Alice's Sequence

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	256 megabytes

Alice has a sequence $a_1, a_2, \ldots, a_n$. Help Alice to construct a new sequence $b_1, b_2, \ldots, b_n$ that

- let $c_i = a_i + c_{i-1} + b_i, c_0 = 0$ and $0 \le c_i \le m$ $(1 \le i \le n)$.

- the number of nonzero elements in sequence $b_1, b_2, \ldots, b_n$ is as small as possible.

Input

The input contains multiple test cases. For each test case:

The first line contains two integers n and m $(1 \le n \le 10^6, 1 \le m \le 10^9)$.

The second line contains n integers $a_1, a_2, \ldots, a_n$ $(|a_i| \le m)$.

The sum of values of n in all test cases doesn't exceed 10^6.

Output

For each test case, output n integers $b_1, b_2, \ldots, b_n$ $(|b_i| \le 10^{18})$, denoting your construction for Alice. The nonzero elements in sequence $b_1, b_2, \ldots, b_n$ must be as small as possible. If there are multiple solutions, you can output any of them.

Examples

standard input	standard output
5 3	0 0 -6 0 -5
1 2 3 3 3	0 0 -3 0 0
5 5	
3 0 5 -3 -2	