ASSIGNMENT

Objective: Implementation and Analysis of Radix sort using python

Code:

```
def radix_sort(alist, base=10):
    if alist == []:
        return
    def key_factory(digit, base):
        def key(alist, index):
            return ((alist[index]//(base**digit)) % base)
        return key
    largest = max(alist)
    exp = 0
    while base**exp <= largest:
        alist = counting_sort(alist, base - 1, key_factory(exp, base))
        exp = exp + 1
    return alist
def counting_sort(alist, largest, key):
    c = [0]*(largest + 1)
    for i in range(len(alist)):
        c[key(alist, i)] = c[key(alist, i)] + 1
    c[0] = c[0] - 1 # to decrement each element for zero-based indexing
    for i in range(1, largest + 1):
        c[i] = c[i] + c[i - 1]
    result = [None]*len(alist)
    for i in range(len(alist) - 1, -1, -1):
```

```
        result[c[key(alist, i)]] = alist[i]

        c[key(alist, i)] = c[key(alist, i)] - 1

    return result

alist = input('Enter the list of (nonnegative) numbers: ').split()

alist = [int(x) for x in alist]

sorted_list = radix_sort(alist)

print('Sorted list: ', end='')

print(sorted_list)
```