

Statistics

Problem Statement

Problem Statement for DistinguishableSetDiv1

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There are N people. Each of them was given the same survey that consisted of M questions. The people were numbered 0 through $N-1$, and the questions were numbered 0 through $M-1$. Each person answered each question by choosing one of the provided options. For each question, the options were labeled using distinct uppercase letters ('A'-'Z').

You are given the responses to the survey: a `String[] answer` with N elements, each consisting of M characters. For each i and j , `answer[i][j]` is the answer person i chose for question j .

A set of questions is called a *distinguishable set* if we can use it to distinguish between any two of our N people. Formally, a distinguishable set of questions has the property that no two people have the same sequence of responses to those questions.

The set of questions used in the survey has exactly 2^M subsets. Count how many of those subsets are distinguishable sets, and return that count.

Definition

Class: `DistinguishableSetDiv1`
 Method: `count`
 Parameters: `String[]`
 Returns: `int`
 Method signature: `int count(String[] answer)`
 (be sure your method is public)

Constraints

- N will be between 2 and 1000, inclusive.
- M will be between 1 and 20, inclusive.
- `answer` will contain exactly N elements, inclusive.
- Each element in `answer` will contain exactly M characters, inclusive.
- Each character in `answer` will be a uppercase letter ('A'-'Z').

Examples

0)
`{"AA", "AB", "CC"}`
 Returns: 2

There are 4 subsets of questions: $\{\}$, $\{0\}$, $\{1\}$, and $\{0,1\}$. Let's look at each of them separately.

- For the empty subset $\{\}$ each person gave the same sequence of answers (an empty sequence).
- For the subset $\{0\}$ the answers given by the three people were "A", "A", and "C". Note that two of the people gave the same response.
- For the subset $\{1\}$ the answers given by the three people were "A", "B", and "C". Note that all three responses are distinct.
- For the subset $\{0,1\}$ the answers given by the three people were "AA", "AB", and "CC". Again, note that all three responses are distinct.

Thus, there are 2 distinguishable sets: $\{1\}$ and $\{0,1\}$.

1)
`{"XYZ", "XYZ", "XYZ"}`
 Returns: 0

Each person gave exactly the same sequence of answers. Thus, no subset of questions is

a distinguishable set. The correct return value in such a case is 0.

2)

`{"AAAA", "BACA", "CDCE"}`

Returns: 11

Among the 16 possible subsets of these questions there are 11 distinguishable sets. The five subsets of questions that are *not* distinguishable sets are {}, {1}, {2}, {3}, and {1,3}.

3)

`{"XYZ", "XAB", "YAC"}`

Returns: 5