

Ore Mining (800 points)

Introduction

A mining operation has discovered deposits of N different kinds of liquid ore, which they have labeled n_i for $0 \leq i < N$. The deposits are spread throughout M sheets of rock, which have been labeled m_j for $0 \leq j < M$.

To simplify the problem, let us imagine we are looking at a cross section of the rock which has been divided into N columns and M rows, for a total of $N \cdot M$ cells. Each type of ore n_i appears exactly once in each sheet of rock m_j (i.e. once per row).

The crew needs to drill paths from the top layer m_0 to the bottom layer m_{M-1} such that each path connects deposits of one type of ore n_i across all M layers.

In the example below with $N=6$ and $M=5$, you can see the best option is to drill 4 paths, for ores n_1 , n_2 , n_3 , and n_5 .

m_0	n_0	n_1	n_2	n_3	n_4	n_5
m_1	n_1	n_0	n_2	n_3	n_4	n_5
m_2	n_0	n_1	n_2	n_3	n_4	n_5
m_3	n_0	n_1	n_2	n_4	n_3	n_5
m_4	n_1	n_2	n_0	n_3	n_5	n_4

Let us define a valid path for ore n_i as $M-1$ line segments, each of which connects a deposit of ore n_i in layer m_j to the deposit of ore n_i in layer m_{j+1} , such that no line segment intersects the line segment of another path. There should be no more than 1 path per type of ore.

What is the **maximum number of valid paths** that can be drilled by the above definition?

Input Specifications

The first line will contain two space-separated integers, N and M , where $1 \leq N < 1000$ and $2 \leq M < 1000$.

The next M lines will contain N space-separated, case-sensitive names of ore types (all names are 20 alphabetic characters or fewer). The same N names will appear on each line, although possibly not necessarily in the same order.

Output Specifications

The maximum number of paths which can be drilled and considered valid by the above criteria.

Sample Input/Output

Input

```
3 2
A B C
A C B
```

Output

```
2
```

Explanation

Here we have two ways to drill 2 paths: {A, B} or {A, C}.

Input

```
3 2
Alpha Beta Gamma
Alpha Beta Gamma
```

Output

```
3
```

Explanation

Here we have one way to drill 3 paths: {Alpha, Beta, Gamma}.

Input

```
3 3
A B C
B C A
C A B
```

Output

```
1
```

Explanation

Here we have three ways to drill 1 path: {A} or {B} or {C}.

Input

5 3
A B C D E
A C E B D
A B D C E

Output

3

Explanation

Here we have two ways to drill 3 paths: {A, B, D} or {A, C, E}.