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//Write a program for sorting given array in ascending/descending order using Quick sort.

#include<iostream>

using namespace std;

class QuickSortDemo

{

    int A[16];

    int n;

public:

    void getData()

    {

        cout << "Enter the number of elements:";

        cin >> n;

        cout << "Enter the element:";

        for (int i = 0; i < n; i++)

        {

            cin >> A[i];

        }

    }

    void QuickSort()

    {

        QuickSort(A, 0, n - 1);

    }

    void display()

    {

        cout << "Sorted elements in ascending order :";

        for (int i = 0; i < n; i++)

        {

            cout << A[i] << "\t";

        }

        cout << endl;

        cout << "Sorted elements in descending order :";

        for (int i = n; i >= 0; i--)

        {

            cout << A[i] << "\t";

        }

        cout << endl;

    }

    int partition(int A[], int lb, int ub);

    void QuickSort(int A[], int lb, int ub);

};

int QuickSortDemo::partition(int A[], int lb, int ub)

{

    int temp;

    int start = lb, end = ub;

    int pivot = A[lb];

    while (start < end)

    {

        while (A[start] <= pivot)start++;

        while (A[end] > pivot)end--;

        if (start < end)

        {

            temp = A[start];

            A[start] = A[end];

            A[end] = temp;

        }

    }

    temp = A[lb];

    A[lb] = A[end];

    A[end] = temp;

    return end;

}

void QuickSortDemo::QuickSort(int A[], int lb, int ub)

{

    int loc;

    if (lb < ub)

    {

        loc = partition(A, lb, ub);

        QuickSort(A, lb, loc - 1);

        QuickSort(A, loc + 1, ub);

    }

}

int main(int argc, char\* argv[])

{

    QuickSortDemo o;

    o.getData();

    o.QuickSort();

    o.display();

}

Output:

Enter the number of elements:5

Enter the element:23

45

65

77

34

Sorted elements in ascending order :23 34 45 65 77

Sorted elements in descending order : 77 65 45 34 23