Telegram - https://t.me/placementclasses

Counting Sort | Goldman Sachs

Write a program to input an array of integers from the user and print the sorted array using counting sort.

Sample input

Sample input-1

Enter the length of array : 3

Enter the element : 9

Enter the element : 0

Enter the element : 3

Sample output-1

Array sorted by counting sort is :

[0, 3, 9]

Sample input-2

Enter the length of array : 6

Enter the element : 7

Enter the element : 3

Enter the element : 8

Enter the element : 1

Enter the element : 0

Enter the element : 2

Sample output-2

Array sorted by counting sort is :

[0, 1, 2, 3, 7, 8]

Algorithm

- Define a function counting_sort( ) to sort the array of integers.
- Initialize two arrays ‘result’ and ‘a’.
- Iterate a for loop to store the count of each element in ‘a’.
- Iterate another loop to store the cumulative count and increment a[i] by a[i+1].
- To find the index of each element of the input array in ‘a’ , append the elements to ‘result’.
- Initialise an array ‘arr’ and input the length and elements of the array from the user.
- Call the function counting_sort( ) from the driver code.
- Print the sorted array.

Code

```python
def counting_sort(arr):
    result = [0] * l

    a = [0] * 10

    for i in range(0, l):
        a[arr[i]] += 1

    for i in range(1, 10):
        a[i] += a[i - 1]

    i = l - 1
    while i >= 0:
        result[a[arr[i]] - 1] = arr[i]
        a[arr[i]] -= 1
        i -= 1
```

Output

```
Enter the length of array : 6
Enter the element : 2
Enter the element : 0
Enter the element : 9
Enter the element : 5
Enter the element : 7
Enter the element : 1
Array sorted by counting sort is :
[0, 1, 2, 5, 7, 9]
```