Mission: Terminate Ultron

Ultron is spreading through the internet on multiple systems, and taking over control over them!

To help Thor (who has a vague idea of what a computer is) observe this battle for the internet, Tony and Bruce decide to describe the situation as a scenario that repeats itself over and over again.

A scenario is described by a sequence of n numbers d_1, d_2, …, d_n. Basically, i minutes after the scenario starts executing, the number of systems taken over by Ultron changes by d_i. So, if Ultron has taken over h systems before the i^{th} minute, then it changes to

$$h = h + d_i$$

after the i^{th} minute.

The systems are secured if number of systems hacked is less than or equal to 0.Given the number of systems taken over by Ultron before the scenarios start occuring, help Thor calculate when the Avenger's will secure the systems (if they can).

Input Format

The first line of input has two integers H and n.

- H is the number of systems Ultron has taken over before the scenarios start executing themselves.
- n is the number of changes in each scenario

The next line ha n integers d_1, d_2, …, d_n which are the terms in the sequence that describes the scenario.

Constraints

$1 \le H \le 10^{12}$

$1 \le n \le 2 \times 10^5$

$-10^6 \le d_i \le 10^6$

Output Format

Print the first minute after which the all systems are secured by the Avengers.

Print -1 if the battle continues infinitely.

Sample Input 0

```
1000 6
-100 -200 -300 125 77 -4
```

Sample Output 0

```
9
```

Explanation 0

Ultron has hacked 1000 systems before the scenario starts occuring. The scenario itself consists of 6 changes :

- 1 minute after the scenario starts, the number of systems hacked *reduces* by 100.
- 2 minutes after the scenario starts, the number of systems hacked *reduces* by 200.
- 3 minutes after the scenario starts, the number of systems hacked *reduces* by 300.
- 4 minutes after the scenario starts, the number of systems hacked *increases* by 125.
- 5 minutes after the scenario starts, the number of systems hacked *increases* by 77.
- 6 minutes after the scenario starts, the number of systems hacked *decreases* by 4.

Hence each scenario takes 6 minutes to occur. The 7^{th} minute after the start will be basically the 1^{st} minute of the scenario (since the scenario is looped).

By this, after the 9^{th} minute the number of systems hacked is -2. Since $-2 \leq 0$, it takes 9 minutes for the Avengers to secure the systems.

Sample Input 1

```
1000000000000 5
-1 0 0 0 0
```

Sample Output 1

```
4999999999996
```

Explanation 1

Ultron has hacked 1000000000000 systems before the scenario starts occuring. The scenario itself consists of 5 changes :

- 1 minute after the scenario starts, the number of systems hacked *reduces* by 1.
- 2 minutes after the scenario starts, the number of systems hacked *reduces* by 0.
- 3 minutes after the scenario starts, the number of systems hacked *reduces* by 0.
- 4 minutes after the scenario starts, the number of systems hacked *reduces* by 0.
- 5 minutes after the scenario starts, the number of systems hacked *reduces* by 0.

Hence each scenario takes 5 minutes to occur. The 5^{th} minute after the start will be basically the 1^{st} minute of the scenario (since the scenario is looped).

By this, after the $4999999999996^{\text{th}}$ minute the number of systems hacked is 0. Since $0 \leq 0$, it takes 4999999999996 minutes for the Avengers to secure the systems.

Sample Input 2

```
10 4
-3 -6 5 4
```

Sample Output 2

```
-1
```

Explanation 2

Ultron has hacked 10 systems before the scenario starts occuring. The scenario itself consists of 4 changes :

- 1 minute after the scenario starts, the number of systems hacked *reduces* by 3.
- 2 minutes after the scenario starts, the number of systems hacked *reduces* by 6.
- 3 minutes after the scenario starts, the number of systems hacked *increase* by 5.
- 4 minutes after the scenario starts, the number of systems hacked *increases* by 4.

Hence each scenario takes 5 minutes to occur. The 5^{th} minute after the start will be basically the 1^{st} minute of the scenario (since the scenario is looped).

By this, we can see that the number of systems hacked sees a net increase. As such, the Avengers can never secure all systems and the battle will continue infinitely; hence we print -1.