Problem J. RANDOM

Time limit 2000 ms
Mem limit 1048576 kB

Problem Statement

You are given patterns S and T consisting of `#` and `.`, each with H rows and W columns. The pattern S is given as H strings, and the j-th character of S_i represents the element at the i-th row and j-th column. The same goes for T.

Determine whether S can be made equal to T by rearranging the columns of S.

Here, rearranging the columns of a pattern X is done as follows.

- Choose a permutation $P = (P_1, P_2, \ldots, P_W)$ of $(1, 2, \ldots, W)$.
- Then, for every integer i such that $1 \leq i \leq H$, simultaneously do the following.
  - For every integer j such that $1 \leq j \leq W$, simultaneously replace the element at the i-th row and j-th column of X with the element at the i-th row and P_j-th column.

Constraints

- H and W are integers.
- $1 \leq H, W$
- $1 \leq H \times W \leq 4 \times 10^5$
- S_i and T_i are strings of length W consisting of `#` and `.`.

Input

The input is given from Standard Input in the following format:

$$
\begin{aligned}
&H\ W\\
&S_1\\
&S_2\\
&\vdots\\
&S_H\\
&T_1\\
&T_2\\
&\vdots\\
&T_H
\end{aligned}
$$

Output

If S can be made equal to T, print `Yes`; otherwise, print `No`.

Sample 1

Input	Output
3 4 ##.# ##.. #... .### ..## ...#	Yes

If you, for instance, arrange the 3-rd, 4-th, 2-nd, and 1-st columns of S in this order from left to right, S will be equal to T.

Sample 2

Input	Output
3 3 #.# .#. #.# ##. ##. .#.	No

In this input, S cannot be made equal to T.

Sample 3

Input	Output
2 1 # . # .	Yes

It is possible that $S = T$.

Sample 4

Input	Output
8 7 #..#..# .##.##. #..#..# .##.##. #..#..# .##.##. #..#..# .##.##. ....### ####... ....### ####... ....### ####... ....### ####...	Yes