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Rotary Lock (Chapter 1)

Level 1

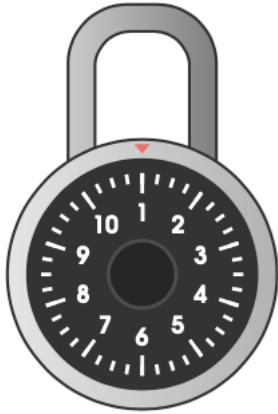
Time limit: 5s

Not started

Note: Chapter 2 is a harder version of this puzzle.

You're trying to open a lock. The lock comes with a wheel which has the integers from 1 to N arranged in a circle in order around it (with integers 1 and N adjacent to one another). The wheel is initially pointing at 1.

For example, the following depicts the lock for $N = 10$ (as is presented in the second sample case).



It takes 1 second to rotate the wheel by 1 unit to an adjacent integer in either direction, and it takes no time to select an integer once the wheel is pointing at it.

The lock will open if you enter a certain code. The code consists of a sequence of M integers, the i th of which is C_i . Determine the minimum number of seconds required to select all M of the code's integers in order.

Please take care to write a solution which runs within the time limit.

Constraints

$$3 \leq N \leq 50,000,000$$

$$1 \leq M \leq 1,000$$

$$1 \leq C_i \leq N$$

Sample test case #1

$N = 3$
 $M = 3$
 $C = [1, 2, 3]$

Expected Return Value = 2

Sample test case #2

$N = 10$
 $M = 4$
 $C = [9, 4, 4, 8]$

Expected Return Value = 11

Sample Explanation

In the first case, there are 3 integers on the lock, and the sequence of integers to be selected is $[1, 2, 3]$. One optimal way to enter the code is: select 1 \rightarrow rotate to 2 (1 second) \rightarrow select 2 \rightarrow rotate to 3 (1 second) \rightarrow select 3. The total time taken is $1 + 1 = 2$ seconds.

In the second case, the lock consists of the integers 1 through 10, and the sequence to be selected is $[9, 4, 4, 8]$. One optimal way to enter the code is: rotate from 1 backwards to 9 (2 seconds) \rightarrow select 9 \rightarrow rotate forwards to 4 (5 seconds) \rightarrow select 4 twice \rightarrow rotate forwards to 8 (4 seconds) \rightarrow select 8. The total time taken is $2 + 5 + 4 = 11$ seconds.

⚠ The code editor for solving puzzles is only available on wider screens.

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