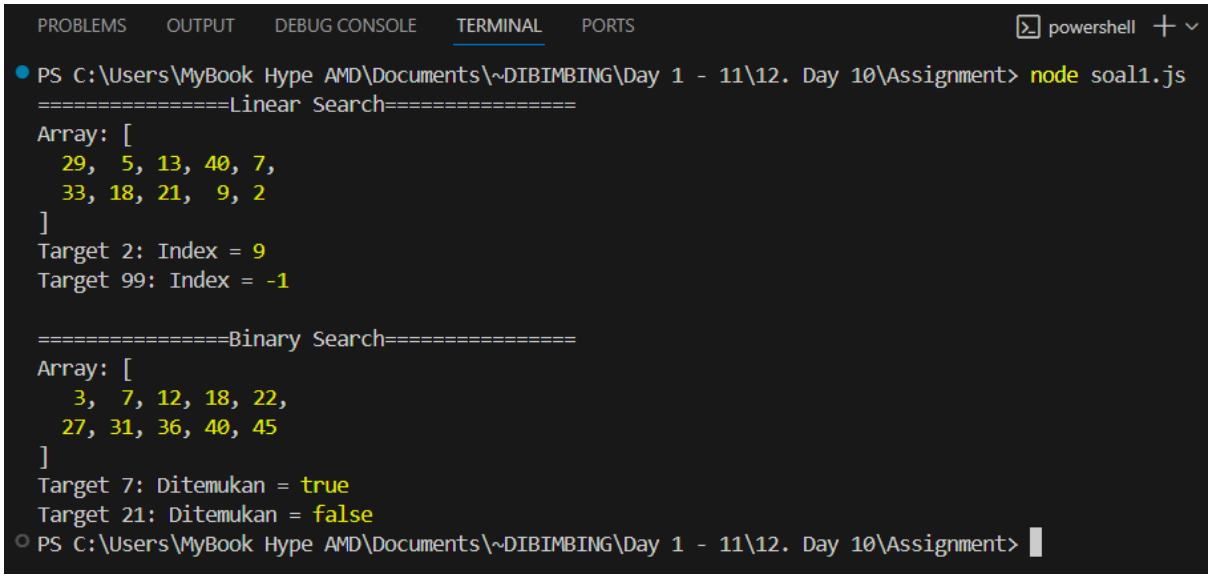
Soal 1: Searching Algorithm (Linear Search dan Binary Search)

Input

soal1.js

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

const arr1 = [29, 5, 13, 40, 7, 33, 18, 21, 9, 2];

console.log("================Linear Search================");
console.log("Array:", arr1);
console.log("Target 2: Index =", linearSearch(arr1, 2));
console.log("Target 99: Index =", linearSearch(arr1, 99));

//! Binary Search
function binarySearch(arr, target) {
    let low = 0;
    let high = arr.length - 1;

    while (low <= high) {
        let mid = Math.floor((low + high) / 2);
        if (arr[mid] === target) {
            return true;
        } else if (arr[mid] < target) {
            low = mid + 1;
        } else {
            high = mid - 1;
        }
    }
    return false;
}

const arr2 = [3, 7, 12, 18, 22, 27, 31, 36, 40, 45];

console.log("\n================Binary Search================");
console.log("Array:", arr2);
console.log("Target 7: Ditemukan =", binarySearch(arr2, 7));
console.log("Target 21: Ditemukan =", binarySearch(arr2, 21));
```

Output


PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS
powershell
PS C:\Users\MyBook Hype AMD\Documents\~DIBIMBING\Day 1 - 11\12. Day 10\Assignment> node soal1.js
==========Linear Search==========
Array: [
29, 5, 13, 40, 7,
33, 18, 21, 9, 2
]
Target 2: Index = 9
Target 99: Index = -1
==========Binary Search==========
Array: [
3, 7, 12, 18, 22,
27, 31, 36, 40, 45
]
Target 7: Ditemukan = true
Target 21: Ditemukan = false
PS C:\Users\MyBook Hype AMD\Documents\~DIBIMBING\Day 1 - 11\12. Day 10\Assignment>

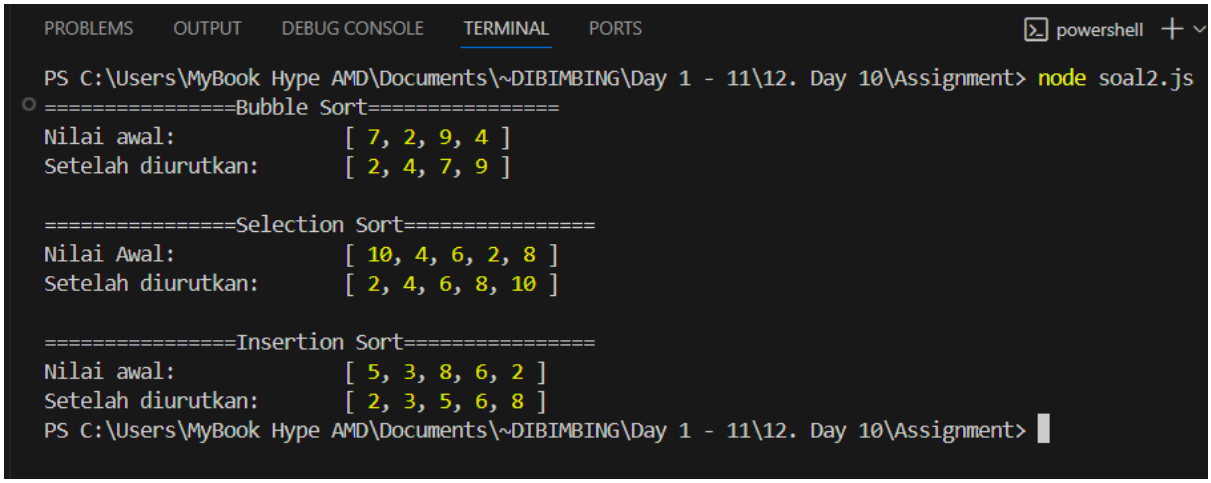
Soal2: Sorting Algorithm (Bubble Sort, Selection Sort dan Insertion Sort)

Input

soal2.js

```
//! Bubble Sort
let bubbleArr = [7, 2, 9, 4];
function bubbleSort(arr) {
    let n = arr.length;
    for (let i = 0; i < n - 1; i++) {
        for (let j = 0; j < n - i - 1; j++) {
            if (arr[j] > arr[j + 1]) {
                let temp = arr[j];
                arr[j] = arr[j + 1];
                arr[j + 1] = temp;
            }
        }
    }
    return arr;
}
console.log("================Bubble Sort================");
console.log("Nilai awal:\t\t", bubbleArr);
bubbleArr = bubbleSort(bubbleArr);
console.log("Setelah diurutkan:\t", bubbleArr);

//! Selection Sort
let selectionArr = [10, 4, 6, 2, 8];
function selectionSort(arr) {
    let n = arr.length;
    for (let i = 0; i < n - 1; i++) {
        let minIndex = i;
        for (let j = i + 1; j < n; j++) {
            if (arr[j] < arr[minIndex]) {
                minIndex = j;
            }
        }
        let temp = arr[minIndex];
        arr[minIndex] = arr[i];
        arr[i] = temp;
    }
    return arr;
}
console.log("\n================Selection Sort================");
console.log("Nilai Awal:\t\t", selectionArr);
selectionArr = selectionSort(selectionArr);
console.log("Setelah diurutkan:\t", selectionArr);

//! Insertion Sort
let insertionArr = [5, 3, 8, 6, 2];
function insertionSort(arr) {
    let n = arr.length;
    for (let i = 1; i < n; i++) {
        let key = arr[i];
        let j = i - 1;
        while (j >= 0 && arr[j] > key) {
            arr[j + 1] = arr[j];
            j--;
        }
        arr[j + 1] = key;
    }
    return arr;
}
console.log("\n================Insertion Sort================");
console.log("Nilai awal:\t\t", insertionArr);
insertionArr = insertionSort(insertionArr);
console.log("Setelah diurutkan:\t", insertionArr);
```

Output


PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS
powershell
PS C:\Users\MyBook Hype AMD\Documents\~DIBIMBING\Day 1 - 11\12. Day 10\Assignment> node soal2.js
==========Bubble Sort==========
Nilai awal: [7, 2, 9, 4]
Setelah diurutkan: [2, 4, 7, 9]
==========Selection Sort==========
Nilai Awal: [10, 4, 6, 2, 8]
Setelah diurutkan: [2, 4, 6, 8, 10]
==========Insertion Sort==========
Nilai awal: [5, 3, 8, 6, 2]
Setelah diurutkan: [2, 3, 5, 6, 8]
PS C:\Users\MyBook Hype AMD\Documents\~DIBIMBING\Day 1 - 11\12. Day 10\Assignment>