**Program to implement Merge Sort**

**#include <stdio.h>**

**void merge(int[], int, int, int);**

**void mergeSort(int[], int, int);**

**int main()**

**{**

**int list[50];**

**int i, size;**

**printf("Enter total number of elements: ");**

**scanf("%d", &size);**

**printf("Enter the elements: \n");**

**for (i = 0; i < size; i++)**

**{**

**scanf("%d", &list[i]);**

**}**

**mergeSort(list, 0, size - 1);**

**printf("Sorting Array using Merge Sort:\n");**

**for (i = 0; i < size; i++)**

**{**

**printf("%d ", list[i]);**

**}**

**}**

**void mergeSort(int list[], int low, int high)**

**{**

**int mid;**

**if (low < high)**

**{**

**mid = (low + high) / 2;**

**mergeSort(list, low, mid);**

**mergeSort(list, mid + 1, high);**

**merge(list, low, mid, high);**

**}**

**}**

**void merge(int list[], int low, int mid, int high)**

**{**

**int i, mi, k, lo, temp[50];**

**lo = low;**

**i = low;**

**mi = mid + 1;**

**while ((lo <= mid) && (mi <= high))**

**{**

**if (list[lo] <= list[mi])**

**{**

**temp[i] = list[lo];**

**lo++;**

**}**

**else**

**{**

**temp[i] = list[mi];**

**mi++;**

**}**

**i++;**

**}**

**if (lo > mid)**

**{**

**for (k = mi; k <= high; k++)**

**{**

**temp[i] = list[k];**

**i++;**

**}**

**}**

**else**

**{**

**for (k = lo; k <= mid; k++)**

**{**

**temp[i] = list[k];**

**i++;**

**}**

**}**

**for (k = low; k <= high; k++)**

**{**

**list[k] = temp[k];**

**}**

**}**

**Output:**

Enter total number of elements: 7

Enter the elements:

45

34

65

22

87

29

40

Sorting Array using Merge Sort:

22 29 34 40 45 65 87