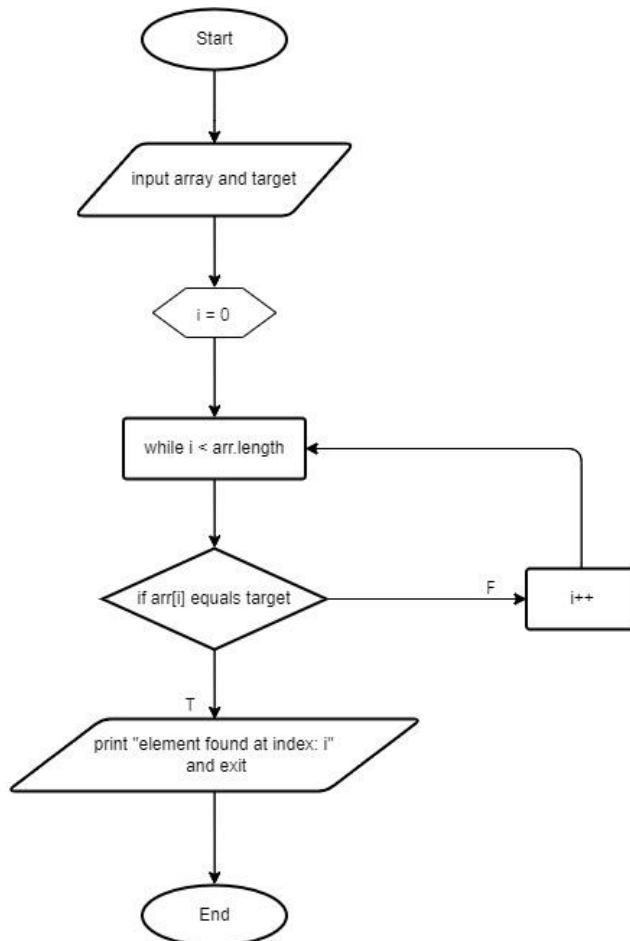


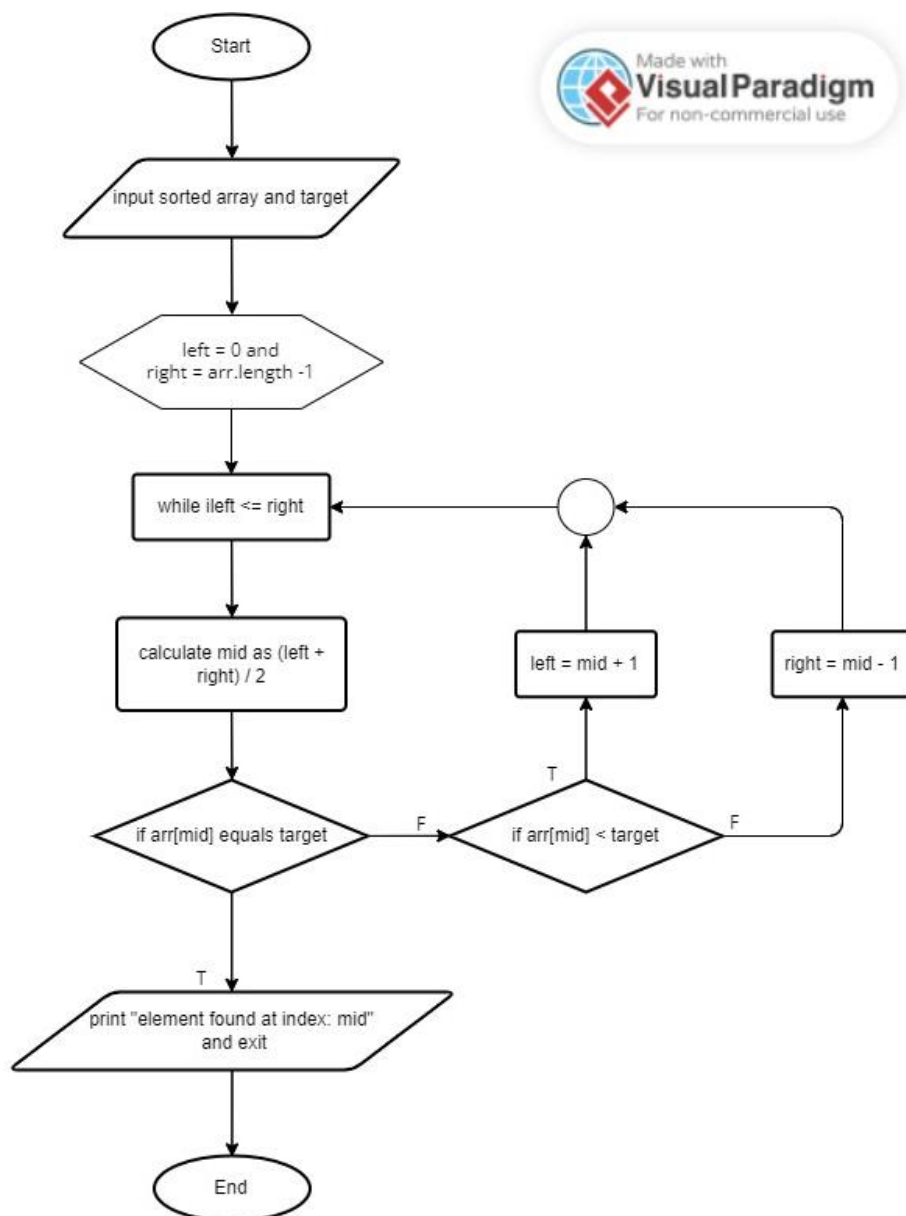


Name : Azaria Cindy Sahasika  
Number Id : 2341760169 / 06  
Class : 1G – Business Information System  
Lesson : Algorithm and Data Structure  
Material : Material 6  
Github Link : <https://github.com/azariacindy/algorithm-ds>

1. Buatlah flowchart dari algoritma binary search!



2. Buatlah flowchart dari algoritma sequential search!



3. Diketahui array sebagai berikut

Index	0	1	2	3	4	5	6
Array	78	13	24	9	30	22	41

Jika nilai yang dicari adalah 9, maka:

Gambarkan proses penyelesaian kasus pencarian dengan binary seach (urutkan dahulu array nya dengan algoritma sorting)!

- a) Sort an array using bubble sort
- b) Determines the values 'left = 0' and 'right = 6'
- c) Calculated the 'middle' value with ' $(\text{left} + \text{right}) / 2 = (0 + 6) / 2 = 3$ '

- d) Compared the value of 'arr[mid]' with the sought/target value (9). Since 'arr[mid]' (value 24) is greater than the target value (9), change 'right' to 'middle - 1 = 2'.
- e) Recalculate the value of 'middle' with ' $(\text{left} + \text{right}) / 2 = (0 + 2) / 2 = 1$ '.
- f) Compared the 'arr[mid]' value (value 13) with the searched value (9) again. Since '(value 13) is greater than the value (9)', change 'right' to 'middle - 1 = 1'.
- g) Recalculate the value of 'middle' with ' $(\text{left} + \text{right}) / 2 = (0 + 0) / 2 = 0$ '.
- h) Now, 'left' is equal to 'right' so the loop has stopped. Then the value 9 is found at index 0.

```

jobsheet6 > J binarySearchEx06.java > ...
Click here to ask Blackbox to help you code faster
1 package jobsheet6;
2
3 public class binarySearchEx06 {
4     public int search(int[] arr, int target) {
5         // urutkan array menggunakan algoritma pengurutan Bubble Sort
6         bubbleSortEx06.sort(arr);
7
8         int left = 0;
9         int right = arr.length - 1;
10
11         while (left <= right) {
12             int mid = left + (right - left) / 2;
13
14             if (arr[mid] == target) {
15                 return mid; // element found, return its index
16             } else if (arr[mid] < target) {
17                 left = mid + 1;
18             } else {
19                 right = mid - 1;
20             }
21         }
22         return -1; // element not found
23     }
24 }

jobsheet6 > J bubbleSortEx06.java > ...
Click here to ask Blackbox to help you code faster
1 package jobsheet6;
2
3 public class bubbleSortEx06 {
4     public static void sort(int[] arr) {
5         int n = arr.length;
6         for (int i = 0; i < n-1; i++) {
7             for (int j = 0; j < n-i-1; j++) {
8                 if (arr[j] > arr[j+1]) {
9                     // swap arr[j] and arr[j+1]
10                    int temp = arr[j];
11                    arr[j] = arr[j+1];
12                    arr[j+1] = temp;
13                }
14            }
15        }
16    }
17 }

jobsheet6 > J exerciseMain06.java > ...
Click here to ask Blackbox to help you code faster
1 package jobsheet6;
2
3 public class exerciseMain06 {
4     public static void main(String[] args) {
5         int[] arr = {78, 13, 24, 9, 30, 22, 41};
6
7         // membuat objek dari kelas binarySearchEx06
8         binarySearchEx06 binarySearch = new binarySearchEx06();
9
10        // mencari nilai 9 dalam array
11        int target = 9;
12        int resultIndex = binarySearch.search(arr, target);
13
14        // menampilkan hasil pencarian
15        if (resultIndex != -1) {
16            System.out.println("Element found at index: " + resultIndex);
17        } else {
18            System.out.println("Element not found in the array.");
19        }
20    }
21 }
  
```