Problem C
Checkerboard Splitting

Time limit: 2 seconds
Memory limit: 2048 megabytes

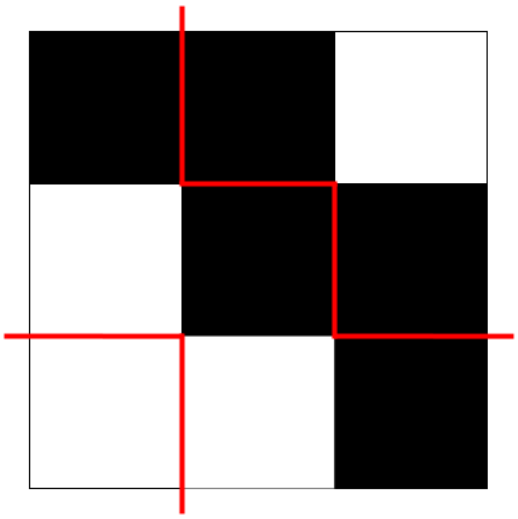
Problem Description

You are given a checkerboard with n row and m columns. The rows are numbered from 1 to n from top to bottom, and the columns are numbered from 1 to m from left to right. Each cell is identified by a pair (x, y), which means that it is located in the x^{th} row and the y^{th} column.

Initially, each cell is either black, white, or gray. You would like to paint every gray cell black or white, each with probability $\frac{1}{2}$. After that, you calculate the beauty of the board. The beauty of the board is calculated as follows:

1. First, check if there exists two positive integers i and j such that $1 \le i \le n-1$, $2 \le j \le m$, and the cells at (i, j) and $(i+1, j-1)$ have the same color. The beauty of the board is 0 if this is true.
2. Otherwise, the beauty of the board is the minimum number of the polyominos the checkerboard has to be split into, such that every pair of adjacent cells in each polyomino have different colors. A polyomino is a connected figure formed by joining one or more adjacent cells. Two cells are called adjacent if and only if they share an edge.

For example, the following checkerboard has a beauty of 3, and you can split the checkerboard into 3 polyominos by cutting along the red lines. Every pair of adjacent cells in each polyomino have different colors.



What is the expected value of the checkerboard's beauty after painting all gray cells?

Input Format

The first line contains two integers n and m. Then n lines follow, each containing m characters. The j^{th} character on the i^{th} line denotes the color of the cell at (i, j). Each character is one of

{B, W, ?} which represent the colors black, white and gray, respectively.

Output Format

Print the expected value of the checkerboard's beauty modulo 998244353.

In other words, let's write the answer as an irreducible fraction $\frac{p}{q}$, where p and q are integers and $q \not\equiv 0 \pmod{998244353}$. Print the integer x such that $0 \leq x < 998244353$ and $x \cdot q \equiv p \pmod{998244353}$.

Technical Specification

- $1 \leq n, m \leq 10^6$
- $1 \leq n \times m \leq 10^6$

Sample Input 1

```
3 5
WBWBB
WBWWW
WBBBB
```

Sample Output 1

```
4
```

Sample Input 2

```
2 2
??
??
```

Sample Output 2

```
1
```

Sample Input 3

```
3 2
?B
B?
??
```

Sample Output 3

```
0
```

Sample Input 4

```
3 7
?B????W
??????B
B??????
```

Sample Output 4

```
997025793
```