ASSIGNMENT

Course Code: SE215
Course Title: Algorithm Analysis and Design Lab
Topic Name: Quicksort

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2) Implement the Quicksort algorithm. Customize your code by naming the quicksort function as "your name" and naming the variables from the letter of your name.

```cpp
#include <bits/stdc++.h>
using namespace std;

int partition(vector<int> &m, int l, int r){
    int pivot = m[l];
    int i = l;
    int j = r;

    while (i < j){
        while (m[i] <= pivot){
            i++;
        }
        while (m[j] > pivot){
            j--;
        }
        if (i < j){
            swap(m[i], m[j]);
        }
    }
    swap(m[l], m[j]);
    return j;
}

void monira_islam(vector<int> &m, int l, int r){
    if (l < r){
        int k = partition(m, l, r);
        monira_islam(m, l, k - 1);
        monira_islam(m, k + 1, r);
    }
}

int main(){
    int n;
    cin >> n;
    vector<int> m;
    for (int i = 0; i < n; i++){
        int element;
        cin >> element;
        m.push_back(element);
    }

    cout << "given array -> ";
    for (int i = 0; i < n; i++){
        cout << m[i] << " ";
    }
    cout << endl;

    cout << "sorted array -> ";
    monira_islam(m, 0, n - 1);
    for (int i = 0; i < n; i++){
        cout << m[i] << " ";
    }
    cout << endl;

    return 0;
}
```

Output:

```
Idba@DESKTOP-EQEQ37R MINGW64 /d/Algorithmn Lab/class_3/lab_task/output (main)
$ ./"monira_quick_sort.exe"
9
7 6 10 5 9 2 1 15 7
given array -> 7 6 10 5 9 2 1 15 7
sorted array -> 1 2 5 6 7 7 9 10 15

Idba@DESKTOP-EQEQ37R MINGW64 /d/Algorithmn Lab/class_3/lab_task/output (main)
$
```