

# Rajalakshmi Engineering College

Name: Karthick Raja R  
Email: 240801147@rajalakshmi.edu.in  
Roll no: 2116240801147  
Phone: 6380349066  
Branch: REC  
Department: I ECE FB  
Batch: 2028  
Degree: B.E - ECE

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## NeoColab\_REC\_CS23231\_DATA STRUCTURES

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

Attempt : 1  
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>
```

```
void swap(int *a,int *b){
```

```
    int temp=*a;
```

```
    *a=*b;
```

```
    *b=temp;
```

```
}
```

```
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){
```

```
            i++;
```

```
            swap(&arr[i],&arr[j]);
```

```
        }
```

```
    }
```

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

```
    return i+1;
```

```
}
```

```
void quickSort(int arr[], int low, int high) {
```

```
    if(low<high){
```

```
        int pivot=partition(arr,low,high);
```

```
        quickSort(arr,low,pivot-1);
        quickSort(arr,pivot+1,high);
    }
}

void findNthLargest(int* nums, int n, int k) {
    quickSort(nums,0,n-1);
    printf("%d",nums[n-k]);
}

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**