

1996. Number of Ways to Rearrange Sticks With K Sticks Visible

Difficulty : Hard

<https://leetcode.com/problems/number-of-ways-to-rearrange-sticks-with-k-sticks-visible>

There are n uniquely-sized sticks whose lengths are integers from 1 to n . You want to arrange the sticks such that **exactly** k sticks are **visible** from the left. A stick is **visible** from the left if there are no **longer** sticks to the **left** of it.

- For example, if the sticks are arranged $[1, \underline{3}, 2, \underline{5}, 4]$, then the sticks with lengths 1, 3, and 5 are visible from the left.

Given n and k , return *the **number** of such arrangements*. Since the answer may be large, return it **modulo** $10^9 + 7$.

Example 1:

Input: $n = 3, k = 2$

Output: 3

Explanation: $[1, \underline{3}, 2]$, $[2, \underline{3}, 1]$, and $[2, 1, \underline{3}]$ are the only arrangements such that exactly 2 sticks are visible. The visible sticks are underlined.

Example 2:

Input: $n = 5, k = 5$

Output: 1

Explanation: $[1, \underline{2}, \underline{3}, \underline{4}, \underline{5}]$ is the only arrangement such that all 5 sticks are visible. The visible sticks are underlined.

Example 3:

Input: $n = 20, k = 11$

Output: 647427950

Explanation: There are 647427950 (mod $10^9 + 7$) ways to rearrange the sticks such that exactly 11 sticks are visible.

Constraints:

- $1 \leq n \leq 1000$
- $1 \leq k \leq n$