

# Rajalakshmi Engineering College

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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 - 1; j++) {
```

```
        if (arr[j] <= pivot) {
```

```
            i++;
```

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

```
        }
```

```
    }
```

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

```
    return (i + 1);
```

```
}
```

```
void quickSortRecursive(int arr[], int low, int high) {  
    if (low < high) {  
        int pi = partition(arr, low, high);  
  
        quickSortRecursive(arr, low, pi - 1);  
        quickSortRecursive(arr, pi + 1, high);  
    }  
}
```

```
void quickSort(int arr[], int n) {  
    quickSortRecursive(arr, 0, n - 1);  
}
```

```
void findNthLargest(int* nums, int n, int k) {  
    quickSort(nums, n);  
  
    printf("%d\n", 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