Rajalakshmi Engineering College

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NeoColab_REC_CS23231_DATA STRUCTURES

REC_DS using C_Week 6_PAH_Updated

Attempt : 1
Total Mark : 50
Marks Obtained : 47.5

Section 1 : Coding

1. Problem Statement

Vishnu, a math enthusiast, is given a task to explore the magic of numbers. He has an array of positive integers, and his goal is to find the integer with the highest digit sum in the sorted array using the merge sort algorithm.

You have to assist Vishnu in implementing the merge sort algorithm.

Input Format

The first line of input consists of an integer N, representing the number of elements in the array.

The second line consists of N space-separated integers, representing the array elements. *Output Format*

The first line of output prints "The sorted array is: " followed by the sorted array, separated by a space.

The second line prints "The integer with the highest digit sum is: " followed by an integer representing the highest-digit sum.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 5
123 456 789 321 654
Output: The sorted array is: 123 321 456 654 789
The integer with the highest digit sum is: 789

Answer

```
// You are using GCC #include <stdio.h>

int digitSum(int n) {
int sum = 0;
while(n) {        sum +=
n % 10;        n /= 10;
   }
   return sum;
}

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

int n2 = r - m;     int

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(L[i] <= R[j]) {                                   arr[k++] =
L[i++];         } else {                             arr[k++] =
R[j++];
        }
    }

    while(i < n1) arr[k++] = L[i++];
while(j < n2) arr[k++] = R[j++];
}

void mergeSort(int 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);     int arr[n];
    for(int i=0; i<n; i++) scanf("%d", &arr[i]);

mergeSort(arr, 0, n-1);

    printf("The sorted array is: ");     for(int i=0; i<n;
i++) printf("%d ", arr[i]);

    int maxDigitSum = digitSum(arr[0]);     int
number = arr[0];                             for(int i=1;                          i<n; i++) {
int currSum =
digitSum(arr[i]);                            if(currSum >
maxDigitSum) {
maxDigitSum =                                currSum;
number = arr[i];
        }
    }
    printf(" The integer                         with the
highest digit sum is:                        %d\n",
number);
    return 0;
}
```

Status : Correct*Marks : 10/10*