

ONTHERUN

Time Limit: 1 second

Memory Limit: 32 Megabytes

Problem Description

Jiahai, along with his fellow potato friends, are escaping from the Pringles' potato chip factory. But due to his inability to turn all the guards' brains into potatoes, they must now escape from the potato chip factory while avoiding detection from the guards.

The road from the Pringles' factory to the main road, which is where they want to go, is made out of N road segments. Each of these road segments contains a certain number of cars that are parked there by Pringles' employees, some of them who already have potatoes as brains. While on the run, a potato can hide behind a car to avoid detection by the guards around them. However, each car can only hide one potato.

The situation starts with P potatoes camped at the Pringles' potato chip factory. Every minute, a potato can either move one road segment towards the road, provided there is a car available for him to hide in, or maintain his current position and continuing to occupy the car he is currently hiding behind. Given a list of the number of cars in each road segment, calculate the minimum number of minutes required to move from the potato chip factory to the main road.

Input

The first line of input will contain two integers, N and P .

The second line of input will contain N integers, with the i th integer indicating the number of cars at road segment i .

Output

Your output should contain one integer, the minimum number of minutes required for all P potatoes to reach the main road without being caught.

Limits

Subtask 1 (21%): $1 \leq N, P \leq 500$. In addition, all road segments will have **one** car only.

Subtask 2 (23%): $1 \leq N, P \leq 500$.

Subtask 3 (56%): $1 \leq N, P \leq 100\,000$.

Sample Input 1

This input set adheres to the limits of Subtask 2 and 3 only.

```
5 7
4 3 2 7 3
```

Sample Output 1

```
9
```

Explanation of Input Set 1

The following table displays one of the ways to get all potatoes across all the road segments in 9 minutes. Note that the number of potatoes at each road segment is always less than or equal to the number of cars at that road segment and that potatoes can only move a maximum of one road segment forward at every minute.

time	factory	1	2	3	4	5	road
0	7	0	0	0	0	0	0
1	4	3	0	0	0	0	0
2	0	4	3	0	0	0	0
3	0	3	2	2	0	0	0
4	0	0	3	2	2	0	0
5	0	0	1	2	2	2	0
6	0	0	0	2	1	3	1
7	0	0	0	0	2	1	4
8	0	0	0	0	0	3	4
9	0	0	0	0	0	0	7

Template

You may utilize *template.cpp* to handle the input and output portions of your code.