

Problem 1735: Count Ways to Make Array With Product

Problem Information

Difficulty: Hard

Acceptance Rate: 53.79%

Paid Only: No

Tags: Array, Math, Dynamic Programming, Combinatorics, Number Theory

Problem Description

You are given a 2D integer array, `queries`. For each `queries[i]`, where `queries[i] = [ni, ki]`, find the number of different ways you can place positive integers into an array of size `ni` such that the product of the integers is `ki`. As the number of ways may be too large, the answer to the `i`th query is the number of ways **modulo** `109 + 7`.

Return `an integer array answer` where `answer.length == queries.length`, and `answer[i]` is the answer to the `i`th query.

Example 1:

Input: `queries = [[2,6],[5,1],[73,660]]` **Output:** `[4,1,50734910]` **Explanation:** Each query is independent. `[2,6]`: There are 4 ways to fill an array of size 2 that multiply to 6: `[1,6]`, `[2,3]`, `[3,2]`, `[6,1]`. `[5,1]`: There is 1 way to fill an array of size 5 that multiply to 1: `[1,1,1,1,1]`. `[73,660]`: There are 1050734917 ways to fill an array of size 73 that multiply to 660. `1050734917 modulo 109 + 7 = 50734910`.

Example 2:

Input: `queries = [[1,1],[2,2],[3,3],[4,4],[5,5]]` **Output:** `[1,2,3,10,5]`

Constraints:

`1 <= queries.length <= 104`, `1 <= ni, ki <= 104`

Code Snippets

C++:

```
class Solution {  
public:  
    vector<int> waysToFillArray(vector<vector<int>>& queries) {  
  
    }  
};
```

Java:

```
class Solution {  
    public int[] waysToFillArray(int[][] queries) {  
  
    }  
}
```

Python3:

```
class Solution:  
    def waysToFillArray(self, queries: List[List[int]]) -> List[int]:
```