

# Rajalakshmi Engineering College

Name: Jeffery Antony J  
Email: 241901041@rajalakshmi.edu.in  
Roll no: 241901041  
Phone: 7305663808  
Branch: REC  
Department: I CSE (CS) FA  
Batch: 2028  
Degree: B.E - CSE (CS)

Scan to verify results



## NeoColab\_REC\_CS23231\_DATA STRUCTURES

### REC\_DS using C\_Week 6\_COD\_Question 4

Attempt : 2  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

Kavya, a software developer, is analyzing data trends. She has a list of integers and wants to identify the  $n$ th largest number in the list after sorting the array using QuickSort.

To optimize performance, Kavya is required to use QuickSort to sort the list before finding the  $n$ th largest number.

##### ***Input Format***

The first line of input consists of an integer  $n$ , representing the size of the array.

The second line consists of  $n$  space-separated integers, representing the elements of the array `nums`.

The third line consists of an integer  $k$ , representing the position of the largest

number you need to print after sorting the array.

### **Output Format**

The output prints the k-th largest number in the sorted array (sorted in ascending order).

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: 6  
-1 0 1 2 -1 -4  
3

Output: 0

### **Answer**

```
#include <stdio.h>
#include <stdlib.h>
```

```
// Swap two integers
void swap(int* a, int* b) {
    int temp = *a;
    *a = *b;
    *b = temp;
}
```

```
// Partition function for QuickSort (Descending Order)
```

```
int partition(int arr[], int low, int high) {
    int pivot = arr[high];
    int i = low - 1;
```

```
    for (int j = low; j < high; j++) {
        if (arr[j] > pivot) { // Change to < for ascending
            i++;
            swap(&arr[i], &arr[j]);
        }
    }
}
```

```

        swap(&arr[i + 1], &arr[high]);
        return i + 1;
    }

    // QuickSort function
    void quickSort(int arr[], int low, int high) {
        if (low < high) {
            int pivotIndex = partition(arr, low, high);
            quickSort(arr, low, pivotIndex - 1);
            quickSort(arr, pivotIndex + 1, high);
        }
    }

    // Function to find the k-th largest element
    void findNthLargest(int* nums, int n, int k) {
        quickSort(nums, 0, n - 1); // Sort in descending order
        if (k > 0 && k <= n)
            printf("%d\n", nums[k - 1]); // Print the k-th largest
        else
            printf("Invalid value of k\n");
    }

```

```

int main() {
    int n, k;
    scanf("%d", &n);
    int* nums = (int*)malloc(n * sizeof(int));
    for (int i = 0; i < n; i++) {
        scanf("%d", &nums[i]);
    }
    scanf("%d", &k);
    findNthLargest(nums, n, k);
    free(nums);
    return 0;
}

```

**Status :** Correct

**Marks :** 10/10