CPRO Assignment 5

a) A Beautiful arrangement of objects is an arrangement in which all the objects of same type are kept together. In this problem we have a string consisting of characters R,G,B placed in any random permutation. You want to make this string beautiful in the least cost possible. The only operation allowed is changing a character Ai to some other colour(R,G,B) and the cost of this is Ci.

Input format
First line contains N.
2nd line contains the string.
3rd line contains N numbers denoting Ci.

Output format
A single number which is the minimum possible cost

Input1
3
RRR
1 2 3

Output1
0

Input2
4
RGBR
1 2 3 4

Output1
1(change A0 to G ie GGBR)

Constraints
1<=N<=10^6
Ci<=10^3

b) RArora is really fond of arrays and recently developed an interest in arrays only containing 1s & 0s. His friend Swapnil gave him an array and asked him to find the maximum length of a subarray containing all

1s. He found it really easy and hence modified the problem and gave the new problem back to Swapnil. The new problem just has 1 change. Swapnil is allowed to invert at max M elements of the array(0 to 1 and vice versa)

Swapnil being an awesome coder solved it in no time. Can you?

Input format
First line contains N & M.
2nd line contains N elements, Ai which are the elements of array

Output format
A single number which is the maximum length.

Input1
10 1
1 1 0 1 1 0 0 1 1 1

Output1
5

Explanation
(flip A[2])

Input2
10 2
1 1 0 1 1 0 0 1 1 1

Output2
7

Explanation
(flip A[5],A[6])

Constraints
2 <= N <= 10^6

c) Swapnil Gupta likes to play video games say CSGO and is getting good at it. He realizes that he needs to spend as much time possible to become a better player, better than the champion of the batch. He plans out a schedule in which he knows how much time is available each day for the next N days in which he can play CSGO. In his model, time can be negative too. The catch is that his professor should not know that he plays CSGO, else he will fail him. If he plays CSGO for any

K consecutive days, his professor will catch him. Your task is to find out the maximum time he can spend playing CSGO in the next N days in such a way that his professor does not catch him.

Input
First line will have two space separated integers N and K.
Next line will have N space separated integers denoting time on each day available for the TA to play CSGO.

Output
A single integer denoting the maximum time for which he can play CSGO in next N days without getting caught by his professor.

Constraints
1 <= N,K <= 1000
-1000 <= Ai <= 1000

Sample Input
5 3
6 10 8 4 2

Sample Output
22(6+10+4+2)

d) You are given a string. A string is considered to be bad if it has k consecutive characters which are all the same. Your task is to make this string good. Given a string, remove any occurrence of similar k consecutive characters from the string. Check if the remaining string is good, if it is not, repeat the above operation till the remaining string is good. Output the remaining good string. If the remaining string is empty, output -1.

Input:
String s
k

Output:
Good string s'

Constraints:
1 <= |s| <= 5000
1 <= k <= |s|

Sample Input:
AABBBA
3

Sample Output:
-1

Sample Input:
AAABB
3

Sample Output:
BB

e)
You are given an array of N integers and want to find the Longest increasing subsequence. Print the indexes of the subsequence you selected. If there are multiple increasing subsequences with the same length, print the one which is lexicographically largest(by indexes).

Input:
N
N integers

Output:
L which is the length of LIS
L numbers which are the indexes of lexicographically largest LIS.

Constraints:
N<=5000
Ai<=10^9

Sample Input1:
5
1 2 1 4 3

Sample Output1:
3
0 1 4

Sample Input1:
7
1 2 3 1 2 3 4

Sample Output1:
4
3 4 5 6

f) Anurudh has a string S(containing lower case english letters) of length L and also a string p. He starts to remove letters from S in the following order A=[a1,a2..aL] where A is a permutation of the numbers 1..L. The ordering/indices of other characters remain same after removal.

He wants to find the maximum number of letters he can remove in this order such that it is still possible to get the string p by removing some more characters (not necessarily in this permutation's order)(can be 0 more removals too).

Input:
String S
String P
The permutation A containing |S| integers.

Output:
The maximum no. of characters Anurudh can remove.

Constraints:
|S|<=10^6

Sample Input1:
ababcba

abb

5 3 4 1 7 6 2

Sample Output1:
3(string becomes 'abba' after 3 removals and 'bba' after 4. so he can remove at most 3 as after 4 removals, 'abb' can never be made from 'bba')

Sample Input2:
bbbabb

bb

1 6 3 4 2 5

Sample Output2:

4