A. Wooden Plank (plank)

Time limit: 1.0 second
Memory limit: 256 MiB

Under the blazing sun of Khwarezm, the esteemed scholar Al-Khwarizmi receives a grand mission to restore a historic monument. For this task, he is provided with a continuous wooden board of length M. On the wall where this board is to be installed, N nails are already permanently fixed in place.

The venerable mathematician insists that the universe operates in flawless harmony. To reflect this philosophy, he decides to divide the board into exactly N distinct segments such that the following rules are strictly met:

1. Every individual segment must have a strictly positive, even integer length (such as 2, 4, 6, and so forth).
2. Segments are strictly forbidden from overlapping, although sharing a common boundary point is acceptable.
3. The entire sequence of segments must fit perfectly within the boundaries of the original board, spanning from coordinate 0 to M.
4. Each segment must be held by exactly one nail. To guarantee absolute physical balance, this nail must strike the exact mathematical center of the segment. This means a segment spanning a length of $2K$ must have its corresponding nail situated exactly K units away from both of its ends.

Any portion of the original board that is not part of these N segments is considered discarded scrap. Your objective is to formulate a methodical approach to minimize the total length of this discarded wood, honoring the Master's pursuit of perfection.

Input

The initial line features two integers M and N — denoting the total length of the board and the number of nails, respectively.

The second line contains N strictly increasing integers: $A_1, A_2, \ldots, A_N$ $(0 < A_i < M)$. These values represent the exact coordinate positions of each nail measured from the left edge of the board.

Output

Print a single integer representing the minimum possible length of the discarded scrap wood. If it is mathematically impossible to assign valid segments that satisfy all the Master's rules, output `-1`.

Constraints

- $1 \leq N \leq 10^6$
- $2 \leq M \leq 10^9$

Scoring

- **Subtask 1 (10 points):** $N = 1$
- **Subtask 2 (15 points):** $N, M \leq 10$
- **Subtask 3 (20 points):** $M \leq 1000$
- **Subtask 4 (25 points):** $M \leq 10^6$
- **Subtask 5 (30 points):** No additional constraints.

Examples

standard input	standard output
10 2 2 7	0
10 2 2 4	6
5 2 1 2	-1

Explanation

Example 1: In the first scenario, the segments can perfectly span the intervals $[0, 4]$ and $[4, 10]$, utilizing lengths of 4 and 6 respectively. The combined length is exactly 10, matching the board's length perfectly, resulting in zero waste.

Example 2: Here, valid balanced segments might occupy the bounds $[1, 3]$ and $[3, 5]$, each possessing a length of 2. The total board utilized is 4 units out of 10, leaving exactly 6 units of discarded scrap.

Example 3: It is mathematically impossible to assign valid, non-overlapping even-length segments that balance perfectly on the given nail coordinates ($A_1 = 1$, $A_2 = 2$) within a board of length 5. Thus, the output must be `-1`.