

2477. Number of Ways to Reach a Position After Exactly k Steps

Difficulty : Medium

<https://leetcode.com/problems/number-of-ways-to-reach-a-position-after-exactly-k-steps>

You are given two **positive** integers `startPos` and `endPos`. Initially, you are standing at position `startPos` on an **infinite** number line. With one step, you can move either one position to the left, or one position to the right.

Given a positive integer `k`, return *the number of **different** ways to reach the position `endPos` starting from `startPos`, such that you perform **exactly** `k` steps*. Since the answer may be very large, return it **modulo** $10^9 + 7$.

Two ways are considered different if the order of the steps made is not exactly the same.

Note that the number line includes negative integers.

Example 1:

Input: `startPos = 1, endPos = 2, k = 3`

Output: 3

Explanation: We can reach position 2 from 1 in exactly 3 steps in three ways:

- 1 -> 2 -> 3 -> 2.

- 1 -> 2 -> 1 -> 2.

- 1 -> 0 -> 1 -> 2.

It can be proven that no other way is possible, so we return 3.

Example 2:

Input: `startPos = 2, endPos = 5, k = 10`

Output: 0

Explanation: It is impossible to reach position 5 from position 2 in exactly 10 steps.

Constraints:

- $1 \leq \text{startPos}, \text{endPos}, k \leq 1000$