

Merge sort :

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

// Function to merge two halves
void merge(int arr[], int left, int mid, int right) {
    int n1 = mid - left + 1;
    int n2 = right - mid;

    int L[n1], R[n2];

    // Copy data to temp arrays
    for(int i = 0; i < n1; i++)
        L[i] = arr[left + i];
    for(int j = 0; j < n2; j++)
        R[j] = arr[mid + 1 + j];

    int i = 0, j = 0, k = left;

    // Merge temp arrays back
    while(i < n1 && j < n2) {
        if(L[i] <= R[j]) {
            arr[k] = L[i];
            i++;
        } else {
            arr[k] = R[j];
            j++;
        }
    }
}
```

```
k++;

}

// Copy remaining elements

while(i < n1) {

    arr[k] = L[i];

    i++; k++;

}

while(j < n2) {

    arr[k] = R[j];

    j++; k++;

}

// Merge Sort function

void mergeSort(int arr[], int left, int right) {

    if(left < right) {

        int mid = (left + right) / 2;

        mergeSort(arr, left, mid);

        mergeSort(arr, mid + 1, right);

        merge(arr, left, mid, right);

    }

}

int main() {
```

```
int n;  
cout << "Enter number of elements: ";  
cin >> n;
```

```
int arr[n];  
  
cout << "Enter elements:\n";  
for(int i = 0; i < n; i++)  
    cin >> arr[i];
```

```
mergeSort(arr, 0, n - 1);
```

```
cout << "Sorted array:\n";  
for(int i = 0; i < n; i++)  
    cout << arr[i] << " ";
```

```
return 0;  
}
```

Output :

Output

```
* Enter number of elements: 5  
Enter elements:  
52 21 12 45 99  
Sorted array:  
12 21 45 52 99  
  
==== Code Execution Successful ===
```