutability
// Initialize an array for immutability operations:

let immutableArray = [1, 2, 3, 4, 5];
console.log("Immutable Array:", immutableArray);

// Create a new array using array methods:

let newArray = immutableArray.map(item => item * 2);
console.log("New Array using map method:", newArray);

// Avoid direct mutations:

let withoutModification = [...immutableArray, 6, 7];
```

```
console.log("New Array without direct modification:", withoutModification);

// Use array methods returning new arrays:

let filteredArray = immutableArray.filter(item => item > 2);
console.log("Filtered Array using filter method:", filteredArray);

console.log("Immutable Array:", immutableArray);

// Advanced Array Destructuring
// Initialize an array for advanced destructuring operations:

let advancedDestructuringArray = [10, 20, 30, 40, 50];
console.log("Advanced Destructuring Array:", advancedDestructuringArray);

// Perform basic array destructuring:

let [first, second, ...rest] = advancedDestructuringArray;
console.log("Destructured Variables - First:", first, "Second:", second, "Rest:", rest);

// Implement nested destructuring:

let [x, [y, z]] = [1, [2, 3]];
console.log("Nested Destructuring - X:", x, "Y:", y, "Z:", z);

// Ignore the rest elements during destructuring:

let [a, , b] = advancedDestructuringArray;
console.log("Ignoring Rest Elements - A:", a, "B:", b);

// Set default values during destructuring:

let [c, d = 0, e = 0] = [10];
console.log("Destructured Variables with Default Values - C:", c, "D:", d, "E:", e);

// Swap variables using destructuring:

let f = 5, g = 10;
[f, g] = [g, f];
console.log("Swapped Variables - F:", f, "G:", g);

// Utilize destructuring in function parameters:
```

```
function multiply({ a, b }) {
  return a * b;
}
```

```
console.log("Function Parameter Destructuring Result:", multiply({ a: 3, b: 4 }));
```

```
// Validation
```

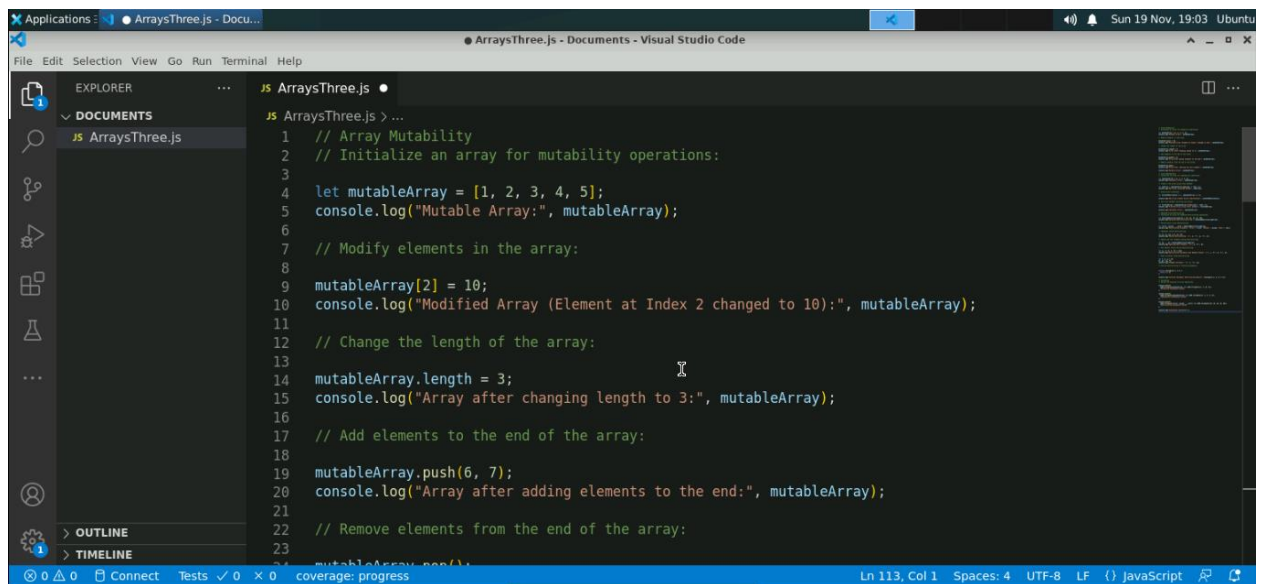
```
// Verify the accuracy of array operations:
```

```
console.assert(
  JSON.stringify(mutableArray) === JSON.stringify([1, 2, 10, 6]),
  "Mutability Validation Failed"
);
```

```
console.assert(
  JSON.stringify(immutableArray) === JSON.stringify([1, 2, 3, 4, 5]),
  "Immutability Validation Failed"
);
```

```
console.assert(
  JSON.stringify([first, second, ...rest]) === JSON.stringify([10, 20, 30, 40, 50]),
  "Destructuring Validation Failed"
);
```

```
console.log("Validation Successful!");
```



```

1  Applications: [x] ArraysThree.js - Docu...
2  ArraysThree.js - Documents - Visual Studio Code
3  File Edit Selection View Go Run Terminal Help
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6  JS ArraysThree.js
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8  92 console.log("Function Parameter Destructuring Result:", multiply({ a: 3, b: 4 }));
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94 // Validation
95 // Verify the accuracy of array operations:
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