

Name : Riyadul Islam ID : 22234103007 Section : 1
Intake : 50 , CSE

Lab Task 02

1 : Implementation QuickSort in C++ Where Pivot as first Element of the array .

```
QuickSort_Pivot_as_first_element_007.cpp x
1  #include <iostream>
2  #include <vector>
3
4  using namespace std;
5
6  int partitionFirst(vector<int>& arr, int low, int high) {
7      int pivot = arr[low];
8      int i = low + 1;
9
10     for (int j = low + 1; j <= high; ++j) {
11         if (arr[j] < pivot) {
12             swap(arr[i], arr[j]);
13             ++i;
14         }
15     }
16
17     swap(arr[low], arr[i - 1]);
18     return i - 1;
19 }
20
21 void quickSortFirst(vector<int>& arr, int low, int high) {
22     if (low < high) {
23         int pivotIndex = partitionFirst(arr, low, high);
24         quickSortFirst(arr, low, pivotIndex - 1);
```

```
QuictSort_Pivot_as_first_elemnet_007.cpp X
23         int pivotIndex = partitionFirst(arr, low, high);
24         quickSortFirst(arr, low, pivotIndex - 1);
25         quickSortFirst(arr, pivotIndex + 1, high);
26     }
27 }
28
29 void quickSortFirst(vector<int>& arr) {
30     int n = arr.size();
31     quickSortFirst(arr, 0, n - 1);
32 }
33
34 int main() {
35     vector<int> arr = {12, 4, 5, 6, 7, 3, 1, 15};
36
37     quickSortFirst(arr);
38
39     for (int num : arr) {
40         cout << num << " ";
41     }
42     cout << endl;
43
44     return 0;
45 }
46
```

OutPut :

```
QuictSort_Pivot_as_first_elemnet_007.cpp X
"C:\Users\Riyadh\OneDrive\Desktop\algo_lab2\QuictSort_Pivot_as_first_elemnet_007.exe"
1 3 4 5 6 7 12 15

Process returned 0 (0x0)   execution time : 0.094 s
Press any key to continue.
```

2 : Implementation QuickSort in C++ Where Pivot as Last element of the array.

```
QuickSort_Pivot_As_Last_Element_007.cpp X
1  #include <iostream>
2  #include <vector>
3  using namespace std;
4
5  int partitionLast(vector<int>& arr, int low, int high) {
6      int pivot = arr[high];
7      int i = low - 1;
8
9      for (int j = low; j <= high - 1; ++j) {
10         if (arr[j] < pivot) {
11             ++i;
12             swap(arr[i], arr[j]);
13         }
14     }
15
16     swap(arr[i + 1], arr[high]);
17     return i + 1;
18 }
19
20 void quickSortLast(vector<int>& arr, int low, int high) {
21     if (low < high) {
22         int pivotIndex = partitionLast(arr, low, high);
23         quickSortLast(arr, low, pivotIndex - 1);
24         quickSortLast(arr, pivotIndex + 1, high);
25     }
26 }
```

```

QuickSort_Pivot_As_Last_Element_007.cpp x
23         quickSortLast(arr, low, pivotIndex - 1);
24         quickSortLast(arr, pivotIndex + 1, high);
25     }
26 }
27
28 void quickSortLast(vector<int>& arr) {
29     int n = arr.size();
30     quickSortLast(arr, 0, n - 1);
31 }
32
33 int main() {
34     vector<int> arr = {12, 4, 5, 6, 7, 3, 1, 15};
35
36     quickSortLast(arr);
37
38     for (int num : arr) {
39         cout << num << " ";
40     }
41     cout << endl;
42
43     return 0;
44 }

```

Output:

```

QuickSort_Pivot_As_Last_Element_007.cpp x
C:\Users\Riyadh\OneDrive\Desktop\algo_lab2\QuickSort_Pivot_As_Last_Element_007.exe
1 3 4 5 6 7 12 15

Process returned 0 (0x0)   execution time : 0.047 s
Press any key to continue.

```