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Lab Task 02

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

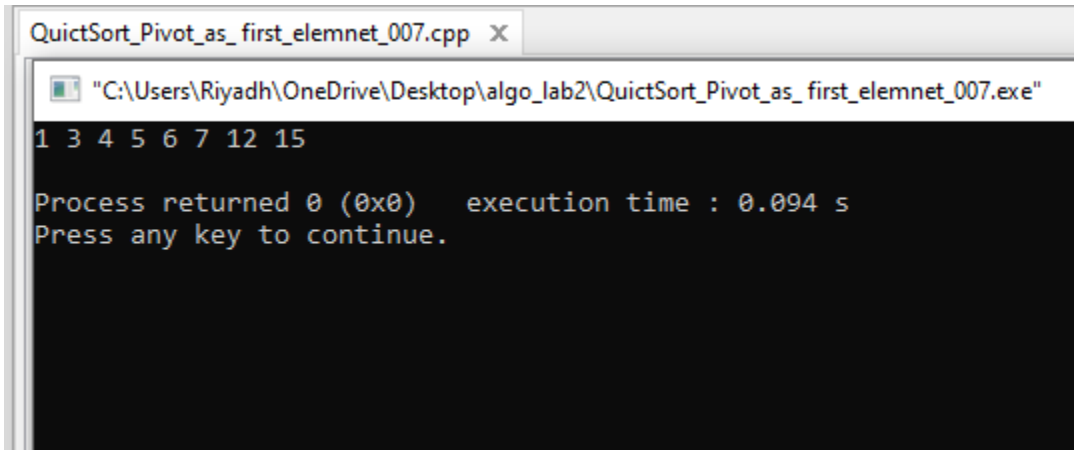
QuictSort_Pivot_as_ first_elemnet_007.cpp

```cpp
#include <iostream>
#include <vector>

using namespace std;

int partitionFirst(vector<int>& arr, int low, int high) {
    int pivot = arr[low];
    int i = low + 1;

    for (int j = low + 1; j <= high; ++j) {
        if (arr[j] < pivot) {
            swap(arr[i], arr[j]);
            ++i;
        }
    }

    swap(arr[low], arr[i - 1]);
    return i - 1;
}

void quickSortFirst(vector<int>& arr, int low, int high) {
    if (low < high) {
        int pivotIndex = partitionFirst(arr, low, high);
        quickSortFirst(arr, low, pivotIndex - 1);
```

QuictSort_Pivot_as_ first_elemnet_007.cpp

```cpp
            int pivotIndex = partitionFirst(arr, low, high);
            quickSortFirst(arr, low, pivotIndex - 1);
            quickSortFirst(arr, pivotIndex + 1, high);
        }
}

void quickSortFirst(vector<int>& arr) {
    int n = arr.size();
    quickSortFirst(arr, 0, n - 1);
}

int main() {
    vector<int> arr = {12, 4, 5, 6, 7, 3, 1, 15};

    quickSortFirst(arr);

    for (int num : arr) {
        cout << num << " ";
    }
    cout << endl;

    return 0;
}
```

OutPut :



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

QuickSort_Pivot_As_Last_Element_007.cpp

```cpp
#include <iostream>
#include <vector>
using namespace std;

int partitionLast(vector<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 quickSortLast(vector<int>& arr, int low, int high) {
    if (low < high) {
        int pivotIndex = partitionLast(arr, low, high);
        quickSortLast(arr, low, pivotIndex - 1);
        quickSortLast(arr, pivotIndex + 1, high);
```

QuickSort_Pivot_As_Last_Element_007.cpp

```cpp
            quickSortLast(arr, low, pivotIndex - 1);
            quickSortLast(arr, pivotIndex + 1, high);
        }
    }

void quickSortLast(vector<int>& arr) {
    int n = arr.size();
    quickSortLast(arr, 0, n - 1);
}

int main() {
    vector<int> arr = {12, 4, 5, 6, 7, 3, 1, 15};

    quickSortLast(arr);

    for (int num : arr) {
        cout << num << " ";
    }
    cout << endl;

    return 0;
}
```

Output: