COI '16 #2 Raspad

Time limit: 6.0s **Memory limit:** 1G

A nearby meadow consists of quadratic *fields* organized in n rows and m columns. The rows are denoted with numbers from 1 to n from top to bottom, and the columns with numbers from 1 to m from left to right. Some fields are grass fields (denoted with `1`), whereas some are underwater because of the heavy spring rainfall (denoted with `0`). Two grass fields are *connected* if it is possible to get from one field to another using a series of moves where, in each step, we move to the adjacent grass field located up, down, left or right. A *component* is a set of mutually connected grass fields that is *maximal* in the sense that, if A is a field in the component K, then all the adjacent grass fields of A are also in the component K.

For a given meadow P and indices a and b $(1 \leq a \leq b \leq n)$, P_b^a is a meadow consisting of rows between the a^{th} and the b^{th} row of the original meadow P (including both a^{th} and b^{th} row). The *complexity* of meadow P_b^a is the number of components of the grass fields located on the meadow. Determine the sum of the complexities of all possible meadows P_b^a.

Input Specification

The first line of input contains the positive integers n and m — dimensions of the meadow. Each of the following n lines contains a string of exactly m characters that denotes one row of the meadow. Each character of the string is either the digit `0` or the digit `1`.

Output Specification

You must output the required sum of all complexities.

Constraints

Subtask	Score	Constraints
1	9	$n \leq 100, m \leq 50$
2	17	$n \leq 1\,000, m \leq 50$
3	35	$n \leq 100\,000, m \leq 15$
4	39	$n \leq 100\,000, m \leq 50$

Sample Input 1

```
4 4
1101
1111
1010
1011
```

Sample Output 1

```
14
```

Explanation for Sample Output 1

If we denote the complexity of meadow P_b^a with $|P_b^a|$ then it holds that $|P_1^1| = 2, |P_2^1| = 1, |P_3^1| = 1, |P_4^1| = 1, |P_2^2| = 1, |P_3^2| = 1, |P_4^2| = 1, |P_3^3| = 2, |P_4^3| = 2, |P_4^4| = 2$, and the sum of these numbers is 14.

Sample Input 2

```
5 7
0100010
0111110
0101001
1111011
0100100
```

Sample Output 2

```
33
```

Sample Input 3

```
4 12
011111010111
110000101001
110111101111
111101111111
```

Sample Output 3

```
28
```