

international collegiate programming contest INDONESIA NATIONAL CONTEST INC 2022



Problem F Stock Market

Adrian owns a stock that he previously purchased, and wants to sell that stock. Currently, at day 0, the price of the stock is P_0 . As a robot, Morgan can predict the future. Morgan tells Adrian that the price changes will repeat every N days.

Formally, suppose that the price change from day i to day i+1 for $0 \le i \le N-1$ is D_i . The price change from day i to i+1 for $i \ge N$ is $D_i = D_{i \bmod N}$. The price of the stock at day i for i>0 is $P_i = P_{i-1} + D_{i-1}$. It is possible for a price to be negative.

Moreover, Morgan also knows that the price is on a downward trend. That is, the sum of all D_i is negative.

The following table is the stock price of each day if N=6, $P_0=20$, and $D_{0..5}=[4,-6,-1,4,-9,-2]$.

Day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
Price	20	24	18	17	21	12	10	14	8	7	11	2	0	4	-2	-3	1	-8	

Adrian can only sell the stock when the price is at least X, the price when he purchased the stock, to avoid any losses. As a thrill seeker, Adrian also would like to sell his stock at the lowest price possible while still being at least X.

Help Adrian to determine the lowest price of the stock that is not lower than X, or tell him if it is impossible. Note that Adrian can sell his stock at day 0, if $P_0 \ge X$.

Input

Input begins with three integers N P_0 X $(1 \le N \le 100\,000; 1 \le P_0, X \le 10^9)$ representing the number of days in a cycle, the price at day 0, and the price when Adrian purchased the stock, respectively. The next line contains N integers D_i $(-10^9 \le D_i \le 10^9)$ representing the price changes that repeat every N days. It is guaranteed that the sum of all D_i is negative.

Output

If a price not lower than X exists, output an integer in a single line representing the lowest price of the stock that is not lower than X. Otherwise, output -1 in a single line.

Sample Input #1

6 20 5 4 -6 -1 4 -9 -2

Sample Output #1

7

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Explanation for the sample input/output #1

The table in the description represents this example. The lowest price of the stock that is not lower than 5 is $P_9 = 7$.

Sample Input #2



Sample Output #2

1

-1

Explanation for the sample input/output #2

The lowest price of the stock that is not lower than 1 is $P_{16} = 1$.

Sample Input #3

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1 3 4
-1
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Sample Output #3

Explanation for the sample input/output #3

The current price, P_0 , is 3 and for any subsequent day, the price will never go up. Thus, it is impossible for the price to reach at least X=4.

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