Name:- Ahmed Ali Asif

SAP ID:- 55346

*****Q#1*****

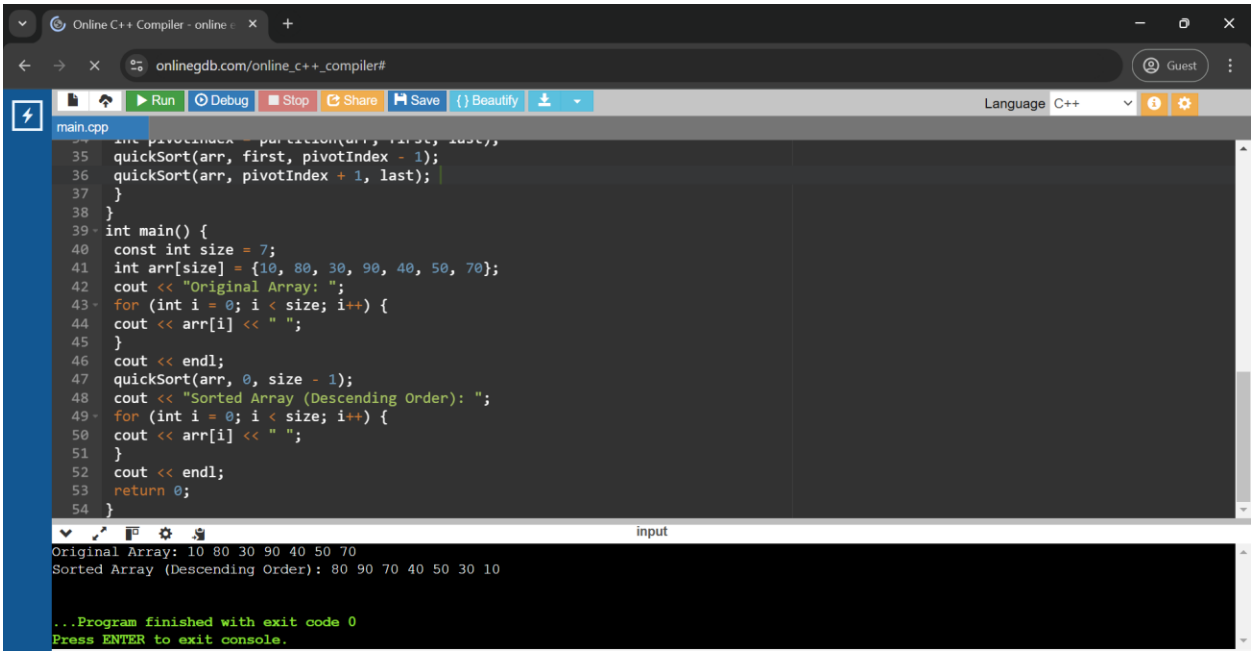
```
#include <iostream>
using namespace std;
int partition(int arr[], int first, int last) {
 int pivot = arr[first];
 int bottom = first + 1, top = last;
 int temp;
while (true) {

 while (arr[top] < pivot && top > bottom) {
 top--;
 }
 while (arr[bottom] > pivot && bottom < top) {
 bottom++;
 }
 // If `bottom` and `top` cross, exit loop
 if (bottom >= top) {
 break;
 } else {
 // Swap elements at `bottom` and `top`
```

```
 temp = arr[bottom];
 arr[bottom] = arr[top];
 arr[top] = temp;
 }
 }
 temp = arr[first];
 arr[first] = arr[top];
 arr[top] = temp;
 return top; // Return the partition index
}

void quickSort(int arr[], int first, int last) {
 if (first < last) {
 int pivotIndex = partition(arr, first, last);
 quickSort(arr, first, pivotIndex - 1);
 quickSort(arr, pivotIndex + 1, last);
 }
}
int main() {
 const int size = 7;
 int arr[size] = {10, 80, 30, 90, 40, 50, 70};
 cout << "Original Array: ";
 for (int i = 0; i < size; i++) {
 cout << arr[i] << " ";
 }
```

```
cout << endl;
quickSort(arr, 0, size - 1);
cout << "Sorted Array (Descending Order): ";
for (int i = 0; i < size; i++) {
cout << arr[i] << " ";
}
cout << endl;
return 0;
}
```



*******Q#2*******

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

void sortDescending(int arr[], int n) {
    for (int i = 0; i < n - 1; i++) {
```

```
        int maxIndex = i;
        for (int j = i + 1; j < n; j++) {
            if (arr[j] > arr[maxIndex]) {
                maxIndex = j;
            }
        }

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

        cout << "After iteration " << i + 1 << ": ";
        for (int k = 0; k < n; k++) {
            cout << arr[k] << " ";
        }
        cout << endl;
    }
}

int main() {
    int arr[5] = {12, 45, 23, 8, 19};
    int size = 5;

    cout << "Original Array: ";
    for (int i = 0; i < size; i++) {
```

```
    cout << arr[i] << " ";
  }
  cout << endl;

  sortDescending(arr, size);

  cout << "Sorted Array (Descending Order): ";
  for (int i = 0; i < size; i++) {
    cout << arr[i] << " ";
  }
  cout << endl;

  return 0;
}
```