Ants

Input file:	standard input
Output file:	standard output
Time limit:	1 second
Memory limit:	256 megabytes

There are n ants living on a stick of length $(10^9 + 1)$ units. The initial position of the i-th ant is a_i units away from the left side of the stick. Some of the ants are facing left at the beginning, while the others are facing right. All ants will move at a speed of 1 unit per second in the direction they're facing. When two ants meet face to face at the same point, both of them will turn around instantly and move on.

There are also two obstacles on the sides of the stick, one located on the leftmost and the other on the rightmost. When an ant runs into one of them, it will also turn around instantly and move on. However, the obstacles aren't indestructible. The left one will break after a hits, while the right one will break for b hits. After an ant passes through a broken obstacle it will fall from the stick. Note that the number of hits is calculated independently for each obstacle, and that the ant which breaks the obstacle will also turn around and will not fall immediately.

In how many seconds will all ants fall from the stick?

Input

There is only one test case in each test file.

The first line of the input contains three integers n, a and b ($1 \le n \le 10^6$, $1 \le a, b \le 10^9$) indicating the number of ants, the number of hits to break the left obstacle and the number of hits to break the right obstacle.

The second line contains n integers $a_1, a_2, \cdots, a_n$ ($1 \le a_i \le 10^9$, $a_i < a_{i+1}$) indicating the initial position of ants.

The third line contains n integers $d_1, d_2, \cdots, d_n$ ($d_i \in \{0, 1\}$). If $d_i = 0$ then the i-th ant is facing left initially, otherwise it is facing right.

Output

Output one line containing one integer indicating the number of seconds for all ants to fall from the stick.

Example

standard input	standard output
2 2 4 2 3 0 1	4000000001

Note

The sample test case is explained as follows.

Time	Event	Left Hit	Right Hit
2	Ant 1 hits the left obstacle	1	0
999999998	Ant 2 hits the right obstacle	1	1
1000000000.5	Ant 1 meets ant 2 at 999999998.5 units from the left	1	1
1000000003	Ant 2 hits the right obstacle	1	2
1999999999	Ant 1 hits the left obstacle	2	2
2000000001.5	Ant 1 meets ant 2 at 2.5 units from the left	2	2
2000000004	Ant 1 falls from the left	2	2
3000000000	Ant 2 hits the right obstacle	2	3
4000000001	Ant 2 falls from the left	2	3