Lazy World Map

The new expansion to your favourite RPG game has just been released! It is called *Infernal Creatures'
Paradise: Clanwars* (ICPC), and this new expansion finally enables the players to join factions and
participate in cool social activities like massacres and mass slaughters.

The world map of the game can be modeled as a grid of square cells, where each grid belongs to one of
the factions. Traveling in the game world takes a lot of time, so you don't even know the exact number
of factions present in the game. However, after playing for a while, you realized that the developers were
lazy, and just procedurally generated all of the factions using a simple algorithm:

- First, they took an $N \times M$ grid of cells and assigned each square a character between A and Z.

- Then, based on this map piece, an $NA \times NB$ grid was formed by placing copies of the original grid
  A times below and B times in parallel to the original piece.

- Finally, the factions are formed using the following rule: two squares belong to the same faction if
  and only if there is a path between them consisting of horizontally or vertically adjacent squares,
  with each square having the same character.

Knowing the size of the world map and the layout of the original $N \times M$ grid piece, you want to compute
the total number of factions present in the game.

Input

The first line contains four integers N, M, A and B ($1 \le N, M \le 20$, $1 \le A, B \le 10^9$).

The following N lines describe the original piece of the grid. Each row contains a string of length M
with uppercase latin characters.

Output

Print a single line containing the number factions. Since the answer can be large, output it modulo
$10^9 + 7$.

Examples

input	output
3 2 2 5 AB BA AA	27

Explanation

The world map is the following grid of 6×10 cells:

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ABABABABAB
BABABABABA
AAAAAAAAAA
ABABABABAB
BABABABABA
AAAAAAAAAA
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Each of the 20 B characters belong to a different faction, similarly to the 5 A characters in the first row. There are two more factions, one consists of every cell with character A in the second, third and fourth rows, and the other consists of the cells with character A in the last two rows.

So there are a total of $20 + 5 + 2 = 27$ factions.