MERGE SORT

```
#include <iostream>

using namespace std;

void merge(int arr[], int left, int mid, int right) {

      int n1 = mid - left + 1;

      int n2 = right - mid;

// Temporary arrays

      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 the 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++;
    }
}
void mergeSort(int arr[], int left, int right) {
    if (left < right) {
        int mid = left + (right - left) / 2;
      // Sort first and second halves
        mergeSort(arr, left, mid);
        mergeSort(arr, mid + 1, right);
   // Merge sorted halves
        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

```
Enter number of elements: 5
Enter elements:
520 48 12 67 99
Sorted array:
12 48 67 99 520

=== Code Execution Successful ===
```