Problem 1434: Number of Ways to Wear Different Hats to Each Other

Problem Information

Difficulty: Hard
Acceptance Rate: 45.21%
Paid Only: No
Tags: Array, Dynamic Programming, Bit Manipulation, Bitmask

Problem Description

There are `n` people and `40` types of hats labeled from `1` to `40`.

Given a 2D integer array `hats`, where `hats[i]` is a list of all hats preferred by the `ith` person.

Return the number of ways that `n` people can wear **different** hats from each other.

Since the answer may be too large, return it modulo `109 + 7`.

Example 1:

Input: hats = [[3,4],[4,5],[5]] **Output:** 1 **Explanation:** There is only one way to choose hats given the conditions. First person choose hat 3, Second person choose hat 4 and last one hat 5.

Example 2:

Input: hats = [[3,5,1],[3,5]] **Output:** 4 **Explanation:** There are 4 ways to choose hats: (3,5), (5,3), (1,3) and (1,5)

Example 3:

Input: hats = [[1,2,3,4],[1,2,3,4],[1,2,3,4],[1,2,3,4]] **Output:** 24 **Explanation:** Each person can choose hats labeled from 1 to 4. Number of Permutations of (1,2,3,4) = 24.

Constraints:

* `n == hats.length` * `1 <= n <= 10` * `1 <= hats[i].length <= 40` * `1 <= hats[i][j] <= 40` * `hats[i]` contains a list of **unique** integers.

Code Snippets

C++:

```
class Solution {
public:
int numberWays(vector<vector<int>>& hats) {

}
};
```

Java:

```
class Solution {
public int numberWays(List<List<Integer>> hats) {

}
}
```

Python3:

```
class Solution:
def numberWays(self, hats: List[List[int]]) -> int:
```