Rajalakshmi Engineering College

Name: Subhalakshmi M
Email: 240701539@rajalakshmi.edu.in
Roll no: 240701539
Phone: 6379032776
Branch: REC
Department: I CSE FE
Batch: 2028
Degree: B.E - CSE

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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) {
    return a > b ? 1 : (a < b ? -1 : 0);
}

void merge(double arr[], int l, int m, int r) {
    int left_size = m - l + 1;
    int right_size = r - m;

    double left[left_size], right[right_size];

    for (int i = 0; i < left_size; i++) {
        left[i] = arr[l + i];
    }
    for (int i = 0; i < right_size; i++) {
        right[i] = arr[m + 1 + i];
    }

    int i = 0, j = 0, k = l;
    while (i < left_size && j < right_size) {
        if (compare(left[i], right[j]) <= 0) {
            arr[k++] = left[i++];
        } else {
            arr[k++] = right[j++];
        }
```

```c
    }

    while (i < left_size) {
        arr[k++] = left[i++];
    }
    while (j < right_size) {
        arr[k++] = right[j++];
    }
}

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