

276. Paint Fence

Medium

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You are painting a fence of  $n$  posts with  $k$  different colors. You must paint the posts following these rules:

- Every post must be painted **exactly one** color.
- There **cannot** be three or more **consecutive** posts with the same color.

Given the two integers  $n$  and  $k$ , return the **number of ways** you can paint the fence.

Example 1:

Input:  $n = 3, k = 2$   
Output: 6  
Explanation: All the possibilities are shown. Note that painting all the posts red or all the posts green is invalid because there cannot be three posts in a row with the same color.

Example 2:

Input:  $n = 1, k = 1$   
Output: 1

Example 3:

Input:  $n = 7, k = 2$   
Output: 42

- Constraints:
- $1 \leq n \leq 50$
  - $1 \leq k \leq 10^5$
  - The testcases are generated such that the answer is in the range  $[0, 2^{31} - 1]$  for the given  $n$  and  $k$ .

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```
1 class Solution {
2     public int numWays(int n, int k) {
3         if (n == 1) return k;
4
5         int twoPostsBack = k;
6         int onePostBack = k * k;
7
8         for (int i = 3; i <= n; i++) {
9             int curr = (k - 1) * (onePostBack + twoPostsBack);
10            twoPostsBack = onePostBack;
11            onePostBack = curr;
12        }
13        return onePostBack;
14    }
15 }
16 }
```