HATFD1025

Find the Second Largest Element in an Array

Write a program to find the second-largest element in an array of integers without using any sorting algorithms or built-in array functions.

Instructions: Traverse the array manually to find both the largest and second-largest elements

Program :

```
const readline = require('readline');

const rl = readline.createInterface({
    input: process.stdin,
    output: process.stdout
});

rl.question('Enter the number of elements: ', (n) => {
    n = parseInt(n);
    const arr = [];

    const inputNumbers = () => {
        if (arr.length < n) {
            rl.question(`Enter number ${arr.length + 1}: `, (num) => {
                arr.push(parseInt(num));
                inputNumbers();
            });
        } else {
            findLargestAndSecondLargest(arr);
            rl.close();
        }
    };

    inputNumbers();
});

function findLargestAndSecondLargest(arr) {
    if (arr.length < 2) {
        console.log('Need at least two numbers to find the largest and second largest.');
        return;
    }

    let l = Number.NEGATIVE_INFINITY;
    let sl = Number.NEGATIVE_INFINITY;

    for (let i = 0; i < arr.length; i++) {
        if (arr[i] > l) {
            sl = l;
            l = arr[i];
        } else if (arr[i] > sl && arr[i] !== l) {
            sl = arr[i];
        }
    }
    console.log(`Largest: ${l}, Second Largest: ${sl}`);
}
```

Test-Cases 1:

Enter the number of elements: 5

Enter number 1: 2

Enter number 2: 6

Enter number 3: 9

Enter number 4: 9

Enter number 5: 2

Largest: 9, Second Largest: 6

Test-Cases 2:

Enter the number of elements: 1

Enter number 1: 6

Need at least two numbers to find the largest and second largest.

Test-Cases 3:

Enter the number of elements: 8

Enter number 1: 5

Enter number 2: 4

Enter number 3: 6

Enter number 4: 7

Enter number 5: 1

Enter number 6: 4

Enter number 7: 7

Enter number 8: 6

Largest: 7, Second Largest: 6