

# Spinning Roulettes

Input file:            **standard input**  
Output file:         **standard output**  
Time limit:          0.4 seconds  
Memory limit:       128 megabytes

Kida has found herself in the casino again! In front of her, there are  $N$  roulettes, each having  $M$  pins. Each of the  $M$  pins of a roulette wheel is coded by a lowercase letter of the English alphabet.

Kida considers two roulettes to be similar if the configuration of the pins of the first roulette can be obtained on the second roulette by shifting left or right all the pins of the second roulette an arbitrary number of times. Note that each shift is a cyclic shift.

For example *abca* can be obtained from *caab*, but *abac* or *aacb* cannot be obtained from *abca*.

Kida asks you to count the number of unordered pairs of similar roulettes.

## Input

The first line contains two integers  $N$  and  $M$  ( $1 \leq N * M \leq 10^6$ ). Each of the following  $N$  lines contains a string of  $M$  characters representing a roulette.

For tests worth 20 points:  $N \leq 100$ ,  $M \leq 100$ .

For tests worth 20 more points:  $N \leq 500$ ,  $M \leq 500$

For tests worth 60 more points: No additional limitations.

## Output

You need to write a single integer, representing the number of unordered pairs of similar roulettes.

## Examples

standard input	standard output
4 4 abcd xbcd cdab dabc	3
3 6 adaada aaadda aadaad	1

## Note

In the **first sample case**, the 3 pairs are (0, 2), (0, 3) and (2, 3).

In the **second sample case**, the only pair is (0, 2).