Problem H

HIIT

Time Limit: 1 second

Alright contestants, I want you to drop right now and give me 10 burpees! 20 pushups! 30 squats! 40 Supermans! And then I want you running high knees and butt kicks for 50 seconds! And then I want you to do all of that all over again! Thrice!

You didn't think that ICPC would just be a mental competition, did you? No way! If your own body isn't operating at peak capacity, then how can you expect your computer to be as well? This routine isn't even that hard, you know!

Alright, now, I want 1 minute each of planks and mountain climbers, and if you don't know the proper form for those exercises, just read the documentation! When you're done with that... we start with the programming problem! It's like chess boxing!

Alice drafted up an exercise routine for Bob to follow, which she calls the *Intense Cardio Punisher Challenge*. It consists of n different exercises, but since Bob is just a beginner, each exercise has an *easy version* which consumes a_i units of energy, and an *intense version* which consumes b_i units of energy. For each exercise, Bob must determine if he wants to do the easy version, or if he wants to do the intense version, or if he wants to skip that exercise today.

Bob can expend up to x units of energy today; any more than that and he, uh, *dies*. Primarily, Alice is happiest when Bob does not die. As a secondary priority, Alice is happiest when Bob skips as few exercises as possible. As a tertiary priority, Alice is then happiest when Bob does as many *intense* exercises as possible.

Bob is too tired to think right now, so let's help him decide on a plan that will make Alice as happy as possible!

Input Format

The first line of input contains the space-separated integers n and x.

The second line of input contains the n space-separated integers $a_1, a_2, \ldots, a_n$, the energy costs of the easy versions of the exercises.

The third line of input contains the n space-separated integers $b_1, b_2, \ldots, b_n$, the energy costs of the intense versions of the exercises.

Constraints

- $1 \leq n \leq 2 \cdot 10^5$
- $1 \leq a_i < b_i \leq 10^9$ for each i
- $1 \leq x \leq 10^{15}$

Output Format

Output a string of n characters, encoding what Bob should do for each exercise.

- If the ith character is `0`, then Bob skips the ith exercise (consuming 0 units of energy).
- If the ith character is `1`, then Bob does the easy version of the ith exercise (consuming a_i units of energy).
- If the ith character is `2`, then Bob does the intense version of the ith exercise (consuming b_i units of energy).

Your solution will be accepted if all of the following are satisfied:

- The total expended energy should be $\leq x$
- Among all solutions that use $\leq x$ energy, the number of `0`s should be minimized.
- Among all solutions that use $\leq x$ energy and have the minimal number of `0`s among such solutions, the number of `2`s should be maximized.

If there are multiple possible solutions, any will be accepted.

Sample Input 1

```
4 6
1 5 2 1
3 7 3 4
```

Sample Output 1

```
1021
```

Sample Input 2

```
5 44
14 11 12 15 8
15 18 17 18 16
```

Sample Output 2

```
20021
```

Sample Input 3

```
5 15
1 2 3 4 5
2 3 4 5 6
```

Sample Output 3

```
11111
```

Sample Input 4

```
5 99
100 101 102 103 104
105 106 107 108 109
```

Sample Output 4

```
00000
```

Explanation

For the first sample input, `2011` would also have been an acceptable solution.

The second sample input has many other acceptable solutions aside from the one given.