Rajalakshmi Engineering College

Name: Piraisoodan R
Email: 240701384@rajalakshmi.edu.in
Roll no: 240701384
Phone: 8056892546
Branch: REC
Department: I CSE FD
Batch: 2028
Degree: B.E - CSE

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NeoColab_REC_CS23231_DATA STRUCTURES

REC_DS using C_Week 6_CY_Updated

Attempt : 1
Total Mark : 30
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Ravi is given an array of integers and is tasked with sorting it in a unique way. He needs to sort the elements in such a way that the elements at odd positions are in descending order, and the elements at even positions are in ascending order. Ravi decided to use the Insertion Sort algorithm for this task.

Your task is to help ravi, to create even_odd_insertion_sort function to sort the array as per the specified conditions and then print the sorted array.

Example

Input:
10

25 36 96 58 74 14 35 15 75 95

Output:

96 14 75 15 74 36 35 58 25 95

Input Format

The first line of input consists of a single integer, N, which represents the size of the array.

The second line contains N space-separated integers, representing the elements of the array.

Output Format

The output displays the sorted array using the even-odd insertion sort algorithm and prints the sorted array.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 4
3 1 4 2

Output: 4 1 3 2

Answer

```
#include <stdio.h>
void even_odd_insertion_sort(int arr[], int n) {
   for (int i = 0; i < n; i += 2) {
      int key = arr[i];
      int j = i - 2;


      while (j >= 0 && arr[j] < key) {
         arr[j + 2] = arr[j];
         j = j - 2;
      }
      arr[j + 2] = key;
   }
```

```
    for (int i = 1; i < n; i += 2) {
        int key = arr[i];
        int j = i - 2;
        while (j >= 0 && arr[j] > key) {
            arr[j + 2] = arr[j];
            j = j - 2;
        }
        arr[j + 2] = key;
    }
}

int main() {
    int n;
    scanf("%d", &n);
    int arr[n];

    for (int i = 0; i < n; i++) {
        scanf("%d", &arr[i]);
    }
    even_odd_insertion_sort(arr, n);
    for (int i = 0; i < n; i++) {
        printf("%d", arr[i]);
        if (i < n - 1) {
            printf(" ");
        }
    }
    printf("\n");

    return 0;
}
```

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

2. Problem Statement

Meera is organizing her art supplies, which are represented as a list of integers: red (0), white (1), and blue (2). She needs to sort these supplies so that all items of the same color are adjacent, in the order red, white, and blue. To achieve this efficiently, Meera decides to use QuickSort to sort the

items. Can you help Meera arrange her supplies in the desired order?

Input Format

The first line of input consists of an integer n, representing the number of items in the list.

The second line consists of n space-separated integers, where each integer is either 0 (red), 1 (white), or 2 (blue).

Output Format

The output prints the sorted list of integers in a single line, where integers are arranged in the order red (0), white (1), and blue (2).

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 6
2 0 2 1 1 0
Output: Sorted colors:
0 0 1 1 2 2

Answer

-

Status : -

Marks : 0/10

3. Problem Statement

Priya, a data analyst, is working on a dataset of integers. She needs to find the maximum difference between two successive elements in the sorted version of the dataset. The dataset may contain a large number of integers, so Priya decides to use QuickSort to sort the array before finding the difference. Can you help Priya solve this efficiently?

Input Format

The first line of input consists of an integer n, representing the size of the array.

The second line consists of n space-separated integers, representing the elements of the array.

Output Format

The output prints a single integer, representing the maximum difference between two successive elements in the sorted form of the array.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 1
10
Output: Maximum gap: 0

Answer

-

Status : *-* ***Marks : 0/10***