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# -22AIE203-
# DATA STRUCTURES AND ALGORITHMS -2

## ASSIGNMENT 6 – Radix Sort

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## Counting Sort

```
def countingSort(arr, exp1):
    n = len(arr)
    output = [0] * (n)
    count = [0] * (10)
    for i in range(0, n):
        index = arr[i] // exp1
        count[index % 10] += 1

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

    i = n - 1
    while i >= 0:
        index = arr[i] // exp1
        output[count[index % 10] - 1] = arr[i]
        count[index % 10] -= 1
        i -= 1
    i = 0
    for i in range(0, len(arr)):
        arr[i] = output[i]
```

# Radix Sort

```
23 def radixSort(arr):
24     max1 = max(arr)
25     exp = 1
26     i=0
27     while max1 / exp >= 1:
28         i += 1
29         countingSort(arr, exp)
30         print(f"Array after {i}th Pass to Counting Sort: {arr}")
31         exp *= 10
```

```
34 arr = [432,8,530,90,88,231,11,45,677,199]
35 print("Array Before Sorting: ")
36 for i in range(len(arr)):
37     print(arr[i], end=", ")
38 print("\n\n")
39
40 radixSort(arr)
41
42 print("\n\nArray after Sorting: ")
43 for i in range(len(arr)):
44     print(arr[i], end=", ")
45
```

```
Array Before Sorting:
432, 8, 530, 90, 88, 231, 11, 45, 677, 199,


Array after 1th Pass to Counting Sort: [530, 90, 231, 11, 432, 45, 677, 8, 88, 199]
Array after 2th Pass to Counting Sort: [8, 11, 530, 231, 432, 45, 677, 88, 90, 199]
Array after 3th Pass to Counting Sort: [8, 11, 45, 88, 90, 199, 231, 432, 530, 677]


Array after Sorting:
8, 11, 45, 88, 90, 199, 231, 432, 530, 677,
>>>
```