

Rajalakshmi Engineering College

Name: Sherwin G M
Email: 240701496@rajalakshmi.edu.in
Roll no: 240701496
Phone: 7708605966
Branch: REC
Department: I CSE FD
Batch: 2028
Degree: B.E - CSE

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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>
```

```
int partition(int arr[], int low, int high) {
```

```
    int pivot = arr[low];
```

```
    int i = low, j = high;
```

```
    while (i < j) {
```

```
        while (arr[i] <= pivot && i < high) i++;
```

```
        while (arr[j] > pivot) j--;
```

```
        if (i < j) {
```

```
            int temp = arr[i];
```

```
            arr[i] = arr[j];
```

```
            arr[j] = temp;
```

```
        }
```

```
    }
```

```
    arr[low] = arr[j];
```

```
    arr[j] = pivot;
```

```
    return j;
```

```
}
```

```
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);  
    }  
}
```

```
void findNthLargest(int* nums, int n, int k) {  
    quickSort(nums, 0, n - 1);  
    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