

3405. Count the Number of Arrays with K Matching Adjacent Elements

Hard

Topics

Companies

Hint

You are given three integers n , m , k . A **good array** arr of size n is defined as follows:

- Each element in arr is in the **inclusive** range $[1, m]$.
- Exactly k indices i (where $1 \leq i < n$) satisfy the condition $arr[i - 1] == arr[i]$.

Return the number of **good arrays** that can be formed.

Since the answer may be very large, return it **modulo** $10^9 + 7$.

Example 1:

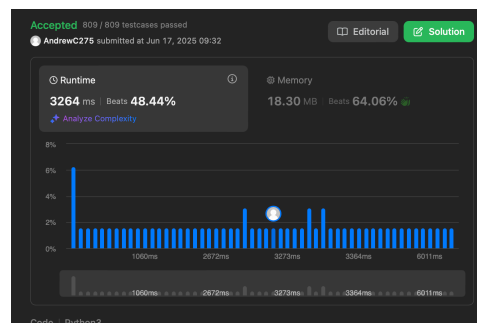
Input: $n = 3, m = 2, k = 1$

Output: 4

Explanation:

- There are 4 good arrays. They are $[1, 1, 2]$, $[1, 2, 2]$, $[2, 1, 1]$ and $[2, 2, 1]$.
- Hence, the answer is 4.

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1 class Solution:
2     def countGoodArrays(self, n: int, m: int, k: int) -> int:
3
4         MOD = 10**9 + 7
5         comb = math.comb(n - 1, k)
6         return comb * m * pow(m - 1, n - k - 1, MOD) % MOD
```



- choose k positions to insert $=$ into $n-1$ spaces
 - each of the remaining $n - k - 1$ groups must have different value from the previous one, so each have $m - 1$ options, then modulo MOD
 - m is the options for the first segment
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- $\text{pow}(\text{base}, \text{exponent}, \text{modulus})$