Manyala Abhishek
180030205

Pre-Lab Task: 1. Given N integers a1,a2,...aN, generate all N- dimentional points (x1,x2,...xN) such thatxi is an integer and 0<=xi<=ai (i=1,2...N). Your task is to find the number of ways to select two points A and B from this set, such that the midpoint of A and B also lies in this set. A and B can be same also. Input Format: First line of input contains a single integer N. The second line contains N integers, the ith of them representing ai, as defined in the problem. Output Format: The output contains a single integer, the answer to the problem

Sample input:

2 1 2

Sample Output:

10

Code :

```
dimensions = int(input())

A = map(int, input().split())

num = 1

for x in A:

   num = num * ((pow(x+1, 2) + 1)//2) % 1000000007

print(num)
```

2. Given an array of integers A and a positive integer k, find whether it's possible to divide this array into sets of k consecutive numbers Return True if its possible otherwise return False.

Example 1:

Input: A = [1,2,3,3,4,4,5,6], k = 4

Output: true

Explanation: Array can be divided into [1,2,3,4] and [3,4,5,6].

Example 2: Input: A = [3,2,1,2,3,4,3,4,5,9,10,11], k = 3

Output: true

Explanation: Array can be divided into [1,2,3] , [2,3,4] , [3,4,5] and [9,10,11].

Example 3: Input: A = [3,3,2,2,1,1], k = 3

Output: true Example 4: Input: A = [1,2,3,4], k = 3

Output: false

Explanation: Each array should be divided in subarrays of size 3.

Manyala Abhishek
180030205

CODE :

```
import collections
def isPossibleDivide(N,k):
   L, C = len(N), collections.Counter(N)
   for i in range(L//k):
      m = min(C.keys())
      for j in range(m,m+k):
         if C[j] > 1: C[j] -= 1
         else: del C[j]
   return not (C or L % k)
a,k =[int(x) for x in input().split()],int(input())
print(isPossibleDivide(a,k))
```

In-Lab Task: 3. A team of people would like to buy a bouquet of roses. The vendor wants to maximize his wide variety of recent clients count and the cash he makes. To do so, he decides to multiply the price of each rose with the aid of the wide variety of that clients previously purchased roses plus 1. The first rose will be original price,(0+1) x original price , the next will be (1+1) x original price and so on. Given the size of the group of people, the number of roses they want to purchase and the original prices of the rose, determine the minimum cost to purchase all of the roses. For example, if there are k=3 group of people such that want to buy n=4 roses that cost c=[1,2,3,4] each will buy one of the roses priced [2,3,4] at the original price. Having each purchased x=1 rose, the first rose in the list,c[0] , will now cost (cuurent purchase + previous purchases) x c[0] = (1 + 1) x 1 = 2. The total cost will be 2 + 3 + 4 + 2 = 11. Input Format The first line contains two space-separated integers n and k, the number of roses and group of people. The second line contains n space-separated positive integers c[i], the original price of each rose. Ouput Format Print the minimum cost to buy all nroses. Sample Input

0 3 3 2 5 6

Sample Output 0 13

Explanation 0 There are n=3 rosess with costs c = [2,5,6] and k=3 people in the team. If each person buys one rose, the total cost of prices paid is 2 + 5 + 6 = 13 dollars. Thus, we print 13 as our answer. Sample Input 1 3 2 2 5 6

Sample Output 1 15

CODE :

```
def getMinimumCost(n, k, c):
    cost = 0
    c = sorted(c, reverse=True)
    for i in range(0, n):
        cost += (i // k + 1) * c[i]
    return cost
n,k=[int(x) for x in input().split()]
c=[int(x) for x in input().split()]
print(getMinimumCost(n, k, c))
```

4)Given a non-negative integer N, find the largest number that is less than or equal to N with monotonically increasing digits. (Recall that an integer has monotonically increasing digits if and only if each pair of adjacent digits x and y satisfy x <= y.)

Example 1:

Input: N = 10

Output: 9

Example 2:

Input: N = 1234

Output: 1234

Example 3:

Input: N = 332

Output: 299

CODE :

```
def monotoneIncreasingDigits(N):
    pivot, s = 0, list(str(N))
    for i in range(1,len(s)):
        if s[i-1] < s[i]:
            pivot = i
        elif s[i-1] > s[i]:
            s[pivot] = str(int(s[pivot])-1)
            s[pivot+1:] = '9'*(len(s)-pivot-1)
            break
    return int(''.join(s))
print(monotoneIncreasingDigits(int(input())))
```

Manyala Abhishek
180030205

Post-Lab

Task: 5. There are n people whose IDs go from 0 to n - 1 and each person belongs exactly to one group. Given the array groupSizes of length n telling the group size each person belongs to, return the groups there are and the people's IDs each group includes. You can return any solution in any order and the same applies for IDs. Also, it is guaranteed that there exists at least one solution. Example 1:

Input: groupSizes = [3,3,3,3,3,1,3]

Output: [[5],[0,1,2],[3,4,6]]

Explanation: Other possible solutions are [[2,1,6],[5],[0,4,3]] and [[5],[0,6,2],[4,3,1]].

Example 2:

Input: groupSizes = [2,1,3,3,3,2]

Output: [[1],[0,5],[2,3,4]]

CODE :

```
def groupThePeople(groupSizes):
    progress = {}
    finished = []


    for i, size in enumerate(groupSizes):
        progress[size] = progress.get(size, []) + [i]
        if len(progress[size]) == size:
            finished += [progress.pop(size)]
    return finished
groupSizes=[int(x) for x in input().split()]
gs=sorted(groupThePeople(groupSizes),key=len)
print(gs)
```

Manyala Abhishek
180030205

6. Tom is a teacher in nursery school. She wants the kids in her class to get some sweets. All the kids sit in a line and each of them has a ranking score in the class according to their results. Tom wants to give every kid a minimum of 1 sweet. When two kids are sitting next to each other, then the one with the better rating gets more sweets. Tom wants the total number of sweets to be minimised.and every of them has a score score in step with his or her performance inside the class. Input Format The first line contains an integer, n, the size of array . Each of the next n lines contains an integer a[i] indicating the rating of the kid at position i. Output Format Output a single line containing the minimum number of candies Alice must buy.

Sample Input 0 3 1 2 2

Sample Output 0 4

Explanation 0 Here 1, 2, 2 is the rating. Note that when two kids have equal rating, they are allowed to have different number of sweets. Hence optimal distribution will be 1, 2, 1.

Sample Input 1 10 2 4 2 6 1 7 8 9 2 1

Sample Output 1 19

CODE:

```
def candies(n, arr):

  l =[1]*n

  for i in range(1,n):

    if arr[i]>arr[i-1]:

      l[i] += l[i-1]


    elif arr[i-1]>arr[i] and l[i-1]<=l[i]:

      l[i-1] += 1


  return sum(l)
```

Manyala Abhishek
180030205

```
n = int(input())

arr=[]

for i in range(n):

   arr.append(int(input()))

print(candies(n,arr))
```

CODECHEF

An unacademy Educational Initiative

Hello 1★ abhi10manyala

1

Logout

PRACTICE & LEARN COMPETE DISCUSS OUR INITIATIVES ASSOCIATE WITH US MORE

Home » IDE

# Code, Compile & Run

Ide ✖ Ide ✖ Ide ✖ Ide ✖ Ide ✖ Ide ✖ +

Contest Code/Name (e.g. JULY15/PRACTICE)

Problem Code/Name (e.g. TEST)

Select

PYTH 3.6 (Python 3.6)

Code gets autosaved every second

```python
def groupThePeople(groupSizes):
    progress = {}
    finished = []

    for i, size in enumerate(groupSizes):
        progress[size] = progress.get(size, []) + [i]
        if len(progress[size]) == size:
            finished += [progress.pop(size)]
    return finished
groupSizes=[int(x) for x in input().split()]
gs=sorted(groupThePeople(groupSizes),key=len)
print(gs)

```

We use cookies to improve your experience and for analytical purposes.
Read our Privacy Policy and Terms to know more. You consent to our cookies if you continue to use our website.

Okay

12:0

Open File ☑ Custom Input Run

Custom Input

```
3 3 3 3 3 1 5
```

**Status** Successfully executed **Date** 2020-08-24 05:15:02 **Time** 0.03 sec **Mem** 17.968 kB

**Input**

```
3 3 3 3 3 1 5
```

**Output**

```
[[5], [0, 1, 2]]
```

We use cookies to improve your experience and for analytical purposes.
Read our Privacy Policy and Terms to know more. You consent to our cookies if you continue to use our website.
Okay

CODECHEF
An unacademy Educational Initiative

Hello 1★ abhi10manyala

Logout

PRACTICE & LEARN COMPETE DISCUSS OUR INITIATIVES ASSOCIATE WITH US MORE

Home » IDE

# Code, Compile & Run

Ide ✖ Ide ✖ Ide ✖ Ide ✖ Ide ✖ Ide ✖ +

Contest Code/Name (e.g. JULY15/PRACTICE) Problem Code/Name (e.g. TEST) Select

PYTH 3.6 (Python 3.6) Code gets autosaved every second

```python
def candies(n, arr):
    l =[1]*n
    for i in range(1,n):
        if arr[i]>arr[i-1]:
            l[i] += l[i-1]

        elif arr[i-1]>arr[i] and l[i-1]<=l[i]:
            l[i-1] += 1

    return sum(l)
n = int(input())
arr=[]
for i in range(n):
    arr.append(int(input()))
print(candies(n,arr))

```

We use cookies to improve your experience and for analytical purposes.
Read our Privacy Policy and Terms to know more. You consent to our cookies if you continue to use our website.

Okay

14:21

Open File

☑ Custom Input

Run

Custom Input

```
3
1
2
2
```

**Status** Successfully executed **Date** 2020-08-24 05:16:21 **Time** 0.04 sec **Mem** 17.968 kB

✖

**Input**

```
3
1
2
2
```

**Output**

```
4
```

We use cookies to improve your experience and for analytical purposes.
Read our Privacy Policy and Terms to know more. You consent to our cookies if you continue to use our website.

Okay

CODECHEF
An unacademy Educational Initiative

Hello 1★ abhi10manyala ▾ 1 Logout

PRACTICE & LEARN COMPETE DISCUSS OUR INITIATIVES ASSOCIATE WITH US MORE

Home » IDE

# Code, Compile & Run

Ide ✖ Ide ✖ Ide ✖ Ide ✖ Ide ✖ Ide ✖ +

Contest Code/Name (e.g. JULY15/PRACTICE) Problem Code/Name (e.g. TEST) Select

PYTH 3.6 (Python 3.6) Code gets autosaved every second

```
def getMinimumCost(n, k, c):
    cost = 0
    c = sorted(c, reverse=True)
    for i in range(0, n):
        cost += (i // k + 1) * c[i]
    return cost
n,k=[int(x) for x in input().split()]
c=[int(x) for x in input().split()]
print(getMinimumCost(n, k, c))

```

We use cookies to improve your experience and for analytical purposes.
Read our Privacy Policy and Terms to know more. You consent to our cookies if you continue to use our website. Okay

9:0

Open File

☑ Custom Input

Run

Custom Input

```
3 3
2 5 6
```

**Status** Successfully executed **Date** 2020-08-24 05:11:22 **Time** 0.02 sec **Mem** 17.968 kB

**Input**

```
3 3
2 5 6
```

**Output**

```
13
```

We use cookies to improve your experience and for analytical purposes.
Read our Privacy Policy and Terms to know more. You consent to our cookies if you continue to use our website.

Okay

CODECHEF
An unacademy Educational Initiative

Hello 1★ abhi10manyala

Logout

PRACTICE & LEARN COMPETE DISCUSS OUR INITIATIVES ASSOCIATE WITH US MORE

Home » IDE

# Code, Compile & Run

Ide ✖ Ide ✖ Ide ✖ Ide ✖ Ide ✖ Ide ✖ +

Contest Code/Name (e.g. JULY15/PRACTICE)

Problem Code/Name (e.g. TEST)

Select

PYTH 3.6 (Python 3.6)

Code gets autosaved every second

```python
def monotoneIncreasingDigits(N):
    pivot, s = 0, list(str(N))
    for i in range(1,len(s)):
        if s[i-1] < s[i]:
            pivot = i
        elif s[i-1] > s[i]:
            s[pivot] = str(int(s[pivot])-1)
            s[pivot+1:] = '9'*(len(s)-pivot-1)
            break
    return int(''.join(s))
print(monotoneIncreasingDigits(int(input())))

```

We use cookies to improve your experience and for analytical purposes.
Read our Privacy Policy and Terms to know more. You consent to our cookies if you continue to use our website.

Okay

11:0

Open File

☑ Custom Input

Run

Custom Input

```
10
```

**Status** Successfully executed **Date** 2020-08-24 05:12:38 **Time** 0.04 sec **Mem** 17.968 kB

**Input**

```
10
```

**Output**

```
9
```

We use cookies to improve your experience and for analytical purposes.
Read our Privacy Policy and Terms to know more. You consent to our cookies if you continue to use our website.

Okay

Home » IDE

# Code, Compile & Run

Ide ✖ Ide ✖ Ide ✖ Ide ✖ Ide ✖ Ide ✖ +

Contest Code/Name (e.g. JULY15/PRACTICE) Problem Code/Name (e.g. TEST) Select

PYTH 3.6 (Python 3.6) Code gets autosaved every second

```
dimensions = int(input())
A = map(int,input().split())
num = 1
for x in A:
    num = num * ((pow(x+1, 2) + 1)//2) % 1000000007
print(num)
```

We use cookies to improve your experience and for analytical purposes.
Read our Privacy Policy and Terms to know more. You consent to our cookies if you continue to use our website. Okay

1:27

Open File ☑ Custom Input Run

Custom Input

```
2
1 2
```

**Status** Successfully executed **Date** 2020-08-24 05:05:56 **Time** 0.02 sec **Mem** 17.968 kB ✖

**Input**

```
2
1 2
```

**Output**

```
10
```

We use cookies to improve your experience and for analytical purposes.
Read our Privacy Policy and Terms to know more. You consent to our cookies if you continue to use our website. Okay

CODECHEF
An unacademy Educational Initiative

Hello 1★ abhi10manyala

Logout

PRACTICE & LEARN COMPETE DISCUSS OUR INITIATIVES ASSOCIATE WITH US MORE

Home » IDE

# Code, Compile & Run

Ide ✖ Ide ✖ Ide ✖ Ide ✖ Ide ✖ Ide ✖ +

Contest Code/Name (e.g. JULY15/PRACTICE)

Problem Code/Name (e.g. TEST)

Select

PYTH 3.6 (Python 3.6)

Code gets autosaved every second

```
import collections
def isPossibleDivide(N,k):
    L, C = len(N), collections.Counter(N)
    for i in range(L//k):
        m = min(C.keys())
        for j in range(m,m+k):
            if C[j] > 1: C[j] -= 1
            else: del C[j]
    return not (C or L % k)
a,k =[int(x) for x in input().split()],int(input())
print(isPossibleDivide(a,k))

```

We use cookies to improve your experience and for analytical purposes.
Read our Privacy Policy and Terms to know more. You consent to our cookies if you continue to use our website.

Okay

11:0

Open File ☑ Custom Input Run

Custom Input

```
4
8
1 2 3 3 4 4 5 6
```

**Status** Successfully executed **Date** 2020-08-24 05:09:30 **Time** 0.04 sec **Mem** 17.712 kB ✖

**Input**

```
4
8
1 2 3 3 4 4 5 6
```

**Output**

```
False
```

We use cookies to improve your experience and for analytical purposes.
Read our Privacy Policy and Terms to know more. You consent to our cookies if you continue to use our website. Okay