

Problem 1420: Build Array Where You Can Find The Maximum Exactly K Comparisons

Problem Information

Difficulty: Hard

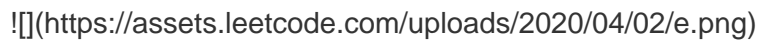
Acceptance Rate: 66.17%

Paid Only: No

Tags: Dynamic Programming, Prefix Sum

Problem Description

You are given three integers n , m and k . Consider the following algorithm to find the maximum element of an array of positive integers:



You should build the array arr which has the following properties:

arr has exactly n integers. $1 \leq arr[i] \leq m$ where $(0 \leq i < n)$. After applying the mentioned algorithm to arr , the value $search_cost$ is equal to k .

Return the number of ways to build the array arr under the mentioned conditions. As the answer may grow large, the answer must be computed modulo $10^9 + 7$.

Example 1:

Input: $n = 2, m = 3, k = 1$ **Output:** 6 **Explanation:** The possible arrays are [1, 1], [2, 1], [2, 2], [3, 1], [3, 2], [3, 3]

Example 2:

Input: $n = 5, m = 2, k = 3$ **Output:** 0 **Explanation:** There are no possible arrays that satisfy the mentioned conditions.

Example 3:

****Input:**** n = 9, m = 1, k = 1 ****Output:**** 1 ****Explanation:**** The only possible array is [1, 1, 1, 1, 1, 1, 1, 1, 1]

****Constraints:****

*`1 <= n <= 50` *`1 <= m <= 100` *`0 <= k <= n`

Code Snippets

C++:

```
class Solution {
public:
    int numOfArrays(int n, int m, int k) {

    }
};
```

Java:

```
class Solution {
    public int numOfArrays(int n, int m, int k) {

    }
}
```

Python3:

```
class Solution:
    def numOfArrays(self, n: int, m: int, k: int) -> int:
```