

Problem . An Array and Partial Sums

A prefix sum array of an integer array a of length n is an array b of length n such that $b_i = a_1 + a_2 + \dots + a_i$.

A suffix sum array of an integer array a of length n is an array b of length n such that $b_i = a_n + a_{n-1} + \dots + a_i$.

We call the *normalization* of an integer array a of length n performing the assignment $a_i \leftarrow \max(\min(a_i, 10^{18}), -10^{18})$ for $1 \leq i \leq n$.

An integer array a of length n is given.

We are allowed to perform operations of three types:

1. replace each element of array a with its opposite (perform the assignment $a_i \leftarrow (-a_i)$ for $1 \leq i \leq n$);
2. select any subsegment of the array a and replace it with the array of its prefix sums, then *normalize* array a ;
3. select any subsegment of the array a and replace it with the array of its suffix sums, then *normalize* array a .

Find the shortest sequence of operations required to make all elements of array a non-negative.

Note that for some blocks of tests, it is allowed to find a sequence of operations that is not the shortest possible.

Input

The first line contains two integers n and g ($1 \leq n \leq 2 \cdot 10^5$, $0 \leq g \leq 8$) — the length of the array and the test group number, respectively.

The second line contains n integers a_1, a_2, \dots, a_n ($-1 \leq a_i \leq 1$) — the elements of the array.

Output

In the first line, print a single integer m — the minimum number of operations required to make all elements of the array a non-negative.

In the next m lines, output the descriptions of the operations. Output the descriptions of operations of the first type in the format “1”. Output the descriptions of operations of the second and third types in the formats “2 l r ” and “3 l r ”, respectively, where l and r ($1 \leq l \leq r \leq n$) denote the left and right boundaries of the subarray of the corresponding operation.

If there are multiple correct answers, any of them may be printed.

Note

In the first example, the array a changes twice:

1. after performing the third type of operation with parameters $l = 1$, $r = 3$, the array a becomes equal to $[1, 1, 1, -1, -1, -1, 1]$;
2. after performing the second type of operation with parameters $l = 1$, $r = 7$, the array a becomes equal to $[1, 2, 3, 2, 1, 0, 1]$.

Examples

test	answer
7 0	2
0 0 1 -1 -1 -1 1	3 1 3 2 1 7

Scoring

Let the minimum number of operations required to make all elements of the array a non-negative for a certain test be m_{ans} , and your solution uses m_{user} operations.

1. (14 points): $m_{ans} \leq 1$;
2. (17 points): your solution will be considered correct if $m_{user} \leq 100$. It can be proved that there always exists a sequence of no more than 100 operations under the given constraints;
3. (18 points): your solution will be considered correct if $m_{user} \leq m_{ans} + 3$;
4. (7 points): your solution will be considered correct if $m_{user} \leq m_{ans} + 1$;
5. (7 points): $n \leq 3000$; it is guaranteed that **all** shortest sequences of operations contain **only** operations of the second type;
6. (19 points): it is guaranteed that **all** shortest sequences of operations contain **only** operations of the second type;
7. (17 points): $n \leq 3000$;
8. (1 point): no additional constraints.