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Lesson 03 Demo 05

Implementing Arrays Methods

Objective: To implement the practical application of JavaScript array properties, methods, and iterators by initializing, manipulating, and iterating through an array, ensuring a clear understanding of array operations and their correctness

Tools required: Visual Studio Code and Node.js

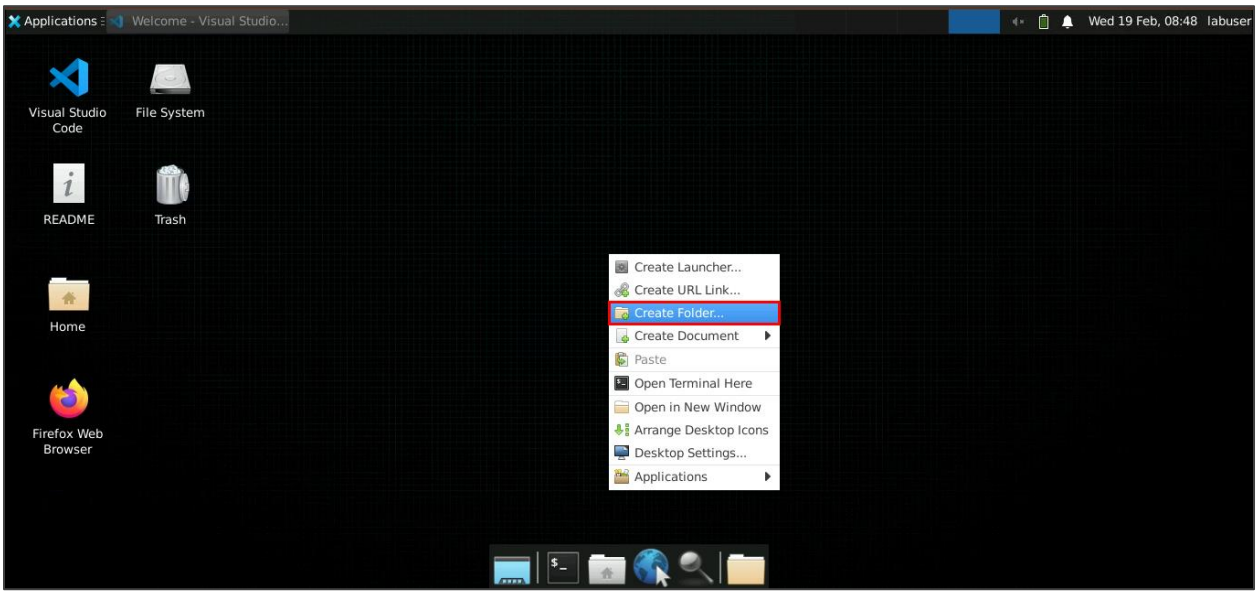
Prerequisites: A basic understanding of array properties, methods, and loops in JavaScript

Steps to be followed:

1. Create a folder named ArraysOne
2. Execute the JavaScript file

Step 1: Create a folder named ArraysOne

1.1 Right-click on the desktop and click on **Create Folder…**



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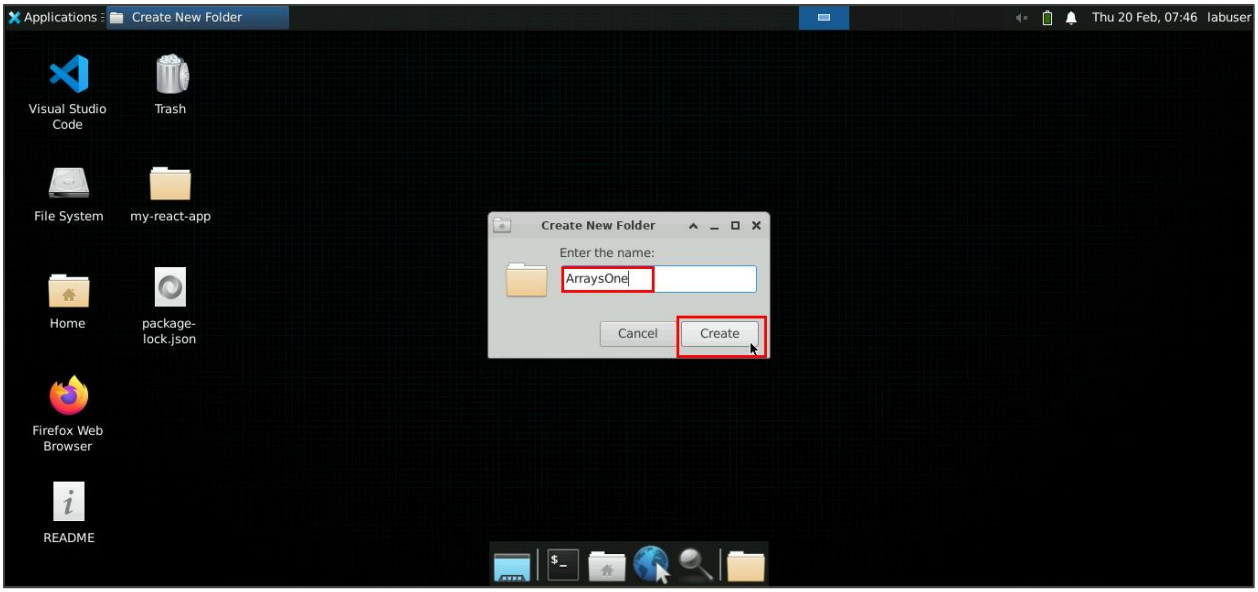
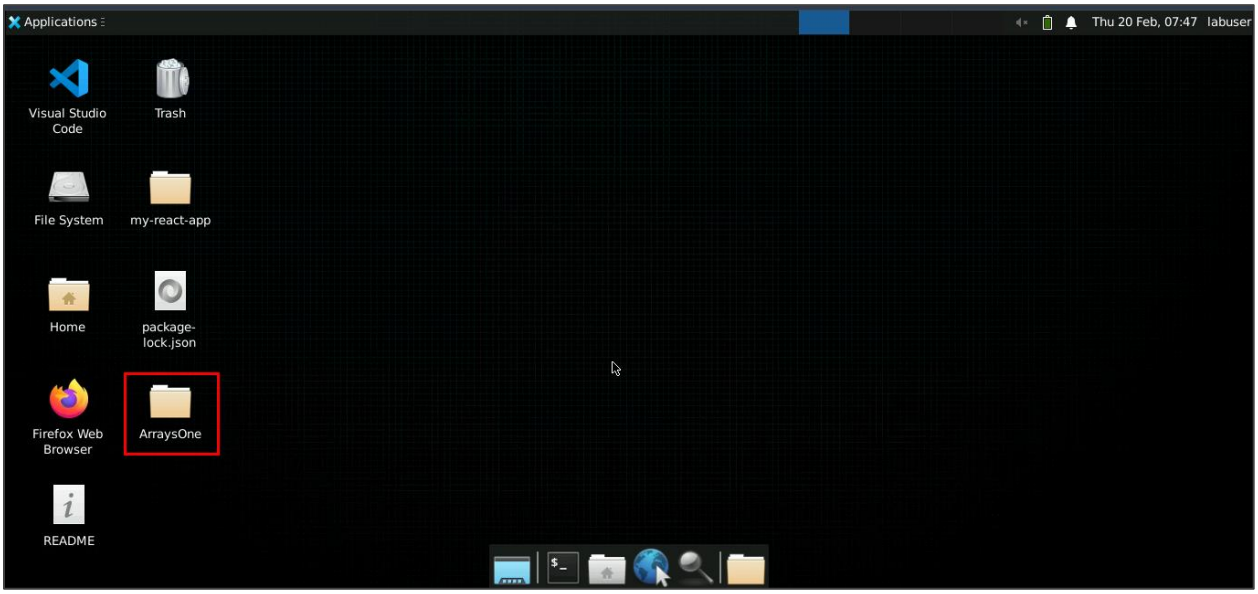
1.2 Enter the name as **ArraysOne** and click on **Create**



The **ArraysOne** folder gets created as shown below:



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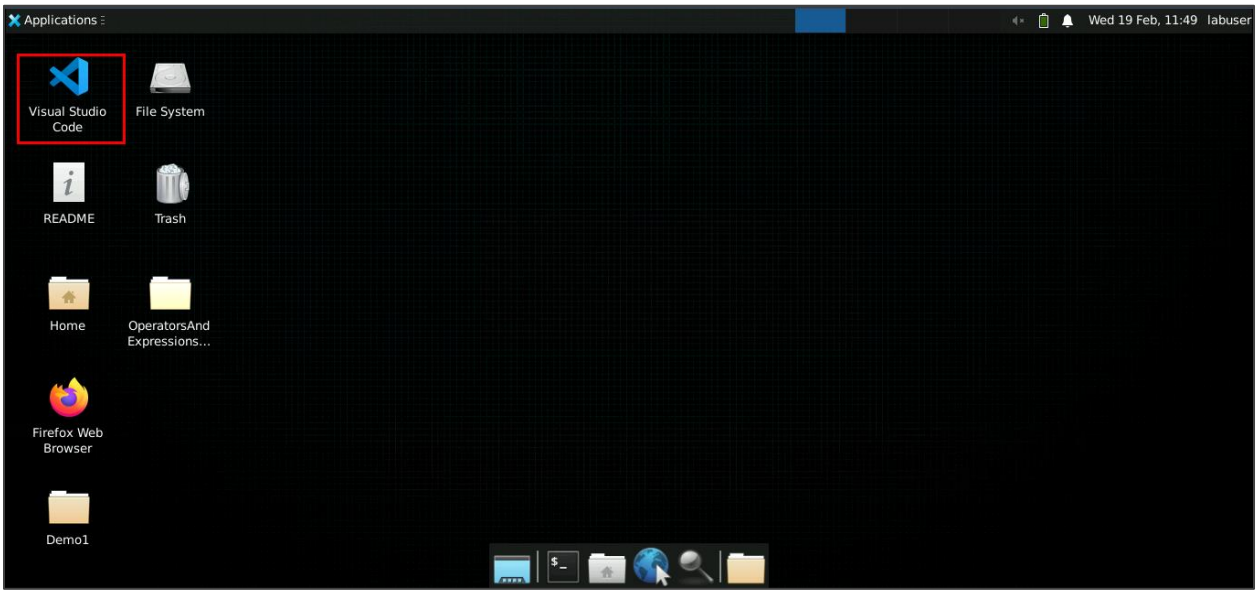
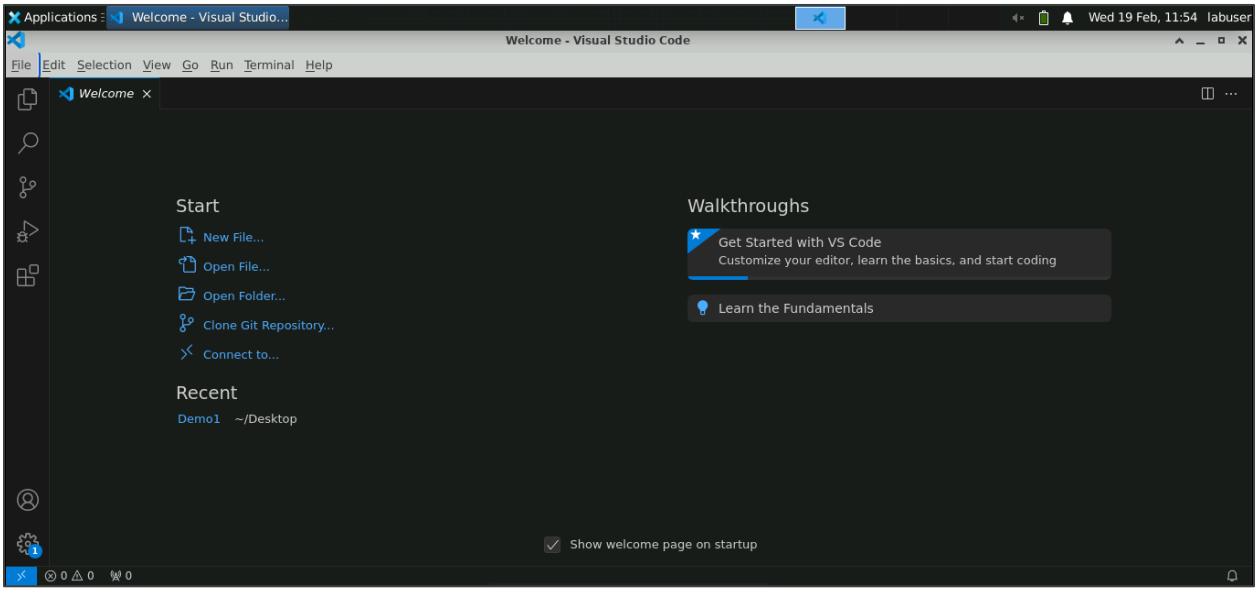
Step 2: Execute the JavaScript file

2.1 Double-click on the **Visual Studio Code** icon to open it



The **Visual Studio Code** opens as shown below:



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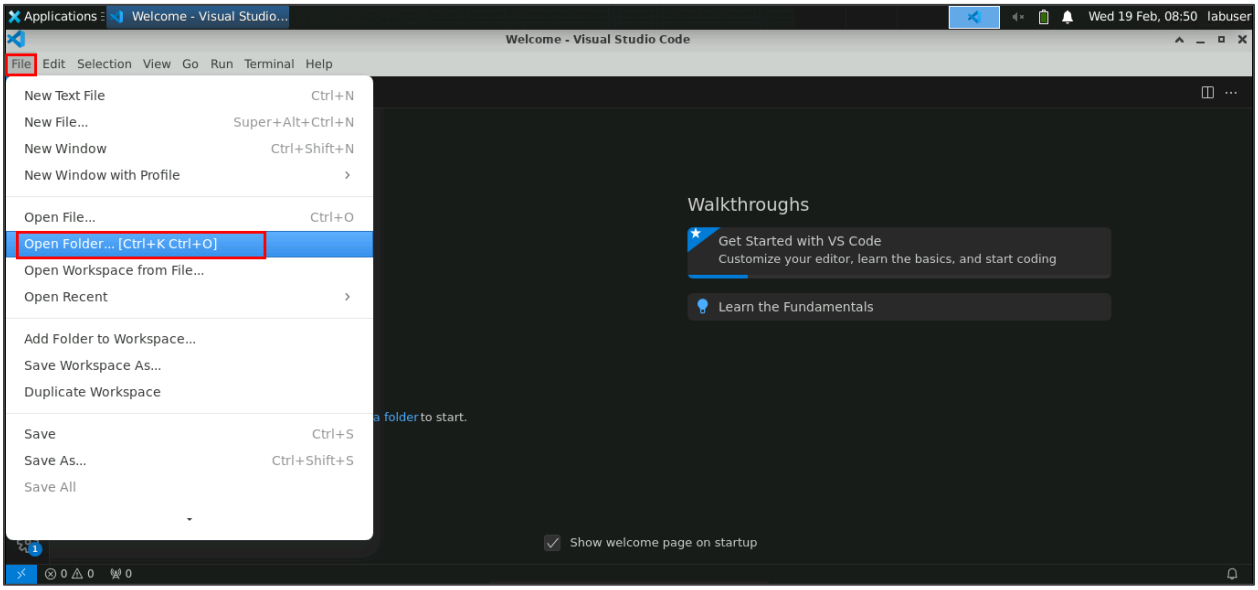
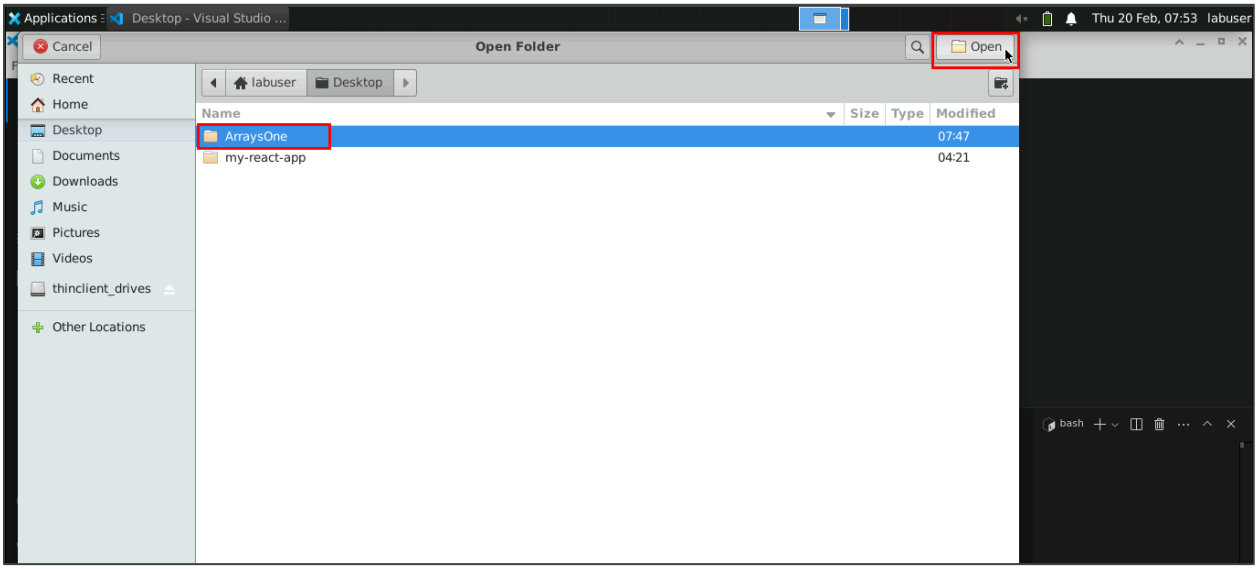
2.2 Click on **File**, then click on **Open Folder…**



2.3 Select the **ArraysOne** folder and click on the **Open** icon to open the folder in Visual Studio Code



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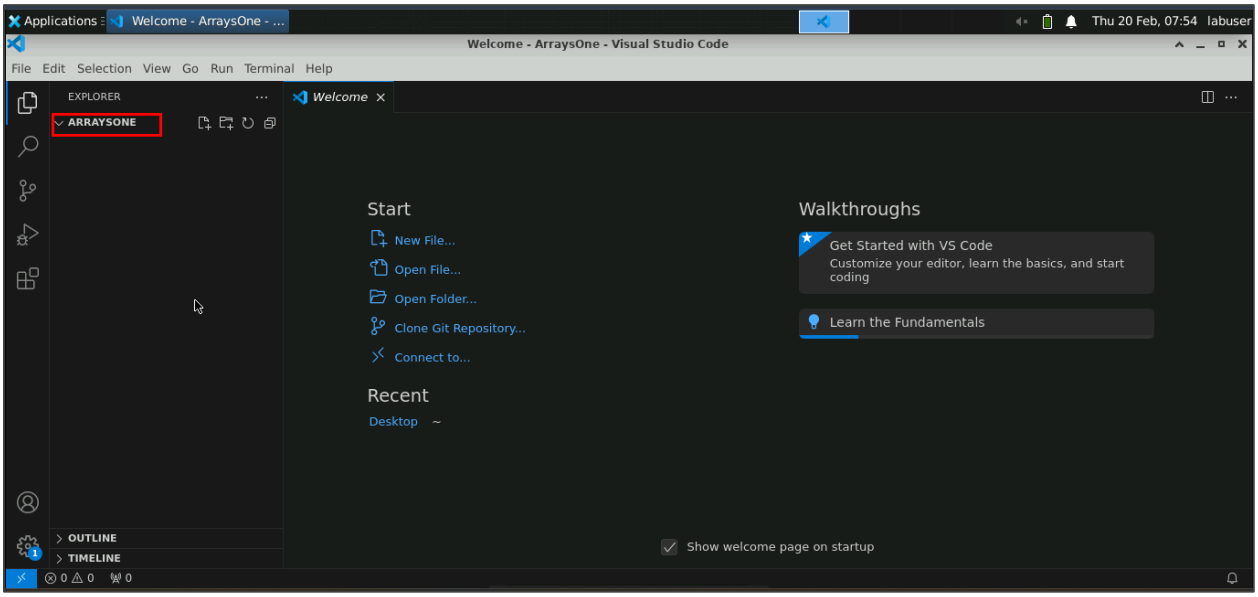
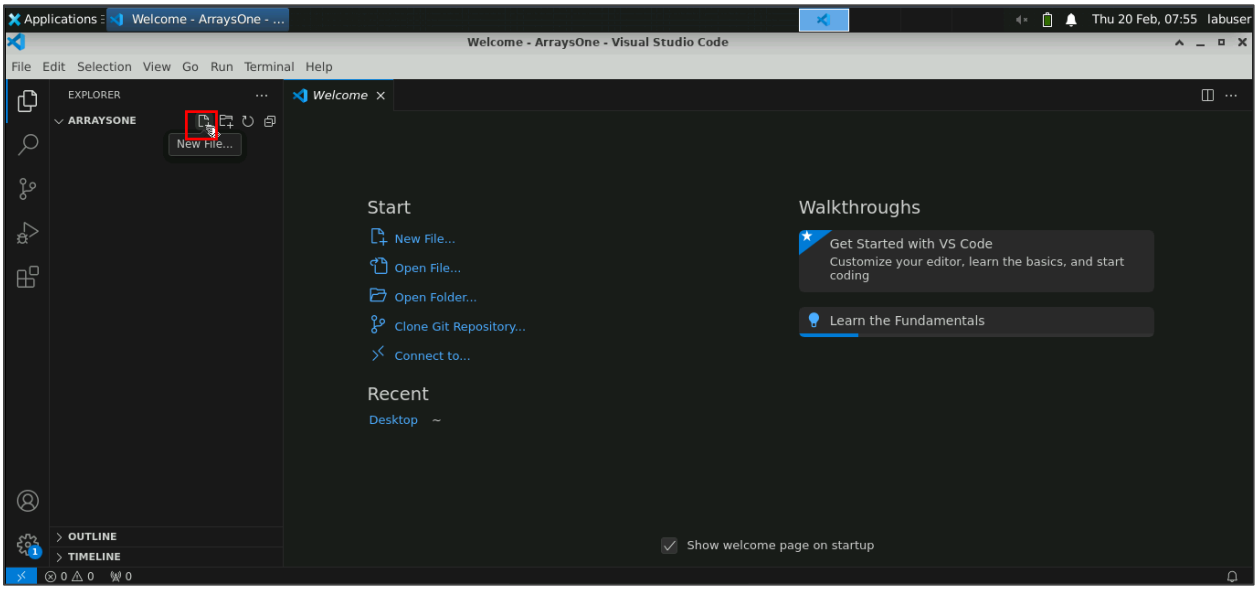
The folder opens in **Visual Studio Code** as shown below:



2.4 Click on the **File** icon to create a new file named **ArraysOne.js**



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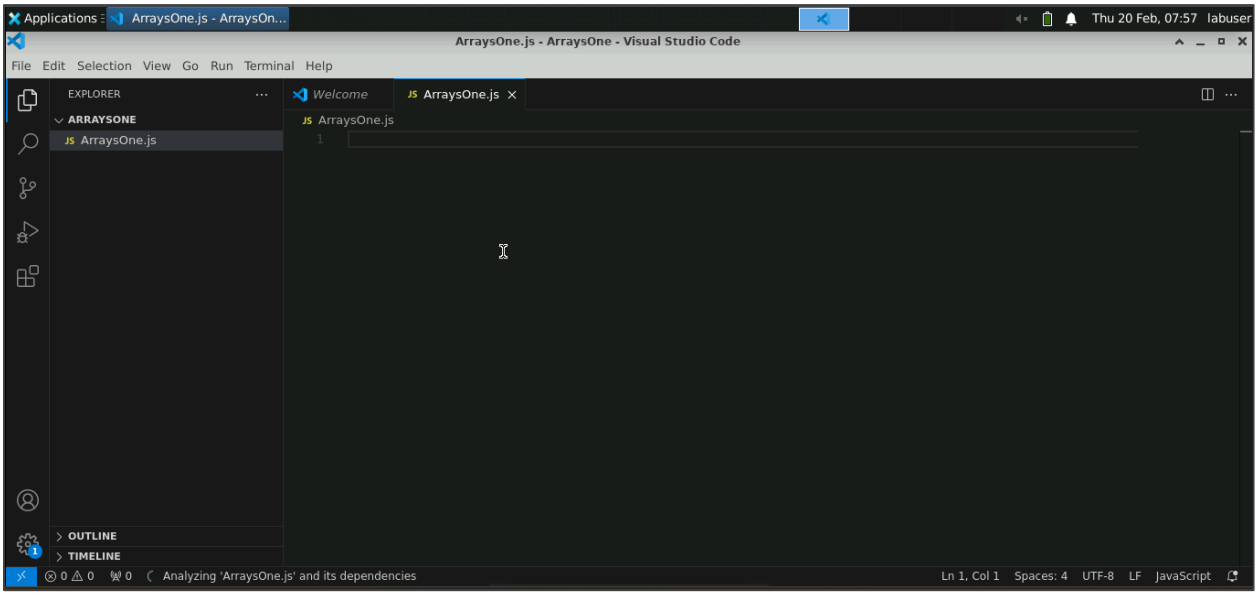
The file gets created as shown below:



2.5 Enter the code below and save the file:

```
// Explore Array Properties
// Initialize an array and highlight the length property:
let myArray = [1, 2, 3, 4, 5];
console.log("Array Length:", myArray.length);

// Display the array's constructor property:

console.log("Array Constructor:", myArray.constructor);

// Access the prototype property of the array:

console.log("Array Prototype:", myArray.constructor.prototype);

//Utilize Array Methods
//Demonstrate the push method to add elements to the end of the array:

myArray.push(6, 7);
console.log("Array after push:", myArray);

// Use the pop method to remove the last element:

let poppedElement = myArray.pop();
console.log("Popped Element:", poppedElement);
console.log("Array after pop:", myArray);
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```
// Apply the shift method to remove the first element:

let shiftedElement = myArray.shift();
console.log("Shifted Element:", shiftedElement);
console.log("Array after shift:", myArray);

// Utilize the unshift method to add elements to the beginning of the array:

myArray.unshift(0, -1);
console.log("Array after unshift:", myArray);

// Create a new array and demonstrate the concat method to merge arrays:

let anotherArray = [8, 9, 10];
let mergedArray = myArray.concat(anotherArray);
console.log("Merged Array:", mergedArray);

// Use the join method to convert the array elements into a string:

let joinedString = myArray.join(" | ");
console.log("Joined String:", joinedString);

// Employ the slice method to extract a portion of the array:

let slicedArray = mergedArray.slice(2, 6);
console.log("Sliced Array:", slicedArray);

// Highlight the splice method to add and remove elements at a specific position:

let splicedElements = mergedArray.splice(2, 3, "a", "b", "c");
console.log("Spliced Elements:", splicedElements);
console.log("Array after splice:", mergedArray);

// Implement Iterator Methods

// Use a traditional for-loop to iterate through the array:

console.log("For-Loop Iteration:");
for (let i = 0; i < mergedArray.length; i++) {
  console.log(mergedArray[i]);
}
// Apply the forEach method for a cleaner iteration:
console.log("forEach Iteration:");
mergedArray.forEach(element => {
```

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```
  console.log(element);
});

// Utilize the map method to transform array elements:

let squaredValues = mergedArray.map(element => element * element);
console.log("Squared Values:", squaredValues);

// Demonstrate the filter method to create a new array with selected elements:

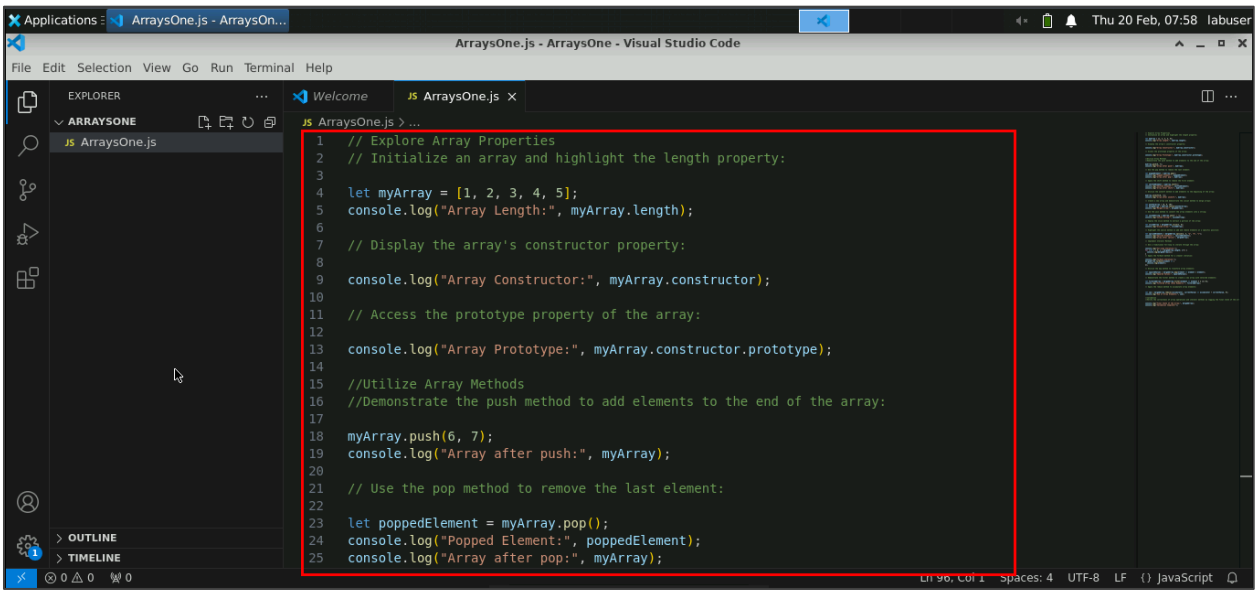
let filteredArray = mergedArray.filter(element => element % 2 === 0);
console.log("Filtered Array (Even Numbers):", filteredArray);

// Apply the reduce method to accumulate array elements:


let sum = mergedArray.reduce((accumulator, currentValue) => accumulator +
currentValue, 0);
console.log("Sum of Array Elements:", sum);

//validation
//Verify the correctness of array operations and iterator methods by logging the final
state of the array and the results of each method.

console.log("Final State of the Array:", mergedArray);
console.log("Validation Complete!");
```



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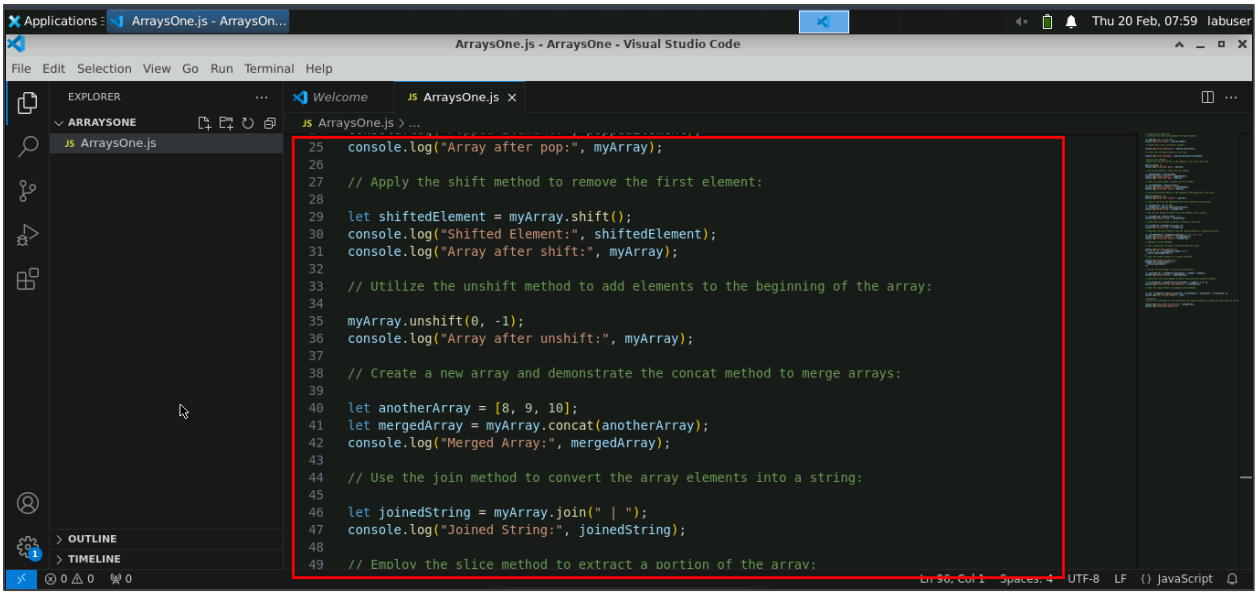
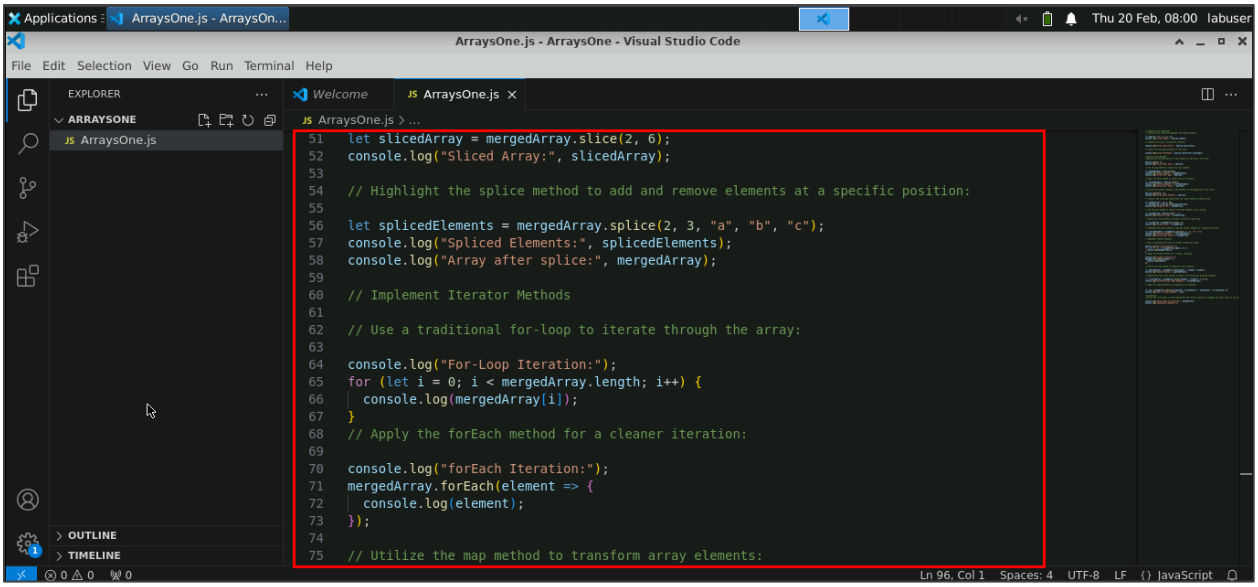

Applications
ArraysOne.js - ArraysOn...
Thu 20 Feb, 07:59 labuser
ArraysOne.js - ArraysOne - Visual Studio Code
File Edit Selection View Go Run Terminal Help
EXPLORER
ARRAYSONE
ArraysOne.js
Welcome
ArraysOne.js
ArraysOne.js > ...
25 console.log("Array after pop:", myArray);
26
27 // Apply the shift method to remove the first element:
28
29 let shiftedElement = myArray.shift();
30 console.log("Shifted Element:", shiftedElement);
31 console.log("Array after shift:", myArray);
32
33 // Utilize the unshift method to add elements to the beginning of the array:
34
35 myArray.unshift(0, -1);
36 console.log("Array after unshift:", myArray);
37
38 // Create a new array and demonstrate the concat method to merge arrays:
39
40 let anotherArray = [8, 9, 10];
41 let mergedArray = myArray.concat(anotherArray);
42 console.log("Merged Array:", mergedArray);
43
44 // Use the join method to convert the array elements into a string:
45
46 let joinedString = myArray.join(" | ");
47 console.log("Joined String:", joinedString);
48
49 // Employ the slice method to extract a portion of the array:
OUTLINE
TIMELINE
Ln 96, Col 1 Spaces: 4 UTF-8 LF JavaScript


Applications
ArraysOne.js - ArraysOn...
Thu 20 Feb, 08:00 labuser
ArraysOne.js - ArraysOne - Visual Studio Code
File Edit Selection View Go Run Terminal Help
EXPLORER
ARRAYSONE
ArraysOne.js
Welcome
ArraysOne.js
ArraysOne.js > ...
51 let slicedArray = mergedArray.slice(2, 6);
52 console.log("Sliced Array:", slicedArray);
53
54 // Highlight the splice method to add and remove elements at a specific position:
55
56 let splicedElements = mergedArray.splice(2, 3, "a", "b", "c");
57 console.log("Spliced Elements:", splicedElements);
58 console.log("Array after splice:", mergedArray);
59
60 // Implement Iterator Methods
61
62 // Use a traditional for-loop to iterate through the array:
63
64 console.log("For-Loop Iteration:");
65 for (let i = 0; i < mergedArray.length; i++) {
66 console.log(mergedArray[i]);
67 }
68 // Apply the forEach method for a cleaner iteration:
69
70 console.log("forEach Iteration:");
71 mergedArray.forEach(element => {
72 console.log(element);
73 });
74
75 // Utilize the map method to transform array elements:
OUTLINE
TIMELINE
Ln 96, Col 1 Spaces: 4 UTF-8 LF JavaScript

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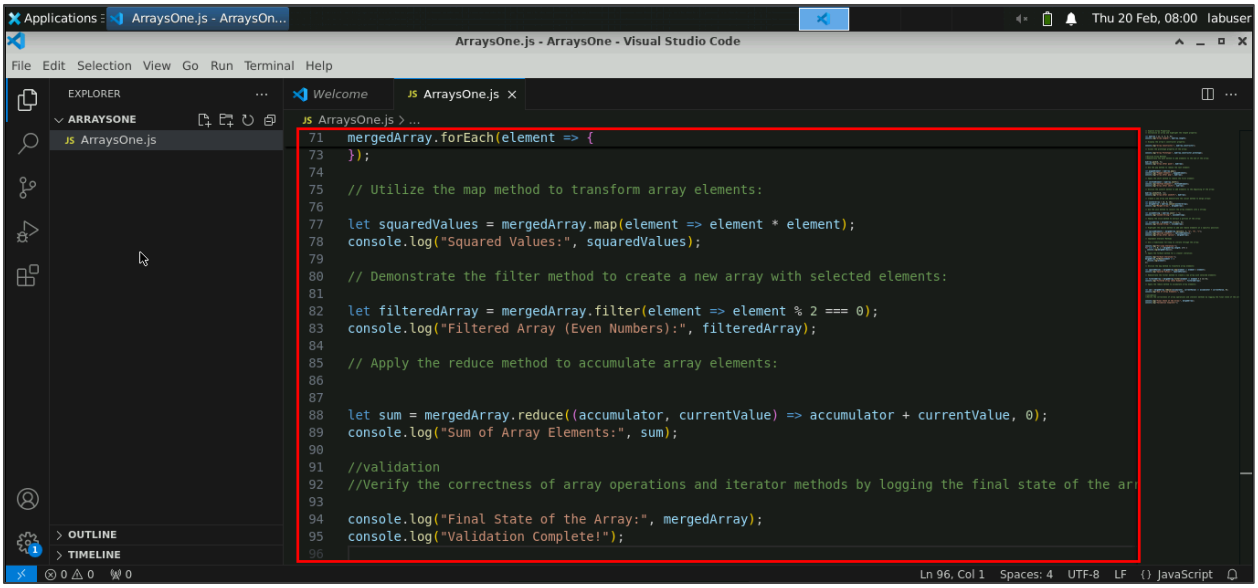
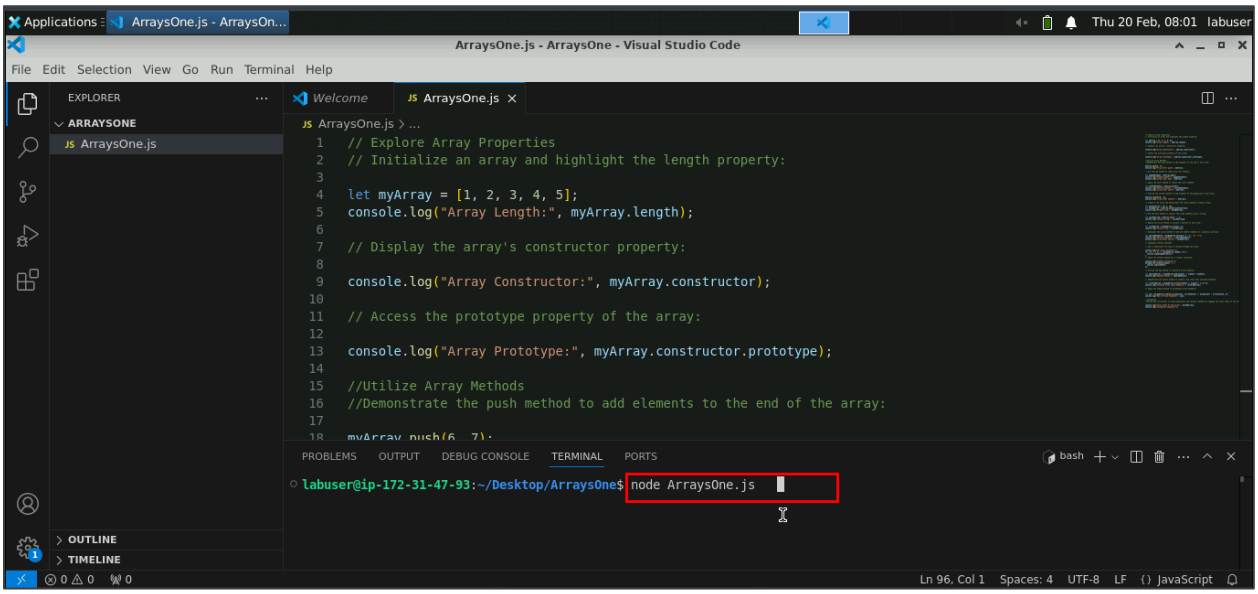


2.6 Save the file and run it using Node.js in the terminal:
node ArraysOne.js



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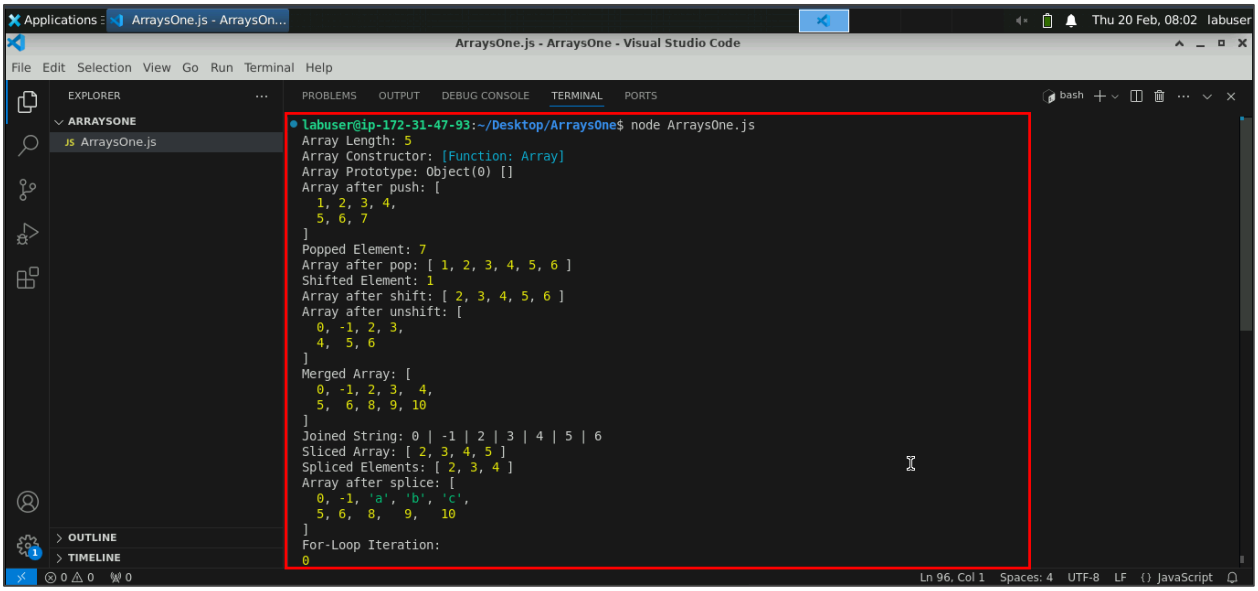
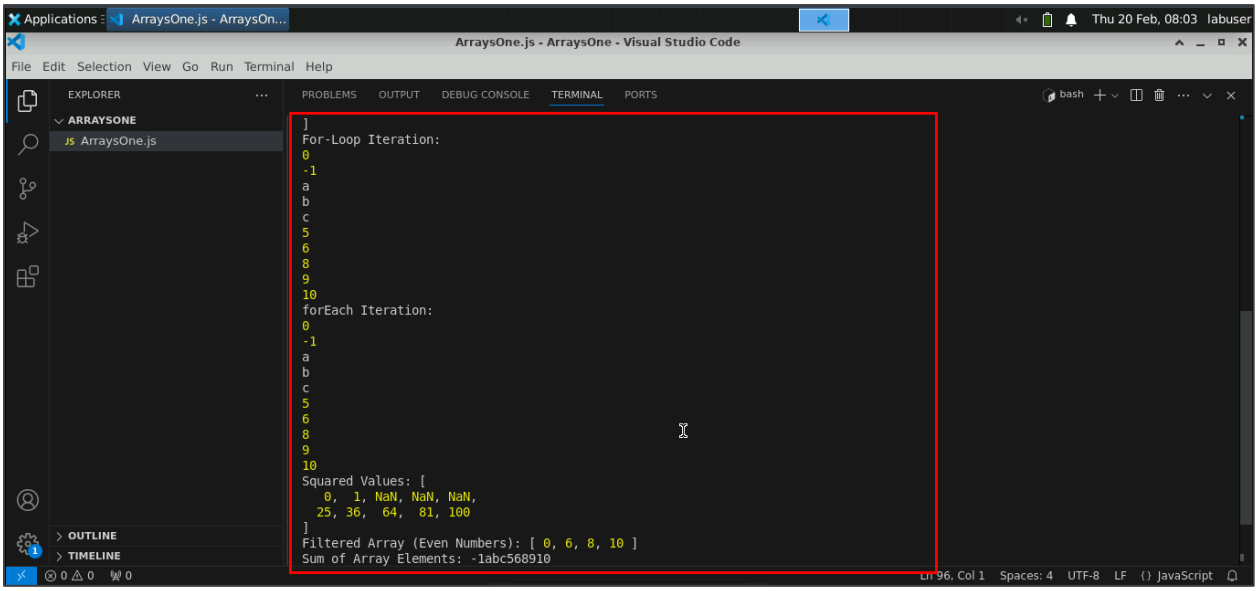

Applications
ArraysOne.js - ArraysOn...
Thu 20 Feb, 08:02 labuser
ArraysOne.js - ArraysOne - Visual Studio Code
File Edit Selection View Go Run Terminal Help
EXPLORER
ARRAYSONE
ArraysOne.js
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
bash
labuser@ip-172-31-47-93:~/Desktop/ArraysOne$ node ArraysOne.js
Array Length: 5
Array Constructor: [Function: Array]
Array Prototype: Object(0) []
Array after push: [
1, 2, 3, 4,
5, 6, 7
]
Popped Element: 7
Array after pop: [1, 2, 3, 4, 5, 6]
Shifted Element: 1
Array after shift: [2, 3, 4, 5, 6]
Array after unshift: [
0, -1, 2, 3,
4, 5, 6
]
Merged Array: [
0, -1, 2, 3, 4,
5, 6, 8, 9, 10
]
Joined String: 0 | -1 | 2 | 3 | 4 | 5 | 6
Sliced Array: [2, 3, 4, 5]
Spliced Elements: [2, 3, 4]
Array after splice: [
0, -1, 'a', 'b', 'c',
5, 6, 8, 9, 10
]
For-Loop Iteration:
0
OUTLINE
TIMELINE
Ln 96, Col 1 Spaces: 4 UTF-8 LF JavaScript


Applications
ArraysOne.js - ArraysOn...
Thu 20 Feb, 08:03 labuser
ArraysOne.js - ArraysOne - Visual Studio Code
File Edit Selection View Go Run Terminal Help
EXPLORER
ARRAYSONE
ArraysOne.js
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
bash
]
For-Loop Iteration:
0
-1
a
b
c
5
6
8
9
10
forEach Iteration:
0
-1
a
b
c
5
6
8
9
10
Squared Values: [
0, 1, NaN, NaN, NaN,
25, 36, 64, 81, 100
]
Filtered Array (Even Numbers): [0, 6, 8, 10]
Sum of Array Elements: -1abc568910
OUTLINE
TIMELINE
Ln 96, Col 1 Spaces: 4 UTF-8 LF JavaScript

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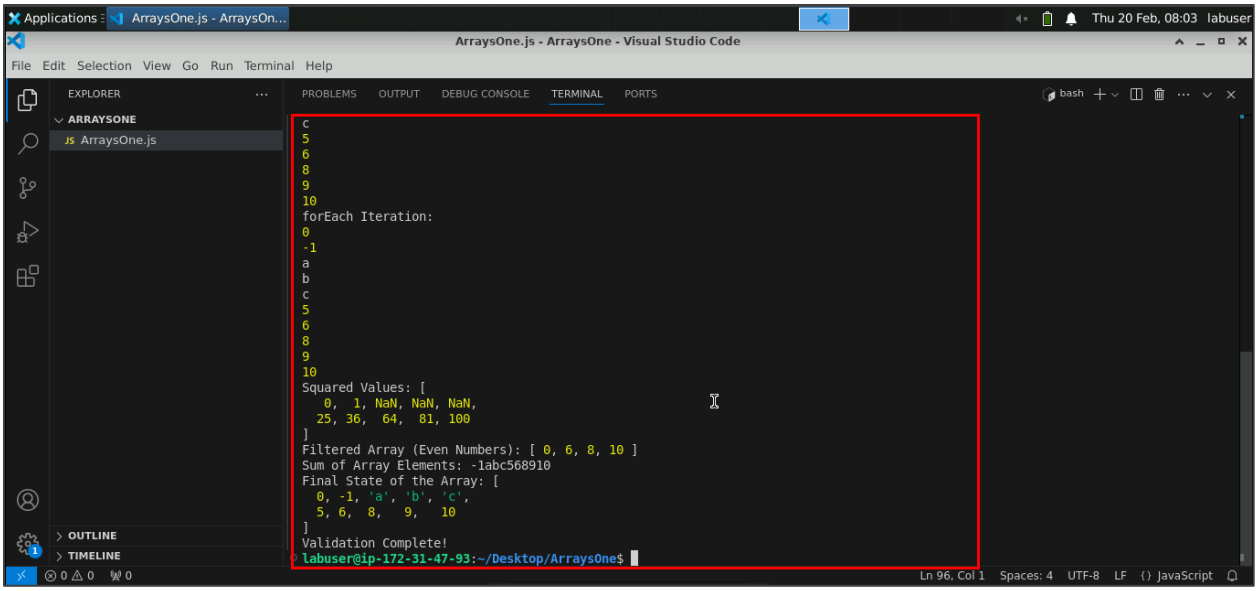

The code initializes, manipulates, and iterates through an array, highlighting properties such as length, constructor, and prototype. Essential array methods—including push, pop, shift, unshift, concat, join, slice, and splice—along with iterator methods such as forEach, map, filter, and reduce are demonstrated. The final state of the array and validation messages confirm the correctness of the operations.

By following these steps, you have successfully demonstrated the practical application of JavaScript array properties, methods, and iterators, enhancing your programming proficiency.