You have a list arr of all integers in the range [1, n] sorted in a strictly increasing order. Apply the following algorithm on arr:

* Starting from left to right, remove the first number and every other number afterward until you reach the end of the list.
* Repeat the previous step again, but this time from right to left, remove the rightmost number and every other number from the remaining numbers.
* Keep repeating the steps again, alternating left to right and right to left, until a single number remains.

Given the integer n, return *the last number that remains in* arr.

**Example 1:**

**Input:** n = 9

**Output:** 6

**Explanation:**

arr = [1, 2, 3, 4, 5, 6, 7, 8, 9]

arr = [2, 4, 6, 8]

arr = [2, 6]

arr = [6]

**Example 2:**

**Input:** n = 1

**Output:** 1

**Constraints:**

* 1 <= n <= 109