

## 1. Ramanujan and 0

Ramanujan has a number  $N$  whose value is initially 0. In one move, he can do one of the following:

Increment  $N$  by 2 i.e.,  $N := N + 2$

Decrement  $N$  by 1 i.e.,  $N := N - 1$

He can perform **at most**  $M$  moves. He wants to determine how many distinct values can  $N$  have after performing at most  $M$  moves.

### Input Format:

Only line of input contains a single integer denoting  $M$ .

### Output Format:

Output the number of distinct values  $N$  can have after performing at most  $M$  moves.

### Constraints:

$0 \leq M \leq 1000000$

### Sample I/O:

Input 1:

1

Output 1:

3

Input 2:

2

Output 2:

6

### Explanation:

Input 1:

Ramanujan can perform at most 1 move. Therefore the final values of  $N$  can be -1, 0, 2.

Input 2:

Ramanujan can perform at most 2 moves. So possible values of  $N$  are as follows.

$N = 0$

$N = N - 1 = 0 - 1 = -1$

$N = N + 2 = 0 + 2 = 2$

$N = N - 1 = 0 - 1 = -1 \rightarrow -1 + 2 = 1$

$N = N - 1 = 0 - 1 = -1 \rightarrow -1 - 1 = -2$

$N = N + 2 = 0 + 2 = 2 \rightarrow 2 + 2 = 4$

So, total possible values of  $N$  are 0, -1, 2, 1, -2, 4. A total of 6.

## 2. Kill'em All

Harry started playing a new game called **Kill'em All**.

An army of  $N$  enemies is approaching his base. The  $i^{th}$  enemy has  $H_i$  health points. An enemy gets killed if his health points become 0.

Harry defends his base using a weapon named *Obsidian*. He can set the *Obsidian* to one of the following two modes:

- Single-Target Mode: In one second, the *Obsidian* can target **exactly one** living enemy and cause damage of at most  $X$  health points.

- Multi-Target Mode: In one second, the *Obsidian* can target **all** living enemies and cause a damage of **1** health point to each of them.

Find the **minimum** time required to kill all the enemies.

**Note:** Harry is **not allowed** to change the mode of the weapon once it is set initially.

**Input Format:**

First line of input contains two integers **N** and **X**.

Second line of input contains **N** integers separated by a space.

**Output Format:**

Print **minimum** time required to kill all the enemies.

**Constraints:**

$$1 \leq N \leq 2 \times 10^2, 1 \leq X, H_i \leq 10^2$$

**Sample I/O:**

**Input 1:**

5 4

2 2 4 1 1

**Output 1:**

4

**Input 2:**

3 5

5 4 5

**Output 2:**

3

**Input 3:**

4 4

4 4 4 4

**Output 3:**

4

**Explanation:**

For Input1,

In Single-Target Mode, all enemies can be killed in 1 second each. Thus, total time required is 5 seconds.

In Multi-Target Mode

- After one second, the health points of the enemies are: [1, 1, 3, 0, 0]. Enemies 4 and 5 are dead after one second.
- After two seconds, the health points of the enemies are: [0, 0, 2, 0, 0]
- After three seconds, the health points of the enemies are: [0, 0, 1, 0, 0]
- After four seconds, the health points of the enemies are: [0, 0, 0, 0, 0]

Thus, 4 seconds are enough to kill enemies using Multi-Target Mode. So the answer is 4 as it is minimum of (5, 4).