Coloring Tiles

Time limit: *6000 ms*
Memory limit: *256 MB*

There is a wall of N rows and M columns of tiles. Some tiles on the wall are *colorable*, while the others are *non-colorable*. You are to color all the colorable tiles using C types of color pigments. Each type of color pigment has a unique color. Every colorable cell needs to be in one of these C colors. Additionally, there should be no three colorable cells within any 2×2 square that have a same color. In how many ways (modulo $1\,000\,000\,007$) can you color the entire wall?

Standard input

The input has a single integer T on the first line, the number of test cases.

Each test case has three integers N, M, C on the first line. The next N lines each has M characters describing one row of the wall. Each character is either a dot `.`, denoting a colorable tile, or a hash `#`, denoting a non-colorable tile.

Standard output

For each test case, output the number of ways to color the wall modulo $1\,000\,000\,007(10^9 + 7)$ on a single line.

Constraints and notes

- $1 \leq T \leq 10$
- $N, M \geq 2$
- $N \times M \leq 75$
- $2 \leq C \leq 4$
- There is at least one colorable tile on the wall.
- For 50% of the test files, $N = 2$.

Input	Output	Explanation

<table>
<tr><th>Input</th><th>Output</th><th>Explanation</th></tr>
<tr>
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```
3
2 2 2
..
..
2 3 3
...
...
2 6 4
..#..#
...#..
```

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```
6
342
177840
```

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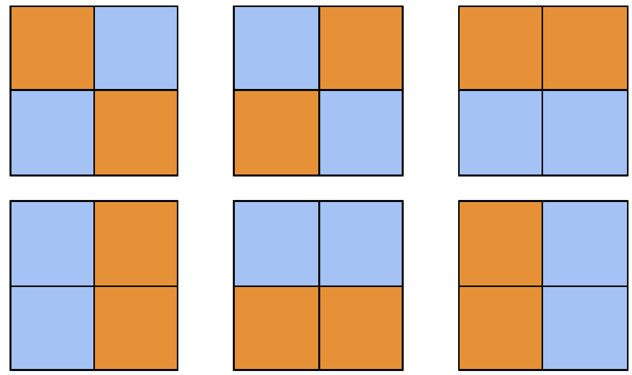
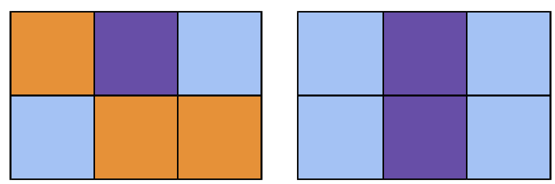
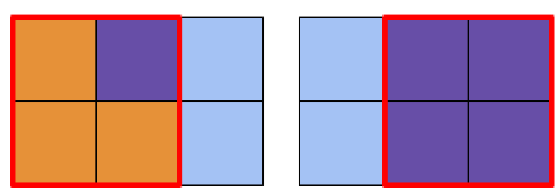
- Case 1: The illustration shows the 6 different ways of coloring a 2×2wall using $C = 2$ colors.



- Case 2: There are 342 different ways, which are too many to enumerate here. Here are two valid ways to color the 2×3wall with $C = 3$ colors:



Here are two invalid ways. They are invalid because the highlighted red 2×2 square contains three cells of a same color.



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