

LAB#27

Q.1: Write a program to sort an unsorted array by using radix sort algorithm.

Solution:

```
1  def counting_sort(initial_arr, exp):
2      n = len(initial_arr)
3      output_arr = [0] * n
4      count_arr = [0] * 10
5
6      for i in range(n):
7          index = initial_arr[i] // exp
8          count_arr[index % 10] += 1
9
10
11     for i in range(1, 10):
12         count_arr[i] += count_arr[i - 1]
13
14     for i in range(n - 1, -1, -1):
15         index = initial_arr[i] // exp
16         output_arr[count_arr[index % 10] - 1] = initial_arr[i]
17         count_arr[index % 10] -= 1
18
19     for i in range(n):
20         initial_arr[i] = output_arr[i]
21
```

```
22 def radix_sort(initial_arr):
23     max_val = max(initial_arr)
24
25     exp = 1
26     while max_val // exp > 0:
27         counting_sort(initial_arr, exp)
28         exp *= 10
29
30     initial_arr = [2050, 1, 14, 100]
31     radix_sort(initial_arr)
32     print("Sorted array:", initial_arr)
```

Output:

```
Sorted array: [1, 14, 100, 2050]
```

Class Assignment:

Q.1: Consider the above code (Lab#27 example#1) then explain the code in detail, visualizing each step.

Q.2: Modify the above program (LAB#27 Example#1) to sort the following array:

a.[-7,-8882,-98,-88,-130]

b.[-99,66,-108,0,10,1]