Name : Yash Srivastava || Section - A || Roll. No - 63

Implementation and Analysis of Counting Sort

```
def counting_sort(a):
    k = max(a) + 1
    c = [0] * k
    b = []
    for x in a:
        c[x] = c[x] + 1
    i = 0
    for x in range(k):
        for j in range(c[x]):
            a[i] = x
            i += 1
    return a


def display(a):
    print("Sorted Array: ")
    for i in range(len(a)):
        print(a[i], end=' ')


print("Enter an array")
a = list(map(int, input().split()))
counting_sort(a)
display(a)
```

Input:

10 20 30 50 40 60

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Output:

10 20 30 40 50 60

Time Complexity:

- O(n) in best case, worst case, average case

Program:

Counting Sort.py

```
def counting_sort(a):
    k = max(a) + 1
    c = [0] * k
    b = []
    for x in a:
        c[x] = c[x] + 1
    i = 0
    for x in range(k):
        for j in range(c[x]):
            a[i] = x
            i += 1
    return a

def display(a):
    print("Sorted Array: ")
    for i in range(len(a)):
        print(a[i], end=' ')


print("Enter an array")
a = list(map(int, input().split()))
counting_sort(a)
display(a)
```

Input/Output:

Counting Sort

```
C:\Anaconda\envs\MLProject\python.exe "C:\MLProject\Counting Sort.py"
Enter an array
10 20 30 50 40 60
Sorted Array:
10 20 30 40 50 60
Process finished with exit code 0
```