# Rajalakshmi Engineering College

Name: Ravi Sankar
Email: 240701424@rajalakshmi.edu.in
Roll no: 240701424
Phone: 8122932671
Branch: REC
Department: I CSE FD
Batch: 2028
Degree: B.E - CSE

## NeoColab_REC_CS23231_DATA STRUCTURES

## REC_DS using C_Week 6_COD_Question 5

Attempt : 1
Total Mark : 10
Marks Obtained : 10

## Section 1 : Coding

1. Problem Statement

Jose has an array of N fractional values, represented as double-point numbers. He needs to sort these fractions in increasing order and seeks your help.

Write a program to help Jose sort the array using the merge sort algorithm.

*Input Format*

The first line of input consists of an integer N, representing the number of fractions to be sorted.

The second line consists of N double-point numbers, separated by spaces, representing the fractions array.

*Output Format*

The output prints N double-point numbers, sorted in increasing order, and rounded to three decimal places.

Refer to the sample output for formatting specifications.

*Sample Test Case*

Input: 4
0.123 0.543 0.321 0.789
Output: 0.123 0.321 0.543 0.789

*Answer*

```c
#include <stdio.h>
#include <stdlib.h>

int compare(double a, double b) {
    if (a < b) return -1;
    if (a > b) return 1;
    return 0;
}

void merge(double arr[], int l, int m, int r) {
    int i, j, k;
    int n1 = m - l + 1;
    int n2 = r - m;

    double L[n1], R[n2];

    for (i = 0; i < n1; i++)
        L[i] = arr[l + i];
    for (j = 0; j < n2; j++)
        R[j] = arr[m + 1 + j];

    i = 0; j = 0; k = l;
    while (i < n1 && j < n2) {
        if (compare(L[i], R[j]) <= 0) {
            arr[k] = L[i];
            i++;
        } else {
            arr[k] = R[j];
```

```c
        j++;
      }
      k++;
    }

    while (i < n1) {
      arr[k] = L[i];
      i++;
      k++;
    }

    while (j < n2) {
      arr[k] = R[j];
      j++;
      k++;
    }
  }

  void mergeSort(double arr[], int l, int r) {
    if (l < r) {
      int m = l + (r - l) / 2;
      mergeSort(arr, l, m);
      mergeSort(arr, m + 1, r);
      merge(arr, l, m, r);
    }
  }

  int main() {
    int n;
    scanf("%d", &n);
    double fractions[n];
    for (int i = 0; i < n; i++) {
      scanf("%lf", &fractions[i]);
    }
    mergeSort(fractions, 0, n - 1);
    for (int i = 0; i < n; i++) {
      printf("%.3f ", fractions[i]);
    }
    return 0;
  }
```

*Status :* Correct                                                                              *Marks : 10/10*