Q)..Number of Ways to Wear Different Hats to Each Other

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 the n people wear different hats to 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

Program:

```
MOD = 10**9 + 7
def numberWays(hats):

    preferences = {}
    for i, person_hats in enumerate(hats):
        for hat in person_hats:
            if hat not in preferences:
                preferences[hat] = []
            preferences[hat].append(i)
    n = len(hats)
    dp = [0] * (1 << n)
    dp[0] = 1
    for hat in range(1, 41):
```

```
        if hat in preferences:
            for i in range(len(dp) - 1, -1, -1):
                for person in preferences[hat]:
                    if not (i & (1 << person)):
                        dp[i | (1 << person)] += dp[i]
                        dp[i | (1 << person)] %= MOD
    return dp[(1 << n) - 1]
hats = [[3, 4], [4, 5], [5]]
print(numberWays(hats))
```

Output:

Time complexity:O(1)