DAY 37

INTERVIEW BIT PROBLEMS :

1. Maximum Consecutive Gap

Given an unsorted array, find the maximum difference between the successive elements in its sorted form.
Try to solve it in linear time/space.
Example :
Input : [1, 10, 5]
Output : 5
Return 0 if the array contains less than 2 elements.

i. You may assume that all the elements in the array are non-negative integers and fit in the 32-bit signed integer range.
ii. You may also assume that the difference will not overflow.

CODE :

PYTHON

```
class Solution:
    # @param A : tuple of integers
    # @return an integer
    def maximumGap(self, A):
        A=list(A)
        A.sort()
        maxi=0
        n=len(A)
        if n<2:
            return maxi
        for i in range(n-1):
            maxi=max(maxi,abs(A[i]-A[i+1]))
        return maxi
```

Time Complexity : O(nlogn)

(OR)

```
class Solution:
    # @param A : tuple of integers
    # @return an integer
    def maximumGap(self, A):
        A=list(A)
        INT_MIN, INT_MAX = float('-inf'), float('inf')
        maxi=0
        n=len(A)
        if n<2:
            return maxi
        min_A,max_A=min(A),max(A)
        if (max_A-min_A)<2:
```

```
            return max_A-min_A
        mini_gap=max(1,(max_A-min_A)//n)
        min_bucket=[INT_MAX]*(n)
        max_bucket=[INT_MIN]*(n)
        for ele in A:
            i=min((ele-min_A)//mini_gap,len(A)-1)
            min_bucket[i]=min(min_bucket[i],ele)
            max_bucket[i]=max(max_bucket[i],ele)
        pr_max=max_bucket[0]
        for i in range(1,n):
            if min_bucket[i]==INT_MAX:
                continue
            maxi=max(min_bucket[i]-pr_max,maxi)
            pr_max=max_bucket[i]
        return maxi
```

Time Complexity : $O(n)$
Space Complexity : $O(n)$