Lab Assignment: Counting Sort

Problem Statement

Write a C program to sort an array of non-negative integers using the Counting Sort algorithm.

Algorithm

1. Find the maximum element max in the input array.
2. Create a count array of size max + 1, and initialize all elements to 0.
3. Traverse the input array, and for each element arr[i], increment count[arr[i]].
4. Modify the count array such that each element at index i stores the sum of previous counts (cumulative frequency).
5. Create an output array. Traverse the input array in reverse order: - Place each element arr[i] at its correct position using count[arr[i]]. - Decrement count[arr[i]] by 1.
6. Copy the sorted elements from the output array back into the input array.

Function Signature

```
void countingSort(int arr[], int n);
```

Example

Input:
Array: 4 2 2 8 3 3 1

Output:
Sorted Array: 1 2 2 3 3 4 8