

9. 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:-

```
def numberWaysToWearHatsMemoization(hats):
    MOD = 10**9 + 7
    n = len(hats)
    all_hats = 1 << 40
    memo = {}

    def dfs(person, hat_mask):
        if person == n:
            return 1

        if (person, hat_mask) in memo:
            return memo[(person, hat_mask)]

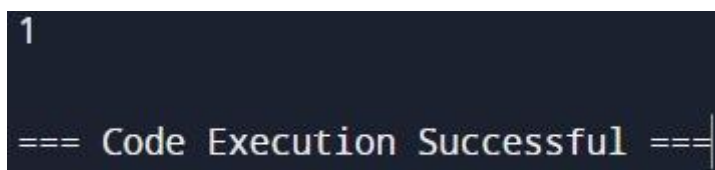
        ways = 0
        for hat in hats[person]:
            if not (hat_mask >> hat) & 1:
                ways = (ways + dfs(person + 1, hat_mask | (1 << hat))) % MOD

        memo[(person, hat_mask)] = ways
        return ways

    return dfs(0, 0)

# Example
hats = [[3, 4], [4, 5], [5]]
print(numberWaysToWearHatsMemoization(hats)) # Output: 1
```

OUTPUT:-



```
1
=== Code Execution Successful ===
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TIME COMPLEXITY:-O(2ⁿ+log n)