39) 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 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)

CODE:

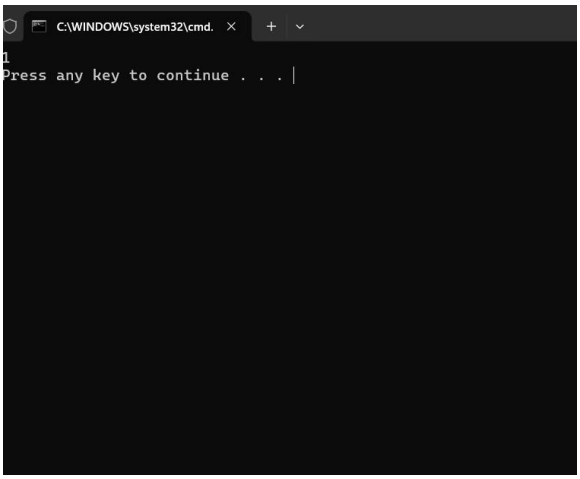
```
def
countWaysToWearHats(hats):
MOD = 10**9 + 7     n =
len(hats)     dp = [0] * (1 <<
n)     dp[0] = 1

   hat_to_people = [[] for _ in range(41)]
for i in range(n):         for hat in hats[i]:
hat_to_people[hat].append(i)
    for hat in range(1, 41):         for state in
range((1 << n) - 1, -1, -1):             for person in
hat_to_people[hat]:                 if state & (1 <<
person):                     continue
                dp[state | (1 << person)] += dp[state]
dp[state | (1 << person)] %= MOD

   return dp[(1 << n) - 1]

hats1 = [[3, 4], [4, 5], [5]]
print(countWaysToWearHats(hats1))
```

OUTPUT:



TIME COMPLEXITY : $O(2^n+n)$