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Lesson 04 Demo 09

Implementing a Linear Search Algorithm

Objective: To use linear search in JavaScript for finding values in small or unsorted data, such as contact lists

Tools required: Visual Studio Code and Node.js

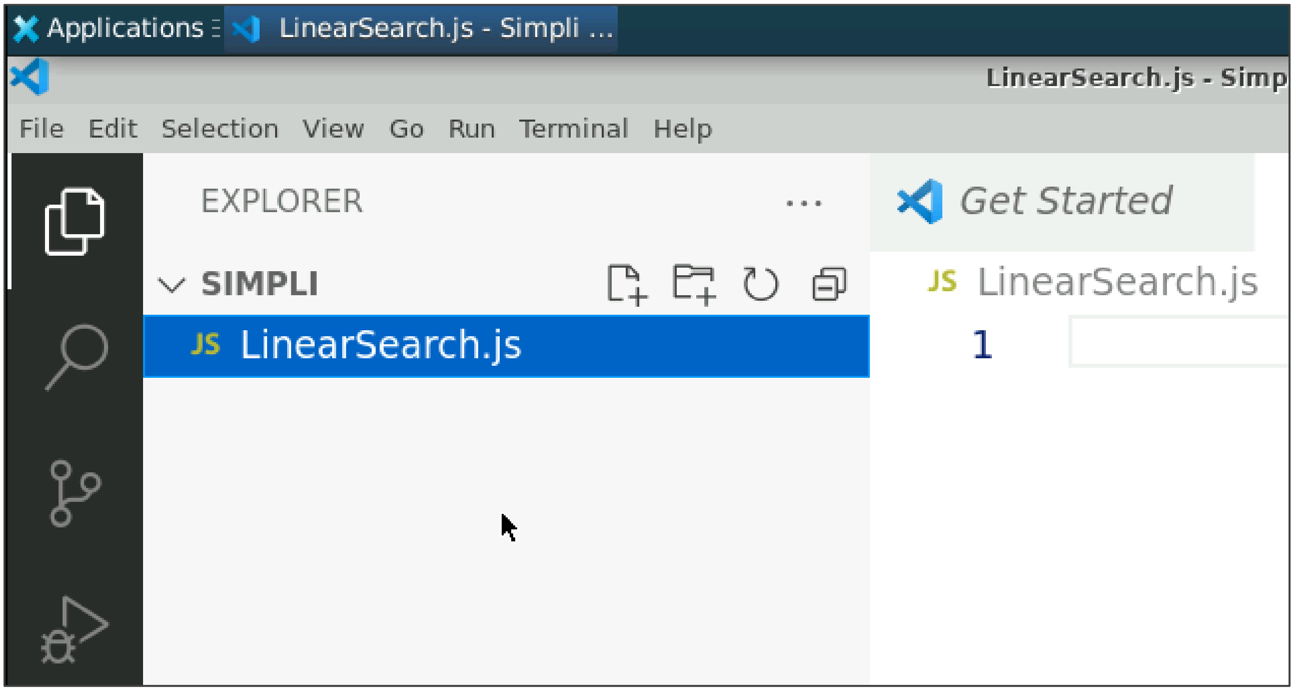
Prerequisites: Basic understanding of arrays and loops in JavaScript

Steps to be followed:

1. Create a JavaScript file and execute it

Step 1: Create a JavaScript file and execute it

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



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1.2 Add the following code to the file:

```
// Function to perform linear search on an array
// Time Complexity: O(n) - linear time complexity
//   In the worst case, the function may need to iterate through the entire array.
// Space Complexity: O(1) - constant space complexity
//   The function only uses a constant amount of extra space regardless of the input
size.

function linearSearch(arr, target) {
  for (let i = 0; i < arr.length; i++) {
   if (arr[i] === target) {
    return i;
   }
  }
  return -1;
 }

 // Example usage
 const arr = [1, 3, 5, 8, 9];

 // Measure the execution time of linearSearch function
 console.time("linearSearch");
 const index = linearSearch(arr, 5);
 console.timeEnd("linearSearch");

 // Output the result
 console.log("Index:", index);
```

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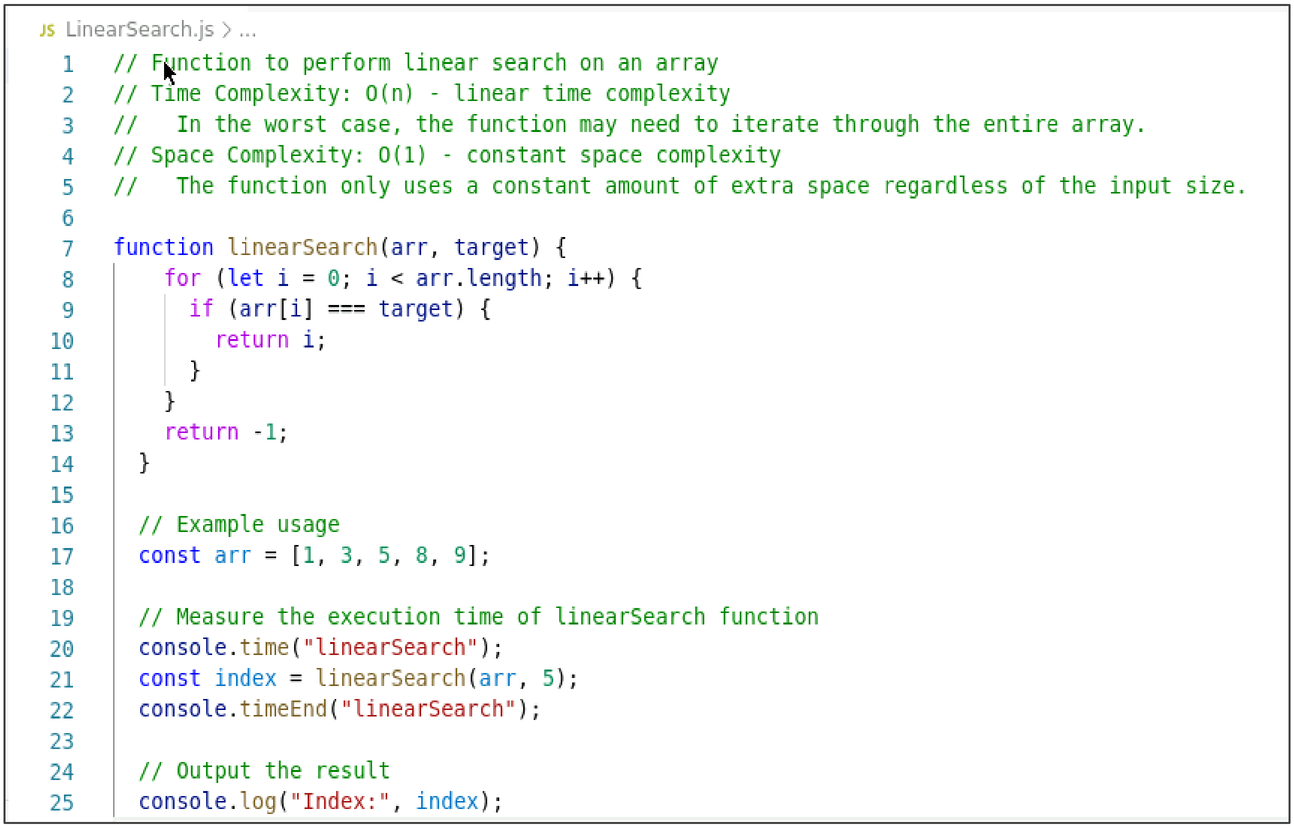

```javascript
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  // Output the result
  console.log("Index:", index);
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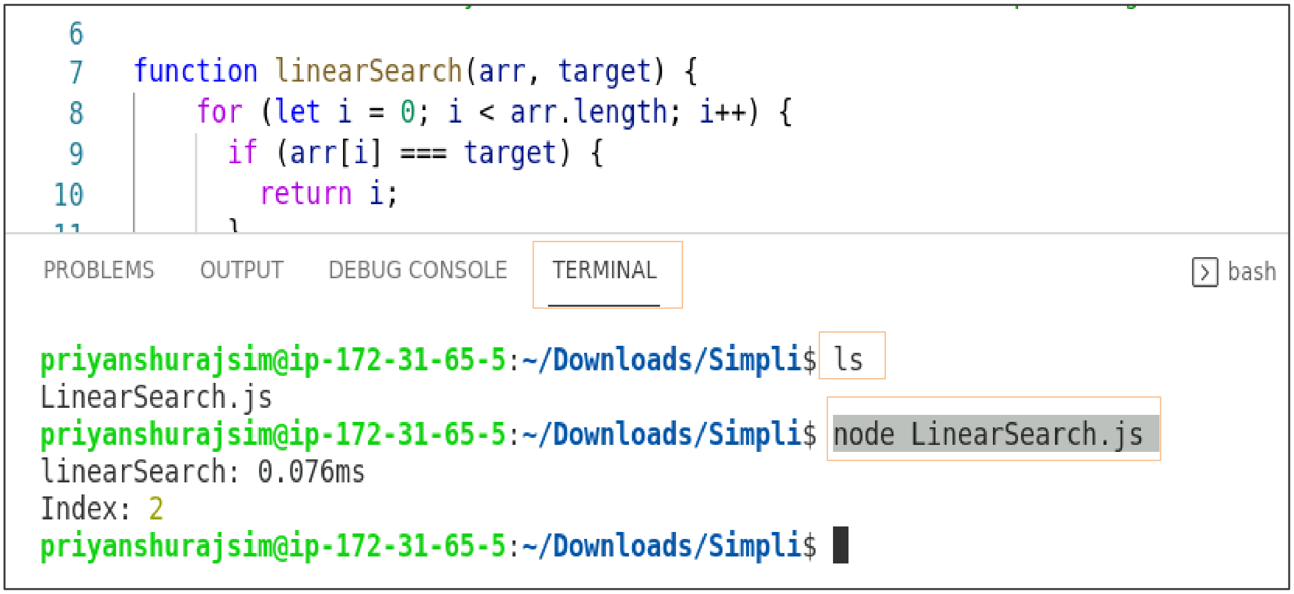
1.3 Press **Ctrl** + **S** to save the file and then execute it in the **TERMINAL** using the commands given below:

ls

node LinearSearch.js



```javascript

function linearSearch(arr, target) {
    for (let i = 0; i < arr.length; i++) {
      if (arr[i] === target) {
        return i;
```

```
priyanshurajsim@ip-172-31-65-5:~/Downloads/Simpli$ ls
LinearSearch.js
priyanshurajsim@ip-172-31-65-5:~/Downloads/Simpli$ node LinearSearch.js
linearSearch: 0.076ms
Index: 2
priyanshurajsim@ip-172-31-65-5:~/Downloads/Simpli$ 
```

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By following these steps, you have successfully used the linear search algorithm in JavaScript to locate items in unsorted data such as contact lists, and learned that it has a time complexity of O(n) and space complexity of O(1).