Problem J. Joy of Sushi

Input file:	*standard input*
Output file:	*standard output*
Time limit:	2 seconds
Memory limit:	1024 mebibytes

In UCPC, there is a world-famous conveyor sushi restaurant. Its name is "Anything Rotating Conveyor Sushi Restaurant"! This conveyor sushi restaurant has gained immense popularity on social media due to its unique concept where both chefs and customers rotate. The UCPC problem setters, not wanting to miss this famous place, made a reservation months ago, and today they finally visit the conveyor sushi restaurant!

A total of n problem setters visited the conveyor sushi restaurant, and accordingly, $n + 1$ chefs were on standby in the kitchen. The i-th chef can make b_i pieces of sushi per minute. Initially, the waiter seated the problem setters in a line and distributed a_i pieces of sushi to the problem setter in the i-th position. Then, the following actions were repeated every minute, in order:

- For all $1 \le i \le n$, the chef in the i-th position makes sushi for the problem setter in the i-th position. The amount of sushi made is equal to the amount that chef can make in one minute. The chef in position $n + 1$ does not make sushi and takes a break.
- The chefs rotate once. That is, the chef originally in the 1-st position moves to the 2-nd, the chef originally in the 2-nd position moves to the 3-rd, ..., and the chef originally in position $n + 1$ moves to the 1-st position.
- The problem setters rotate once. That is, the problem setter originally in the 1-st position moves to the 2-nd, the problem setter originally in the 2-nd position moves to the 3-rd, ..., and the problem setter originally in position n moves to the 1-st position.

Each problem setter eats a set of sushi as soon as they have one available. Here, a set of sushi refers to a bundle of exactly k pieces of sushi, regardless of type (some may be provided by the waiter, others made by one or more chefs). The time taken to eat the sushi is negligible.

The problem setters dislike leaving food behind, so they will continue to eat until everyone has 0 pieces of sushi left. How many minutes will it take for them to finish their meal?

Input

The first line contains two integers, n and k ($1 \le n \le 2000$; $2 \le k \le 10^6$).

The second line contains n integers $a_1, a_2, \ldots, a_n$ ($0 \le a_i \le k - 1$).

The third line contains $n + 1$ integers $b_1, b_2, \ldots, b_{n+1}$ ($1 \le b_i \le k - 1$).

Output

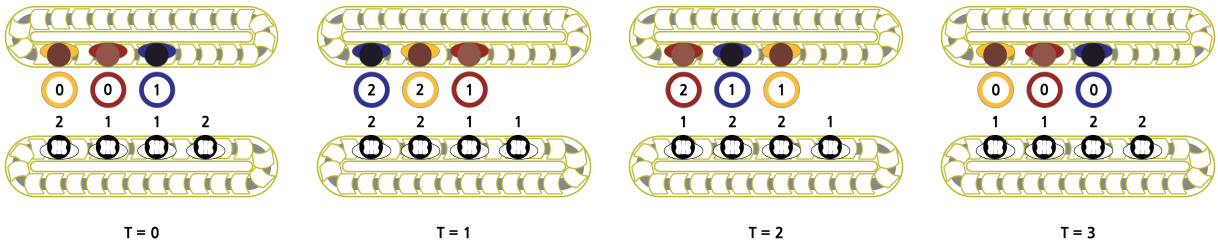
Output the time in minutes it takes for the problem setters to finish their meal. If they cannot finish their meal even after an infinite amount of time, output -1 instead.

Examples

standard input	*standard output*
3 3 0 0 1 2 1 1 2	3
3 3 0 0 0 2 1 1 2	0

Note

In the first example, visualizing the positions of the problem setters and chefs, as well as the amount of sushi each problem setter received and the amount each chef can make at each time interval, would look as follows:



In the second example, the problem setters finish their meal as soon as they start eating.