MidSem-B Lab Exam

Problem 1: Transpose Triumph

Write a C program that transform given **2D array (arr)** into **arrT** such that `arr[i][j]= arrT[j][i]`, using recursion and pointers. Program should read a array from the user and then use a recursive function to transform the given array with **in place** program(no extra space or without defining a new array or temp array).

Input Format

- The first line contains an integer `N (1 ≤ N≤ 100)`, representing the size of the array.
- The next `N` lines each contain `N` integers representing the elements of the array.

Output Format

The output should be the transposed array.

Constraints

The array will have at most `100` rows and `100` columns.
The integer values in the array can be between `-1000` and `1000`.

Example

Input:

```
3
1 2 3
4 5 6
7 8 9
```

Output:

```
1 4 7
2 5 8
3 6 9
```

Function Signature

```
void transposeArray(int *array, int n, int row, int col);
```

Problem 2: Night Cricket blursed work

In football ground, there are cricket balls scattered everywhere, and of three distinct colors: `red` (representing 0s), `green` (representing 1s), and `white` (representing 2s). The cricket supervisor, Aaditya, is overwhelmed by the chaos and needs your help to organize the balls into a neat sequence.

Your task is to assist Aaditya in sorting the balls so that all the `red balls (0s)` are grouped together first, followed by the `green balls (1s)` , and finally the `white balls (2s)` . Imagine creating a vibrant display of colors for everyone to enjoy!

Input Format:

- The first line contains an integer **N** (the total number of balls).
- The second line contains **N** integers, each representing the color of a ball (`0 for red, 1 for green, and 2 for white`).

Output Format:

- A single line containing the sorted sequence of balls.

Constraints:

- 0 ≤ N ≤ 100000000

Example 1:

Input:

```
5
2 0 1 2 0
```

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Output:

```
0 0 1 2 2
```

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Input:

```
8
1 2 0 1 0 2 1 0
```

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Output:

```
0 0 0 1 1 1 2 2
```

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Explanation:

Your program should sort the balls. The sorted sequence is `0 0 1 2 2`.

Problem 3: Array Manipulator

You are tasked with creating a program that performs several operations on an array of integers. These operations include calculating the sum of the elements, finding the maximum value, reversing the array, and displaying the contents of the array.

Input

- The first line contains an integer N $(1 \le N \le 1000)$, representing the number of elements in the array.
- The second line contains N integers, which are the elements of the array.

Output: program should output the following:

- Print sum of the elements of the array.
- Print maximum value in the array.

- Print reversed array.

Constraints

- Array size: $1\le N \le 1000$
- Array elements: $-10^6 \le element \le 10^6$
- Memory Allocation: Ensure that memory allocation for the array is successful. If not, handle the error appropriately.

Examples

Input:

```
5
3 1 4 1 5
```

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Output:

```
Sum of array: 14
Maximum value: 5
Reversed array: 5 1 4 1 3
```

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Input:

```
4
10 20 30 40
```

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Output:

```
Sum of array: 100
Maximum value: 40
Reversed array: 40 30 20 10
```

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Submission Guidelines

- Do not rename any files given in the handout. Only write the code in the specified C files in the respective directories.

Good luck!